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### **VISION**

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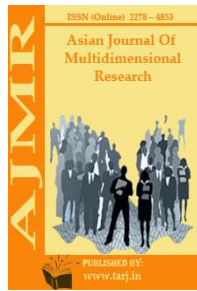
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**A STUDY ON ATTITUDE OF MIDDLE-CLASS INVESTORS TOWARDS  
VARIOUS INVESTMENT AVENUES IN WESTERN REGION**

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**ABSTRACT**

*Investment forms an important part of the economy and support of earning income and appreciation. With the savings invested in various options available to the people, the money acts as the driver for growth of the country. One needs to invest and earn return on their idle resources and generate a specified sum of money for a specific goal in life and make a provision for an uncertain future. One of the important reasons why one needs to invest wisely is to meet the cost of inflation. The cost of living is simply what it cost to buy the goods and services you need to live. The sooner one starts investing the better. It is very important to analyse the attitude of Investors who they are and in which form they are investing their idle resources. This paper focuses on analysing the attitude of the Middle-class investors of western part of India and their preferences of the investment avenues. The paper highlights the behaviour patterns and preference of the investment avenues of Middle-class investors of few cities in Western Region of India. The study will help in identifying the investment options which the investors prefer and to adopt proper strategies to earn good profits by various Financial Institutions.*

**KEYWORDS:** Attitude Avenues, Investment, Investors, Savings

## INTRODUCTION

Investment is the engagement of funds with the aim of achieving additional income or growth in value. Investment involves 'waiting' for rewards and commitment of resources which have been saved or put away from current consumption so that some profits will produce in future. It is always recommended to the investors to decide rationally without the emotions and personal feelings interferences i.e. to decide on real bases. Behavioural finance has become an integral part of decision-making process because it heavily influences the investor's attitude. One of the significant reasons why investors need to invest wisely is to meet the cost of inflation. Inflation causes drop in value of money to drop as it will not buy the same amount of a good or service in the future as it does in present or did in the past. The sooner one starts investing the better profits earn. By investing early, investors allow the investments more time to grow and produce good returns. The three golden rules for all investors are:

- Start investing early.
- Do invest regularly.
- Investment should be done for long term and not for short term.

The various investment avenues available for the investment are:

- Equity
- FI Bonds
- Corporate Debenture
- Company Fixed deposits
- Bank Fixed deposits
- PPF
- Life Insurance
- Post Office-NSC
- Gold/Sliver
- Real Estate
- Mutual Funds

## LITERATURE REVIEW

Avinash Kumar Singh (2006) studied "Investment Pattern of People" undertaken to analyse the investment pattern of people in Bangalore city and Bhubaneswar analysis of the study was undertaken with the help of survey conducted. After analysis and interpretation of data it is concluded that in Bangalore investors are more aware about various investment avenues & the risk associated with that. All the age groups give more important to invest in equity & except people those who are above 50 give important to insurance, fixed deposits and tax saving benefits.

Sunil Gupta (2008) studied the investment pattern among different groups in Shimla had revealed a clear as well as a complex picture. The complex picture means that the people are not aware about the different investment avenues and they did not respond positively, probably it was difficult for them to understand the different avenues. The study showed that the more investors in the city prefer to deposit their surplus in banks, post offices, fixed deposits, saving accounts and different UTI schemes, etc.

Securities and Exchange Board of India (SEBI) and NCAER (2000) 'Survey of Indian Investors' has reported that safety and liquidity were the primary considerations which determined the choice of an asset. Ranked by an ascending

order of risk perception fixed deposit accounts in bank were considered very safe, followed by gold, units of UTI-US64, fixed deposits of non-government companies, mutual funds, equity shares, and debentures.

Brown, Ivkovic, Smith, and Weisbenner (2008) found in their study that Individual's financial investment decisions might be stimulated by approval from peers and family and they found it easier to learn about taking financial decisions by discussing with their friends than by using other mechanism. Even without verbal commendation or suggestion, people observed the behavior of others and learned in the course of interaction with them.

Funfgeld and Wang (2009) conducted a study on the financial attitude and behaviour of German-speaking part of Switzerland on daily financial affairs. The paper revealed five underlying dimensions on financial attitudes and behaviour, i.e. anxiety, interests in financial issues, decision styles, need for precautionary savings and spending tendency. Moreover, gender, age, and education were found to have significant impacts. Graham et al. (2009) have recognized that perceived expertise leads to overconfidence among investors regarding investing their hard-earned money.

## RESEARCH GAP

From the analysis of earlier literature in relation to present topic it is found that only few studies focused on studying attitude of investors but no studies specifically focused on attitude of Middle-class investors region-wise. So present study is intended to study behavior patterns and preference of Middle-class investors of Western region of India.

## OBJECTIVE OF THE STUDY

- To study the behaviour patterns of investors of middle-class families of Western Region.
- To know the preference of the investment instruments of middle class of Western region of India.

## SCOPE OF THE STUDY

The study will attempt to study the investing behaviour and investment preferences of the investors of middle-class families of selected cities of western region of India. The study will help Banks, Non-banking and other companies to identify the investment options which the investors prefer and to adopt proper strategies to earn good profits.

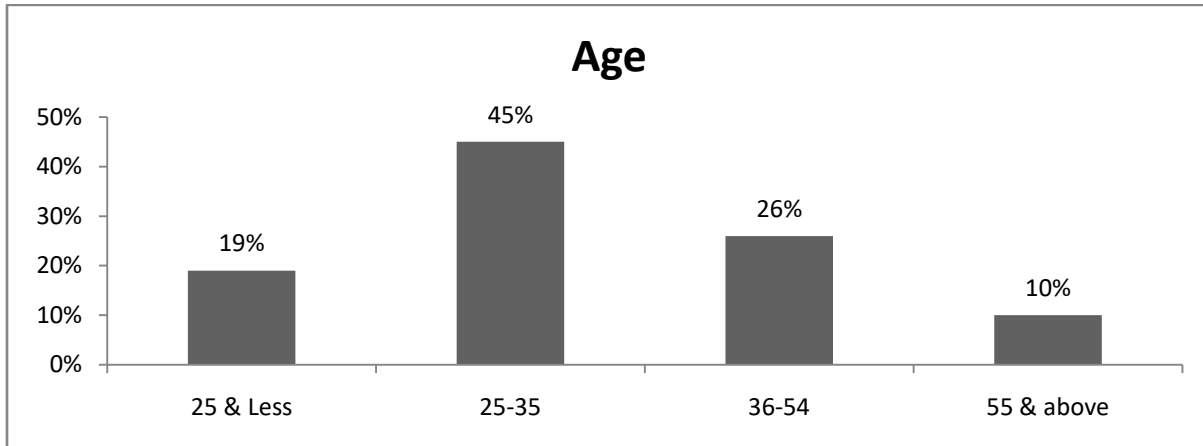
**Sample Size:** 250 Respondents from cities of Western region

**Data collection:** Questionnaire through Electronic mail and social media.

## DATA ANALYSIS AND INTERPRETATION

### 1. Age of the Respondents

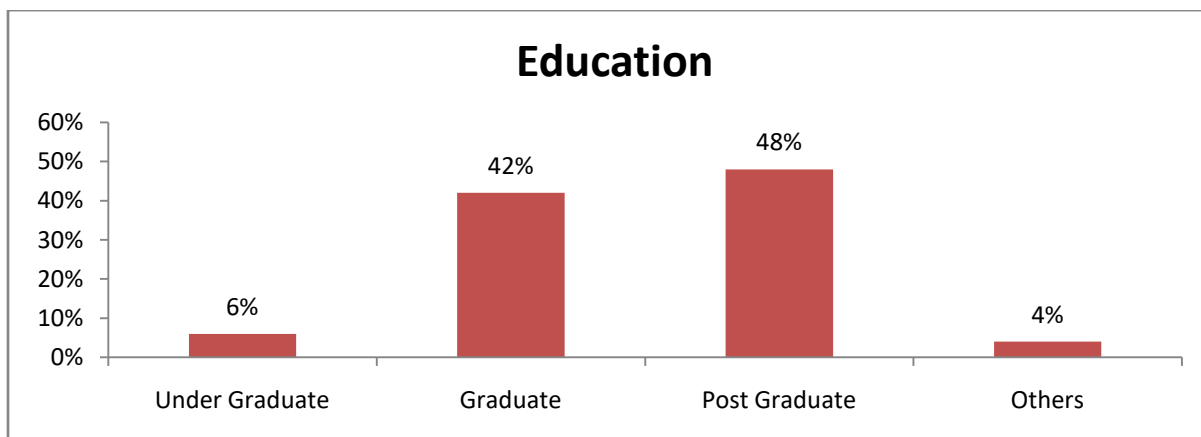
Dimension	Category	Percentage
Age	25 & Less	19%
	25-35	45%
	36-54	26%
	55 & above	10%



From the above table and graph it can be concluded that majority of respondent are from 25-35 years of age. 19 percent of investors are below 25 years of age. Only 10 percent of investors belong to age more than 55 years. A small proportion belongs to higher age group of greater than 50 years.

## 2. Education Background of the Respondents

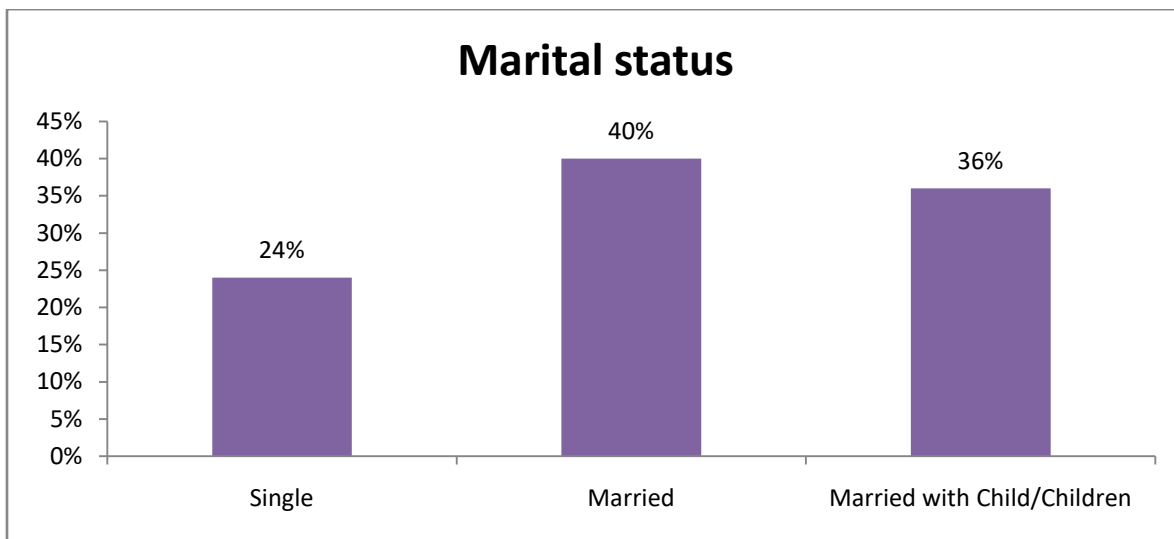
Dimension	Category	Percentage
Education	Under Graduate	6%
	Graduate	42%
	Post Graduate	48%
	Others	4%



It can be concluded from the above table and graph that majority of respondents are graduate (42 percent) and post graduate (48 percent) and only 6 percent of investors are undergraduate. Hence the result of the opinion includes perspective of all categories of investors with different education backgrounds.

### 3. Marital Status of the Respondents

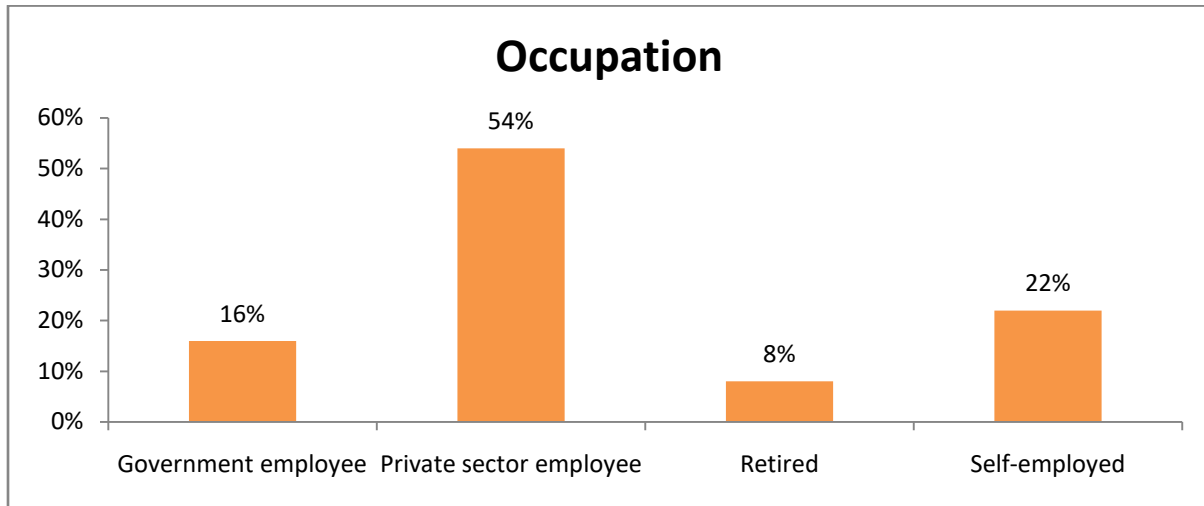
Dimension	Category	Percentage
<b>Marital status</b>	Single	24%
	Married	40%
	Married with Child/Children	36%



It can be concluded from the above table and graph that majority of respondent are married (40 percent) with child responsibility (36 percent) and about 24 percent of respondents are single or unmarried.

### 4. Occupation of the Respondents

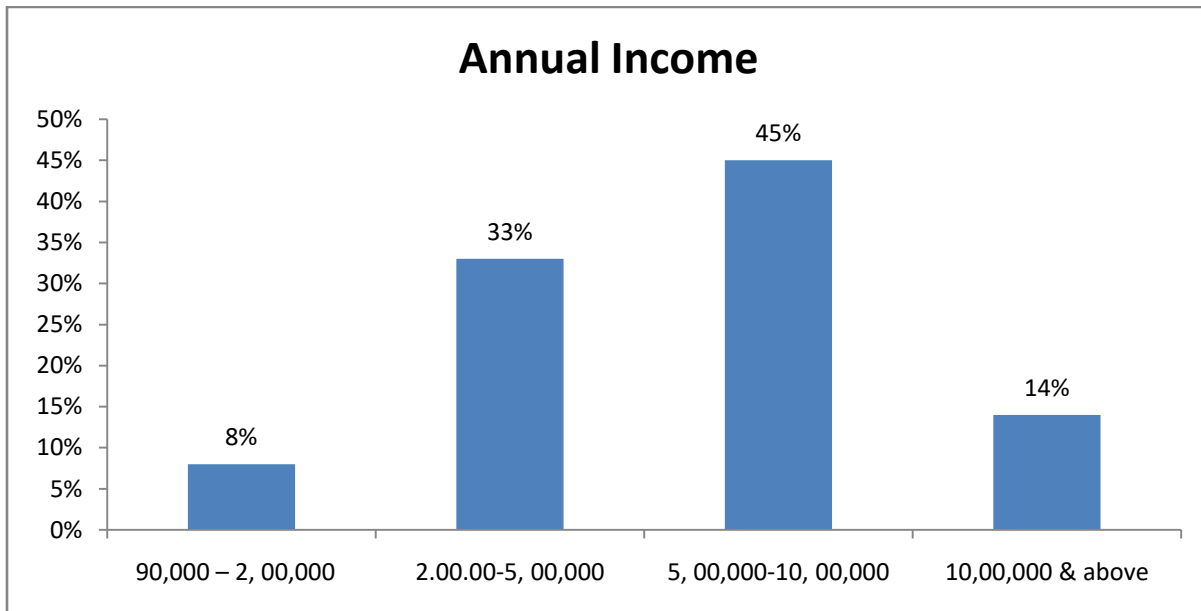
Dimension	Category	Percentage
<b>Occupation</b>	Government employee	16%
	Private sector employee	54%
	Retired	8%
	Self-employed	22%



Graph revealed that a large proportion (54 percent) of sample is engaged in private sector organization. Out of the total sample, about 16 percent have government job. 22 percent are self-employed and only 8 percent belong to retired class.

**5. Annual Income**

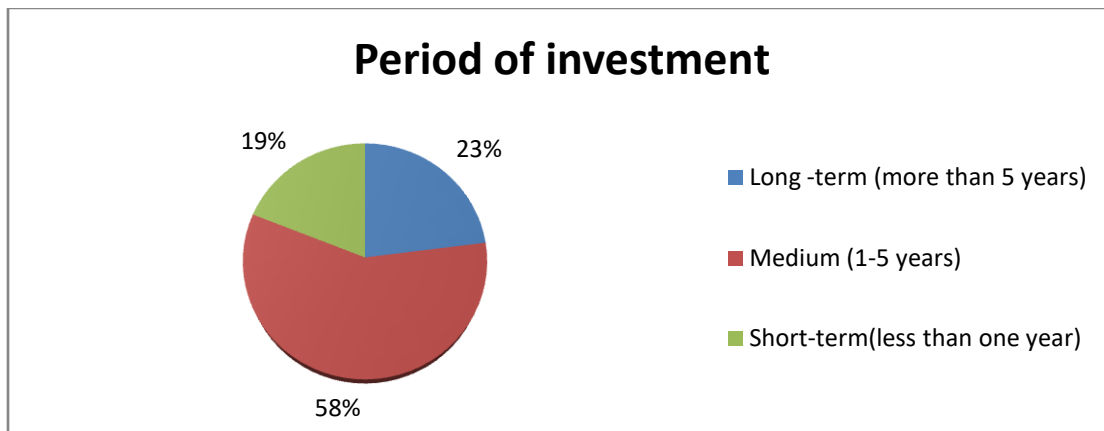
Dimension	Category	Percentage
<b>Annual Income</b>	90,000 – 2, 00,000	8%
	2.00.00-5, 00,000	33%
	5, 00,000-10, 00,000	45%
	10,00,000 & above	14%



Above data revealed that a large proportion (45 percent) of sample belongs to 5-10 LPA group. 33 percent of investors have 2-5 LPA income. Only, 14 percent belong to higher income group of 10 LPA and above income group.

## 6. Time period of investment

Period of investment	Percentage
Long -term (more than 5 years)	23%
Medium (1-5 years)	58%
Short-term (less than one year)	19%
<b>Grand Total</b>	<b>100%</b>



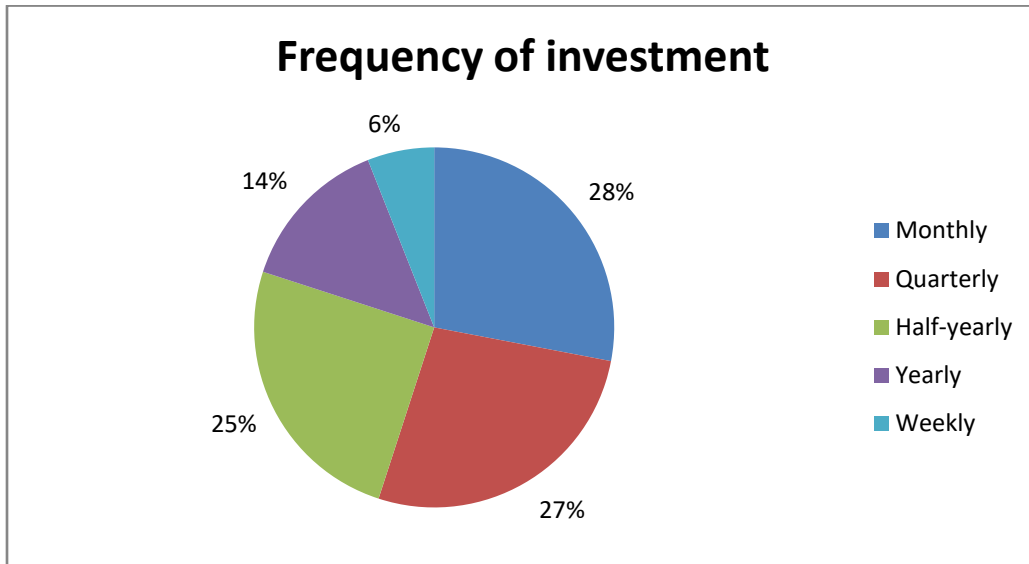
It revealed that a large proportion of investor like to invest for medium time period of 1-5 year followed by short term investment plan (less than one year).

## 7. Frequency of Investment

Only 19 percent of respondents invest for more than 5 years.

Frequency of investment	Percentage
Monthly	28%
Quarterly	27%
Half-yearly	25%
Yearly	14%
Weekly	6%
<b>Grand Total</b>	<b>100%</b>





### 8. Preference of the investment

Rank	West	Percent
1	Mutual funds	18%
2	Life Insurance	15%
3	Public Provident fund	11%
4	Fixed Deposits	11%
5	Savings account	9%
6	Government securities	9%
7	Real Estate	8%
8	Gold/Silver	6%
9	Post office savings	6%
10	Chit funds	4%
11	Debentures	4%

From the above table and graph, it can be concluded that for the west region investor's top 5 most popular avenues for investments are mutual funds, life insurance, Public Provident fund, Fixed Deposits and Savings account.

### 9. Reason for selecting investment avenues

Reasons	Percentage
Liquidity	29%
High return	26%
Tax Saving	23%
Safety (low risk)	22%
<b>Grand Total</b>	<b>100%</b>

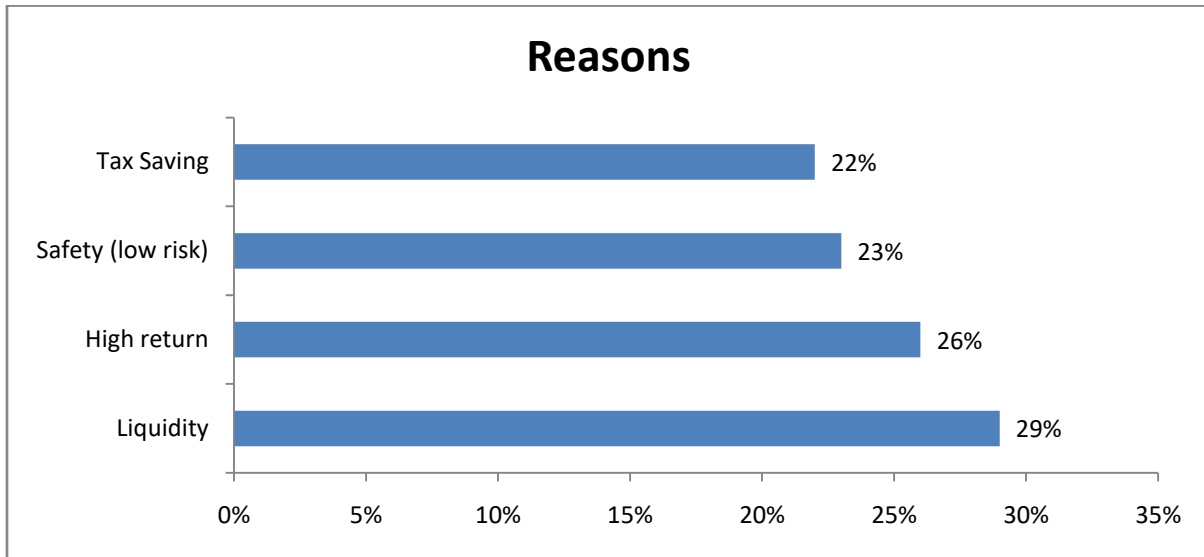
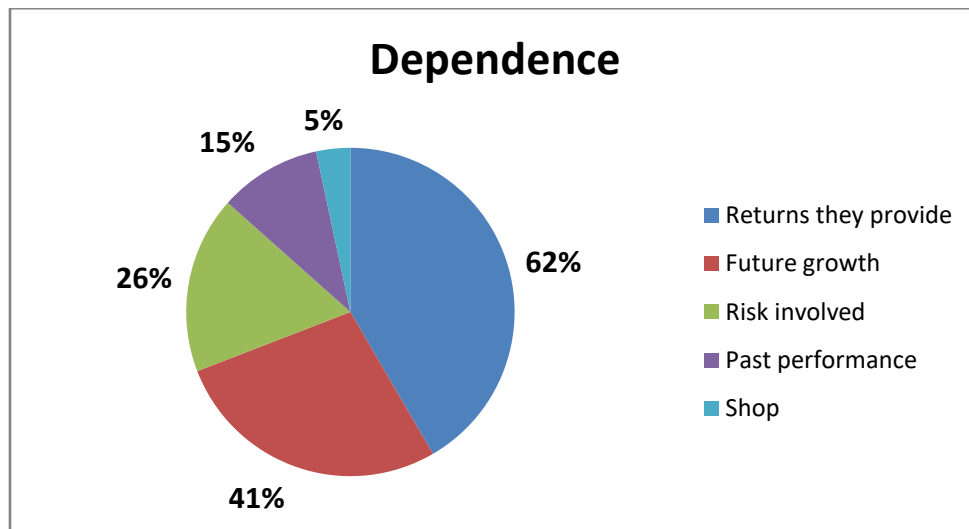


Table and graph revealed that a majority of investors made investment due settlement of liquidity and expectation of high return. Investment with low risk and steady return is also preferred by many investors. 22 percent of respondent choose tax saving investment avenues

**10. Dependence of investment decision**

Dependence	Percentage
Returns they provide	62%
Future growth	41%
Risk involved	26%
Past performance	15%
shop	5%
<b>Grand Total</b>	<b>100%</b>



From the above table, it is clear that most of the investor's investment decisions depend on the return they provide and future growth. 26 percent of investors believe that their decision depends on risk involved in the investment. 15 percent believe on the past performance of the investment options in western region.

## FINDINGS

The major findings from the study were that Respondent have shown positive attitude towards the Investment. Majority of the respondents who preferred investment are between 25-35 years of age and are post graduates. The Middle-class Investors of western part of India mostly preferred Mutual funds, life insurance, Public Provident fund, Fixed Deposits and Savings account. for Investment. The reason for selecting these avenues have found to be for Liquidity and high return. The main objective of doing Investment by the Investors is to meet future expenses and for tax saving purpose. The Investment decision depends mainly on the return the avenues provide and future growth. This shows that Respondents mostly preferred low risk and safe avenues.

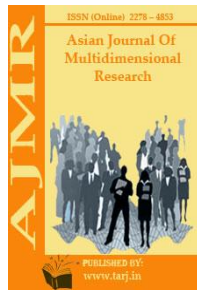
## CONCLUSION

Investing decisions are supposed to be rationally decided on real bases and is very necessary for the investors to invest all savings in a meaningful way, and then only returns are possible. It is concluded from the study that Investors prefer safe and secured investment avenues in order to earn returns and save tax. The investment is generally done to save taxes and meet future expenses. The Middle-class investors of Western Part of India mostly preferred Mutual Funds, Life Insurance, Public provident Fund, Saving Account for investing their money. Thus, Savings and investment should be properly planned for each year in order to meet the investment objectives. It is necessary to invest all the savings in a meaningful way in order to maximize returns on the investment

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## **PRACTICAL-LEGAL PROBLEMS OF THE LAND PROCEDURAL AFFAIRS**

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### **ABSTRACT**

*In reason the comparatively-theoretical analysis of earth-legal, earth-judicial norms is conducted with other industries right. The basic problems of the material and judicial landed right are including expounded. However, because of the subject matter of governance, the land law is defined as the independent branch of law, whereas the subject of the land law is all relationships, including the allocation and management of land fund, without any exception. At the same time, it is necessary to take into account the limited number of legal materials, the absence of a single qualification certificate, the complexity of coordinating the procedural norms of land legislation, and the formation of a common law. In fact, the system of legal norms can be called institutional or sub-sector, but only if they are strengthened in the normative act. In particular, S. Kavelin said: "The emergence, registration and protection of the rights of the population constitute the broad sense of the land process. Land dispute is narrowly grounded in the protection of land rights, which can be called land jurisdiction or jurisdiction. " The initial judgments of land management as jurisdiction-related jurisdictions have had an impact on the understanding of the land process boundaries.*

**KEYWORDS:** *Earth process, general legal process, earth trial, administrative process, judicial forms, legal institutes, industry is a right, landed spores, material norms, judicial norms.*

## INTRODUCTION

When the principles and norms of the law are implemented and carried out in the activities of private actors, it is seen as a supreme social value, so that it is important for the community. Unless the right is exercised, it eventually loses its essence.

Actually, the adoption of the law is just the first step in the legal regulation. The main task of the law is to apply social life. The First President of our country said: "We attach great importance to the proper functioning of the legislative and executive branches of power in the implementation of laws and other normative acts, not just the substitution of the legal system. Therefore, the issue of applying the adopted laws in everyday life is always relevant to us. "

Procedural problems of law enforcement are one of the central and extensive issues that play an important role in the development of traditional "non-proliferation" spheres of law. Today, in the jurisprudence it is necessary to bring together the theoretical generalization of the collected scientific materials on these fundamental issues. While the relationship between substantive and procedural law is a very controversial issue, it is important for the definition of procedural forms, legal procedures, procedural actions, procedural relations, pragmatic steps, and other similar scientific categories that define the extent to which the theory of law and practice, , basic approaches are needed.

## THEORETICAL BACKGROUND

*The concept of land law was born and evolved in the 20s of the last century.*

At that time, the emergence of an independent jurisdiction network, its separation from the civil and civil procedural law, and the existence of special land commissions during that time, created the interest of scientists to this issue, such as the land dispute over land disputes. In particular, S. Kavelin said: "The emergence, registration and protection of the rights of the population constitute the broad sense of the land process. Land dispute is narrowly grounded in the protection of land rights, which can be called land jurisdiction or jurisdiction. "

"The jurisdiction of the proceedings is one of the manifestations of civil proceedings and is subject to review by territorial commissions on the basis of the rules set out in the Civil Procedural Code." Consequently, S. Kavelin's views allowed the land process to be limited to the jurisdiction of the state in the protection of the rights of the land, in the broader sense, in the context of procedural actions involving the exercise of land rights by the state authorities.

I.Ikonitskaya and N.Krasnovs analyzed land legislation in terms of combination of material and procedural forms, as well as studying and summarizing procedural forms of implementation of land law norms by them. The authors intend to answer the question, whether it is possible to apply the norms of land rights through the use of procedural norms or whether the material lines of the law comply with the system of procedural networks.

I.Ikonitskaya and N.Krasnov come to the conclusions of the authors of the concept of "general legal proceedings" and come to the conclusion that there are procedural norms in the field of land legislation referring to law enforcement activities on the establishment, alteration and cessation of land relations.

I.Ikonitskaya noted the commitment to the theory of "general legal process" and noted the existence of procedural norms in the institute of land use right, which regulates the activity of the collective farm, agricultural and other businesses.

This situation led to the clarification of the concept of "general legal process". The overall essence of the land process includes the activities of enterprises involved in agriculture and other internal management. The initial judgments of land management as jurisdiction-related jurisdictions have had an impact on the understanding of the land process boundaries.

I.Ikonitskaya and S. Kavelin agree that the "narrow" and "broad" aspects of the land process can be limited to the scope of the jurisdictional jurisdiction of the land jurisdiction, fully complying with the theory of "common legal proceedings". In a broad sense, it can be said:

- 1) local organizational norms, unilaterally coordinated by the state bodies with activities related to the management of land fund; procedural norms of the enterprise and organizations associated with agriculture and other internal management of land use;
- 2) judicial proceedings related to consideration of land disputes;
- 3) activities related to the application of land law enforcement measures.

Since many land disputes at that time were handled in an administrative way, the question arises as to why the authors of the ideas ignore the administrative procedure and focus their attention on solving the disputes only through the courts.

A. Getman expresses his opinion on this matter. Studying the procedural aspects of environmental law, it concludes that procedural norms of environmental law are applied even when such disputes are considered in an administrative order, even when disagreements arise. In his opinion, this is:

- a) At a very low level;
- b) In other cases, other branches of law are interconnected in the application of procedural norms;
- c) Within the limits specified by the law<sup>1</sup>.

## LITERATURE REVIEW

N. Osipov believes that the rules of land provide for the application of the material provisions of the land law in the absence of any obstacles to their application. If there is a disagreement or necessity to comply with the requirements of substantive norms of the land law, then other norms of the law are used.

This attitude clearly reflects the real situation, because the compulsory enforcement of land law is currently being ensured on the basis of the procedural norms of administrative, civil, procedural, criminal and other legal systems.

Not only Osipov, but also other authors favor the issue of procedural norms on the ground. I.Ikonitsky stated that, based on the claims of the procedural branches of the right to material sectors and their dependence on the subject of law enforcement, based on the views expressed in the scientific literature, the property relationships are subject to procedural law, which means that the object of this relationship is also part of the object of procedural relations and the land ... all land relationships, regardless of their nature, are the only to help collect objects that can rust.

Ikonitskaya continued, "Every branch of property rights concludes that it has its own procedural form regardless of whether the procedural standards are divided into an independent legal

network, or that they have entered the only network that summarizes material and procedural standards.

If the land governance system is recognized as an administrative law institute, then the relations that arise in the management of land fund would be legal-legal relations with the question of whether land jurisdiction is a form of administrative proceedings. However, because of the subject matter of governance, the land law is defined as the independent branch of law, whereas the subject of the land law is all relationships, including the allocation and management of land fund, without any exception.

According to J.Abduraimov, the issue of linkage of land norms (in broad terms) with the norms of administrative law should not be addressed only in the context of the conventional limitations of the legal regulation of land and administrative law. B. Abduraimov says that there are three approaches to this problem:

First, it is the allocation of the land and the administrative law by the specifics of social relations, which are the norms of land and administrative law. Obviously, there are differences.

Secondly, it is the methods of managing the problems of the state, in which it is possible to ensure a clear differentiation of the land law, which is aggregated by the methods of mass-legal, administrative and material-legal, civilian methods.

### **Main part**

There is also a third stage of interpreting these networks. This is a governing staging phase, which, according to its essence, sets the rules of procedure of the right to a substantial degree on administrative law norms. Consequently, such a state is included in the classical form of administrative-legal relations between state bodies and other subjects of land-legal relations. These arguments are sufficient grounds for the question of whether the land jurisdiction should have a certain period of administrative proceedings or legal boundaries<sup>2</sup>.

Attempts to define criteria for the allocation of procedural standards in scientific literature have been observed and are still being observed. A. Getman describes the environmental-procedural norms that allow them to distinguish between procedural norms of other law-enforcement systems:

- 1) The ecological factor is the main content and essence of ecological and procedural norms;
- 2) Ecological and procedural norms only on the implementation of environmental rights;
- 3) absence of the optimal mechanism for the introduction of the legal norms of the ecological right through the legal dispensation of natural resources, the legal differences between the subjects of environmental law and the property rights on natural objects, methods and methods of other procedural networks;
- 4) The presence of non-legal provisions in the environmental law;
- 5) The only way to increase the effectiveness of law enforcement of environmental law norms by justifying this area with material norms.

Contrary to the opinion of H. Salisheva, which states that citizens and organizations should consider the application of the land for their application as a form of administrative and procedural proceedings at the request of citizens and organizations, I.Ikonitskaya denies the



administrative and procedural nature of the said legal norms. At the same time, he states that these norms are defined in normative-legal acts, which are the source of land law.

Can the reason be sufficient to resolve the issue of sectoral land use? In order to answer this question, it is necessary to apply to research in general law theory. Although the legal system is a somewhat objective objective in the field of the land law, not all of these categories are the same, but there are substantial differences between them that emphasize their relative independence.

In the legal literature, the inability of the people's will and the legal system are explained in different ways. In particular, the drafting of normative acts is based not only on the existing legal system but also on many other factors, including subjective factors, mainly on targeted and targeted benchmarks<sup>3</sup>.

From this, the approach of the legislative framework to the legal framework appears to be one of the ways in which legislation can be developed. The system of legislation, however, has a sufficiently widespread, normative act that is incompatible with the law. That is why, in our opinion, relying on the fact that these procedural norms are incorporated in the normative legal acts can not serve as a basis for a definitive confirmation of their right to land.

In order to increase the effectiveness of land law norms and to determine whether the procedural norms are appropriate, it is necessary to define their functional relationships with other legal branches. First of all, it is necessary to analyze the views expressed in various legal scientific literature on the same principles as the principles of the examined procedure.

According to one of the concepts, the procedural norms included in the material law are part of the relevant law network. Researchers apply these conclusions to the areas of material law that do not have a clear procedural network.

As the right to land is of such a kind, the procedural norms included in the legislation can be seen as a component of land law. Such conclusions are also supported by some representatives of traditional procedural law enforcement agencies.

The peculiarity of the next position is that the procedural law network corresponds to each property-legal network. Justification of theoretical aspects of land process is based on the following points: each type of proprietary network, including land rights, should have a procedural network of the same name; The accumulation of a substantial amount of legal material is a factor that prevents the formation of the process of the process as an independent legal network; legal system and social relations, undoubtedly, lead to the differentiation of organizational forms of legal regulation of separate branches of law.

During the discussion of the legal issues of land acquisition for state and social needs, Mr. Syrodoev said that the legal norms expressing this process are the legal institution of the land.

A. Zabelyshenskiy examines the functions of land management functions: "Land use, land acquisition, land dispute resolution, and other land-use relationships can be either ground-based jurisdictions or acknowledged as a small land law .

It is controversial to raise any legal framework that includes procedural norms of land legislation in the field of land law. Can the integrity of these procedural norms be viewed as a component of land rights?

It is well known that the main function of any institute of law is to ensure that a certain type of social relationships are completed with relative legal control.

To carry out this function, there must be a complete set of procedural standards that have a set of specific features, including independent, sustainable, and autonomous. At the same time, scientists point out that as a necessary mark of the institute of law, it is necessary to strengthen its legal system or legal act, or chapter or section.

The same is true of Z.M. Islamov. He says the institute of law "is a distinctive feature of the legal norms regulating the same quality of relations."<sup>4</sup>.

In our view, it is appropriate to look at the necessary elements of the law's organizational elements and to overcome the external alienation. In fact, the system of legal norms can be called institutional or sub-sector, but only if they are strengthened in the normative act. In this regard, at this stage of land law development, we can only confirm that there are land-based groups in smaller procedural norms of administrative law.

At this stage of the development of land rights, we still have time to say that an independent legal framework has been created. From our point of view, the fact that the procedural norms of land legislation are fragmented, and their lack of development, as well as the absence of a codified act, do not allow the status of procedural sub-status in the field of land law.

It is crucial to determine the role of land law in the field of land law and its relationships with other legal branches to determine the proper degree of validity of the specified procedural norms.

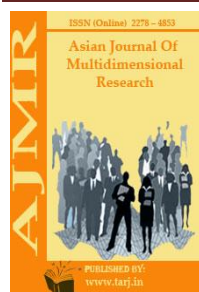
Thus, the law represents a single system that interacts with elements such as networks, institutions, and norms. The developed legal system is an organism, which is characterized by a great deal of intricacies, strong relationships within the law. On the basis of the legal system, there are legal documents, which include a single system. They reflect the legal nature of the legal system, their integrity, the difference, the tendency to independence.

## CONCLUSION

At the same time, it is necessary to take into account the limited number of legal materials, the absence of a single qualification certificate, the complexity of coordinating the procedural norms of land legislation, and the formation of a common law. All discussions on this topic should not be a schematic character, but should have theoretical and practical implications for the development of human rights and the implementation of the constitution.

In this regard, the issue of the independence of the land law as a law enforcement institution, a small network of land rights or a separate network is not sufficient enough not only to develop a general program of requirements, but also to enforce procedural norms in a single regulatory and codification system it is possible to disclose it only when it has a legal right.

At this stage, the task of science is to develop scientific recommendations to identify gaps in the law and contradictory views, disproportionate legal decisions, and to improve the procedural forms of introducing land law.



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## **AWARENESS ON HEALTH PROBLEMS RELATED TO PLASTIC MATERIALS AMONG SECONDARY SCHOOL STUDENTS**

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### **ABSTRACT**

*The study reflects the awareness on health problems related to plastic materials among secondary school students. **Objectives of the study:** 1. To identify there is any significant difference between Genders in health problems related to children who are using plastic materials. 2. To find out there is any significant difference between different locations of the student in health problems related to children who are using plastic materials. 3. To find out there is any significant difference between different locations of the school in health problems related to children who are using plastic materials. **Methodology:** Normative survey method was adopted in the study. **Sample:** Three hundred Pupils of studying in secondary school from Coimbatore district. **Tool:** Investigators self-made questionnaire was used as a tool for the study.*

**KEYWORDS:** Awareness, Health problems, Secondary school, Plastic Materials, Related.

## INTRODUCTION

In the last 60 years, plastic has become a useful and versatile material with a wide range of applications. Its uses are likely to increase with ongoing developments in the plastic industry. In the future plastic could help address some of the world's most problems. Such as, climate change and food shortages. Unfortunately the properties of plastic that make are so valuable also make its disposal problematic such as its durability light weight and low cost. In many cases plastics are thrown away after one use especially packing and sheeting but because they are durable the persist in the environment.

The plastic waste make global warming and climate changing and producing then many diseases affecting the human health. In the fast changing and development of the world the science and technology new inventions are to pollute the earth. Especially the plastic bags and plastic materials are polite the overall environment. The younger generation particularly the secondary students have more awareness on health problems related to plastic materials. But the awareness level is very low secondary school, student's present situation. From the collection of data the various health problems related to plastic materials identified the health problems are following. The breathing problems, the plastics make the food position, the heart problems, damage the kidney functions, the asthma problems, reproductive problems and Cancer problems. By considering the above aspect the investigator made an attempt to conduct the present study.

## REVIEW OF LITERATURE

Bauer (2012), conduct a research on "health issues of travelers" in this study describes environmental health risks cover a wide spectrum. Biological health risks concentrate on the contact with animals or plants. There is an urgent need for more and detailed research so that Pretravel advice to tourists can be updated, and modifications at the destinations protect tourist and locals alike.

Dan Wilhemsson (2013), conduct a research on "Marine pollution with plastic usage" in this study describes that pollution impacts may also undermine the resilience of ecosystems to other stressors such as elevated sea surface temperatures and ocean acidification. Solid and concise predictions of the future magnitude and impact of marine pollution.

Tanima Ferdous (2014), conduct a study on "A study about attitude of grade eight students for the use of plastic" in this study identified that overall understanding of the knowledge towards behavior under the impact of plastic use. A gap between knowledge and behavior was located under the challenges from knowledge gain, to attitude building, and behavior change. Transferring knowledge to behavior lost some knowledge due to mode and instrument of transfer.

## NEED AND SIGNIFICANCE OF THE STUDY

The Tamil Nadu Government has passed on the bill in 2002, the plastic prohibition of ACT for sale, storage, transport. But, sales man, public and shop keepers are do not obey this Act. They are sale the things with the help of plastic Bags. Now, a days the plastic bags and plastic materials are great pollution and non-degradable of the land. So, the plastic materials make so many environmental problems and health problems to the human beings particularly the school students are affecting these problems. The problems are kidney disfunction, respirioritory system damage; reproductive effects and cancer risks are spread to human beings. It is essential to know the present state of awareness on health problems related to plastic materials. The main

function of the education is the all-round development of the students. The major problems of health problems related to plastic materials are Cancer, asthma, affect the Reproductive system and breathing system, heart and kidney diseases are make the plastic materials threw the chemicals to the human beings. By the minimizing of the health problems related to plastic materials to create awareness to the pupils. This awareness should be cultivated from the secondary school students. So, that the investigator prefer this topic for the present study.

### **OBJECTIVES OF THE STUDY**

1. To identify there is any significant difference between Genders in health problems related to children who are using plastic materials.
2. To find out there is any significant difference between different locations of the student in health problems related to children who are using plastic materials.
3. To find out there is any significant difference between different location of the school in health problems related to children who are using plastic materials

### **HYPOTHESES OF THE STUDY**

1. There is no significant difference between Genders in health problems related to children who are using plastic materials.
2. There is no significant difference between different locations of the student in health problems related to children who are using plastic materials.
3. There is no significant difference between different location of the school in health problems related to children who are using plastic materials

### **DELIMITATION OF THE STUDY**

The following are some of the delimitations of the study

1. The study is confirmed to the area of Coimbatore District.
2. The secondary school students in located in Coimbatore District alone are considered for the present study.
3. Only 300 samples were collected from the students at secondary level.
4. The items of the questions are closed ended items alone.

### **METHOD AND SAMPLE**

In this study, the investigator preferred normative survey method. This normative survey method is generally use questionnaire to collect data in an easiest way. Therefore the investigator preferred the easy way of collecting the data of the present study. Three hundred Pupils of studying in secondary school from Coimbatore district.

### **TOOL**

The investigator himself developed a questionnaire on health problems related to using plastic materials among secondary school students in various schools at located in Coimbatore District.

**ANALYSIS AND INTERPRETATION****TABLE 1: MEAN DIFFERENCE BETWEEN GENDERS IN HEALTH PROBLEMS RELATED TO CHILDREN WHO ARE USING PLASTIC MATERIALS.**

Synod	Gender	Mean	S.D	N	't' value	Level of Significance
1.	Male	40.2	9.01	140	2.942	P>0.05
2.	Female	37.31	7.85	160		

The calculated 't' value is (2.942) greater than the table value(1.96). Hence the null hypothesis is rejected at 0.05 level. Hence there is no significant difference between the Male and female in health problems related to plastic materials.

**TABLE 2: MEAN DIFFERENCE BETWEEN DIFFERENT LOCATIONS OF THE STUDENT IN HEALTH PROBLEMS RELATED TO CHILDREN WHO ARE USING PLASTIC MATERIALS.**

Synod	Residential of the Students	Mean	S.D	N	't' value	Level of Significance
1.	Rural area	40.56	8.72	164	4.629	P>0.05
2.	Urban area	36.08	8.02	136		

The calculated 't' value is (4.629) greater than the table value (1.96). Hence the null hypothesis is rejected at 0.05 level. Hence there is no significant difference between the between different locations of the student in health problems related to children who are using plastic materials.

**TABLE 3: MEAN DIFFERENCE BETWEEN THE LOCATION OF SCHOOL IN RURAL AND URBAN AREA AND THEIR AWARENESS ON HEALTH PROBLEMS RELATED TO PLASTIC MATERIALS**

Synod	School Location	Mean	S.D	N	't' value	Level of Significance
1.	Rural	38.73	8.89	164	1.602	P<0.05
2.	Urban	37.04	9.26	136		

The calculated 't' value is (1.602) lesser than the table value (1.96). Hence the null hypothesis is accepted at 0.05 level. Hence there is significant difference between the location of school in rural and urban area and their awareness on health problems related to plastic materials.

**FINDINGS**

The following main findings have been drawn by the investigator:

1. There is significant difference between the Male and female in health problems related to Plastic materials

2. There is significant difference between the between different locations of the student in health problems related to children who are using plastic materials
3. There is significant difference between the location of school in rural and urban area and their awareness on health problems related to plastic materials.

### SUGGESTION FOR FURTHER RESEARCH

Following are few areas of research related to the present study, which deserved further investigation.

- The same investigation may be conducted at higher secondary level and tertiary level.
- The same study may be conducted with different demographic variables that not included in the study.
- The same study may be conducted the large number of samples.
- This study conducted only as Coimbatore District level this study can be extended to state, national and international level.

### CONCLUSION

The research investigation reveals that the secondary students have less awareness on health problems related to plastic materials the variables namely Gender, student's residency place, location of school these factors to develop the awareness on health problems related to plastic materials among secondary school students

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**ATTITUDE OF GENERATION X AND GENERATION Y MALE  
EMPLOYEES TOWARDS FEMALE EMPLOYEES AT A MANAGERIAL  
POSITION**

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**ABSTRACT**

*“Attitude is a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual’s response to ill objects and situations with which it is related” (Allport G,1935). The aim of this study was to see the difference in attitudes of generation X and Y male employees towards female employees at a managerial position. The sample of this study was 100 Indian male employees who belong to the generations X and Y. The scale used for this study was the Attitude Towards Women Managers Scale (ATWoM) developed by Zeynep Aycan, Mahmut Bayazi, Yonca Berkman and Hale Bolak Boratav (2011). The data was collected from the respondents and analysed statically using the Mann-Whitney U test. According to the results of the test, the null hypothesis was rejected proving the difference in the attitudes of generation X and Y male employees towards female managers. As per the results of this study, generation Y male employees are more accepting towards their female superiors at work. The change in attitude could be due to the socialization process of generation Y, the increased efforts taken by the Indian government and female activists in the form of women empowerment programmes and policies and also due to the increase in dual income families as a result of increased cost of living.*

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**KEYWORDS:** *Attitude, Generation X and Y, Attitude towards Female Managers*

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**INTRODUCTION**

Attitude is a combination of our personality, beliefs, values, behaviours, and motivations. Attitudes are not biologically inherited but built out of continuous experiences of the world around us. From the time an individual is born, he/she is continuously exposed to direct and indirect stimuli of the environment. This exposure teaches the individual to hold certain ideas, values and beliefs. They influence and guide an individual's actions. Thus, "an attitude is a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to ill objects and situations with which it is related." (Allport G, 1935). The Indian society has always been a patriarchal society. During the earlier times, it was the men who went hunting and built networks, while the woman's job was to look after her kids and the house. A woman had four-fold status-role sequences- her role as a daughter, wife, housewife and mother. Ever since, women in India and many other countries have been the victims of this patriarchal society. Today, most women are well aware of their rights and privileges, and are actively participating in social, economic, and political activities due to the third wave of feminism, awareness programs, and women empowerment and so on.

According to research, social and employment trends indicate that increasing number of women are rejecting traditional views of appropriate sex-role behaviour and are seeking full-time employment in previously masculine dominated occupations. However, in positions of authority and responsibility within the organization, the integration of women has achieved limited success (Terborg, Peters, Ilgen and Smith, 1977). Also, when employees from different generations are present at your workplace, the work values of the different employees from different generations could differ which could result in tensions or conflicts at workplace. This will also have an impact on their communication process, their attitudes, and knowledge sharing process, problem solving process, interpersonal relationship, leadership and management styles.

Influences that guide an individual's actions more often than not, lead to cultural and social attitudes such as what constitutes of "male" or "female" jobs. This results in occupational segregation, although the range and expanse of the issue differs based on country and even the types of jobs. There is also the fact that belief systems vary from society to society. This multitudinous variation in attitudes can be explained by viewing various theoretical perspectives. The gender-centered and organization structure perspectives comprehend why women are underrepresented in top management positions (Fagenson, 1990). The gender-centered perspective or the person centered view suggests that there are certain factors which can be deemed responsible for the behaviour and limited representation of women in higher level positions. These characteristics are internal to women, i.e., indecorous traits, cognitions, attitudes and behaviours. This perspective states that, the attributes women have been reared to possess are at conflict with the requirements of the managerial role and are considered unethical when it comes to promoting them to the higher ranks of the organization. The view point, from which the framework of an organization stands, is based on the assumption that an organization structures shape the behaviour of women, on the job. This view contends that the differences between women and men in their attitudes and behaviour are because of the differences in the opportunity and power structures in organizations rather than to gender.

In another research that was conducted in India during 1990, to study the stereotypical attitudes towards women as managers, it was found that the result reflected similar results obtained in

Taiwan and USA. The results suggested that gender determines the negative or positive attitudes. Women were seen to have more positive attitude than men. This means that males perceive women to be incapable or less capable in handling higher positions of responsibility as compared to women who perceive them to be equally capable to be managers (Gulhati, 1990). 'Women are stereotyped with "feminine" characteristics and are considered emotional, intuitive, dependent and unambitious' (Bowman, et al., 1965; Dipboye, 1978; Larwood and Wood, 1977; Schein, 1973). Studies also show that negative attitude towards women as managers restrict their upward movement in the corporate ladder (Gulhati, 1990). In a report by HR firm Redileon, it was found out less than 1 per cent of CEOs in India are women; and, of a total of about 9,000 board members in the 1,500 listed companies surveyed, only 465 were women (Shrivastava, 2007, as cited in Maithani, A, et al.,2012).

The rationale behind this study is to see if there is any difference in the attitude of generation X and Y male employees towards female employees at a managerial position in India. This study would indicate if there are any changes in the attitudes of male employees towards their female manager from one generation to another. According to H.L. Kaila's research on women managers in Indian organisations in 2007, one of the biggest problems faced by women managers at work was uncooperative subordinates who never took the leadership of a woman seriously. Attitude towards women as managers measures an individual's attitude towards women as being seen as a manager. The attitude can be positive which implies an individual's acceptance towards women as managers or it can be negative implying the individual is not too keen to see women in managerial position.

It is theorized that differences between generations tend to occur in majority due to the influences of the individuals environment within which early human socialization occurs. This refers to influences that have a direct effect on the development of one's personality, values, beliefs and expectations which once established, become a stable part of adulthood. There are pivotal changes and experiences that one generation experiences but another either does not, occur after the critical socialization years. Over time these experiences because major shifts in the socio-cultural environment. As each generation develops and matures by means of these events, each generation claims to develop attributes that are reflected in personality traits, work values, attitudes, and motivations to work in ways that are surmised to be important to managers. In India, where there is a composite culture, each group has its own separate but overlapping regional, religious and linguistic cultures which are respected by and interact with their shared culture. Generation X born between 1960 and 1980 are characterised with the following characteristics hardship, self-sufficient, belief in hierarchy and a socialist economy and generation Y born between 1981 and 1995 are usually ambitious, emphasise financial reward, entrepreneurial, business savvy, technologically capable and adept. (Roongrerngsuke, 2010 and Erickson, 2009).

Since there is very little research done with regard to this particular issue in India, and as a result of the study, if an unfavourable attitude is found in both generation X and Y despite the changes that have taken place so far with respect to women in Indian society, the results can help motivate the female managers to work harder in order change the attitude of their male employees. This study can also be employed in organizations to determine the existing perspectives towards women managers and the preferences to work with women managers, and therefore create awareness about any kind of prejudice against the same. Issues in diversity management in an organization can also be detected by means of this study. The scale used for

this study would be the Attitude towards Women Managers Scale (ATWoM) by Zeynep Aycan, Mahmut Bayazi, Yonca Berkman and Hale Bolak Boratav in 2011 using Turkish samples. Despite the development of the scale originating from and validating data collected from Turkey, neither the variables studied, nor the items in the scale are culture bound. The discoveries of the study are not constricted to Turkey either, as the samples represent professionals, well educated, urban, middle-upper income level, white collar employee populations, in the corporate world, rather than a typical working class Turkey.

## **METHOD**

### **Aim**

To study the difference in attitudes between generation X and Y male employees towards female employees at a managerial position.

### **Hypothesis**

**H1** There is a difference in attitude between the generation X and Y male employees towards female employees at a managerial position.

### **Sample**

The sample of this study is 100 Indian male employees who were born between the years 1960 and 1995 i.e. male employees who belong to the generations X and Y. The sampling technique used for this study is purposive sampling technique due to the nature of the sample. This non-probability sampling technique was chosen due to the definite criteria for sample.

Data for the same was collected through Google forms that were sent only to the target population.

### **Inclusion criteria**

- The sample included only male employees who were currently employed at the time of taking the test and were born between the years 1960 and 1995.

### **Exclusion Criteria**

- The sample did not include unemployed males and females or include employed females.
- Sample of retired, transgender, LGBT employees were not included in the study.

### **Design**

The design of this study is between group designs. A between groups research design is defined as: "a design that uses a separate sample of individuals for each treatment condition." The same dependent variable (attitude) was being measured in generation X and generation Y male employees (independent variable). All responses were marked by a score.

### **Variables**

- 1) Attitude (Dependant variable)
- 2) Generational difference (Independent Variable)

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## OPERATIONAL DEFINITIONS

**Attitude.** Attitude is defined as the male employee's belief whether positive, neutral or negative sex-role stereotypes about women as manager. (Ali, U., Khan, A., & Munaf, S, 2013)

**Generation X.** Generation X includes male employees who are born between the years 1960 and 1980.

**Generation Y.** Generation Y includes Male employees born between the years 1981 and 1995.

**Managerial position.** A female employee who is in charge of a certain group of tasks, or a certain subset of a company and has a staff of people who report to her. (Manager. Business Dictionary, 2018)

## Measures

The scale used for this study is the Attitude towards Women Managers Scale (ATWoM) by Zeynep Aycan, Mahmut Bayazi, Yonca Berkman and Hale Bolak Boratav in 2011 as it is more recent and relevant to the Indian society. Items for this scale were derived from both theory (i.e., role theories of leadership) and empirical data (i.e., in-depth interviews with working men and women). The construction and selection of items was guided by the role theories of management. Item development and scale validation were based on employee samples (i.e., item generation based on 43 employees from 8 organizations; item selection based on 456 employees from 23 organizations). A sample, comprising 312 students enrolled in undergraduate and MBA programmes, was used to retest the validity of Attitude towards Women Managers Scale in its final form. The resulting items had low skewness, low kurtosis, high item-total correlations, insignificant correlations with the social desirability scale, and high internal consistency (Cronbach's alpha  $\alpha$  . 91 for the first sample. The internal consistency (i.e., Cronbach's alphas) of the scale was  $\alpha$ .88 and .90 for the first and second samples, respectively. It was found that the scale was a reliable measure of the construct for both gender groups and both employees and students. The scale's construct and criterion related validities were tested and supported in both employee and student samples. Items directly tapped attitudes towards women managers. Therefore, the measure was also content valid. All items in Attitude towards Women Managers Scale had a normal distribution, high item-total correlations, and low correlations with the social desirability scale. Items were written in short fragments with distinct wording to enable easy understanding and appropriate response. Every item used a singular attitude statement, rather than multiple ones. . Thus the Attitude towards Women Managers Scale is a reliable and valid measure that can be used in future research and in applied settings.

## Data Analysis

The data that was collected from the respondents was analysed using the, Statistical Package for the Social Sciences (SPSS). In order to find the attitudes of generation X and Y male employees towards female employees at a managerial position, and non-parametric independent sample t test was done on the scores of the respondents.

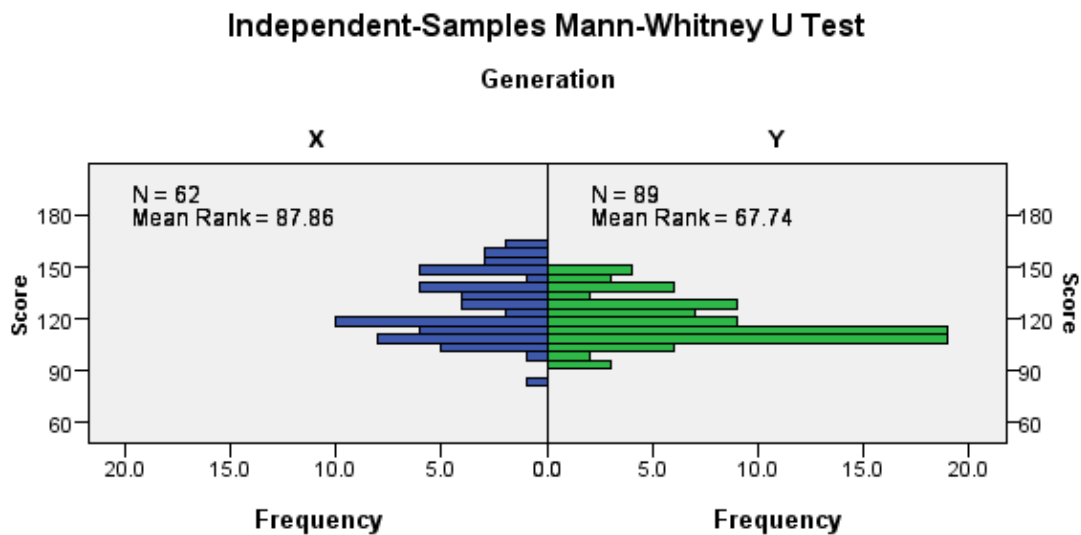
## Ethical Concerns

All ethical guidelines as per the American Psychological Association for research was followed in the study. For this research, the participants were given the information that participation is voluntary and that refusal to participate will not result in any consequences or any loss of benefits that the person is otherwise entitled to receive. All the participants had complete

knowledge of the purpose of the research and the procedure involved in the research. Confidentiality of the participants was assured along with the participant's right to right to withdraw from the study at any time without any consequences.

## RESULTS

An independent sample t test compares the means of two independent groups, in this case attitude and generation (X and Y) to determine their level of significance in relation to each other. Since the data was not normally distributed, Mann-Whitney U test, which is the non-parametric equivalent of the independentsample t-test was used to compare differences between two independent groups. The results of the study was as intended, proving the alternate hypothesis which states that there is a difference in the attitudes of generation x and generation y with respect to female employees at a managerial position.



**TABLE1 TABLE SHOWING THE SCORES OF THE FOLLOWING TESTS**

Test	Scores
Mann-Whitney U	2,023.500
Wilcoxon	W 6,025.500
Asymptotic Sig.(2-sided test)	0.005

As per the non-parametric independent sample t test results (table 1), there is a significant difference between the generation X and Y male employees towards female employees at a managerial position. Hence, the null hypothesis “there is no difference in attitude between the generation X and Y male employees towards female employees at a managerial position” is rejected.

## DISCUSSION

According to the analysis, the results of the research reject the null hypothesis. One of the major reasons for the same could be the people realising the need for women empowerment in the

recent decades. Efforts have been taken by both the government of India and female activists in the form of several women empowerment programmes and policies, which brought about several changes in terms of advancement, development and empowerment of the women in India. For example, India's National Policy for the Empowerment of Women, 2001 perceived the need for increased space for women in decision making, economic and social policies, enhanced opportunities and gender equality in the fields of education, health and employment. According to a research in 1998 done in Kerala, India, attitude towards women's employment revealed the negative attitudes of men towards women's employment. But when this study was repeated after 15 years, the change in the results was drastic. The results of the same, revealed a significant change (positive) of attitude of men towards women's employment. (Kuruvilla, Seema S P, 2014). The reason for the same as mentioned in the study, is the efforts taken by the Kerala government towards social advancement and better status and position for women with regard to literacy, educational standards and health indicators compared to other parts of the country.

Another reason for the results of this study could be increased cost of living in today's world. Realising that improved economic status and better living conditions of the family can result from women's employment it is possible for men to change their attitudes towards working women. Efforts are being made both by men and women to change the attitude of men towards women and their role in the working force. The Government of India has taken several legislative measures relating to issues from female foeticide, practice of child marriage, widow re-marriage to women's right to property for example, the Beti Bachao, Beti Padhao Scheme, ensure safety and education for women, which is the first step to empower and change negative attitude towards women. Social media and movies in the recent decades have also helped people change their attitude towards women. Movies and commercials have portrayed women to be strong, independent and efficient with a healthy work-life balance.

The socialization process and the upbringing of generation Y could have also had an impact on the results of the study. A large number of the generation Y had working mothers as well as fathers who helped at home. Dual income families have started growing in number where parents take turns to take care or spend time with their children. Growing up in such households, having watched their own parents engage in such a relationship, has had a huge impact on their opinions and attitude towards women employment and women managers. Education and educating people is the most powerful and efficient tool to bring about any change in the society. Unless some kind of awareness is created people tend to remain ignorant. Children in schools are now taught from a very young age to respect women and treat them as equals in order to remove the stereotypes and negative perceptions against women. Colleges have gender cells in order to ensure equality and no biased caused on the basis of gender. Gender sensitization workshops and talks are given to children at school and college level in order to create more awareness, stress on equality and break stereotypes and help the students make unbiased decisions with respect to gender. A gender sensitized person is more likely to make an effort to make the environment favourable for everyone around them to flourish and prosper and thus reduce sexist barriers by increasing the individual's potential, abilities and opportunities to thrive in our so called patriarchal society.

## **.CONCLUSION**

As per the results of this study, the null hypothesis has been rejected proving that, between the two generations- X and Y, there has been a change in the attitude of men towards female managers. This difference in attitudes is a positive result because recognising women as integral

part of the community and their participation in the work force will eventually lead individuals to grow holistically and help change the patriarchal mind-set of the society. Also, India being a developing country can benefit very much from its human resources. Since women are key resources, if their potential and capabilities are recognized and tapped on properly in an optimum manner, it will lead to progress and result in an increased economic performance of communities and the country.

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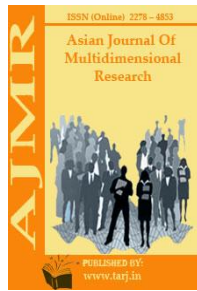
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## THE WAYS OF TOURISM DEVELOPMENT IN UZBEKISTAN

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### ABSTRACT

*This paper investigates the ways of the tourism development in Uzbekistan. Main points of the modification in tourism policy by government were investigated theoretically. Therefore, tourism perspectives of the travel and tourism industry were scrutinized as the whole. Finally, concluded with most vital factors of the expansion in the future standpoints. In addition, the Concept of the development of tourism in the Republic of Uzbekistan in 2019-2025 has been approved in pursuance of the Decree of the President of the Republic of Uzbekistan dated January 5, 2019, in order to implement these proposals. At the same time, there are serious problems in solving the problem of development of ecological tourism in our country. Shavkat Mirziyoev said, "Tourism is one of the most important sectors of the economy. Thus, ecotourism is actually a recreation, and it also includes networks that connect tourists. However, the problem of economic development of all sectors of the organization and development of ecotourism in the region, the problem of employment of a part of the population, as well as the reconstruction, repair and expansion of ecotourism objects.*

**KEY WORDS:** *Tourism, Ways Of Development, Hospitality, Uzbekistan, Travel*

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**INTRODUCTION**

Uzbekistan has a rich spiritual and cultural heritage, a wide range of historical and archaeological monuments, favorable natural and climatic conditions and a diversified social infrastructure that creates all the necessary conditions for the development of various forms of tourism. After gaining independence, a number of measures were taken to develop the tourism industry in the country. In particular, Uzbekistan has adopted more than 20 legal acts aimed at the development of tourism, which, in its turn, laid the foundations for a new state policy in the field of tourism. Also, there are a number of unsolved issues in the area, including the fact that there is a slow process of liberalization of visas and passports for foreign nationals, the lack of opportunity for electronic entry visas, poor domestic and tourist tourism, Low level of tourism infrastructure due to lack of infrastructure to address issues that hinder the development of the industry. President of the Republic of Uzbekistan adopted a number of decrees and decisions. "We are gradually creating the conditions for tourism, providing investors with a wide range of opportunities for entrepreneurs. 2019 will be a turning point in the development of tourism," Shavkat Mirziyoev said in his appeal to the Oliy Majlis of the Republic of Uzbekistan. In addition, the Concept of the development of tourism in the Republic of Uzbekistan in 2019-2025 has been approved in pursuance of the Decree of the President of the Republic of Uzbekistan dated January 5, 2019, in order to implement these proposals. Also, according to the signed Presidential decree, the list of promising investment projects on hotels was accepted [1].

**Tourism development perspectives in Uzbekistan**

One of the most important sectors contributing significantly to the socio-economic development of the country is tourism. Nowadays, the time has come for the need to further improve the network, effectively using the opportunities created. In our homeland called Uzbekistan, which is also a convenient country for both historical and travel, we have lived and worked in the world famous and famous thinkers. The rich scientific and spiritual heritage left by our ancestors has attracted great interest in the international arena. It is not accidental that the President of the Republic of Uzbekistan Sh.M.Mirziyoev emphasized that it is necessary to improve the infrastructure necessary for the further development of the tourism industry [2]. Today, tourism is a major source of income for the national economy, which is a major source of income. According to the report, in 2008 the world tourism industry has raised \$ 250 million. and more than \$ 720 billion in revenue. The United States dollar [3]. It should be noted that the figures have shown that in recent years, the number of tour operators has grown steadily in recent years. The tourism industry, along with the accumulation of huge investments and resources, is also a branch of the economy, which carries out the spiritual and cultural tasks necessary for the state and society. At the same time, its non-traditional species such as ecotourism, agro-tourism, archeology, ethnographic, religious tourism, extreme tourism, traveling tourism, etc. Especially, it should be said that these areas are recognized as rapidly developing and growing areas of expertise. The World Tourism Organization recognizes that the most promising destination of tourism is adventure tourism, sea and water tourism and ecotourism [4]. One of the younger and perspective trends in these types of tourism is ecotourism, which can be distinguished by its exceptional development and profitability. Indeed, the World Tourism Organization (WTO) has identified trends in the development of ecological tourism, which, according to the organization, will be one of the main strategic directions of ecological tourism until 2020. Recently, ecotourism can be explained by the growing contribution of the world tourism industry.

In the development of ecotourism in the Republic of Uzbekistan, first of all, there is a great potential for tourism, but organizational, legal, political and other factors play an important role in the growth and prospect of ecotourism and tourism. It is important to develop the ecotouristic and tourism industry in Uzbekistan and to build organizational bases for the further development of the tourism industry in the future. From the first years of independence, the conditions for the creation of laws and legal norms were sufficiently created.

### **Structure and policy of the sector**

The reason is that the normative documents that have been used as a result of the collapse of the former Soviet Union have lost their significance, and the need to create laws within the framework of international requirements. In order to develop the ecotourism sector and tourism in general, it is of particular importance to adopt the Cabinet of Ministers' August 8, 1998 Laws "On Improvement of Activity of Tourism Organizations" [5], and on August 20, 1999, "On Tourism" [6]. These laws serve as the basis for creating a major tourism industry and its infrastructure. [7] It should be noted that at the meeting of the Cabinet of Ministers of the Republic of Uzbekistan held on February 1, 2016, "Conducting concrete measures to promote further development of tourism industry and increase export of tourism services", the focus was on the issues of ecotourism development in the regions. At the same time, according to the decree of President Sh. Mirziyoev "On measures to further increase the responsibility of local executive bodies in the development of tourism industry" on July 12, 2017, the post of deputy khokims of Khorezm, Bukhara, Samarkand and Tashkent regions on issues of tourism development has been introduced.

The Presidential Decree of August 16, 2017 "On Priority Measures for the Development of Tourism in 2018-2019" raised the work to a new level. According to the document, a separate program for the solution of important issues faced by the industry in 2018-2019 was approved, and the program defined the adoption of separate programs on tourism, medical, recreational, agro and ecotourism.

### **DISCUSSIONS**

A great work is being done in our country on the program of "Concept of the development of ecological tourism in Uzbekistan" in the development of ecological tourism. At the same time, there are serious problems in solving the problem of development of ecological tourism in our country. Shavkat Mirziyoev said, "Tourism is one of the most important sectors of the economy. Effective use of existing opportunities requires further improvement of the given network, which is why the era itself "[8].

In 2017, programs to improve tourism infrastructure, create new tourist destinations and promote tourism potential of the regions in Khorezm, Bukhara, Samarkand, Surkhandarya, Kashkadarya, Jizzakh and Ferghana regions, are implemented all day long for tourists in Bukhara and Samarkand, works on the construction of tourist zones "Old Bukhara" and "Samarkand siti", each of which covers 10 hectares. Complex arrangements for the organization of hotels in the territory of tourist areas of Tashkent region, Bostanlik, Parkent and Ahangaran-Angren have been developed and implemented in practice.

On additional organizational measures to create favorable conditions for the development of tourist potential of the Republic of Uzbekistan with the aim of further improving the sphere of tourism activities: Decree of the President of the Republic of Uzbekistan on February 3, 2018

[9], February 6, 2018 On the introduction of amendments and supplements to certain resolutions by the President of the Republic of Uzbekistan "On measures to further improve the activities of the State Committee for Tourism Development of the Republic of Uzbekistan" dated February 6, 2018, No. PP-3510 [11], February 7, 2018 "Internal" On measures to ensure the rapid development of tourism in Resolution No. PP-3514 [12] are reported.

Looking at the area of our country, there are adequate opportunities for development of ecotourism in all places. For example, in Samarkand alone, huge tourist potential plays an important role in the economic, social and cultural life of our country. The President of Uzbekistan, Sh.Mirziyoev, commented: "In order to further develop the tourist potential of Samarkand, the region has become one of the most important cities in the region, It is planned to build more than 40 new hotels and expand 12 hotels. As a result, the number of hotels in the world will increase to 7,000, or 1.5 times more than today. "[13] Continuous renovation of historic monuments, restoration and beautification of ancient monuments in Samarkand, reconstruction of famous gardens of Amir Temur, which has long been a great contribution to the further development of ecological tourism.

Foreign guests have an idea of ecotourism about Uzbekistan and its rich and unique nature, while citizens get acquainted with their country. Through tourism, they have the opportunity to shape national pride and pride in their motherland. It is important to emphasize that the establishment of scientifically-based ecotourism education and upbringing is one of the primary objectives for this positive function. Almost all regions of Uzbekistan can be centers of mass eco-tourism.

Similarly, in the Namangan region, as well as for the development of this sector, the regional governor's office adopted a Resolution No 66 of February 16, 2016 of the regional government's "Tourism development in Namangan region for 2016-2017 years", promoting regional tourists a number of positive steps are being taken to create cultural environments. Tourists visiting Namangan region are mainly local and come from Andijan, Ferghana, Tashkent, Samarkand and other regions. Sometimes foreign tourists visit the area to study archaeological finds in the region. Justifying the trust of foreign tourists, guaranteeing their security, and the correct interpretation of the political situation play an important role in the growth and development of international tourism. Therefore, the region's ecotourism and ecotourism perspectives, as well as promoting tourism in the future and raising the flow of tourists depend on a variety of conditions, both internal and external. It is worth noting that the study of the interest of leading tourists in the tourism industry and finding ways to attract more tourists are important in the development of ecotourism in the region.

### **Development program of tourism in the republic of Uzbekistan.**

The development of ecotourism, that is, the expansion of the flow of tourists will lead to the development of industries, construction, transport, trade and others. Therefore, along with the organization of the tourism infrastructure, the development of various services is also required. For example, the hotel is a complex of services for businesses, restaurants and food businesses, souvenir production, community and home-based businesses. Thus, ecotourism is actually a recreation, and it also includes networks that connect tourists. However, the problem of economic development of all sectors of the organization and development of ecotourism in the region, the problem of employment of a part of the population, as well as the reconstruction, repair and expansion of ecotourism objects.

One of the many organizational measures in the development of tourism in the Namangan region is training of specialists who are well aware of the ecotourism industry, creating new modern types. There are a lot of things to do in the region. In particular, it is desirable to open such directions as "Ecotourism", "Tour Operator", which will train highly qualified translators and excursions in higher education institutions. There are a number of problems in Uzbekistan that are waiting for solutions in the field of tourism, and their gradual solution will help to make this sector a key component of macroeconomics. For example, in Namangan region, the best way to improve the ecotourism is to make tourists the most important problem. At the same time, joint work of tourist companies and organizations is of great importance in the regional distribution of local and international tourists in the regions. Increasing the number of tourists visiting the region and setting up the world class standards is one of the most important tasks of the region's tourism. For this purpose it is necessary to solve the problems of tourist activity, increase of activity of small and average tourist companies and enterprises, study of tourist demand. Studies show that ecotourisms in the region are based on the altitude law [5.23]. In this regard, ecotourism facilities are characterized by their landscapes and their natural environment. However, the disadvantages of transport routes to some ecotourism sites and the lack of ecotourism infrastructure have an impact on the flow of tourists. In order to solve these problems, it is desirable to increase the interest of tourist companies and firms operating in the city and to create opportunities for them by the city administration. It is also important to study short-term surveys, wishes and desires of the rural population in the region.

## RECOMMENDATIONS

Uzbekistan is located in the central part of Central Asia at the crossroads of transport links that have the potential for tourism development. In practice, however, the lack of adequate attention to the full utilization of these potentials and capacities, the ecotourists' arrival in the republic is not enough to attract tourists. Nevertheless, in the years to come, the first steps have been taken for the development of domestic and foreign tourism and, at the same time, it is necessary to note that the infrastructure of this sector is well-established in accordance with international standards.

## CONCLUSION

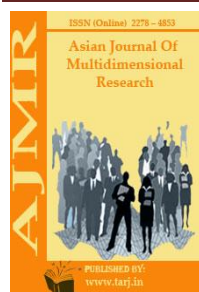
In recent years, new perspectives of tourism have been opened in our country and large-scale projects have been implemented in various directions. In recent years, new tourism destinations such as mountaineering, horseback riding, camel rides, bicycle trips, off-road trips, fishing, rafting, hauling, geotourism, educational tourism, medical tourism are becoming more and more popular. Indeed, after gaining the state independence of the Republic of Uzbekistan, integration into the international community has been steadily strengthening, and in a short period of time, political, diplomatic, trade economic and cultural ties with foreign countries have been developing. This relationship has a special place in tourism, and in recent years this issue has risen to the level of public policy

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## **A REVIEW ON PRODUCTION OF VEGETABLE WINE**

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### **ABSTRACT**

*The article presents review on prospective of wine production from various vegetables, categorization of wines and current status of wine industry. Wine production from vegetable is a very good alternative to utilize the surplus and value addition.. The process of making wines from various types of fruits, vegetables and spices is no more complicated than making wine from grapes and it is a good preservation method. The wine produced resembled the commercial wine in terms of its composition, taste and aroma. During the fermentation period the wines were analyzed for pH, titratable acidity, specific gravity, alcohol and total sugar on a daily basis. In this present review, we discussed about fermentation, Saccharomyces cerevisiae and alcoholic wine quality, and Indian wine market.*

**KEYWORDS:** *Saccharomyces cerevisiae, fermentation, wine, vegetables*



## INTRODUCTION

Production and consumption of fermented beverages like wine is an ancient practice. However, production and consumption of fruit based distilled alcoholic beverages is a later development. Different aspects of fruit based alcoholic beverage other than grapes have been investigated. Wine is composed of two main ingredients, water (generally over 80%) and ethanol (usually over 9%). Alcohol, the second major component of the wine, is primarily produced by yeasts during alcoholic fermentation. Ethanol in wine is the basic alcohol produced in the course of fermentation. On the other hand ethanol can also be produced by grape cells in the course of carbonic maceration in small amounts [1].

Processing of fruits and vegetables result in high amounts of waste materials which include peels. Disposal of these materials usually represents a problem that is further aggravated by legal restrictions. Edible vegetable peels normally discarded as a traditional culinary practice contains large amounts of substances important for human metabolism and could be used as alternative nutritional sources [2]. There is another reason to choose peel as a substrate for making wine. Peels of several fruits such as apple mango have also been found to contain higher amount of phenolics than edible flesh parts. Flavonol glycosides are located mainly in leaves, flowers, and outer parts of the plants such as skin and peel and decrease in concentration toward the central core.

### Fermentation

Fermentation is biotechnology in which desirable microorganisms are used in the production of value-added products of commercial importance. Fermentation occurs in nature in any sugar-containing mash from fruit, berries, honey, or sap tapped from palms. If left exposed in a warm atmosphere, airborne yeasts act on the sugar to convert it into alcohol and carbon dioxide. The making of wines and beers uses this biotechnology under controlled conditions. Alcoholic beverages have been produced for centuries in various societies. They are often central to the most valued personal and social ceremonies of both modern and less literate societies. In such traditional ceremonies as child naming, marriage feasts, and funerals, alcoholic beverages are often present. In Africa, maize, millet, bananas, honey, palm and bamboo saps, and many fruits are used to ferment nutrient beers and wines. The best known being kaffir beer and palm wines [3].

Industrial fermentation processes are conducted with selected microorganisms under specified conditions with carefully adjusted nutrient concentrations. The products of fermentation are as follows: Alcohol, glycerol, and carbon dioxide are obtained from yeast fermentation of various sugars; Butyl alcohol, acetone, lactic acid, monosodium glutamate, and acetic acid are products of bacteria action; and citric acid, gluconic acid, antibiotics, Vitamin B12, and riboflavin are some of the products obtained from mold fermentation.

Fermentation is a relatively efficient, low-energy preservation process which increases the shelf life and decreases the need for refrigeration or other form of food preservation technology. It is, therefore, a highly appropriate technique for use in developing countries and remote areas where access to sophisticated equipment is limited. Fermented fruit wines are popular throughout the world, and in some regions, it makes a significant contribution to the diet of millions of individuals [4]. The possibility and the use of pineapple for the production of wine will create employment, income generation for farmers, and address the post-harvest losses associated with the glut on the local market in India.

## The Energy issue

Climate change and its potential impact is one of the greatest challenges facing mankind today. Viticulture and winemaking, much like the ski industry, are climate change bellwethers as both are highly dependent upon the weather, climate and place. The sensitivity of vines to climate is illustrated in their use as proxy indicators of past climates. Any future changes in the seasons, extreme weather events, duration, local maximum, minimum and mean temperatures, frost occurrence and heat accumulation could have a major impact on the winegrowing areas of the world [5]. These changes are already evident in the form of increased vineyard plantings in traditionally extreme northerly viticultural regions, such as southern England, or the pole-ward movement and plantings of varieties suited to intermediate or warm climates.

## Screening of yeast strain

Inoculation of must with selected yeasts minimize the influence of wild yeast on wine quality though the contribution of wild yeasts to the synthesis of volatile compounds during inoculated fermentations is not known. In mango wine fermentation, different investigators used different yeast strains. Fifteen morphologically different groups of yeasts were isolated from fresh, fermenting and fermented juice of two varieties of mango.

### Yeast (*Saccharomyces cerevisiae*)

<b>Division</b>	: Amastigomycota
<b>Sub-division</b>	: Ascomycotina
<b>Class</b>	: Ascomycetes
<b>Sub-class</b>	: Hemiascomycetes
<b>Order</b>	: Endomycetales
<b>Family</b>	: Saccharomycetaceae
<b>Genus</b>	: <i>Saccharomyces</i>
<b>Species</b>	: <i>Saccharomyces cerevisiae</i>

Yeast is a group of fungi in which unicellular form is predominant. Most of the yeast is represented in sub division Ascomycotina and *Basidiomycotina* of the kingdom Mycotina. They have been isolated from natural substrates like leaves, flowers, sweet fruits, grains, fleshy fungi and exudates of trees *Saccharomyces cerevisiae* the yeast used in alcoholic fermentation is primarily responsible for the formation of main metabolic products and also several other flavour compounds [6].

## Viticulture Applications

Alcohol level of wine is mainly determined by the sugar content of the grapes to be used in wine production. The sugar content of grape increases during ripening and continues to rise in the course of dehydration. Therefore it is important to consider the viticulture practises to control final alcohol concentration of wines. A wide range of factors significantly affect sugar accumulation in the grape such as choice of vineyard site, soil composition, irrigation strategy, rootstocks, grape varieties, grape yield and leaf area managements. The most evident strategy among these is lowering grape sugar content by increasing yield. Enhancing the bud load, lowering cluster thinning and choosing a vigorous rootstock may be helpful to increase grape

yield. While increasing grape yield, special attention should be paid to limit the potential detrimental effects on grape and wine quality [7].

According to the studies performed it is reported that lowering leaf area/ grape weight ratio (less than 0,8 and 0,5 m/kg, respectively, for Vertical Shoot Position-VSP trained vines and for vines trained to horizontal or divided canopy) may be useful to reduce the grape sugar accumulation in vineyards having high unitary grape yields . Grape sugar accumulation may be taken under control by basal leaf removal since it has a negative influence on sugar accumulation. Contrary to limiting sugar accumulation, it evidently has a positive effect on phenolic development due to the fact that leaf removal increases rate of enzymatic activity responsible for the synthesis of phenolic compounds. Sugar accumulation in the grapes likely to base on available active leaf surface during the period between version and harvest.

However, it should be underlined that photosynthetic capacity and photosynthate sinks should be well balanced to prevent grape maturity delays. Reducing shoot vigour and getting small berries and clusters rich in phenols may also supposed to be effective in lowering maturity level in terms of sugar concentration with high quality grapes providing low alcohol wines. This strategy requires applying combination of appropriate irrigation management, pruning intensity and new genotypes [8].

### **Ginger (*Zingiber officinale*)**

The ginger wine contains small amounts of alcohol, it is not harmful, but health-giving, digestible, and stimulates the release of the hormone gastrin, which in turns stimulates the release of enzymes in the stomach. Thus, wine stimulates the release of digestive enzymes, which digest not only the alcohol but the many other nutrients found in wine [9].

### **Tomato (*Solanum lycopersicum*)**

Tomato is wide spread production and special nutritive values. It is a rich source of vitamin A and C, it is also contain minerals like iron, phosphorus and pigments. Tomato is commonly used in preserved products like ketch-up, sauce, soup, etc. apart from these food products, tomato is also used to prepare wine due to its easy availability and nutritional property [10].

### **Beetroot (*Beta vulgaris*)**

Beetroot is a valuable vegetable, which is semi-hardy and biennial. It is grown year-round for its sweet, tender, succulent root. Beetroot contain more sugar than any other vegetable, and its different colours, sizes and shaped have been grown, ranging from red, yellow, round, long cylindrical and huge sugar [11].

### **Carrot (*Daucus carot osubsp*)**

Carrot is one of the popular root vegetables grown throughout the world and its high anthocyanin content makes it a suitable diet supplement as antioxidant. The high antioxidant properties of carrots are due to their high vitamin C, anthocyanin and  $\beta$ -carotene contents. These are also rich in nutraceuticals and biologically active compounds such as vitamins, dietary fibres and minerals.

### **Optimization of fermentation processes [12].**

#### **Incubation period**

The incubation time for vegetable wine was standardised by analysing for a period of 1 -16 days.

**Size of inoculum**

The size of inoculum on wine fermentation is of great importance in completing the fermentation process. Different levels of inoculum (5, 7, 10, 12 and 15%) were used to inoculate the fermentation mixture.

**pH of the juice**

The pH of juice is important parameter for the successful progress of fermentation. Control of pH during wine fermentation is important for two reasons (a) the growth of harmful bacteria is retarded by acidic solution (b) yeast grows well in acidic conditions (Mathewson, 1980).

**Adjustment of brix**

The effect of total soluble solid on tomato wine preparation was studied after 4 days of incubation by carrying out at various soluble solid concentration of 20°Brix to 26°Brix.

**Incubation temperature**

Different levels of temperature was studied to optimize wine preparation. They are 20, 25 and 30°C.

**Alcohol adapted and Non- adapted culture**

The term adapted is referred as modifying the environment of microorganism (*S.cerevisiae*), such that the *S.cerevisiae* develop the ability to live and thrive in different environmental conditions (Randall Padgett, 2012). *S.cerevisiae* was in adapted in 10 percent concentration of ethyl alcohol during culture preparation to produce alcohol more efficiently than acclimated (non adapted) culture.

**Age of culture**

The age of culture (24 hour or 48 hour old culture) for vegetable wine preparation was optimized by analysing different parameters.

**Purification or Racking**

After fermentation the wine is often clarified, by drawing off the wine into clean vats or barrels from the sediment (lees), in a process known as 'racking'. Additionally, fining can be initiated to precipitate out any proteins and tannins that are suspended in colloidal form in the wine. Gelatin might be used, or the suspension can be adsorbed onto the surface of substances such as bentonite. Wine is often also cold stabilized (left at 0 to -3 °C for 10–14 days), to crystallize out any potassium hydrogen tartrate [13].

**Physical factors****pH levels**

Typical pH levels in wine normally range from 2.9 to 3.9 and can be measured using a pH meter. Care should be taken during pH measurement to ensure accurate results as there are various components in juice and wine that can affect the performance of the pH electrode; these include proteins, sulfides, tannins, and polyphenols.

### **Titratable acidity**

Slight increase in acidity (0.37% to 0.38%) in peptic enzyme treated jamun wine. Joshi and Sandhu while working on apple vermouth reported that, the spices level (2.5% and 5%) did not alter the titratable acidity of vermouth. Changes in titratable acidity of pomegranate wine, during storage (60 days) were studied by Matapathi who found that there was a significant decrease in the titratable acidity of pomegranate dry wine [14]. The highest titratable acidity of 0.645% and 0.585% was recorded in wine produced from Kesar inoculated with FWY-6 on 1st day and 60th day of storage.

### **Total soluble solids (TSS)**

While studying the effect of pectinase enzyme concentration and incubation time on quality attributes of durian juice Norjana and Noor reported that the total soluble solids of juice increased significantly from 6.5°brix to 9.0°brix within 3 hours of incubation. Higher degree of Brix and levels of pectinase in durian juices might attribute to the greater degree of tissue breakdown which released more components that contributes to soluble solids. also reported similar findings in apple, pears, apricots and carrot juice. When treated with enzyme, the cell walls got collapsed, separated and the nutritional components released from the interior of the cells. Total soluble solid (Brix) content of the enzyme treated pulps slightly increases with increased incubation time from 30 min to 120 min. While studying the effect of incubation temperature (35°C to 55°C), incubation time (210 min to 540 min), and crude enzyme (0.05 - 0.15 ml/50 g pulp) concentration on juice yield of alu Bukhara. Robin *et al.*, found that the juice yield ranged between 58.1% to 79.6%. They reported that the incubation time was the most significant factor affecting the juice yield [12]. They also observed the juice yield increased with the increase in both time and temperature, but with further increase in temperature above 45.77°C and incubation time beyond 516.42 min, the juice yield decreased slowly which might be due to denaturation of protein which leads to decrease in enzyme activity at higher temperature. Thus they recommended the incubation time, temperature as 463 min, 45°C, and crude enzyme concentration of 0.12 ml/50 g pulp for maximum recovery of juice. Similar findings of maximum juice yield from guava is obtained by pectinolytic enzyme treatment of pulp at 43.30°C temperature for 447 min of time [15].

### **Ethanol**

While working on standardization of methodology and screening of jamun cultivars for wine making a slight increase in the alcohol content (11.23% to 11.61%) have been noticed in wines prepared by using pectinase enzyme at 0.25% in the pulp as pretreatment and have been matured for six months. Changes in quality attributes during storage of Tanzanian wines were that storage of wines at ambient temperature for various length of time resulted in significant increase in alcohol content which ranged from 3.84 to 9.75 g/100 ml. Sharma and Joshi also reported decrease in the ethanol content of strawberry wine during nine months of maturation. Qualitative changes in banana pulp and juice wine were studied there was no change in alcohol content of wines during storage of 90 days. Kumar *et al.* while working on the mango wine produced from eight different mango varieties under optimized fermentation conditions by using *S. bayanus* and reported that the ethanol produced in the mango wines was between 7.8% and 10.3%, and were comparable with moderate grape wines. While as Sharma *et al.* reported that the alcohol content of Jackfruit wine ranged from 8.5% to 19.3%. The ethanol content of 6.8% (v/v) in Tendu wine. Joshi *et al.*, while studying the effect of dilution and maturation on the physico- chemical and

sensory quality of jamun wine reported that the alcohol content decreased from the initial levels of 10.7% to 10.5% (v/v) after one year of ageing [16].

### **Effect of enzyme treatment on juice yield and quality**

Enzymatic treatment alone or in combination with others, is one of the potential pretreatment, which results in increased yield with better juice quality, colour and acceptability. Sharma et al., optimized the enzymatic process parameters for increased juice yield from carrot. They reported that enzymatic treatment resulted in increase in juice yield by 13.95% and decrease in viscosity by 0.45 cp. fruit juice yield, viscosity, and clarity are functions of enzymatic hydrolysis conditions. The usage of either crude or commercial enzymes significantly enhanced juice yield and clarity as compared to the control. optimized the conditions for clarification of guava fruit juice using commercial pectinase enzyme. Optimum conditions reported were: incubation temperature 45.35°C, incubation time 7.23 h and enzyme concentration of 0.70 mg/100 g guava pulp with ascorbic acid 77.71 mg/100 g clarity 34.54% transmittance, viscosity 1.24 cps and color (L value) 23.33. used pectinase and cellulose enzymes for sugar extraction process from date fruits. They reported 18% increase in the amount of extracted sugars in the case of pretreated fruits by each of these two enzymes equally, while using a combination of two enzymes in proper ration and a suitable condition resulted in a further increase of sugar to about 46%, in relation to untreated samples [17].

### **Tannin**

While standardization methodology for wine making and screening of the tannin content of jamun wine decreased from 105 to 94 mg/100 ml. The tannin content of base wine and mahu vermouth was 0.09% and 0.32% respectively. They observed that the tannin content of vermouth decreased from 0.32% to 0.11%, after maturation for one year. Six types of elderberry fruit wines with addition of different amounts of sugar and water and observed that the concentration of hydrolyzed tannins in elderberry wines varies from 299.14 mg to 739.32 mg GAE/L. While working on apple vermouth [18]. The spices level (2.5% and 5%) did not alter the total tannins of vermouth. The tannin content of wines produced from different varieties of mango using with *Saccharomyces cerevisiae* MTCC 172 and *Saccharomyces cerevisiae* AM 113, ranged from 0.01 to 0.02 and 0.012 to 0.024 at 45 days of storage respectively as reported by Beera et al., They also found marked increase in tannin content during further storage. Garde-Cerdan et al., studied changes in the concentration of volatile oak compounds and esters in red wine stored for 18 months and reported decrease in phenol content at the end of ageing.

### **Analytical testing through the production process**

Throughout the wine production procedure, analytical testing is essential to ensure that conditions are optimized for successful fermentation; if necessary any adjustments can be made by addition of appropriate substances. This testing is an on-going process and there are a variety of approaches and methods that can be employed for testing, depending on the scale of production, which determines the numbers of samples to be analyzed per day. Methods range from classical chemical analysis through to the use of modern analytical instrument techniques. The most important parameters that need to be measured in grapes, juice and must during fermentation, and in wine, are described below and the specific points in the wine making process where tested [19].

### **Acid levels or titratable acidity**

Acid level or titratable acidity is a measure of acid content in wine, juice, or must. It can be determined by classical titration with an indicator or potentiometric titration with sodium hydroxide and is usually expressed as g/L equivalent of tartaric acid. Alternatively when large numbers of wine samples need to be tested, the Gallery discrete photometric analyzer provides a dedicated automated system. Laboratories may choose to employ ion chromatography (IC), with suppressed conductivity detection, to separate a large variety of organic acids and inorganic anions and detect them with high sensitivity [20]. This detection system overcomes the problem of poor ultraviolet (UV) absorption of several organic acids and interference from the sugars and wines and can be analyzed directly without extensive cleanup. Grapes contain significant quantities of organic acids that affect taste, color, and microbial stability of the juice, making measurement of acid levels one of the most important basic analyses conducted in a wine laboratory. Levels of tartaric acid can be as high as 15 g/L in unripe grapes, but even in ripe grapes levels range from 6 g/L in grapes from northerly vineyards to only 2–3 g/L in vineyards in the south. Similarly, levels of malic acid can be as high as 4–6.5 g/L in mature must in the north, but only 1–2 g/L in vineyards in the south. Citric acid levels average around 0.5–1 g/L, while acid levels average 1 g/L whilst other acids such as benzoic and cinnamic acids only occur in the mg/L range.

Sugar levels are measured by refractive index (RI), using an Abbe refractometer 5 or Abbe refractometer 60, specific gravity or chemical reduction of copper salts. In the weeks and days preceding harvest, grapes are regularly tested for sugar content, to determine optimum harvest time. Conversely, to determine when fermentation is nearly finished, sugar levels are again monitored by specific gravity. Initially grape juice has a specific gravity greater than 1.000, due mainly to dissolved sugars, but when the specific gravity falls to 1.000, the wine is nearly ready. Some manufacturers also use "Clinitest" tablets (similar to those used in diabetic testing) or Fehling reaction for more precise monitoring as the color of the resulting solution indicates the amount of sugar remaining [20]. A large amount of sugar results in complete loss of the blue copper (II) ions, leaving the red copper (I) oxide. With less sugar, some blue copper (II) ions remain and less red copper (I) oxide is formed. In the absence of sugar the solution remains blue. For routine high-throughput sugar analysis the Thermo Scientific Gallery™ discrete analyzer can be used to determine glucose and fructose levels. Sample pre-treatment is minimal; generally centrifugation or filtration is adequate to prepare the wine samples. Another popular analytical technique for sugar analysis is ion chromatography (IC), using the easy-to-use and reliable Thermo Scientific™ Dionex™ Integrion™ HPIC™ system, with high-performance anion-exchange chromatography with pulsed amperometric detection (HPAE-PAD) [21].

### **Sensorial evaluation**

The wine quality is tested based on main characteristics visual, aroma, taste and harmony. It can be concluded that the different produced different types of wines including three yeast strains produced three wines with different characters [22].

### **Energy use in the winery**

The modern winery can produce a wide range of different wine products, from dry sparkling to sweet dessert wines. However, the vast majority of wines fall under the heading of sparkling or still red, rose and white wines. This is exactly the case in English wine making with a more or less even split between sparkling and still wine with significantly more white still wine produced

compared to rose or red wine. Energy use within the English wineries surveyed is described as either energy expended in wine production or energy expended in ancillary support services. Energy used in production describes all the energy expended by the processes and equipment necessary to produce the final product and covers everything from the arrival of the grapes at the winery door to the finished, packaged product leaving the facility. Ancillary support services relates to all the energy expended in the retail and administrative functions necessary to facilitate the winemaking process and includes wine tasting and sales, sanitation, food preparation, office and staff areas [23]. The total winemaking energy use presented in this study is the combined value of energy expended in production and ancillary requirements for any given winery. This study did not cover the energy used in vineyard activities, product transportation, accommodation and other separate product processes conducted on the site such as beer, cider or cheese production [24].

### **Winery Refrigeration**

Refrigeration and related cooling plant and equipment are the single largest users of energy in most wineries worldwide. This study indicates that a significant proportion of English wineries employed some form of mechanical refrigeration equipment for either production chilling needs or space AC requirements. All of the mechanical refrigeration systems listed in the survey used vapor compression refrigeration [25]. The vapor compression cycle uses a circulating liquid refrigerant as the heat transfer medium which absorbs and removes heat from the space/fluid to be cooled and subsequently rejects that heat to another space/fluid. Schematically illustrates the components and operation of the vapor compression cycle.

### **Future wine testing**

wine analysis is one of the few areas where classical ‘tried and tested’ methods based on simple inexpensive techniques, still exist alongside new automated technologies and extend to some of the most sophisticated analytical techniques available today. Thermo Fisher Scientific uniquely provides equipment and instrumentation to meet the most basic as well as the most sophisticated of needs, operating at the forefront of analytical chemistry [26]. Wine testing cannot replace the skills of the wine-maker, but providing real-time data indicating critical compositional parameters before, during and after fermentation can provide insights which allow the wine-maker to optimize production and produce wines of a consistently high quality. For the wine control authority, analysis provides the means to ensure compliance with rules of wine production and the means to guard against wine fraud, whether it be illegal addition of sugar or mislabeling the geographical origin of wine. For the future, hand-held devices based on spectroscopic techniques such as FTIR will play an increasingly important role in rapid and routine wine testing, whilst sophisticated separation and identification tools will continue to develop.

### **Wine Imports**

Current Indian reported trade data suggest that the top three wine suppliers to India are France, Australia, and Italy and wine imports from “New World” wine countries are growing, especially for Australian, American, South African, and New Zealand products, while imports from France and Italy have fallen [27]. After the setbacks of 2001 and 2008 due to the ban on imported wines and Mumbai terror attacks, there was a huge drop in Indian wine imports. Sales of imported wine are through hospitality (63%) and retail (30%) sectors, the two major marketing segments. There was an increase in wine imports since 2009 and reaching a high of 44,000 hL in 2011 and are on



pace to match that level in 2012. The Indian Ministry of Commerce reports the wine imports in 2013 equaled nearly 4 ML and totaled almost US \$25 million. In the 1st 7 months of 2014, imports were just over 1.7 ML and have totaled just over US \$10 million. In comparison with the first 7 months of 2013, import volumes and values were down by over 27% and 28%, respectively. Lower domestic production and persistent promotion efforts appear to be yielding results for imported wines [28].

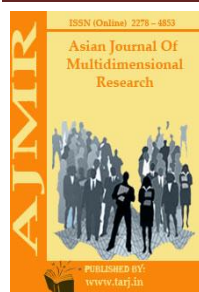
## CONCLUSION

Vegetables are fresh as well as in processed form not only improve the quality of our diet but also provide essential ingredients such as vitamins, minerals, and carbohydrates. vegetable wines are un distilled alcoholic beverages usually made from grapes or other fruits such as peaches, plums, or apricots, banana, elderberry, or black current which are nutritive, more tasty, and mild stimulants. Being vegetable-based fermented and un distilled product, wine contains most of the nutrients present in the original vegetable juice. The nutritive value of wine is increased due to the release of amino acids and other nutrients from yeast during fermentation.

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## **THE RELATIONSHIP OF ENZYME ACTIVITY WITH THE PRODUCTIVITY OF KARAKUL SHEEP**

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### **ABSTRACT**

*The article presents materials on the relationship of enzyme activity with multiple karakul sheep. The ways of increasing the growth and development of animals and the productivity of karakul sheep were determined depending on the activity of aspartate aminotransferase responsible for protein metabolism of the organism. The relationship between the growth rate of animals and the activity of this enzyme in the blood of karakul sheep was revealed. From the materials listed in the table it is clear that aspartate aminotransferase activity with body weight and growth rate in most cases there is a significant positive relationship. In most cases, correlations between traits occur on the basis of the pleiotropic effect of not one, but many genes that make up gene systems. Some of these genes have a pleiotropic effect, others included in these systems do not have a pleiotropic effect. Thus, Karakul sheep established intra-breed differences in the activity of the studied enzymes. Evaluation of lambs of various colors and colors is carried out according to the generally accepted Instructions on the assessment of Karakul lambs with the basics of breeding. Digital material processed by the method of N.A. Plokhinsky.*

**KEYWORDS:** *Bobotog-Suri, Breeding, Karakul Lambs, Correlation, Aspartate-Aminotransferase, Enzyme, Embryo, Phenotype, Nucleic Acids, Colors.*

## INTRODUCTION

### MATERIAL AND METHODS OF RESEARCH

The experimental part of the work was carried out on purebred karakul sheep of the Surkhandarya breed type of sheep bred in the Bobotog-Suri breeding plant in the Kumkurgan district of the Surkhandarya region. Evaluation of lambs of various colors and colors is carried out according to the generally accepted Instructions on the assessment of Karakul lambs with the basics of breeding. Digital material processed by the method of N.A. Plokhinsky.

### RELEVANCE OF THE TOPIC

In the selection of Karakul sheep, methods based on the achievement of genetics, biochemistry and other biological sciences are becoming increasingly important. The study of the productive and breeding qualities of animals, the patterns of variability and heritability of economic and biological indicators will allow to a certain extent to judge the nature of the processes occurring in the body and come closer to the directional regulation of the productive characteristics of sheep.

The correlation of individual traits of farm animals is extremely important for solving a number of breeding issues, in particular, in terms of predicting economically useful traits. Yusupov S.Yu., Gaziev A., Fazilov U.T. It is argued that many correlations between various traits have developed historically as an adaptation of an organism to certain environmental conditions and through selection, such connections can be significantly changed. Aboneev V.V. He wrote: "Enzymes need not only be studied, but also to master them, learn to control their action and thereby change the course of the life process at will, change the physiological and economically important properties of organisms in the direction we need."

Research Vorontsova OA It has been established that the selection of parental pairs of cattle, taking into account their genetic and biochemical characteristics, contributes to an increase in the crossing effect by 12-14%. In his study Vorontsova, O.A. on sheep, the Romney March breed found that serum aspartate aminotransferase activity is transmitted from parents to descendants at birth, to a large extent from the mother. The author explains this by the influence of the maternal organism during the embryonic period; she also indicates that with age, the influence of the mother decreases from 64 to 22% and the influence of the father increases from 14 to 48%. It is established that the indicators of the correlation of the selected traits serve as one of the main genetic parameters in the planning of breeding work.

Thus, in studying the connection between the activity of transamination enzymes and the meat productivity of gobies of the red steppe breed and its hybrid with the Herefords, A.I. Prudovym and D.B. Pereverzev established a highly significant correlation, which allows the use of the activity of alanine-aminotransferase as tests for predicting the growth energy and meat qualities in young cattle. According to Bondarev A.P. lambs with a high level of transaminase activity grew faster and in all periods had a greater live weight and average daily gains than their "low level peers". Aboneev V.V. It is reported that the activity of aminotransferases at an early age (2 months) in sheep steadily correlates with the body weight of animals at 6 and 7 months ( $r = 0.30-0.84$ ) by the growth energy over the rearing period ( $r = 0.63-0.64$ ).

In studies Yusupov S.Yu. et al. established a close relationship between the amount of total protein, aminotransferase (AST) activity in the blood of karakul lambs with growth intensity and resistance of the organism. In experiments conducted on Uzbek meat and wool sheep, studies

have shown that the activity of aspartate aminotransferase in two-month-old lambs reliably correlates with body weight at birth ( $r = 0.44$ ). When beating lambs, the activity of this enzyme was significantly correlated with the body weight of the young at this age.

### Phenotypic correlation of aspartate aminotransferase activity serum with live weight and growth rate of animals

Correlated group signs	Groups			Average
	Plus options	Medium options	Minus options	
Included animals	44	45	44	133
Aspartate aminotransferase live weight at birth	0,15±0,14	0,56±0,10	-0,03±0,15	0,20±0,88
Aspartate aminotransferase live weight during beating	0,29±0,13	0,68±0,09	-0,41±0,12	0,23±0,08
Aspartate aminotransferase absolute gain before beating	0,29±0,13	0,63±0,09	0,42±1,12	0,21±0,08
Aspartate aminotransferase average daily gain of	0,10±0,14	0,65±0,09	-0,30±0,13	0,13±0,08

Our task was to establish a link between some biochemical indicators of blood and body weight and the growth rate of animals. The table shows data on the relationship of the activity of aspartate aminotransferase with some of the productive properties of experimental animals. From the materials listed in the table it is clear that aspartate aminotransferase activity with body weight and growth rate in most cases there is a significant positive relationship.

A reliable relationship was established between the aspartate aminotransferase activity in the blood serum absolute increase before beating ( $r = 0.21 - 0.63$ ) and particularly high correlation rates were found in the group of animals "mean variants" ( $r = 0.56 - 0.68$ ) which indicates a greater possibility of selection for these characteristics in this group. So it was established that in many analyzed cases (except for the group of medium variants) the correlation of the activity of aspartate aminotransferase in the blood serum of young stock with the body weight and growth rate was negative and unreliable. The data obtained by us coincide with the results of a number of domestic and foreign scientists.

### Phenotypic correlation of the amount of nucleic acids in the blood serum with the body weight and growth rate of animals

Correlated signs of group	Groups			B average
	"Plus" options	"medium" options	"minus" options	
Animals counted, (goal)	44	45	44	133
The amount of nucleic acids - the absolute increase before beating	0,32±0,14	0,05±0,15	0,08±0,15	0,25±0,07
Amount of nucleic acids - average daily growth of	0,01±0,15	0,03±0,15	0,10±0,15	0,10±0,08

The amount of nucleic acids - live weight at birth	0,01±0,12	0,03±0,15	0,10±0,15	0,10±0,08
The amount of nucleic acids - live weight when beating	0,32±0,14	0,13±0,14	0,06±0,15	0,28±0,07

It follows from the table that a significant positive correlation has been established for the whole experimental group of animals between the sum of nucleic acids with absolute gains prior to beating ( $r = 0.25$ ,  $P < 0.01$ ).

Depending on the selection group for the activity of aspartate aminotransferase in serum, the correlation of the sum of nucleic acids from one side and the body weight with the arc was different.

So, in the group of "medium" variants, a significant positive relationship was established between the sum of nucleic acids and the live at birth ( $r = 0.28$ ,  $P 0.05$ ). In the group of animals "minus" options such connections were low and unreliable. A reliable connection was found on average for all groups of animals according to the studied characteristics.

In most cases, correlations between traits occur on the basis of the pleiotropic effect of not one, but many genes that make up gene systems. Some of these genes have a pleiotropic effect, others included in these systems do not have a pleiotropic effect. Therefore, depending on the genotypes of animals, the direction of selection, the selection of pairs in animals of different herds, there are different correlation indicators between the same characters. The genetic indicators of the association of characters determined by us are listed in the table. From the data in the table it can be seen that a significant genetic relationship has been established between the activity of aspartate - aminotransferase in serum and the body weight of experimental animals and their growth rate.

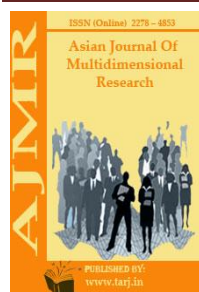
## CONCLUSION

Thus, Karakul sheep established intra-breed differences in the activity of the studied enzymes. It is revealed that these enzymes change activity within the limits of colors and coloring, are well inherited and have a correlative connection with the color and coloring of astrakhan and other indicators of productivity. In connection with the above, it can be concluded that these studies will allow the development of biochemical aspects of the selection of Karakul sheep.

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## **MORPHOLOGICAL CHANGES AND COLOUR ADHERENCE OF SELECTED NATURAL FIBRES**

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### **ABSTRACT**

*The vegetable fibres are obtained from plant source and are cent per cent bio degradable. Now a days the global consideration is cradle to cradle effect which bothers about the recycling and disposal of the finished goods. Though all the vegetable fibres are from plant source, each has unique property in it. The portion of the plant from which the fibres are separated influence the properties of the fibres. With this consideration and literature survey an attempt was made to scour, bleach and dye the fibres with standard method for all the three selected fibres namely obtained from Arecanut, Jute and Sisal fibres. Then these fibres were analysed for essential properties along with chemical constituents, colour fastness and spectro photometric analysis for determining the colour strength. Morphological study was done with Scanning Electron Microscopic Analysis. It was noted that the fibres had very good colour strength and fastness to rubbing.*

**KEYWORDS:** Degradable, Obtained, Consideration



## 1. INTRODUCTION

Natural fibres are produced from renewable resources, are biodegradable and relatively inexpensive compared to the traditionally used synthetic fibres. Fibres of this type, for instance, hemp and flax, are successfully used as packaging material, interior panels in vehicles, and building components, among others. Also, natural fibres like banana, sisal, hemp and flax, jute, coconut, local fibres and oil palm [5-11] have attracted scientists and technologists for applications in consumer goods, low-cost housing and other civil structures. **Oladele 2010**

The plant fibres often referred to as vegetable fibres. These play a vital role in our day to day life. The types of plant fibre include bast, seed and leaf fibres. Bast fibres are collected from the inner bark or bast surrounding the stem of the plant which have higher tensile strength than other fibres. Therefore, these are used for durable yarn, fabric, packaging and paper industries. The leaf fibres are collected from leaves, and seed fibres are obtained from seeds or seed cases. **(Kiruthika)** A fibre is defined as 'a unit of matter characterised by flexibility, fineness, and high ratio of length to thickness' while fibre ultimate can be defined as 'one of the unit botanical cells into which leaf and bast fibres can be distinguished' except for seed fibres most plant fibres exist in bundles of ultimate fibres. **Mwaikambo, I. Y, 2017**. The leaf fibres, also referred to as 'hard' fibres and are obtained from the leaves or leaf stalks of various monocotyledonous plants. Monocotyledons have parallel veined leaves and have one seed leaf **Perry 1975**. The seed fibres are generally formed from a single biological cell. It is reported that more than one cell takes part in the growth of fibres. **Morton 1975**. Areca belongs to the species *Areca catechu Linnaeus* under the family palmecea and originated in the Malaya peninsula, East India. The sisal and jute fibers are considered as hard cellulose fibers because of their high tensile modulus and low elongation at break. **Dhanalakshmi, 2012**. Sisal with the botanical name *Agave sisalana*, is a species of Agave native to southern Mexico but widely cultivated and naturalized in many other countries. <https://en.wikipedia.org/wiki/Sisal>. Jute botanically called *Corchorus capsularis* is the second most important fibre apart from cotton. It is a fast growing annual plant in hot and humid climate jute plants reach about 2.5 - 3 m in height within 4-6 months has a globular shaped pod. **Rowell, 1998**. The bast fibers were once of major importance, particularly before the supply of cotton from America, for clothing and other textiles; and the leaf fibers were dominant in ropes and cordage. The additional competition from manufactured fibers, their use is now limited. The lower-cost fibers have inferior properties, and the superior fibers are expensive to produce. <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/bast-fibre>. This study was undertaken considering the positive attributes of the fibres namely Arecanut (seed) Jute (bast) and Sisal (leaf) fibres which are obtained from various portions of the plants, to analyse the essential physical properties on scouring and bleaching, and assess the colour adherence of the fibres.

## 2. METHOD

The materials and method used for the study are explained under the following heads.

### Scouring of Fibres

Alkalisiation successfully modifies structure of natural fibres such as hemp, jute, sisal and kapok. **Bledzki et al. (2002)**. Conventionally, scouring is done in a hot aqueous solution of NaOH to remove hydrophobic components from the primary wall (e.g. pectin, protein and organic acids) and the cuticle (waxes and fats). The alkaline scouring is effective and the costs of NaOH are low. **Anelise**

The scouring process is done to remove the nitrogenous matters and to make the operations of bleaching and dyeing efficient, say Modi and Garde (1995). The parameter and the operational range are given in the Table - I. Scouring of cotton textiles is an essential treatment in textile wet processing in order to obtain a sufficiently hydrophilic nature in textiles as the waxes and other hydrophobic materials are removed. The presence of the non-cellulosic materials in them creates a physical hydrophobic barrier to protect the fiber from the environment throughout its development. **InTech- Pre\_treatment\_of\_textiles\_prior\_to\_dyeing.pdf**

**TABLE – I RECIPE USED FOR SCOURING OF FIBRES**

S.No.	Parameter	Operational Range
1	Sodium carbonate (%) Sodium silicate (%)	2-3
2	Wetting agent (%) Material to liquor ratio	1.0-1.5
3	Temperature (□ C)	0.1
4	Time (Hour)	1 : 4
5		60
6		1

### Bleaching of Fibres

Bleaching of the fibre was done using hydrogen peroxide as suggested by Ghosh et al. (2005). The recipe used for bleaching is given in Table – II.

**TABLE – II RECIPE USED FOR BLEACHING OF FIBRES**

S.No.	Parameter	Operational Range
1	Hydrogen peroxide (%) Soda ash (%)	1.0
2	Sodium silicate (%) Wetting agent (%) Material to liquor ratio	1.0
3	Temperature (□ C)	1.0
4	Time (Hours)	0.1
5		1 : 20
6		80□
7		2

After the bleaching process, the fibres were washed in distilled water and dried at room temperature. The fibres are exhibited in plate 1-3

### Dyeing of Fibres

The reactive dye has advantages that these are soluble in water, give brighter shades, have moderate rubbing fastness and cheap. <http://textilelearner.blogspot.com/2013/10/reactive-dyestuff-dyeing-method-of.html>.

Reactive dyes are colored compounds that contain functional groups capable of forming covalent bonds with active sites in fibers such as hydroxyl groups in cellulose, amino, thiol and hydroxyl

groups in wool or amino groups in polyamides. Bond formation between the functional groups and substrate; result in high wet fastness properties. **Hossen and Imran, 2017.**

The dye bath was set with calculated amount of dye solution and water using MLR 1:20. The bleached fibre samples were wetted and entered into the bath containing dye solution. The temperature of the bath was raised to 40<sup>o</sup> c and worked for 10 min and then the calculated quantity of salt was added in three portions at regular intervals (10 min). Then the temperature was raised to 50<sup>o</sup>c and the dyeing process was continued for 30 min. Then a calculated quantity of soda ash was added and dyeing was continued for further 30 min. Finally the fibre samples were taken out, washed with cold water and then given soaping treatment to remove the unfixed dyestuffs and chemicals. <https://www.fibre2fashion.com/industry-article/1661/salt--alkali-free-reactive..>

### **Evaluation of fibres**

The fibres were evaluated for various properties as explained under.

#### **2.4a. Visual evaluation**

The original and processed fibres were subjectively assessed by visual inspection. A group of people were asked to evaluate the fibres visually colour, texture and general appearance. The results were recorded and tabulated.

#### **2.4b Weight loss**

The weight of the fibres was assessed using electronic balance. The known weight of the selected fibres were given scouring and bleaching treatments and assessed again after each treatment. Then the loss in weight was calculated and percentage loss was obtained.

#### **2.4c. Chemical Constituents**

Hemi celluloses are a group of complex hetero polysaccharides made up of various sugars and sugaracids depending on the plantspecies.

<https://www.sciencedirect.com/topics/engineering/hemicelluloses>

Lignin is a complex biopolymer composed of different amounts of three monolignols. <https://www.sciencedirect.com/topics/materials-science/lignin>

Chemical compositions of fibers (-celluloses, hemicelluloses and holocelluloses) were estimated according to the following TAPPI procedures: αcelluloses – T203cm-99, and holocelluloses – Tappi 249-75. The difference between the values of holocelluloses and αcellulose gives the hemicelluloses content of the fibers. For the estimation of lignin, 0.75 ml of 0.1 M sodium hydroxide was added to 15 mg of the sample and kept under stirring in hot water bath. After one hour the sample was removed and washed first with distilled water followed by 10% acetic acid. The samples were dried in a hot air oven. Ten mg of this sample was soaked in 0.2 ml of 72% sulfuric acid for two hour and then added 10 ml of distilled water. The sample was filtered, washed and dried under high vacuum.

#### **2.4d Moisture content**

The weighed (A) amount of sample was kept in hot air oven for two hours at 105 ±3 °C followed by cooling in a desiccators, replaced the stopper and opened the stopper momentarily to equalize the air pressure and weigh. Bottle was returned to the oven for one hour; repeat the cooling and

weighing as above for successive hourly periods until constant weight (B) was reached, that is, until successive weighing do not changed by more than 0.002g. The moisture content was calculated as follows:

$$\text{Moisture content (\%)} = A - B / A \times 100.$$

Where C and D are the initial and final weight of fibers. **Khan 2009 2.4e Fiber Morphology**

The fibre morphology was found and analysed through Scanning Electron Microscopic appearance (SEM) analysis. It was observed at different magnification in both the longitudinal and cross section for raw and treated fiber samples.

#### **.2.4f Spectrophotometric Analysis for colour strength and brightness index**

It is now possible to quantify colour through use of instruments. Although, there are many other instruments which can measure colour but textiles are measured in spectrophotometer. Spectrophotometer measures appearance and measuring appearance is a different aspect than measuring colour. Appearance includes both geometrical attributes and colour attributes, since the textile surface is textured where the geometrical attributes also contribute to the resultant colour, so this is the reason why coloured textiles are measured in spectrophotometer **R McDonald** The objective evaluation was carried out using spectrophotometer. The instrument used for the study was SS 5100H Premier Colour Scan dual beam Spectrophotometer. It is designed with features which can be seen on international class of spectros. It is an advanced aberration corrected concave holographic grating for dispersion reflected light coupled with highly accurate discrete sensing photodiode array detector. The integrating sphere conforms to CIE/ASTM specifications for size, which is 152 mm diameter. The light source is pulsed Xenon with wave length ranging from 360nm to 700nm and interval of 10nm. The equipment was adjusted to have a medium area view (MAV) of 5.0 mm x 10.0 mm, with operating temperature of 15<sup>0</sup>C. The RH was less than 90%. Loose fibres were difficult to measure as it tends to protrude into the sphere. This may introduce errors into the reflectance measurement. There is also risk in falling into the instrument. A better technique is to place an exact mass of fibres into a compression cell and apply a constant amount of pressure. This will eliminate errors due to gaps between fibres that exist under conditions of minimal pressure. Knowledgebase. [datacolor.com/.../color\\_measurement\\_methods\\_for\\_textile\\_fabrics. pd](http://datacolor.com/.../color_measurement_methods_for_textile_fabrics.pdf). The three fibre samples were analysed for the colour strength, a\*, b\*, C\*, H\*, dE\*K/S value and Reflectance were found of all the dyed samples. The difference between the undyed and dyed samples also were observed as the undyed samples of are canut and jute had their self colour.

Fibre brightness was also observed using spectrophotometer. The brightness index was observed for raw and treated fibre samples.

#### **2.4g Colour Fastness**

If the **color fastness** to rubbing is good then its other properties like Washing fastness and durability etc improves automatically because the rubbing is a method to check the fixation of the color on the fabric. So if the fixation is good its washing properties will be good. Color Fastness to rubbing is a main test which is always required for every colored fabric either it is Printed or dyed. So wet and dry rubbing fastness properties were observed in all the three dyed samples. [http://textilelearner.blogspot.com/2011/08/color-fastness-to-rubbing-rubbing\\_1201.html](http://textilelearner.blogspot.com/2011/08/color-fastness-to-rubbing-rubbing_1201.html)

The standards AATCC- 08 was used to check rubbing by Dry and Wet methods. In wet rubbing the rubbing cloth is wet and the test is performed according to test method and rating is given by comparing the Staining with the gray scale. Dry rubbing is checked by rubbing with dry cloth and comparing with the staining with gray scale for ratings. The fibre bunch of jute and sisal were held in position for rubbing and the areca nut fibres were stitched to a base fabric for doing the process as the fibres were too short to handle.

### 3. Results and Discussion

The results and discussion of the study are presented under the following heads.

#### 3.1. Visual Assessment of Fibres













The visual assessment results are presented in the Table III.

**TABLE-III VISUAL ASSESSMENT OF FIBRES**

S.NO	FIBRES	ASPECTS IN PERCENTAGE												
		GENERAL APPEARANCE			COLOUR			LUSTURE			TEXTURE			
		GOOD	FAIR	POOR	WHITE	YELLOW	BROWN	GOOD	FAIR	POOR	SOFT	COARSE	VERY COARSE	
1.	ARECA NUT	O	60	40	-	-	90	10	-	5	95	80	20	-
		S	75	25	-	-	95	5	-	80	20	25	75	-
		B	90	10	-	-	100	-	75	25	-	90	10	-
6.	JUTE	O	20	80	-	-	-	100	-	80	20	-	90	10
		S	40	60	-	-	90	10	-	90	10	20	80	-
		B	80	20	-	-	100	-	-	95	5	30	70	-
8.	SISAL	O	80	20	-	20	80	-	10	90	-	-	90	10
		S	90	10	-	10	90	-	20	80	-	-	95	5
		B	100	-	-	100	-	-	35	65	-	-	100	-

From the Table III it is vivid that the bleached areca nut sample was rated as good in general appearance by the maximum of 90 percentage of judges. It was also rated as yellow in colour, good in lusture and soft in texture by the majority of judges. The bleached jute fibre sample was rated as good in general appearance by 80 percentage of judges and yellow in colour by 100 percent of judges. It was also rated as fair in lusture and coarse in texture by the majority of judges. The bleached sisal fibre sample was rated as good in general appearance by 100 percentage of judges and white in colour by 100 percent of judges as well as coarse in texture by again 100 percent of judges.

From visual assessment of original and treated fibers it is clear that bleaching has improved the general appearance and colour of all the samples. On the other hand, bleaching had modified the original lusture but improved the texture of all the samples. The fibre samples are presented in the plate1.

			
<b>1a ARECANUT ORIGINAL SAMPLE</b>	<b>1b ARECANUT SCOURED SAMPLE</b>	<b>1c ARECANUT BLEACHED SAMPLE</b>	<b>1d ARECANUT DYED SAMPLE</b>
			
<b>2a JUTE ORIGINAL SAMPLE</b>	<b>2b JUTE SCOURED SAMPLE</b>	<b>2c JUTE BLEACHED SAMPLE</b>	<b>2d JUTE DYED SAMPLE</b>
			
<b>3a SISAL ORIGINAL SAMPLE</b>	<b>3b SISAL SCOURED SAMPLE</b>	<b>3c SISAL BLEACHED SAMPLES</b>	<b>3d SISAL DYED SAMPLE</b>
<b>PLATE 1 -3</b>			

**Weight loss**

The weight loss in the scoured and bleached fibre samples are presented in the Tables IV and

**TABLE-IV WEIGHT LOSS IN SCOURED FIBRE SAMPLES**

Fibre	Areca nut	Jute	Sisal	
Un treated Weight (gm)	30	33	34	
Alkali Treated Weight (gm)	12	27.3	28.3	
Weight loss after treatment (%)	26.6	17.2	16.7	

**Figure I**

From the Table IV it is obvious that the weight of the areca nut jute and sisal fibres were 30,33 and 34 grams respectively. This reduced drastically in the areca nut fibre of 26.6 per cent followed by jute fibre sample of 17.2 per cent and sial fibres of 16.7 per cent. The sisal fibre showed the least weight loss on alkali treatment of the selected fibres.

The weight loss values obtained for fibres treated with NaOH solution identify the extent of swelling/dissolution. The presence of NaOH in the solution only boosted the fibre swelling without causing the dissolution. **Fibtex(2injoy6q3lsnkoio).pdf**. Accordingly weight loss in fibres was observed in the all the three fibres on scouring.

**TABLE-V WEIGHT LOSS IN BLEACHED FIBRE SAMPLES**

Fibre	Areca nut	Jute	Sisal	
Un bleached Weight (gm)	75	48.7	52.5	
Bleached Weight (gm)	55	45.9	49.7	
Weight loss after treatment (%)	26.6	5.7	5.3	

**Figure II**

The weight loss was the highest in the arecanut fibre samples of 26.6 per cent over the unbleached fibre samples. The jute and sisal fibres showed a weight loss of 5.7 and 5.3 per cents respectively. Bleaching removes any unwanted colour from the fibres. This process also eliminates the traces of other impurities remaining from the previous preparation steps and

improves the absorbency of the material for dyeing and printing. **Uddin 2010**. Accordingly, the fibre colour has changed and brightness is improved in all the fibre samples after bleaching. **(Plate 1-3)**

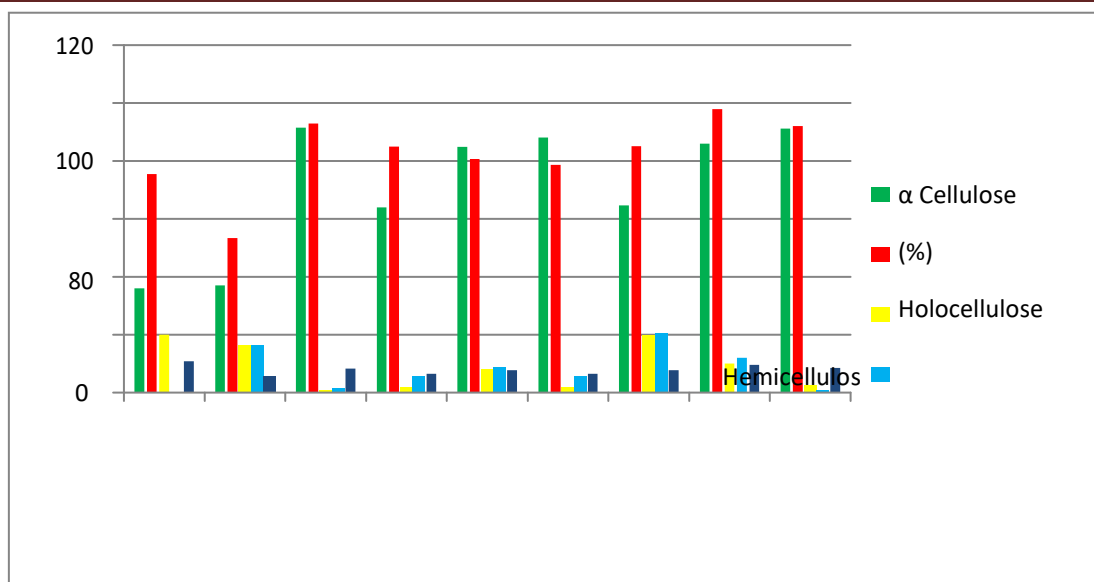
### Chemical constituents of Fibres

The Chemical constituents of the treated and untreated fibre samples are presented in the Table VI.

**TABLE-VI CHEMICAL CONSTITUENTS AND MOISTURE CONTENT FIBRE SAMPLES**

S. No	Name of fibres	Obtained Results					Source
		$\alpha$ Cellulose (%)	Holocellulose (%)	Lignin (%)	Hemicelluloses (%)	Moisture Content (%)	
1.	Areca nut Raw	36.0	75.49	20	39.5	10.8	-
	Areca nut Scoured	37	53.39	16.6	16.39	5.75	
	Areca nut Bleached	91.5	92.93	1	1.43	8.27	
2.	Jute raw	64.0	85.0	2	5.6	6.55	
	Scoured Sample	84.8	80.60	8.0	8.8	7.74	
	Bleached Sample	88.1	78.70	2	5.6	6.5	
3.	Sisal Raw	64.6	85.10	20	20.5	7.76	
	Sisal Scoured	85.9	97.90	10	12	9.62	
	Sisal Bleached	91.1	92.0	2.5	0.9	8.55	
<b>Literature</b>							
	Jute	51-84	-	5-13	12-20	-	Gassan, J., Chate, A.
	Sisal	43-78	-	4-12	10-13	-	El-Saied, H., Waly, A.I. and Basta, A.H. (2000)





**Figure III**

### Chemical Constituents and Moisture content Fibre Samples

**α Cellulose (%):** The α Cellulose (%) content of arecanut fibres improved slightly in the scoured sample which increased drastically in the bleached arecanut sample. In the jute and the sisal samples drastic increase in α Cellulose was observed in both scoured and bleached samples.

**Holocellulose:** The holocellulose of the fibres decreased in the scoured samples of jute over the untreated samples whereas it increased in the sisal scoured sample. The arecanut and sisal samples showed an increase of holocellulose in the bleached samples whereas it decreased in bleached jute samples.

**Lignin:** The lignin content decreased in the three samples on scouring and bleaching except for the jute scoured fibre samples which showed an increase. Removal of surface lignin improved bleachability. Part of brightness development during bleaching is due to the elimination of chromophores in lignin by peroxide. **Stenius.P**

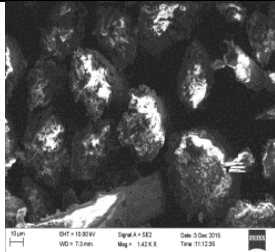
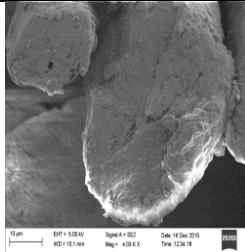
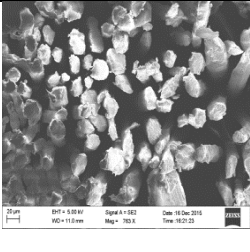
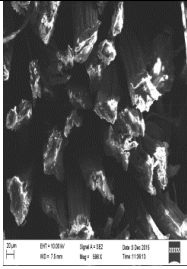
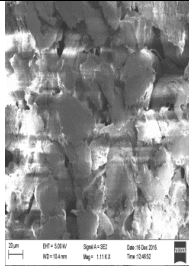
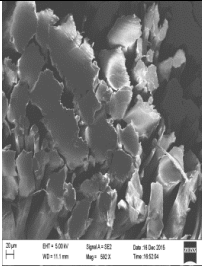
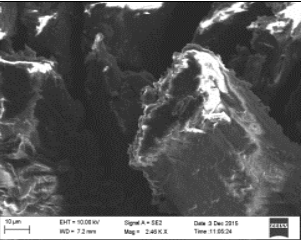
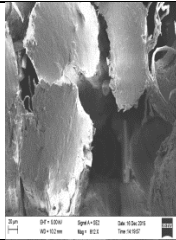
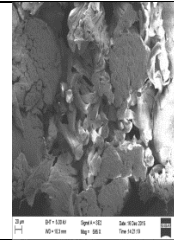
**Hemi cellulose:** Hemi cellulose content also showed a decrease in the scoured samples of areca nut, jute and sisal samples except the scoured jute sample as it showed an increase in the content.

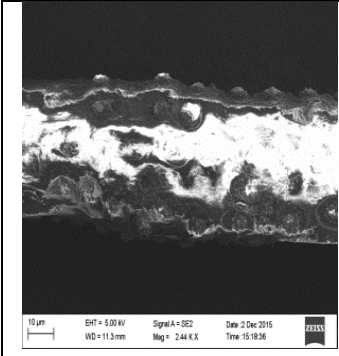
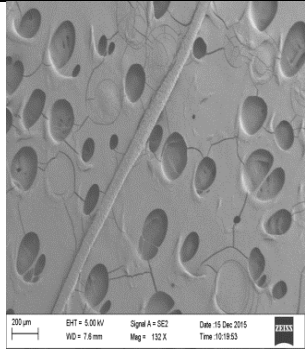
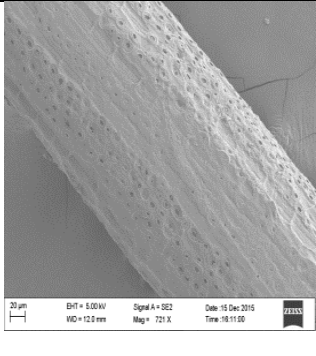
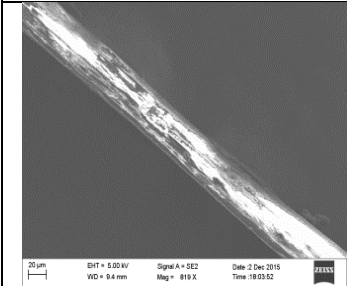
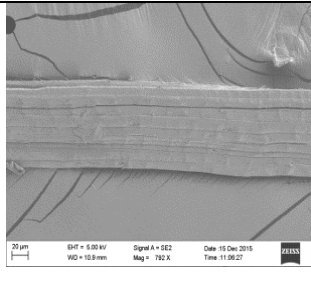
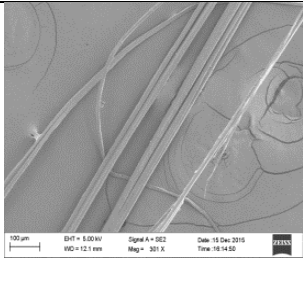
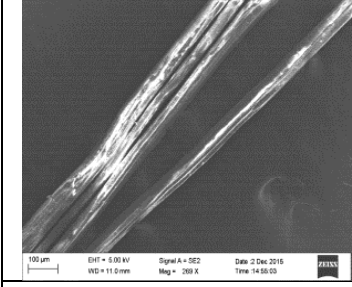
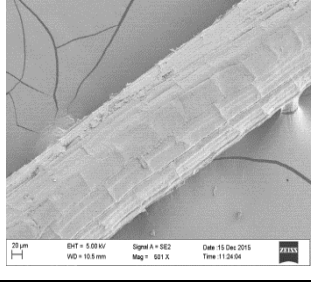
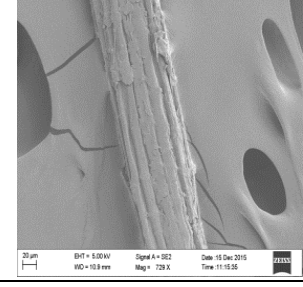
The changes in the chemical constituents were observed in the alpha cellulose, lignin and hemicelluloses from the fibres after chemical treatments. The cellulose content increased with the removal of hemi cellulose and lignin (Ling 2017) which is in par with the present study in both scoured and bleached fibre samples of areca nut and sisal fibres. But in the case of jute fibres it is contrast to the above condition.

**Moisture content:** Moisture content content of the arecanut fibre samples decreased on scouring and bleaching over the raw fibres but it showed an increase in the scoured jute and scoured and bleached samples of sisal fibres.

**Morphological study with SEM**

The cross sectional and longitudinal views observed through SEM appearance are presented in Plate 4 and 5.

		
Raw Areca Fibre	Scoured Areca Fibre	Bleached Areca Fibre
		
Raw Jute Fibre	Scoured Jute Fibre	Bleached Jute fibre
		
Raw Sisal Fibre	Scoured Sisal Fibre	Bleached Sisal Fibre
<b>Plate 4. Cross sectional view of Fibres</b>		

		
Raw Areca nut fibres	Scoured Areca nut fibres	Bleached Areca nut fibres
		
Raw jute fibre	Scoured jute fibre	Bleached Jute Fibre
		
Raw Sisal Fibre	Scoured Sisal Fibre	Bleached Sisal Fibre
<b>Plate 5 Longitudinal view of Fibres</b>		

From the SEM appearance study, physical changes are observed in the fibre surface after bleaching.

Changes in the surface occur due to the removal of surface impurities, lignin and hemicellulose which has happened in the present study also. Existence of pores on the fibre surface is also noted. (Maruah et al 2014).

### Fibre brightness

The original, scoured and bleached fibre brightness index is presented in the Table VI.

**TABLE VII BRIGHTNESS INDEX OF FIBRE SAMPLES**

Fibre samples		Brightness	Brightness Index			
1	OAR	13.828	50			
	SAR	10.095	40			
	BAR	14.022	30			
2	OJ	13.047	20			
	SJ	12.514	10			
	BJ	17.698	0			
3	OS	26.271				
	SS	28.644				
	BS	40.611				

**FIGURE IV**

**Colour Strength**

Spectrophotometric analysis for the colour strength and difference were recorded and is presented in the Table VIII.

**TABLE VIII COLOUR STRENGTH**

S. No	Sample	a*	b*	C*	H*	dE*	DL*	Da*	Db*	Dc*	DH*	K/S
1	Arca	O	6.495	26.092	26.888	75.991	-	-	-	-	-	25.140
		D	20.808	26.041	33.312	51.324	14.409	-1.658	14.313	-0.078	6.424	-12.791
2	Jute	O	8.063	17.311	19.097	64.999	-	-	-	-	-	32.045
		D	22.706	22.588	32.028	44.833	16.075	4.017	14.643	5.277	12.931	-8.663
3	Sisal	O	5.005	17.852	18.540	74.309	-	-	-	-	-	17.133
		D	25.728	22.754	34.346	41.473	21.545	3.273	20.723	4.902	15.806	-14.270

From the above Table VIII it is clear that a\* coordinate indicates the redder in axis in all the cases of the dyed samples of Areca, Jute and Sisal fibre samples with 20.808, 22.706 and 25.728 respectively. Of these the maximum was observed in the dyed sisal sample followed by the dyed

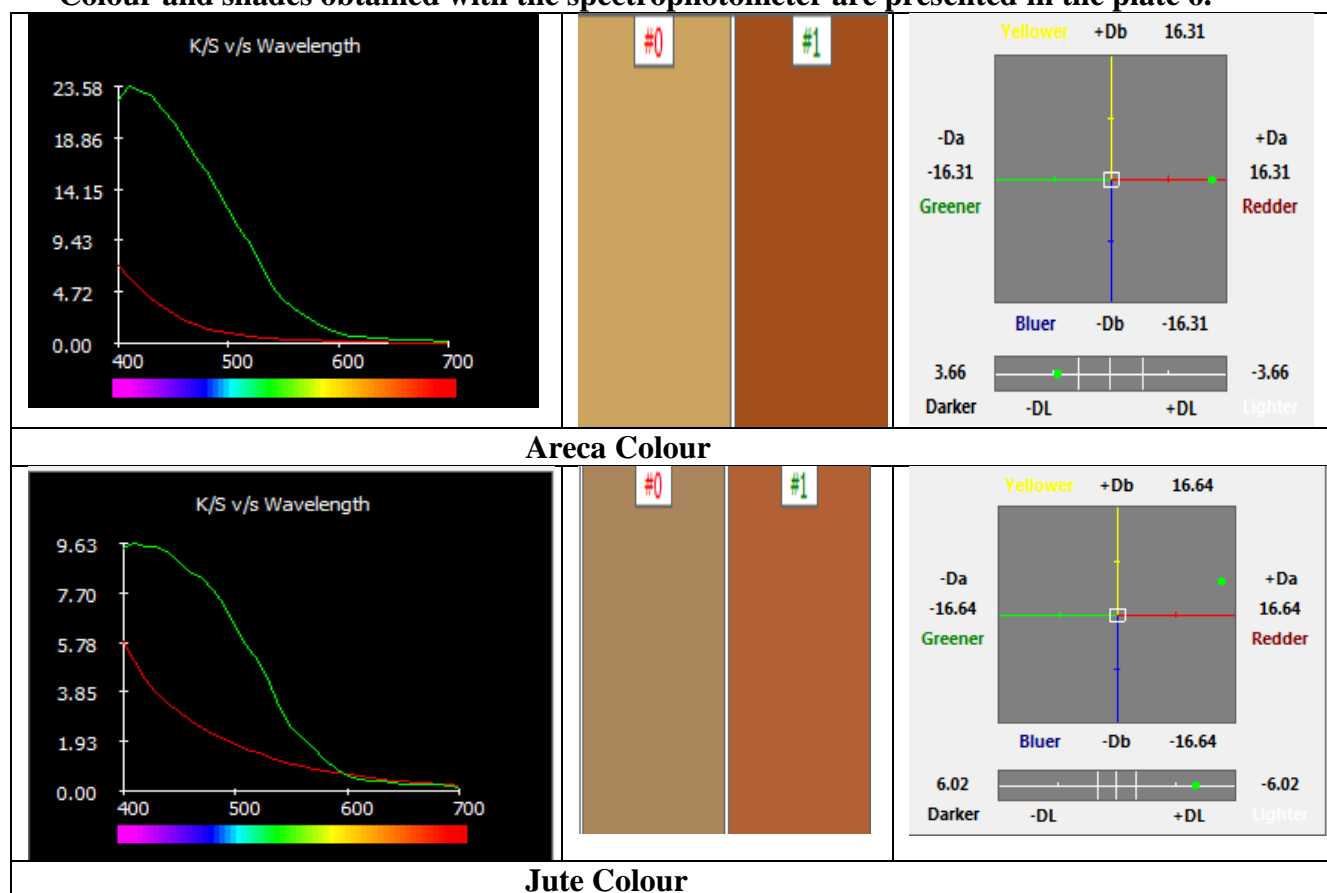
jute sample. All the undyed samples show lesser values as they are dyed but have self colour in them.

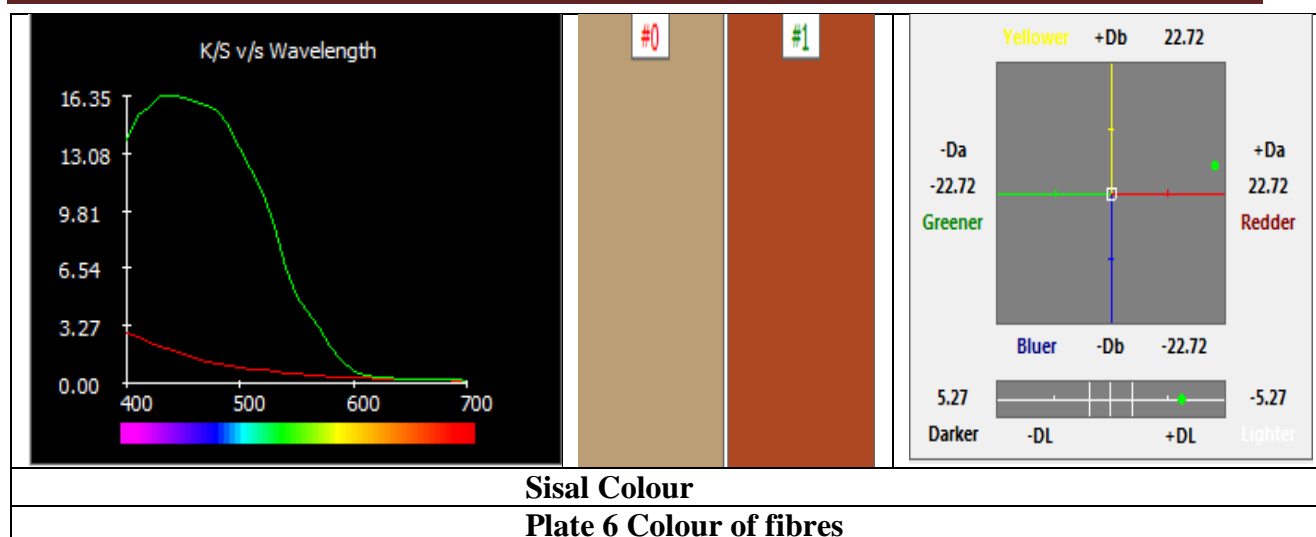
The  $b^*$  indicates yellower when it is positive. The highest value is observed in the Areca dyed sample. In this case the values of undyed samples are lesser than the dyed samples.

The  $C^*$  is the chroma which was noted to be the highest in the dyed sample of sisal of 34.346 followed by the areca of 33.312 and jute of 32.028 samples.

The difference between undyed and dyed samples  $Da^*$   $Db^*$  and  $Dc^*$  were observed to be the highest in the sisal dyed sample. The colour strength that is the K/S value was observed to be the highest in the dyed arecanut fibre sample 175.632, followed by the dyed sisal fibre sample 152.667 and the dyed jute fibre sample of 82.767. Difference in chroma is positive expressing to be brighter. The graphical representation of the standard (undyed) and the dyed samples is presented in the plate

**Colour and shades obtained with the spectrophotometer are presented in the plate 6.**





### Colour fastness of the fibre samples

The Colour fastness of the fibre samples to rubbing are expressed in the Table IX.

**TABLE IX COLOUR FASTNESS TO RUBBING**

S.No	Samples	Colour Change		Staining	
		Dry	Wet	Dry	Wet
1.	Areca nut	4/5	4	4	3/4
2.	Jute	4	3/4	4	4
3.	Sisal	4/5	4	3	3/4

**Grey Scale Ratings : For colour change (CC) : 1-Very Poor, 2-Poor, 3-Moderate, 3/4-Fair, 4-Good, 4/5-Very Good, 5-Excellent / For Staining : 1-Very Poor, 2-Poor, 2/3-3 - Moderately poor, 3/4-Fair, 4-Good, 4/5-Very good, 5-Excellent**

From the Table IX it is clear that the colour change to dry crocking showed very good colour fastness to crocking in both areca and sisal dyed fibres whereas the jute fibres showed good colourfastness property to crocking. The wet crocking was good in the fibres of areca nut and sisal dyed fibres whereas it was fair in the jute dyed fibre sample. The staining was noted to be good in both the fibres namely areca nut and jute and it was only moderately poor in the sisal fibre sample in dry crocking. The wet crocking was observed to be fair in both areca nut and sisal fibre samples but it was good in the jute dyed fibre sample. The dry crocking was higher than the wet crocking in almost all the dyed fibre samples.

### CONCLUSION

The visual assessment of original and treated fibers show that the bleaching has improved the general appearance and colour of all the samples and had also modified the original lusture and improved the texture of all the samples. The weight loss was had occurred in all the three fibre samples on scouring and bleaching of which it was the highest in the arecanut samples and least in the sisal samples. The cellulose content increased with the removal of hemi cellulose and lignin in both scoured and bleached fibre samples of areca nut and sisal fibres, but in the case of

jute fibres it was contrast. Moisture content of the arecanut fibre samples decreased on scouring and bleaching over the raw fibres. The surface modification occurred due to the removal of surface impurities, lignin and hemi cellulose which is vividly observed from the SEM appearance. The use of spectrophotometer and colour software can significantly reduce the lead time and brings accuracy and perfection at both level colour approval stage and during coloration process. The colour strength was the highest in the arecanut fibres with K/S value of 175.632. The dry crocking was higher than the wet crocking in almost all the dyed fibre samples.

### Acknowledgement

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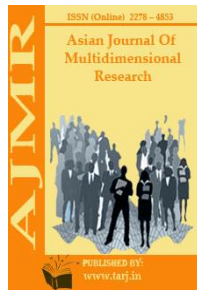
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## IMAGE ENCRYPTION APPROACH USING IKEDA MAP AND VERTICAL AND HORIZONTAL BLOCKS

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### ABSTRACT

*In some works Arnold cat map [4] is used as the chaotic function to permute the pixel and cause disturbance in it. These operations are done on the semi-encrypted image and then horizontal blocks are combined to give the final encrypted image. It should be noted that the actual contents of  $x$  are not modified in this operation. Now,  $Img_3$  is taken for applying row wise operations. A flat histogram indicates that pixel intensities at all pixels in image are same in frequency. On the other hand, a meaningful image would have an uneven histogram indicating some information present inside it. For obtaining correlation coefficient values, randomly a pair of 3000 pixels were chosen from both plain and encrypted images in all the three directions-horizontal, vertical and top-right diagonal. Using simple bit XOR operations and blocks of image in horizontal and vertical directions, encrypted image is obtained. The encrypted image is tested for statistical properties, key analysis and information entropy values. Hence there is a requirement of developing an encryption algorithm which can convert the image data into some unrecognizable form (called encrypted form). Chaotic system in image encryption was first used by Matthews [2].*

**KEYWORDS:** Encrypted, Directions-Horizontal, Semi-Encrypted

## 1. INTRODUCTION

High speed internet and voluminous information available over a few clicks has facilitated our lives in many ways. It has however, made it available to all kinds of internet users present in all four corners of the world. Images reveal a lot more information than a piece of text. Thus, image security has become extremely important in today's era of information and technology. Conversion of image to some jumbled form is one of some solutions to this problem. This process is called image encryption whereby a plain image is transformed into some image that appears to be some noise and information in image is not revealed. That being said, traditional methods do not guarantee the safety of information inside image [1] as they are incapable to sample image data. Hence there is a requirement of developing an encryption algorithm which can convert the image data into some unrecognizable form (called encrypted form). Chaotic system in image encryption was first used by Matthews [2]. The proposed technique paved the way for other image encryption algorithms to use chaotic systems for confusion and diffusion phases of image encryption technique.

The proposed image encryption algorithm is based on ikeda map. It first performs the operations column wise and then row wise operations are performed. For column wise operations, vertical blocks of given plain image are made first and then using chaotic sequences of ikeda map, diffusion is performed. Afterwards, the semi-diffused image blocks are combined to give a semi-encrypted image. Then, row-wise operations are performed on it. These operations are done on the semi-encrypted image and then horizontal blocks are combined to give the final encrypted image.

Rest of the paper is structured as follows. Section 2 lists a brief literature review. The proposed approach is explained in detail in section 3. Results of simulation of the proposed approach are presented in section 4 while we conclude the paper in section 5.

## 2. RELATED WORK

Chaotic maps are used in image encryption process for permutation and confusion processes of various works proposed in literature. In some works Arnold cat map [4] is used as the chaotic function to permute the pixel and cause disturbance in it. Some other chaotic function such as logistic map [5], Arnold cat map [6], Anti-Arnold map [7], Fibonacci numbers [8], Henon map [9] and Lorenz-Rosler [15] are used. A study in [10] reveals that the image encryption techniques based only on permutation of pixel values are vulnerable towards plain-text and chosen-text attacks. Zou et al. [11] proposed the encryption technique at two levels- block scrambling and bits scrambling, which enhance the security of information. So, pixel values are permuted and changed in order to be robust against attacks. Chai et al. [12] proposed an image encryption algorithm which compresses the cipher image using compressive sensing. Huang et al. [13] implements gray image encryption which shuffles row and column with the chaotic map and then bit level encryption is performed in order to security of an image. Permutation of pixel values is known as confusion and changing the values of pixels is called diffusion. Chaotic functions have been used to provide randomness in image encryption technique.

## 3. Proposed approach

In this paper, new image encryption technique is proposed which works by first dividing the image into two vertical blocks and performing operations on it column wise and then combining it back to obtain a semi-encrypted image. Then, obtained semi-encrypted image is divided into

two horizontal blocks and operations are performed on these horizontal blocks row wise. These blocks are then combined together to finally obtain the encrypted image.

Step1: Obtain chaotic sequences from ikeda map

Ikeda map is given by the following equation:

$$x_{k+1} = (1 + u \times ((x_k \cos t_k) - (y_k \sin t_k))) \bmod 1, u \geq 0.6 \quad (1)$$

$$y_{k+1} = (u \times ((x_k \sin t_k) + (y_k \cos t_k))) \bmod 1, u \geq 0.6 \quad (2)$$

$$t_k = 0.4 - \left( \frac{6}{1 + x_k^2 + y_k^2} \right) \quad (3)$$

Where u is the control parameter and for the mentioned value, system goes into chaotic state.[14]

Thus, chaotic sequences are obtained from the two equations mentioned above. Size of arrays x and y depends on the size of image.

Step 2. Modifications on the chaotic sequences

Then, obtained chaotic sequences are modified so that they are valid pixel intensities. For this, the values in chaotic sequences are multiplied by 256.

$$x_k = x_k \times 256 \quad (4)$$

$$y_k = y_k \times 256 \quad (5)$$

This results in values in chaotic sequence to be in the range [0,255].

Step3. Obtain vertical blocks

Let the plain image be of dimension  $N \times N$ . Then two vertical blocks are obtained from it of dimension  $N \times (N/2)$  as shown below in Fig. 1.  $Img_1$  and  $Img_2$

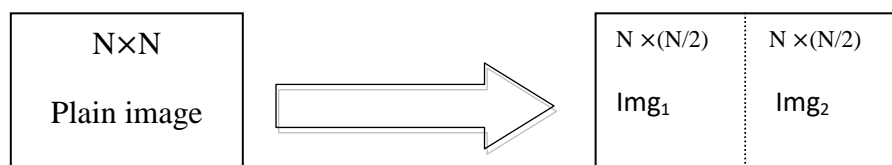


Fig. 1. Division of plain image in two vertical blocks

Step4. Reshaping x and y

One dimensional arrays x and y are reshaped to two-dimensional arrays so that they are of identical shape as that of  $Img_1$ , i.e.  $N \times (N/2)$ .

Step 5. Perform column wise operation on  $Img_1$

Sort operation is performed on y array column wise and ascending orders are saved in  $y\_sort\_order$  array. It should be noted that the actual contents of y are not modified in this operation. Now,  $Img_1$  is taken for applying column wise operations. For a particular row index in a column in  $Img_1$ , value in  $y\_sort\_order$  is checked and that value is taken as row value of this column in x. Value present at this new location in x is read and is bitXORed with that in  $Img_1$ . This step is explained in fig.2 and fig.3 below.

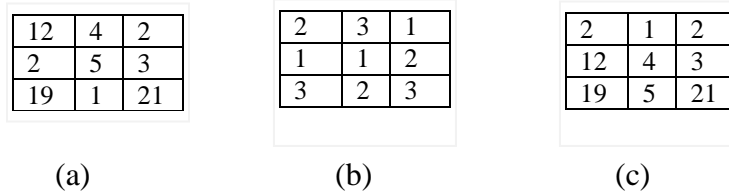


Fig. 2. (a) y array, (b) y\_sort\_order array and (c) sort operation on y array

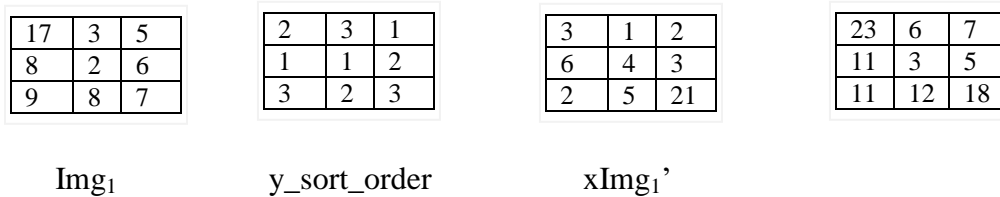


Fig. 3. BitXOR operation on  $Img_1$  with x array using  $y\_sort\_order$

In BitXOR operation, the decimal values are XORed with each other's binary equivalents. For example, if bitXOR operation is to be performed between  $(2)_{10}$  and  $(3)_{10}$ , then it will be  $(10)_2 \oplus (11)_2 = (01)_2$ , i.e.  $(1)_{10}$ .

Step6. Perform column wise operation on  $Img_2$  Sort operation is performed on x array column wise and ascending orders are saved in  $x\_sort\_order$  array. It should be noted that the actual contents of x are not modified in this operation. Now,  $Img_2$  is taken for applying column wise operations and bitXOR of  $Img_2$  and y array is done with the help of x array.

Step7. Obtain the semi-encrypted image

Combine  $Img_1'$  and  $Img_2'$  to obtain the semi-encrypted image  $Img'$ .

Step8. Obtain horizontal blocks from  $Img'$

As done in step3, two horizontal blocks are obtained from  $Img'$ . This is done as shown in fig. 4.

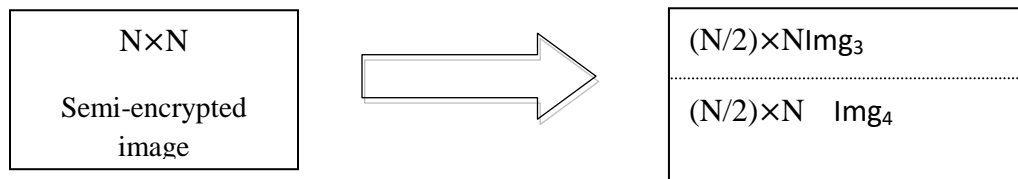


Fig.4. Division of image to obtain two horizontal blocks  $Img_3$  and  $Img_4$

Step9. Reshaping x and y

One dimensional arrays x and y are reshaped to two-dimensional arrays so that they are of identical shape as that of  $Img_3$ , i.e.  $(N/2) \times N$ .

Step10. Perform row wise operations on  $Img_3$  and  $Img_4$

Sort operation is performed on x array row wise and ascending orders are saved in  $x\_sort\_horizontal$  array. It should be noted that the actual contents of x are not modified in this operation. Now,  $Img_3$  is taken for applying row wise operations. Using value from  $x\_sort\_horizontal$  array, bitXOR operation is performed between  $Img_3$  and y array. Similarly, sort operation is performed on y array row wise and ascending orders are saved in  $y\_sort\_horizontal$  array. Using value from  $y\_sort\_horizontal$  array, bitXOR operation is performed between  $Img_4$  and x array. In fig. 5 below, one such example is shown.

17	3	5
8	2	6
9	8	7

3	2	1
1	3	2
2	3	1

3	1	2
6	4	3
2	5	21

19	2	7
14	1	2
12	29	5

Img<sub>3</sub>x\_sort\_horizontal y

Img<sub>3</sub>'

Fig.5. bitXOR operation on Img<sub>3</sub> and y array using x\_sort\_horizontal

Step11. Combine to obtain encrypted image

Combine Img<sub>3</sub>' and Img<sub>4</sub>' to obtain Encrypted\_image.

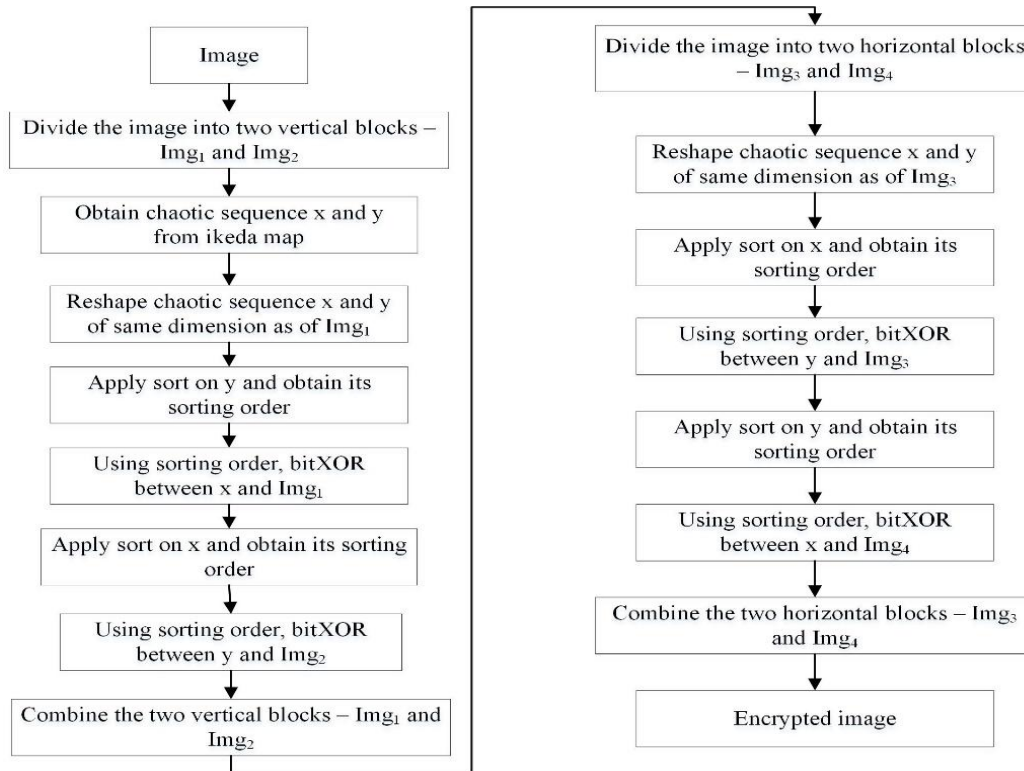


Fig. 5. Encryption algorithm flowchart

In order to decrypt the encrypted image, the same procedure is followed but in reverse order.

#### 4. Results obtained

In this section, results obtained from simulation of the proposed approach on a test image from the USC-SIPI database [16]. The performance of the proposed approach is evaluated on the following performance metrics.

##### 4.1.Statistical analysis

Statistical properties of a plain image should be destroyed during the encryption process otherwise the attacker may know that the image is carrying some important information that is not known directly. Histogram of an image can be obtained by obtaining number of pixels having a certain pixel intensity value. A flat histogram indicates that pixel intensities at all pixels in image are same in frequency. On the other hand, a meaningful image would have an uneven histogram indicating some information present inside it. Histograms were obtained for plain

image and encrypted image. As can be observed in Fig. 6, a nearly flat histogram is obtained for encrypted image and an uneven histogram is obtained for plain image of lady.

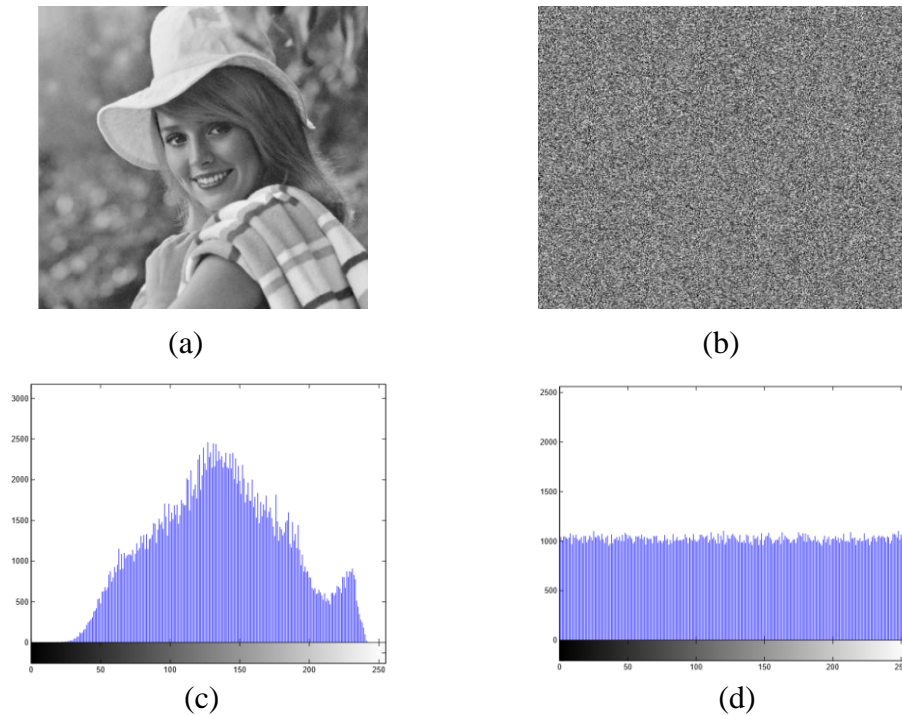


Fig. 6. Plain image(a) and encrypted image(b) with their histograms (c) and (d) respectively

#### 4.2.Key Space and sensitivity

The key space for this approach for brute force attack is  $10^{45}$ , taking  $10^{15}$  for each of the three keys,  $u$ ,  $x_0$  and  $y_0$ . Since the chaotic systems are extremely sensitive to the initial conditions, a very small change would induce a completely different chaotic sequence for it. Thus, larger the key space more difficult it is for the brute force attacker to able to decipher the encrypted image completely.

Key sensitivity is also a crucial characteristic for the image encryption to work well. As chaotic functions are extremely sensitive to slightest of change in initial conditions, the proposed system is also sensitive to slightest change in key value. In fig. 7 below, decryption od image was done with a slight change in key value at  $10^{-14}$  place in the key value. As can be observed correct decrypted image cannot be obtained with this changed key value.

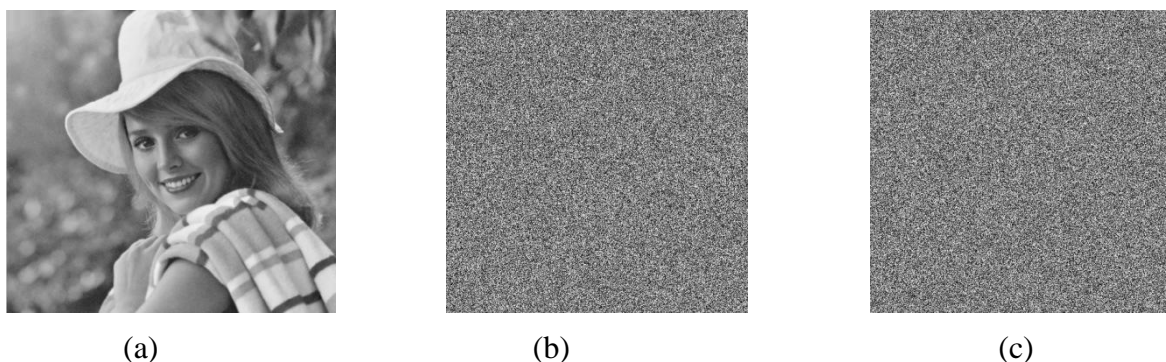


Fig. 7. Plain image(a), encrypted image(b), decrypted image with wrong key(c)

### 4.3. Information entropy

Information entropy of an image is the measure of randomness in an image. A true random image has an entropy value of 8. Entropy value of encrypted image is evaluated and as shown in table 1 below, it has value 7.9994, which is nearly equal to 8. Thus; the proposed system increases the randomness in the given plain image and makes it nearly random.

**TABLE 1. ENTROPY VALUE**

Image	Entropy
Plain image	7.5060
Encrypted image	7.9994

### 4.4. Correlation coefficient analysis

Pixels in a meaningful plain image are highly correlated with the adjoining pixels in horizontal, vertical and diagonal directions. Correlation of pixels with each other must be destroyed in order to obtain randomness in image. Thus intelligible property of image is destroyed completely when the correlation of pixels with one another is removed. For obtaining correlation coefficient values, randomly a pair of 3000 pixels were chosen from both plain and encrypted images in all the three directions-horizontal, vertical and top-right diagonal. The correlation coefficient values in encrypted image should be less. Correlation coefficient can be calculated with the following equations (6)-(9): -

$$r_{pq} = \text{cov}(p, q) / \sqrt{D(p)D(q)} \quad (6)$$

$$E(p) = \frac{1}{R} \sum_{i=1}^R p_i \quad (7)$$

$$D(p) = \frac{1}{R} \sum_{i=1}^R (p_i - E(p))^2 \quad (8)$$

$$\text{cov}(p, q) = \frac{1}{R} \sum_{i=1}^R (p_i - E(p))(q_i - E(q)) \quad (9)$$

Coefficient correlation is calculated using the mean,  $E(p)$ , standard deviation  $D(p)$  and covariance between pixels.

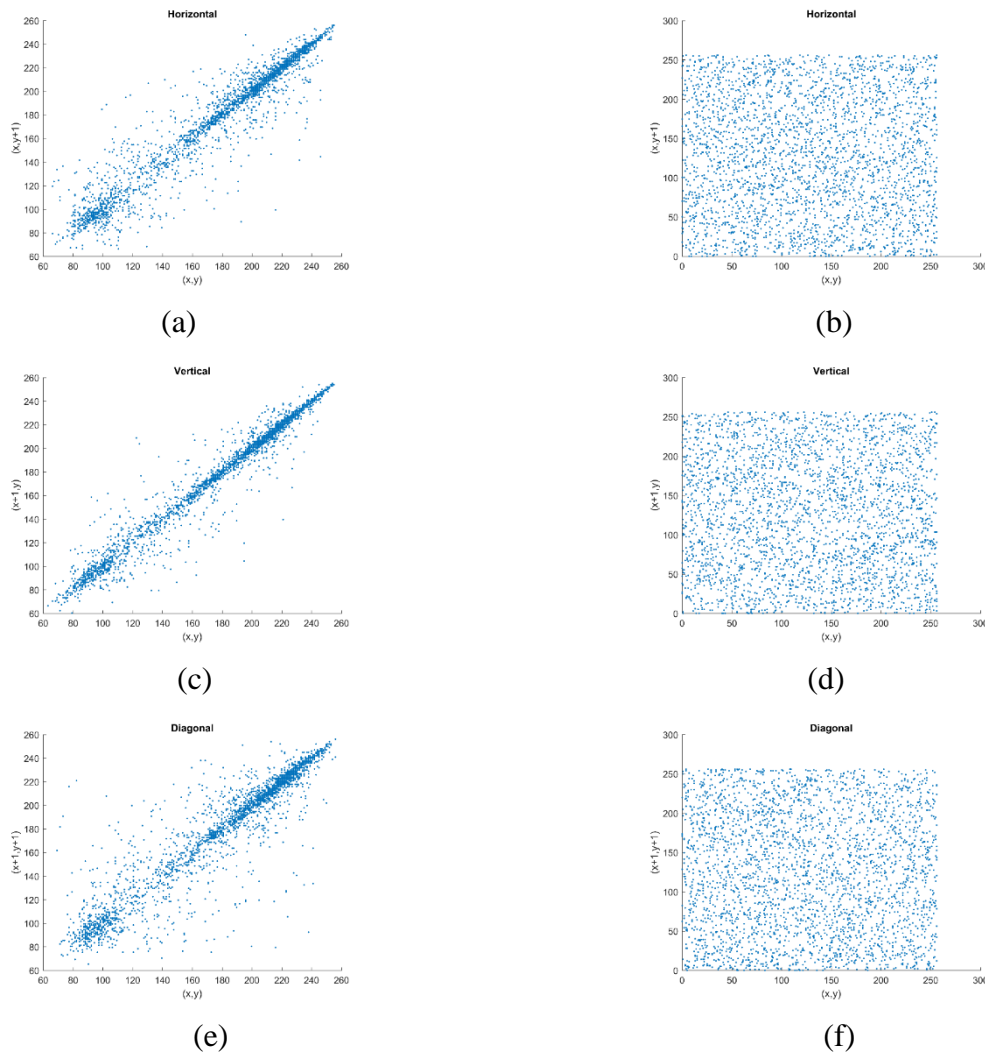


Fig. 8. Correlation coefficient graphs for horizontal, vertical and diagonal directions for both plain and encrypted images

## 5. CONCLUSION

In this paper, a novel image encryption algorithm is presented based on ikeda chaotic map. Using simple bit XOR operations and blocks of image in horizontal and vertical directions, encrypted image is obtained. The encrypted image is tested for statistical properties, key analysis and information entropy values. The proposed image encryption algorithm has nice encryption properties and is able decor relate the pixel values in horizontal, vertical and diagonal directions. Ikeda map provides good randomness to the plain image.

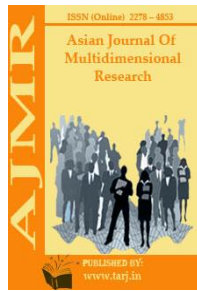
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## **A STUDY OF SPIRITUAL INTELLIGENCE AMONG GRADUATING STUDENTS**

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### **ABSTRACT**

*Spiritual intelligence (SI) is connected with the inner life of mind and spirit and their relationship to being in the world. The major objective of this research was to study the relation among various components of spiritual intelligence in graduating students. A total of 146 students across various disciplines were selected using simple random sampling technique. All the subjects were assessed on the Spiritual Intelligence Self Report Inventory (SISRI- 24) to analyze the spiritual intelligence of students. The findings of the study revealed that there is moderate relation between Critical Existential Thinking and other components i.e., Personal Meaning Production, Transcendental Awareness, and Conscious State Expansion of Spiritual Intelligence Self Report Inventory (SISRI-24). The study concluded that there is high level of spiritual intelligence in students irrespective of disciplines that they study.*

**KEY WORDS:** *Students, Spirituality, Spiritual Intelligence, components of Spiritual intelligence*

## **PART I-INTRODUCTION**

Scientific progress has increased our understanding about outer world, yet barely exploring man's inner world. A fundamental shift is taking place in philosophical paradigm of education - from seeing the world in a mechanical way to a new paradigm mediating our understanding of the world by language, beliefs, values and ways of being. This new paradigm lays emphasis on **Spiritual Intelligence- SQ** for short.

SQ is ability as old as humanity, but concept developed fully most recently in 1990s. Spiritual intelligence has been awkward for academics because existing science is not equipped to study things that cannot be objectively measured. Scientists have already done most of the basic research revealing the neural foundations of SQ in the brain, but the dominating IQ paradigm has overshadowed further into their own data. However, in this article the researcher tried to examine the level of Spiritual intelligence in graduating students.

The objective of this research paper is to investigate the relation among the components of spiritual Intelligence in graduating students across various disciplines. The paper contains five parts: Part I - is Introductory in nature. Part II – Review of Literature. Part III- Research methodology, Part IV- Review and Discussion, Part V- Last Part - presents the future perspectives to follow, concluding observations and indicates some aspects for further research in this area.

### **NEED OF THE STUDY**

Researcher selected graduating students and wanted to study the relationship among various components of SI and the level of SI in graduating students. Researcher decided that Spiritual Intelligence is the new dimension of intelligence and makes a human being different from other organism.

### **SCOPE OF THE STUDY**

The research will be conducted on the Graduating students across various disciplines. The respondents of the questionnaire are final year students of B.Com, B. Sc., and MBA.

### **Objectives**

- To examine the relationship among various components of SI in graduating students
- To study the level of Spiritual Intelligence in graduating students.
- To provide suggestions to improve the components of Spiritual Intelligence in students to achieve success.

### **LIMITATIONS**

- The research is confined to only the final year students of St. Ann's P.G and Degree College for Women, Mallapur-Hyderabad
- The questions in the questionnaire are closed-ended questions, which limits the ability of the report to provide unique insights.

## **PART II-LITERATURE REVIEW**

We cannot solely rely on the development of cognitive (IQ) and emotional intelligence (EQ) to make us whole. By themselves, they are not enough. As long as the development of spiritual intelligence (SQ) is considered unimportant or old-fashioned, we will continue to feel like we are

missing something. We cannot be complete without developing greater levels of individual and collective spiritual intelligence (SQ).

### **Spiritual intelligence and Spirituality**

The term “spiritual intelligence” is made up of two words “spiritual” which mean something related to the spirit and “intelligence” which mean the ability to acquire and apply knowledge. So the term spiritual intelligence may be defined as the ability to acquire and apply the knowledge of spirit

SQ is the central and most fundamental of all the intelligences, because it becomes the source of guidance for others, being an integrating intelligence, linking our rational (IQ) and emotional (EQ) intelligences. Bowell, Richard A. (2005) has drawn a distinction among the three Qs stating that “IQ is the intelligence that seeks to understand the “what”, EQ is the intelligence that seeks to understand the “how”, and SQ is the intelligence that seeks to understand the “why” of things.

The term spirituality was first proposed by Stevens in 1996 and expanded by Emmons in 1999. Spiritual intelligence (SQ) is an inherently difficult term to define. Some may think they know its meaning, but they may be confusing SQ with spirituality. So in order to explain the term thoroughly both spirituality and intelligence topics must be examined.

First to deal with spirituality term, some current definitions can be summarized as follows: (a) Spirituality involves the highest levels of any of the developmental lines, for example, cognitive, moral, emotional and interpersonal; (b) Spirituality is itself a separate developmental line. (c) Spirituality is an attitude (such as openness to love) at any stage; and (d) Spirituality involves peak experiences, not stages. An integral perspective would presumably include all these different views and others as well (Vaughan, <http://francesvaughan.com/> 2006).

Wigglesworth, Cindy (2012) defines **spirituality** as “the innate human need to be connected to something larger than ourselves, something we consider to be divine or of exceptional nobility. This innate desire for that connection transcends any particular faith or tradition. It does not require a belief in a divinity by any description, nor does it preclude belief in God or Spirit or the divine”.

Studies on various kinds of intelligences are have been made since the early 1900’s. And many scholars mentioned different intelligence types and set theories to explain them Danah Zohar and Ian Marshall introduced a new dimension to human intelligence in 2000. However the concept was known for ages, the term **spiritual intelligence** is first exposed by them.

SQ is what we use to develop our longing and capacity for meaning, vision and value. It facilitates a dialogue between reason and emotion, between mind, body, and soul. SQ allows us to integrate the intrapersonal, the interpersonal, and the transpersonal communication to transcend the gap between soul, self, spirit, and other (Zohar & Marshall 2000, pp. 23-27).

After Zohar and Marshall’s (2000) definition, many different definitions were put forward by scholars and some of these are;

- SQ is a way of thinking. We are all born with it, live with it, and use it. It can never be taken from us. Yet many have not named it and do not have a conscious choice when they use it (Edwards 1999, pp. 2-4).

- SQ is about questions more than answers. It lives in stories, poetry and metaphor, uncertainty and paradox. One of the qualities of SQ is wisdom. This includes knowing the limits of your knowledge. Other ingredients are values such as courage, integrity, intuition, and compassion (McMullen, <http://www.adhom.com/>, 2003).
- SQ is the ultimate way of knowing. It is used to envision unrealized possibilities and to transcend the methodical plod of life. It is also used to understand pain, to answer the basic philosophical questions about life and to find meaning both temporally and existentially (Davis, <http://www.mindwise.com.au/>, 2004).
- Spiritual intelligence as “the ability to apply, manifest and embody spiritual resources, values and qualities to enhance daily functioning and wellbeing”. (Amram, 2007)

With a high level of spiritual intelligence, we can use our spirituality to bring meaning, importance, and general enrichment to our lives. This helps us achieve personal integrity, determine the purpose of our lives, and stay on the right path (Zohar & Marshall, 2000).

### **RELIGION AND SPIRITUALITY**

Spirituality and religion are two different and distinct constructs. Religion is a by-product, or the end result, of humanity’s quest for spirituality. Spirituality is “a state of being spiritual; essence distinct from matter” (Grosset, 2005)

Wigglesworth, Cindy (2012), defines religion as “a specific set of beliefs and practices, usually based on sacred text, and represented by a community of people”. Some people may be high on SQ through following a religious beliefs and practices, others may be high on SQ being atheists. Contrarily, many people, though religious, are low on SQ.

Zohar, Danah (2000) professes that “conventional religion is an externally imposed set of rules and beliefs. It is inherited from priests and prophets and holy books, or absorbed through the family and tradition. Spiritual intelligence is the soul’s intelligence. SQ is prior to all specific value and to any given culture. It is prior to any form of religious expression that it might take. SQ makes religion possible (perhaps even necessary), but SQ does not depend upon religion”.

To sum up, the term and concept of spiritual intelligence emerged as a result of integrating intelligence with spirituality. Spirituality is the knowledge of oneself as spirit/soul, and the understanding of one’s highest spiritual qualities and attributes and Spiritual Intelligence is the expression of these innate spiritual qualities through one’s thoughts, attitudes and behaviours. Integrating spirituality with classroom teaching-learning process, enables students unfold their inner abilities and give expressions to their inner potentials and achieve better performance. Improving various components of Spiritual intelligence in students, they will find meaning and purpose in teaching-learning process and pursue path that leads to success.

### **PART: III –RESEARCH METHODOLOGY**

**Data Collection:** The research methodology used to analyze the data in Descriptive Research Methodology. The data is used for study is primary as well as the secondary data. The primary data will be collected from the Graduating students across various disciplines using survey method.

**Sample Size:** 146 graduating students from MBA, B.Com, and B.Sc.

**Sampling technique used:** Simple Random Sampling.

**Procedure:** The questionnaire Spiritual Intelligence Self Report Inventory (SISRI- 24) developed by D. King (2008) was administered to the participants to analyse the spiritual intelligence of students and responses quantified.

The **questionnaire** used here is divided components of the Spiritual Intelligence i.e., Critical Existential Thinking(CET), Personal Meaning Production(PMP), Transcendental Awareness(TA), Conscious State Expansion(CSE).

**Correlation analysis and Regression analysis** is performed on the data acquired. The results obtained through questionnaire are categorized into the components of Spiritual Intelligence. Here the **dependent variable** is taken as CET and **independent variables** are PMP, TA, and CSE. Analysis of the data has been performed in MS Excel using Data Analysis to understand the relationship between the independent and dependent variables.

The dependent and independent variables are defined in the following **Table 1** given below. Responses for the survey have been recorded in the form of rating using, Likert Scale. Rating taken as 1– Not at all true of me | 2– Not very true of me | 3 – Somewhat true of me | 4 – Very true of me | 5 – Completely true of me.

<b>Independent Variables</b>	<ul style="list-style-type: none"> <li>• <b>Transcendental Awareness (TA)</b> - The capacity to perceive the “Big Picture” that is not material and goes beyond normal experiences. This awareness of spiritual existence can be recognized in others and personally observed.</li> <li>• <b>Conscious State Expansion(CSE)</b> - The power to control and move into higher spiritual planes (e.g. pure consciousness, cosmic consciousness, unity, oneness) through deep meditation, prayer, or contemplation</li> <li>• <b>Personal Meaning Production (PMP)</b> - The ability to create meaning and purpose in one’s life and discern purpose from both mental and physical experiences even in failure.</li> </ul>
<b>Dependent Variable</b>	<ul style="list-style-type: none"> <li>• <b>Critical Existential Thinking (CET)</b>- The contemplation of one’s purpose or existence and connection to the universe as well as such topics as life, death, reality, truth, or justice.</li> </ul>

**TABLE: 1- DEPENDENT AND INDEPENDENT VARIABLES**

## **PART: IV - RESULT AND DISCUSSION**

### **A. Relationship among various components of SI**

Testing of Hypothesis is done to obtain significant relationship between the dependent and independent variables.

**Null Hypothesis $H_0$ :** There is significant relationship between the dependent and independent variables

**Alternative hypothesis $H_1$ :** There is no significant relationship between dependent and independent variables.

	PMP	TA	CSE	CET
PMP	1			
TA	0.688518922	1		
CSE	0.605270395	0.594379634	1	
CET	0.612828279	0.699916436	0.612871	1

**TABLE 2: RELATIONSHIP AMONG THE COMPONENTS OF SI**

### Correlation Analysis

In Correlation, if the correlation coefficient is  $<0.3$  it represents a weak relationship between the variables,  $0.3 - 0.7$  represents a moderate relationship while the strong relationship between the variables is represented with the values  $>0.7$ .

From the results obtained in the above table (Table 2), Null Hypothesis  $H_0$  is accepted and Alternate hypothesis  $H_1$  is rejected. There is a significant relationship between all the components of the Spiritual Intelligence of the students.

Here from the Table 2, we can say that there is a moderate relationship between the CET and the other components of SI. The component CET of Spiritual Intelligence is also moderately related to the other components (PMP, TA, and CSE). The correlation coefficient for PMP, TA, and CSE is 0.61, 0.69 and 0.61 respectively which indicates a moderate relationship among the components of SI in the students. If the components PMP, TA, and CSE are developed among students then CET can be enhanced.

### Regression Analysis

<i>Regression Statistics</i>	
Multiple R	0.748790204
R Square	0.560686769
Adjusted R Square	0.551470408
Standard Error	0.391731203
Observations	147

**TABLE: 3-REGRESSION ANALYSIS STATISTICS AMONG THE COMPONENTS OF SI**

The results of the above table-3 indicates that CET has a correlation coefficient percentage of 55% with the other components (i.e., PMP, TA, and CSE) and can explain 39% of the variance in other components of SI.

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	3	28.00647147	9.33549	60.83602	2.0746E-25
Residual	143	21.94382701	0.153453		
Total	146	49.95029849			

**TABLE 4: SUMMARY OF REGRESSION ANALYSIS**

The overall regression model was significant. Significance  $F(3, 143)=60.83$ ,  $P<.001$ ,  $R^2=.56$

$R^2=.56$ , taken as a set, the predictors PMP, TA, and CSE variables account for 56% of the variance in CET



## B. The level of Spiritual Intelligence in students

The students who have chosen who chose very true of me and completely true of mein the given questionnaire are at our high level of SI. Following table gives the frequencies of Students from various disciplines having good degree of SI.

		Spiritual Intelligence				Total
		2.00	3.00	4.00	5.00	
Discipline	B.Com	2	8	51	18	79
	B.Sc.	1	3	22	6	32
	MBA	0	6	19	10	35
Total		3	17	92	34	146

**TABLE 5- FREQUENCY OF RESPONSES**

The above table shows that out of 146 students who chose very true of me and completely true of me were 69 From B.com, 28 from B.Sc., and 28 from MBA. Accordingly the– 87.3% of B.Com, 87.5% of B. Sc., and 82.8 % of MBA students are on a higher level of SI .

Overall 85.8 % of the students across various disciplines have demonstrated higher level of SI.

## C. Recommendation for improving SQ

Since there is a moderate relationship among the components of SI, it is imperative that students engage in purposeful teaching learning process by enhancing SQ because that is the underpinning factor. The brain is wired for SQ but it remains dormant and needs to be activated. It takes effort and time to develop SQ but it is worth the effort realizing its benefits. Some of the methods available are discussed in the succeeding text:

**Meditation:** Meditation is the cultivation of self-awareness. It helps one restore the ability to control one's thoughts and feelings, sharpen one's ability to discern truth from illusion, and thereby make more intelligent choices.

**Detached Observation:** the ability to disengage from inner world of thoughts and feelings and outer world of action in order to see more clearly and understand more deeply what is actually happening.

**Introspection:** This involves taking time out on a daily basis to review and re-assess past experiences of the interactions with others. This allows the self/soul to build awareness of the connection between inner world of thoughts and feelings and the outer world of action and the consequences of those actions.

**Communion:** There is a higher source of spiritual power and it is possible to connect with that source and empower oneself. Energy absorbed from the Supreme Source is essential to clearing the inner clutter and to focus one's consciousness.

**Practice:** New learning, new insights, new realisations are only theories and have no power to change one's life unless they are brought into action, allowed to shape new behaviours, and then perfected in the process of expression. Practical action is essential to sustaining the momentum of developing spiritual intelligence.

Besides these, other ways could be followed such as yoga, long travel, maintaining silence, writing journal, recollection, reading sacred scriptures and motivational books and walk in the garden or nature meditation, etc., to help sustain and enhance Spiritual intelligence in students.

#### **PART V: CONCLUSION AND AREA OF FUTURE STUDY**

The purpose of the study was to investigate the relationship among the components of Spiritual Intelligence in students across various disciplines. It was found that the components of Spiritual Intelligence CET has a moderate correlation with other components of SI. The relationship among components could be enhanced from moderate level to high level by practicing certain methods. It is suggested that for future research, the study would also involve more students from other colleges. Having a larger sample size would also improve the reliability of the results and provide an even deeper insight to the subject matter. As claimed by Dougherty (2011), empirical research on the topic is rather limited and therefore more studies could be taken to improve the knowledge and understanding of the matter.

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**STRATEGIC ISSUES IN MARKETING OF CONSUMER AND  
TECHNOLOGY PRODUCTS DEALER SATISFACTION SURVEY  
- IMPLICATIONS FOR ENHANCING CHANNEL RELATIONSHIP**

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**ABSTRACT**

*Marketing literature shows that the main sequences of strategic marketing planning and control processes are based upon the point of sales management which means strong bonding with the Sales channel network i.e. dealers. Considering the fact that the way in which a dealer is treated by its manufacturer has decisive influence on the dealer's commitment to the brand as well as on the dealer's business success, an examination of dealer satisfaction or dissatisfaction has become strikingly important during the last few years. But equally important is how dealer rates the manufacturer company. On the above lines, the objective of the study is to evaluate a manufacturer company on overall product standing, product demand, quality consciousness, price sensitivity, providing optimal combination of price and quality, timely delivery and performance in order execution by its dealers. This in turn would provide an overall perspective on the Company's abilities in terms of Channel Management. The dealers also evaluated the company's responsiveness and dealing of front line office employees towards dealers. A complete Dealer Level survey performed to ascertain product and company standing in the market and dealer relationship strength. The consumer product considered for the study is Jyoti Tempcore (TMT bars) of Madhav Group of Industries, Mandi Gobindgarh, Punjab, India. This is among the top 10 steel producers of the region and commands a high position in construction and structural steel. The sample consists of all of its dealers in Punjab. There are 169 respondents. A structured questionnaire has been formulated. With reference to the survey, a varied set of outcomes appeared in a variety of segments. But, primarily the outcome was quite progressive. With just a few areas showing scope of major reforms - like company's interaction with dealers, distributor relationship with dealers and brand visibility at dealerships. The other factors showed promising*

results. At the end, it is remarkable to note that high satisfaction is persisting in most of the factors.

**KEY WORDS:** *sequences, persisting, dissatisfaction*

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## **INTRODUCTION& LITERATURE REVIEW**

The primary focus of marketing is on exchange relationship but this exchange relationship is not limited only to just the buyer and seller but all the network relations are important. Relationship marketing puts stress on company's relation with its distributors. A good relationship with the distributor will help in creating long term relations and provide good penetration of firm's products in the market and it is considered equally important to customer satisfaction and customer loyalty. Marketing practice and thought have been benefited substantially from the adoption of long-term perspective in the analysis of exchange. Arndt (1979) and Heide (1994) analysed the features that would be required to manage long-term vertical exchange relationships. But these alliances most of the time create stress and conflicts in case of small firms. Thus, small organizations rely on network management as their growth strategies rather than merger-related activities. This is the dilemma faced by small or local firms and there comes the implication for co-ordinating and managing channel to achieve higher customer value (Anderson and Narus, 1995).

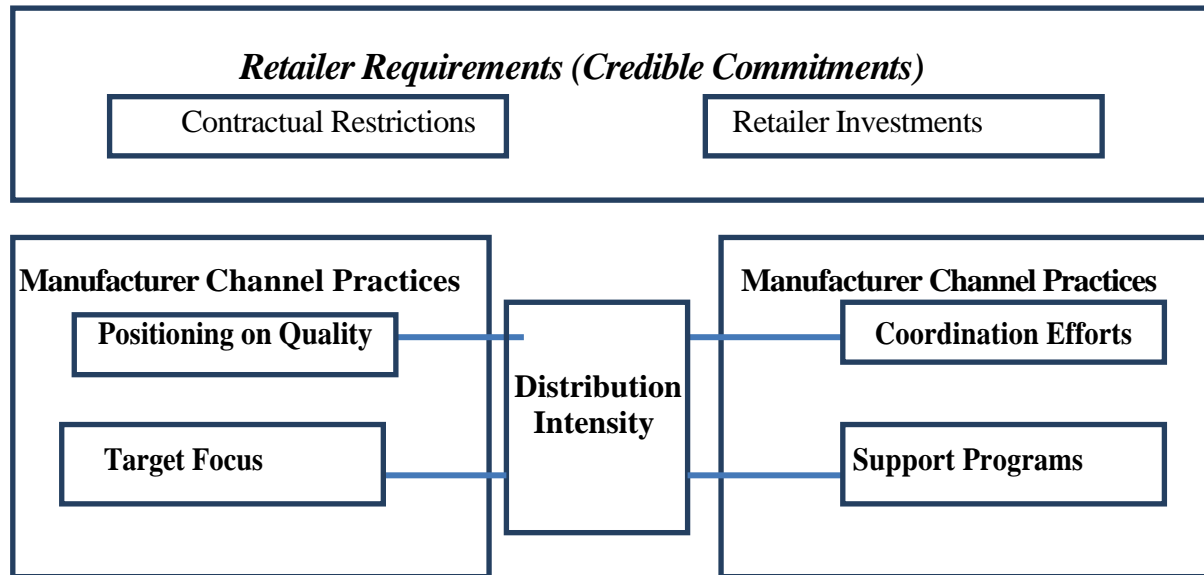
Distributors in today's world act as **comrade-in-arms**. They are manufacture's first customers and partners; they add value to the marketer's offer. In developing countries the number of distributors available to these manufactures is relatively large. The reasons appear to be low entry barriers in distribution, the enthusiasm created by the increase in economic development and emergence of a business based entrepreneurial middle class, as well as demand supply conditions (Zikmund and D'Amico 1984). Seminal studies using the PIMS (profit impact of market strategy) data set has uncovered significant association among service quality, marketing variable and profitability. The findings depict that companies offering superior services achieve higher than normal market share (Buzzeli and Gate 1992). The Ford Motor Company has also demonstrated that dealers with higher service quality scores have higher than normal profits, return on investment and profit per vehicle sold. Wilson (1995) summarized different relationship variables that affects the relationship of firm with different stakeholders, those variables are commitment, trust, cooperation, mutual goals, interdependence and power, performance satisfaction, structural bonds, comparison level of alternatives, adaptation, non-retrievable investments, shared technology, and social bonds.

Morgan and Hunt (1994) while discussing relationship variables focused more on commitment and trust as a major variable affecting relationship between different parties involved in marketing transaction and exchange. Simon (1953) remarked that there is asymmetric relation between the behavior of two persons and we cannot comment how the behavior of one alters the behavior of other. Thus, dealers are a strong link between the manufacturer and customer. Thus, manufacturers should adopt those strategies for dealers which would lead to positive buying behavior of customers and their ultimate satisfaction. There is always a problem of power which results into conflict in these relations but Reve and Stern (1979) observed that more of dependence on each other will lead to reduction in conflict and raising level of satisfaction. Frazier (1983) and Summers (1986) remarked that dealer dependence relates positively to the manufacture's use of non-coercive strategies and negatively to coercive strategies. They also respond affirmatively to

inter-firm agreement on market strategy, dealer satisfaction and the manufacturer's perceived interest in the dealer's welfare.

Distribution today includes all activities involved in selling goods or services to those who buy for resale or business use.

**FIGURE 1**  
**Determinants of Distribution intensity**



Distributors play a crucial role for the manufacturer starting from selling and promoting, buying and assortment, warehousing, transportation, financing, risk bearing, market (customer) feedback etc. They have to face mounting pressures in recent years from new source of competition, demanding customers and ever increasing direct-buying initiatives. Accordingly, they have to develop appropriate selling responses. Today manufactures are concentrating on increasing distributors' asset productivity by helping them to manage their inventories and receivables better. Figure 1 depicts relationship between contractual restrictions and dealer's investments. Successful channel management is ensured when distributors are given due importance with respect to product positioning, credit facility, sales incentives, cost effectiveness in the product logistics, prompt supply and target market penetration. According to Koshy (2007), there are four ways to strengthen manufacturer-distributor relationship:

- There should be clear agreement between the manufacturer and distributor about their expected functions in the marketing channel,
- Distributors should be provided with a fair insight into the manufacture's requirements by visiting their plants and attending manufacture association and trade shows,
- A detailed account-should be maintained having information regarding fulfillment of distributor's commitments regarding volume targets, paying billson time, feeding back information of customers,
- Identifying and providing value added services to the dealers.

Thus, this study is based on evaluating dealers' satisfaction for achieving strong network management.

## OBJECTIVES

- The first objective of the study is to evaluate a manufacturer company on overall product standing, product demand, quality consciousness, price sensitivity, providing optimal combination of price and quality, timely delivery and performance in order execution by its dealers.
- The study has also measured an overall perspective on the Company's abilities in terms of Channel Management.
- Lastly, the dealers also evaluated the company's responsiveness and dealing of front line office employees towards dealers.

## RESEARCH METHODOLOGY

A complete dealer level survey performed to ascertain product and company standing in the market and dealer relationship strength. The product chosen to test the conceptual framework is JyotiTempcore (TMT bars) of Madhav Group of Industries, MandiGobindgarh, Punjab, India. They are among the top 10 steel producers of the north India and commands a high position in construction and structural steel. The rolling capacity of the plant is close to 300 thousand tones. It has one lakh square meter four lane production facility comprising of 1000 workers. The firm has an exclusive R&D centre, in house testing lab equipped with latest machines to check material at entry, production and dispatch levels.

The main thrust of Madhav Group is on complete customer satisfaction and building strong relationship base with its distributors. The study has been categorized into four parts i.e. the dealers have ranked the satisfaction level for the product JyotiTempcore, secondly, their association with Madhav Group of Industries and next is the satisfaction of dealers in terms of employees of Madhav Group and lastly, the satisfaction level in terms of promotion of Jyoti brand.

## DATA AND SAMPLE

A structured questionnaire containing 20 questions has been formulated to analyse the dealers' satisfaction level for JyotiTempcore, a product of Madhav Group of Industries. The sample of 169 dealers from all the major cities of Punjab has been considered for the study. The dealers were required to rank the company on a scale of 1 -5 where 1 stands for lowest score and 5 stands for the highest. Thus, the highest response value can be 845 (169\*5) and through this response rates for each question has been calculated. These response rates have further been converted into response scale of 10. The questionnaire has been floated in both Hindi and English languages. The initial mailing of the questionnaire was preceded by a letter introducing the project and soliciting the dealers' co-operation. Approximately, two weeks later a follow up mailing with a spare questionnaire enclosed was conducted. This resulted in a response rate of 60 per cent. The representatives were also sent at some places to get high degree of response rate. The final response rate was 85 per cent.

## ANALYSIS AND RESULTS

The study is based on measuring the satisfaction levels and to see the gaps in performance levels of Jyoti Brand. The dealers were asked to rate JyotiTempcore (TMT bars), Madhav Group of Industries, employees of Madhav Group and Jyoti Brand and its promotion on various fronts.

## RESULTS FOR DEALERS' SATISFACTION

In a competitive marketplace where businesses compete for customers, customer satisfaction is seen as a key differentiator and increasingly has become a key element of business strategy but equally important is the role of dealers and distributors. Dealers' satisfaction is an ambiguous and abstract concept and the actual manifestation of the state of satisfaction will vary from person to person and service to service. The state of satisfaction depends on a number of both psychological and physical variables. The factors considered have been explained in table 1.

**TABLE 1 : SATISFACTION LEVEL FOR PRODUCT (JYOTI TEMPCORE)**

S.No.	Parameter	Satisfaction Level:
1	Overall Product Standing	8.9
2	Overall Product Demand	7.7
3	Quality Consciousness	8.6
4	Price Sensitivity	7.1
5	Optimization of Price and Quality	7.9
6	Timely Delivery	9.3
7	Performance in Order Execution	9.3

Table 1 discloses that the dealers are highly satisfied in terms of timely delivery and performance in order execution but the company is not able to cope up with the price sensitivity. They are conscious about the quality of the product and do not compromise over it. They have rated the overall demand of the product at 7.7 but the product has long term standing as proved by the overall product standing (8.9).

The study has also considered suggestion and grievance handling system used by the organization for its dealers. The dealers want early redressal for their problems and delay in complaints resolution can create problem in their relationships. Table 2 tells us the satisfaction level of dealers for complaint handling and solution providing system adopted by top management of the organization. The overall ranking shows that 52 per cent of-the dealers ranked the product as excellent, 43 per cent ranked it as satisfactory and 5 per cent ranked the product as average.

**TABLE 2 DEALERS' SATISFACTION FOR TOP MANAGEMENT**

1	Dealers suggestion and complaints reach the Management	7
2	Responsive to suggestions and complaints	4
3	Degree of responsibility towards dealers	7.3
4	Pride level of dealers with respect to organization	7

The above table explains the fact that dealers are satisfied with the management but level is not so high. It can be improved in future. Direct communication and link with the management is always good for maintaining strong bonding with the network partners. Top managements fully responsible for their dealers and dealers in turn feel proud that they are associated with the company. The overall results depicted that 50 per cent of dealers have considered their association with management as excellent, 12 per cent as satisfactory and rest have considered this association as an average.

**TABLE 3 DEALERS' SATISFACTION WITH EMPLOYEES**

1	Satisfaction with respect to Company Officials	5.5
2	Employees are able listeners on Dealers' visit	8.1
3	Overall satisfaction with dealers contact program	7

Table 3 discloses that dealers show low degree of satisfaction for visits of company's officials but they are highly satisfied with front line employees of the company. 43 per cent of dealers rated attitude of employees as excellent, 45 per cent considered it as satisfactory while 12 per cent ranked it as an average.

**TABLE 4 DEALERS' SATISFACTION TOWARDS BRAND AND ITS PROMOTION**

1	Satisfaction with local promotional schemes in dealer area	7
2	Overall Satisfaction towards brand	8.8
3	Understands customers needs	8
4	Deliverance of market expectations	8.4

Manufacturers are always concerned with the extent to which their dealer organizations approve or disapprove of the resources assigned to the various media for different products. Thus, dealers are asked whether concentration on current media is satisfactory or the company should launch some more media plans. It has also tested whether company's policies are framed as per market and dealers' expectations. The dealers have shown high level of satisfaction towards overall brand but lower satisfaction towards various promotional schemes. The overall results show that 45 per cent of dealers feel excellent sales promotion by company while 47 per cent considered their brand promotion as satisfactory and others considered it as an average.

### RELIABILITY ANALYSIS

Reliability is the consistency of a set of measurements or of a measuring instrument, often used to describe a test. In the reliability test method, reliability is estimated as a Pearson product moment correlation coefficient between two administrations of the same measure. The value of Cronbach's Alpha is computed for each category of dealers' satisfaction. Table 5 reveals that the values are highly reliable for dealers' satisfaction on association with top management and attitude and dealings of employees.

**TABLE 5 RELIABILITY ANALYSIS**

1	Dealers' Satisfaction for Product	0.613
2	Dealers' Satisfaction for Management	0.818
3	Dealers' Satisfaction about Employees	0.791
4	Dealers' Satisfaction about brand and its promotion	0.734

But the reliability levels are average for overall product satisfaction and satisfaction about brand its promotional policies. This proves that there is a scope for improvement in quality enhancement, raising product demand through clear target focus, dealing sensibly with pricing issues and maintaining best quality at affordable prices.

### CONCLUSION

Today is the world of relationship marketing where channel management holds the key to company's wealth creation and success strategies. Within many categories of consumer products, manufacturers seek intensive distribution for their brand. This is the time when organizations cannot neglect the needs of their channel partners. The channel relationships are characterized by high levels of interdependency, trust and mutual co-operation. Firms have to create and maintain a



win-win situation for themselves to achieve competitive advantage over others. Thus, organizations have started looking for innovative measures to attract their dealers. The dealers' feedback shows positive attitude towards product, Jyoti Tempcore leaving certain exceptions. The dealers have demanded high interaction from top management and requested the Madhav Group to organize few workshops for them. The company affirms the fact that strong bonding with the dealers has positive impact on their performance and they have future plans to provide strong support program for them.

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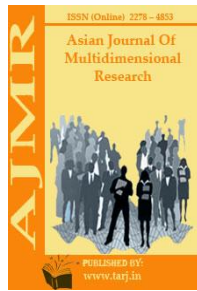
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**A PROBE INTO THE POLICY FRAMEWORK OF SOLID WASTE  
MANAGEMENT: IT'S APPLICABILITY IN DARJEELING  
MUNICIPALITY**

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**ABSTRACT**

*The management of municipal solid waste is a topic that has moved to the forefront of infrastructural agenda and embarrassment to most of the ULBs. The authorities are struggling to grapple with the rising heap of garbage. They are yet to come up with a magic wand to ward away this pervasive problem. The waste is an offshoot of unplanned urbanization, unstoppable population growth and a reckless lifestyle change. Despite the promulgation of various policies, the picture of their implementation seems very dismal. Moreover, when it comes to hill areas the overall waste scenario and its management becomes bleak. The authorities have limited themselves to collect and dispose indiscriminately without the waste being processed. The million dollar question is who is to be blamed for the system failure. The policy, the institutional debilities, the public or the mismatch. The blame game goes on. It is in this regard, the paper makes a humble endeavor to touch upon the policies of municipal solid waste management and cite possible reasons of systemic failure specifically in hill area with reference to Darjeeling Municipality. It calls for the inclusive policies to have hill perspective based on the local need.*

**KEYWORDS:** *Municipal Solid Waste, Policy, Stakeholders, Disposal.*

**INTRODUCTION:**

India is experiencing high urbanization, currently 31 percent as per Census 2011, contributing to 11 percent of the world population but produces gigantic 1, 43,449 metric tons per day of MSW (CPCB, 2014-15). In 2011 India generated 46 million tons of waste and by 2048 this will shoot up to 125 million tones, making India the largest waste contributor of the world (Kumar, S. 2017). Urban growth is essential but unrestrained growth may beget pollution and constraint land for dumping. Despite various efforts taken in the past, overall waste generation is still increasing. The management of solid waste is one of the most visible of urban services that tells a lot about the management capability as well as the failure of the urban local bodies. SWM is part and parcel of public health and sanitation and Indian Constitution has placed it in the state list. Several studies opine that reutilizing of solid waste is not only a practical option to MSWM (Kasseva & Mbuligwe, 2000) but also advantageous socially, environmentally and economically at large (Kaseva & Gupta, 1996). As per the Indian Penal Code, 1860, solid waste management falls under Chapter XIV 'of offences that adversely affect the public health, convenience, decency and safety at large and basically equated with 'public nuisance' during the British times. Since it affects public health, is consider dangerous and has been treated as 'public nuisance' and made punishable. (Vilas, M.A. 2015)

**OBJECTIVES:**

To overview policies and legal framework with regard to MSWM

To highlight system anomalies in the hill areas.

To throw light on the feasible solutions to mitigate problems associated with waste management.

**METHODOLOGY:**

The study is based on the studies made by referring various sources of secondary data. It banks mostly on the data available from various government and non government and individual sources.

**STUDY AREA:**

Located in the lap of the grand Kanchenjunga with a geographical coordinates of 27°0'16"N to 27°4'32"N latitude and between 88°14'28"E to 88°17'4"E longitudes, Darjeeling municipality is one of the oldest city administrative bodies (set up in 1850) in India. It predates the Mumbai Municipal Corporation also. The British founded it to cater a population of 20,000 people then. Today it has grown beyond the core 5km. radius to 7.43sq.km and extends from Jorebunglow to Ging bazaar. It is divided into 32 municipal wards with a population of 1, 18,805 (Census 2011). The growth has been unplanned and the amenities developed in 1930s are still in practice with very few changes.

**NAVIGATING THROUGH THE WASTE POLICIES:**

The historic "Surat Plague" in 1994 may be taken as the wakeup call for the management of solid waste in India. Almitra Patel and others filed a PIL in the Supreme Court of India in 1996 stating that state governments and urban local bodies failed to manage MSW appropriately. It culminated into the framing of report 'Solid Waste Management in Class I Cities in India' in 1999. It is often regarded as the bible of waste management in India (Patel .A.H.). In the mean time Central Pollution Control Board prepared waste-management rules based on this report and at the Supreme Court's behest, Ministry of Environment, GOI issued the country's first

comprehensive Municipal Solid Waste (Management and Handling) Rules 2000 under the Environment Protection Act 1986 (Vilas, M.A, 2015). After 16 years, “poor implementation of the rule led to diseases and wide scale protests” (Hindustan Times 2016; Annepu 2014; Hindu 2012; Times of India 2016) in different states of India as a result the new “Solid Waste Management rule 2016” came into force. After the first National Environment Protection Act, 1986, several rules pertaining to waste specific management and handling rules have been passed such as plastic waste rules, e-waste rule, and batteries rules etc. The enormity of these rules thus has either been too weighty for organizations to implement or they have been overlooked even by local authorities (Annepu, 2014).

#### Legal Frameworks and Policies on Waste Management (A Glance)

YEAR	LAWS/RULES/ACTS	SALIENT FEATURES
1860	IPC	Chapter XIV treated as public nuisance, made punishable.
1973	Criminal Procedure Code, 1973	Deals with ‘removal of nuisance’ under Section 133 Empowers the Sub-Divisional/ Executive Magistrate, o to order the removal of the public nuisance and desist from carrying any business that causes public nuisance.
1989	Hazardous Wastes (Management and Handling) Rules, 1989 revised in 2016	Provided a list of 44 processes generating hazardous wastes and details relating to collection, reception, treatment, storage, transportation and disposal.
1998	The Biomedical Waste (Management and Handling) Rules, 1998 revised in 2016	The health care institutions are asked to streamline the process of proper handling of hospital waste in waste chain.
2000	Municipal Solid Wastes (Management and Handling) Rules, 2000	Mandates all municipal authorities to manage solid waste from collection to disposal in their jurisdiction. A door to door collection emphasized, separate biodegradable and non-bio-dustbins must be installed. The transportation to be in closed trucks. Composting of bio-degradable waste or waste-to-energy plant. The inert material to be land filled.
2001	The Batteries (Management and Handling) Rules, 2001	Applies to all concerned persons dealing with the purchase manufacture, processing, sale and use of batteries or components to regulate and to ensure environmentally safe disposal of such used batteries.
2011	Plastic Waste Rules, 2011 revised in 2016	Minimum thickness of Plastic carry bags increased from 40-50 Microns. Responsibility of local bodies gram panchayats and wastegenerator.EPR
2011	E-waste Rules, 2011 revised in 2016	Duty of producer to carry out recycling or disposal, collection of e-waste generated from ‘end of life’ of their products in line with the principle of EPR.

2016	Construction and Demolition Waste Management Rules 2016	ULB responsible for proper management of C&D waste placing appropriate containers for collection, removal at regular intervals, transportation to suitable sites and also establish a data base and update once in a year, device appropriate measures in with expert consultation, use the recycled products in the best possible manner.
2016	Solid Waste Management Rules 2016	The word municipal has been removed to include “urban agglomerations, census towns, notified industrial townships, areas under the command of airports, railways, airbase, port and harbor, SEZs, defense establishments, State-Central government organizations religious and historical places”.

Source: Mithun R. and Mijanur.R (2016)

Some provisions added in the Solid Waste Management Rules, 2016 are:

- Source segregation of waste and duties of waste generator.
- Introduction of the concept of partnership in Swachh Bharat.
- Collection and disposal of sanitary waste.
- Collect back scheme for packaging waste.
- User fee and spot fine.

Criteria and actions to be taken for Solid Waste Management in hilly areas as per 2016 rules:

- Construction of landfill on the hill shall be avoided instead within 25 kilometers a suitable land shall be identified in the plain areas down the hill for sanitary landfill. If not try to construct a regional sanitary landfill for the inert and residual waste.
- Local body shall frame bye-laws and bar citizen from littering wastes and give strict direction to the tourists not to dispose any waste.
- Local body may levy solid waste management charge from the tourist at the entry point to make the solid waste management services sustainable.
- The department in- charge of the allocation of land assignment shall identify and allot suitable space on the hills for setting up decentralized waste processing facilities. Step garden system may be adopted for optimum utilization of hill space.

### **SPECIFIC CHALLENGES OF MSWM IN HILL AREAS:**

The geographical alienation, difficult hilly terrain, fragile ecosystem, prevailing socio-economic conditions and vulnerability to natural hazards are some of the formidable barriers to effective implementation of policies. Difficult terrain coupled with narrow winding roads accentuates taking up conventional policies and developmental initiatives. The unscientific and highly informal means of waste disposal, including partial collection, open burning and indiscriminate dumping aggravates the waste issues. It becomes difficult to retrieve the waste once it is thrown down the hill. Its repercussions are felt not only locally but to a large extent thousand kilometers or more downstream.

Most of the hill areas are small in size as compared to their counterparts in the lowlands. Achieving economies of scale for the recycling and retrieving of materials, can pose significant challenge due to the cost and difficulties of transport, and relatively low volumes of recyclable

waste as reported in Waste Management Outlook for Mountain Regions, Sources and Solutions, UNEP, ISWA, GRID, IETC, 2016.

While most of the hill towns in India are already grappling with the huge burden of lack of infrastructure, unfavorable climatic condition, and the apathy of the people towards waste management ails the already dilapidated civic amenities.

Tourism induced challenges further threatens the human security in the Himalaya and its geographical milieu. Although tourism has an immense impact on the economy; it comes with an additional challenge in terms of waste generation and its safe disposal resulting into disastrous impacts on the fragile hill environment. In the name of management only the prime locations of tourist interest are cleaned leaving most of the places chocking with waste all around.

#### **DEFICIENCIES SPECIFIC TO DARJEELING MUNICIPALITY:**

Darjeeling's embarrassingly low ranking of 451 in a list of 471 Indian cities ranked in order of cleanliness in the Swachh Survekshan 2018 should have been a wakeup call. In view of this Darjeeling requires immediate policy intervention and initiation. Few challenges are:

No baseline data, the biggest drawback, as without a historical database it is difficult to ascertain the link and wove to make a complete circle. The lack and subsequently loss of data (very few information lies with the municipality as the building was destroyed in a fire on 1996) are the biggest stumbling block for the policies makers. Urry (2016) categorically states that lack of knowledge and awareness of historical developments are the reasons for failure of most policies.

Volatile political situation in Darjeeling leads to poor governance that eventually reflects in the implementation process.

Source segregation is virtually nonexistent. Partial waste collection as door to door collection coverage is very low as most of the municipal wards cannot be reached by door to door service. Unscientific arrangement for waste transportation as big dumpers cannot negotiates several hairpin bends to the final dump chute located in ward 18. Absence of transfer station and treatment of waste make the management challenging. The geographical constraint for landfill gives way to indiscriminate disposal (roll down the hill) in this ecologically fragile city. This is perhaps the weakest link in the chain. Moreover, in the absence of buffer zone near the dumping chute as several houses are thriving in less than 100 meters radius posing serious health threat. Surprising, the municipality till date has not undertaken the physical -chemical study of the waste for reasons not known. In the absence of Weigh Bridge in the study area, to quantify the solid waste becomes difficult.

The Solid Waste Management Rules 2016 in Hilly Areas, mandates the civic body to frame bye laws that includes tourists visiting the hilly areas at the entry point in the town as well as through the hotels, guest houses or like where they stay and by putting suitable hoardings at tourist destinations, not to dispose waste indiscriminately. Till date no bye laws has been framed by the municipality to address this issue.

Poor perception of the locals as waste is not perceived as a threat. If the local community fails to conceive it then any sophisticated system is bound to perish. The stench of rotting waste affects all yet surprisingly rarely do they lodge a complaint about the malodor and the visible eyesore.

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**ANOMALIES OF POLICIES IN HILL AREAS:**

India has a varied geographic and climatic region. These manifest in the diverse food habits that get reflected in the complex consumption and waste generation patterns. However, till date, no region specific steps has been taken to analyze regional and geographical waste generation patterns for the urban areas and researchers have to rely on the limited data available based on the study conducted by Central Pollution Control Board, National Engineering and Environmental Research Institute, Central Institute of Plastics Engineering and Technology to cite a few.

Several policies have been planned and formulated in the National and state level but none of them speak about the practical difficulties of their implementation in the hill areas. Seldom have the planners and policy makers tried to sincerely acknowledge the necessity of a region specific policy that addresses the practical problem in the hill areas making them less inclusive. Broadly speaking, policies are generalized and imposed upon with no or little knowledge of local conditions and proves futile in the planning stage. Lack of research and field survey on the feasibility and sustainability conducted before the planning stage cripples the system.

In almost all policies the provision for the hill areas are basically sidelined as done in both the Solid Waste Management Rules 2000 and subsequently 2016. The national policies seldom address the location problems specific to hilly areas.

The solid waste management laws in India speak volumes about treatment, collection and safe disposal techniques but whether implementation is successfully carried out is questionable and matter of concern; many things remain confined to papers. On the contrary, very few laws deal with monitoring mechanisms on performance evaluation of the government authorities and concerned agencies. (Vilas. M.A. 2015) nor do they talk about the role played by the informal sector. None of the laws, policies at different level mandate the concerned departments to collect the baseline data. Though, the rules recommend recycling they do not say how to follow it or give any direction towards promoting recycling. The effectiveness of the participatory approach is not mentioned in all the laws and policies. Moreover, the successful models of the country cannot be implemented in a relatively smaller Darjeeling city as it is highly capital-intensive.

Since there is no provision in law for dumping untreated mixed waste, open dumping sites have mushroomed along the roadside and jhoras. However, highly regulated approaches may not offer sustainable solutions as culture- and incentive-based approaches would. It has been observed that municipalities do not maintain regular data on waste generation and its composition. Presently systematic and authentic data on MSW generation at national and subsequently at state, district and even at city / town level is available. The lack of one comprehensive policy with an umbrella framework of governing bodies has perhaps been the greatest faltering block for efficient implementation. Different rules necessitate different certifications from Central Pollution Control Boards, making the process tiresome. (Subramanian M. 2018).

**FINDING VIABLE SOLUTIONS:**

Today, we live in a highly “risk society” that is highly mobile and globalised (Beck, 1992). In many ways, politics and planning equals “walking on quicksand” (Bauman, 2013), as social, political, and economic risks, uncertainties and instabilities are shaping the institutional and societal environment for policy-makers, planners, and decision-makers. However, there is no

tailor cut ideal model to slip into any condition for waste management. This calls for not only research but its proper application in tandem with the specific local need.

The policies should appeal to the ground zero situation with due consideration to the local demography, geo-climatic conditions and the fragility of the region to bear fruits. The inadequacy and lacunae of existing service and planning should be revisited thoroughly to find local solutions to local problem. The policies will have to be in tandem with the local situation, its difficult terrain and the socio cultural milieu.

A low cost service delivery model by utilizing the local knowledge and information for planning and monitoring processes need to emphasize upon that can be easily implemented by the people themselves.

The idea of a participatory approach to solid waste management to be facilitated through solid waste management committee at ward level. To overcome the initial reluctance to pay for the waste, the phase wise payment mode be adopted. "Willing to pay" study, however, needs to be done to arrive at the different rate structure in consultation with the local conditions and wisdom (World Bank Oct. 2006)

The choice of technologies should be done after detailed feasibility survey is executed under local conditions. The best and the worst faring ward should be notified and encourage and reward the wards showing continuous monitoring and supervision. The weighing of waste and paying accordingly should be introduced. The society should be made responsive by involving them in policy planning. The policies should bring in mountain perspective keeping in view the mountain environment, its local resources and people alike. Planners and policy makers particularly, need to be sensitized regarding the importance of sustained waste management in specific region. (Planning Commission 2011).

#### CONCLUSION:

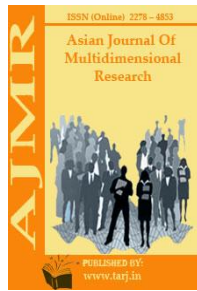
The ULBs have to be sensitized and vigilant as to not let the policies not feasible to hill areas be imposed. Improved legal regime and strict implementation and monitoring and adhering of the laws are to be enforced upon. To shed off the tag of the dirtiest city the residents must set out to manage waste from their doorstep. It calls for an upheaval in the behavioral change and try relentlessly to put in place the system deficiencies and restore the lost glory of this city through massive propaganda. This is the right time to include waste issues in the priority agenda for the reincarnation of Darjeeling.

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## **DEVELOPMENT OF TOURISM INDUSTRY IN RAJASTHAN**

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### **ABSTRACT**

*Tourism industry can be considered one of the ancient industries of the world. With the growth of science, technology and revolutionary changes that have been taken place in the field of transportation and communication have contributed massively to the development of tourist trade all over the world. National policies and increased economy is also affecting tourism positively. India has full potential to become a major global destination. A state like Rajasthan has all ingredients and elements to become a model state for tourism in the country. Rajasthan is one of the most popular tourist destination in India, for both domestic and international tourists. Rajasthan attract tourists for its historical forts, palaces, art and culture with its slogan "Padharo mhare desh". Every third foreign tourist visiting India travels to Rajasthan as it is part of the Golden Triangle for tourists visiting India. Rajasthan is easily accessible to other states in India through air and rail. Replete with one of its kind and world famous handicraft, royal delicacies, scenic beauty like Udaipur, Mt.abu, and many more things make a perfect blend for tourists but still there are many aspects which can be worked upon to facilitate international guests and generate new income sources for localites. This article analyse the factors of Rajasthan tourism which are very much important for tourist satisfaction. It also attempts to understand overall impact of this industry on people living here.*

**KEYWORDS:** *Rajasthan Tourism, International Tourist, Economy*

## **INTRODUCTION:**

Rajasthan literally means “Land of Kings” is a state in northern India. It is the largest state in India by area and seventh largest by population. Rajasthan comprises Thar deserts, ruins of Indus valley civilisation, Dilwara temple, ancient Aravali mountain range, Keoladeo and Ranthambore National Park, and many magnificent forts as evidence of glorified past. It is a perfect amalgamation of various kinds of tourist destinations to attract almost all types of tourists around the world. Rajasthan is well known for its hospitality also. Recently National Tourism Awards were given to Rajasthan for the overall development of tourism in the state under “Best State – Comprehensive Development of Tourism” category and best promotional films. Apart from the very well known destinations here, many beautiful places are yet to be promoted to explore the complete legacy of this state. As the tourism ministry of India is giving open platform to states for coming up with new strategies to accelerate tourism, Rajasthan government has drafted and implemented many initiatives to promote tourism.

## **REVIEW OF LITERATURE**

Fairs, festivals or events are very important for the growth in tourism industry in Rajasthan as tourism plays an important role in the socio-economic development of any country. The potential of tourism of Rajasthan is yet to be tapped fully. This requires combination of efforts on both policy and marketing side (**Sharma, A. and Arora, S.2015**) there is a need for a framework to be evolved which is Government - led, private sector driven and community -welfare oriented. Government will have to provide a legislative framework to regulate tourism trade and industry, ensure safety and security of the tourists and create basic infrastructure and health care facilities. The private sector has to act as a main spring of the activities and impart dynamism and speed to the process of development as well as conservation (**Singh, R.2013**).

Research article named spatial availability of Tourism Services in Rajasthan with its sustainability concept proved that Rajasthan is not well prepared for the increasing number of tourist arrival. Policies and planning to increase the availability of basic tourism facilities are needed in these areas to sustain tourism industry. (**Poonia,A.2011**).Many Potential destinations in Rajasthan like Mandwa, Fatehpur, Dhunlod, Nawalgarh etc. are not able to attract tourists due to many factors like lack of education, awareness and promotion. By teaching principles of management of cultural attraction and good interaction with cultural tourist and also by, reinforcement reformation, conservation and developing cultural attraction, Tourists attention can be dragged to these places. (**Sinha S, Varshney M,2017**) Another study on Haduati and Shekhawati region also gives similar results that due to lack of awareness, tourist coming to Rajasthan do not get the opportunity to visit these areas where From self-indulgent tourism to spiritual, every experience is available. Falling price of agriculture, economic instability, unemployment are few outcomes of this ignorance. Education tourism can be a solution to this problem which will enhance the economic and social structure of these backward regions. (**Sharma A., 2015**) Deception by shop keepers of shoes, garments, ornaments, handicraft in Rajasthan gives very bad experience and impression to international tourists. There should be government control on such practices, to enhance trust and comfort of guests. Tourist guides are also very important factors for tourist satisfaction because the historical places can not be enjoyed full without proper information of history belongs to them. Proper training should be given to guides so that they can commit the norms of their profession. (**Dharmwani L.T., 2013**). Apart from many points like ignorance of government towards many interior regions like Haduati, Shekhawati, lack of proper infrastructure etc, adverse climate condition also play role of

hindrance for tourism in western Rajasthan including Barmer, and Jaisalmer. To overcome such issues, important railway stations and terminals should be modernized to lodge the tourists. Deluxe buses, luxury coaches, air connectivity is required for proper connectivity. Wild life tourism should be encouraged in entire area of Jodhpur, Jaisalmer and Bikaner. (Mehar I. 2011) Swot analysis of Rajasthan tourism consider good range of shopping products and royal history as the biggest strength as tourist destination. Lack of safety and security for tourists and lack of proper training to guides to host international guests is the biggest weakness. Eco and literacy tourism can be taken as upcoming opportunity whereas threat is political instability. (Sharma A., 2013)

### **OBJECTIVE OF STUDY:**

1. To study the steps taken by state government for accelerating growth in tourism and analysis of the current trends in Rajasthan Tourism Industry
2. To evaluate the weaknesses of Rajasthan tourism industry
3. To examine the positive as well as negative impact of tourism in society

### **RESEARCH METHODOLOGY**

This paper is diagnostic and exploratory in nature. Research is based on analysis of secondary data about Rajasthan tourism, collected from various National and International research articles, official website of Ministry of tourism, Government of India, Travel and Tourism Competitiveness Index (TTCI) issued by World Economic Forum, reports of UNESCO etc. Number of foreign and domestic tourist visits to Rajasthan has been analyzed.

### **Initiatives by State Government -**

In recent times, Rajasthan has made rapid strides on tourism front and the Rajasthan Tourism Development Corporation Ltd (RTDC) has also worked to introduce many more pro-tourism sector initiatives that would be instrumental in boosting Rajasthan's image as a tourism hotspot. In recent times, the State government has been focussing on renovation and providing world-class amenities at various museums spread across the State. Similarly, at the wildlife sanctuaries, such as at the tiger reserves, similar services are being extended.

Apart from this, Government has also taken steps to organise various cultural activities throughout the year. For this, they have now drawn a calendar of events, festivals and fairs to be organised throughout the year. As part of this, they have also been focussing to showcase the lesser-known fairs and festivals of the State. In addition, RTDC has been also making efforts in providing budget hotels for tourists, and by running of two luxury trains, giving world-class experience to tourists coming to the State

Government has been also looking forward to showcase cultural events such as Udaipur Music Festival, storytelling festivals, Jaipur Literature Festival and various other such events that in recent times have caught the attention of world community. The State government has been making efforts to develop desert circuit across the State. At present, luxury tourist train – 'Palace on Wheels' also goes to all such desert regions, covering attractions such as the 'Desert National Park', and 'Akal Wood Fossil Park' (at Jaisalmer). The amenities around these attractions are also being made more tourist-friendly.

The concept of night tourism has gained immense popularity in the State. To cater to such a demand, government has partnered with the Confederation of Indian Industry (CII) and, together

have launched the 'Jaipur by Nite' concept. The tourism landscape in Rajasthan is flourishing and with the launch of new media campaign "Jane Kya Dikh Jaye" many more domestic tourists are visiting Rajasthan to explore the lesser known destinations,

Apart from all these initiatives, Augmenting tourism infrastructure, easing of visa regime, assurance of quality standards in services of tourism service providers, projecting the state as a 365 days' tourist destination, promoting tourism in a sustainable manner, etc. are some of the policy areas which need to be constantly worked upon to increase and facilitate tourism in Rajasthan.

### **Problems to be resolved**

The absence of good transportation system is a big problem in the development of tourism in Rajasthan. Most of the public transportation are in very poor conditions and require immediate attention. There is a lack of parking around most of the tourism attraction .

Higher taxes are charged to tourist at various stages right from their entry in Rajasthan. Taxes are charged on airport, hotel accommodation, food provided. This has snowballing impact on the overall expenses. These are fairly high compared to other countries. This has highly negative impact on the growth of tourism and demotivate tourists from visiting Rajasthan. Along with that In most of the historical monuments there is discriminating pricing for domestic and foreign tourist. This generates a feeling of alienation among the visiting tourists.

There is a lack of Tourists reception centres in Rajasthan which can provide the basic information about the tourist destination. It leads to loss in revenue, as tourists visiting Rajasthan do not move to all places of tourists attraction.

Due to continuous anti social attacks on tourism destinations in different parts of the Rajasthan, tourists are worried about their safety and security.

### **Impact of Tourism :**

As the subject itself, impact of tourism has vast scope. Tourism industry of any state touches life of every localite whether directly or indirectly. In Rajasthan too, impact of tourism can be seen in every aspect of society be it economic, environmental or cultural. Being an internationally popular destination impact of tourism on people of Rajasthan has both sides, Positive as well as Negative.

#### **Positive Impact –**

- Generation of Employment in different sectors as hotel industry, transport, handicraft etc.
- Earning of Foreign Exchange.
- Protection of monuments and other historically valuable artifacts.
- Development of Infrastructure as roads, Hotels etc.
- Culture exchange between Rajasthan and visitors coming from all over the world.

#### **Negative Impact –**

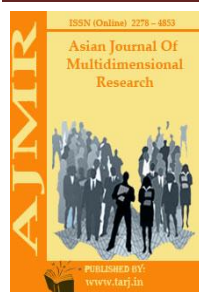
- Loss of natural landscape through irresponsible tourism.
- Commercialization of bequest culture and art and fail to respect social values.
- Acculturation: Acculturation theory states that when two cultures come into contact for any length of time, an exchange of ideas and products will take place that, through time, produce varying levels of convergence between the cultures; that is they become similar

**CONCLUSION:**

As we can conclude that there is no doubt that tourism industry of Rajasthan has important place in Indian economy. It is a fickle industry, subjects to consumer whims and forces beyond the industry's control, it is also a dynamic and exciting industry. Analysis of the present research proved that state government has strategies very aggressively to flourish tourism internationally. This will certainly give much needed fillip to propel the traffic towards our colorful State. Along with the economic growth, state need to have a keen insight for sustainability of environment. It is responsibility of tourists, local crowd, stakeholders, private companies and state government to keep the tourist destinations safe and pure and to be enjoyed by generations.

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## **ASSESSMENT OF REFLECTANCE INDEX OF SELECTED VEGETABLE FIBRES**

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### **ABSTRACT**

*Colour is an important factor in the evaluation of aesthetic appearance and functionality of many products especially in textiles. Nature has given colour to the fibres which are obtained from different vegetable sources depending on the origin and other geographical factors. Natural fibre yielding plants are abundantly available in our country. The non edible portion of these plants should be rightly used for various purposes. For this reason, the selected fibres were processed to obtain the required properties and to remove the adherence of unnecessary materials from it. The purpose of the study is to identify the effect of scouring and bleaching on the tristimulus values for brightness, whiteness and yellowness indices. The instrument spectrophotometer was used to analyse the selected vegetable fibres namely areca nut, aloe vera, banana, coir, hemp, jute, korai and sisal at raw state, and after scouring and bleaching processes. The degree of whiteness, yellowness and brightness between the fibre samples has*

been assessed. A comparison was made between the visual evaluations made by observers and spectrophotometric analyses. The tristimulus values of the indices varied between the fibres in raw state as the selected fibres had self colour on their own. After scouring and bleaching also these values varied. It is also observed that all the Y values are positive depicting the yellowish shade as the negative Y values express a bluish shade in the fibres. From the spectrophotometric analysis it was understood that the yellowness was predominant in few fibre samples. In the jute and sisal bleached samples the spectrophotometer analysis is in par with the visual evaluation. Statistical analyses also support the study with 1% significant difference among the fibre samples between the tristimulus values and the indices among fibres.

**KEYWORDS:** *Tristimulus, Spectrophotometer, visual evaluation, Index values*

## 1. INTRODUCTION

Color is defined as the sensation experienced or caused by light reflected from or transmitted through objects. The perceived color cannot be directly measured. So quantification of the color properties in textile materials has a great economic value in industry. Color instrumentation has experienced a tremendous advancement in technology during the past 40 years<sup>1</sup>. The advantages of using natural fibre are that they are economical, eco-friendly, bio compatible, non-toxic, bio degradable and abundant in availability<sup>2</sup>. Visual comparison of samples under different lighting conditions is always a good idea to understand how the whiteness has been achieved, how the samples compare in low and high levels of UV light and whether the samples appear neutral white or more tinted in comparison to other samples<sup>3</sup>. Measurement related to visual observations poses the greatest problem. Different observers judge a sample differently because they assess the deviation in lightness, hue and saturation differently and the problem is further complicated by personal preferences<sup>4</sup>. Colour is the human eye's perception of reflected radiation in the visible region of the electromagnetic spectrum.

One of the most objective ways to measure colour is to use diffuse-reflected spectrophotometer. The light reflected from the material is collected in an integration sphere, normalized to the source light of the reflectance and calibrated with the measurement of a pure white standard and black box over the entire wave length spectrum of visible light<sup>5</sup>. Colour measurement may involve transmittance, reflectance, translucence, fluorescence, radiant energy or even gloss measurement<sup>6</sup>. The quality of the measurement can be determined by the analysis of uncertainty. The quantification of measurement uncertainty is allowing the textile manufacturer to control the quality of products<sup>7</sup>.

**Whiteness** is the measurement of light reflectance across all wavelengths of light comprising the full visible spectrum. Whiteness is an aspect of color resultant by high luminosity with an absence of any hue<sup>8</sup>. **Yellowness** is defined as the attribute by which an object color is judged to depart from a preferred white towards yellow. Yellowness index measurements are used primarily to study degradation of white color from raw materials, processing, or subsequent service exposure. The yellowness index equations all involve difference between Z and the other tristimulus values<sup>9</sup>. **Brightness** is the measurement of light reflectance of a specific wavelength of blue light. It represents a more narrow measurement of light reflectance than whiteness. Reflected color can be measured using a spectrophotometer called spectroreflectometer or reflect meter, which takes measurements in the visible region and a little beyond of a given color



sample. This system mirrors the color receptors in the human eye, referred to as cone cells. Tristimulus values measure light intensity based on the three primary color values (RGB), typically represented by X, Y, and Z coordinates. The tristimulus values system is the foundation of color language, also referred to as the CIE color system, and is used to communicate precise color values around the world. White is a colour that is very difficult to describe qualitatively without comparing it with another sample. The original or the raw fibres of the selected sources in the present study have unique colour and they change in their shades on chemical treatment. So to analyse the variation in the colour this study has been carried out.

## 2. MATERIALS AND METHODS

The materials and methods used for the study are explained in the following heads.

### 2.a. Selection of Fibres

The fibres selected for the study were Areca nut (*Areca catechu*), jute (*Corchorus olitorius*), sisal (*Agave sisalana*), *Aloe vera*, hemp (*Cannabis sativa*), korai (*Cyperus rotundus*), banana (*Musa sapientum*) and coir (*Cocos nucifera*). The fibres of different shades were selected for the study. The plates of the raw fibres are presented in the Plate-1. The fibres were designated the nomenclature as presented in the Table – I.

**TABLE – I NOMENCLATURE**

S.No	Nomenclature	Sample Details
1	OAR	Original Arecanut Fibre
2	SAR	Scoured Arecanut Fibre
3	BAR	Bleached Arecanut Fibre
4	OAL	Original Aloevera Fibre
5	SAL	Scoured Aloevera Fibre
6	BAL	Bleached Aloevera Fibre
7	OB	Original Banana Fibre
8	SB	Scoured Banana Fibre
9	BB	Bleached Banana Fibre
10	OC	Original Coir Fibre
11	SC	Scoured Coir Fibre
12	BC	Bleached Coir Fibre
13	OH	Original Hemp Fibre
14	SH	Scoured Hemp Fibre
15	BH	Bleached Hemp Fibre
16	OJ	Original Jute Fibre
17	SJ	Scoured Jute Fibre
18	BJ	Bleached Jute Fibre
19	OK	Original Korai Fibre
20	SK	Scoured Korai Fibre
21	BK	Bleached Korai Fibre
22	OS	Original Sisal Fibre
23	SS	Scoured Sisal Fibre
24	BS	Bleached Sisal Fibre

## 2. b. Scouring of Fibres

The fibres were subjected to scouring and bleaching treatments which are the pre treatments for any cellulosic fibres for further processes. Some of the waxy substances melt in the high temperature and other parts make water soluble compounds with NaOH. Caustic soda (NaOH) neutralizes the fibres which contain some acidic compounds in it such as amino acids, pectic acids etc. Since some of the NaOH is absorbed by fibres, the intra and intermolecular hydrogen bonds becomes stronger in the cellulosic fibres<sup>10</sup>.






















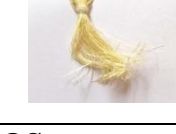


**To scour the vegetable fibres the recipe used was<sup>11</sup> Sodium Hydroxide - 3.0% (owf), Wetting agent - 0.5% (owf), Emulsifying agent - 0.5% (owf), Temperature - 100°C and Duration - 90 minutes. The pictures of scoured fibre samples are presented in the **Plate 2**.**

## 2. c. Bleaching of Fibres

Bleaching is the removal or lightening of coloured materials. It is accomplished chemically with oxidizing and reducing agents. Hydrogen per oxide and related peroxy compounds are the most widely used class of textiles bleaching agents particularly in United States. These compounds always contain a per oxide bond in which at least one oxygen atom is active<sup>12</sup>.

Bleaching of the fibre was done using hydrogen peroxide as suggested by Ghosh *et al.* (2005)<sup>13</sup>. The bleaching process was carried out using Hydrogen peroxide - 1%, Soda ash 1%, Sodium silicate 1%, Wetting agent 0.1%, Material to liquor ratio - 1 : 20, Temperature - 80°C and Time 2 hours.

After the bleaching process, the fibres were washed in distilled water and dried at room temperature. The pictures of bleached fibres are exhibited in plate 3

S.No	Original	Scoured	Bleached
1			
	OAR	SAR	BAR
2			
	OAL	SAL	BAL
3			
	OB	SB	BB
4			
	OC	SC	BC
			
	OH	SH	BH
5			
	OJ	SJ	BJ
6			
	OK	SK	BK
8			
	OS	SS	BS
	PLATE - 1	PLATE - 2	PLATE - 3
<b>UNTREATED AND TREATED FIBRE SAMPLES</b>			

## 2. d. Evaluation of fibre samples

The fibre samples were subjectively evaluated by a group of observers and analysed objectively using spectrophotometer.

### 2. d.1 Subjective Evaluation

The fibre samples were subjectively analysed through Visual evaluation by a group of observers. The fibre samples namely OAR, SAR, BAR, OAL, SAL, BAL, OB, SB, BB, OC, SC, BC, OH, SH, BH, OJ,SJ,BJ,KO,KS,KB OS,SS and BS were assessed subjectively and the results obtained were recorded and tabulated.

### 2. d.2. Objective Evaluation

The objective evaluation was carried out using spectrophotometer. The instrument used for the study was SS 5100H Premier Colour Scan dual beam Spectrophotometer. It is designed with features which can be seen on international class of spectros. It is an advanced aberration corrected concave holographic grating for dispersion reflected light coupled with highly accurate discrete sensing photodiode array detector. The integrating sphere conforms to CIE/ASTM specifications for size, which is 152 mm diameter. The light source is pulsed Xenon with wave length ranging from 360nm to 700nm and interval of 10nm. The equipment was adjusted to have a medium area view (MAV) of 5.0 mm x 10.0 mm, with operating temperature of 15<sup>0</sup>C. The RH was less than 90%. Loose fibres were difficult to measure as it tends to protrude into the sphere. This may introduce errors into the reflectance measurement. There is also risk in falling into the instrument. A better technique is to place an exact mass of fibres into a compression cell and apply a constant amount of pressure. This will eliminate errors made due to gaps between fibres that exist under conditions of minimal pressure<sup>14</sup>.

Thus the fibre samples namely OAR, SAR, BAR, OAL, SAL, BAL, OB, SB, BB, OC, SC, BC,OH,SH,BH, OJ,SJ,BJ, KO,KS, KB OS,SS and BS were analysed using spectrophotometer.

## 3. RESULT AND DISCUSSION

The results obtained from the visual evaluation and spectrophotometric analysis are presented under the following heads.

### 3.1. Visual evaluation

From the Table II it is clear that from the visual assessment that the bleached fibres have improved in the general appearance and colour in all the fibre samples. The bleaching process has modified the original lusture and improved the texture of all the samples. This result is in par with the finding that alkali and acid treatments improve the color, texture, luster and general appearance of the *Abutilon* Fibre<sup>15</sup>.

**TABLE II SUBJECTIVE EVALUATION OF TREATED AND UNTREATED FIBRES**

S.no	Fibres		Aspects in percentage											
			General appearance			Colour			Lusture			Texture		
			Good	Fair	Poor	White	Yell ow	Brown	Good	Fai r	Poor	Soft	Coarse	Very coars e
1.	ARE CA NUT	O	60	40	-	-	90	10	-	5	95	80	20	-
		S	75	25	-	-	95	5	-	80	20	25	75	-
		B	90	10	-	-	100	-	75	25	-	90	10	-
2.	ALO E VER A	O	20	80	-	5	95	-	70	30	-	-	10	90
		S	40	60	-	20	80	-	60	40	-	20	80	-
		B	80	20	-	100	-	-	50	50	-	30	70	-
3.	BAN ANA	O	-	100	-	-	5	95	-	5	95	-	20	80
		S	-	100	-	-	5	95	-	5	95	-	20	80
		B	90	10	-	100	-	-	10	90	-	-	75	25
4.	COIR	O	5	95	-	-	-	100	-	5	95	-	20	80
		S	10	90	-	-	-	100	-	60	40	-	10	90
		B	90	10	-	-	100	-	5	95	-	5	90	5
5.	HEM P	O	20	80	-	-	-	100	-	10	90	10	10	80
		S	10	90	-	-	-	100	-	20	80	15	20	65
		B	90	10	-	-	100	-	-	70	30	75	25	-
6.	JUTE	O	20	80	-	-	-	100	-	80	20	-	90	10
		S	40	60	-	-	90	10	-	90	10	20	80	-
		B	80	20	-	-	100	-	-	95	5	30	70	-
7.	KOR AI	O	-	80	20	-	-	100	-	-	100	-	-	100
		S	-	80	20	-	-	100	-	-	100	-	10	90
		B	10	90	-	-	100	-	-	60	40	-	60	40
8.	SISA L	O	80	20	-	20	80	-	10	90	-	-	90	10
		S	90	10	-	10	90	-	20	80	-	-	95	5
		B	100	-	-	100	-	-	35	65	-	-	100	-

The sample BAR was rated as good in general appearance by the maximum of 90 percentages of judges. It was also rated as yellow in colour, good in lusture and soft in texture by the majority of judges.

The sample BAL was rated as good as general appearance by 80 percent of the judges and white in colour by cent percent of the judges; Bleaching had improved the general appearance as well as colour of the sample.

The fibre sample BB was rated as good in general appearance by 90 percentages of judges and white in colour by cent percent of judges. It was also rated as fair in lusture (90%) and course in texture (75%) by the majority of judges.

The fibre sample BC was rated as good in general appearance by 90 percentages of judges and yellow in colour by 100 percent of judges. It was also rated as fair in lusture (95%) and course in texture (90%) by the majority of judges.

The fibre sample BH was rated as good in general appearance by 90 percentage of judges and yellow in colour by cent per cent of judges. It was also rated as fair in lusture (70%) and soft in texture (75%) by the majority of judges.

The fibre sample BJ was rated as good in general appearance by 80 per cent of judges and yellow in colour by cent percent of judges. It was also rated as fair in lusture (95%) and course in texture (70%) by the majority of judges.

The fibre sample BK was rated as fair in general appearance by 90 percentage of judges and yellow in colour by cent per cent of judges. It was also rated as fair in lusture (95%) and course in texture (60%) by the majority of judges.

The fibre sample BS was rated as good in general appearance by 100 percentage of judges and white in colour by 100 percent of judges as well as coarse in texture by again 100 percent of judges.

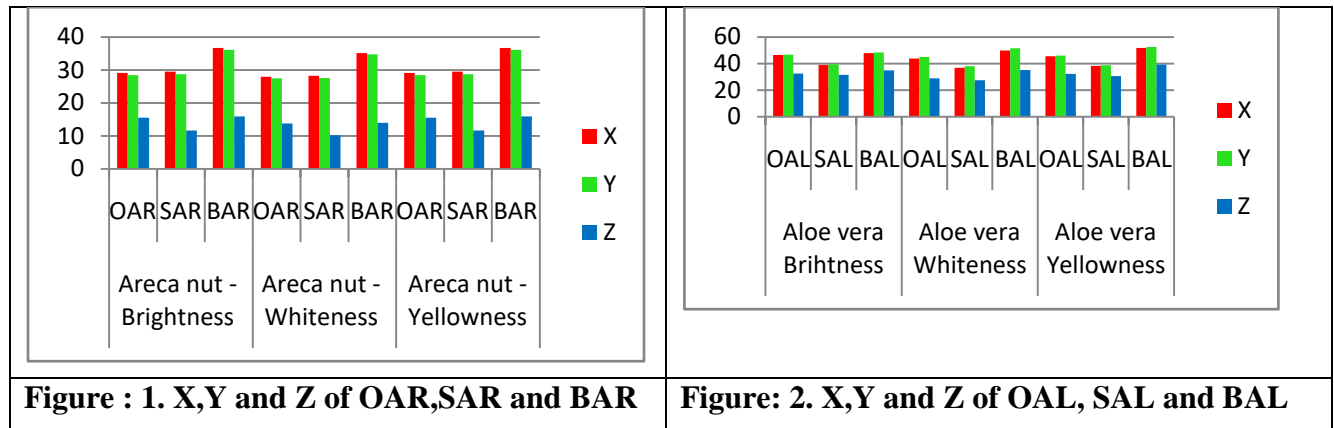
From visual assessment of original and treated fibers it is clear that bleaching has improved the general appearance and colour of all the samples. On the other hand, bleaching had modified the original lusture but improved the texture of all the fibre samples.

**3.2. Objective Evaluation - Spectrophotometric analysis**

The objective evaluation of spectrophotometric analysis are presented under the following heads.

**3.2a. Tristimulus (XYZ) values of brightness, whiteness and yellowness indices**

The figures of the tristimulus indices of X, Y and Z for yellowness, whiteness and brightness are presented in Figures 1-8.



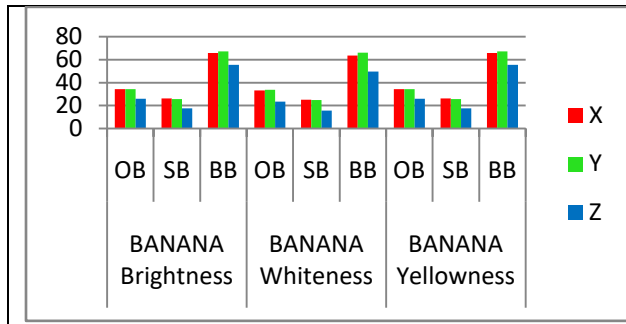


Figure: 3. X,Y and Z of OB, SB and BB

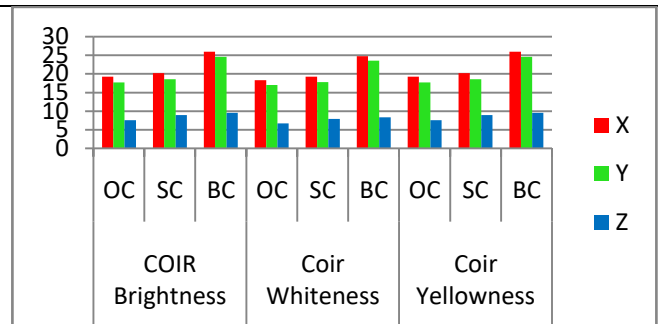


Figure: 4. X,Y and Z of OC,SC and BC

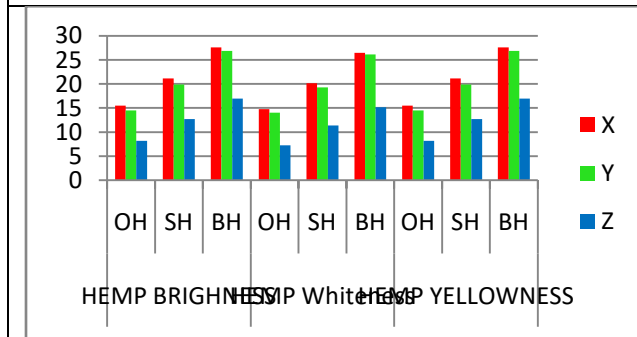


Figure :5. X,Y and Z of OH,SH and BH

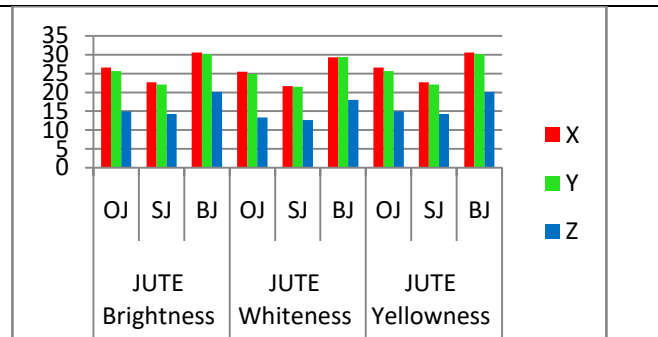


Figure :6..X,Y and Z of OJ,SJ and BJ

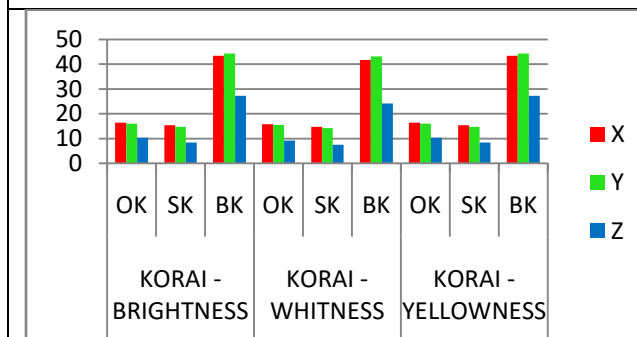


Figure :7. X,Y and Z of OK,SK and BK

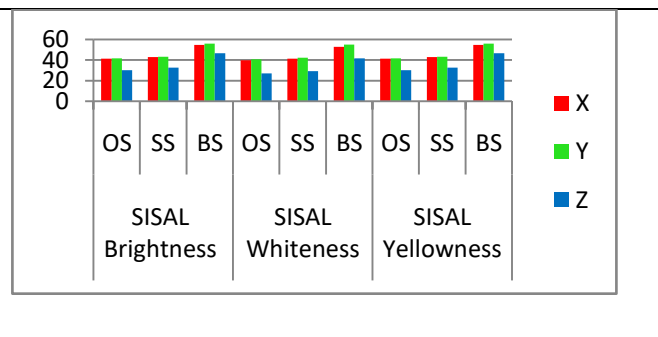


Figure :8.X,Y and Z of OS,SS and BS

Figures 1-8, Tristimulus Values of Fibre Samples

From the diagram it is vivid that the X value is prominent in all the three indices of brightness, whiteness and yellowness in the treated and untreated fibres of arecanut, coir and hemp. The Y stimulus value is the highest in the samples of Aloe vera and sisal in treated and untreated fibres in all the three indices. The samples of banana fibres OB and BB Y was the highest in whiteness index and in BB in Yellowness index. Of all the Jute samples, BJ exhibited Y with highest value in whiteness index. In case of Okra fibres, the sample BK had the highest value in Y in all the three indices.

### 3.2b. Statistical analysis for Tristimulus (XYZ) values

The statistical analysis for the tristimulus values for yellowness, whiteness and brightness among the fibres samples are presented in Table III.

**TABLE III ONE WAY ANALYSIS OF VARIANCE FOR TRISTIMULUS (XYZ) VALUES OF BRIGHTNESS, YELLOWNESS AND WHITENESS INDICES**

S.No	Fibre Sample		'F' value	Sig
1	Areca nut	Brightness	20.632	.002
		Whiteness	24.088	.001
		Yellowness	20.632	.002
2	Jute	Brightness	6.823	.028
		Whiteness	8.844	.016
		yellowness	6.823	.028
3	Sisal	Brightness	1.598	.278
		Whiteness	2.748	.142
		yellowness	1.598	.278
4	Aloe Vera	Brightness	5.439	.045
		Whiteness	8.496	.018
		yellowness	3.421	.102
5	Hemp	Brightness	2.209	.191
		Whiteness	2.735	.143
		yellowness	2.2009	.191
6	Korai	Brightness	.438	.665
		Whiteness	.568	.594
		yellowness	.438	.664
7	Banana	Brightness	.195	.827
		Whiteness	.332	.730
		yellowness	.195	.827
8	Coir	Brightness	16.354	.004
		Whiteness	18.086	.003
		yellowness	16.354	.004

From the Table III it is clear that in the statistical analysis made in the comparison between X, Y and Z, of the **areca nut** samples, the X value was the highest with mean of 31.795 followed by Y of 31.009 and Z of 14.361. Whiteness was the highest with X value of 30.453 followed by the Y value of 29.948. Yellowness exhibited the highest value of 31.795. The X value was the highest in the brightness, yellowness and whiteness indices in areca nut samples. A significance at 1 % level was observed between the XYZ and the three indices. In the **jute** fibre samples, the X index was the highest as for the brightness, whiteness and yellowness are concerned with mean value of 26.6117, 25.499 and 26.612 respectively. A significance at 10% level was noted. In the **sisal** fibres, the value of Y was predominant in brightness, whiteness and yellowness with 46.966,



46.049 and 46.966 respectively. No significant difference was noted between sisal samples in the three indices. As far as the *aloe vera* samples are concerned, there was only 10% significance noted for brightness and whiteness indices with mean values of 44.808 and 44.884 in the yellowness index. Yellowness did not show any significant difference among X, Y and Z.

The **hemp and korai** samples did not show any significant difference in X,Y and Z values with the three indices of brightness, whiteness and yellowness. The mean value was the highest in the X, Y and again X as for the brightness, whiteness and yellowness are concerned. No significant difference was observed in the **banana** fibre samples which exhibited the highest Y value in all the three indices. **Coir** fibre samples showed the highest X value in the three indices of brightness, whiteness and yellowness with the highest values of 21.806, 20.772 and 21.806 respectively. A significant difference at 1 % level was observed in coir fibres between the indices and X, Y and Z values.

### 3.2c. Yellowness, Whiteness and Brightness Indices of Original and Treated Fibre Samples.

The Yellowness, Whiteness and Brightness Indices obtained from the spectrophotometric analysis of Original and Treated Fibre Samples are presented in the Table IV and Figure 9.

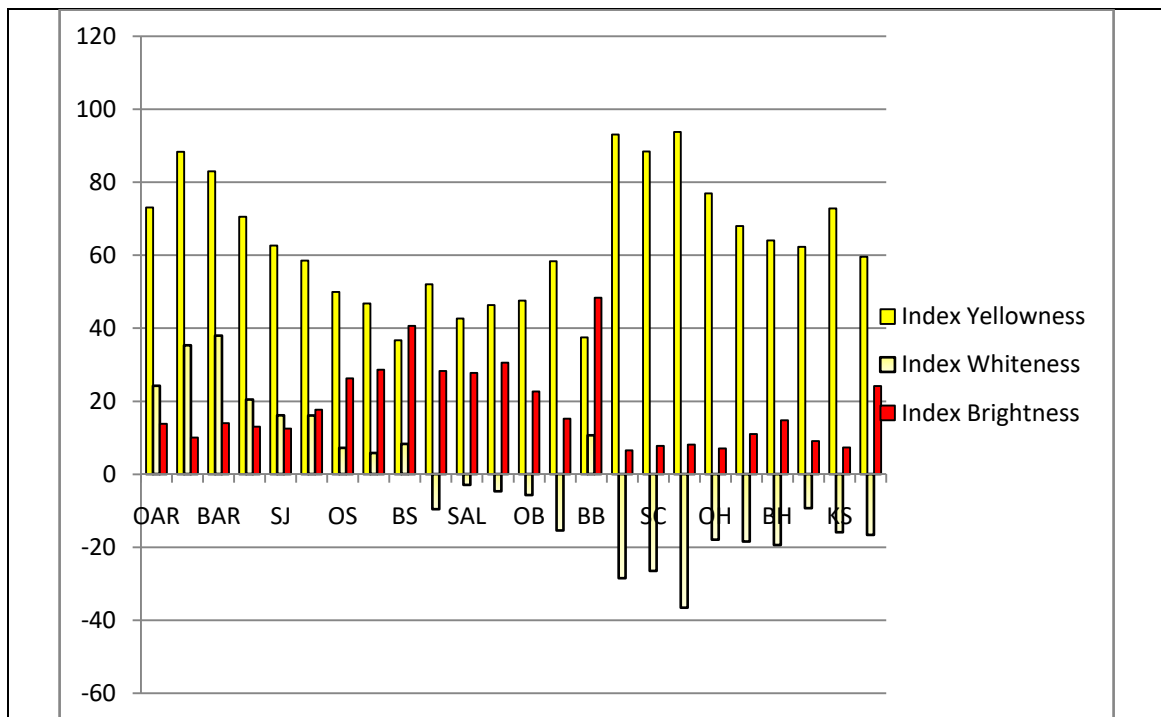
**TABLE IV YELLOWNESS, WHITENESS AND BRIGHTNESS INDICES OF ORIGINAL AND TREATED FIBRE SAMPLES.**

Sl. no	Samples	Index			Statistical Analysis	
		Yellowness	Whiteness	Brightness	'F' value	Significance
1	OAR	73.073	24.196	13.828	95.526	.000
	SAR	88.361	35.296	10.095		
	BAR	83.021	37.942	14.022		
2	OJ	70.58	20.427	13.047	133.860	.000
	SJ	62.683	16.104	12.514		
	BJ	58.562	16.055	17.698		
3	OS	49.964	7.177	26.271	29.923	.001
	SS	46.785	5.774	28.644		
	BS	36.664	8.261	40.611		
4	OAL	52.083	-9.621	28.277	177.360	.000
	SAL	42.672	-2.965	27.798		
	BAL	46.378	-4.716	30.543		
5	OB	47.587	-5.747	22.657	10.380	.011
	SB	58.388	-15.456	15.251		
	BB	37.524	10.625	48.348		
6	OC	93.071	-28.535	6.512	934.152	.000
	SC	88.412	-26.541	7.767		
	BC	93.812	-36.622	8.09		
7	OH	76.973	-17.973	7.044	306.350	.000

	<b>SH</b>	67.978	-18.485	11.008		
	<b>BH</b>	64.094	-19.442	14.831		
8	<b>KO</b>	62.324	-9.343	9.061	95.441	.000
	<b>KS</b>	72.826	-15.942	7.336		
	<b>KB</b>	59.58	-16.671	24.195		

The scoured samples namely SAR,SJ,SB,SH and KS show the highest yellowness index over original and bleached samples. In few vegetable fibres namely OS, OAL and OC/BC it is observed that the yellowness index was the highest over other two samples though it was original. This may be due to the self colour in the fibres of sisal, aloevera and coir.

As for the brightness index, the bleached samples namely BAR, BJ, BS, BAL, BB, BH and KB show the highest values over the other two indices. Only in the case of coir fibre SC the soured sample showed the highest brightness. The whiteness index was the highest in the bleached samples namely BAR and BS. Whiteness is the measure of the reflection of light by the surface at equal intensities in all directions<sup>16</sup>. The samples namely BAL, BC, BH and KB show very less reflectance values. The statistical analysis of variance also shows a significant difference at 1 % level between the fibres in yellowness, whiteness and brightness except the sample of banana fibres which show a significant difference at 10 % level. The whiteness index of the samples are in negative values in the study Impregnated glass fiber strands and product including the same noted in patent image<sup>17</sup>. In this study the self colour in the fibres namely aloevera, banana, coir, hemp and korai predominated giving lesser whiteness index than yellowness index.



**Figure: 9 Comparison of Yellowness, Whiteness and Brightness indices of the treated and untreated fibres.**

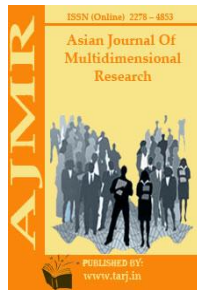
## CONCLUSION

It is evident that the spectrophotometric analysis showed predominance in X values in almost all the vegetable fibres except *Aloe vera*, korai and sisal fibres after bleaching. In the visual inspection cent per cent of the observers express that the bleached samples of areca nut, coir, hemp, jute and sisal fibres were yellow in colour. This may be the reason for the low values in the whiteness index in the objective evaluation. The jute and sisal bleached samples results of the spectrophotometer analysis is in par with the visual evaluation. The statistical analysis prove that there is 1 per cent significance in the coir and arecanut fibres between the tristimulus values and the indices.

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## **FACTORS AFFECTING THE DEVELOPMENT OF MIGRATION FLOWS AND MEASURES TAKEN BY EUROPEAN COUNTRIES TO ADDRESS THE PROBLEM**

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UZBEKISTAN

### **ABSTRACT**

*This article is dedicated to one of the urgent problems of our time as the migration to the example of the countries of Africa and the Middle East. Actuality is characterized by the fact that in spite of the measures taken in recent years, the number of migrants is increasing on a large scale and become unmanageable process. This is facilitated by a number of factors, which are discussed in detail in the article. Modern migration crisis in Europe is the result of a number of reasons, which can be divided into two major groups: structural and direct. The first group includes the global economic crisis that has engulfed the world in 2008. Finally, the fifth structural reason, in our opinion, is not always far-sighted policy of the world powers, especially the US, in the Arab world, whose intervention in the internal situation in Afghanistan, Iraq, and Syria has put the state on the brink of survival. In Germany this discourse has two complementary sides. A general sentiment is that “we have not been affected” by the crisis as much as others, but the political discourse of crisis persists in calls for its management. Many argue that the experiences and strategies of those who fall outside existing categories of forced migrant tend to disappear from view, leading to their neglect or worse.*

**KEYWORDS:** *Migration, Crisis, Labor Migration, Refugees, Trafficking, Unemployment, Terrorism And Security.*

## INTRODUCTION

In today's world, labor migration is becoming more widespread. In accordance with the International Convention on protection rights of migrant workers and their families adopted by the UN General Assembly on 18 December 1990, the term "migrant worker" means a person who is engaged in paid employment in the State of which he is not (paragraph 1 article 2). Analyzing the processes may be somewhat broader approach to the concept of migration, considering it one of the temporary migration of species populations, aimed at working outside the place of permanent residence abroad.

In the evolution of normative and operational responses to movement in the context of humanitarian crises, causality has been of paramount concern in framing responses and has shaped classification systems that place those who migrate into specific categories - for example, the classification of people who flee across borders "owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion" as refugees. Yet the convergence of factors such as drought and conflict or the interplay of drivers and motivations hinders a straight forward assessment of causation in many cases.

Many argue that the experiences and strategies of those who fall outside existing categories of forced migrant tend to disappear from view, leading to their neglect or worse. Dominating efforts to address this is the recognition - by governments, academics and institutional and civil society actors - of protection gaps for those who move across national borders because of environmental and climate change. Commendable as these efforts are, questions remain as to the benefits of isolating and privileging these factors as a cause of movement, particularly in light of the abundance of evidence about the diversity of factors influencing movement-related decisions<sup>1</sup>.

## RESEARCH BACKGROUND

Humanitarian crises may result from acute events, such as natural and human-made hazards - earthquakes, cyclones, and nuclear accidents and conflict, or from slow-onset processes that cause environmental damage, erode livelihoods, and, in extreme cases, lead to famine. These events and processes may be the trigger for movement, but in most cases, underlying structural factors such as poverty and poor governance comprise the context.

Between 2010 and 2012, some 700 natural disasters were registered worldwide, affecting more than 450 million people.<sup>2</sup> Armed conflict or political instability in Iraq, Syria, Pakistan, Libya, Mali, Cote d'Ivoire, South Sudan and the Democratic Republic of Congo affected millions more. Protracted conflicts in countries such as Somalia and Afghanistan have produced secondary irregular movements, highlighting the complex and exigent issues created in situations of conflict-induced displacement.

Modern migration crisis in Europe is the result of a number of reasons, which can be divided into two major groups: structural and direct. The first group includes the global economic crisis that has engulfed the world in 2008. One of its devastating effects was the loss of work and livelihood of hundreds of thousands of people around the world. However, most of all in this respect, affected the poorest countries, many of which are on the African continent. In addition to mass unemployment, which in 2010 covered 20-25% of the African population, another reason contributing to an increase in migration from there to Europe, reinforced by the global economic crisis, is the income inequality in developed and developing countries<sup>2</sup>.

Most research suggests that climate and environmental change-related impacts have a multiplier effect on other drivers that influence movement-related decisions. In some cases environmental change-related impacts may be the trigger for movement but not necessarily the cause. Should those who are forced to move because of environmental and climate-change impacts be treated any differently or more generously than those who move because they fear for their lives, safety or health because of a nuclear accident or persistent gang violence? Should responses privilege particular 'causes'? These are not easy questions to answer and they also prompt us to challenge traditional notions of a crisis as a finite event, especially in the context of slow-onset crises.

### **Main part**

European governments and their careless citizens are responsible for their own problems with immigrants. Within 14 years, Europe has supported the aggressive militarism of Washington, has killed and expelled from their homes, millions of people who do not represent any threat to Washington. The destruction of entire countries, such as Iraq, Libya, Afghanistan, and now Syria and Yemen, as well as the ongoing murder of Pakistani civilians, with full complicity of corrupt and traitorous government of Pakistan created a flow of refugees the problem that the European marazmatik brought upon themselves.

The second reason is the structural demographic growth in African countries and the Arab world. Despite the fact that the birth rate in the Arab world in recent years is reduced as compared with the XX century, it still remains at a high level. By 2030, the population of the Arab countries will grow by 36.5%, ie 120 million people when compared with 2010<sup>3</sup>.

The third reason svyazana with a high percentage of young people in the African countries and the countries of the Arab world, and in the past, young people are often quite educated. The Arab countries of North Africa and the Middle East provide good educational opportunities, can not be said about employment prospects in them. Therefore, young people are directed to where they can fulfill your potential and find jobs - in Europe<sup>4</sup>.

Undoubtedly, a key cause of the crisis of contemporary migration in Europe, structural steel consequences of the "Arab Spring", which set in motion the entire Arab world, as well as significantly increased the instability in North African countries and in the Middle Eastern countries. The Arab awakening has started in these regions turbulent process, which was accompanied by and / or caused a rebellion, coups, civil wars and contributed to a significant deterioration of the economic situation in a number of states - Egypt, Libya, Syria and Yemen. Moreover, in these countries during the events of the "Arab Spring" and after it more than once the question arose about the prospects of statehood, what power and in what way will lead the state. These circumstances have led to a sharp increase in migratory flows from North Africa and the Middle East, the nearest to him a stable and rich region - Europe.

One could even argue polemically that we can observe a readiness for a methodological (and politically intended) nationalism with regard to whether further "European integration" is a favorable process. The analysis within the European Left frames the problem as one between Germany and Greece, Germany and the United Kingdom, and so forth. In Germany this discourse has two complementary sides. A general sentiment is that "we have not been affected" by the crisis as much as others, but the political discourse of crisis persists in calls for its management.

Finally, the fifth structural reason, in our opinion, is not always far-sighted policy of the world powers, especially the US, in the Arab world, whose intervention in the internal situation in Afghanistan, Iraq, and Syria has put the state on the brink of survival. Speaking about the unconstructive role of the US and the EU, SA Filonik rightly points out: "... clearly emerges the destabilizing effect of the policy of the world industrial leaders. They direct efforts to stifle features a whole group of Arab countries to move to new forms of government naturally in the course of evolution, taking into account the national representation of the device power "[8, p. 68]. It is important to emphasize that the "destabilizing effect", which is described by the famous Russian orientalist, turned serious test for the European Union itself - incredible in scale influx of refugees.

With regard to the direct causes, there is a key factor was the emergence or continuation of armed conflict in Libya, Iraq, Afghanistan, Somalia, Eritrea, Yemen, sad primacy among which currently belongs to the civil war in the Syrian Arab Republic (UAR). It is not only the fact of the ongoing military action, but also that they are drawn more and more forces, complicating the configuration and making the most protracted conflict in virtually infinite<sup>5</sup>.

According to the Dublin Agreement of 1990, governing the EU common immigration policy, the responsibility for the consideration of asylum rests with the country whose first crossed the border worker when entering the EU territory.

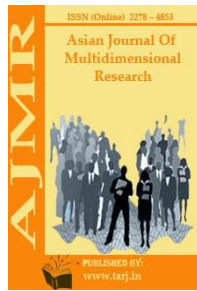
### **Finally**

The extent to which those who move in the context of humanitarian crises (or those who should move but are trapped) can access protection is affected by where the movement falls within the continuum of voluntary and forced movement. Political will and capacity, institutional mandates, operational decisions, and geopolitical vagaries also affect access to protection. Protection in the context of crises may need to comprise access to territory, obligations on the part of states not to return persons to serious harm, and physical safeguards as well as access to humanitarian assistance and durable solutions.

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## **VALIDATION OF SCALE FOR GROUP RELATED FACTORS AFFECTING ACHIEVEMENT MOTIVATION**

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### **ABSTRACT**

*This paper tries to test the scale for measuring the impact of group behavior on achievement motivation. Taking reference from different sources a scale was developed and tested. The sample consisted of 574 employees working in sectors like Information Technology, Hospitality and Telecom in the cities of western India. The data was collected by interviewing personally or through internet or by using a structured questionnaire between April-September, 2017. Based on the questionnaire and its variables an estimated model of group behavior was developed. It was found that the overall constructs for group behavior were reliable and valid. Additionally, all values were within the acceptable limits hence it can be concluded that the overall model is valid and the data fits into the model. The findings also had practical implications which showed that the employees wanted to influence the group and its members for desired results.*

**KEYWORDS:** *Achievement Motivation, Scale, Measurement, Groups, Control, India*

## INTRODUCTION

### **Achievement motivation**

It is a well known fact that one of the competitive edge for organizations is its human resources today. It is equally important that this resource is kept motivated most of the time. An appropriate environment is important in influencing the employees to contribute good performance. Rabideau (2005) defined the motivation as the driving force behind all the actions of an individual. There are different forms of motivation including extrinsic, intrinsic, physiological, and achievement motivation. Intrinsic motivation is related to psychological rewards such as the opportunity to use one's ability. A sense of challenge and achievement, receiving appreciation, positive recognition and being treated in a caring and considerate manner. Psychological rewards are those that can usually be determined by the actions and behaviour of the individual managers (Mullins, 2005).

One of the aspects of motivation is 'Achievement motivation'. Achievement motivation can best be understood by examining the meanings of "achievement" and "motivation" separately. Achievement typically stresses the importance of accomplishment and attainment with effort involved (Mandel and Marcus, 1988). Sharma (1998) pointed out that achievement motivation refers to the tendency to strive for success or the attainment of desired end. According to Atkinson and Feather (1966), "Achievement motivation is conceived as a talent disposition which is manifested in overt striving only when the individual perceives performance as instrumental to a sense of personal accomplishment."

### **Importance of achievement motivation**

McClelland, 1985; McClelland et al., 1989; McClelland & Koestner, 1992 argued that people who are high in achievement motivation are characterized by the three main attributes: moderate risk-taking preference; personal responsibility for decisions and performance; an interest in concrete knowledge of the results of decisions or need for performance feedback. High achievement also do well in small business (McClelland, 1985a). It would therefore important to look at the scale which measures achievement motivation.

### **Relationship between group behavior and achievement motivation**

Literature reveals that apart from personal and organizational factors, group factors significantly affect achievement motivation. These group related factors could be based on age, gender, qualifications, years of experience etc. To understand this, a list of factors namely 'need for interaction', 'influencing the group and its members' and 'control of group' were identified from the literature. To understand these factors the perception of respondents were collected using an established questionnaire on a five point Likert scale.

## RESEARCH METHODOLOGY

The sample consisted of 574 employees working in sectors like Information Technology, Hospitality and Telecom in the cities of western India namely Ahmedabad, Vadodara, Rajkot and Surat. The data was collected by interviewing them personally or through internet or both using a structured questionnaire between April-September, 2017. Further classification of the sample is given below:

**Industry wise bifurcation of the sample**

From the sample 36.4 percent of the respondents worked in Information technology, 29.6 percent in hospitality while 34 percent in Telecom industry.

**TABLE 1: INDUSTRY WISE BIFURCATION OF THE SAMPLE**

Industry	Frequency	Percent	Valid Percent	Cumulative Percent
Information Technology	209	36.4	36.4	36.4
Hospitality	170	29.6	29.6	66.0
Telecom	195	34.0	34.0	100.0
<b>Total</b>	574	100.0	100.0	

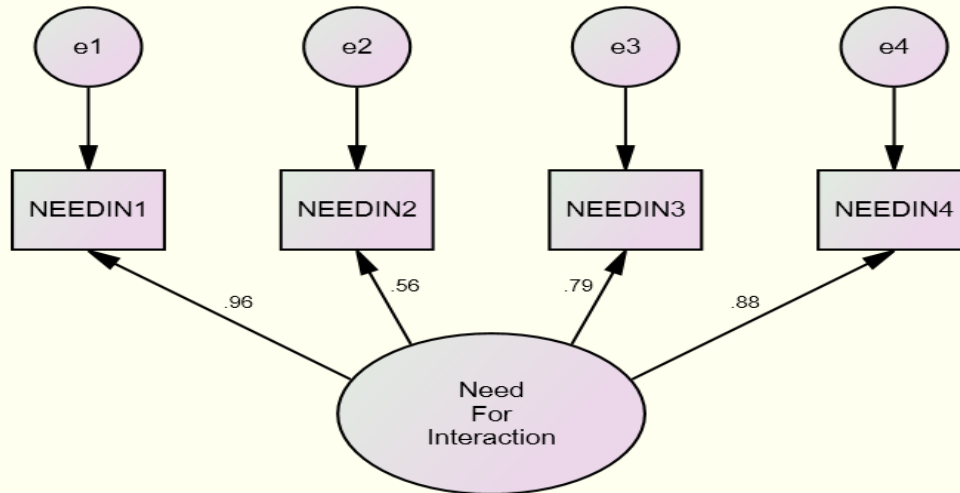
**Introduction to scales**

McClelland used the Thematic Apperception Test (TAT) and other imagination methods to measure achievement motivation. The Thematic Apperception Test is a projective test that was initially used to assess achievement motivation. Various measures like The Achievement Motives Scale (AMS), Leistungs motivations test, Multi-Motive-Grid (MMG), The Questionnaire on Current Motivation (QCM), Achievement Motivation Inventory (AMI), Achievement Motivation Profile (AMP), Mehrabian Achievement Risk Preference Scale (MARPS) have been used to assess levels of achievement motivation.

However, these scales also face criticism. Most of the paper-pencil measures used to assess achievement motivation have not sufficiently addressed theory that supports their instrument development (2015). Later he developed a new scale namely 'The Contextual Achievement Motivation Scale (CAMS). This paper tries to test the scale for measuring the impact of group behavior on achievement motivation. The variables needed to prepare the present scale was adopted from various studies by Weiner (1985), Byrne (2004), Woo (2007) etc. The inventory consisted of 11 inhomogeneous subscales which assessed the impact of 'need for interaction', 'influencing the group and its members' and 'control of group' on achievement motivation.

**Validating the scale of group behavior**

The construct 'group behaviour' is represented by need for interaction 'influencing the group and its members' and 'control of group'. The third construct 'control of group' had only two items therefore it was not possible to test the validity of the scale. The process of validating the construct is discussed below.

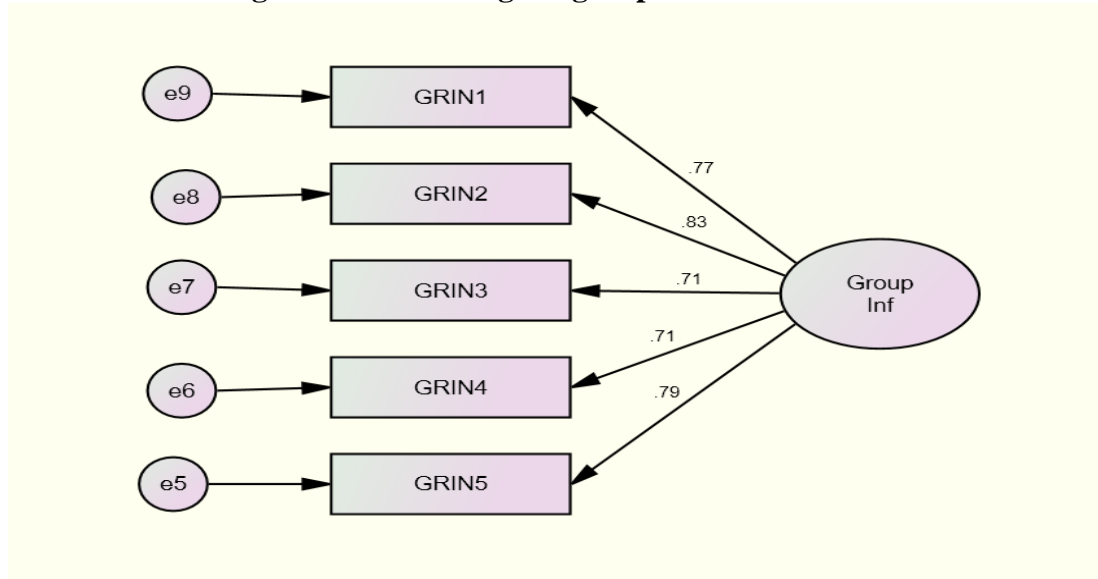
**Figure 1: Group behavior: Need for Interaction**

In this construct, the three items were submitted to a measurement model analysis to check validity and reliability. Majority of path estimates were found nearer to 0.70, hence model modification was not carried out and it was decided to retain all the items.

The convergent validity of the construct was tested using Variance Extracted (VE), path estimates and reliability test. The entire path estimates more than 0.5 shows sufficient convergent validity. All the path estimates for construct was more than 0.5. The VE for the construct was 0.65 (the value of VE nearer 0.5 or more can be accepted). Similarly the reliability of the construct was measured in the form of construct reliability (CR). The CR for this construct was 0.86 and was well above the acceptable range (acceptable range for CR is 0.7). Considering all the measures, the constructs shows significant convergent validity. The final set of measurement items for the construct, VE, CR and model fit indices is shown in table below. The final measurement model for the construct is shown in figure above.

**TABLE 2: GROUP BEHAVIOUR: MODEL FIT INDICES**

Item Description	Path Estimates	Variance Extracted	Construct Reliability	Fit Indices
Opportunity to meet people and interact with them (NEEDIN1)	0.96	0.65	0.86	CMIN/DF =4.27 GFI =0.92 CFI = 0.92 RMSEA = 0.07
I believe in building networking with people. (NEEDIN2)	0.56			
I like to build relationship with every person I meet. (NEEDIN3)	0.79			
I am satisfied after discussing my problem in group. (NEEDIN4)	0.88			

**Figure 2: Influencing the group and its members**

In this construct, the three items were submitted to a measurement model analysis to check validity and Reliability. Majority of path estimates were found nearer to 0.70, hence model modification was not carried out and it was decided to retain all the items.

The convergent validity of the construct is tested using Variance Extracted (VE), Path estimates and Reliability test. The entire path estimates more than 0.5 shows sufficient convergent validity. All the path estimates for construct is more than 0.5. The VE for the construct is 0.58 (the value of VE nearer 0.5 or more can be accepted). Similarly the reliability of the construct is measured in the form of construct reliability (CR). The CR for this construct is 0.84 and is well above the acceptable range (acceptable range for CR is 0.7). Considering all the measures, the construct shows significant convergent validity. The final set of measurement items for the construct, VE, CR and model fit indices is shown in table below. The final measurement model for the construct is shown in figure above.

**TABLE 3: INFLUENCING THE GROUP AND ITS MEMBERS: MODEL FIT INDICES**

Item Description	Path Estimates	Variance Extracted	Construct Reliability	Fit Indices
I try to make impression on others in a group. (GRIN1)	0.77	0.58	0.84	CMIN/DF =4.69 GFI =0.91 CFI = 0.91 RMSEA = 0.09
I easily get influenced by other's actions. (GRIN2)	0.83			
My goal in the job is to get a better result than most of the other workers. (GRIN3)	0.71			
It is important for me to do well compare to others in the job. (GRIN4)	0.71			
My colleagues, and fellow workers are pleasant and agreeable with me. (GRIN5)	0.79			

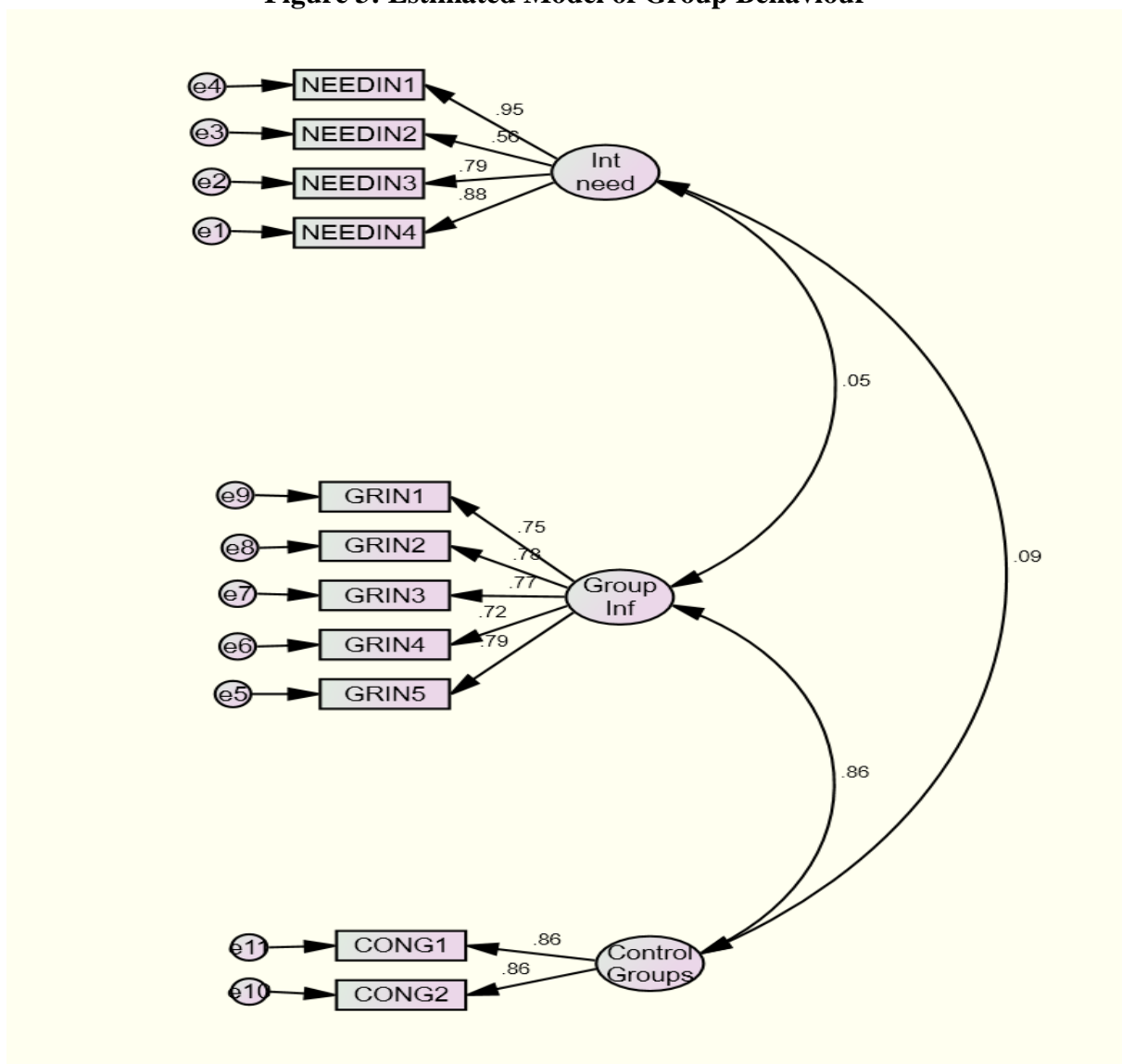
## Confirmatory Factor Analysis: Personal characteristics affecting achievement motivation of Group Behavior

### The Model under Study:

1. The model of the Performance Measurement Factors has 3 factors, as indicated by the ellipses.
2. There are 11 observed variables, as indicated by the 11 rectangles.
3. The observed variables load on the factors in the given pattern:
4. Each observed variable loads on one and only one factor.
5. Errors of measurement associated with each observed variable are also shown in the figure.

### Estimated Model: Group Behaviour

Figure 3: Estimated Model of Group Behaviour



### Standardized Regression Weights

The table below shows the standardized regression weight for each of the variables. It can be seen that all the standardized regression weights are nearer to 0.5 indicating high level of convergent validity. It can be concluded that all variables are contributing in explaining the fair amount of variance in factors. Hence scale of Individual behaviour is to be considered as valid.

**TABLE 4: STANDARDIZED REGRESSION WEIGHTS**

		Estimate
Opportunity to meet people and interact with them	Need for Interaction	.885
I believe in building networking with people.	Need for Interaction	.792
I like to build relationship with every person I meet.	Need for Interaction	.561
I am satisfied after discussing my problem in group.	Need for Interaction	.955
I try to make impression on others in a group.	Influencing the Group and its members	.786
I easily get influenced by other's actions.	Influencing the Group and its members	.720
My goal in the job is to get a better result than most of the other workers.	Influencing the Group and its members	.772
It is important for me to do well compare to others in the job.	Influencing the Group and its members	.779
My colleagues and fellow workers are pleasant and agreeable with me.	Influencing the Group and its members	.754
I want to control people while participating in group activity.	Control of Groups	.861
I want others to say what to do and what not to do	Control of Groups	.864

### Correlations between Factors

The table below shows the correlation between three extracted factors. All factors are assumed to have correlation. The correlation coefficients between all factors are found positive indicating high level of dependency among each other.

**TABLE 5: CORRELATIONS: (GROUP NUMBER 1 - DEFAULT MODEL)**

			Estimate
Need for Interaction	<-->	Influencing the Group and its members	.055
Need for Interaction	<-->	Control of Groups	.094
Influencing the Group and its members	<-->	Control of Groups	.857

The above table shows a strong positive correlation between ‘Influencing the Group and its members’ and ‘Control of Groups’. The questionnaire consisted of different statements related to above mentioned estimated parameters.

### Model Fit Summary

On the basis of all three types’ of-fit results, it can be concluded that the hypothesized model fits the sample data extremely well.

**TABLE 6: ABSOLUTE FIT MEASURES**

Absolute Fit Measures		
Test	Recommended Value	Model Under Study
$\chi^2$	$p > 0.05$	$p = 0.000$
CMIN/DF	$< 5$	4.86
RMSEA	$< 0.10$	0.09

**TABLE 7: RELATIVE FIT MEASURES**

Relative Fit Measures		
Test	Recommended Value	Model Under Study
CFI	$> 0.90$	0.92
NFI	$> 0.90$	0.92
RFI	$> 0.90$	0.91
IFI	$> 0.90$	0.91

**TABLE 8: PARSIMONIOUS FIT MEASURES**

Parsimonious Fit Measures		
Test	Recommended Value	Model Under Study
PCFI	$> 0.50$	0.52
PNFI	$> 0.50$	0.54

### CONCLUSION

Scales play an important to measure the factors in social science research. Due to the difficulty in frame new scales/questionnaires, replicability of results is becoming more prevalent among the researchers today. Therefore it important that the scale has to be validated before using it.

It was found that the overall constructs for group behavior were found reliable and valid. Based on absolute, relative and parsimonious fit measures it was found that all values are within the acceptable limits hence it can be concluded that the overall model is valid and the data fits into the model.

### Managerial implications

The findings have managerial implications. In practical world there the employees want to make impression or other in a group. Due to competition they also want to perform better than others. At the same time they want their colleagues to be pleasant and agreeable. Overall, they want to influence the group and its members. These factors force them to find want ways or have intention to control the group with which they are working. Practically it can be seen that there is



a relationship between statements like ‘I try to make impression on others in a group’ and ‘I want to control people while participating in group activity’. Similarly, the statement ‘My goal in the job is to get a better result than most of the other workers’ and ‘I want to control people while participating in group activity’ are also related. This proves the relationship between two constructs ‘Influencing the group and its members’ and ‘Control of group’.

➤ **TABLE 9 SCALE: GROUP BEHAVIOR**

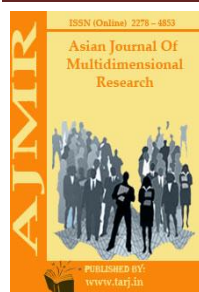
No.	Particular	1 (SD)	2 (DA)	3 (N)	4 (A)	5 (SA)
<b>A</b>	<b>Need for interaction</b>					
1	Opportunity to meet people and interact with them					
2	I believe in building networking with people.					
3	I like to build relationship with every person I meet.					
4	I am satisfied after discussing my problem in group.					
<b>B</b>	<b>Influencing the group and its members</b>					
5	I try to make impression on others in a group.					
6	I easily get influenced by other’s actions.					
7	My goal in the job is to get a better result than most of the other workers.					
8	It is important for me to do well compared to others in the job.					
9	My colleagues, and fellow workers are pleasant and agreeable with me.					
<b>C</b>	<b>Control of group</b>					
10	I want to control people while participating in group activity.					
11	I want others to say what to do and what not to do					

SD : Strongly disagree, DA : Disagree, N: Neutral, A: Agree, SA: Strongly agree

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## **REVIEW ON MICROPROPAGATION OF MUSA ACCUMINATA L**

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### **ABSTRACT**

*Banana is an important food crop and the second most important fruit crop. The planting materials obtained through conventional methods (suckers) do not meet the increasing demand for planting and they are of poor quality. Production of Banana is constrained by many biotic as well as abiotic factors. The production of disease free planting material of banana by meristem culture technique is an urgent need. Tissue culture is the approach which can solve these problems. Micro propagation of the crop is also faced with challenges which need to be addressed in order to improve its production. This review highlights the challenges encountered in tissue culture of banana and explores the in vitro propagation techniques by using shoot tip cultures of banana as the possibilities to overcome these problems. The relevant and recent reports have been included in this review.*

**KEYWORDS:** BAP, in vitro, Media Composition, Meristem, Micro propagation

## INTRODUCTION

Banana (*Musa accuminata L.*) belongs to the Musaceae family. Banana provides millions of people throughout the tropics and subtropics with staple food and accounts for one of the most widely exported fruits in the world. Presently, banana is grown in around 150 countries across the world on an area of 4.84 million ha, producing 95.6 million tonnes [1]. It accounts for approximately 22% of the fresh fruit production and as the second most important fruit crop; Africa accounts for 35% of the total world production [2]. It is one of the oldest fruits known to mankind and is the most delicious fruit used as subsidiary food. It is used in different ways such as for table purpose as well as culinary fruit; its leaves and stems are chopped and used as cattle feed. Some species of banana yield fibre, which is used for making ropes. The tip of inflorescence is cooked as a vegetable in some places [3]. The plant is also used for decoration purpose in wedding, festivals and fairs. It is also used as raw material in industries for preparation of banana powder, chips, juices and beer. The juice of banana stem is used in making paper bond, tissue paper etc. Propagation of banana through suckers is seriously limited due to low multiplication rate, clonal degradation and the perils of spreading disastrous diseases. Micropropagation is preferred over conventional method of propagation owing to its faster multiplication rate, uniformity in planting materials and production of disease-free materials. Although conventional method of vegetative propagation has commercial acceptability, to ensure an extremely rapid rate of multiplication, tissue culture technique has definite and indispensable advantage over the conventional method. This technique is independent of season due to controlled conditions and requires limited quantity of plant tissue as the explant source. The apical meristem or shoot-tip culture is very efficient for rapid clonal propagation. Moreover, *in vitro* propagated banana plants give higher bunch weight, more fingers and hands and less variability in fruit size and shape. Banana plants are usually propagated by vegetative means by using suckers which grow from lateral buds originating from corms, and suckers are used for production of individual plants. In some instances, complete or separated corms with one or several buds may be used. This process is very slow as the rate of multiplication of suckers through conventional vegetative means has been found to express several negative impacts which include transmission of diseases, low production and poor preservation of original plant genetic material [4]. For commercialization, it is necessary that consistent supplies of good quality bananas are produced to meet the increasing demand. The high rate of multiplication of genetically uniform, pest and disease free planting material can be achieved through tissue culture. Tissue culture approaches would also allow for off-season production of fast growing plants compared with conventionally propagated ones [5]. The *in vitro* propagation technique for producing banana using shoot tip cultures is a necessary approach in dealing with the problems encountered in tissue culture. These techniques will ensure sustainable production of banana planting materials.

### Planting Material

Bananas are asexually propagated using suckers or tissue cultured plantlets.

### Tissue-Cultured Plantlets

Tissue culture (Tc) is a technique that allows mass multiplication of planting materials. It is a form of biotechnology that refers to the production of plants from very small plant parts, tissues or cells grown aseptically under laboratory conditions where the environment and nutrition are rigidly controlled. The basis of the tc technology lies on the ability of many plant species to

regenerate a whole plant from a plant part [6]. Using tissue culture, it is possible to produce 1000 plantlets from one sucker in one year in comparison to ten suckers produced per banana in the same period. Advantages of tc technology Plants are free from pests and diseases Faster growth and early maturity (9-10 months after planting) Uniformity in production, and hence essential in marketing Higher crop yields as compared to conventional bananas

### Centre of Origin

Bananas originated from South East Asia, a region considered as the primary centre of diversification of the crop and where the earliest domestication has occurred<sup>28</sup>. This is an area bordered on the west by India and on the east by Samoa, Fiji and other South Pacific islands <sup>29</sup>. *Musa acuminata* is said to have originated from Malaysia, while the hardy *Musa balbisiana* originated from Indochina [7].

### Native Cultivars of India

The Indian subcontinent is thought to have been the major centre for hybridisation of *acuminata* types with the indigenous *M. balbisiana* and the region is noted for the wide variation of (AAB) and (ABB) cultivars. Cultivated bananas and plantains evolved from the intra and/or interspecific hybridisation of two wild species, *Musa accuminata Colla*. That originates.

India has been considered as one of the important centres of biodiversity for banana, having about eight species and 120 distinct clones. Banana is well adapted to diverse regions varying from humid tropics to humid sub tropics and semi-arid sub tropics upto an elevation of 2000 m above mean sea level. The wide range of adoption of banana is due to its appreciable genetic diversity and suitability to varied agro climatic conditions. The diverse agro climatic conditions have encouraged the development and sustenance of a large number of varieties catering to local needs.

The micropropagation in native cultivars is of limited success mainly because of the occurrence of hormone-mediated apical dominance of the mother plant. A plant produces only 5-20 suckers during its life time of 12-14 months. Even though there is a huge demand for local cultivars across the country supply of tissue culture plantlets is meagre. For accelerating the propagation rate, suckers with growing buds or cut rhizomes called 'bits' and 'peepers' are used. Several good bits, each with a centrally placed germinating eye can be cut from an unbunched rhizome after trimming the roots. Selection of appropriate mother plant for raising new propagules through in vitro methods is important.

### Micropropagation

The most important technique in micropropagation is meristem proliferation where in apical buds or nodal segments harbouring an axillary bud are cultured to regenerate multiple shoots without any intervening callus phase.

### Stages involved in micropropagation

In this present study a successful micropropagation protocol proceeds through a series of stages, each with a specific set of requirements. These are (i) initiation of aseptic cultures, (ii) shoot multiplication, (iii) rooting of microshoots, (iv) hardening and field transfer of plants raised from tissue culture [8].

### Initiation of aseptic cultures

Choice of explants: The choice of explants for initiation of culture is largely dictated by the method to be adopted for *in vitro* propagation. Explants with vegetative meristems are often suitable for enhanced axillary branching. The most commonly used explants is a nodal stem segment, wherein the axillary bud is made to proliferate to form multiple shoots. The performance of nodal segments is much better than the shoot tips [9].

### Sterilization

The middle part including axillary buds of *R.damascena* Mill L. from vegetative shoots were excised and collected. The explants were surface sterilized by dipping in 70% ethanol for 30s, then incubated in 10% Clorox (sodium hypochlorite 5.25%) with 3 drops of tween-20 for 10 min, followed by 5% Clorox for 5 min and subsequently rinsed three to four times with sterile distilled water. Axillary node (1 cm long) sections were excised and transferred to glass bottles with plastic closures (1 explant per flask).

The nodal explants were cultured on semisolid MS (Murashige and Shoog, 1962), [10] basal medium supplemented with different concentrations 6-benzylaminopurine (BAP) indole-3-acetic acid (IAA) or 1-naphthalene acetic acid (NAA) alone or in combination. Agar-agar was added to the medium as gelling agent after adjusting the pH to 5.7-5.8 using 0.1N NaOH or 0.1N HCL before autoclaving. 20 ml of the molten medium was dispersed into the culture tube (25×15mm) plugged with non-absorbent cotton wrapped in one layer of cheesecloth and autoclaved at 121<sup>0</sup>c or 1.06 kg/cm<sup>2</sup> for 15 min. The explants were inoculated aseptically. The cultures were maintained at 25±2<sup>0</sup>c less than 16 hrs photoperiod. Subsequently, the cultures were maintained by regular subculture at four week intervals on fresh medium with the same composition.

### Browning of the medium

Browning of the medium is the result of oxidation of polyphenols exuded from the cut surface of the explants which could be overcome by adding substances such as PVP (polyvinylpyrrolidone), citric acid or ascorbic acid or resorting to frequent sub culturing [11] or incubating cultures for a day or two in total darkness after inoculation as polyphenols oxidase activity was found to be induced by light [12]. [13] stated that 3 days of culture on the medium containing charcoal followed by transfer to a fresh medium was highly effective in enhancing the growth of primary explants

### Establishment Medium:

In establishment stage, all explants cultured on a MS medium containing salts, vitamins and sucrose and without any hormones. Explants were sub cultured to the fresh medium after 3 days because it was released phenol compounds. MS (Murashige and Skoog, 1962) [14] basal medium (without hormone) was used for the *in vitro* of induction of explants in culture; the pH of the medium was adjusted to 5.8 before adding 8gl<sup>-1</sup> plant agar. Media were autoclaved for 15 min at 121<sup>0</sup>c and 1.2kPa pressure. Cultures were placed under high pressure metal halide lamps on a 16/8 hour light/dark cycle in a culture room maintained at 21±1<sup>0</sup>c. Axillary shoots were detached and transferred to MS medium in which FeNaEDTA was replaced by FeEDDHA as iron source after 14 days.

### **Proliferation Medium**

The basal nutrient medium containing MS (Murashige and Skoog, 1962) [14] salts and vitamins was used with BAP. Two experiments were separately designed. In the first experiment, NAA at the concentrations of 0, 0.005, 0.01 mg l<sup>-1</sup> was combined with BAP at the concentrations of 0, 1, 2, 3 mg l<sup>-1</sup>. After that better hormones and compositions of them were selected, in the second experiment, the effects of BAP with 0, 1 and 2mg l<sup>-1</sup> were examined. Explants were sub cultured to the fresh medium every 4 weeks. Finally, excised single shoot from multiple shoots were transferred to the fresh medium for root induction.

### **Shoot proliferation**

The shoot proliferation media contained full strength MS salts and vitamins with various levels of BAP (0, 2, 4 and 8µM) in combination with NAA (0, 0.05, 0.25 and 0.5µM). Each treatment involved 5 repeats with 5 explants (25 explants). Number of axillary shoots and number of new leaves were recorded after 21 days for three subsequent subcultures and the averages were calculated [15].

This is the most crucial stage of micropropagation. The success of a micropropagation protocol, to a large extent, depends on the rate and mode of shoot multiplication. Various factors that influence *in vitro* shoot multiplication in rose are listed below.

### **Media**

Murashige and skoog's (1962) (MS) [14] medium was found to be the most commonly used for rose propagation. [16] Reported that the standard MS medium induced the best rates of shoot proliferation in different rose cultivars. However, the use of other media has also been reported. [16] Used Linsmair and Skoog's medium supplemented with BAP (0.5 mg/l) and IBA (0.1 mg/l) for shoot initiation. [15] Also used Linsmair and skoog's medium and obtained faster rates of proliferation with BAP (0.1-2.5 mg/l). Other media like Gamborg's and Lee and de Fossard's were used. Quorine Lepoivre (QL) and woody plant medium (WPM) were used for micropropagation of *R.hybrida* CV [17].

### **Rooting Medium:**

To establish root proliferation, green and normal adventitious shoots from shoot proliferation cultures were excised and cultured on MS medium containing full and ½ strength of MS salts. Two additional treatments (with or without IBA at the concentration 2 mg l<sup>-1</sup>) were tested in the both above mediums. Cultures were maintained at 22 °c in a culture room with a 16 hrs photoperiod light. For rooting, shoots were transferred to the MS medium supplemented 3mg/l active charcoal and of 0.25 mg/l BAP, 1 mg/l NAA, 0.5 mg/l NAA+0.25 BAP, 1 mg/l NAA+0.25 BAP and 1.5 mg/l NAA+0.25 MG/L BAP. Root length and percentage of roots induction were recorded after 40 days.

### **Rooting of microshoots**

For any micropropagation protocol, successful rooting of microshoots is a pre-requisite to facilitate their establishment in soil. Considerable work has been done to enhance rooting efficiency in different rose varieties. Rooting of microshoots can be accomplished both under *in vitro* and *ex vitro* conditions.

### Induction of rooting from microshoots

After successful multiplication, the microshoots were excised and transferred to different rooting media for induction of roots. The rate of rooting varied in different varieties and types of media. The result showed that the development of roots from microshoots was obtained on half-strength MS medium supplemented with IBA or NAA or IAA with 2% sucrose. It was also observed that among the three auxins tested, IBA favored a good response as compared to IAA or NAA. The *in vitro* rooting capacity depends on the interaction of internal and external factors [18].

### Shoot tip culture

The earliest reports of *in vitro* culture of bananas came from Taiwan in the 70's. Shoot tip (meristem plus a few attached leaf primordia) culture of *Musa* may be considered simple, easy, and applicable to a wide range of *Musa* genotypes. *In vitro* propagation has many advantages, such as higher propagation rates for multiplying clean (pest and pathogen free) planting materials, small space requirements regardless of season, and short time requirements. Till date, protocols have been standardized for *in vitro* propagation of a wide range of *Musa* species and cultivars belonging to various ploidy levels and genomes [19]. Shoot tips can be extracted from the pseudostem, suckers, peepers, lateral buds or even small eyes which contain a shoot meristem [20]. Though all of them behave similarly under *in vitro* conditions, peepers and sword suckers are highly preferred because of their ease of handling and the minimum damage caused to the parent stool during their removal.

### Initiation of shoot culture

Shoot cultures of banana start conventionally from any plant part that contains a shoot meristem, i.e. the parental pseudostem, small suckers, peepers and lateral buds. For rapid *in vitro* multiplication of banana, shoot tips from young suckers of 40–100 cm height are most commonly used as explants. From the selected sucker a cube of tissue of about 1–2 cm<sup>3</sup> containing the apical meristem is excised. This block of tissue is dipped in 70% ethanol for 10 seconds; Sodium hypochlorite at higher concentration (1.0 %) has turned out to be a better sterilant than mercuric chlorite alone at 0.1 % for 5 minutes treatment time. However, a treatment combination of Sodium hypochlorite (1.0%) for 15 minutes followed and HgCl<sub>2</sub> (0.1%) for 7 minutes resulted the highest percentage (85, 75 and 90 %) of aseptic culture establishment in banana cultivars Amritsagar-AAA, Malbhog-AAB and Chenichampa-AAB respectively in *in vitro* condition followed by Sodium hypochlorite (1.0%) for 10 minutes and HgCl<sub>2</sub> (0.1 %) for 7 minutes and Sodium hypochlorite (1.0%) for 15 minutes alone. Subsequently a shoot tip of about 3 × 5 mm, consisting of the apical dome covered with several leaf primordia and a thin layer of corm tissue is aseptically dissected. Larger explants have the merit of consisting of a shoot apex bearing more lateral buds which rapidly develop into shoots. The explant is further reduced to a size of 0.5–1 mm length, leaving a meristematic dome with one or two leaf primordia.

Success of *in vitro* culture depends largely on the choice of nutrient medium, including its chemical composition and physical form [21]. Several media formulations have been reported for banana shoot tip culture but nearly half of them are modified MS media. For banana micropropagation, MS based media are widely adopted. Generally, they are supplemented with sucrose as a carbon source at a concentration of 30–40 g/l. Banana tissue cultures often suffer from excessive blackening caused by oxidation of polyphenolic compounds released from wounded tissues. These undesirable exudates form a barrier round the tissue, preventing nutrient uptake and hindering growth. Therefore, during the first 4–6 weeks, fresh shoot-tips are



transferred to new medium every 1–2 weeks. Alternatively, freshly initiated cultures can be kept in complete darkness for one week. Browning or oxidation of phenolic compounds which is a common problem in the establishment of plantain *in vitro* culture may be reduced with the use of antioxidants, such as Potassium citrate-citrate (0.2 mg/L) combination for excised plantain tissue proved to be the best. The explants are dipped in antioxidant solution (cysteine 50mg/l) prior to their transfer to culture medium will substantially reduce blackening in the medium. Generally, the cultures are established on a separate initiation medium, which has a lower concentration of cytokinin than the multiplication medium to which the cultures are subsequently transferred [22]. In most banana micropropagation systems, semi-solid media are used. As a gelling agent agar (5–8 g/l) is frequently added to the culture medium but Gelwell which was stated equivalent to Phytigel has beneficial effect on shoot multiplication and growth in the micropropagation of banana [23]. The accelerated shoot growth in the gel medium may be due more availability of water in the media than in agar. The most prominent distinction among the gelling agents which influences the *in vitro* growth characters is the water retention capacity of the gels and the availability of nutrients to the cultured tissue.

### **BANANA ORCHARD ESTABLISHMENT**

A farmer should observe the following sequential stages in establishing an orchard

#### **a) Site selection**

The site should have shelter against winds, free from hail storms, should not be prone to water logging and salinity, and should be close to reliable water supply.

#### **b) Land preparation**

Deep plough the land (200–300mm) until a fine tilth is reached. Install soil conservation measures on sloping land. Bench terraces and contour channel banks covered with grass are ideal.

#### **c) Hole Preparation and Planting**

Dimension of the holes should be 60cm x 60cm x 60cm. Dig deeper holes measuring 90cm x 90cm x 90cm in dry areas. Deeper holes are also recommended for tc plantlets due to their tendency to “push-up”.

Separate the top soil (0–30cm) from the sub-soil. Mix top soil with 2–3 dekes of well decomposed manure and 200g of DAP and return half of the mixture into the hole. Carefully remove the tc plantlet from the plastic bag making sure the soil in the bag does not break-up. Place the tc plantlet into the hole, and put the rest of the soil mixture. The plantlet should be covered up to the level where the soil in the plastic bag had reached. Use the sub-soil to make a basin around the plant.

#### **d) Spacing Spacing depends with the banana height.**

For tall varieties, space the plants at 4.0m x 4.0m (625 plants/ha). Medium height varieties can be spaced at 3.0m x 3.0m (1110 plants/ha), and 3.0m x 2.0m (1667 plants/ha) for short varieties.

#### **e) Weed control**

Remove the weeds regularly, especially when the leaf canopy is not well established. Herbicides can be used but only when the plants are over 2 m tall.

**f) Fertilizing and manuring**

Apply 200g of Calcium Ammonium Nitrate (CAN) and 2 deces of manure every year

**EFFECTS OF MEDIA COMPOSITION ON GROWTH AND DEVELOPMENT OF BANANA SHOOTS**

The ingredients of plant tissue culture media can be categorized as inorganic salts, organic compounds, complex natural preparations and inert supportive materials [24]. The successes with plant cell and organ cultures have been depended on use of appropriate nutrient media. By providing the necessary chemicals in good combinations and forms, it has been possible to establish cultures from virtually every plant part. Inorganic macronutrient and micronutrient levels used in most plant tissue culture media are based on levels established in the plant tissue culture medium developed by “MS medium” . As such no single medium can be suggested as being entirely satisfactory for all types of plant tissues and organs. Murashige and Skoog , is the most widely used plant culture medium . Several media formulations have been reported for banana shoot tip culture with slight modifications of MS media. The MS medium of [14] is a salt composition that supplies the needed macro and micronutrients. In order to achieve growth and differentiation of cells or tissues, concentrations of inorganic nutrients must be optimized such that the medium meets the requirements of the cells or tissues used. The active factor in the medium is the ions of different types rather than the compounds. One type of ion can be contributed by more than one compound, example  $\text{NO}_3^-$  ions may be contributed by  $\text{NH}_4\text{NO}_3$  as well as  $\text{KNO}_3$ . However, the success in these efforts is limited. The source of explants from different parts of same plants may also have different requirements for satisfactory growth. Therefore a need for developing a media with suitable composition for a specific banana cultivar is important in ensuring successful *in vitro* growth and development of each cultivar.

**THE ROLE OF VITAMINS IN BANANA TISSUE CULTURE**

Although the basis of all nutrient media is a composition of essential nutrients, vitamins are required in trace amounts to serve the catalytic functions in enzyme systems [25]. Some plants can synthesize the essential vitamins for their growth. However when plants are grown *in vitro*, vitamins may act as limiting factors for cell growth and differentiation. Other studies have confirmed that the vitamins thiamine and nicotinic acid affected cellular division in the pea root meristem. These vitamins worked in combination, i.e. both the presence of thiamine and nicotinic acid promoted the root growth. The four vitamins; myo-inositol, thiamine, nicotinic acid, and pyridoxine are ingredients of Murashige and Skoog (1962) medium and have been used in varying proportions for the culture of tissues of many plant species. The requirements of cells for added vitamins vary according to the nature of the plant and the type of culture. This makes it impossible to conclude that all the vitamins which have been used in a particular experiment were essential or they will work for another experiment. Sometimes complex mixtures of as many as nine or ten vitamins have been employed. Therefore, there is a need to investigate the optimum amount of commonly used vitamins for each banana variety in tissue culture.

**THE USE OF ACTIVATED CHARCOAL IN REDUCING OXIDATIVE BROWNING IN BANANA TISSUE CULTURE**

Banana contains constituents of phenolic enzymes principally polyphenol oxidase enzymes. The polyphenol oxidase enzymes serve as a very important phyto auxine in banana and help to defend the plant against infection from fungi, viruses and bacteria when injured [26]. Browning

reactions and astringency of the fruit are caused by phenolic compounds, and are responsible for high mortality rate (lethal browning) in tissue culture [27]. This process is initiated by browning of the surface of plant tissues due to the oxidation of phenolic compounds resulting in the formation of quinines which are highly reactive and toxic to plant tissue. Apart from being an important group of secondary metabolites, phenolics may act as modulators of plant development by regulating indole acetic acid (IAA) catabolism [28]. They also play effective role in plant growth regulation, cell differentiation and organogenesis [29]. Their concentration is often affected by several internal and external factors example nutrients. Other factors include stress factors such as drought, water, radiation and pathogen infection from injured surfaces, which directly affects the concentrations of phenolics in plants. Activated charcoal is used in control of lethal browning and it was suggested that charcoal was responsible for adsorption and desorption which controlled the release of nutrients in the production of synthetic seeds. Activated charcoal has a very fine network of pores with large inner surface area on which many substances can be adsorbed. Activated charcoal (AC) is often used in tissue culture to improve cell growth and development. The main benefit is its adsorption of inhibitory substances in culture media. The phenolic oxidation or brown exudates accumulation can be significantly reduced by activated charcoal,. However, AC can also adsorb vitamins, BAP, thus changing the ratios of medium components and subsequently influencing plant regeneration [30]. This makes the researchers using AC unaware of the actual quantity available to the plant tissues. Obtaining target levels of adequate free exogenous hormone may be difficult. As an antioxidant, potassium citrate-citrate reduced browning within two hours before culturing the tissues. Ascorbic acid is also an antioxidant used to control oxidation of phenols. [31] Reported that addition of cysteine to the growth media reduced explants blackening in banana tissue culture. Understanding the processes contributing to the oxidation of phenols and how these can be minimized when initiating banana tissue culture is critical for successful *in vitro* culture, not only of banana but also of other crops.

Among the banana varieties susceptible to tissue browning, elimination or reduction of this process is necessary requirement for successful culture establishment. Development of suitable and efficient treatment to minimize tissue browning of these varieties by focusing on suitable antioxidant, the optimum concentration and method of application during explants preparation is of paramount importance.

### **THE ROLE OF GROWTH REGULATORS BAP (BENZYL AMINO PURINE) ON GROWTH AND DEVELOPMENT OF BANANA SHOOTS**

Growth regulators play a key role for developing a specific mode of growth in the cultured cells or tissues, which may be due to accumulation of specific biochemical contents in them. The single or combination of different hormones in the medium causes maintenance of specific and balanced inorganic and organic contents in the growing tissue. This leads the cells or tissues to develop either into shoots/or roots or even death [32]. In tissue culture, plant growth regulators are important media components in determining the development and developmental pathway of the plant cells. Growth regulators are used in different proportions to break dormancy and enhance shoot formation as the apical dormancy is under control of these growth regulators. The BAP are of importance in *in vitro* culture as the later are concerned with root formation, the former is mainly required in the media for shoot formation and growth of buds. These growth regulators are required in combination in the media as it is always the manipulation and variation of BAP levels that can successfully change the growth behavior of plant cultures. Such as benzyl

amino purine (BAP) are known to reduce the apical meristem dominance and induce both auxiliary and adventitious shoot formation from meristematic explants in banana. However, the application of higher BAP concentrations inhibits elongation of adventitious meristems and the conversion into complete plants [33]. BAP play an important role in buds formation *in vitro*. However buds proliferation *in vitro* is influenced by apical dominance which is controlled by various growth regulators. N6-benzylaminopurine (BAP) is the most commonly preferred cytokinin. The concentration of exogenous cytokinin appears to be the main factor affecting multiplication. Many studies have reported the use of BAP in tissue culture. The reported that moderate concentrations of cytokinins increased the shoot proliferation rate, but very high concentrations decreased multiplication and especially depressed shoot elongation [34]. Also they reported higher shoot proliferation and elongation with Thidiazuron (TDZ) than with BAP. However, BAP above 20  $\mu\text{M}$  and TDZ over 2  $\mu\text{M}$  decreased shoot elongation. In a study on effects of auxin/cytokinin combination on shoot proliferation on banana cultivars, [35], reported that incorporation of a strong auxin in the media suppressed the shoot proliferation rates of the banana cultivars. On media modified with low BAP ratios, for example 16.8/1.0 and 16.8/1.2 ZN/NAA combinations, the East African Highland banana (AAA-EA) cultivars showed single shoot development and callus induction due to apical dominance resulting from increased level of BAP concentration. In another study, [36], demonstrated that differences existed in the relative strengths of different cytokinin types in inducing shoots. This differential ability of different hormones in inducing shoots *in vitro* was attributed to factors such as stability, mobility and the rate of conjugation and oxidation of hormones. The concentration and combination of BAP in the nutrient mediums is an important factor which determines successful plant regeneration. Thus for efficient *in vitro* propagation of banana the establishment of optimum combination of BAP and their interaction in a tissue culture medium for a specific cultivar is necessary.

### THE EFFECT OF MULTIPLE BUDS DEVELOPMENT

The demand for banana planting material is a major constraint to the expansion of banana production. The long time required for conventional planting material to mature and the prevalence of pests and diseases contributes to these problems. In the application of bud splitting technique, the banana plantlets of a younger physiological age (single leaf) are longitudinally split to increase the number of explants during tissue culture. This is thought to promote buds proliferation by breaking the apical dominance [37]. It is established that lateral bud development in stems is under the control of the apical bud and that BAP application can sufficiently replace the stem apex in this function in as much as it has also been found that BAP stimulates  $\text{C}_2\text{H}_4$  production in stems. The development of auxiliary meristems is inhibited by apical dominance. These auxiliary meristems are commonly the source of buds formation in nature especially when the apical shoots are damaged or injured. Poor rationing of plantains results from the strong apical dominance exhibited by the main plant and the competition between suckers [38]. The apical dominance is controlled by growth substances released by the terminal bud, which inhibit growth of lateral buds. Apical dominance is also under the control of several plant growth regulators. Thus, sword suckers of plantains remain small until after flowering of the mother plant because their demand for assimilates (sinks) is too weak under the influence of apical dominance. Bud splitting is not a common practice in banana tissue culture. Some reports on the role of apical dominance in shoot production from explants of banana are conflicting. The multiplication rate was also found to depend on the origin of sucker bud, where

by lateral buds doubled in size within three weeks while the apical buds reached three times their size. In general, different cultivars shows variation in the degree of their shoot bud proliferation tendency and the type of multiple budding can be distinguished.

### **ESTABLISHING THE HARDENING NURSERY**

- Should be located in a banana growing area
- Accessibility
- Availability of water
- Area free from pests such as insects, fungi, nematodes, weevils
- Fenced to protect seedlings from external damage

### **Soil mixtures**

The soil should comprise of top /forest soil plus any of the following; gravel, rice husks, sawdust, wood shavings, wood bark, or sand at a ratio of 6 parts to 1 part [39]. Fertilizer application is not necessary at this stage.

### **Soil sterilization**

It is important to sterilize soil to kill harmful organisms such as soilborne fungal diseases, nematodes and weeds [40]. This can be done through either steam sterilization, soil solarization or chemical sterilization [41].

#### **a) Steam sterilization procedure**

This involves heating soil with a steam-air mixture. A simple steam sterilization kit is illustrated [42]. Two drums are required, an upright drum filled with moist soil mixture and a horizontal one half-filled with water which is then heated at 60-700 C. The steam produced sterilizes the soil and then emerges through the top lid after which a thirty minutes (30) sterilization period is observed/recommended.

Steam sterilization improves the soil physical structure, is harmless to beneficial organisms in the soil, cheap and more effective than chemicals. The main disadvantage is the use of firewood which may be costly and environmentally unfriendly [43].

#### **b) Soil Solarization**

This involves using solar energy to heat the soil. The soil is collected and spread in a shallow 'pit' then covered with a clear polythene sheet in an open area to allow sunlight to penetrate [44]. It takes 30-60 days depending on the weather.

#### **c) Chemical Sterilization**

This involves the use of chemicals. The commonly used chemicals are furadan (2kg per tonne of moist soil); mocap 10G (3kg per tonne) and Basamid (one tonne=2 pickup trucks =80 wheelbarrows). The soil is spread in a nursery-like bed and sprinkled with some water to moisten it. The chemical is mixed thoroughly with soil and mixture covered with polythene [45]. After one week, the soil is turned over and covered again. After the second week the soil is completely uncovered, turned and left open for any leftover fumes to diffuse out. The soil is ready for use after three weeks.

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## **TRANSPLANTING OF PLANTLETS FROM LABORATORY TO NURSERY**

- Tunnels and/or trays into which the plantlets will be transplanted are prepared by making a nursery bed containing sterile soil mixture.
- Rooted plantlets are removed from the growth chamber and removed from jars, variety per variety.
- The media is washed off gently without injuring the plantlet.
- The plantlets are taken to the hardening nursery shed as soon as possible preferably the same day and transplanted into seedling trays or tunnels in rows.
- They are then watered twice or once a day depending on weather conditions.
- One month later, they are transferred into 6 X 9 polythene bags containing sterilized soil and manure.

The seedlings are monitored regularly for somaclonal variants. Any plants showing unusual growth habits are removed and kept aside for further observation. Some varieties may show some purplish coloration on the leaves which is normal in the early stages of growth [46]. The seedlings are ready for field transplanting after two months when they are about one foot tall and have at least five leaves.

## **NURSERY HYGIENE AND ORGANIZATION**

Should be kept clean and free from weeds. Pests and diseases should be controlled immediately they are spotted. Seedlings should be arranged in neat rows with clear paths for walking and transportation [47]. Varieties should be separated and labeled accordingly, showing date of transplanting and number of seedlings for ease of marketing.

## **ADVANTAGES OF USING TISSUE CULTURE METHOD FOR MULTIPLICATION OF BANANA SEEDLINGS**

- The planting material produced is free from pest and disease
- It is a rapid method of multiplication, Uniformity in establishment and production is achieved
- Production of banana fruits is obtained after 9-10 months
- The yields are higher, Easy transportation and /or importation of new varieties is made possible
- Challenges of using tissue culture method for multiplication of banana seedlings
- The price of tc plants is higher compared to conventional suckers.
- The plants require added care and management.
- The occurrence of off-types (somaclonal variants) is possible. These mutations are usually inferior and can lead to dwarfing or other undesired morphological features.
- Viruses are not eliminated through tissue culture process.

## **REGENERATION OF PLANTS**

Individual shoot or shoot clumps are transferred to a nutrient medium which does not promote further shoot proliferation but stimulates root formation. To initiate rhizogenesis IAA, NAA (naphthalene acetic acid) or IBA (indole -3-butyric acid) are commonly included in the medium at between 0.1 and 2mg/l [48]. In rooting medium, MS medium fortified with indole butyric acid (IBA) 0.5 mg l<sup>-1</sup> + naphthalene acetic acid (NAA) 1.0 mg l<sup>-1</sup> + activated charcoal (AC) 250 mg l<sup>-1</sup> (Saraswathi et al.26). Activated charcoal at 250 mg l<sup>-1</sup> of rooting medium invariably increases rooting per cent, because besides acting as an antioxidant it also promotes the root growth and development in banana [49].

## **DE-SUCKERING, MULCHING AND LEAF REMOVAL**

Remove all suckers until the mother plant is 5-6 months old. Destroy the middle of the cut suckers to avoid re-sprouting [50]. After 5-6 months select follower suckers to ensure the banana stool has 3 plants as follows: One bearing or nearly bearing mother plant, one large daughter, and one small granddaughter sucker. Remove dry leaves hanging down the plant and any leaves rubbing the banana fingers to avoid bruising and improve fruit quality. Use the leaves as mulch for conserving moisture, to reduce weed growth and improve soil nutrient level. Spread the mulch evenly at least six inches away from the stems.

### **Bunch trimming**

Break off the male flower bud, once the bunch has fully emerged [51]. The bud will otherwise compete for food and is often a shelter for banana pests.

### **Watering**

Irrigate your plants immediately after planting [52]. Irrigate newlyplanted tissue culture banana plants every day for 2 weeks to protect leaves from heat stress. Water your orchard regularly especially during the dry spells. Water requirements vary with the area although banana does best with plenty of water.

### **Yield**

Banana annual yield depends on climatic conditions, plant management and the banana variety. Below table shows average results of trials conducted in six sites across Kenya. Good orchard management is crucial for high yields [53].

## **HARDENING**

During hardening, the plantlets undergo physiological adaptation to changing external factors like water, temperature, relative humidity and nutrient supply. Primary hardening should be done in a controlled environment of 24-26°C temperature and more than 80 % humidity. Planting media for primary hardening range from sieved sand augmented with nutrients to mixtures of cocopeat and Soilrite with fine sand in equal proportions [54]. Cocopeat + vermiculite (1:1) showed the optimum growth and development in cultivar Udhayam-ABB26 . The reason might be that cocopeat + vermiculite would have improved the water retention ability and aeration to the growing plant as well as altered anchorage and nutrient content of the medium thereby promoting the growth and development of nursery plants [55].

## CONCLUSION

Banana is a staple food and it accounts for one of the most widely exported fruits in the world. Demand for planting material of banana is very high throughout the tropics and sub tropics. Propagation of banana through tissue culture is reliable solution to the problems facing farmers. The success in producing banana planting material through tissue culture is limited by the technical difficulties associated with our public laboratories among other things. From this background efficient *in vitro* propagation techniques are necessary to overcome these challenges. Therefore, from the composition might be applied for large scale propagation of healthy and disease free banana.

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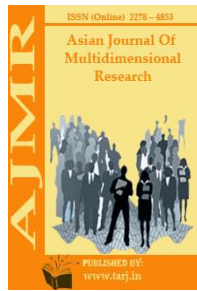
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**FOREST DEPENDENCY AND RURAL LIVELIHOOD—A STUDY IN  
PASCHIM MEDINIPUR DISTRICT, WEST BENGAL**

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**ABSTRACT:**

*Non Timber Forest Products (NTFPs) are a collection of biological resources derived from natural and managed forest. NTFPs play significant role in rural livelihoods for a significant crucial portion of poor tribal populations in many parts of India. The present paper investigates the dependence of rural households on NTFPs in the district of Paschim Medinipur in West Bengal. The paper also attempts to find the disparities in forest earnings between different income groups with particular emphasis on income from NTFPs. We have used primary data*

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*collected from 158 households from 7 Forest Protection Committees (FPCs) in Garhbeta I Block of Paschim Medinipur district in West Bengal in India. This paper reveals that households in forest-fringe areas are highly dependent on NTFPs for maintaining their livelihoods. The result shows that dependency of household on NTFPs varies between income groups. Also we find that dependency of households on NTFPs depend significant on the factors like value of land, households size, number of days going to forest, number of forest goers and income diversification of the households.*

**KEY WORDS:** *Diversification, Livelihood, Non Timber Forest Product (NTFPs), West Bengal*

**JEL CLASSIFICATION:** *Q23, L73*

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## **INTRODUCTION**

Forests deliver a great range of different goods and services. Next to timber, they provide an impressive variety of other natural goods, such as leaves, fuels, fruits, barks, fibres and other vegetable textures, which are essential to, amongst others, human diets, construction purposes, cultural-spiritual traditions and medical treatment, particularly to rural households in the developing world (Babulo et al., 2009; Belcher et al., 2005; Chauhan et al., 2008; FAO, 1992; FAO, 1995). Non Timber Forest Products (NTFPs) are a collection of biological resources derived from natural & managed forest and enriched forests with insects and animals or their parts (de Beer and mc Dermott, 1989; Peters, 1996; Ros-Tonen et al., 1995; Ros-Tonen et al., 1998). Such NTFPs play very important and crucial role in the forest based livelihoods of millions of poor, rural and tribal people across the World (Anonymous, 2009; Areki and Cunningham, 2010; Asfaw et al., 2013). NTFPs have attracted considerable global attention in recent years due to an increased recognition of their great contribution to household and regional economies (Marshall et al, 2003; Marshall et al, 2006), as well as food security, livelihood security and poverty palliation (Campbell and Luckert, 2002; Ravindranath and Sudha, 2004; Timko et al., 2010; Heubach et al., 2011; Johnson et al., 2013; Olaniyi et al., 2013; Saifullah et al., 2016). Therefore NTFPs fulfil various types of multiple functions in supporting human well being as well as increase the standard of living (Pandey et al., 2016).

In India, total forest cover in 2015 is 7,08,273 sq km which is 21.54% of the geographic area of the country. In terms of density classes, area covered by Very Dense Forest (VDF) is 98,153 sq km, that with Moderate Dense Forest (MDF) is 3, 08,318 sq km and Open Forest (OF) is 3,01,797 sq km corresponding to 2.99, 9.38 and 9.18 percent respectively of the total geographical area of the country (ISFR, 2017). There are about 15,000 plant species, out of which nearly 3,000 species yield NTFPs, they are massively used by forest dependent people representing a necessary part of their daily supply in forest adjacent areas. According to FAO, The total forest area of the world is more than 4 billion hectares and around 13 million hectares of forest are cleared every year due to development activities, agriculture purpose, forest filling and others activity. Therefore widespread relation changes between forest with NTFPs and forest fringe population are happening that support strengthening local rights over forest resources and more secure land residence. These have the potential to improve sustainable resource use and management.

National Forest Policy of 1988, the Government of India, issued an order on June 1, 1990 formalized a framework for creating a massive people's movement through the Joint Forest

Management (JFM) or Forest Protection Committee (FPC) for the protection, regeneration and development of degraded forest lands. This has its roots in participatory forestry at “Arabari Project” in the Midnapore district in West Bengal in 1972. West Bengal is a pioneer in the field of JFM in India, with about 54% of the total forest area being regulated under this regime (GoWB, 2014). Presently, there are 4,261 FPCs under 31 forest divisions, protecting about 527877.7 hectare (AARWB. 2017). JFM should also have positively contributed to the continuation of the provision of NTFPs. According to Das and Sarker (2008), JFM plays the dominant role in reducing measured income inequality for poor households who are relatively asset poor and live below poverty line.

## REVIEW OF LITERATURE

Studies in different countries worldwide revealed that household dependency on NTFPs vary considerably across countries or regions. In African studies, for example, the mean economic contribution of NTFPs to household economies across all studies was found to be 25% of total household income, which was close to that in Asia 24% and Latin America 25% (Stanley et al., 2012). Majority of rural households and a large proportion of urban households in underdeveloped countries as well as developing countries depend on the products to fulfil some part of their daily calories, health, house construction, energy or other needs (Anonymous, 2009). The NTFPs create significant economic value in regional economy and large-scale informal employment (Marshall et al, 2003).

Forest fringe tribal people continue to be documented as the poorest in the population in terms of income all over the world. One study evaluated that in USA, more than quarter of the forest fringe population lives below the poverty line (Kalt, 2007). The scenario is not several for other region of the World, such as India (Mahapatra et al. 2005; Krishnakumar et al. 2015), Ethiopia (Melaku et al. 2014), Australia (Altman 2007), Nepal (Adhikari et al. 2004), Zimbabwe (Cavendish 2000), Malaysia (Howell et al. 2010) and Myanmar (Liu and Moe 2016). As evaluate by the World Bank, about 1.6 billion people throughout the world heavily depend on forests and NTFPs for both sustenance and regular income, and some 350 million people depend solely on forests, both for their subsistence and incomes (World Bank, 2004; Wasiq and Ahmad, 2004). Another study evaluated that over two billion people, a third of the world’s population, use biomass fuels, mainly firewood, to cook and heat their homes and rely on traditional medicines harvested from forests, and some 60 developing countries, hunting and fishing on forested land supplies over a fifth of people’s protein requirements (Mery et al., 2005; Arnold et al., 2006). The another study also found that, in developing countries, forest-based activities provide about 30 million jobs in the informal sector, as well as up to one-third of all rural non-farm employment (CIFOR, 2016). Asia is undoubtedly the world’s greatest producer and consumer of NTFPs (Vantomme et al., 2002,) and about 27 million people in South East Asia rely on NTFPs (de Beer and mc Dermott, 1996). The importance of NTFPs in rural livelihoods in **developing countries** has become widely acknowledged.

## SIGNIFICANCE OF THE STUDY

NTFPs mostly make major contributions to rural forest based livelihoods; collectively they often represent a larger proportion of the rural economy. Also NTFPs provide big range of households with a significant income generation, either as supplementary income to other livelihood activities, or as the primary means of cash generation (GOI, 2000; Hegde and Enters, 2000; Kaimowitz, 2003; MOEF, 2006; Mahapatra et al. 2005). However, there are a

very limited number of studies on NTFPs dependency of rural households in the 'Jangal Mahal' areas of West Bengal after Forest Right Act (FRA) in 2006, which guaranteed the right of tribal and other forest dwellers to continue to cultivate forest land.

### **OBJECTIVE AND HYPOTHESIS**

The study is to investigate the economic contribution of NTFPs to the annual income of a rural household in the Paschim Medinipur district of West Bengal in India, and to find the factors determining on average share of NTFPs income.

In this study, we test the hypothesis that poorer households are comparatively more depend on income from NTFPs.

### **STUDY AREA**

Our survey area falls in the Garbeta-I Community Development (CD) Block of Paschim Medinipur district in West Bengal. It is located at 22°52'N 87°22'E. As on 2005-06, Garhbeta I CD Block had a forest cover of 7,460 hectares, against a total geographical area of 36,117 hectares. This region is that it falls in the 'Jungle Mahal' area which has seen many revolts by the forest fringe people for protecting their rights over forest. This drought prone region is of undulating character with lateritic and unproductive soil, and climate is wet and hot during summer and cool and dry during winter. The state of West Bengal played a pioneering role in introducing JFM in India, starting in the erstwhile Medinipur district with the first FPC recognized by Forest Department (FD) established in 1972 (MOEF, 2015). Today, the major part of the forest tract in this state is managed by FPCs under JFM. We have selected the households for our study in 7 FPCs in Rupnarayan forest division.

### **DATA COLLECTION**

A purposive sampling method was employed in order to select households for the present study. In the first, we have used purposive sampling procedure for the selection of one CD Block (Garbeta-I CD Block) and one forest division (Rupnarayan forest division) under this block in the district of Paschim Medinipur in West Bengal for our study. Then, we randomly selected two forest bits (Dhadika and Shyamnagar forest bit) under this forest division and random selected ten villages under than two forest bits. Lastly we have selected 158 households in my study area. We selected the study area with the discussion of the officials of the Departments of Irrigation, District Planning Office, Office of the Block Development Officer, Divisional forest Officer and other officials in the district of Paschim Medinipur in West Bengal. Primary data collection for the study was conducted through a structured household survey. We conducted a structured household survey containing closed and open questions. Data collection took place during the period of August- November 2018. Table-1 shows the regional stratification of the 158 households covered by the survey and some important statistical information are reported in Table 1.

**TABLE 1: PROFILE OF THE STUDY AREA**

Forest bit	Villages	Average distance between forest and house (Km.)	Sample household		Population of the sample household	
			(N)	(%)	(N)	(%)
Dhadika	Asnasuli	0.28	31	19.6%	167	22.7%
	Bhatmara	0.76	12	7.6%	49	6.7%
	Birsinghapur	0.34	17	10.8%	70	9.5%
	Chikurmara	0.45	8	5.1%	40	5.4%
	Kharikashuli	0.35	26	16.5%	136	18.5%
	Methordanga	0.79	11	7.0%	59	8.0%
	Tatuldanga	0.80	2	1.3%	7	1.0%
	<b>Total</b>	<b>0.44</b>	<b>107</b>	<b>67.7%</b>	<b>528</b>	<b>71.7%</b>
Shyamnagar	Aguiboni	0.98	22	13.9%	97	13.2%
	Bankoima	1.01	25	15.8%	95	12.9%
	Shyamnagar	1.10	4	2.5%	16	2.2%
	<b>Total</b>	<b>1.00</b>	<b>51</b>	<b>32.3%</b>	<b>208</b>	<b>28.3%</b>
<b>Grand Total</b>		<b>0.62</b>	<b>158</b>	<b>100.0%</b>	<b>736</b>	<b>100.0%</b>

Source: Primary data

## METHODOLOGY

We have defined total income of household as the sum of income generated from various activities and the monetary equivalent of a household's subsistence use of the output of these activities. First, we have taken a household's total annual income as the sum income arising from eight categories- agriculture, farm wage, non-farm wage, public works, services, petty business, livestock and NTFPs. We have used the income diversity index (DI) to judge the Income diversification of the households in study area. Income diversification of the households leads to increase in the strength of the households to cope with the unforeseen changes of the income sources. Income diversity index is given by the following formula (Jana et al., 2017):

$$\text{Index of diversity DI} = \frac{1}{\sum_{i=1}^N p_i^2}$$

Where,

P<sub>1</sub>= Proportion of income from agriculture

P<sub>2</sub>= Proportion of income from farm wage

P<sub>3</sub>= Proportion of income from non-farm wage

P<sub>4</sub>= Proportion of income from public works

P<sub>5</sub>= Proportion of income from services

P<sub>6</sub>= Proportion of income from petty business

P<sub>7</sub>= Proportion of income from livestock

P<sub>8</sub>= Proportion of income from NTFPs



Second we have used simply OLS regression analysis to judge the exact impact of the influencing variables on the NTFPs income. Forest dependence is measured in terms of NTFPs income as a proportion of total income. Here, the dependent variable appears as a proportion or fraction: the share of NTFPs income in total income.

The model is given by

$$y = \beta_0 + \beta_1 x_1 + \dots + \beta_k x_k = x\beta + u$$

Where  $y$  is the dependent variable (share of NTFPs income in total income) and  $x_1, x_2, \dots, x_k$  is the explanatory variable which are listed in Table 2. We have also given the expected sign of the relationship with dependent variable i.e. NTFP dependency for the different independent variables.

In order to test which socio-economic variables influence NTFP dependency, we run OLS regression. We selected these variables on the following assumptions:

- i) Caste of the household: this is dummy variable. We are expected cast of the household to have influence also on NTFPs dependency as Scheduled Tribe (ST) households as factors are traditional source of livelihood for them;
- ii) Household size: We are expected that large numbers of household member are more and more NTFPs extraction in the forest.
- iii) Cultivated land size: If the cultivated land size and crop production rising, NTFPs extraction is likely to decrease.
- iv) Students of the household: If the number of the student in a household is higher, it is expected that NTFPs collection would lower.
- v) Number of days going to forest: If forest going days higher of the household, it is expected that NTFPs collocation would higher.
- vi) Number of forest goers: If the number of forest goers in a household is higher, it is expected that NTFPs collection would increase.
- vii) Income earning people: If the number of income earning people in a household is higher, it is expected that NTFPs collocation would lower.
- viii) Dependency ratio: If the number of dependent people in a household is higher, it is expected that NTFPs collocation would lower.
- ix) Diversification index: Higher is the value of diversification index means the grater possibility of earning from different sources. We are hypothesizing a negative relationship between the index of diversification and NTFPs dependency.
- x) Annual household energy expenditure: As the energy expenditure in a household purchase raise, it is indicates that household less dependency on forest.
- xi) Employment in the organized sector: If any member of the household is employed in organized sector, dependencies on forest like to be less.
- xii) Livestock in the household: n number of livestock is expected to be positively related to NTFP dependency.

**TABLE 2: DESCRIPTION OF VARIABLES**

Variables	Code	Unit	Expected sign
Caste of the household	ST	Dummy, Yes=1 if the caste is Schedule Tribe, 0 otherwise	+
Total person of the household	HHsize	Number	+
Total cultivated land of the household	Land	Decimals	—
Total number of students in the household	Student	Number	—
Total number of days going to forest in a household members	Forestday	Days	+
Number of forest goers in the household	Goers	Number	+
Number of income earning people in a household	INearner	Number	—
Dependency ratio	DR	Value	—
Diversification index	DI	Value	—
The annual expenditure of the household on energy	Energy	Rs.	—
Whether the household has any member who is employed	Service	Dummy, Yes=1, No=0	—
Livestock in the household	Livestock	Dummy, Yes=1, No=0	—

Source: Own estimation

## RESULTS AND DISCUSSIONS

### HOUSEHOLD CHARACTERISTICS

Table 3 exhibit some socio economy characteristics of the survey households in study area. The average household size is 4.7. Households live at different distances from villages with average distance from forest 0.62 km. The average value of non-agricultural assets per household is calculated as Rs. 15,756 and the average value of agricultural assets per households is Rs.1,449. Most of the households (75.3%) live in *kacha* houses. Average cultivated land 0.68 acre and 0.57 acre are irrigated land.

**TABLE 3: HOUSEHOLD CHARACTERISTICS**

	Frequency	Percentage	Average
Nuclear families (Nos)	108	68.4	
Average household size			4.7
BPL households (Nos)	129	82	
Literacy rate		69	
Education of the HHs (Yr.)			4.5
Kutcha house (Nos)	119	75.3	
Cultivation land (Acre)			0.68
Irrigated land (Acre)			0.57
Land of the HHs (Acre)			0.81
Value of non-agriculture assets (Rs.)			15,756
Value of agriculture assets (Rs.)			1,449
Distance between forest and house (Km.)			0.62

Source: Own estimation

### CLASSIFICATION OF NTFPs

The main items of NTFP include fuel (like firewood, dry leaves), food (like fruits, mushroom, potatoes, honey), medicinal, and ornamental forest products (flowers, leaves etc.) (Jana et al., 2017). Our purpose in this study is to illustrate the diversity of the non-timber products and to introduce their most important raw material sources and uses. The raw materials are plant products and animal products resources, some of which are themselves 'products', since they are used directly, while others must be processed to make useful products. Through the survey, we identified 15 different major domestically consumed and commercial purpose NTFPs use in the study area. We classified them into two use categories: edible product and non edible product. Table 4 gives general details on the collection times for the major domestically consumed and commercial purpose NTFPs use in the study area. *Sal* leaves and honey are the only items that are collected throughout the year but *Sal* leaves mainly collected for eight months of the year. Most of the tree-based fruits are available in the early part of the year (January to June) such as Bel Fruit, Kendu Fruit, Neem Fruit, etc. Mushrooms are available in the food- deficit monsoon period between June and September. Tree-based oilseeds are more staggered in their availability, with *sal* and mahua seeds being collected mainly in March to June.

**TABLE 4: LIST OF SOME IMPORTANT NTFPS IN THE STUDY AREA**

Name	Local Name	Collect ed HHs	Uses	Season
<i>Sal</i> leaf	<i>Sal</i> leaf	148	Handicraft, Plate	April to June, Sept to Jan
Mushroom	Mushroom	124	Food	June to Sept
Firewood	Firewood	72	Fuel	Oct to May
Mahula Flower	Mahula Flower	19	Food, Medicinal	March, April
Diospyros Melanoxylon Leaf	Kendu (leaf)	10	Wrapping Bidi	March, April
Indian Beech	Karanja	6	Medicinal	Dec
<i>Sal</i> seed	<i>Sal</i> seed	5	Food	April to June
Wood Apple	Bel Fruit	4	Food	Feb, March
Underground Wild Potato	Khamalu	3	Food	Nov to Jan
Air Potato	Bon Alu	2	Food	March to May
Wild Colacasia Idica	Bon Kundari	2	Food	April to June
Wild Trichosanthes Dioca	Vondrru	2	Food	April to June
Diospyros Melanoxylon Fruit	Kendu (fruit)	2	Food	March, April
Neem Fruit	Neem Fruit	2	Food	Feb to April
Honey	Honey	3	Food, Medicinal	12 months

Source: Primary data

### CONTRIBUTION OF NON-TIMBER FOREST PRODUCT IN HOUSEHOLD'S INCOME AND INCOME DIVERSIFICATION

We divided the income earning source of the rural households into eight categories. There are agriculture, farm wage, non-farm wage, public works, services, petty business, livestock and

non-timber forest product. As exhibit in Table 5, the average annual income (Rs.) per household for the whole illustrative sample from non-timber forest production is Rs. 27,406 and its share is 28.6%, which is the second largest out of eight categories. The top-tier being agriculture with average annual income entity Rs. 43,568 and it is share is 45.5%. Of the remaining six categories, the average annual income of the household from farm wage, non-farm wage, public works, services, petty business and livestock are respectively Rs. 3,661 (3.8%), Rs.9,114 (9.5%), Rs. 3,101 (3.2%), Rs. 6,753 (7.1%), Rs. 1,710 (1.8%) and Rs.350 (0.4%).

**TABLE 5: ANNUAL INCOME OF THE HOUSEHOLD'S**

Sl.No.	Income source	Average annual income (Rs.) of household	Income shares
1	Agriculture	43,568	45.5%
2	Farm Wage	3,661	3.8%
3	Non Farm Wage	9,114	9.5%
4	Public Works	3,101	3.2%
5	Services	6,753	7.1%
6	Petty Business	1,710	1.8%
7	Livestock	350	0.4%
8	NTPP	27,406	28.6%

Source: Primary data

In order to compare income groups regarding their non-timber forest product dependency, according National Council for Applied Economic Research (NCAER), we are dividing the all illustrative sample into five income quartile of the households. We are exhibit categories of income quartile of the households in Table 6. National Council for Applied Economic Research (NCAER) concluded a study; titled India Human Development Survey (IHDS) based on data for the year 2011-12 and has come up with some broad classifications. The Study divides the Indian population into five classes of equal sizes of 20% each, on the basis of the annual income of the households in each classification: 1) The low income group quintile with an annual household income between Rs.1,000 to Rs. 33,000. 2) The next middle income group quintile comprises of households with an annual income of Rs.33,001 to Rs. 55,000. 3) The upper middle income group quintile with households with an annual income of Rs.55,001 to Rs.88,800. 4) The rich income group quintile will cover households with an annual income of Rs.88,801 to Rs.1,50,000 and, 5) The top most quintile comprising of households with annual incomes above Rs.1.5 Lakhs.

**TABLE 6: CATEGORIES OF INCOME QUARTILE OF THE HOUSEHOLD**

Sl.No.	Income group	Income rang	Households	
			Number	Percentage
1	Low income group	Less than Rs.33,000	18	11.4%
2	Middle income group	Rs. 33,001 to Rs. 55,000	29	18.4%
3	Upper middle income group	Rs. 55,001 to Rs. 88,800	49	31.0%
4	Rich income group	Rs. 88,801 to 1,50,000	38	24.1%
5	Supper rich income group	Above Rs. 1,50,000	24	15.2%

Source: NCAER, concluded by IHDS, <https://www.quora.com/How-are-the-different-family-classes-starting-from-low-middle-upper-middle-rich-and-supper-rich-classified-in-India-based-on-the-income-as-of-2014>

We have exhibit source wise average annual income for the quartiles in Table 7. As we see in the Table 7 the income of agriculture for upper two (rich and supper rich) quartiles is Rs. 49,650.4 and Rs.1,37,498.3. This two upper quartiles agriculture is the dominating source of income which is higher than others income sources. The income of the non-timber forest product for lower two (low income group and middle income group) quartiles is Rs.14,828.9 and Rs.19,924.8. These two lower quartiles, non-timber forest product income is the dominating source of income which is higher than others income sources.

**TABLE 7: AVERAGE ANNUAL INCOME (RS.) OF THE HOUSEHOLDS FOR QUARTILES**

Income source	Income group				
	Low	Middle	Upper middle	Rich	Supper rich
Agriculture	5,166.5	10,990.2	26,232.1	49,650.4	1,37,498.3
Farm Wage	2,500.0	4,424.1	5,174.5	3,286.6	1,111.3
Non Farm Wage	750.0	6,051.7	8,173.5	15,986.8	10,125.0
Public Works	2,192.1	2,371.7	2,604.2	4,059.8	4,163.0
Service	0.0	0.0	0.0	0.0	44,458.3
Petty Business	1,333.3	0.0	1,102.0	4,742.1	500.0
Livestock	55.6	37.9	408.2	178.9	1,100.0
NTFP	14,828.3	19,924.1	26,292.9	31,437.1	41,768.1
Total	26,825.9	43,799.8	69,987.3	1,09,341.8	2,40,724.0

Source: Primary data

We have exhibit source wise household's income for the quartiles in Table 8. As we see in the Table 8, the share of non-timber forest product in total income for first quartile (the poorest group or low income group) is 55.3% which is higher than others four groups i.e. medium income group (45.5%), upper medium income group (37.6%), rich income group (28.8%) and Supper rich income group (17.4%). The Rich income group and supper rich income group derives higher share of income (45.4% and 57.1%) from agriculture compared to the low income group and middle income group (19.3% and 25.1%). The low income quartile and middle quartile derives higher share of income (55.3% and 45.5%) from non-timber forest product compared to the rich income quartile and supper rich income quartile (28.8% and 17.4%). Therefore, conclude that the low income group and medium income group more depend on non-timber forest product compared to rich income group and supper rich income group. Some important others income source of share of households income are reported in Table 8 and compression between share of agriculture income and share of non-timber forest product income exhibit in Fig 1.

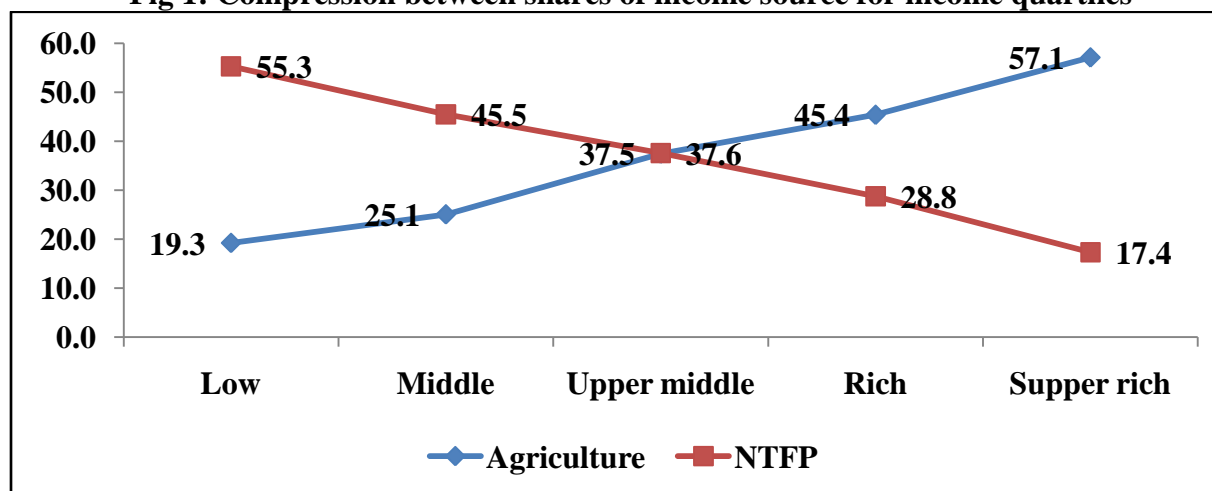
**TABLE 8: INCOME SHARE (%) OF THE HOUSEHOLDS FOR QUARTILES**

Income source	Income group				
	Low	Middle	Upper middle	Rich	Supper rich
Agriculture	19.3	25.1	37.5	45.4	57.1
Farm Wage	9.3	10.1	7.4	3.0	0.5
Non Farm Wage	2.8	13.8	11.7	14.6	4.2
Public Works	8.2	5.4	3.7	3.7	1.7
Service	0.0	0.0	0.0	0.0	18.5

Petty Business	5.0	0.0	1.6	4.3	0.2
Livestock	0.2	0.1	0.6	0.2	0.5
NTFP	55.3	45.5	37.6	28.8	17.4
Total	100.0	100.0	100.0	100.0	100.0

Source: Primary data

**Fig 1: Compression between shares of income source for income quartiles**



Source: Primary data

#### DETERMINANTS OF FOREST DEPENDENCY (REGRESSION RESULTS)

To find the determinants of forest dependency of our 158 sample households we have used regression analysis. The regression results are reported in Table 9. The 'Adjusted R<sup>2</sup>' value of 0.484 implies that about 48.4% of variation in the NTFP dependency is explained by the regression model. The significant 'F' value indicates that a significant relationship exists between the independent variables as specified by the model and the dependent variable. The estimated results of Table 5.6 show that the results match with our hypothesis. As revealed from Table 5.6, the significant factors to reduce NTFP dependency of households are i) Total cultivated land of the household, ii) Total number of students in the household, iii) Number of income earning people in a household, iv) Dependency ratio, v) Diversification index, vi) The annual expenditure of the household on energy, vii) having government employ member and viii) Livestock in the household. The significant factors affecting higher NTFP dependency of the households are i) Caste of the household, ii) Total person of the household, iii) Total number of days going to forest in a household members

**TABLE 9: ESTIMATED REGRESSION RESULTS**

Variable	Coefficients	Sig. (p value)	Level
Intercept	63.29	0.000	***
ST	5.98	0.032	**
HHsize	6.81	0.005	***
Land	-0.33	0.000	***
Student	-4.02	0.008	***
Forestday	0.02	0.001	***

Goers	2.33	0.270	
INearner	-9.21	0.016	**
DR	-0.27	0.079	*
DI	-74275.34	0.000	***
Energy	-0.003	0.017	**
Service	-29.45	0.000	***
Livestock	-5.17	0.082	*
Adj. R <sup>2</sup>	0.49		
F value	13.29		
P-value	0.000		
<b>Dependent Variable – NTFPV (Share of NTFP value in total income)</b>			

Source: Own estimation

Note: \*\*\*= 1% level of significant, \*\*= 5% level of significant, \*= 10% level of significant.

## CONCLUSION

Our study finds that rural, poor and tribal households living in forest fringe area have a high level of involvement in NTFPs having nutritious and economic relevance. These have contributed to cash income of forest fringe community. This study reveals that, average contribution NTFPs in total household's income is 28.6 % for maintaining their livelihood. Our study exhibit that, the importance of NTFPs differs between households regard to their annual household income. The lower income group is relatively more dependent on NTFPs to meet the basic needs. The significant factors affecting the dependency of households on NTFPs are cultivated land size, diversification index (DI), the number of days gone to the forest and the number of forest goers.

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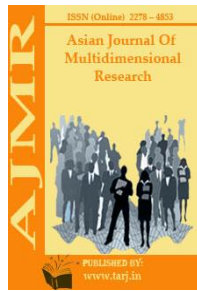
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**GROWTH AND PERFORMANCE OF REGIONAL RURAL BANKS –  
WITH SPECIAL REFERENCE TO BARODA RAJASTHAN KESHTRIYA  
GRAMIN BANK**

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**ABSTRACT**

*Rural banking system occupies an important position in the structure of Indian banking system. Being an agrarian economy with more than 50% of the population depending on agriculture for their livelihood, rural banking has acquired increasing relevance in the recent times. Regional Rural Banks play a very important role for the growth of Indian economy. The RRBs ignore the richer sections of the village society in providing direct financial assistance. At present time most of the RRBs in India are suffering from various problems of overdue, recovery and deposits mobilization. The main objective of this study is to analyze key financial indicators of Baroda Rajasthan Keshtriya Gramin Bank. And the study period is taken from 2013 to 2018. The study is based on Secondary data. And the data was collected from annual reports of NABARD and BRKGB. This study finds and concludes that the growth of the branch is also increasing the business of the bank and its performance is also improved by increasing business.*

**KEYWORDS:** NABARD, Growth, Performance and BRKGB.

## 1. INTRODUCTION

Activities of modern economy are significantly induced by the functions and services of banks. Banking sector forms the core part of economic system. Indian economy is an agricultural economy and real India lies in villages. Village economy is the backbone of Indian economy. Even after many years of independence in terms of infrastructure and other chronic problems of cultivators rural economy in India is still handicapped. In fact, economic progress and industrial development are firm by the rural sector. More than 70% of Indians are dependent on agriculture; 60% of industries are agro based; 50% of national income is contributed by rural sector, and the agricultural sector is the largest foreign exchange recipient to India. The objectives of economic planning cannot be achieved without the development of rural economy. Hence, banks and other financial institutions are measured to play a vital role for the development of the rural economy in India. The Commercial Banks had slight interest in rural areas, as these banks focused on deposits rather than credits. Thus they provide for the flight of funds from the rural to the urban. So, there was a strong need for the establishment of Regional Rural Banks (RRB).

Ordinance Passed in September 1975 and the RRB Act 1976 to provide adequate banking and credit facility to agriculture and other rural sectors. On recommendations of the M. Narasimam Working Group Regional Rural Banks were set up during the tenure of Indira Gandhi's government with a view to include rural areas into economic mainstream since that time about 70% of the Indian population was of Rural direction. The Central Government, the State Government and the Sponsor Bank (There were five commercial banks, State Bank of India, Syndicate Bank, United Bank of India Punjab National Bank and UCO BANK basically owned the Regional Rural Banks. Which sponsored the regional rural banks) with the ratio of Central Government- 50%, State Government- 15% and Sponsor Banks- 35%. The number of RRBs registered continuous declining trend from 196 (2005) to 57 (2014) indicating their negative growth. This phenomenon can be attributed to the policy measures initiated by the Government of India towards amalgamation of RRBs in sponsored banks at state level in order to give operational freedom and to improve their financial performance. By March 2010, RRBs of the same sponsor banks with in a State were amalgamated bringing down their number from 196 to 82. In the second and ongoing phase, starting from October 2012, geographically contiguous RRBs within a State under different sponsor banks are being amalgamated to have just one RRB in medium-sized and two/three RRBs in large states. Throughout the year 2013- 14, 13 RRBs have been amalgamated into 6 new RRBs in 5 States (Chhattisgarh, Uttar Pradesh, Kerala, Karnataka and Haryana). With this, the effective number of RRBs as on 31st March 2016 stands at 56 playing a significant role in developing agriculture and rural economy.

## RURAL DEVELOPMENT

Rural development is the process for refining the quality of life and economic well being of people living in comparatively isolated and sparsely populated areas. Rural development has usually centered on the exploitation of land-intensive natural resources such as agriculture and forestry. However, changes in global production networks and increased urbanization have changed the atmosphere of rural areas. Progressively tourism, niche manufacturers, and recreation have changed resource removal and agriculture as dominant economic drivers. The need for rural people to approach development from a wider viewpoint has twisted more focus on a comprehensive range of development goals rather than merely creating inducement for agricultural or resource based businesses. Education, entrepreneurship, physical infrastructure,

and social infrastructure all play a significant role to developing rural regions. Rural development is also considered by its emphasis on locally produced economic development strategies. In contrast to urban regions, which have many similarities, rural areas are highly typical from one another. For this reason there are a large variety of rural development methods used globally.

### **RRBs in Rajasthan**

Until 2010 six Rural Banks were working to facilitate rural population & to provide them financial help in Rajasthan namely; Baroda Rajasthan Gramin Bank , Hadoti Kshetriya Gramin Bank, Jaipur Thar Gramin Bank, Mewar Anchalik Gramin Bank, MGB Gramin Bank, Rajasthan Gramin Bank. As a result of the merger and amalgamation process of Regional Rural Banks in India under the policy of "One RRB in One State", in 2014 there were only 3 RRB (Regional Rural Banks) in Rajasthan. Baroda Rajasthan Gramin Bank, Kota Hadauti Kshetriya Gramin Bank and Rajasthan Gramin Bank merged and a new Gramin bank was formed named "Baroda Rajasthan Kshetriya Gramin Bank" with its head office in Ajmer. Bank Of Baroda sponsors it. MGB Gramin Bank and Jaipur Thar Gramin Bank was merged and "Marudhara Gramin Bank" was formed with head office of in Jodhpur. The bank is sponsored by SBBJ. The third bank named Mewar Anchalik Gramin Bank was not merged in 2014. It was sponsored by ICICI Bank. Finally in 2015, Mewar Aanchalik Gramin Bank (MAGB) and Marudhara Gramin Bank (MGB) were merged as "Rajasthan Marudhara Gramin Bank" (RMGB). After Amalgamation total branches of newly formed Rajasthan Marudhara Gramin bank (RMGB) are approximately 550, which are sponsored by SBBJ. The performance of RRBs in Rajasthan has improved in the post-merger period. Even though number of RRBs reduced, the branch network has been increased. During post-merger period, there has been increased number of districts covered by Regional Rural Banks. Total capital funds have been increased tremendously. Credit-deposit ratio has been increased over the years showing that a remarkable deployment of credit provided by these banks in rural areas. However, it is the responsibility of the bank management and the sponsored banks to take the change for corrective steps to raise the credit-deposit ratio of the bank. The gap between CD ratio of commercial banks and the RRBs need to be minimized. With a view to facilitate the seamless integration of RRBs with the main payment system, there is a need to provide computerization support to them. RRBs should extend their services in to un-banked areas and increase their credit-deposit ratio. ". At present the State of Rajasthan is being served by 2 RRBs with a network of 1422 branches spread over 36 districts of the State. These two banks are as follows:

1. Baroda Rajasthan Kshetriya Gramin Bank
2. Rajasthan Marudhara Gramin Bank

### **Baroda Rajasthan Keshtriya Gramin Bank**

Baroda Rajasthan Keshtriya Gramin Bank (Sponsored by Bank of Baroda) was established by Central Government in exercise of the powers conferred by sub section (1) of section 23A of the Regional Rural Bank Act, 1976 (21 of 1976) by allotting Gazette Notification No. F No. 7/9/2011- RRB dated 01-01-13, by amalgamating 3 Regional Rural Banks viz. Baroda Rajasthan Gramin Bank, Hadoti Kshetriya Gramin Bank and Rajasthan Gramin Bank, Sponsored by Bank of Baroda, Central Bank of India and Punjab National Bank respectively.

The Head Office of the Bank is at Ajmer and its 12 Regional Offices are at Alwar, Banswara, Baran, Bharatpur, Bhilwara, Chittorgarh, Churu, Jhunjhunu, Kota, Neem ka Thana, Sawaimadhopur and Sikar.

The working area of the bank is in 21 Districts in Rajasthan viz. Ajmer, Alwar, Banswara, Baran, Bharatpur, Bhilwara, Bikaner, Bundi, Chittorgarh, Churu, Dausa, Dholpur, Dungarpur, Jhalawar, Jhunjhunu, Karauli, Kota, Pratapgarh, Sawaimadhopur, Sikar and Tonk.

Bank is having largest network of branches and area of operation amongst RRBs functioning in the State of Rajasthan and second highest among all banks in the state. It has largest number of rural branches in the state among all banks.

## 2. REVIEW OF LITERATURE

**(H L Bhat Ganesh, 2009)** The study reveals that at present RRBs are facing number of obstacles in their complete growth. Although RRBs had a rapid expansion of branch network and increase in volume of business, these institutions went through a very difficult evolutionary procedure due to some problems like limited service area, High risk due to exposure only to the target group, Mounting losses due to non-viable level of operations in branches located at resource poor areas, Switch over to narrow investment banking as a turnover strategy. **(Ibrahim Syed M., 2010)** The performance of RRBs in India enhanced in the post-merger period. However number of RRBs decreased, the branch network has been increased. During this period, there has been increased number of districts covered by the RRBs. With a view to ease the seamless integration of RRBs with the main payment system, there is a need to provide computerization support to them. RRBs should spread their services in to un-banked areas and increase their credit-deposit ratio. The procedure of merger should not proceed beyond the level of sponsor bank in each state. Several committees have underlined the need to improve the performance of these banks, which play an important role in the rural credit market in India. Performance of rural banks in India has significantly improved after amalgamation process, which has been introduced by the Government of India. **(Reddy Maheshwara D., Prasad K.V.N. 2011)** This study examines the overall performance of Andhra prapathi grameena bank and Saphthagiri grameena bank. Andhra prapathi grameena bank topped over Saphthagiri grameena bank in protecting the interest of the creditors. Saphthagiri grameena bank proved to be good in Asset Quality viewpoint. Andhra prapathi grameena bank acted better than Saphthagiri grameena bank in case of TA/TD, where as Saphthagiri grameena bank demonstrated to be good in Profit per employee perspective. On the basis of overall performance Andhra prapathi grameena bank performed as top branch. **(Chaudhary Kajal and Sharma Monika, 2011)** It was anticipated that public banks must pay attentiveness on their functioning to compete private banks. Banks should be well conversant in proper selection of borrower/project and in analyzing the financial statement. This paper is attempted to analyze how resourcefully Public and Private sector banks have been managing NPA. Commercial Banks should be allowed to come up with their own measures to discourage the problem of NPAs. Banks should be fully authorized and they should be able to apply all the preferential policies granted to the asset management companies. Another way to manage the NPAs by the banks is Compromise Settlement Schemes or One Time payment or settlement Schemes. However, under such schemes the banks keep the actual amount improved secret. **(Murthy Sudarsana D., Narasaiah P.V. and Mohan B., 2012)** RRBs play a meager role when compared to Scheduled Commercial Banks and Co-operatives in spreading institutional credit to agriculture. Majority of the respondents stated that crop failure is the major constraint in

repayment of loans. The Government of India has to provide some schemes to improve the share of RRBs in agriculture credit by institutional assistances. There is an urgent need to modernize agriculture and improve productivity. Farmers have to be empowered with education on farm training and guidance to employ modern cultivation performs. **(Ahmed J. U., Bhandari G.P., Ahmed Rohima, 2012)** It was anticipated that the regional level analysis of productivity of RRBs that MRB placed in 3<sup>rd</sup> rank among the RRBs in NER in terms of both labour and branch productivity. The productivity measured in terms of labour, branch, return on assets (ROI), return on investment (ROA), profit as percent of business volume etc. have been calculated to examine the innovativeness of MRB. In order to survive in the present viable environment, the banks should be supported sufficiently and would attain competitiveness through the use of its existing resources and handling business in effective way. And it was also found that an urgent step is required to control the unnecessary operating expenditure of Meghalaya Rural bank. **(Verma K Niraj, V. Alagu Pandian, 2013)** The study indicates that all the economic variables of profitability are taken into accounts, which affect the profit of RRBs in India. . It also analyses the economic variables, which impact the profit of the RRBs in India. The suggestions offered would enable the RRBs, to take essential steps to improve its financial performance, which will also recover the profitability of the RRBs in India. The growth rate of interest income, total income, and interest used and total expenditure of SCBs in India and RRBs in India. **(Kanika and Nancy 2013)** RRB successfully achieve its objectives like to take banking to door steps of rural households mainly in banking deprived rural area, to avail easy and inexpensive credit to weaker rural section who are dependent on private lenders, to inspire rural savings for productive activities, to generate employment in rural areas and to bring down the cost of purveying credit in rural areas. The expansion of RRB at a quick rate has helped in reducing substantially the regional disparities of banking facilities in India. Thus RRB is providing the strongest banking network. Government should take some effective corrective steps to make Rural Banks profitable by concentrating on qualitative, safe and speedy banking services. **(Suresh R., 2014)** The negative results shown in the above study does not mean that the banks did not perform well, but due to the methods as downsizing the banks taken by the Government of India to protect the Regional Rural Banks from its stagnations. And this study also shows that Regional Rural Banks are competing with other banks with its limited resources and restrictions. It is found that the Nagaland state is totally neglected in opening the Regional Rural Banks. Initiative measures should be taken to give total coverage in districts located in India by creating Regional Rural Banks. **Singh Kuldeep, 2014)** The study reveals that RRB successfully achieve its objectives like to take banking to door steps of rural households particularly in banking depressed rural area, to gain easy and cheaper credit to weaker rural section who are dependent on private lenders, to boost rural savings for productive activities, to generate employment in rural areas and to provide credit facilities in rural areas. The rapid expansion of RRB has helped in reducing substantially the regional differences in respect of banking facilities in India. In this competitive era, RRBs have to focus on immediate, qualitative and secure banking services to retain existing customers and attract latent customers.

### **OBJECTIVE OF THE STUDY**

The main object of this study is to measure financial performance of Baroda Rajasthan Keshtriya Gramin Bank.

## RESEARCH METHODOLOGY

This is a descriptive paper and based on secondary data. And data was collected from different Annual reports of NABARD and Baroda Rajasthan Keshtriya Gramin bank. Other related information collected form Books, newspaper articles and research journals.

### Area of the Study

The study is based on the performance of Baroda Rajasthan Keshtriya Gramin Bank. Therefore study covers BRKSGB to fulfillment of objective of the study.

### Key Performance indicators and Growth of Baroda Rajasthan Keshtriya Gramin Bank

Table 1 presents the key performance indicators and growth of Baroda Rajasthan Keshtriya Gramin Bank from year 2013 to 2018.

**TABLE 1. KEY PERFORMANCE INDICATORS OF BARODA RAJASTHAN KESHTRIYA GRAMIN BANK (IN LAKHS)**

Parameters	2013-14	2014-15	2015-16	2016-17	2017-18	Growth
No. of Branches	675	715	756	798	832	--
Districts covered	21	21	21	21	21	--
Staff	2949	3158	3050	3257	3463	6.32
Deposits	801808	905212	998182	1221499	1322840	-8.3
Borrowings	194045	195583	128118	157433	164752	4.65
Investments	186973	193105	220053	294573	292067	-0.85
Gross Loan Outstandings	628050	717452	808038	899072	1028367	14.38
Loan Issued	480631	586802	657765	962099	877143	-8.83
CD Ratio	78.33	79.26	80.95	73.60	77.74	--
Profit	8376	12743	4450	10111	10277	1.64
Recovery	83.70%	83.70%	85.07%	89.59%	88.26%	-
Per Branch Productivity	2118	2269	2389	2651	2826	6.60
Per Staff Productivity	485	514	592	651	679	4.3

Source: www.brkgm.org

### Summery/ Observation of the study (Findings)

#### 1. Branch Network

The bank has been extending its services through 832 branches, one extension counter and 3401 Bank Mitras (Business Correspondents) in 21 districts spread in the state of Rajasthan.

#### 2. Deposits

Deposits of BRKGB increased from ₹ 1221499 to ₹ 1322840 lakhs during year registering growth rate of 8.3%. Table shows highest deposits during the year 2018.

#### 3. Borrowings

Borrowings of BRKGB increased from ₹ 157433 lakhs as on 31 March 2017 to ₹ 164752 lakhs as on 31 March 2018 registering an increase of 4.65%.

#### 3. Investments

The investment of BRKGB decreased from ₹ 294573 lakhs as on 31 March 2017 to ₹ 292067



lakhs as on 31 March 2018 registering a decrease of 0.85%.

#### **4. Gross Loans Outstandings**

The outstanding loans are continuously increasing. The loans increased ₹ 899072 lakhs as on 31 March 2017 to ₹ 1028367 lakhs as on 31 March 2018 registering a increase of 14.38%.

#### **5. Loan Issued**

Bank has the Loan Policy approved by the Board, which encompasses the objectives of overall growth of rural areas by providing credit and also outlines the prudent lending norms to minimize the credit risks and ensuring qualitative credit growth. BRKG bank has issued 877143 lakhs during the financial year 2017-18. The table shows that loans are declined with the rate of 8.83%

#### **6. Credit Deposit Ratio**

The aggregate CDR of BRKGB increased over the years from 73.60% as on 31 March 2017 to 77.74% as on 31 March 2018.

#### **7. Profit**

RRBs have earned profit to the extent of ₹10277 lakhs during the year 2017-2018. The profit was marginally higher than the previous year.

#### **8. Productivity of Branch and Staff**

The branch productivity increased to ₹2651 lakhs in 2017 from ₹2826 lakhs in 2018 with a growth of 6.60%. Similarly, staff productivity in 2017 increased to ₹651 lakhs from ₹679 lakhs in 2009-10 with a growth of 4.3%.

#### **9. Recovery**

Concerted efforts were made during the year July 2016 to June 2017, which resulted into substantial recovery as on 30.06.2017. Recovery percentage achieved was 88.26%

#### **Policy Initiatives during 2017-18**

**Cheque/Instruments collection policy-** The overall purpose of this policy is to present a general framework for collection of cheques and instruments on behalf of the customers of the bank, comply with such norms and compensate the customers in the case of extinction. This policy is based on the principle of transparency and correctness in dealing with customers.

**Uniform Service Charges-**50% additional Service charges should be levied from Non-customers. Rebate may be given of collection charges for part of amount of cheque if it is kept with bank for a minimum period of one year as Term Deposit. A remark should be marked on Term Deposit Receipt for rebate given to customers and in case of premature payment; amount of rebate must be recovered. Regional Manager may take decision to give rebate in collection charges for out station cheques/instruments, deposited to credit salary of employees of Govt. Institute/Department/Employers through accounts in branch. If any Firm/Organization or its subordinate agencies in different branches of Bank maintain accounts, Regional Manager may take decision on case-to-case basis to give rebate in exchange for remittance of funds. These cases must be reported to Head Office on monthly basis and must be reviewed on annual basis.

**Employee Benefit-** Gratuity liability is provided for as provisions of payment of gratuity (Amendment) Act 2018 wef 29.03.2018, on the basis of valuation Actuarial for Gratuity liability. Bank has taken group gratuity policy from LIC of India.

**Code of Bank's commitment for Micro and Small Enterprises-** This is a code, which are for small (micro) and small-scale customers of the bank to provide easy, prompt and transparent banking services. Its objectives are as follows:-

- To provide easy access to efficient and suitable banking services to micro and small Positive emphasis on entrepreneurial field.

-Enhancing transparency from which you can better understand that you are concerned about services

## CONCLUSION

Baroda Rajasthan Keshtriya Gramin Bank is playing a very important role in development of rural people in Rajasthan. BRKGB is making new initiative policies for the development of rural people. Marginal Farmers and Artisans are getting direct benefits from these new policies. Branches of this bank are available in both rural and urban areas. It is not only benefiting the rural people but also the urban people. From 2013 to 2018 its branches have been constantly increased. The growth of the branch is also increasing the business of the bank and its performance is also improved by increasing business. The main reason for the establishment of these banks is to provide loans to farmers on easy installments for agriculture.

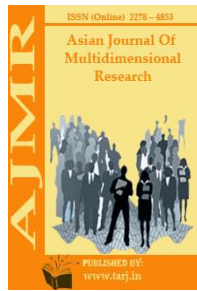
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**EMPLOYER BRANDING AND EMPLOYEE WORK RELATED  
OUTCOMES: A CONCEPTUAL FRAMEWORK**

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**ABSTRACT**

*Previous research on employer branding has focused on its impact on recruitment and retention and rarely explores the impact of employer brand on employee work related outcomes. The purpose of this paper is to present a framework to understand the relationship between employer branding and employee work related outcomes including organization commitment and organization citizenship behavior. The framework is developed by reviewing relevant literature on organization commitment, employer branding, employee engagement and organization citizenship behavior. Using the Social Exchange Theory and Job-Demand Resource Model the paper provides a conceptual framework illustrating the link between employer branding, commitment and citizenship behaviour that is mediated by employee engagement. The present paper outspread research on employer branding by including employee engagement as mediator between employer branding, commitment and citizenship behaviour.*

**KEYWORDS:** *Employer Branding, Employee Engagement, Organization Commitment, Organization Citizenship Behavior.*

## 1. INTRODUCTION

Emerging role of India in the global economy has forced the government to take initiatives for making India manufacturing and service center. This has fueled organizations to undertake initiatives to attract and retain best talent, as it has been projected that for 79% of the organizations there will be increased hiring for the upcoming years. Accordingly, organizations are under constant pressure to attract, retain and engage the best talent for driving India's full potential on the world stage (Aon Hewitt, 2017 and Wills Tower Watson, 2016). Hence, it becomes important for an organization to adequately manage their employees to ensure that they remain engaged and committed to their work.

Employer Branding is useful strategy used by organizations to manage talent. Employer brand is "the package of functional, economic and psychological benefits provided by employment, and identified with the employing company" (Ambler and Barrow, 1996). Aon Hewitt report on Best Employers (Aon Hewitt, 2017) states that best employers experience high growth rate, high employee engagement, and are less impacted by people issues. Researchers believe that successful employer brand in addition to increasing the number of job applicants and reducing employee turnover increases employee engagement, satisfaction, commitment and other work related outcomes (Dabirian, Kietzmann, and Diba, 2016; Sartain and Schumman, 2006; Backhaus and Tikoo, 2004; Harding, 2003). From this view, investment in employer brand may differentiate employer from other employers and may enable organization to improve employee engagement, satisfaction, commitment and so on. In spite of such arguments, academic research on the topic has been limited to attraction and retention. Researchers believe that there is a paucity of frameworks and theories explaining other important outcomes of employer branding (Theurer *et al.*, 2018).

While there has been a lot of research on external oriented employer brand that measures the perception of potential employees (Wong, 2014; Mosley, 2007), some researchers (Lievens, 2007; Backhaus and Tikoo, 2004) also suggest exploring another aspect of employer branding i.e. internal oriented employer brand, which focuses on current employees. The main reason is that it is the current employees act as brand ambassadors of the organization to both customers and potential employees. Current employees perception of employer brand add value to the organization by increasing the level of engagement (Morya and Yadav, 2017; Lee, Kim and Kim, 2013; Kunerth and Mosely, 2011), employee loyalty and productivity (Backhaus and Tikoo, 2004). Overall, these benefits will improve overall employee performance which in turn will impact organization performance (Fulmer, Gerhart, & Scott, 2003). Further, researchers argued that there is a dearth of theories explaining the relationship between employer brand and employee work related outcomes (Hanin *et al.*, 2013). Accordingly, there is a need to carry out research that studies the relationship between employer branding and work-related outcomes.

Filling this gap, the present research attempts to understand the relationship between employer brand and employee work-related outcomes. For this, first, a theoretical foundation using literature from human resource management and organization behavior has been presented. Next, a conceptual model illustrating relationship between constructs and a set of propositions is discussed. Finally, the academic and managerial implications and future research agenda have been deliberated.

## 2. THEORETICAL FOUNDATION

Literature in the field of organization behavior states that employee behavior in an organization depends largely on psychological relationship between employers and employees (Alcover *et al.*, 2017; Löhndorf and Diamantopoulos, 2014). Therefore, employee behaviour in an organization is the reflection of his work experiences. There are number of theories in literature that supports this view. Hence, in this section a theoretical foundation to explain this relationship has been discussed.

“The practice of employer branding is predicated on the assumption that human capital brings value to the firm, and through skillful investment in human capital, firm performance can be enhanced” (Backhaus and Tikoo, 2004). Social Exchange Theory supports this, suggesting that individuals or organizations will participate in the exchange if the other party has something of value in return (Chiaburu and Marinova, 2006). Researchers are of the view that under ideal conditions when employees feel supported within the organization they will develop a desire or obligation to give back to the organization (Xerri and Brunetto, 2013). However, employees in an organization will feel supported when organization’s employer brand strategies are aligned to deliver superior employment experience in an organization. Hence, the employer brand within the organization will impact the employee’s propensity to reciprocate with engaging behavior, commitment and organization citizenship behaviour.

Psychological contract theory provides important basis to understand the link between employer branding and employee work-related outcomes. “Psychological contract comprises subjective beliefs regarding an exchange agreement between an individual and, in organisation typically, the employing firm and its agents” (Rousseau, 2001). These contracts are the beliefs that employee holds regarding the terms of employment and the obligation to provide benefits in return (Kasekende *et al.*, 2016; Rousseau, 1995). Hence, psychological contract involves cost-benefit analysis where employees reciprocate on the basis of benefits they receive from the employers in terms of employment conditions. Kasekende (2016) is of view that one of the outcomes of psychological contract fulfillment is that employees will be more engaged and this translates into employee discretionary behavior (organization citizenship behavior). Hence, it can be assumed that it will be difficult for the employees to display citizenship behavior unless the employees are engaged in their job and their psychological contract is fulfilled.

Job Demand-Resource (JD-R) model provides complimentary theoretical perspective for understanding employee work-related outcomes based on employer branding. This (JD-R) model is widely used to predict burnout and engagement. The model classifies job characteristic into - job resources and job demands (Demerouti *et al.*, 2001). He defines job demands are “those physical, social, or organization aspects of the job that require sustained physical or mental effort and are therefore associated with certain psychological costs (e.g., exhaustion) and include aspects such as workload, time pressure, and difficult physical environments”. On the other hand, job resources are “those physical, social, psychological or organization aspects of the job that facilitates in achieving completion of job demands and help in personal growth and development” (Crawford *et al.*, 2010). These include training, task variety, instrumental-symbolic benefits and feedback. The presence of such resources in a job determines the level to which an employee is ready to invest in their role and hence, the level of engagement. Borst *et al.* (2017) from his study on 9465 public servants concluded that job resources positively impacts employee engagement. Further, the study revealed that engagement mediates the relationship between job resources and positive job outcomes. Hence, when an organization, through its

employer brand will convey and deliver such job resources to its employee, the employee will reciprocate with the high level of engagement and will create their own “gain spiral”(Bakker and Demerouti, 2017).

### 3. CONCEPTUAL FRAMEWORK AND RESEARCH PROPOSITIONS

The detailed discussion on employer branding, mediating role of employee engagement and impact of employer branding on organization commitment and organization citizenship behavior is given below and depicted in Figure 1.

#### 3.1 Employer Branding

“Brand is a name, term, sign, symbol, or design, or a combination of them which is intended to identify the goods and services of one seller or group of sellers and to differentiate them from those of competitors” (Kotler, 1997). Backhaus and Tikoo (2004) argue that brands were traditionally used by marketing managers for creating a unique image for products and services, but in recent years branding principles are being applied to almost everything including people, places, and firms (Peters, 1999). Increasing ‘war for talent’ between the organizations has forced human resource practitioners to use branding principles to position an organization as desirable employer among employees (Edward, 2017). Vinayak, Khan and Jain (2017) defines employer branding as an important source of sustainable competitive advantage. Researchers are of the view that successful employer brand increases the number of job applicants, reduce employee turnover and increases employee engagement (Dabirian, Kietzmann, and Diba, 2016). Therefore, getting some assessment of the content of employer brand will help the employers in understanding that what makes an organization an employer of choice.

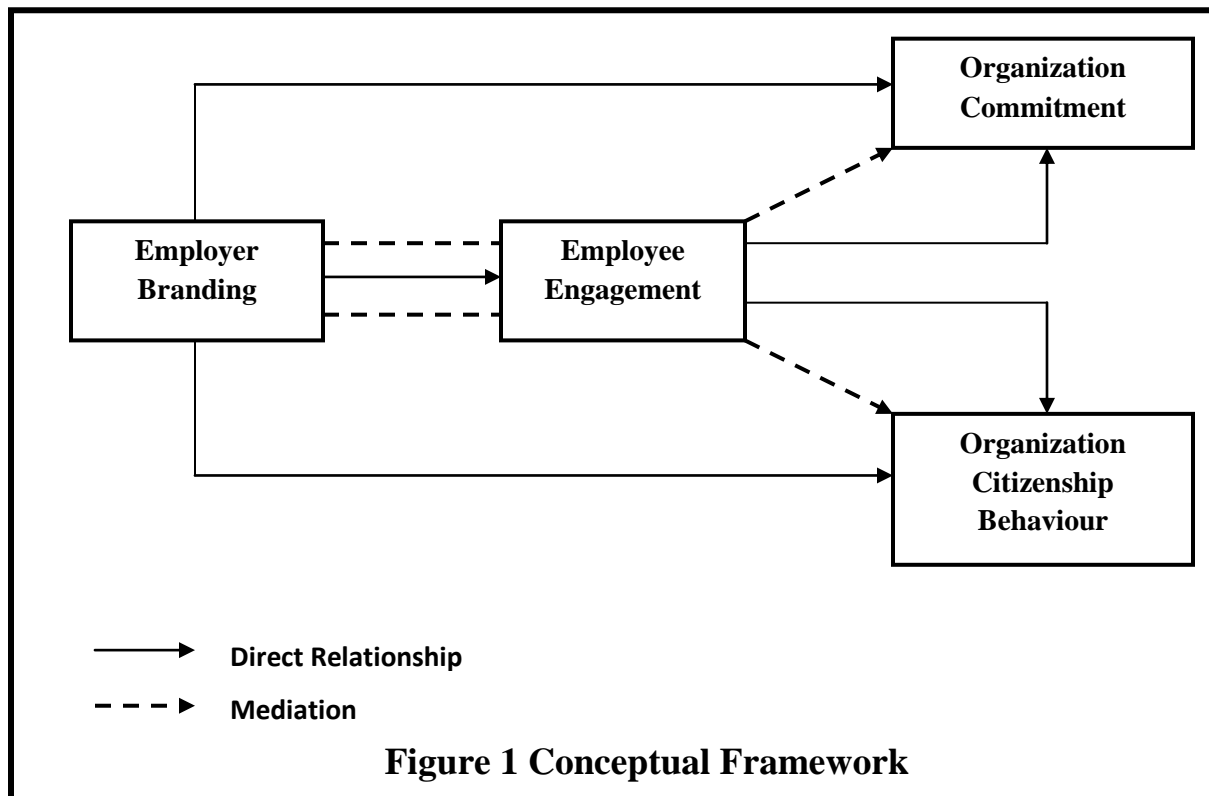
In the process of understanding and theorizing the components of employer branding, researchers have drawn arguments from human resource management and marketing literature. Berthon *et al.* (2005) conceptualized employer brand as a function of economic, social, development, application and interest value. Further, authors (Lievens and Slaughter, 2016; Kissel and Büttgen, 2015; Xie *et al.*, 2015; Edward, 2010) used the Albert and Whetten (1985) concept of organization identity to conceptualize employer brand. According to this concept employer brand consists of central, enduring and distinctive characteristics of organization that makes it a desirable employer among the current and potential employees. Schlager *et al.* (2011) modified Berthon *et al.* (2005) framework and replaced application and interest value with diversity and reputation value. Lievens (2007) applied the instrumental and symbolic brand approach in marketing to conceptualize employer brand. The author is of the view that employer brand in an organization consist of instrumental (tangible) and symbolic (intangible) benefits. Instrumental benefits include “physical, objective and tangible attributes” while symbolic benefits include “abstract, subjective, and intangible attributes” (Lievens, Hoye and Anseel, 2007). Accordingly, instrumental and symbolic benefits provide useful framework for understanding the aspects of employer brand that makes an employer, an employer of choice in the minds of employees. Hoye *et al.* (2013) in the nationwide study with Turkish students found that instrumental and symbolic characteristics are positively related to organization attractiveness. Lievens and Slaughter (2016) are of the view that the holistic approach to employer image dimensions includes both instrumental attributes and symbolic traits.

Although the relationship between employer brand and instrumental-symbolic benefits seems to be simple, research in this area has been differentiated between its impact on current and potential employees. Researchers are of the view that although the potential employees who are

not the part of the organizations will develop the idea of the instrumental-symbolic benefits based in the signals that an employer sends, current employees are the one who live the employer brand and have formulated the perception of employer brand based on their experience. Accordingly, both of them are expected to have different beliefs about the organizations' employer brand. Linked to this, the employer brand referred to here only means the instrumental-symbolic benefits that the employer provides to its current employees. Hence, we propose that:

*P1:* Organization that provides its employee with instrumental and symbolic benefits will have a positive image in the minds of employees.

*P2:* Experience of instrumental and symbolic benefits provided by the organization to its current employees will form the basis of one's perception of the employer brand.



Employee engagement is one of the most popular psychological construct that gathered the interest of academicians and managers (Shuck *et al.*, 2017). The concept was introduced by Kahn in 1990s. Kahn's view of work engagement involves interplay between three dimensions i.e. cognitive, physical and emotional. More recently Shuck *et al.* (2017) build up their work on Kahn (1990) conceptualization of personal engagement to define and measure employee engagement. The study confirmed three factor structure of employee engagement including cognitive, emotional, and behavioral factors. According to Shuck *et al.* (2017) "Employee engagement is defined as an active, work-related positive psychological state operationalized by the intensity and direction of cognitive, emotional and behavioral energy (Shuck and Wollard, 2010)".

Research in the area of employee engagement has not been limited to the conceptualization and definitions. However, significant research has focused on determining its determinants and



consequences. Saks (2006) in his research made an attempt to determine its antecedents and consequences. Thus study revealed that job characteristics, reward and recognition, perceived organization support and justice predict job and organization engagement. The author enlisted other factor like flexible timings, training, development and salary as antecedents of employee engagement. Drizin (2005) in his research found that job satisfaction, effectiveness of leadership and reputation are the most significant drivers of engagement. Another study conducted by Aon Hewitt (2011) revealed that career opportunities, recognition, organization reputation, brand alignment and human resource practices are top five global antecedents of employee engagement. Further, Bailey *et al.* (2017) summarized the results of 155 empirical studies that determine the antecedents of employee engagement. The results revealed that job design, organization leadership, team factors and organization interventions are important antecedents of employee engagement. The above mentioned factors form employer brand of an organization. Further, Corporate Leadership Council (2006) is of the view that employees who perceive their employer as an unique and desirable exhibit higher levels of engagement. Heilmann *et al.* (2013) are of view that employer branding is not just about attracting and retaining employees. The authors claim that the ultimate outcome of the employer branding efforts is to improve performance by engaging employees. Biswas and Suar (2016) predicted that all the dimensions of the employer brand directly correlate to employer brand loyalty and employee engagement. Tanwar (2017) in a study on Indian IT sector revealed that economic, social and development value are essential antecedents of employee engagement. The present study proposes following proposition in this regard:

*P3: Employer brand is an antecedent of employee engagement.*

### ***3.3 Organization Commitment***

Organization Commitment is considered as a critical management issues faced by organizations today (Nazir and Islam 2017). Brown (1996) defines commitment as “the state of being obligated or bound” (emotional and intellectual ties). Organization commitment has been defined in social exchange context as a manifestation of relationship between organization and employee where favorable treatment by organization is reciprocated by similar treatment from the employee (Kaur and Mahajan, 2014; Rhoades and Eisenberger 2002; Blau, 1984). Mowday *et al.* (1982) conceptualizes organization commitment as “the relative strength of an individual’s identification with and involvement in a particular organization and can be characterized by a strong belief in and acceptance of the organization’s goals and values, willingness to exert considerable effort on behalf of the organization and a strong desire to maintain membership of the organization”. Further, employees are deemed to be committed when they spread positive word of mouth about the organization, stays in the organization and exhibits discretionary work behavior (Kaur and Mahajan, 2014).

With regards to its determinants, research has shown that organization commitment is significantly related to employment conditions and experience (Davies *et al.*, 2018; Hanin *et al.*, 2013; Meyer *et al.*, 2002; Meyer and Allen, 1997). According to Social Exchange Theory (Blau, 1964), employees who receive favorable employment experience at workplace would reciprocate this favorable treatment by getting more committed to their employers (Hanin *et al.*, 2013; Meyer *et al.*, 2002; Meyer and Allen, 1997). Such findings are in line with Backhaus and Tikoo (2004) who are of view that favorable employer brand of the organization will develop certain assumptions about employment with in the firm in the minds of recruits, thereby enhancing commitment to the firm. Research conducted by Steers (1977); Lam and Zhang (2003); Bartlett

(2007); Slattery *et al.* (2010); Katsikea *et al.* (2011) and Ozturk *et al.*, (2014) revealed that job characteristics (like job opportunities, challenging job, job variety, autonomy and feedback) improves employee satisfaction and organization commitment (ibid). Further a research conducted by Hanin *et al.* (2013) predicted that favorable job attributes and positive work experience enhances affective commitment. Thus, it can be assumed that more employees perceive their lived employment experience as composed of favorable job attributes, more would be they committed to the employer.

Furthermore Hakanen *et al.* (2006) argues that as per the theory of Self-Determination propounded by Deci *et al.* (1991) in social settings any process that gratifies human desires results in a fulfilling and positive state of mind which is termed as engagement, which enhances commitment (Houkes *et al.*, 2001; Hackman and Oldham, 1980). On the similar lines, Saks (2006) is of view that relationship between job attributes and employee outcomes is mediated by employee engagement. Researchers believe that employees that get support from employers will reciprocate with enhanced engagement and increased levels of organization commitment (Nazir and Islam, 2017; Gupta *et al.*, 2015; Saks, 2006; Schaufeli and Bakker, 2004). Further a study found that job resources including salary, training, flex working hours and so on enhances employee engagement which eventually results in increased organization commitment (Hakanen *et al.*, 2008; Bakker *et al.*, 2016). Hence, it can be proposed for the present study that:

P4: Employee engagement has a significant impact on organization commitment.

P5: Employer Brand has a significant impact on organization commitment.

P6: Employee engagement mediates the effect of employer branding on organization commitment.

### **3.4 Organization Citizenship Behavior**

Organization Citizenship Behavior is among the most studied topics in organization behavior research (Khalid and Ali, 2005). Bateman and Organ defined organization citizenship behavior as a distinct work behavior exhibited by individuals that are valuable for the employer, and are discretionary i.e. the ones that goes beyond the existing roles (Organ, 1995). Such behaviors may include helping coworkers, completing assignments on time, suggesting innovative ways to do work, and doing things beyond those mentioned in the job description (Bateman and Organ, 1983). Such behaviors are discretionary as non-performance of such behavior is not punishable (Chahal and Mehta, 2010).

Researchers are of the view that to ensure success in today's competitive environment it is important that employees must fulfil tasks beyond their job description (Katz, 1964). Such behaviors also known as discretionary effort or organization citizenship behavior may lead to positive results (Mohanty and Rath, 2012; Walz and Rush, 2000; Podsakoff and MacKenzie, 1994; Organ, 1988). Parrey and Bhasin (2012) in their research concluded that organization citizenship behaviour depends on motivational level of employees. Further, according to social exchange theory, employees who experience better employment experience in the form of job content, compensation, leadership, and organization support from their employers usually care more about their organization, can sacrifice their interest for the sake of organization, and may exhibit extra-role behaviors. Such job attitudes, organization support, leadership, and tasks variables are related to employer brand (Corte *et al.*, 2012). This is supported by a study conducted by Coyle Shapiro and Kessler (2000) who are of view that employees who perceive

that employer have met its responsibilities and obligations are more committed and involved in organization citizenship behavior (Gozukara and Hatipoglu, 2016). Accordingly, it can be implied that employer branding impacts organization citizenship behavior.

Further, researchers (Christian *et al.*, 2011; Lyu *et al.*, 2016) suggests that engaged employees, accomplish their professional goals are more expected to perform extra-role behavior and involve in organization citizenship behavior. Hughes and Rog (2008) in a study revealed that highly engaged employees spread positive word of mouth about the organization, exhibits extra-role behavior and report a superior employer brand of the organization. Sulea *et al.* (2012) in this line states that when organization provides its employees with the required resources, employees exhibit high levels of engagement, which in turn, leads to organization citizenship behavior (Salanova and Schaufeli, 2008). Further, as social exchange theory states that positive experience at employment could generate positive discretionary behavior i.e. organization citizenship behavior, as when employee feel supported at work they may reciprocate it with positive emotions. Fredrickson (2003) is a view that such emotions generate a feeling of achievement among employees, that can be attained showing extra role behavior like by helping colleagues, team and organization at large (ibid). Piyachat (2015) argues that when organization fails to deliver employer brand experience, employees feel disengaged, which, in turn, results to lower productivity, and no or low citizenship behavior (Piyachat, 2015). Hence, it can be proposed that:

*P7: Employer Brand has a positive impact on organization citizenship behavior.*

*P8: Employee engagement is positively associated with organization citizenship behavior.*

*P9: Employee engagement mediates the relationship between employer branding and organization citizenship behavior.*

#### **4. ACADEMIC AND MANAGERIAL IMPLICATIONS**

The present research can have several academic and practical implications when studied empirically. The present paper introduces a different perspective to understand the role of employer brand in an organization. Since its inception, researchers, practitioners and consulting firms around the world have conducted a lot of research on employer branding (Wong, 2014; Martin *et al.*, 2005). However, research in this area is still limited to attraction and retention (Theurer *et al.*, 2018; Davies *et al.*, 2018; Kashyap and Rangnekar, 2016). Researchers believe that employer branding is much more than employee attraction and retention, however, it is a strategic process that affects attitude and behavior (Theurer *et al.*, 2018; Angelopoulou, 2015; Aggerholm *et al.*, 2011). Employee attitude and behavior enhances employee satisfaction and employee related outcomes like employee engagement, organization commitment and citizenship behavior (Sartain and Schumman, 2006; Barrow and Mosley, 2006; Fulmer *et al.*, 2003; Ainspan *et al.*, 2001; Ambler and Barrow, 1996). Consequently, a few researchers (Biswas and Suar 2016) attempt to study the relationship between the constructs and there is yet very limited research that attempts to provide a comprehensive framework to conceptualize the relationship between employer brand experience, employee engagement, organization commitment, and citizenship behavior (Wong, 2014; Priyadarshi, 2011; Lievens, 2007). Thus, the present research attempts to conceptually present the relationship between employer branding, employee engagement, commitment and citizenship behavior.

Further, it is seen that research in this area has predominantly considered employee satisfaction as mediator between employer branding, employee commitment and citizenship behavior. However, while some studies have argued that it is possible to measure employee's perception of work experience through satisfaction, other studies suggests that it in no way is a predictor of commitment and citizenship behavior (Wong, 2014; Fernandez, 2007; Heger, 2007; Kahn, 1990). Therefore, in recent years, attention has shifted to the relationship between employee engagement and organization citizenship behavior as it is considered as superior predictor of employee behavior (Wong, 2014; Rashid *et al.*, 2011; Markos and Sridevi, 2010; Medlin and Green, 2008; Heger 2007). Employee engagement has been considered as the significant predictor of commitment and citizenship behavior as employee engagement includes satisfaction as well as actual effort by employees as a part of their job. Moreover, employee engagement is a two-way process between employees and organization whereas satisfaction is a one way process (Wong, 2014). Consequently, there is a need for complementary research that links employer branding and employee commitment and organization citizenship behavior while analyzing the mediating effect of employee engagement. Accordingly, the framework attempts to understand the mediating role of employee engagement between employer branding and employee engagement and citizenship behavior. From the practitioners point of view, the research will remind employers that employer branding strategy which was designed to attract and retain talent may also impact employee work related outcomes. Thus, employers should keep this in mind while developing employer branding strategy to maximize the results.

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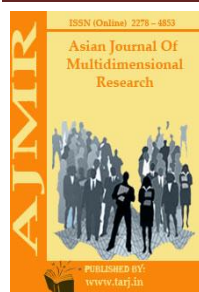
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## **STATUS OF WOMEN ENTREPRENEURSHIP IN HARYANA: AN ANALYSIS OF CHALLENGES AND FUTURE PROSPECTS**

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### **ABSTRACT**

*The importance of women's entrepreneurship is evident to the business community itself, but more to the country's economy. In order to achieve the growth potential of the economy, women need to take a more active role as entrepreneurs or workers. Women entrepreneurship is defined as entire concept whereby a confident, innovative and creative woman adopt a business activity to prove herself to be economic independent either individually or in consortium, aim at generating employment opportunities for other individuals and running the enterprise by keeping balance pace with her personal, family and social life. Earlier the role of women was confined to nurture the family as homemakers but this perception has changed now. The discussion on women entrepreneurship has always been avoided in Indian society. The situation has completely changed now. In modern India, more and more women are taking up entrepreneurial activities. Women across India are displaying an attentiveness to be economically independent. But the procedure is not so easy to get transformed from house makers to businesswomen. The study endeavours to analyse the challenges and future prospects of women entrepreneurs in Haryana, India. The study also intends to suggest some fruitful ways to eliminate and reduce the hurdles related to women entrepreneurship development.*

**KEY WORDS:** *Entrepreneurship, Entrepreneurial activity, Women entrepreneurship.*

## 1.1 INTRODUCTION:

Women are the foundation of transitional phases in every society. Their productive role being a mother, daughter, house maker and bread winner cannot be neglected. They have ability to create balance in all spheres of life, proficiency to prioritize their responsibilities as well finding ways to proceed further by withstanding as well as vanquishing all gauntlets. They are the reservoirs of creativity and have efficacy to channelize their energy in adequate direction depending upon the circumstances. Earlier, the society was bogged by the cynicism

of the male dominated and antiquated ideology in the society. Apart from carving their niche in the advanced nations like Canada, Germany, Australia and United States etc., women are emerging as strong economic force with creative skills, proficiencies and industrious abilities to prove themselves in the emerging nations like Africa, Asia and Latin America.

There are many push as well as pull factors like innovations, creativity, capabilities, skill development and opportunity perceptions among the aspirants that led to the generation of self-employment women entrepreneurs (Global entrepreneurship Research Association, 2016-2017). Some women start their business due to uncertain and traumatic reasons such as divorce, death of the bread winner in the family and lack of income in their family. The economic crisis as the prominent push factor to persuade the aspirants to take initiatives despite the existence of risks associated with the ventures. (Fafaliou and Salamouris, 2014). Sugaraj and P.S. in their study with 63 women run enterprises from sub urban areas of Pune, Maharashtra, highlighted self esteem, desire for making more money, market potential, skills, family support, ability to accept business challenges, social status, family responsibilities, availability of infrastructural facilities as the major factors, which push the desires of women entrepreneurs to start with business ventures (Sugaraj and P.S., 2014). Besides, there are many motivating and enabling factors like innovative thinking, education, skills, awareness, creativity, desire for self actualization, employment opportunities, credit facilities, cooperation from the family members, accomplishment of excellence and desire for carving their niche (C. and B. N., 2013). Moreover, the influence of psychological, motivational, experience, education, social, financial and cultural constraints that affected the acceptance of self-employment by the women aspirants (Ronsen, 2012).

Apart from this, the concept of single mother, which is in vogue these days, which is another prominent reason for the women stepping in to the world of opportunities. Even in India, the trend of women entrepreneurship is rapidly mushrooming with their actual and active participation in the economic domain. If nation has to grow and overcome the dynamic aspects in the global environment, then it is substantial that it has to promote the women entrepreneurship as the key strategy. Hence, all these factors play a significant role in enabling the women heading towards the possibilities of growth and development across many spheres.

## 1.2 CONCEPT AND MEANING OF WOMEN ENTREPRENEURSHIP

Entrepreneurship plays a significant role in the overall development of the nations whether developed or developing over the globe. Women entrepreneurship is an economic activity that provides platform for those who makes efforts to take initiatives, make effective management of available resources by combining them in an efficient manner, ready to take risks and possess the capabilities to withstand the uncertainties engrossed in running the business enterprises. Medha Dubhashi Vinze has illuminated women entrepreneurs as individuals who are the enterprising individuals with an eye for prospects, uncanny vision, commercial mind set with unwavering

perservance, adventurous spirit and ability to take risks with the uncertainties (Vinze, 1987). It could be defined as making the use of already existing scarce natural resources in consortium with innovative practices. It is the process where all the women make effective organizations of all factors of production by undertaking risks and make provision of employment opportunities to others.

Women entrepreneurship is substantial as building backbone of the nation's economic setup. It helps in providing economic stability, capital formation, improvement in per capita income, generation of employment opportunities, balanced regional growth, improved standard of living and innovativeness in leading to further enhancement in all the spheres of the society (Mlyadri, 2014).

In the words J. Schumpeter, "*Women who innovate, initiate or adopt business activity are called women entrepreneur*" (Manju, 2017). It is necessary to study the concept as the women has been emerging as magnificent source of overall growth over the last few decades, they help in providing employment generation for others, provide significant solutions for managing, organizing and exploiting the entrepreneurial opportunities.

Government of India has defined women entrepreneurship, "*Enterprise which is owned and controlled by women whose minimum financial interest of 51% of employment generated in the enterprise to women*" (Manju, 2017).

### **NEED OF THE STUDY:**

The State of Haryana is one of the growing and swiftly advancing States in India. The state has widely seen many upheavals and encountered a lot of criticism at many intervals of time due to the antiquated ideology of living beings in the male dominated society. The transformation in the social fabric in terms of increased in the educational status in India and inspiration for a better living have inspired the women of Haryana, which is brimmed with the success stories of many women. Although, many initiatives have been taken by the government in the terms of infrastructural development, financial opportunities, pliable platforms, the efforts promotional institutions like NABARD, National Women Development Co-operation, World Association of Women Entrepreneurs, Self-help groups and Rural and Women entrepreneurship Development and Women's India Trust in strengthening the efforts of women entrepreneurs at National level as well as execution of many schemes such as HWDC (Haryana Development Women Corporation), HSRCW (Haryana State Resource Centre for Women), Swawlamban scheme and Mahila Mandal Scheme etc. as well as economic policies to promote start ups in the State, even then women encounter certain challenges in turning their dream and need prospects into reality (C. and B. N., 2013). Amitabh Kant, CEO of NITI Aayog has pointed out the adverse impact of interference of Khap Panchayats as a stumbling block in promoting the adequate opportunities for women across many state districts (PTI, 2008). Moreover, many studies have been conducted in context to the challenges faced by aspirant women in other states, which is lacking in Haryana. Hence, the study would bridge the gap between the challenges and possible opportunities in the State of Haryana. Moreover, it would suggest some realistic initiatives, which could prove to be fruitful in future.

### **1.3 OBJECTIVES OF THE STUDY:**

The main objective of the study is to analyse the status of women entrepreneurship in Haryana in the light of major research works conducted. The study would serve many objectives:

- To highlight the factors responsible to encourage the women to become entrepreneurs and access the impact of various initiatives taken by the government for supporting and promoting the women entrepreneurship.
- To illuminate the major challenges faced by the women entrepreneurs.
- To suggest certain effective measures to promote the women entrepreneurship.

#### **1.4 RESEARCH METHODOLOGY:**

Present study is based on the secondary sources, which are from article journals, published reports, published reports and books.

#### **1.5 REVIEW OF LITERATURE:**

Many studies have been undertaken in the past, which elucidate the factors that promote the women entrepreneurship in India, the challenges encountered by them. Moreover, the studies also foregrounded the various possibilities as well as prospects for proliferation of aspect in the future. The studies have been conducted to illuminate the challenges and future prospects related to women entrepreneurship.

##### **1.5.1 Challenges and Obstacles Related To Women Entrepreneurship:**

Rani and Hashim (2017) investigated the prominent factors affecting the success of women entrepreneurship in Malaysia. The study found the significant and positive association between self-confidence, creativity, innovative approach, risk-bearing ability, craving for achievement and presence of entrepreneurial traits as well as the success of women entrepreneurs. Besides this, the financial factors like human capital, financial support, credit availability, networking and opportunities were also found more influencing as compare to the non-financial factors. Hence, it is necessary that proper analysis of these factors is must for persuading the women entrepreneurs to make efforts.

Sengar (2017) made an attempt to reveal the problems and prospects in context to women entrepreneurship. The sample size of the study was 100 women entrepreneurs of Jaipur and Ajmer cities in Rajasthan, India. The study found family, self and societal factors as the most prominent factors followed by financial, political, environmental and economic factors as well as mobility and marketing as the least affecting factors of women entrepreneurship. The study suggested that women entrepreneurs must undertake adequate research with regard to new innovations, risks involves, possibilities of starting new business, nature of administration, availability of resources and other associated aspects related to new business ventures.

Shamith (2017) examined the present scenario related to women entrepreneurship in India in the light of Start-up and Digital initiative of BJP led NDA government in Tamilnadu. The introduction of Information and Communication Technologies have enabled many women aspirants to take initiatives and availed the benefits from them. The study depicted the combined impact of the initiatives on the women entrepreneurship. Hence, the study suggested that adequate efforts and initiatives should be executed to uplift right spirit and enhance the probability of women entrepreneurship.

Bouzekraoui and Ferhane (2017) explored the aspects related to women entrepreneurship by analyzing the traits like profile, features of the company and the major barriers which women are likely to encounter while establishing and working with their business institutions. The study was conducted with 80 potential respondents who were the female entrepreneurs in Tangier, Rabat,

Marrakech, Larache and Casablanca cities in Morocco. The study elucidated major constraints like finances, imbalance between professional and personal life as well as fluctuating level of mentalities among the women respondents. The study suggested the introduction of concrete actions by government to support the women entrepreneurs.

Sorensson and Dalborg (2017) explored the working conditions, life situation and ambition for women entrepreneurs. The study was undertaken with 18 women entrepreneurs in Sweden. The study stated the women harness opportunity based entrepreneurship in the male dominated industry. The women entrepreneurs found economic aspect as the major concern in stabilizing their ventures as well as gaining profits in the companies. Women are very creative and innovative but they have to encounter Self-employment was found as the rewarding work for influencing the women entrepreneurs in the industry. The study emphasized that an adequate supportive environment must be provided to the women entrepreneurs.

Kukkonen (2017) concentrated to investigate the gauntlets encountered by women entrepreneurs in male dominated society in Southern Finland. The study was undertaken with 8 respondents across both genders. The study highlighted the impact of family background, which acted as the significant push factor to influence the initiatives of women entrepreneurs. Besides this, there are certain push and pull factors, which help in structuring the mindset of the entrepreneurs. Both male and female respondents were found to have distinctive approaches towards these factors to excel in their lives.

Mustafa (2016) analyzed the prospects and gauntlets related to women entrepreneurs. The data was collected from 60 women entrepreneurs from Jammu and Kashmir. The study foregrounded that many factors such as initiatives on the part of Government in terms of schemes, subsidies and incentives had acted as stimulants for women to take steps towards building their financial capacities. The study also highlighted the problems faced by the entrepreneurs in terms of discriminatory practices, corruption, lack of adequate infrastructural facilities as well as lack of infrastructural support. Media must use its power and potential to highlight major platforms to encourage the women understanding their worth and come forth for the cause of stability.

Jit and Bharti (2016) analyzed the challenges and prospects related to women entrepreneurs in India. The study revealed the existence of some constraints in terms of psycho-socio aspects, legal framework, inadequate infrastructure, lack of technological advancements, absence of support services like training programmes, market information, family support and credit facilities, which hamper the initiatives of women entrepreneurs. The study emphasized on the need of adequate research to get deep insights related to the numerous aspects of women entrepreneurship. Government must formulate and execute gender-sensitive industrial policies for supporting the women entrepreneurs in the nation.

Kemkar and Sharma (2016) ascertained the impact of personal factors such as risk taking approach, innovativeness as well as entrepreneurial competencies on the success of women led entities. The sample size of the study was 100 respondents who were the aspirant entrepreneurs. The study revealed the positive impact of risk taking attitude, innovativeness and entrepreneurial competencies on the success of business ventures. Moreover, the study emphasized on the dire need to focus on effective programmes and strategies like skill enhancement programmes and training initiatives to encourage the women to enter into the multiple domains to strengthen themselves.

Johar (2015) analyzed the performance, growth and challenges of women entrepreneurs. The study was undertaken with 100 women respondents in Ghaziabad city, India. The study revealed that majority of the women accepted the positive impact of entrepreneurship on their confidence, skills and esteem level. Most of the women entrepreneurs were separated or widowed and accepted the support of family members as a push factor to excel in their lives. The study also highlighted the important steps taken by the government for the infrastructural development of the area. It was focused that people must recognize the need to inculcate and polish their skills towards entrepreneurship.

G. et al (2015) have highlighted the major social problems faced by 25 women entrepreneurs in Ernakulam district. The study revealed some problems like personal, educational, family, financial, lack of entrepreneurial skills and training as well as gender discrimination as the major hurdles that hinder the willingness of women entrepreneurs. Government must provide adequate subsidies to the women entrepreneurs. Systematic awareness programs must be organized to sensitize women to understand their importance to stand ahead with the technology benefits.

Jarniou et al. (2015) conducted a study to assess the research on women entrepreneurs in context to French-speaking perspective to understand the situations and perspectives related to the success women in the society. Both the genders should work in unison to bring and realize transformation in the society. Besides this, there is need for continuous attention to the research regarding the visible and invisible social norms to revitalize and reinforce them for providing positive work environment to the female entrepreneurs. It is also necessary to legitimate certain condition and situations to enable the women entrepreneurs to manage their personal and professional lives. State must focus to find out multiple ways to stabilize the situations rather than relying on one conventional and rigid way to excel in their own domains.

Smith et al. (2015) reviewed the challenges related to female academic entrepreneurship. The study highlighted that women constitute a very small segment of academic entrepreneurs. Women entrepreneurs were found to reveal few innovative ways as compare to their male counterparts. The research also showed the low level of commercialization activity among women entrepreneurs. Hence, it was suggested that there is dire need to conduct adequate research to depict the true picture of the multiple deep and hidden aspects related to women entrepreneurship.

Aggarwal and Jain (2014) evaluated the challenges regarding women entrepreneurs in the 21<sup>st</sup> epoch in India. The study reflected male dominance, credit constraints, lack of educational facilities, very limited mobilization, limited efficacy and skills, lack of family support, paucity of the intermediate goods and inappropriate infrastructural facilities as the major problems faced by women entrepreneurs. Hence, it was suggested that government must impart quality education and skills to the women to empower them to take decisions.

Gandhi and Sharma (2014) examined the current status of women entrepreneurship, and problems as well as challenges faced by women entrepreneurs in the modern era. Almost every nation has understood the emerging potentialities of women entrepreneurs. Despite all these aspects, women entrepreneurs have to tackle many constraints like scarcity of raw material, cut-throat competition, responsibilities of family, low level of risk bearing approach, antiquated rituals and lack of firm support. The research focused on the attempts to bring ideological transformation, proper training programmes, availability of raw material, adequate policies to



strengthen the position of the women in the society, ways as well as means to encourage the women to take risk in life.

Bharthavajan (2014) stated the major obstacles faced by women entrepreneurs in terms of finance, limited mobility, lack of adequate training and managing skills, inadequate working capital as well as confidence, unfavourable regulatory environment, presence of some socio-cultural barriers. The research emphasized on promotion of both qualitative as well as quantitative aspects related to promotion in the nation as the effervescent and adamant entrepreneurs are capable of harnessing the potential of available resources. Moreover, there is dire need to institutionalize the network to advise and support the women entrepreneurs with equal opportunities.

Shyla et al. (2014) undertook a study with 100 women entrepreneurs to understand the challenges encountered by women entrepreneurs in Urban area of Thiruvananthapuram in Kerala, India from 2013 to 2014. Women entrepreneurs were found to have exposure to lack of education and skills, tough competition, low risk bearing attitude, inadequate raw material, improper infrastructural facilities, male dominance society, lack of self confidence and succinct managerial competencies, which impede their initiative to start with the business ventures. Government must take appropriate initiatives to lay support to women entrepreneurs to move ahead in their lives and sustain their livelihood. Regular assessment should be done to find out flaws and suggest ways to enhance the ways.

Satpal et al. (2014) analyzed the challenges related to women entrepreneurship in the present technological epoch. The study revealed the existence of imbalance between personal and professional life, socio-cultural constraints, improper marketing and entrepreneurial skills, improper technical knowledge and improper mobility in the society as the major challenges faced by the women entrepreneurs in the society. The study suggested that women must be educated and made aware regarding their roles, responsibilities and abilities.

Singh and Monga (2013) have depicted the changing status of women entrepreneurs. The study was conducted with 276 women entrepreneurs across 5 districts in Himachal Pradesh, India. The study highlighted that women have to encounter many problems like stiff competition, lack of adequate education and finance facilities, lack of risk bearing competency, lack of support from family and improper framework for excelling in the external environment. The study stressed that government must monitor its policies and schemes for analyzing their effectiveness and weakness. Regular workshops and campaigns must be organized to create awareness among women to understand their own caliber and efficiency.

Mercy (2013) investigated the major challenges faced by women at the establishment and development of their business ventures in the contemporary ventures. The study was conducted with 120 graduate women respondents in Nairobi, Kenya. Many challenges like lack of entrepreneurial knowledge, lack of mentoring and business strategic planning, inadequate access to financial ventures, setting and maintaining the business network. The study suggested the formulation and execution of suitable strategies for the women entrepreneurs. Women should be able to address and sort out the obstacles to set up a favorable as well as positive business environment.

Mahajan (2013) examined the current status of women entrepreneurship in India. The study reflected the example of Hina Bhutani as a successful entrepreneur and director of International Centre for Entrepreneurship and Career Development. Women entrepreneurs have to face many

obstacles in terms of work life imbalance, gender gap in education, lack of financial facilities, bundle of family responsibilities, lack of confidence and faith, inappropriate existence of institutions and improper legal framework. It is required to encourage the active efforts on the part of women to establish themselves, promote the work spirit among them and help them to become successful entrepreneurs in the international market.

Anis and Hasan (2013) examined the opportunities and challenges regarding the women entrepreneurs of 150 small and medium enterprises in Rajshahi area. The study revealed low level of mentality, improper access to raw materials, shortage of power supply, complex credit system, limited financial assistance, interference of religion and politics, lack of adequate training facilities, improper initiatives by government, marketing problems, lack of expertise and skills as well as communication gap as the major challenges faced by women entrepreneurs. The study stressed on adequate provisions to provide financial support, organize training programmes, simplify the work procedures, removal of marketing problems so that women could work in healthy environment.

Chander and Arora (2013) conducted a study to examine the financial challenges encountered by women entrepreneurs at the different phases of business. The sample of the study was 189 women entrepreneurs across Ambala, Hissar, Gurgaon and Rohtak in Haryana. The study revealed the lack of appropriate financial schemes for women entrepreneurs and the lack of initiative on the part of officials to take adequate steps for providing suitable facilities to women. Hence, the research stressed the significance of uprooting the problems for contributing towards social progress and economic development of the women. Government, policy framers and financial institutions should play an active role in synchronization with each other for helping the aspirants.

Kumbhar (2013) have foregrounded some critical aspects related to women entrepreneurship in rural India. The research stated the higher possibility of existence of lack of awareness, a gulf between the facilities for poor and rich women, improper communication with the successful entrepreneurs and the aspirants, paradox of choices between the family and career etc. Hence, there is dire need to make effective initiatives in terms of awareness programmes at the large scale so that women must get support to withstand the obstacles.

Popescu (2012) in her study made an attempt to examine the obstacles and challenges faced by female entrepreneurs in the society. The study highlighted the important role played by females towards the economic development of the nation. Moreover, women face many challenges in terms of discrimination, lack of adequate support from the families, existence of gender differences both at the micro as well as macro level. The study also revealed the existence of a gap between the profile of millennial and younger population. The study suggested that there must be adequate provisions regarding the settlement of women by providing them work environment essential for nation as well.

Vatharkar (2012) foregrounded the problems encountered by women entrepreneurs in Pune district in terms of inadequate financial opportunities, lack of stimulation, conflicting roles, struggle for work life balance, discriminatory practices and complex rules and regulations. The study revealed the financial support to family and economic independence as the magnificent causes for persuading the women to take work initiative. The study also focused on making the suitable environment wherein women could make precise attempts to start with the self-employment.

Al-Hossienie (2011) in his study evaluated the socio-economic influence of women entrepreneurship. The study was conducted with the women entrepreneurs engaged in tailoring and beauty salons in Sylhet city, Bangladesh. The study depicted the positive influence of women entrepreneurship on attitude, behaviour of family members as well as society. It was also found that majority of the women use their income for their family and with the prior approval of their spouses. The study also suggested that government must plan some suitable strategies and policies for the development of ventures related to women entrepreneurship. Apart from this, it is necessary to incorporate the demographic, social and other cultural variables to provide a sound environment to the aspirants.

Goyal and Parkash (2011) studied the various aspects, challenges and prospects regarding the women entrepreneurship in India. The study revealed the slow growth of women entrepreneurs in India due to lack of will power, antiquated norms and rituals, male dominance, obligations from the family, conflicts in prioritizing the choices, tough competition from the male counterparts, lack of cooperation, support and back from the family, poor infrastructural facilities and lack of awareness regarding the financial assistance. The study suggested that training programs and seminars must be organized by government and non-government agencies to enhance the competencies of women. Self-help groups must come forth to provide financial assistance to women.

Bharadwaj et al. (2011) investigated the challenges and opportunities related to women entrepreneurship in India. Changes in the ways of living, growing awareness among people, advancement in technology and growth in the literacy level has led to acceptance of role of women as entrepreneurs. The study revealed that dependence on service sector has opened many work opportunities for the women entrepreneurs with skills, education, competencies and potential. The study stated lack of financial opportunities, inadequate support from family, over burden of responsibilities and gender discrimination as the prominent challenges faced by them. Hence, it is suggested that family members must understand the feelings and emotions of women as well as provide them adequate psychological support. Government must strengthen the infrastructural facilities for them.

Cphoon et al. (2010) analyzed the aspects related to motivation, background and experiences across women and men entrepreneurs. The study highlighted the role of some financial and psychological factors such as desire to build the wealth, capitalizing their ideas and appeal to startup culture, which affect their zeal and desire to take initiative to prove themselves in the numerous domains. The study focused on the need to mentor the women entrepreneurs to initiate and proceed with the adequate initiatives to establish themselves. Moreover, it is also required that there should be adequate networking and infrastructural development for the well being of women.

Deshpande and Sethi (2009) conducted a study to foreground the problems and future prospects in context to women entrepreneurship in India. The study highlighted that many factors such as awareness among women about their skills and change in their approach, efforts on the part of Government, cooperation from the society, initiatives from the corporate sector, relaxation policies to enable the women enter into the entrepreneurship sector, impact of education as well as help from the Non government organizations had played an important role in strengthening the position in the economy. Hence, the study emphasized that continuous efforts must be taken across all the segments so that women could be able to perform magnificently in order to bring positive changes in the economy.

Tambunan (2009) studies the recent developments regarding women entrepreneurs from small and medium enterprises in emerging nations in Asian. The study highlighted the increase in growth of SMEs in the advancing nations. The study also revealed the comparatively low level of women representation in these regions due to many reasons like lack of adequate capital facilities, cultural hurdles, geographical constraints, low level of education and lack of infrastructural facilities. The study depicted the forced indulgence of aspirants in to muster more capital and strengthen their position in the society. Hence, it was suggested that adequate initiatives must be taken across all the domains and at all the levels so that women must get healthy work environment to excel and prove themselves.

Orser (2008) has given an overview regarding aspects related to research, public policy and women entrepreneurs in Canada. The study has depicted the economic growth and development contributed by the Canadian women entrepreneurs. Besides this, the researchers have presented the challenges faced by the entrepreneurs in terms of gender discrimination, bias in credit sanctions from the financial institutions, professional and personal obstacles. The study stressed on initiatives related to self-employed assistance programs, SME development initiatives and adequate infrastructural as well as financial support to enable them establish themselves across different arenas.

Jamali (2008) made an analysis regarding the opportunities and challenges faced by the women entrepreneurs in the advancing nations. The study was undertaken with the 10 women entrepreneurs in Lebanon. It was found that majority of the women struggles with lack of access to financial support, undercapitalization, and responsibilities of the family, gender pay discrepancies, frustration and discrimination in the market practices. The research stressed on adequate analysis of techniques and possibilities regarding women entrepreneurship in the advancing nations. Government must motivate other institutional agencies to participate actively to encourage the women entrepreneurship.

Singh (2008) identified the causes, obstacles and the major factors affecting the women entrepreneurship in India. The research depicted the existence of gender discrimination, inadequate networking, and male dominance, improper association of women with successful women entrepreneurs and lack of acceptance of women entrepreneurs in society. The research also suggested that women, economic and social development ministry must collaborate to synergize the females. Government must promote micro enterprises and revitalize the existing institutional framework for supporting the initiatives taken by women as well as supporting the spirit of winners to guide the aspirants in society.

Lall and Sahai (2008) made a comparative study regarding the aspects, issues and gauntlets related to family business and women entrepreneurship by identifying some psychographic and demographic variables like degree of commitment, entrepreneurial challenges and future plans for business expansion. The study was undertaken with working women entrepreneurs from urban area of Lucknow. There has been tremendous growth in the number of women opting for family business in the recent years. The study highlighted the low level of self-perception, self esteem, entrepreneurial intensity, lower status and operational challenges for the growth and expansion of business ventures. Hence, the study suggested that women must acknowledge their potential and importance with regard to business opportunities.

Damwad (2007) examined the initiatives, challenges and experiences of women entrepreneurs across Finland, Denmark, Iceland, Norway and Sweden. The work highlighted finance,

knowledge, skills, competencies, family, marketing proficiency, will to grow, entrepreneurial activities, work life balance, schemes and policies by the government as the major problems faced by the women while setting and establishing their business ventures. Hence, the study focused on developing adequate policy mix to enable the women to proceed ahead. There must be provision of institutions to educate the aspirants regarding managerial skills.

Verheul et al (2004) have elucidated the aspects and factors related to female entrepreneurship across 29 nations. The study highlighted the active participation of female entrepreneurs in the informal segment, especially in the poor nations. The study also found the negative influence of unemployment level, impact of investment in Research and Development and economic transition and the positive impact of family on female entrepreneurial activities. The research suggested that government must focus on the institutional factors such as social security, taxation policy, availability of capital and adequate support system, which have strong impact on female entrepreneurship than on the male entrepreneurship.

Mehrotra (2003) analyzed the managerial problems among the 120 rural as well as urban working female governed households in India. The study revealed that majority of the women belonging to both rural as well as urban areas had been significantly affected by the financial constraints. It was also highlighted that 82% of the rural and 75% of the urban women had to encounter the psychological challenges due to problems created by the spouse and in-laws and the accountability towards the family. Most of the rural women were exposed to stress due to lack of adequate paid help available to them. Hence, it was suggested that women aspirants must be provided with adequate training skills at regular intervals to enable them withstanding the problems in their family.

Rao (2002) conducted a study to elucidate the problems faced by women at social, personal and economic level in Chennai, India. The research revealed that majority of the women faced lack of adequate knowledge, improper business exposure, dominance of the males, heavy dependency on spouse for financial matters, narrow ideology towards life, lack of establish and fair set of rules as well as regulations. The study also recommended that women should be provided with adequate facilities to motivate them to take initiative to excel in their lives with the appropriate financial assistance and facilities.

Yadav (1999) examined the situation of women entrepreneurs of Saurashtra region and depicted the major challenges encountered by them. The study revealed that 100% of the women were unable to harness their production capability. Majority of the women were found with some complexities such as procedures related to financing and marketing as well as lack of adequate training related to begin any kind of work. The study also foregrounded that many factors such as age, religion, education and marital status had magnificent influence on the ideology of entrepreneurs. Therefore, the study emphasized on providing adequate knowledge to the women through mobile training institutes.

Sunderpandian (1999) highlighted the major difficulties faced by the women entrepreneurs in context to Indian economy. The research foregrounded the low level of entrepreneurial ideas, initiative and knowledge on the part of aspirants, lack of financial support from the family, inability to encounter risks, managerial and financial problems, tough competition from the male counterparts, possibility of technical complexities, soaring prices of the raw materials as the major problems faced by the women aspirants. The study stressed that government must take suitable steps to boost the research to enhance the work capabilities of the aspirants and provide

more opportunities to enable them to meet their desires to establish as well as be financially independent.

Bowen and Hisrich (1986) examined the research studies undertaken by researchers regarding the possibilities of women entrepreneurship. The study highlighted the skills, potentials and creativity among women entrepreneurs as well as the challenges faced by them in terms of male dominated society, problems of family background, financial constraints, education, responsibilities of the family, lack of support from spouse and improper work environment. Hence, it is necessary that women must be provided with adequate environment and facilities so that they could prove themselves and support their families. Government must organize suitable training programmes and provide financial assistance to them. Apart from this, family members must lay a supportive hand to make them accomplish their goals in life.

### **1.5.2 Future prospects for Women Entrepreneurship**

Gautam and Mishra (2016) examined the multiple aspects and future prospects related to women entrepreneurship in India. The study has drawn the attention towards the challenges encountered by women entrepreneurs in terms of finance management, scarcity of raw materials for productive capacities, competitive environment, family burden, lack of supportive environment, inadequacy of skills and capabilities, antiquated rituals, male dominance societal framework and lack of optimistic approach. The study suggested the need to change in approach of males, initiate awareness drives to create awareness among women and proper mobilization of resources.

M. (2016) discussed the problems and prospects related to women entrepreneurship. This concept has been accepted as significant source in the financial growth of the advancing as well as advanced nations. The study stated the challenges faced by women entrepreneurs right from the beginning of their journey regarding the establishment of their business in terms of travelling constraints, credit inadequacy, marketing problems, patriarchal society, higher cost of production, lack of sufficient raw materials, conflicts in the family and higher cost of production. It was suggested that government must strengthen and revive their schemes, policies, plans and initiatives from time to time. Women must conduct proper market study before entering into any business venture.

Kalim (2016) have ascertained the challenges and opportunities related to women entrepreneurship in the modern era. Women have been recognized as influential resource to withstand the economic challenges over the globe in the high-tech world. Hence, it is necessary that nations must establish and develop the networks and platforms to provide healthy work culture to the women entrepreneurs. Government must make effort to transform them into opportunities for the sake of well being of women, social institutions as well as the nations throughout the world.

Deo et al. (2016) examined the association between women entrepreneurship and the socio-economic development of their families. The study was conducted specifically with the 381 respondents who were the working women in the rural areas of Rwanda. The research exhibited the higher degree of positive correlation between women's contribution towards the upliftment of their family. The study also highlighted the lack of adequate education and training facilities as the major constraints hampering the efforts of women. Hence, women entrepreneurs must strive hard to reduce the intensity of the loss incurred due to the presence of such constraints in their regular functioning.

Dwibedi (2015) made an initiative to understand the current trends, innovations and aspects related to women entrepreneurship in India. The study supported that increase in awareness among women, change in the social fabric, rise in the educational level of women and some change in the infrastructural facilities had acted as the positive instrument for women entrepreneurship. Women had been capable of making stupendous contribution towards the nation. The study also highlighted that the initiatives taken by the government had benefitted only a particular segment of the nation. The study stressed on providing some fruitful platforms for enabling the women to polish their capacities.

Muthukumar and Bhuvanewari (2014) studied the prospects and possibilities related to empowerment of women entrepreneurship. The sample of the study was 90 women entrepreneurs from Pudukkottai district. The study depicted the probability of many challenges and opportunities for the women entrepreneurs in the present epoch. Women must be confident, skilled, intelligent, vigilant and productive to face challenges and withstand them to establish themselves and be independent. It is also essential to update knowledge and technical transformations to enhance the work capabilities.

Shah (2013) in his study highlighted the ways to create a positive work environment in context to women entrepreneurship in India. The study was carried out with 63 women entrepreneurs in 12 states across India. The research revealed the contribution of women entrepreneurship in the economic development of the nation. The study also highlighted the imbalance between the personal and professional life as the major barrier for entrepreneurial activities of women. Only a few women entrepreneurs were found to access the support from the government assistant. The study stressed on providing a sound and enabling work environment to women to conduct their initiatives without entangling in the whirlpool of obstacles.

Barrett and Moores (2010) depicted the radical subjective approach related to contribution of women entrepreneurs in family business. The study highlighted the impact of self-organization, modularity and empathy on the working competencies and proficiencies of women. Women have proved themselves in bringing the gargantuan transformations in the family and society itself. Family of the women entrepreneurs has been considered as the foundation in promoting their efforts. The upward shift in the ladder of class was found to paly an imperative role in removing the constraints and establishing the women in the technical and male dominated industry in the society. The phenomenon of self-organization has focused on providing numerous productive ways for entrepreneurial development in India.

Singh and Sengupta (1985) explored the visions of potential women entrepreneurs in India. The study highlighted the higher level of potential on the part of educated women to accept entrepreneurship as a positive challenge, ambition as well as fruitful way to excel in life and prove themselves in the society. It was also found the tendency and potential of less qualified women having perception of the EDP training as the effective way to make swift money. Besides this, majority of the women entrepreneurs were found to be clear regarding the ways and means regarding the projects. The study suggested that males and other family members should support the women to set up their enterprises and establish themselves to make active contribution towards the family and the nation.

Surti and Sarupriya (1983) examined the psychological factors influencing the entrepreneurs across the different segments of the women. The study indicated the low level of stress and a self-role distance among unmarried women and the women entrepreneurs belonging to the joint

families. The study also found the close association between fear of success and role inadequacy as well as external focus of control and stress role. Hence, it was focused that women entrepreneurs should engross themselves in certain ways to uplift themselves and uproot the major obstacles in their successful attempts. It is also required to provide concessional rates facilities to encourage women. Importance should be given to the need of regulations for better functioning.

In the light of the above studies, it is corroborated that almost all the nations have accepted the emerging proficiencies and potentials of women entrepreneurship. Even though, the women have to encounter numerous challenges to establish themselves and make significant contributions towards the nation's development.

### **1.6 CHALLENGES FACED BY WOMEN ENTREPRENURSHIP**

Many initiatives have been taken at National as well as State level in terms of infrastructural development, financial assistance, awareness programmes, regulations and various policies to strengthen the situation of women entrepreneurs. Despite the initiatives, most of the women entrepreneurs struggle with some problems while stepping ahead for the establishment of their business ventures in market (Fazalbhoj, 2014).

- 1. Political Instability:** The lack of political Instability is the main reason for the problems faced by the women. The strategies and policies are formulated for the sake of benefitting the ruling party itself and they are not implemented by taking right initiatives. The policies are not reviewed at regular intervals of time, which act as gulf in fulfilling the needs of present generation as well as the demands of the contemporary era. There is lack of cooperative spirit among the officials and the policy makers to create effective framework to look into and serve the needs of the aspirant women entrepreneurs.
- 2. Poor Infrastructural facilities:** There is lack of adequate execution on the part of State governments Ghani et al. (2014). The infrastructural facilities are not appropriate to enable the women to take suitable initiatives to make their living in the present times. The limited access to resources like land and credit is another major constraints. Only few are exposed to the major facilities available in the market. A study says that the women belonging to elite business families and those living in urban areas could have better access to the resources in comparison to those living in rural areas. Government make more access of facilities in the urban areas as compare to the rural areas.
- 3. Lack of support from family and spouse:** The obligations of the family act as a major stumbling block for successful women entrepreneurs both in the emerging as well as advanced nations. Majority of families in the State of Haryana prefer to have boys and the women are still confined in their homes after a particular point of time. A study conducted in four districts of Haryana depicted that majority of respondents studied were not in favour of women's activities away from home after sunset (Manju, 2014). The education level as well as family background of the husbands play an important role in the women participation across the business world. So women have to wind up with their thought process to step out and make their living.
- 4. Socio-cultural Environment:** The antiquated rituals of the male dominated society and conventional social fabric impede the women from entering the field of entrepreneurship. They have to bear the lot of load to work within the boundaries and conditions specified by the social framework that restrains them to prosper as well as attain success across numerous fields of entrepreneurship. Women give importance to their family and relationship ties; they



are sentimental and emotional; hence, their innocence is misguided as well as misused by the outdated mindset of those who don't want to see the women as their counterparts.

5. **Lesser Knowledge of competitive environment and market mechanism:** Unlike men, the women in Haryana have lesser mobility due to the traditional social ties. If a single woman asks for a room, then she is still looked with suspicion and this pressure restrains them to take initiatives. They are also exposed to tiresome and unsafe work environment where they have to encounter many officials for paper work. The officials don't give up a single chance to take their advantage forcing the women to give up the idea of surviving the challenges. Moreover, the businesses owned by the women are comparatively small so they do not get easy access to the innovative schemes, advantages and assistance.
6. **Lack of adequate research:** There is sheer inadequacy of timely research in understanding the challenges, processes, strategies and opportunities related to the aspect of women entrepreneurship (Bulsara et al 2014). Government lacks in providing proper institutional framework, where a team of appropriate officials could work for conducting research at regular intervals of time for the betterment of society with the provision of some fruitful provisions necessary to elate the women to come forward.
7. **Role conflicts and Inability to maintain work life balance:** The lack of support from the family leaves many women in trouble. This leaves them less motivated, reduces their strength, confidence and will power while conducting their business. The family members are reluctant to stay as a strong support system behind them and this lesser support from their family leaves them hay and dry. It also creates imbalance in their personal and professional life once they enter the turf. It leads to stress, anxiety and disorganization in the long run.
8. **Lack of financial assistance:** The lack of future security had proved as major constraints that hamper the growth of women entrepreneurs. The poor knowledge about the various schemes initiated by government, incentives, subsidies, loan facilities by the government also play as a major factor which hamper the efforts of the aspirants to take further initiatives. Hence, the efforts made to support the women do not reach the needy entrepreneurs in the backward as well as remote rural areas.

Hence, it is necessary to take suitable measures to make the best use of capacities and abilities of women, who make equal efforts to make significant contribution towards the development of nation across all spheres.

### 1.7 SUGGESTIVE MEASURES FOR BETTER POSSIBILITIES IN FUTURE

The following suggestions must be executed in Haryana to enrich and enhance the status of women entrepreneurship in Haryana.

- Women should focus on self fulfilment to motivate themselves as well as others to face the challenges in their work. Resurgence of women entrepreneurship is necessary by spreading awareness among the women, making them realize of their role in the development of nation as well as enable them recognize their competencies (Bulsara et al 2014).
- Seenivasan also highlighted the significance of research practices in the field of women entrepreneurs a substantial mechanism to conduct proper research for getting deep insight and knowledge regarding women development through gender as a lens (Seenivasan, 2014).
- Besides this, government must collaborate with some NGOs and corporate sector for organizing empowerment programmes in order to encourage the women to start with their

business ventures and take adequate decisions to establish themselves in future (Ayogu and Agu, 2015).

- The study also focuses to enhance some fruitful initiatives by persuading the Self-help groups for revitalizing the work competencies and development of mind (Fazalbhoy, 2014). Hence, women should be prompted to acknowledge their potentials and capabilities to perform their best for supporting the nation across multiple perspectives.
- Government must make effective inputs to provide the aspirants with proper infrastructural facilities to enable them fulfill their basic and advanced courses like make the suitable provision of appropriate scholarship amounts to the brilliant women to enable them creating sustainable business opportunities (Emile, 2011).
- Government must enhance the women participation in the decisions as entrepreneurs. This would make them feel worthy and fill them with ample enthusiasm as well as effervescence for further course of action in future.
- It is also necessary to revise the schemes supporting and promoting women entrepreneurship. Government must ensure the strict as well as effective execution for some schemes for the benefit of entire society. Women entrepreneurship must be promoted with local resources by focusing on non-monetary benefits like prospects for refined vision, rejuvenation of mind and refined skills.
- Moreover, government must take responsibility to implement the policies for promoting the women entrepreneurship in rural as well as urban areas. So that women belonging to both the segments of society could be able to get equal opportunities to try their proficiencies and make the possible efforts for their survival.

Above all, it is necessary women must be aware about **the benefits of reading some self-motivating books like I am the Mind, Think and Grow Rich etc.** As these books would help them to make the use of innate flair and give them right direction. Moreover, they would act as a significant factor to boost their will power and pump them to take adamant decisions in future.

### 1.8 CONCLUSION:

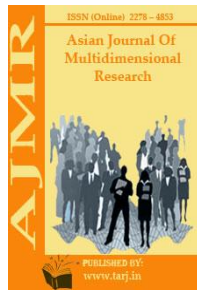
In the nutshell, it is concluded that many changes like urbanization, globalisation, education and technological innovations have been the major force to bring such transformation in the society. Entrepreneurship not only promotes wealth among the women but make significant contribution towards the national development. Hence, it is also necessary that women entrepreneurs have to be organised into some productive association, which would cater to the needs of aspirants by identifying their potentials, develop markets for their initiatives, enhance the product quality, inculcate skills and practice them positively for better performance. It enables the women to make the best possible use of their abilities with the adequate use of available resources. Many initiatives have been taken by the government, but there are some problems that are faced by women to prove themselves. Although, the growth rate in the women entrepreneurship shows the positive trend in India as well as the state of Haryana, even then there is a far way to go to reach the maximum level of harnessing the available opportunities. The study has proposed many suggestive measures, which are essential to be incorporated in order to get the maximum benefits from the initiatives to enable the women to proceed further and achieve their career goals and needs, whichever act as their driving force.

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**WOMEN ENTREPRENEURSHIP IN BACKWARD REGION: A STUDY IN JHARGRAM DISTRICT OF WEST BENGAL**

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**ABSTRACT**

*Women entrepreneur is a woman who sets a business unit, becomes leader of that and struggles for achieving success for economic independency The growth of women entrepreneurship in*

*India especially in rural areas has become an important domain of Indian economy. Government initiatives are motivating more rural women to come forward to take entrepreneurship. In the course of self help group (SHG) operation, women are gradually motivated to set up small enterprises for their self employment and creating opportunities for others. Formation of group among poor women, generating small savings, taking loan from group fund and starting up small enterprises are the process through which women entrepreneurship development takes place. At the dawn of the present century, government has been giving thrust to bring out development of backward districts all over the country specially those districts which have low literacy among women and lower rate of employment opportunities. The present paper has highlighted the development of entrepreneurship among women in backward area like Jhargram of West Bengal based on the primary data. It has highlighted different aspects of entrepreneurship like trades, profitability of each trade and contribution of income from entrepreneurship to household income etc.*

**KEY WORDS:** MFI, Women Entrepreneur, SHG, Backward Region **JEL CLASSIFICATION:** L26, L31

## **INTRODUCTION**

It is generally said that entrepreneur is a person who accepts challenging role for setting a unit for production or trading of goods and services in order to meet personal need and economic independency. Accordingly, women entrepreneur is a woman who sets a business unit, becomes leader of that and struggles for achieving success for economic independency (Maheshwari & Sodani-2015). The term entrepreneur is defined in other ways also, as a person who combines capital and labour for production (Ansari 2016), the agent who buys means of production at certain prices, in order to sell at prices that are certain at the moment at which he/she commits him/her self to his cost. The progress of women entrepreneurship and self help groups has significant impact on sustainable development as it involves poor women of rural and backward areas towards income generation and creating employment opportunities. The SHG based microfinance is mostly concentrated among poor women (Daley-Harris S. 2007). The increasing rate of women's education and their urge to become financially independency has led them to be entrepreneurs (Bama et al., 2018). The government also takes remarkable effort from time to time to draft plan and policies suitable for self employment including women empowerment. Keeping the gradual increasing rate of unemployment, more thrust has been given for entrepreneurship development among youth including formation of SHGs for women. It is fact that since the passage of time Government has also made several changes in drafting its plan and policy in order to minimise the gender gap in development process (Pal et al. 2016). Some of such initiatives include- Rashtriya Mahila Kosh, Indira Mahila Yojana, Micro Credit Scheme, Women's Dev Corporations, Marketing of Non-Farm Products of Rural Women, NABARD-SEWA Bank project, Priyadarshini Project, Trade Related Entrepreneurship Assistance and Dev., Mahila Vikas Pariyojana, setting up Ministry for Skill Development and Entrepreneurship, Mudra Bank, Start up Village Enterprises Programme, Micro & Small Enterprises Cluster Development Programs, Aajeevika skill development, SBI's Stree Shakti Scheme, Prime Minister Employment Generation Programme, Interest Subvention, Pradhan Mantri Koushal Vikash Yojana, etc. The progress of women entrepreneurship has also received global attention.

The distribution of women entrepreneurship across economic activities indicates that women tend to work in retail and service sectors (UNDP-2018).

## REVIEW OF LITERATURE

Scholars (Moore & Buttner, 1997) have pointed out that in the developing countries women entrepreneurship has been growing up to make themselves survive as well as to help support their families. Their self determination, expectation to be recognised, self esteem and career making goal have encouraged women to take up entrepreneurships. Study based in Mumbai highlighted on women entrepreneurship development in three categories like manufacturing, trading and service sectors for which descriptive statistics used to draw the level of significance (Rajeshwary 2006). Scholar (Sharma 2013) has pointed out that women as specific target group for all developmental programmers, better educational facilities, adequate training program on management skills, encourage participation in decision-making are some of the important consideration Government of Ethiopia has emerged that development of micro and small enterprise (MSE) is the important focus area of the strategic development of the country for massive support to them. Access to finance, market, technology, training and working space are provided as the entrepreneurship play crucial role to reduce unemployment and poverty. (UNDP, 2018). Scholars (Alam et.al, 2011) have investigated the key factors affecting the success of women entrepreneurship in Southern Region of Malayasia and found that family support, social ties and internal motivations have positive effect to the success of women entrepreneurship in small business. A case analysis in Nigerian entrepreneurs indicates (Singh et.al, 2010) that female entrepreneurs usually face problem of sexual harassment in their business but the challenges faced by them motivate others to start the business. Interestingly, women entrepreneurs having basic qualification, having previous work experience and have started business from difficult situations have higher rate of success. In Bangladesh, scholars (Morshed & Hoque, 2015) have pointed out that there is significant relation between entrepreneurship and empowerment of women. The impact of entrepreneurship has positive correlation with empowerment. Different opinions have been expressed by the scholars studied on women entrepreneurship in Indian perspective. There are increasing numbers of women becoming leaders of their own business and struggling for success which also, lead them for empowerment. Different categories of entrepreneurships have been identified in India by the scholars which include large scale and small scale entrepreneurship (Ratnam, 2012), farm and non-farm and of so many other types. There are other categorical distribution of women run/managed entrepreneurship such as women run, women managed and women-men jointly managed (Thyammal-2014). Scholars have also outlined other categories like 1<sup>st</sup> generation enterprises, parent as entrepreneurs and in-laws as entrepreneurs (Antony et al. 2013).

## SIGNIFICANCE OF THE STUDY

While going through the research paper across the states of our country and abroad it has been observed that scholars have studied on women entrepreneurships mostly in rural, semi urban and urban areas but there is negligible number of study in backward region like Jhargram. Some have captured the role of SHGs and economic empowerment but hardly have they put thrust on women entrepreneurships in backward region.

Considering the emerging need and gap of research work, this study has been taken up to make some contribution in this field as well as to highlight the progress of the development of women entrepreneurship and SHGs in backward region of West Bengal.



## OBJECTIVES OF THE STUDY

The major objective of the study is to understand the profit generated from business entrepreneurs and to assess the contribution to household income by the entrepreneurs.

## HYPOTHESIS

1. There is no significant difference across educational groups in respect of entrepreneur's monthly income from enterprise.
2. There is no significant difference among farm and non-farm group in respect of entrepreneur's monthly income from enterprise.
3. There is no significant difference across caste groups in respect of entrepreneur's monthly income from enterprise.

## RESEARCH METHODOLOGY

This primary data has been collected through face to face interviews from the women entrepreneurs of Jhargram district in West Bengal. Analysis of variance (ANOVA) is a collection of statistical models used to analyze the differences among group means and their associated procedures (such as "variation" among and between groups). There are two types of analysis of variance (ANOVA): one-way and two-way. Here ANOVA is used to test the significant difference between the following different groups.

1. Educational group wise income variation
2. Category of enterprise income variation like farm and non farm
3. Caste wise variation of woman entrepreneurs' income from enterprise

## RESULT AND DISCUSSION

### 1. Types of women's enterprises

Various types of enterprises run by women entrepreneurs as revealed from the primary survey have been presented herewith as follows:

**TABLE-1: DISTRIBUTION AS PER TYPE OF WOMEN'S ENTERPRISES**

Sl. No.	Name of Enterprise	f (Frequency)	% (Percentage)
1	Handicraft	11	18
2	Tailoring	8	13
3	Poultry	4	7
4	Animal Husbandry	6	10
5	Babui Craft	4	7
6	Shop	6	10
7	Gala ring making	3	5
8	Diet Supply	2	3
9	Fishing	3	5
10	Others	13	22
Total		60	100

*Source: Primary Data from Field Survey*

From the above table 1, it is found that there are ten different types of women entrepreneurs including other categories. The percentage distribution shows that 18% of the entrepreneurs are engaged with handicrafts, 13% are in tailoring, 10% are with animal husbandry and 10% are running shops. Of the rest, 7% engaged in poultry farming, 7% are in babui grass craft, 5% are with gala ring (imitation) making, 5% are with fishing and 3% are engaged with cooked diet supply activities. The other trades of enterprises constitute 22% which include, mushroom, saal leaf craft, palm leaf crafts, transport service, tasar weaving, handloom, etc.

## 2. Monthly average income from enterprises and share of contribution to household income

Average monthly income from different enterprises has been presented in Table 2.

**TABLE-2: ENTERPRISE WISE AVERAGE MONTHLY INCOME OF WOMEN ENTREPRENEURS**

Sl. No.	Name of Enterprise	No. of Woman Entrepreneurs	Average Monthly Income/enterprise (Rs.)
1	Handicraft	11	2458
2	Tailoring	8	4097
3	Poultry	4	6307
4	Animal Husbandry	6	6743
5	Babui Craft	4	3623
6	Shop	6	5052
7	Gala ring making	3	3028
8	Diet Supply	2	1938
9	Fishing	3	5778
10	Others	13	2669
Total		60	3922

Source: Primary Data from Field Survey

The Table-2 indicates that average monthly income from enterprise of animal husbandry is Rs. 6743/-, followed by poultry is Rs. 6307/-, fishing is Rs. 5778/- all of which are based on farm. There is fourth higher position of average monthly income from shop i.e., Rs. 5052/- and fifth higher position of average monthly income from tailoring i.e., Rs. 4097/-. All other trades like babui craft, gala ring making, handicrafts and diet supply are having less than average total income per enterprise i.e., Rs. 3922/-

**TABLE-3: ENTERPRISE WISE AVERAGE % SHARE OF CONTRIBUTION TO FAMILY INCOME**

Sl No	Name of Enterprise	No. of Women Entrepreneurs	Average Household income/month	Average of income from entrepreneur	Average % Share to family income from Enterprise
1	Handicraft	11	4358	2458	66
2	Tailoring	8	9672	4097	52
3	Poultry	4	9207	6307	64
4	Animal Husbandry	6	10826	6743	66
5	Babui Craft	4	6998	3623	71
6	Shop	6	7602	5052	66

7	Gala ring making	3	5794	3028	58
8	Diet supply	2	3438	1938	69
9	Fishing	3	7444	5778	76
10	Others	13	6200	2669	50
Total		60	7132	3922	61

Source: Primary Data from Field Survey

The Table 3 shows the average % share of contribution to family income from enterprises. It indicates that contribution to family income from enterprise on fishery is 76% and income from enterprise on babui grass craft is 71%. There are more than average share to family income (i.e., 61% ) share to family income from enterprise like- diet supply, handicrafts, shop and poultry. Other enterprises which have less than average % of contribution to family income from the enterprises like – gala ring making and tailoring. It is interesting to see that income from almost every enterprise has more than average 50% share of contribution to family income.

### 3. Average family income and savings per month

Average monthly household income, expenditure and amount of average savings have been presented in the Table 4.

**TABLE-4: ENTERPRISE WISE AVERAGE FAMILY INCOME, EXPENDITURE AND SAVINGS**

Sl. No	Name of Enterprise	No. of Woman Entrepreneurs	Average Household Income /Month	Average family Expenditure /Month	Average of Savings/ Month
1	Handicraft	11	4358	2755	1603
2	Tailoring	8	9672	5660	4012
3	Poultry	4	9207	5140	4067
4	Animal Husbandry	6	10826	5858	4968
5	Babui Craft	4	6998	4218	2780
6	Shop	6	7602	4917	2685
7	Gala ring making	3	5794	3933	1861
8	Diet Supply	2	3438	2850	588
9	Fishing	3	7444	4067	3378
10	Others	13	6200	4013	2187
Total		60	7132	4326	2806

Source: Primary Data from Field Survey

As shown in Table-3 women entrepreneurs are getting income from enterprises run by them and making remarkable contribution to their family income. The Table 4 presents their average monthly household income, average expenditure and savings per month. It indicates that monthly household income of those who engaged in animal husbandry and poultry is higher and their monthly average amount of savings is also higher. In terms of monthly average expenditure, it is observed that those families who are engaged in tailoring, animal husbandry, poultry and running shops are higher than the others.

#### 4. Average loan taken from SHGs and profit margin ratio

Average loan taken from SHGs is being found in the following table (4.5) and the profit margin ration is being presented after this (under table no 4.6).

**TABLE-5: AVERAGE LOAN TAKEN FROM SHGS BY WOMEN ENTREPRENEUR**

SL No	Name of Enterprise	No. of Entrepreneur	Average Loan (Rs.)
1	Handicraft	11	7455
2	Tailoring	8	16375
3	Poultry	4	30750
4	Animal Husbandry	6	19167
5	Babui Craft	4	4000
6	Shop	6	22833
7	Gala ring making	3	9000
8	Diet Supply	2	11000
9	Fishing	3	33333
10	Others	13	4769
Total		60	13583

Source: Primary Data from Field Survey

Data collected on the loan taken by the women entrepreneurs up to 31<sup>st</sup> March 2018 has been presented in the above table 5. It indicates that entrepreneurs engaged in fishing have taken highest amount of average loan i.e., Rs. 33,333/- followed by the entrepreneurs engaged in poultry Rs. 30750/-

**TABLE-6: AVERAGE PROFIT MARGIN RATIO OF ENTREPRENEURS**

SL. No.	Name of Enterprise	Number of Entrepreneurs	Average Profit Margin Ratio (%)
1	Handicraft	11	75
2	Tailoring	8	60
3	Poultry	4	62
4	Animal Husbandry	6	72
5	Babui Craft	4	82
6	Shop	6	63
7	Gala ring making	3	65
8	Diet Supply	2	50
9	Fishing	3	54
10	Others	13	77
Total		60	69

Source: Primary Data from Field Survey

#### 4. ANOVA Results

In Table 4, we have presentd the ANOVA results by different factors.

**TABLE 7: RESULT OF ANOVA**

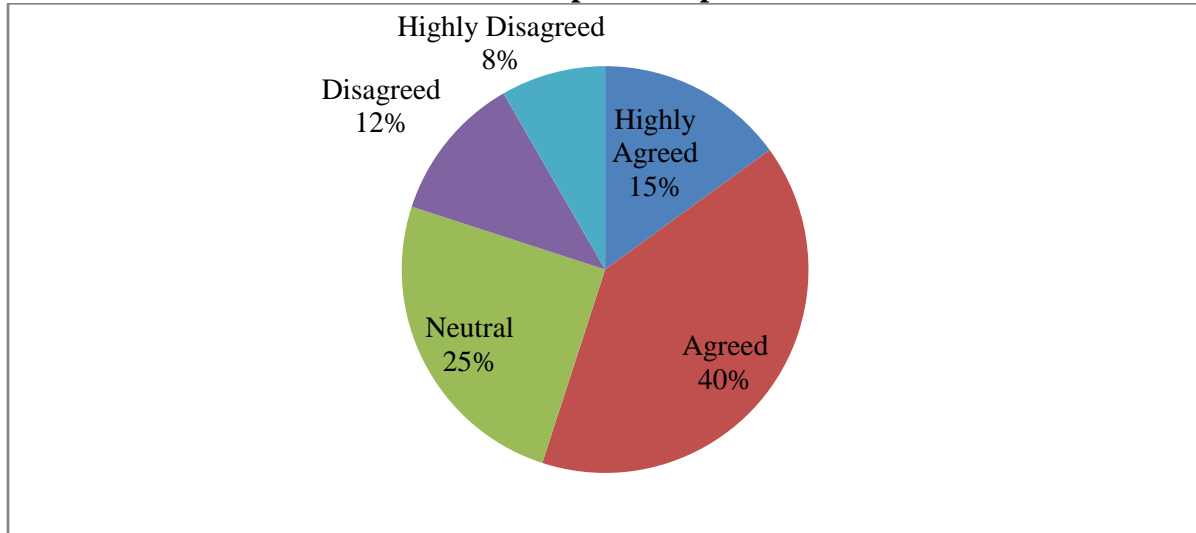
Factors		Number	Monthly Income (Average)	F- Value	Level of significance
Education Level	Illiterate	14	2705.4	20.898	0.000
	1 to 10	31	3241.2		
	Above 10	15	6462.5		
Type of Entrepreneurs	Farm	17	5360.9	10.854	0.002
	Non Farm	43	3352.4		
Caste	SC	9	4041.3	0.599	0.618
	ST	13	3393.5		
	OBC	9	3418.3		
	General	29	4277.2		

*Source: Own Estimation*

From the table 7, it is observed that there is statistically significant difference in monthly average income of women entrepreneurs in different educational group i.e. 'illiterate', '1 to 10' and 'above 10' at 1 % level of significance as p-value is 0.000. Thus, null hypothesis is rejected, that is why alternative hypothesis is accepted. In case of involvement in farm and nonfarm activities there is also statistically significant difference in monthly average income between them at 1 % level of significance as p value is 0.002 but in different caste group like SC, ST, OBC and GEN there is no statistical significant difference among them. Here, we are unable to reject null hypothesis at any level of significance i.e. caste is not the factor affecting in entrepreneurs monthly average income.

### **6. Opinion about helping of micro finance to start business**

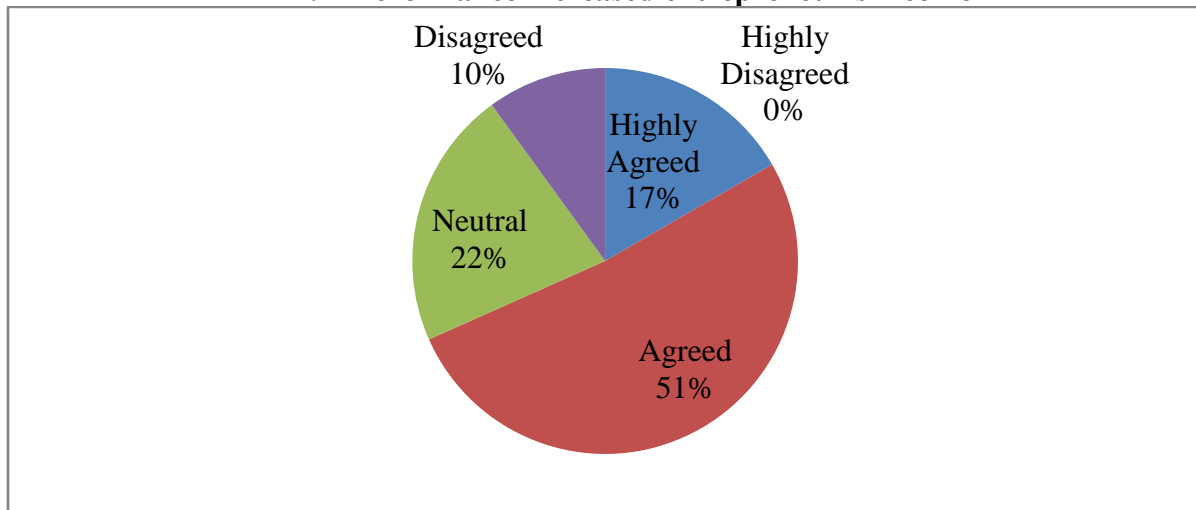
Five point Likert's scale was used (highly agree, agree, neutral, disagree, highly disagree) to collect opinion of the women entrepreneurs. The opinion given against the statement has been presented in different pie charts herewith as follows. The chart 1, shows that 15% of the women entrepreneurs is highly agree, 40% is agree with the statement that 'micro finance helped to start the business.' On the other hand, 12% is disagree, 8% is highly disagree and 25% is neutral about their opinion against the statement.

**Chart-1: Microfinance helped entrepreneurs to start business**

Source: Primary Data from Field Survey

### 7. Opinion about role of micro finance to increase income

Opinion in respect of the statement that micro finance increased the income of women entrepreneurs has been presented in the Chart 2. It indicates that 17% highly agreed, 51% of the respondents agreed with the statement. On the other hand, 22% of the respondents is neutral, 10% disagree and nobody strongly disagreed with the statement.

**-2: Microfinance increased entrepreneur's income**

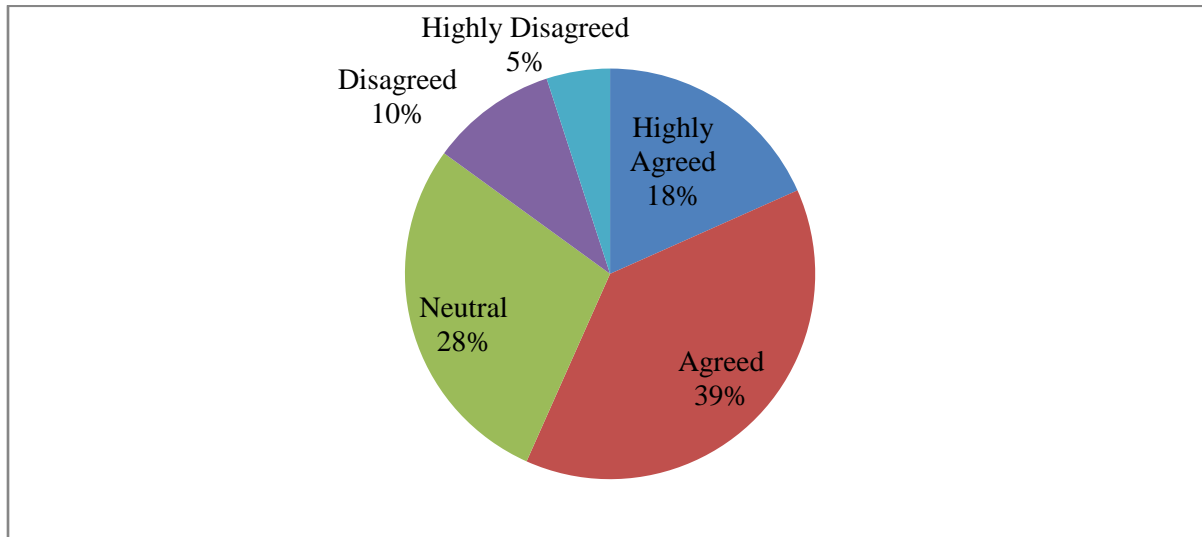
Source: Primary Data from Field Survey

### 8. Opinion about participation in decision making of family affairs

The Chart 3 shows that 18% of the women entrepreneurs highly agreed about their participation in decision making of family affairs is increased, 39% agreed. 28% women entrepreneurs were found neutral (neither agree nor disagree) with the statement. On the other hand, 10% of the women entrepreneurs disagreed and 5% highly disagreed with the statement that their participation in decision making of family affairs has been increased. In majority cases (57%),

women entrepreneurs agreed that their decision making power in family affairs had been increased.

**Chart-3: Entrepreneurs participation in decision making of family affairs has been increased**

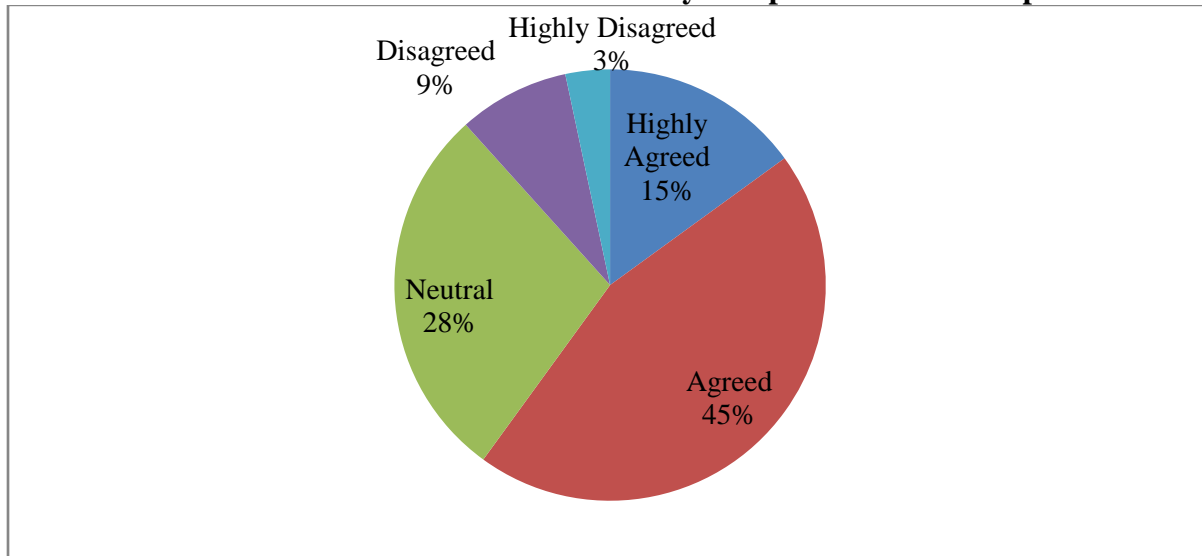


Source: Primary Data from Field Survey

### 9. Opinion about micro finance increased society's respect

In the chart-4, it is found that 15% of the women entrepreneurs have highly been agreed with the statement that involvement in microfinance has increased societal respect towards them and 45% have agreed with the statement. There are 28% women entrepreneurs who have given neutral opinion with the statement, 9% disagreed and 3% highly disagreed. The majority of the women entrepreneurs (60%) have agreed that societal respect has been increased for their involvement with microfinance.

**Chart-4. Microfinance increased the society's respect towards entrepreneurs**



Source: Primary Data from Field Survey

## CONCLUSIONS

In conclusion, it is important to state that development of women entrepreneurship has got its pace and SHGs have been playing its role as tool of micro finance support. In their opinion about progress in light of five point (Likert's) scale, majority have either agreed or strongly agreed about the fact that microfinance has helped to start their business, to increase their income, participation in decision making of family, societal respect towards them etc.

## ACKNOWLEDGEMENT:

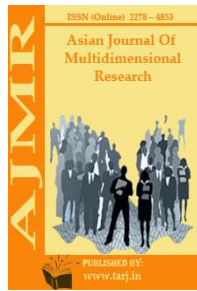
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**A STUDY ON PERCEPTION AND PROBLEMS TOWARDS EDUCATION  
IN NAMAKKAL DISTRICT**

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**ABSTRACT**

*India has unity in diversity. This is not only for culture, soil, language and religion but also in economical status. India is with huge population and different economical clauses. These are simply managed only with the help of education. It has international standard institutions and produces lot of talented young generation. One and only big problem for the talented students in India is financial issue due to poor family background and high cost of education. The only solution for this is to help them with the educational loan. This financial assistance makes many people's life worthy and economy a developed one. This article give s an overview about situation prevails in the Educational loan segment, need of the educational loan, challenges in educational loan in India.*

**KEYWORDS:** *Educational loan, economical status, economical clauses, international standard institutions, talented young generation and financial assistance*

## **INTRODUCTION**

As per the report of the National Statistical Commission, Government of India, 2017, India is the youngest country in the world as it has largest share of the youth in the world. 87 per cent of young women and men are working in the developing nations. The young, energetic, vibrant, innovative and dynamic man power should be used in a right way. India has a large young population with low gross enrolment ratios providing opportunity for the players in the education sector including education loan providers i.e. Banks and NBFCs. Comparatively, the percentage of beneficiaries of Education loan (25%) in higher education is the lower than the developed nations like USA and Europe who have 75% beneficiaries.

Educational loan is playing a vital role in the countries like India which has more man power. It is not providing employment opportunity but also eradicates the social disparity. Future economy of every family and whole nation is developed because of quality of higher education. The educational loan paves the ways for attaining the goal of providing education for every children of the nation who are the pillar of the future India. Though there is the need of the educational loan, the financial institutions are having norms to consider for providing the loan to the students. The socio-economic profile of the students is scrutinized. The course they pursue and the nature of the institute are also important for the applicant to avail the educational loan.

## **SCOPE OF THE STUDY**

The present study is confined to the Higher Educational Loans provided by the various commercial banking institutions in Kerala to the students for pursuing higher professional education like Engineering, Medical, Management and other specified professional courses. The study will make a broad perspective of the total sanctioning, disbursement and repayment of loan for the specified period. Adequacy of financing is also examined in the study. Attitude of banks and satisfaction level of students are the other variables included in the study. The study incorporates the perspectives of both the students and the financing agency, i.e. the bank.

## **SIGNIFICANCE OF THE STUDY**

This study will be a significant endeavor in promoting a good environment in the field of educational financing. The study will be beneficial to the students and commercial banks for the timely disbursement of adequate finance to the needy students so that they can attain their higher education dream in this globally competitive environment. By understanding the needs of the students and benefits of quality education, commercial banks can grant loans for higher education, which should be seen as an investment for economic development and prosperity. The results of the study would act a feedback to the regulators so that they can correct their pitfalls and thereby they can motivate the Indian banks in implementing the educational loan scheme without hurting the interest of the students/parents.

## **CHALLENGES**

There is lack of specialized lending financial institutions for this educational loan segment. The poor repayment of the borrowers to the public sector banks caused for declining rate in the educational loan segment. The public sector banks are only contributing much in the educational loan. But the performance of the banks towards managing the nonperforming assets in the Educational loan is very pathetic. There is no need of collateral security for the educational loan upto Rs. 4 lakh. In this scenario, the bankers are struggling to collect the loan amount from the

student borrowers. The bankers do not have any stringent regulation for the recovery of the loan. Moreover, it is not possible to take severe action on those borrowers for social cause.

Unemployment is one of the biggest threats for the educational loan segment. The repaying capacity of the borrowers will rise only after their employability. In the Indian context, creating the employment opportunity to all the students are a mountain task. The students are getting priority for getting the educational loan on the basis of their employability. But it does not mean for all the students to have educational loan. Majority (56%) of the educational loan in India is given to southern region only. Eastern region (13%), west (12%), central (10%) and north (9%) are other share of educational loan. Tamil Nadu and Kerala alone together received 36% of the total loans. And these states alone unrecovered loan share is 10%.

The repaying capacity between the undergraduate and post graduate students differs. The repayment from the postgraduate is better the undergraduates because of the chance of getting more employment opportunity by the postgraduates. But the conversion ratio for the higher education is very low in India compared to other developed nations. It shows that majority of the students are unable to go for the post graduation.

### **NON-PERFORMING ASSETS IN EDUCATIONAL LOAN IN INDIA**

The rate of declining educational loan is increasing and Non-performing asset is also increasing in the educational loan amount. It is a big setback in the educational loan segment. Non-performing asset in the education sector have shown a rising trend in the past three financial years. Non-performing asset in the educational loan is nearing 9 per cent of the outstanding by March 2018. According to an official data, while disbursing the loans, banks follow the Indian Banks Association's (IBA) model education loan scheme, which provides for repayment period of up to 15 years. Under the scheme, there is a provision for a one-year moratorium on repayment after completion of studies. Besides, there is a moratorium on repayment on account of spells of unemployment, under-employment, 2-3 times during the life cycle of the loan period.

The percentage of Non-performing asset to outstanding education loan rose from 7.3 per cent in March 2016 to 7.67 per cent in the following year and then jumped to 8.97 per cent in March 2018 says the IBA data, The outstanding education loan amount at the end of 2017-18 was Rs 71,724.65 crores of which Rs 6,434.62 crores was Non-performing asset.

The cost of higher education is very in India due to the private institutions. There is lack of government sponsored institutions in India. Cost of higher education has gone up by leaps and bounds in the last decade as private institutions mushroomed like never before. Often, they charge bulky amounts from technical institutions, but there is no certainty to the students for getting placements. Student borrowers are finding it difficult to repay them.

Education loan is the first loan taken by a student, so it is important to ensure steady repayment and maintaining of a good CIBIL score. Unless the repayment track record of education loan is clean, there is a risk that the student might face challenges in availing other loans later.

Owing to the high NPAs, bankers are now more reluctant to lend to this class of borrower. This is one of the reasons for a steep decline in volumes in this segment. Other reasons include difficulty in locating and chasing students after the completion of the course.

In financial year 2017, as data released by the ministry of finance showed that public-sector banks ended with poor non-performing asset ratio in the education loans category as high as 18% in some cases. Seven public sector banks had a double-digit gross Non-performing asset ratio as a share of their education loan portfolio, as on March 31, 2017. Indian Bank had the poorest Non-performing asset ratio among public sector banks at 18.43 per cent, followed by Central Bank of India (16.64%) and Bank of Baroda (16.13%). The average Non-performing asset ratio of 18 public sector banks was 8.89% at the end of financial year 2017. State Bank of India and its associates showed Non-performing assets worth Rs 891.94 crore in education loans, while the numbers for UCO Bank and IDBI Bank were Rs 346.71 crore and Rs 35.58 crore, respectively.

## REVIEW OF LITERATURE

Shashikala, P (2006) carried out an empirical study in order to measure customer satisfaction of telecom services providers and to examine relationship between service quality and its variables and to derive key quality elements that could improve customer retention. SERVQUAL scale and its dimensions were used to collect data and used discriminant analysis technique to analyse data. The results revealed that reliability is identified as the important criterion to determine behavioural intention. It also revealed that the service quality includes elements like coverage, connectivity and voice clarity. Raheem,

Vannirajan (2006) conducted a study to examine the impact of service quality dimensions on customer satisfaction. It revealed that the important services offered by banks are traditional services, non-traditional services, tangibles, reliability, responsiveness, assurance and empathy. It also found that reliability and non-traditional services affect more on the customer satisfaction level. The study concluded that the private sector banks and associates of State Bank of India are better in providing services to the customers than the nationalist banks and co-operative banks.

Abdul A. (2005) conducted a study to identify the latent factors determining satisfaction of the quality parameters in public sector banks. It pointed out four major parameters of service quality such as, empathy, responsiveness, system and tangibility. The customer perfection on these service quality dimensions was obtained by averaging the mean value of the entire dimensions. The study highlighted the areas in which public sector banks need to improve to survive the competition posed by the new entrants in the banking sector.

Angelis, Vasilis A. et al. (2005) conducted a research study with an objective of determine customer's satisfaction and also their perceived value received from the banking services -in the country- Greece. The sample size of the study was 1470 customers selected by using quota sampling technique and a modified form of SERVQUAL instrument was used to collect data from them. One of the major findings of the study was that State-controlled bank customers enjoy a higher perceived value in the case of marketing efficiency where as private bank customer enjoy a higher perceived value in the case of professional service and effective communications. Laxman, G (2005) analysed the performance of ATM services of Andra Bank and ascertained the satisfaction level of ATM using customers of Andra Bank. The study identified number of motivational factors for availing ATM services from Andra Bank. It also revealed that majority of respondents from middle and higher income groups and above qualification holders expressed good and very good opinion about the services while others expressed performance as average.

Man Siu, Noel Yee et al. (2005) made a study was an attempt to examine customer's service quality perceptions in internet banking as well as the impact of these on customer satisfaction

and future consumption behaviour. The study was based on four dimensions of service quality viz., credibility, efficiency, problem handling and security. The results of the study showed that all dimensions except security are important in determining overall service quality perceptions, credibility, problem handling and security are important on customer satisfaction and security and efficiency are significantly associated with future consumption behaviour. It concluded as, technically functioning websites and quick confirmations are the essential elements in satisfying customer needs.

Selvam, M (2005) conducted a study titled 'Customer satisfaction of banking service an overview' to assess the measurement criteria and to evaluate customer satisfaction of banking services. The study selected 50 customers via, quota sampling method from five branches of 42 banks operating in the Tiruchirappalli city. One of the finding of the study is that the ATM facility is contributed relatively maximum to the ultimate satisfaction. The study revealed that technology adaptation process is slow in banks of that area.

Liang, Chiung-Ju, et al. (2004) empirically studied the relations among attributes, benefits, customer satisfaction and customer behavioural loyalty in a marketing system on the basis of data collected from 1000 customers of Asia Trust Merchant Banking Services in Taiwan. The study pointed out that customers buy dissimilar financial products with different benefits with different attributes, hence the difference in the level of customer satisfaction and behavioural consequences. It also found that the relationship marketing could effectively increase the awareness of customer's trust and commitment.

## OBJECTIVE

The primary objective of the present article is to measure the perception and problems towards education load in Namakkal District

## METHODOLOGY

The present study was made in Namakkal District of Tamil Nadu during the month of December 2018. 150 sample respondents were selected on the basis of convenient sampling method. The primary data relating to beneficiaries' satisfaction and problems were collected through questionnaire. ONE WAY ANOVA and Garret ranking were applied for analyzing the data.

## SATISFACTION OF THE BENEFICIARIES TOWARDS THE EDUCATIONAL LOAN

The students Stream of education (Engineering, Arts and Science) is considered to find the relationship with the level of satisfaction of the beneficiaries towards educational loan. The satisfaction of the beneficiaries were calculated with the help of five point likert scale using ten statements relating to interest, sanctioning procedure, repayment of loan, collateral security, bank procedure, manager and staff cooperation, etc., of educational loan. The result is shown below

**TABLE – 1 DISTRIBUTION OF SAMPLE RESPONDENTS ACCORDING TO THEIR DISCIPLINE AND SATISFACTION LEVEL**

EDUCATION STREAM	SATISFACTION LEVEL			TOTAL
	LOW	MEDIUM	HIGH	
Engineering	12 (48%)	10 (40%)	3 (12%)	25 (100%)
Arts	10 (13%)	45 (58%)	22 (29%)	77 (100%)
Science	8 (17%)	27 (56%)	13 (27%)	48 (100%)
<b>Total</b>	<b>30 (20%)</b>	<b>82 (55%)</b>	<b>38 (25%)</b>	<b>150 (100%)</b>

The above table shows that majority (55%) of the respondents are moderately satisfied with the service of the educational loan. Most (48%) of the students from engineering stream have shown low satisfaction towards educational loan. In high satisfaction category, percentage (29%) of arts students is comparatively higher than other stream students.

The relationship between the stream of education and the satisfaction score of the respondents was tested by framing the null hypothesis.

$H_0$ : There is no relationship between the stream of education of respondents and their level of satisfaction towards educational loan.

The hypothesis is tested with the ONE WAY ANOVA at 5% level of significance. The result is given below:

**TABLE – 2 RELATIONSHIPS BETWEEN EDUCATION STREAM AND LEVEL OF SATISFACTION: ONE WAY ANOVA**

Source	MEAN	DF	MS	F	S
Between Groups	5.038	2	2.519	3.583	Significant at 5% level
Within Groups	371.879	148	0.703		
<b>Total</b>	<b>376.917</b>	<b>150</b>			

The above table reveals the relationship between the education stream of the respondents and their level of satisfaction towards educational loan services.

The F value of ONE WAY ANOVA (3.583) is more than the table value. hence, the framed null hypothesis is rejected at 5% level of significance. It is concluded that the beneficiaries' satisfaction level is varying according to the stream of education. Low satisfaction is found among the engineering students than arts and science stream students.

### PROBLEMS IN EDUCATIONAL LOAN

There are some constraints to the beneficiaries in getting the loan and repaying the loan. By keeping this in mind, it is an attempt to know the problems of the respondents. Sanctioning of insufficient fund, bank requires collateral security, repaying difficulties, sanctioning procedure, high interest rate were considered the problems in the educational loan. The respondents ranked their problems. The result is given below using Garret ranking technique.

**TABLE 3 THE MAJOR PROBLEMS IN EDUCATIONAL LOAN: GARRET RANKING**

Rank scale		I	II	III	IV	V	Total	Total score	Mean score	Rank
Factors	x	76	61	50	40	25				
Insufficient fund	F	18	20	53	34	31	150	7373	46.45	II
	Fx	1368	1220	2650	1360	775				
Security and other banking norms	F	29	45	31	13	39	150	7994	46.56	I
	Fx	2204	2745	1550	520	975				
Difficulty to repayment	F	18	20	18	20	73	150	6113	40.75	IV
	Fx	1368	1220	900	800	1950				
Procedure for sanctioning the loan	F	26	30	12	35	47	150	6981	57.23	III
	Fx	1976	1830	600	1400	1175				
Interest rate	F	28	46	7	42	27	150	5753	48.06	V
	Fx	2128	920	350	1680	675				
<b>Total</b>	$\sum f$	150	150	150	150	150				

The table depicts that sample respondents opined the collateral security required by the bankers is a biggest issue. Though it is not required for the educational loan for a small amount, the bankers force to provide for their safety purpose. The beneficiaries of educational loan also feel that the amount sanctioned for tuition fee is not enough. As other expenses are cost more, they may expect a higher amount in the educational loan.

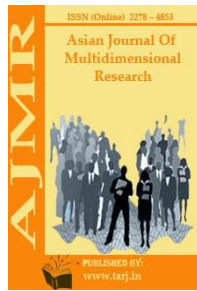
## CONCLUSION

Educational loan is playing an important role in developing human resource in the country. Indian economy mostly is mostly contributed by the service sector. More than fifty percent of the gross domestic product is coming from the service sector. The resourceful man power is the main reason for the economic development. When the most energetic and talented young generation is getting employment through proper education, the nation will be economically strong. It is found from the study that the satisfaction level of the beneficiaries is not up to the mark. They are also opined that security for the loan and sanctioned amount are big trouble. The government and banker should keep in the mind the above situation and take necessary steps to create convenient atmosphere for the students.

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## **PUBLIC-PRIVATE PARTNERSHIP AND GOOD GOVERNANCE: AN OVERVIEW**

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### **ABSTRACT**

*The concept of good governance covers a broad vision following a comprehensive approach. Its journey can be regarded as a process starting from Policy-making to Policy implementation. A government organization is considered to be successful if its actions exhibit good governance. Good Governance is an attempt to use the available manpower and financial resources to the best to respond to the societal needs not only confined to the increased public services but exhibit qualitative service delivery within a specific time period. It aims to increase people's participation in the decision making process directly/indirectly while framing the policies for various target groups. To achieve the objective of good governance, various combinations of Public-Private Partnership arrangements with E-Governance projects strengthen the administrative agencies at a global level. With the "Digital India" initiative, Twenty first century marks the transformation of government to E-Government with various phases of governance from governance to democratic governance, good governance, spiritual governance, corporate governance, and so on. Good Governance demands transparency, responsiveness and accountability in the administrative system with E-Governance as a tool to direct the development goals towards good governance. This empowers the citizens to become creative with the digital world and enhance their knowledge about the country's economy and understand the working of the Indian government. The E-Governance projects were designed to make the public services available at their door steps and reduce corruption, but due to limited digital infrastructure and ever-increasing demands of the society, it has not been a success yet. The effectiveness of administrative machinery and the efficiency of the public officials are reflected by the quality of service delivery, performance of the government officials and the satisfaction level of the citizens. Without good governance, the development goals of the country cannot be achieved. The concept of E-Governance involves a well planned and multi-dimensional*

*approach. Since independence, the different phases of the government have given new dimensions to the society. With the impact of LPG, the government has to face numerable challenges to balance public and the public services in compliance with time and the changing demands of the society. The prosperity and growth of any nation depends upon the quality of life of its citizens. The government agencies are responsible to look after the basic needs of its citizens and aim for their overall well being. But the present era reflects the mistrust and dissatisfaction of citizens on the public officials and government agencies. One major hindrance is corruption. Hence, e-government policy aims to reduce corruption and make government corruption-free. With-E-Governance, the policy makers while framing the policies should keep in mind that the public policies serve the purpose of the target groups for which they are framed. If the policy formulation and implementation are successful at both ends, this can make the administrative machinery much effective. Hence, the objective of good governance is also achieved.*

**KEYWORDS:** *Development, Welfare, Digital, Democracy, LPG (Liberalization, Privatization, Globalization), Good Governance*

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## **INTRODUCTION**

### **Public-Private Partnership (PPP) Model in Public Policy: A mechanism for Governance**

Rapid economic growth is regarded as one of the major objectives of planning in any country. It necessitates numerable structural and institutional changes in the administrative set-up related to the economy of our country. The economic growth of any country largely depends on the infrastructure of government. Public sector was responsible to frame the policies of the country. With time and changing circumstances influencing the country's economy, the policy formulation also involved the private sector. With the focus to boost the economic status of the country and to improve the infrastructure, the coordinated role of public and the private sectors gained importance while framing the public policies. With this, the contribution of private sector increased.

According to the changing needs and opportunities of the country, the economic planning for the growth and development of any nation keeps on varying. The evolution of economic planning in India can be traced back to the period of pre-independence after Great Agricultural Depression during the period 1929-33. After Independence, a formal model of economic planning was adopted in the form of Five Year Plans by the Planning Commission which was established on 15<sup>th</sup> March 1950, with Prime Minister Jawaharlal Nehru as the Chairman. On 17<sup>th</sup> Aug 2014, the present Modi government decided to wind down the Planning Commission and it was replaced by the newly formed NITI Aayog.

Modernization has led to the wide expansion of the public and private sectors to contribute to the growth of Indian economy at a global level. Public sector includes heavy industries, transport, petro-chemicals, petroleum, steel, etc whereas private sector includes banking, financial institutions, capital markets etc. As India is following "mixed economy", various arrangements of private and public sectors are coupled together to direct economic activity to sectors of social importance having impact on the lives of the citizens. The private entities contribute to the economic growth of the country in the form of taxes. As such, the private sectors also experience

growth and hence can contribute to the welfare of the society e.g health, social security, education, employment etc.

Since last two decades, India has emerged as one of the leading nations using Public- Private Partnership model. With Public-Private Partnership (PPP), the concept of governance aims to improve the quality of service delivery and the quality of life for all citizens. PPP model has been described by various scholars in their own way. According to Weimer and Vining; *“A P3 typically involves a private entity financing, constructing, or managing a project in return for a promised stream of payments directly from government or indirectly from users over the projected life of the project or some other specified period of time”*.<sup>1</sup>

According to the World Bank, PPP is *“a joint initiatives of the public sector in conjunction with the private, for profit and not-for-profit sectors”, also referred to as the government, business and civic organizations. In these partnerships, each of the actors contributes resources (finance, human, technical and intangibles, such as information or political support) and participates in the decision making process*.<sup>2</sup>

Yescombe explains that *“PPPs aim at financing, designing, implementing and operating public sector facilities and services. Their key characteristics include long-term service provision, the transfer of risk to the private sector, and different forms of long-term contracts drawn up between legal entities and public authorities”*.<sup>3</sup>

V. Varnavskiy defines PPP as *“institutional and organizational alliance between government and business in order to implement national and international, large-scale and local, but always socially significant projects in a broad range of areas: the development of strategic industries and R&D to provide public services”*.<sup>4</sup>

According to Grimsey and Lewis, PPP model is described **in a comprehensive manner as an “agreement where the public sector enters into long-term contractual agreements with private sector entities for the construction or management of public sector infrastructure facilities by the private sector entity, or the provision of services (using infrastructure facilities) by the private sector entity to the community on behalf of a public sector entity”**.<sup>5</sup>

Hodge and Grieve perceive PPP as *“a tool of governance, which provides a novel approach to delivery of goods and services to citizens. Being a novel mode of governance and management, the focus in this perception is on the organizational aspect of the relationship”*.<sup>6</sup>

Organization for Economic Cooperation and Development i.e. OECD defines *“a public-private partnership as an agreement between the government and one or more private partners (which may include the operators and the financiers) according to which the private partners deliver the service in such a manner that the service delivery objectives of the government are aligned with the profit objectives of the private partners and where the effectiveness of the alignment depends on a sufficient transfer of risk to the private partners”*.<sup>7</sup>

PPP Model aims to make the country’s economy direct towards economic development in general and sustainable development in the long run. The government organizations have the responsibility to provide numerable services to its citizens and maintain their budget for proper growth and development of the nation. The private organizations with the interest to earn more profits and strengthen their growth and organizational structure also develop the necessary infrastructure to provide various services and facilitate service delivery mechanism.

PPP (P3) Model as defined by the Government of India as:

*“Public Private Partnership (PPP) Project means a project based on a contract or concession agreement, between a Government or statutory entity on the one side and a private sector company on the other side, for delivering an infrastructure service on payment of user charges.”<sup>8</sup>*

The economy of our country is increasing at a rapid rate. In early 1990s, a new model of public service delivery was established redefining the role of public and private actors. Since, 1991, various economic reforms have been initiated to stabilize the economic position. By the end of 20<sup>th</sup> century, the modern concept of PPP model came up as an alternative instrument of public procurement and was implemented across the world involving several countries. In the words of Sh N. Pongsiri;

*“Public agencies and private organizations can indeed seek mutual advantages in developing a PPP, particularly when the latter is characterized by trust, openness, fairness and mutual respect. For the public agency, the main rewards from partnering with the private sector are improvement of program performance, cost efficiencies, better service provisions and appropriate allocation of risks and responsibilities”<sup>9</sup>*

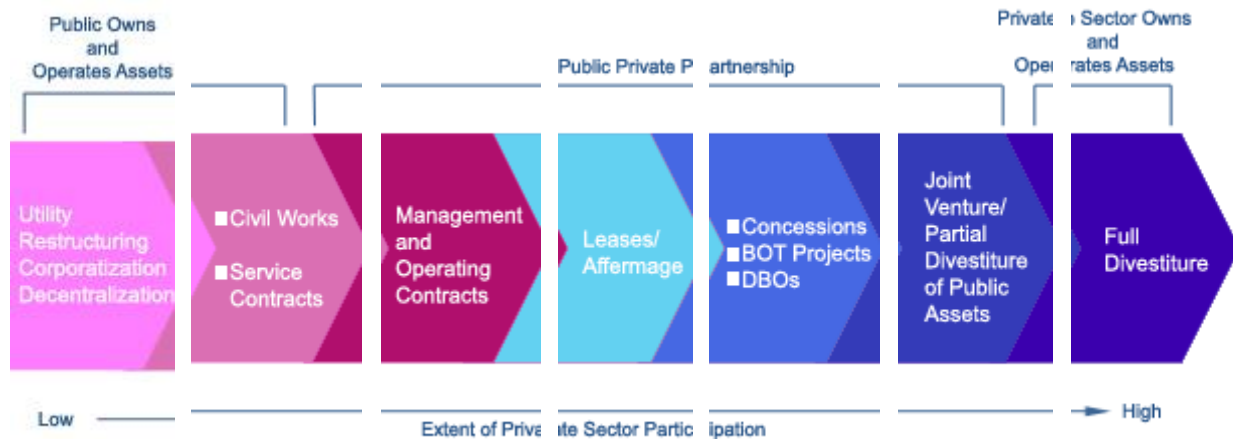
The PPP model covers a wide range of approaches from private participation through the process contracting out of services by the public sectors, lease hold, BOT Projects, sharing of revenue etc (Table 1).

**TABLE 1.1: SCHEMES AND MODALITIES OF PPP**

<b>Box 1. PPP Schemes and Modalities</b>	
<b>Schemes</b>	<b>Modalities</b>
Build-own-operate (BOO) Build-develop-operate (BDO) Design-construct-manage-finance (DCMF)	The private sector designs, builds, owns, develops, operates and manages an asset with no obligation to transfer ownership to the government. These are variants of design-build-finance-operate (DBFO) schemes.
Buy-build-operate (BBO) Lease-develop-operate (LDO) Wrap-around addition (WAA)	The private sector buys or leases an existing asset from the government, renovates, modernizes, and/or expands it, and then operates the asset, again with no obligation to transfer ownership back to the government.
Build-operate-transfer (BOT) Build-own-operate-transfer (BOOT) Build-rent-own-transfer (BROT) Build-lease-operate-transfer (BLOT) Build-transfer-operate (BTO)	The private sector designs and builds an asset, operates it, and then transfers it to the government when the operating contract ends, or at some other prespecified time. The private partner may subsequently rent or lease the asset from the government.

PPP is typically a contract or agreement to outline the responsibilities of each party and clearly allocate risk. Depending upon the extent of involvement of and risk taken by the private party, Public-private partnerships (PPPs) has several arrangements. Fig 1 shows the graph with the spectrum of PPP agreements.

**Fig 1: Spectrum of PPP agreements**<sup>10</sup>



Among many features of PPP arrangements, some are as follows:

- PPP model lays emphasis on service delivery and investment by the private sector
- Transfers considerable risk from the Government to the private sector
- The PPP model is very flexible and discernible in different forms
- A typical PPP model takes the form of a design-build-finance-operate (DBFO) scheme

Under such a scheme, the government specifies the services it wants the private sector to deliver, and then the private partner designs and builds a dedicated asset for that purpose, finances its construction, and subsequently operates the asset and provides the services deriving from it.

- The private operator owns the PPP asset while operating it under a DBFO scheme

In this scheme, the asset is transferred to the government at the end of the operating contract, usually for less than its true residual value (and often at zero or a small nominal cost). The government is in many cases the main purchaser of services provided under a PPP. These services can be purchased either for the government's own use, as an input to provide another service, or on behalf of final consumers; a prison, a school, and a free-access road would fall into these respective categories. Private operators also sell services directly to the public, as with a toll road or railway.

- The term PPP is sometimes used to describe a wider range of arrangements

In particular, some PPPs exclude functions that characterize DBFO schemes. Most common schemes combine traditional public investment and private sector operation of a government-owned asset.

- Shared responsibility between the public and private sector
- Operating leases and similar arrangements
- Private sector involvement in asset building alone refers to design-build-finance-transfer (DBFT) scheme or a financial lease
- PPPs enable flexible arrangements between public and private bodies, where the public body may or may not retain ownership of the project or facility that is produced
- A PPP arrangement involving both investment and service delivery by the private sector, and private financing and ownership reflects DBFO schemes

Under PPP (P3) scheme, the decision making process incorporates collaborative suggestions of the members of public and private sectors involved in the process of public policy formulation thereby, maintaining the spirit of teamwork. This pattern of partnership lead to the management of the organization working in collaboration and good governance.. According to the UNDP, *“both economic and political aspects of governance emphasize decision making process which affect the economic activities, its relationship with other interested groups and also the policy formulation process.”*<sup>11</sup>

The Public Private Partnerships (PPPs) supports the public sector to meet the infrastructure gap in India. They represent a claim on public resources which needs to be understood and assessed by the actors of public and private sectors. To avoid any unfavorable circumstances, a stable relationship between the private and public sectors is required to be maintained.

The success of PPP model depends upon the management of PPP arrangement. PPP is an integration of design, construction, investment, risk sharing tendency, operation, and maintenance reflecting the performance based on value for money. PPP model aims to utilize various resources judiciously and efficiently leading to the competitiveness of the project in the highly competitive market. The resources involve human resources, financial resources, skills, knowledge, expertise and experience of both the public and private sectors to deliver higher standard of services/products to citizens as consumers. Thus, PPP model uses the twinning effect of the strength and power of the public sector and professional efficacy, advanced technology as well as efficiency and flexibility of the private sector to enhance the quality of service delivery.

### **E-Governance in Public Policy: An effective tool for Good Governance**

In large democracies like India with huge population, the government is overwhelmed by the ever-growing demands of the people. Increased literacy rate has generated awareness among the masses. They pay directly or indirectly to the government. Hence, they have the right to demand quality services from the government. As such, the government is overburdened and unable to perform efficiently to meet their demands. With time, the complexity in the nature of functions of the government increased generating bitterness in the relation between the government and the citizens. This further widened the gap as the traditional working of the administrative machinery failed to respond to the modern day challenges.

Many reforms have been introduced from time to time to improve the service delivery and enhance the administrative efficiency and performance. With the initiative of “Digital India”, E-Governance gained momentum to reduce corruption and bring transparency, responsiveness and accountability in the working, policy formulation and implementation in administration. E-governance (Electronic Governance) occupies a prominent place in the art of governance and aims to transform the face of government organizations thereby improving the quality and efficiency of governance. E-Governance is a tool that adopts information and communication

technology with the objective to induce more transparency, widening the horizons of government (geographically and demographically) in a large country like India. To make E-Governance a success, it is important to channelize the available resources in the right direction. Some factors are financial and human resources, well-planned policies and programmes, to meet the needs of interest groups, leadership skills, administrative changes, generating awareness among citizens and public officials etc.

Over the years, various State Governments and Central Ministries have made number of attempts from time to time to usher in an era e-Government. Sustained efforts have been made at different organizational levels of to improve the quality of public service delivery and make it accessible at the doorsteps of the citizens.

In India, E-Governance has steadily been evolved with the introduction of computerization of Government Departments with the aim to improve the process of Governance e.g making the services citizen centric and inculcate accountability, responsiveness, specific time period and transparency in administration. Previous e-Governance initiatives have also contributed in shaping the progressive e-Governance strategy of the country implemented at various levels (national, State and local).

Since 1990's, E-Governance, a distinct dimension of New Public Management (NPM) gained considerable momentum to rectify the gap between the citizens and the government.

***“In India, the main thrust for e-Governance was provided by the launching of NICNET in 1987 – the national satellite-based computer network. This was followed by the launch of the District Information System of the National Informatics Centre (DISNIC) programme to computerize all district offices in the country for which free hardware and software was offered to the State Governments.”<sup>12</sup>***

On 15<sup>th</sup> August 2002, Hon'ble Prime Minister Sh Atal Bihari Vajpayee announced 15 important initiatives and as such government intends to implement a comprehensive programme to accelerate e-Governance at all levels of the Government to improve efficiency, transparency and accountability at the Government–Citizen interface. An extract of the Hon'ble PM's announcement of 15<sup>th</sup> August 2002, pertaining to E-Governance is reproduced as:

***“The Ministry will implement a comprehensive programme to accelerate eGovernance at all levels of the government to improve efficiency, transparency and accountability at the Government–citizen interface. ....” •***

The Government of India approved the National e-Governance Plan (NeGP)<sup>13</sup>, comprising of 27 Mission Mode Projects (MMPs ) and 8 components, on 18<sup>th</sup> May, 2006. In 2011, 4 major projects - Health, Education, PDS and Posts were introduced. To promote e-Governance initiative in a holistic manner, various policies and projects have been undertaken to develop core and support infrastructure. Among the core infrastructure components are State Data Centres (SDCs), State Wide Area Networks (S.W.A.N), Common Services Centres (CSCs) and middleware gateways i.e National e-Governance Service Delivery Gateway (NSDG), State e-Governance Service Delivery Gateway (SSDG), and Mobile e-Governance Service Delivery Gateway (MSDG). The important support components include Core policies and guidelines on Security, HR, Citizen Engagement, Social Media as well as Standards related to Metadata, Interoperability, Enterprise Architecture, Information Security etc. New initiatives include a

framework for authentication. The initiatives “e-Pramaan” and “G-I cloud” aim to ensure benefits of cloud computing for e-Governance projects.

The National e-Governance Plan (NeGP) provides a base to access the e-Governance initiatives all across the country to the remote areas. With large-scale digitalization, it is possible to enable easy, quick and reliable access over the internet among the service users. This makes public services available to the citizens just at their door steps at the click of the button. As articulated in the Vision Statement of NeGP:

***“Make all Government services accessible to the common man in his locality, through common service delivery outlets, and ensure efficiency, transparency, and reliability of such services at affordable costs to realise the basic needs of the common man.”<sup>14</sup>***

With the digital platform, E-governance initiatives have led to the considerable progress in the information and communication technology sector.

In the modern world, the LPG (liberalization, privatization and globalization) effect has also played an important role in the transition of the quality of governance. In the present era of digitization, Fig (2) gives an idea of transformation of governance to Good governance using E-Governance initiatives.

**Fig (2): E- Governance as a tool for Good Governance**



Governance can be understood as a process or mechanism of government to carry on the administrative functions.

***Electronic governance or E-governance is the application of information and communication technology (ICT) for delivering government services, exchange of information, communication transactions, integration of various stand-alone systems and services between government-to-citizen (G2C), government-to-business (G2B), government-to-government (G2G), government-to-employees (G2E) as well as back office processes and interactions within the entire government framework.<sup>15</sup>***

With E-Governance, the public services are accessible to the citizens efficiently and conveniently. This also exhibits transparency in the activities of government.

In administrative organizations, the advancement in science and technology has led to the rapid use of ICT to carry on the day to day activities. This has placed the administrative agencies on the digital platform demanding the revolutionary change in the traditional working of the organizations and learning new techniques to enrich the skills of public officials. This will not only make the public officials more responsive and accountable but strengthen the bond between the citizens and government. ***The governance of ICTs typically require a substantial increase***



*in regulation and policy-making capabilities, as well as additional expertise and opinion-shaping processes among various social stakeholders. The perspective of e-governance is "the use of the technologies that both help governing and have to be governed,"*<sup>16</sup> The central goal of e-governance is to reach the beneficiary and to ensure that their service needs are met. Ideally, the government will automatically recognize the importance of achieving this goal in order to maximize its efficiency.

The e-Governance projects focus on citizen-centric criteria, but due to many limitations, they do not reflect the desired output with which they were designed and implemented. Their successful implementation requires a well-planned and comprehensive approach with proper allocation of manpower and financial resources. E-Governance strategy promotes two-way communication to understand and solve the problems of the public. This can be regarded as a positive step to connect people with the government. In India, PPP projects coupled with E-Governance are becoming successful as they support corruption free model of governance.

### **Public Policy and Good Governance: Two sides of the same coin**

The terms "Public Policy" and "Governance" complement each other to achieve the administrative and development goals of our nation not only at local level but also to reach the global heights. They are well connected to each other and aim to promote good governance. Good Governance promotes citizen-friendly environment in the administrative organizations and directs the political executives and the civil servants to perform in a professional manner fit to comply with various challenges (political, social, administrative and financial) and deliver qualitative and time bound services to the people.

*"...Administration is meant to achieve something, and not to exist in some kind of an ivory tower, following certain rules of procedure and, Narcissus-like, looking on itself with complete satisfaction. The test after all is the human beings and their welfare."*<sup>17</sup>

Good Governance strengthens the bond between the one who govern and those to be governed. It is a basic necessity for the government of any country as it aims to provide best services to its citizens enhancing their quality of life. Good Governance not only covers the process of governance but also the public officials and political executives involved in the policy formulation and policy implementation. They are responsible for governing the country directly or indirectly.

*"Public service as an ideal" has been the classical view of good governance. That classical view also included such values as: probity, applying objective standards universally, willingness to speak truth to Ministers but a readiness to carry out instructions to the contrary if overridden, an appreciation of the wider common good which is over and above public interest, equity, and a constant concern for democratic ideals. Because, confidence and trust in the democratic system can be safeguarded only when the governing process demonstrates a higher moral tone, keeping in view the upholding of common good. Because we get a moral government by creating and sustaining certain conditions within which Dharma and Loka Sangraha can survive. Such is the duty of those who wish to be involved in the difficult and complex world of governance. This is the essence and basis of good governance."*<sup>18</sup>

As stated by the Hon'ble President, Pranab Mukherjee on Independence Day Speech in 2013;

***“There is (presently) widespread cynicism and disillusionment with government and functioning of institutions.” Further, he added “This is largely because of rampant and mounting corruption, especially among the people is the political class i.e ministers and MPs who exercise real power in a democracy. General feeling among the people is that institutions dominated by the politicians are corruption-ridden even though there are many honest and dedicated personalities among them who neither suffer from arrogance of power-nor abuse their position for personal gains. The criminal elements among the political class, however, appear to be more dominating and visible to be abusing power and amassing illegal wealth discarding all good norms or ethical values. They thus give a bad image to the political class in general. All kinds of scams involving the corrupt political class keep coming to lightday-after-day, e.g 2G Scam, Coal Scam, Rail Scam, Common Wealth Games Scam etc. The media naturally highlights these major scams and the people in general form adverse opinions about politicians. They have by now lost public esteem and credibility.”<sup>19</sup>***

The public officials in the government are habitual to work in their respective comfort zones. Hence, the problems of improvement in working of administration is becoming complex with the changing circumstances and factors like increased literacy rate, limited resources, population explosion, unemployment, lack of expertise and professional competence among the public officials, worldwide competition, corruption etc. With increased people's mistrust on the administrative agencies, the administration has started taking steps in this direction to bring back the public faith on the government. As per the observation of Thomas Jefferson, one of the American “founding fathers”, ***“that government is best which governs least.”***<sup>20</sup> The cult of belief that government service is intrinsically and irretrievably inefficient has been strengthened in recent years by a delightful humorous essay-“Parkinson's Law”:

***“work expands so as to fill the time available for the completion.”***

***“.....it now becomes possibly to state Parkinson's Law in mathematic form. In any public administrative department not actually at war the staff increase.....will invariably prove to be between 5.17 per cent and 6.56 per cent , irrespective of any variation in the amount of work (if any) to be done.”***<sup>21</sup>

Though there has been increase in the number of professionally trained officials and skilled employees, but due to the traditional working of government, the officials resist to work out of their comfort zone. As a result, the private organizations are considered more effective and efficient. The present government under the direction and guidance of Hon'ble prime minister has started making efforts to deal with the administrative problems of corruption, red tapism, lack of sincerity and responsibility among public officials and so on. Sh Narendra Modi stated:

***“I believe government has no business to do business. The focus should be on Minimum Government but Maximum Governance.”***<sup>22</sup>

***“Narendra Modi had demonstrated that a good justice delivery mechanism and an entrepreneur-friendly environment is possible, even with a small and less intrusive government.”***<sup>23</sup>

The working and performance of administration can be improved with sincere and dedicated efforts not only by the government organizations but with the support of private organizations and citizen participation also. Many factors are responsible to enhance the performance and efficiency of administration such as;

- The social responsibility of the Public officials to boost the morale of the employees and provide better working conditions so that they feel as an integral part of their organization
- An environment of mutual respect and desired confidence level of the employees
- Utilization of skills and expertise and available financial and manpower resources
- A passion of the organization to deliver quality and time bound services
- A well designed redress grievance mechanism unit for corrective actions on regular basis
- Active participation of the employees at different levels of hierarchical set-up
- Regular feedback from the service users
- Some basic minimum standards of performance should be set for employees and the guilty officials should be punished
- Proper two way communication system should be followed in the organizations
- Coordination among different units/divisions/departments of an organizations to foster smooth working
- Surprise checks should be done to analyze the working of organizations
- Less political interference
- Favoritism and bias should be discouraged

With increased complexity of the nature and functions of the organizations of contemporary administrative organizations, it is difficult to achieve perfection but not impossible to be close to the development goals. This requires a deep understanding of the needs of the people and purpose of the organizations.

### **CONCLUSION**

The coordinated role of political executives and public servants act as a catalyst in achieving the objective of good governance. Government holds the responsibility to frame the policies and programmes keeping in mind “welfare of the people”, hence it should ensure that the policies so framed comply with the needs of the target groups for which they are framed and should be implemented successfully following a comprehensive and well-planned and directed approach. Public policy and good governance are thus used concurrently towards achieving the goal of increasing efficiency in governance. In India, with the influence of LPG, PPP based public policies are gaining momentum to achieve the development goals of the nation world wide.

In a developing country like India, administrative actions are very much affected by political influence. In such politically affected community, Public policy acts as a key instrument to govern the large masses and nation at a large. The policy formulation and its implementation involve huge funds to make them purposeful for the concerned interest or target groups. Hence, while formulating the policies, well planned and directed approach should be focused using the Public-Private Partnership arrangement coupled with the usage of digital platform to promote good governance. With good governance, the administration will reflect accountability, responsiveness, transparency and time bound as well as qualitative delivery of public services. This will put a check on the administrative activities and thus act as an instrument of effective control over the administrative actions.

Thus, the combo of PPP based Public Policies and digital platform with E-Governance as a tool will definitely be effective to achieve the administrative and development goals of the country.

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## **COMMERCIAL BANKS FINANCING TO MICRO, SMALL, AND MEDIUM ENTERPRISES: A STUDY IN INDIA**

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### **ABSTRACT**

*The importance of Micro, Small, and Medium Enterprises (MSMEs) is unequivocally pronounced by every entity due to their visible contribution for economic growth, enhancing social cohesiveness, and creating employment for vulnerable group of society like female. Despite the importance this sector has, it faces a number of bottlenecks that needs close attention and research. One of the critical impediments of MSMEs is access to finance. Habitually, it is believed that micro finance institutions are the only formal financial institution to finance MSMEs. This, in addition to the relatively high lending rate and collateral requirement, discouraged operators from seeking commercial banks loan. Due to this issue, a need to assess the overall practice of commercial banks financing to MSMEs is overwhelmingly essential. Therefore, the objective of this study is to assess the practice of commercial banks financing to Micro, Small, and Medium Enterprises in the districts of Dakshina Kannada and Udupi in Karnataka state. To achieve the objective, data was collected from Dakshina Kannada and Udupi districts through questionnaire and interview techniques. The result of the descriptive analysis revealed that commercial banks are placed in the third rank based on the finance priority of the owner-managers to fund their expansion plan. The less attention given for commercial banks was due to awareness problems that MSMEs operators perceive commercial banks are meant for big companies. In addition, it was found that most of the operators in MSMEs are males and their age category is more than 33. To enhance the success and performance of MSMEs through commercial banks financing, appropriate suggestions were given to different participants.*

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**KEYWORDS:** *Commercial Banks, MSMEs, financing, Enterprise Financing*

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## 1. INTRODUCTION

The importance of the Micro, Small and Medium Enterprise (MSMEs) sector is well recognized worldwide due to its significant contribution to meet various socio-economic objectives, such as higher growth of employment, promotion of exports and fostering entrepreneurship (Hidayet, Onur, & Hakan, 2010). For example in India, Micro, Small and Medium Enterprises (MSMEs) are widely called the backbone of the Indian economy and the largest employment providing sector (Samta & Shweta, 2014). According to the report of the committee set by Department of Financial Services, Ministry of Finance (2015) to examine the financial architecture of MSMEs sector in India, it is found that the Indian government has created enabling environment, particularly in terms of financing MSMEs though it has further recommended to leverage and improve the existing financial architecture to create new financial construct wherein financing is easier to obtain, available in all corners of the country at a competitive rate of interest.

However, the absence of a universally accepted definition of MSMEs is the main challenge in the identification and investigation of MSMEs (Manish & Sunil, 2016). Different countries and even different industries in the same country may have different definitions and categories of MSMEs which increase the complexity of conducting a study on the sector. According to the definition given by European Commission, Small and Medium Enterprises (SMEs) are enterprises with less than 250 employees, with a turnover of less than 50 million euro, and total assets less than 43 million euro (European Commission, 2015). The Micro, Small and Medium Enterprise (MSMEs) Development Act of India has classified Micro, Small and Medium Enterprises into manufacturing and service MSMEs that have an investment in plant and machinery and investment in equipment respectively (Indian Ministry of Law and Justice, 2006).

According to this definition, Manufacturing units having investment in plant and machinery below Rs 25 lakh (Rs 2.5 mn) were named Micro, those between Rs 25 lakh and Rs 5 crore (Rs 50 mn) named as Small and, from Rs 5 crore to Rs 10 crore (Rs 100 mn) as Medium. So also, for Service units, comparing investment thresholds were investment in equipment up to Rs 10 lakh (Rs 1 mn) Micro, between Rs 10 lakh to Rs 2 crore (Rs 20 mn) Small and between Rs 2 crore to Rs 5 crore (Rs 50 mn) Medium (Indiatimes.com, 2018). Manish & Sunil (2016) conducted research aimed at studying the evolution for the definition of SMEs after India's independence. This study revealed that SMEs definitions are creating confusion because of variability in the definitions. After studying criteria used to define MSMEs in different regulations, researchers concluded that there is a need for revising the definition of MSMEs stated in MSME Act 2006. In addition, Amare & Raghurama (2017) suggested the use of turnover as a parameter to define MSMEs due to the supposition that labor could not be the exact attribute to label the size of enterprises in technology-intensive firms.

Due to different problems existed in the current definition of MSMEs, the government of India has proposed a new turnover based classification of MSMEs (Indian economy.net, 2018). The new definition is based on turnover. Hence, the new definition treats both manufacturing and service categories similarly unlike the previous one. The following table shows the previous and current categories of MSMEs.

**TABLE1: CLASSIFICATION OF MSMES**

Classification of the MSME	New Classification (annual turnover)	Previous classification – Ceiling on Investment in Plant and Machinery (in Rs)
Micro	Not exceeding Rs 5 crores	Below 25 lakhs
Small	Between Rs 5 crores and Rs 75 crores	25 lakhs to 5 crores
Medium	Between Rs 75 and Rs 250 crores	5 crores to 10 crores

Source: Indianeconomy.net(2018)

Despite all the limitations the sector faced, MSMEs have a crucial role in the development of the country and states too. In the report compiled by MSME-Development Institute, Government of India (2016), on Karnataka State Industrial Profile 2015-2016, it was articulated that Micro, Small & Medium Enterprises (MSMEs) form an important and growing segment of Karnataka's industrial sector. In the report, it was also expressed that the MSME sector is a vibrant and vital sector of the State economy in terms of employment generation and share of production. Hence, the importance of MSMEs is with no doubt recognized in India that the sector has its own separate structure organized at Ministry level.

According to the study carried out by Shweta, Sohan, Siddharth, & Prashant(2015), MSMEs are providing employment opportunities to more than 10 million people every year and have become the second largest sector generating employment opportunities and providing equitable regional development after agriculture.

Though the sector has an enormous contribution to the economic and social development of a country, it is also stated that the sector is heavily hit by different impediments like limited access to finance. Biswajit(2013), in his study aimed at exploring the financial challenges of MSMEs, noted that there is a mismatch between demand and supply of finance in India. According to the research, lack of timely and adequate credit is the major constraints of MSMEs. The research further explained that the share of micro enterprises in the total number of MSMEs in India is disproportionately high and the banking service provided to these enterprises is limited. Jaskaran & Davinder(2014) found that there are limited financial resources available for MSMEs engaged in innovative activities. The study further revealed that due to the accessibility problem of debt financing, startup capital depends on the internal source.

Though there are limitations in MSMEs financing in India, there are also good practices that could be taken by other countries as a frame of reference. For example, Ngboawaji & Otu(2014) witnessed that Indian MSMEs represent useful models of institutionalized financing of an all-important sector that can be an example to other countries.

In the same manner, the performance of the commercial banks in terms of a banking network, mobilization of deposits, disbursement of credit and penetration of the cooperative movement was found pleasant in Karnataka state (Kushalakshi & Raghurama, 2016).

Using secondary data for the period from 1997/98 to 2008/09, Sandeep(2012) found that public and private sector banks have achieved the overall lending target of 40 percent set by Reserve Bank of India while foreign banks have achieved their target of lending to small scale industries and exporters.

With the aim of analyzing whether existing credit flow system is satisfactory to MSMEs or not, Samta & Shweta (2014) conducted a study at Bank of Baroda, and found that the process of



SMEs' financing was very well carried out by the bank officials and customers were very much satisfied by its lending and other services.

Despite the fact that banks are trying their best to satisfy their MSMEs customers needs, their loan sanction related decisions are affected by different factors. Taking a sample from bank managers and loan officers, Ramakrishna(2015) conducted a study in India to explore factors affecting decision of Commercial banks to extend finance to SMEs. In the study, the researcher noted that information provided, Collateral, and Technical Skill are the important factors considered by the Banks in loan decision making for MSMEs.

## **2. STATEMENT OF THE PROBLEM**

Though the MSMEs sector is recognized as a contributor to the country's economy, the current global trends would force it to have more liberalized and well-structured MSMEs systems. In addition to the institutional structures, MSME needs liberal financial assistance from commercial banks to set up and extend their operation in a way they encounter the worldwide challenges. For this to happen, the role of commercial banks financial service is great that the trend should be known well. One of the research gaps this research aims to bridge is, therefore, assessing the practice of commercial banks in financing MSMEs and suggesting them to improve and sustain their contribution.

## **3. OBJECTIVES OF THE STUDY**

The general objective of the study is to assess the practice of commercial banks financing to Micro, Small, and Medium Enterprises in districts of Dakshina Kannada and Udupi. In line with this general objective, specific objectives addressed by this study are;

- To understand the major source of finance to MSMEs and assess the share of Commercial Banks
- To identify reasons for non-repayment of loan by MSMEs owner managers
- To examine the Business models of banks and procedures used to address financial needs of MSMEs
- To assess the government support to MSMEs as perceived by owner-managers
- To analyse factors that affect the performances of Micro, Small, and Medium Enterprises

## **4. RESEARCH METHODOLOGY**

To achieve the objectives stated, a comprehensive methodology that can address the purpose of the study is used. Accordingly, exploratory and descriptive types of research methods were used. Using exploratory research is particularly useful if a researcher wishes to clarify the understanding of a problem (Mark, Philip, & Adrian, 2007). A descriptive study, on the other hand, is an extension of exploratory research, which helps the researcher to have a clear picture of the phenomena on which the researcher wish to collect a full-scale data. Therefore, the study used exploratory and descriptive study types so as to meet the objectives.

### **4.1. Sampling techniques and Data Collection**

To study the practice of commercial Banks financing to MSMEs, data was collected from Karnataka state, Mysore Division, districts of Dakshina Kannada and Udupi. These districts are selected because the region comprising of them is referred to as the cradle of banking in India (Ravi, 2005). According to this, banks like Canara Bank, Syndicate Bank, Corporation

Bank, Vijaya Bank, and Karnataka Bank Ltd were originated from the district of Dakshina Kannada and Udupi. The first five in the above list were established in Udupi and Dakshina Kannada districts where a branch of banks is available for every 500 persons (Ravi, 2005). Accordingly, two banks, whose head offices are located in Mangalore are chosen as supply-side sample elements and; MSMEs that are working in Mangalore and Udupi cities and are customers of these two banks are sample frame of the demand side. With this regard, Karnataka bank Ltd and Corporation bank are chosen. Corporation Bank and Karnataka bank Ltd are chosen due to their location convenience and their engagement to MSMEs (for example Corporation Bank was a winner of the 'MSME Banking Excellence Award 2015 which was organized by Chamber of Indian Micro, Small and Medium Enterprises (CIMSME) (Corporation Bank, 2016).

To collect data for the purpose mentioned, the researcher has availed the assistance of two local assistants. The sampling and data collection method employed was convenience and purposive sampling techniques and owner-managers were approached to fill the questionnaire on the basis of the researcher's convenience. To reach owner-managers who are customers of the selected banks, the first question raised to MSMEs owners was whether they are customers of the stated Banks or not. Those who are customers of these banks were then requested to fill the questionnaire. In addition, respondents were chosen from banks that are doing relatively better in financing MSMEs in the districts. Therefore, based on the purpose of the study, two MSMEs related department officers of Corporation Bank and Karnataka Bank Ltd. were approached. The total sample size considered to collect data from MSMEs owner managers was 100 and two MSMEs related managers from two banks. According to Roscoe (1975) cited in Robin (1998), the choice of sample size is often as much a budgetary consideration including time, place and energy. Considering this, taking a sample size of 100 from the demand side was believed to be sufficient for the districts under consideration.

After collecting the required data from samples, data editing, coding, tabulation, and validation was done and all the tests (validity and reliability) were made. For analysis of the data, Statistical Package for Social Science (SPSS version 22) was used and discussion and analysis were made using descriptive statistics. Interpretations of the result using descriptive statistics, graphs and pie charts are presented in the analysis and discussion section of the study.

## **5. Analysis and Discussion**

In this section, the result is described according to the objectives of the research stated in the prior section. Thus, the demographic characteristics of respondents, the major source of finance to MSMEs, loan repayment tendencies of MSMEs, the business models and procedures banks follow, government support, MSMEs performance factors and other related concepts are discussed.

### **5.1. Demographic Characteristics of Respondents**

The demographic variables mentioned in this study are gender, age, and education. To have a clear demographic understanding of the sample elements, the researcher made frequency and descriptive analysis with the help of SPSS.

### 5.1.1. Age groups of respondents

**TABLE 2: AGE OF RESPONDENTS**

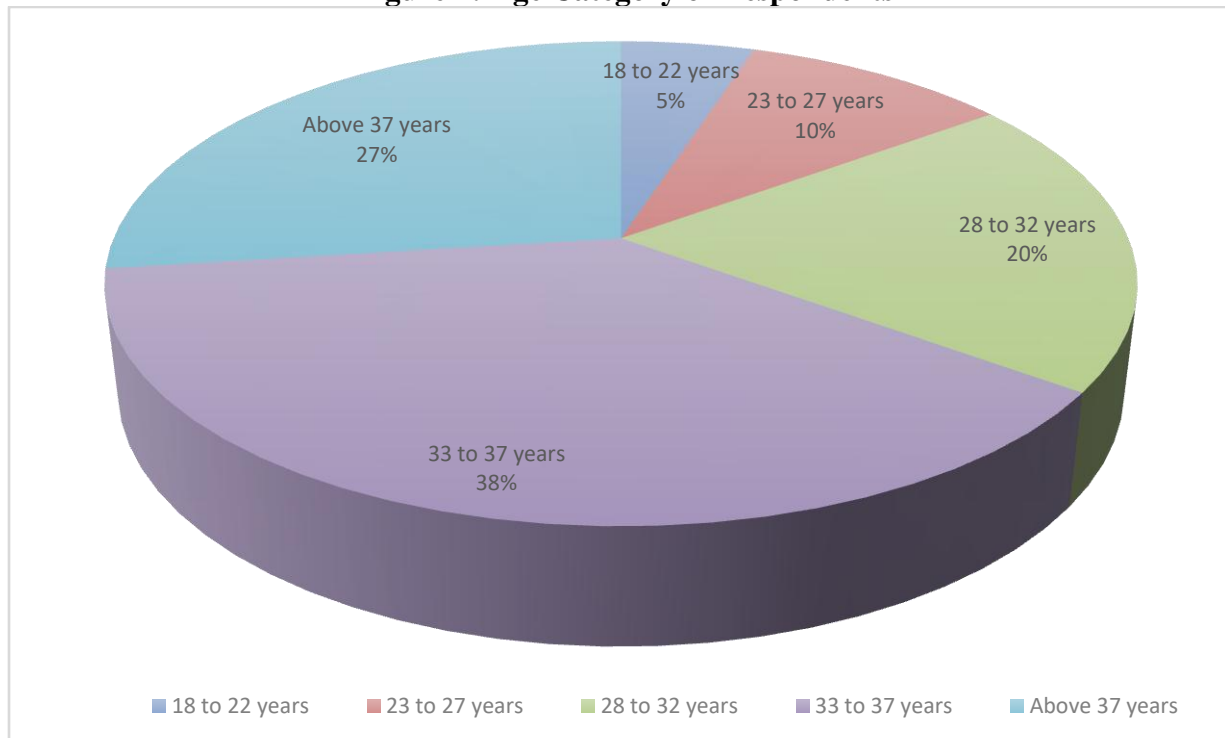
Age Group of respondents	Frequency	Percent
18 to 22 years	5	5.0
23 to 27 years	10	10.0
28 to 32 years	20	20.0
33 to 37 years	38	38.0
Above 37 years	27	27.0
<b>Total</b>	<b>100</b>	<b>100.0</b>

Source: own survey

Analysis of the above table (table2) shows that 38% of respondents belongs to the age group between 33 and 37 years. In addition, 27% of the MSMEs operators in the study belongs to the age group above 37 years. The remaining 5% belongs to the age group between 18 and 22 years. Most of the age group in the study is concentrated between 33 and 37 years that most of the MSMEs operators are not youth according to the UNESCO(2017) definition of youth that indicates entrepreneurs at these stated ages are able to shoulder the responsibility of having their own business.

Usually, MSMEs are assumed to generate employment opportunities for the youth. However, due to lack of seed money youth may not be engaged in the sector that the government has to give attention to.

**Figure 1: Age Category of Respondents**



Source: Own Survey

### 5.1.2. Gender of Respondents

**TABLE 3: GENDER OF RESPONDENTS**

		Frequency	Percent
Valid	Female	27	27.0
	Male	73	73.0
	Total	100	100.0

Source: Own survey

Another socio-demographic variable used in the descriptive analysis is gender. The frequency analysis shows that the lion share of the respondents in terms of gender was male that they constituted 73 %. This finding is consistent with the study conducted by Meunier, Yulia, & Rita(2017) that only less than one-third of new company owners in the world are women. Being one of the vulnerable group in society, females should be encouraged in a special manner so that their burden could be reduced.

Taking the variable gender into account we made a cross-tabulation analysis between gender and size of enterprises. According to the analysis, from the total 47 micro enterprises, 36.2% are operated by females while 63.8% of micro enterprises are operated by male owner-managers. 15.6% of small enterprises are owned by females while 84.4% are operated by males. In addition, 23.8% of Medium enterprises are operated by females while males operate 76.2% of medium enterprises. Though female owners are less in all of the enterprise's size, their proportion is relatively higher in Microenterprises. That is, 36.2% of owners are females in microenterprises while they are 15.6% and 23.8% in small and medium enterprises respectively. From the entire respondents, 73% of the enterprises were owned by men that need some policy adjustments to encourage women entrepreneurs.

**TABLE 4: CROSS TABULATION OF GENDER AND SIZE OF THE RESPONDENTS**

		The size of the Enterprise			Total
		Micro	Small	Medium	
Gender	Female	17	5	5	27
	Percentage	36.2%	15.6%	23.8%	27%
	Male	30	27	16	73
	Percentage	63.8%	84.4%	76.2	73%
Total		47	32	21	100
Percentage		100%	100%	100%	100%

The male domination in enterprises ownership is also shown at National level as publicized in the MSME 2017-18 annual reports. For proprietary MSMEs as a whole, male owned 79.63% of enterprises as compared to 20.37% owned by female at the country level. Further, male dominance in ownership has been more pronounced for small and medium enterprises with 95% or more enterprises being owned by a male, as compared to micro-enterprises where 77.76% were owned by males. Though the percentage is different, the survey result is consistent with the national level report that males are the dominant owners of enterprises regardless of the size.

### 5.1.3. Education of Respondents

Education is considered one of the variables that enhances the success of entrepreneurs. For example, a positive relationship between levels of education (either it is general education or specific programs of entrepreneurship education) and entrepreneurs success was witnessed (Dickson, George, & Weaver, 2008). With regard to the level of education in the survey, 30% of the respondents have completed Pre University Courses and only 2% have completed post-graduation. According to the survey result, only one percent was found illiterate and that most of the respondents had access to education. When we see the educational status of respondents from top to bottom, the result is 30%, 29%, 15%, 13%, 10%, 2%, and 1% for Pre University Course (PUC) completed, primary education (up to 4<sup>th</sup> standard), graduates, secondary education (up to 7<sup>th</sup> standard), above 7<sup>th</sup> but below 10<sup>th</sup> standard, post-graduation, and illiterates respectively. The self-employment success increases significantly for each year of education that enlightens the significant positive relationship between success and each schooling year (Peter & Sexton, 1994). In nutshell, most of the respondents' education category is Pre University course Completed that entrepreneurs should be encouraged to be more successful. The details of the analysis is shown visually from the following table.

**TABLE 5: EDUCATION**

	Frequency	Percent
Illiterates	1	1.0
Primary Education Up to 4th Standard	29	29.0
Secondary Education Up to 7th Standard	13	13.0
Above 7th to but below 10th Standard	10	10.0
S.S.L.C and PUC <sup>1</sup>	30	30.0
Graduates	15	15.0
Post-Graduates	2	2.0
Total	100	100.0

Source: own survey

### 5.2. Major Sources of Finance to MSMEs

The source of finance for MSME is basically divided into internal (personal savings, contributions from family and friends) and external (trade credit, venture capitals, business angle, leasing, loans from institutions, grant, and other). For example, Gbandi & Amissah (2014) conducted research on "Financing Options for Small and Medium Enterprises in Nigeria" and identified debt financing commercial banks and equity financing as a prime source of finance for MSMEs. To alleviate less access to formal sources of external finance to MSMEs, specific financing tools such as leasing and factoring can be useful in facilitating greater access to finance even in the absence of well-developed institutions (Thorsten & Demirguc-Kunt, 2006).

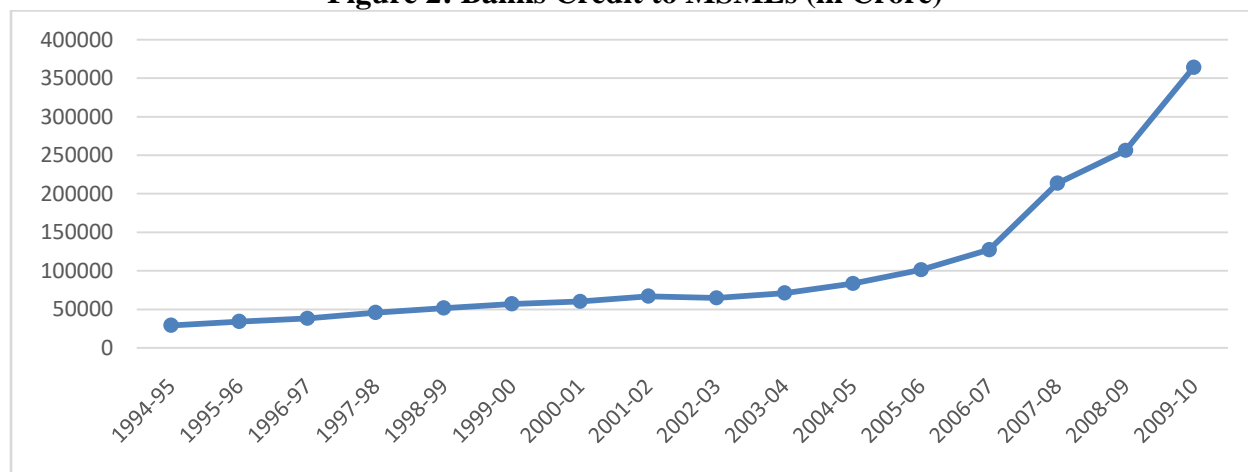
Commercial banks have a great role in financing MSMEs. For example, the following table shows the amount of loan sanctioned to MSMEs in the respective years in India.

**TABLE 6: LOAN SANCTIONED TO MSMES**

Year	Net bank credit(In crores)	Annual Growth (percent)	Credit to MSME(In crores)	Annual Growth (percent)	MSME as percent of Net Bank Credit
1994-95	192424	----	29175	----	15.17
1995-96	228198	18.75	34246	17.12	14.98
1996-97	245999	17.89	38196	11.40	15.52
1997-98	297265	21.20	45771	19.60	15.40
1998-99	339477	14.14	51679	12.66	15.22
1999-00	398205	17.40	57035	10.46	14.31
2000-01	467206	17.33	60141	5.43	12.86
2001-02	535063	14.56	67107	11.65	12.53
2002-03	668576	25.04	64707	(-)-3.60	09.67
2003-04	763855	14.20	71209	10.04	09.32
2004-05	971809	27.22	83498	16.71	08.55
2005-06	1350467	38.96	101285	21.30	07.5
2006-07	1768376	30.95	127323	25.71	07.2
2007-08	1840853	04.09	213539	67.72	11.6
2008-09	2266611	23.13	256127	19.9	11.3
2009-10 (Provisional)	2716507	19.85	364012	42.1	13.4

Source: Ngboawaji & Otu(2014)

When we see the trend of access to commercial banks financing, it shows an increasing trend that the MSMEs in India are favored accordingly in terms of accessing finance from commercial banks.

**Figure 2: Banks Credit to MSMEs (in Crore)**

Source: Own calculation

For the study at hand, the survey result showed that 33% of the MSMEs in the study have chosen a loan from family and relatives. According to the result, commercial bank credit is the third priority when MSMEs owners look for finance. The second priority is the money saved from other jobs. As shown, operators request their families and relatives to finance their expansion plan before they utilized their savings. However, they utilize their saving before they go for

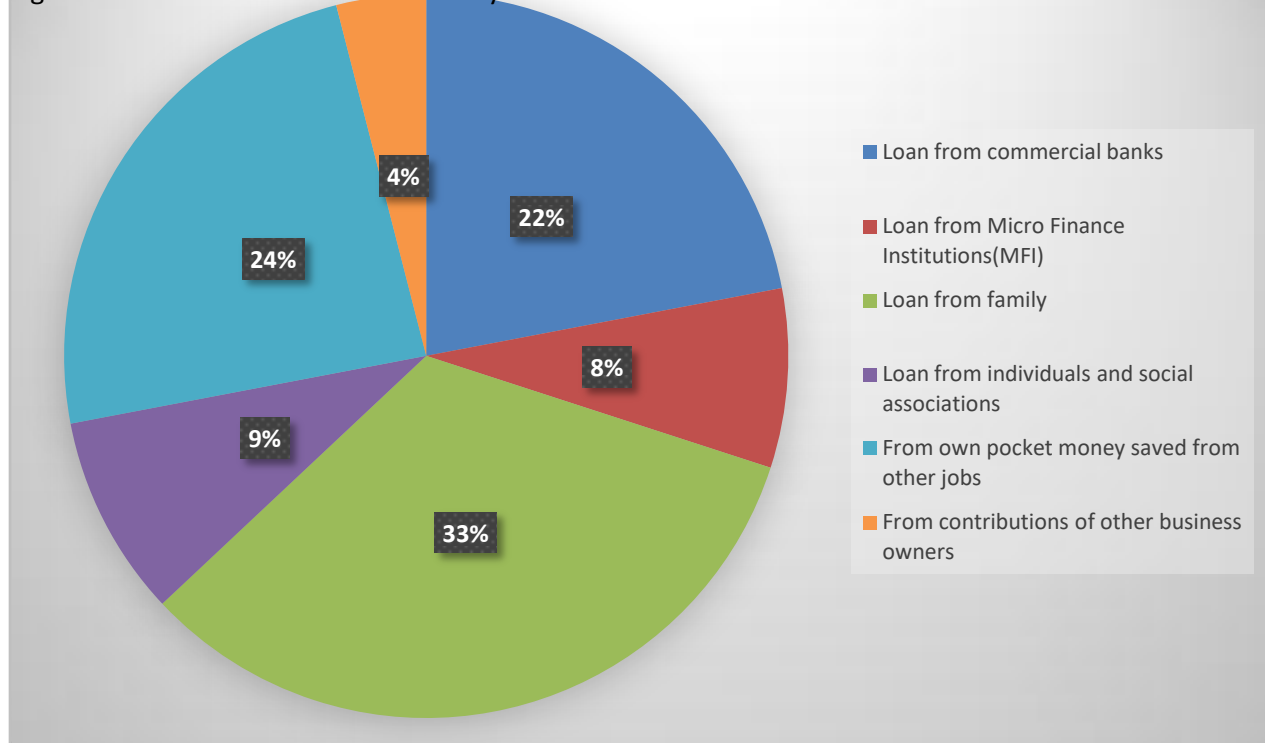
commercial banks credit. The last option considered as the result revealed is fund contributions from other business owners. In other words, MSMEs operators in the study are not that much happy to invite other business owners to share their business unless they have utilized all the options to finance their plan. Hence, the first three financing priorities are a loan from family, own savings, and the loan from commercial banks claimed by 33%, 24%, and 22% respectively.

**TABLE 6: MAJOR SOURCES OF FINANCE**

		Frequency	Percent	Rank
Valid	Loan from commercial banks	22	22.0	3
	Loan from Micro Finance Institutions(MFI)	8	8.0	5
	Loan from family	33	33.0	1
	Loan from individuals and social associations	9	9.0	4
	From own pocket money saved from other jobs	24	24.0	2
	From the contributions of other business owners	4	4.0	6
	Total	100	100.0	

Source: Own survey

Figure 1: Source of Finance Prioritized by MSMEs owners



Source: Own Survey

### 5.2.1. Commercial Banks Financing

In figure 3, commercial bank is the third preferred financing option. There are a number of reasons for MSMEs why commercial banks are not the first priority. Some of these reasons are

lack of collateral, inability to provide a well-articulated business plan, the presence of lending rate, and the perception that banks finance only very big companies.

To examine the commercial banks financing practices in the selected area, the researcher has conducted an interview with MSME banking chief managers in Karnataka Banks Ltd. and Corporation Bank. In both of the banks, MSMEs are considered unsaturated potential. In Karnataka Bank Ltd, for example, Enterprises qualified for MSME finance are all enterprises “engaged in manufacturing or production, processing or preservation of goods and engaged in providing or rendering of services, conforming to the definition of MSME as per MSME Act 2006”. The bank finances Working Capital requirements, Establishment and/or improvement of the unit, repairs & renovations, acquiring machinery/vehicles/ equipment/ any fixed assets for the unit, Purchase/acquiring of property (shop/factory/office) for self-use.

According to the data obtained from Karnataka Bank Ltd, the maximum amount of loan MSMEs are entitled to is 500 Lakh. However, in case of loans eligible to be covered under Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE) arranged by Government of India and Small Industry Development Bank of India (SIDBI) is up to ₹200 lakh, subject to certain conditions and; loans upto ₹10 lakh is collateral free. The loans sanctioned are entitled to different loan tenures according to the agreement. The loan repayment period (loan tenure) is one of the factors that discourage MSMEs from the loan application. In Karnataka Bank Ltd, the loan tenure ranges from 12 months to 84 months.

### **5.2.2. Loan Repayment Trends of MSMEs**

Financial institutions argued that if MSMEs want a higher amount of finance to satisfy their need, they must pledge collateral, provide factual information, and be able to prepare a good plan. This issue is supported by Hatice(2000) that enlightened as ‘relying on collateral to back small business loans is positively related to the level of banks’ amount outstanding’. In addition, a study conducted by Gabriel, Vicente, & Jesus(2006)revealed a negative relationship between collateral and borrower's risk that gives confidence to the lender. Nevertheless, Commercial Banks could also be reluctant to use their excess liquidity for lending to MSMEs due to the accessibility of safe investment in Treasury Bills(Martina, et al., 2008). However, the survey result shows that MSMEs are great potential for banks to generate revenue given that these enterprises are well planned.

For the question that raised to know whether the default rate of borrowers was high or not, the respondents in both banks assured that the default rate was not that much dreadful due to the follow-ups and strict underwriting procedures. The evidence at hand revealed that one of the reasons that MSMEs operators could fail to repay the loan is a miss match between the value of the collateral and the amount of loan (35%) and due to unforeseen circumstances (37%). Hence, pledging collateral could not always lead to reduced borrowers risk that other related factors should also be reflected.

From the following table (Table 8), it is shown that 20% of the respondents supposed borrowers may default due to lack of follow-up by the lenders. Hence, lenders are required to follow up their customers to find out whether they put the borrowed sum appropriately as per the prior plan or not. Because of inappropriate follow-up, borrowers may put the borrowed money in some other risky investments without the knowledge of the bank that could worsen the failure rate.



When MSMEs are stressed, banks have a separate mechanism to address this issue. This mechanism is stipulated by Reserve Bank of India as a "framework for revival and rehabilitation of Micro, Small, and Medium Enterprises". When banks perceive stress, they handle cases under this framework.

Timely discovery of stress is basic for any undertaking, as any delay in action may interrupt on the revival prospects of the potentially viable enterprise. The revival and rehabilitation framework is set to guarantee that the Bank pursues a rapid procedure of restoration and recovery of MSMEs having a loan limit up to Rs.25 crore and to encourage the promotion and development of MSMEs. To apply this framework, the detection of the stress is done by internal monitoring of lenders. Hence, whatever may be the causes, when MSMEs are perceived stressed, the revival and rehabilitation framework could be in place.

**TABLE 8: REASONS FOR DEFAULT**

		Frequency	Percent
Valid	Due to lack of follow-up by lenders	20	20.0
	When collaterals are less than the loan value	35	35.0
	Due to unforeseen business circumstances	37	37.0
	Due to the negligence of borrowers	6	6.0
	Due to an illegal agreement between borrower and loan officer	2	2.0
	Total	100	100.0

Source: Own Survey

### 5.3. Business Models used by Banks

Financial providers could decide to reflect holistically and define a model that the entire organization reshapes towards. As a result, financial service providers may adopt one or several banking models that fit the needs of a specific customer like MSMEs. Bank model is one of the important attributes for MSMEs service provision. MSMEs operators were comfortable with the business model that banks use. To collect data on commercial banks business model, respondents were asked related questions and the descriptive analysis of the response for the variables shows most of the respondents (38%) replied that they are happy that the banks' model is very appropriate and welcoming to them. Only a few respondents (7%) replied that they are not happy with the model the bank has installed. In general, respondents agreed that the operating model and procedures followed by commercial banks fit customers' expectation and could motivate them to apply for the loan. The detail is shown in the table below.

**TABLE 9: APPROPRIATENESS OF THE BANK MODEL**

The model and procedures of the banks are appropriate for MSMEs		Frequency	Percent
	Disagree	7	7.0
	Neutral	24	24.0
	Agree	31	31.0
	Strongly Agree	38	38.0
	Total	100	100.0

Source: Own Survey

#### 5.4. Government Supports to MSMEs

**TABLE 10: GOVERNMENT SUPPORT**

The government support is sufficient		Frequency	Percent
Valid	Strongly Disagree	5	5.0
	Disagree	43	43.0
	Neutral	43	43.0
	Agree	9	9.0
	Total	100	100.0

Source: Own Survey

Micro, Small, and Medium Enterprises and entrepreneurs assume a key responsibility in national economies around the globe, creating jobs, adding to economic development, satisfy social needs, and improving social networks. However, MSMEs are fragile and are affected by business conditions and policies than bigger firms. To compensate this fragility nature of these Enterprises, the government support is of paramount importance.

In addition to the formulation of policy that creates enabling business environment, government support to be provided to enterprises could take different forms including credit guarantee scheme, provision of training, facilitation & provision of shades and working premises, and other on-call supports for both enterprises and operators.

In this manner, MSMEs operators were asked if they believe the government's support they receive is sufficient. From the MSMEs operators considered for the study, 43% replied that they disagree with the notion 'the government support is sufficient'. Only 9% of respondents have agreed with the same notion that operators are not happy with the support provided to them.

##### 5.4.1. MSMEs Challenges

Though MSMEs want support from the government in different ways, the exact needs of MSMEs should be known for the government to intervene. To identify the type of supports the government could provide, the researcher has asked MSMEs operators about their challenging areas. With this regard, the issues that need the attention of the government are credit issues, training facilities, and marketing issues.

Table 11 shows the MSMEs challenge that could be resolved by the government. For 43% of the respondents, the inadequate credit facility is the most challenging issues that need to be addressed. In addition, 36% of the respondents are challenged by a lack of training facilities, 16% with a lack of marketing support and only 5% are complaining about the infrastructure.

However, the government of India has claimed that it has provided a number of supports as stated in the MSMEs report 2017-18 (Government of India, Ministry of MSMEs, 2018). It claimed that the marketing and budgetary related support has been provided to the needy MSMEs sector. For example, the government provided funds to Coir Board for undertaking its various activities and for the promotion and development of the coir (coconut fiber) industry in India. In addition, the government has provided credit support too. For example, National Small Industry Corporation (NISC) has entered into tie-up arrangements with various Banks for providing Credit facilities to the MSME sector and it has facilitated a total credit of Rs. 4139 crore during the year 2017-18. In addition, NISC has facilitated skill development by imparting

training according to requirements of industries so as to strengthen on-going training programmes through its seven Technical Services Centres (NTSCs) located at Okhla (New Delhi), Hyderabad (Telangana), Howrah (West Bengal), Rajkot (Gujarat), Chennai (Tamil Nadu), Rajpura (Punjab) & Aligarh (Uttar Pradesh) (Government of India, Ministry of MSMEs, 2018). Moreover, the MSME Ministry provides grants for infrastructure development under the Community Development Programme (CDP) scheme. The government grant is restricted to 60% of the cost of the project of Rs 10.00 crore.

Though the central government provided different MSMEs support schemes, MSMEs in the study area are not satisfied with the support they are getting from the state and local governments that need attention.

**TABLE 11: CHALLENGES THAT AFFECT MSMEs**

	Frequency	Percent
Valid Lack of Infrastructure	5	5.0
Lack of Marketing support	16	16.0
Lack of Training Facility	36	36.0
Inadequate Credit	43	43.0
Total	100	100.0

Source: Own Survey

### 5.5. Performance and its Measures

The measurement of business performance, particularly of MSMEs, is a difficult and controversial issue. While some scholars advocated the strict use of financial indicators, others, emphasized the relevance of non-financial aspects of business performance (Buttner & Moor, 1997; Simpson, Tuck, & Bellamy, 2004; Elizabeth & Alan, 2004). Moreover, some gave due attention to the importance of non-financial indicators for the measurement of firm success (Michael, Anouk, & Rogier, 2002); (O'Regan & Ghobadian, 2004).

Even though there is no uniformly accepted performance measure that has been used consistently among researchers, a wide range of measurement techniques have been used. Generally, firm performance has been measured by using changes in sales, assets, employment, productivity, profits, and profit margins Frederic, Davidsson, & William, 2003; Yassine, 2013; Efofi, Tanankem, Asongu, & Beecroft, 2016).

However, these variations have led to contradictory results reported by previous studies, left the topic of performance measure awkward. Indeed, the different forms of performance, based on the different measures, may have different determinants and effects.

In all types of researches, firm performance is of great importance and frequently used as a dependent variable. However, there is hardly a consensus on its definition, dimensionality, and measurement of MSMEs concepts. To understand the performance of MSMEs is especially difficult due to the fact that objective measurement and attributes of performance in this subsector is rare that performance is taken usually on self-reporting performance of SME owner-managers.

As noted by Leković & Marić (2015), financial performance measures of small business are not sufficient for real and objective expression of realized business results. Hence, a self-reporting performance indicator criterion is necessary to measure the success of Small and Medium Enterprises. Moreover, Micro, Small and Medium Enterprises do not usually keep a record of their performance that adds to the difficulty of gathering historical and objective data that shows their performance with a different dimension. Hence, for this study, performance is considered from owners reporting perspective and these dimensions are profit, Social Budget, additional product development, and additional jobs created (Yassine, 2013; Miroslav & Yanko, 2010).

**TABLE 12: MEAN SCORE OF PERFORMANCE MEASURE**

	N	Mean	Std. Deviation
Profit	100	3.61	1.004
New Jobs Created	100	3.77	.815
Social Budget	100	3.93	.946
Additional Product	100	3.92	.981
Valid N (listwise)	100		

Source: Own Survey

Based on the mean score, increase in social budget (3.93) is the most important factor to measure the performance of MSMEs. Producing additional value-added product is the next important measure with the mean score of 3.92 and new jobs created and increment in profit are important dimensions of MSMEs performance with a mean score of 3.77 and 3.61 respectively.

In addition to the performance of MSMEs at enterprises level, the performance of the sector as a whole could be measured in terms of employment creation and Gross Domestic Product (GDP) contribution. For example, in India, the Performance of the MSME sector is measured in terms of GDP contribution (Government of India, Ministry of MSMEs, 2018).

**TABLE 13: CONTRIBUTIONS OF MSMEs IN THE COUNTRY'S ECONOMY (AT CURRENT PRICE)**

Year	MSME Gross Value Added (GVA)	Growth (%)	Total GVA	The share of MSME in GVA (%)	Total GDP	The share of MSME in GDP (in %)
2011-12	2583263	-	8106946	31.86	8736329	29.57
2012-13	2977623	15.27	9202692	32.36	9944013	29.94
2013-14	3343009	12.27	10363153	32.26	11233522	29.76
2014-15	3658196	9.43	1148179	31.86	12445128	29.39
2015-16	3936788	7.62	124586424	31.60	13682035	28.77

Source: Government of India, Ministry of MSMEs(2018)

As shown in the above table, the performance of the MSMEs sector in terms of GDP share was 29.57% in the year 2011-12 and the performance dropped to 28.77% in the year 2015-16. The prime intention here is to indicate how the performance of the sector can also be measured in

addition to the enterprises level measures that can be done in terms of increase in profit, social budget, additional value-added products and jobs created.

### 5.5.1. Factors Affecting the Performance of MSMEs

Regardless of the level of performance, we look at sector or enterprise level, the success and performance of Micro, Small, and Medium Enterprises is affected by many factors. These factors could be internal or external to the enterprises. As discussed in table 11, the issues that challenged MSMEs are lack of infrastructure, lack of finance, lack of training, and lack of marketing related supports. These constraints are assumed to be solved through the support provided by the government.

Usually, access to finance is one of the prominent problems that affect the performance of MSMEs. Commercial banks are reluctant to provide financial services to MSMEs due to a number of reasons. Some of the factors that affect the commercial banks decision to sanction loan to MSMEs are government regulation (reserve requirement, lack of credit guarantee scheme, determining the ceiling of interest rate), Bank characteristics (Experience of the bank, unique department to serve MSMEs, the size of the bank, underwriting capacity and others), and characteristics of MSMEs (size, experience, and location). Hence, the decision of bank is influenced by enterprises related factor, banks related factors and regulation related factors.

### 5.6.Types of Enterprises activities

Because of the free entry and exit, MSMEs operators choose a number of business activities to be engaged. These activities could range from proprietor retailing to manufacturing private limited company. The research result revealed that 33% of the operators are engaged in retailing activities. In addition, the hotel and restaurant business has accounted for the 2<sup>nd</sup> most known businesses by operators participated in the study (13%). From the operators participated in the study, only 3% are engaged in agriculture. This may be due to the target population considered (Mangalore and Udupi) were agriculture is not the primary activity. From the operators, 11% are also engaged in hardware and software maintenance that respondents were middle-level professionals.

**TABLE 13: TYPE OF ACTIVITY THE BUSINESS IS ENGAGED (SECTOR)**

	Frequency	Percent
Retailing commercial activities	33	33.0
Agriculture	3	3.0
Education	7	7.0
Hotel & Restaurant	13	13.0
Health	13	13.0
Manufacturing	9	9.0
Hardware & Software Maintenance	11	11.0
Other (Decoration and beautification)	11	11.0
Total	100	100.0

## 6. SUGGESTIONS AND CONCLUSION

In this section, the suggestions are given to stakeholders so that their actions can enhance the success and performance of MSMEs in the study area. Moreover, in this section, the conclusion is drawn based on the finding of the study.

### 6.1. Suggestions

- Being one of the vulnerable section in the society, females should be encouraged in a special manner that the proportion of owning a business and to create a job for themselves must be improved so that their burden could be relieved.
- Most of the MSMEs owners were found within age category of above 33 years. This is an indication that youths are not running their business due to lack of seed money. Hence, the government is required to strengthen the schemes that most prioritize youths too so that they will create their own job and contribute to the development of their country
- Though commercial banks have installed a suitable business model for MSMEs, the loan application turnout did not increase due to attitude issues that MSMEs operators perceive banks are meant for big companies. Therefore, banks and the government should work on awareness creation on banks credit facilities
- Because pledging collateral is not a guarantee to reduce borrowers' risk, banks should make a handy follow-up of borrowers' operation so that they will be able to identify stressed MSMEs and enterprises that are not utilizing the borrowed money in the pre-planned way.

### 6.2. CONCLUSION

Most of the MSMEs operators were with the age group between 33 and 37 years. In terms of gender, the lion share of the respondents were male and most of the educational programme was Pre University course (PUC). Loan from family and relatives was the first priority chosen by MSMEs to finance their expansion plan. However, commercial banks also took the third rank in terms of priority despite the fact that MSMEs are considered unsaturated potential for banks.

The experience of borrowers was not that much a concern for banks since banks were doing well in the underwriting process. Pledging collateral could not always lead to reduced borrowers risk that default could be caused by follow up and related mistakes committed by banks. The business model used by banks was comfortable for MSMEs operators that they feel welcomed when they visit banks for loan applications.

Though the central government has claimed a variety of supports provided to MSMEs in different localities, the local and state government was blamed by MSMEs operators that the support was inadequate. The most challenging issues perceived by MSMEs that could hinder their success are inadequate credit facility, lack of training facilities, lack of marketing support and lack of infrastructure.

Though the performance of MSMEs can be measured in a different dimension, the attributes used to measure their success were found to be increased in the social budget, additional value-added product, new jobs created, and increment in profit. The banks' loan related decision was affected by the availability of collateral, provision of factual information, and the technical ability of MSMEs operators.

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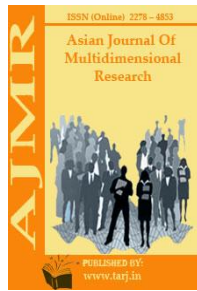
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## **IMPACT OF CAPITAL STRUCTURE ON PROFITABILITY: EVIDENCE FROM INDIAN AUTOMOBILE COMPANIES**

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### **ABSTRACT**

*The relative proportion of various sources of funds used in a business is termed as financial structure. Capital structure is a part of the financial structure and refers to the proportion of the various long-term sources of financing. It is concerned with making the array of the sources of the funds in a proper manner, which is in relative magnitude and proportion. The secondary data of the companies for a period of 2011-12 to 2016-17 were taken from the annual report of the companies. The impact of various variables on profitability were measured with multiple regression technique and four variables of capital structure i.e. DER, PPropR, FAOE, SR were selected that has impact over the profitability in the Indian automobile companies.*

**KEYWORDS:** *Capital structure, debt, equity, automobile companies.*

## INTROCDUCTION

The capital structure is how a firm finances its overall operations and growth by using different sources of funds. Debt comes in the form of bond issues or long-term notes payable, while equity is classified as common stock, preferred stock or retained earnings. Short-term debt such as working capital requirements is also considered to be part of the capital structure. Capital structure of a company refers to the make-up of its capitalisation and it includes all long-term capital resources viz., loans, reserves, shares and bonds (Gerstenberg, 1972).

The capital structure of a company is made up of debt and equity securities that comprise a firm's financing of its assets. It is the permanent financing of a firm represented by long-term debt, preferred stock and net worth. So it relates to the arrangement of capital and excludes short-term borrowings. It denotes some degree of permanency as it excludes short-term sources of financing.

Capital structure can be a mixture of a firm's long-term debt, short-term debt, common equity and preferred equity. A company's proportion of short- and long-term debt is considered when analyzing capital structure. When analysts refer to capital structure, they are most likely referring to a firm's debt-to-equity (D/E) ratio, which provides insight into how risky a company is. Usually, a company that is heavily financed by debt has a more aggressive capital structure and therefore poses greater risk to investors. This risk, however, may be the primary source of the firm's growth.

## REVIEWS OF LITERATURE

Nagarajan and Burthwal (2007) examined the relationship between profitability and capital structure to find out the determination of profitability. The analysis demonstrated that under the condition of price controls the most significant determinant of the profitability of the firms in this industry is vertical integration. Size and advertising intensity did not appear to be major determinants. This was perhaps due to the inability of firms to translate their market power into prices, because of controls. The coefficient of growth rate of sales was positive and significant.

Modigliani and Miller (1958) believed that the value of a firm is determined by its real assets and not by the amount of debt and equity available as part of its capital structure. Studies of the determinants of capital structure mix have provided some evidence that 34 could be used as an indicator of the relationship between capital structure mix and firm performance.

Since Modigliani and Miller's (1958) landmark paper, the cost of capital, corporate finance, the theory of investment, and the theory of capital structure and its effect on firm value and financial performance have remained confusing issues (Ebaid 2009). Some theories consider the roles of managers to maximise a firm's value and subsequently shareholders' benefits. This is central to a firm's effectiveness (Chakravarthy 1986). The importance of shareholders emerges from the degree to which they form the capital structure of the firm issuing the shares. However, debt holders can also influence a firm's value, depending on debt benefits. In this study, capital structure refers to the way that firms finance their activities by using a mix of debt and equity. Matsa(2010) analyzed the strategic use of debt financing to improve a firm's bargaining position and found that strategic incentives from union bargaining appear to have a substantial impact on corporate financing decisions. Jang and Tang (2009) examined the international diversification and financial leverage in a simultaneous equations model to understand how they affect profitability after accounting for the endogeneity between strategic and financial decisions. They

indicated that financial leverage is more closely related to profitability than international diversification. However, the results also suggest that the effect of international diversification still needs to be considered when making financial decisions. Turner et.al, (2015) evaluated the drivers of profitability for a large sample of U.S. hospitals. They used a DuPont analysis as a framework to evaluate the profitability and capital structure.

## RESEARCH METHODOLOGY

To accomplish the above objective of the study the following research methodology is proposed.

**Source of data:** For the purpose of study secondary data will be taken into consideration. Secondary data were collected from annual report and websites of selected automobile industries. In addition, magazines, newspapers and other reports of selected automobile company will be used.

**Selection of Samples** The sample of the major companies amongst the automobile industries is included in the study. In Indian automobile industry major four players are Tata Motors Limited, Mahindra & Mahindra Limited, Maruti Suzuki Limited and Hyundai Limited. Thus these companies are included in the study.

**Collection of Data:** The secondary data of the companies for a period of 2011-12 to 2016-17 were taken from the annual report of the companies.

**Data Type:** For achieving the objective of this study and to conduct the investigation, data was collected secondary sources mainly from annual reports.

## DATA ANALYSIS

The data from the selected 4 companies were gathered and presented in table as under:

**TABLE-1: THE CAPITAL STRUCTURE RATIOS OF SELECTED COMPANIES (IN CRORES)**

Company	Years	Debt Equity Ratio in	Capital Gearing Ratio	Propri etary Ratio	Solvency Ratio	Fixed Assets to Owner's Equity Ratio	Fixed Assets to Employed Capital Ratio
Tata Motors Ltd. (In Crores)	2011-12	1.80	0.66	0.36	0.35	1.66	1.66
	2012-13	1.73	0.62	0.37	0.18	1.62	1.62
	2013-14	1.59	0.61	0.39	0.21	1.61	1.61
	2014-15	2.36	0.99	0.30	0.17	1.99	1.99
	2015-16	1.49	0.63	0.39	0.79	1.70	1.63
	2016-17	1.81	0.77	0.36	0.47	1.77	1.77
Mahindra and Mahindra	2011-12	0.96	0.36	0.51	0.81	1.36	1.36
	2012-13	0.87	0.32	0.53	0.94	1.32	1.32
	2013-14	0.86	0.34	0.54	0.76	1.34	1.34
	2014-15	0.71	0.24	0.58	0.88	1.24	1.24
	2015-16	3.05	1.41	0.22	0.18	2.86	2.85
	2016-17	3.07	1.51	0.22	0.16	2.92	2.92
Maruti	2011-12	0.47	0.04	0.68	3.78	1.04	1.04

Suzuki Ltd.	2012-13	0.44	0.07	0.70	2.33	1.07	1.07
	2013-14	0.46	0.07	0.69	2.47	1.07	1.07
	2014-15	0.42	0.04	0.71	4.76	1.04	1.04
	2015-16	0.45	0.04	0.64	7.32	1.14	1.14
	2016-17	0.42	0.04	0.70	6.25	1.06	1.06
Hyundai Ltd	2011-12	1.54	0.01	0.39	0.21	1.85	0.02
	2012-13	0.09	0.01	0.42	2.89	2.32	0.36
	2013-14	0.09	0.01	0.43	2.39	2.32	0.36
	2014-15	0.09	0.01	0.40	1.73	2.43	0.38
	2015-16	1.35	0.00	0.03	5.11	34.66	0.04
	2016-17	1.14	0.00	0.03	3.16	32.25	0.04

To analyse the above data and further to measure the impact of the independent variables on profit is measured with the following hypothesis:

H1= the variables of capital structure are having impact over profitability in the automobile companies.

To analyse the above hypothesis for measuring the variables that have impact over the profitability, the multiple regression analysis by SPSS-19 software were conducted and the results are as under:

**TABLE-2: MULTIPLE REGRESSION ANALYSIS**

Descriptive Statistics			
	Mean	Std. Deviation	N
Profit	108895.1423	259136.28079	24
DER	1.1358	.86510	24
CGR	.3667	.44844	24
PRopR	.4412	.19679	24
SR	2.0125	2.09698	24
FAOE	4.3183	8.99850	24
FACE	1.2054	.77198	24

Correlations								
		Profit	DER	CGR	PRopR	SR	FAOE	FACE
Pearson Correlation	Profit	1.000						
	DER	-.456	1.000					
	CGR	-.324	.905	1.000				
	PRopR	-.085	-.611	-.402	1.000			
	SR	.081	-.574	-.618	.317	1.000		
	FAOE	-.034	.073	-.215	-.683	.289	1.000	
	FACE	-.456	.719	.912	-.026	-.463	-.446	1.000
Sig. (1-tailed)	Profit	.						
	DER	.013	.					
	CGR	.061	.000	.				
	PRopR	.346	.001	.026	.			

	SR	.353	.002	.001	.066	.		
	FAOE	.438	.367	.156	.000	.085	.	
	FACE	.013	.000	.000	.451	.011	.014	.
N		24	24	24	24	24	24	24

Model Summary											
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics						
					R Square Change	F Change	df1	df2	Sig. Change	F	
4	.923 <sup>d</sup>	.853	.822	109453.89680	.034	4.445	1	19	.049		
d. Predictors: (Constant), DER, PPropR, FAOE, SR											
ANOVA <sup>e</sup>											
Model	Sum of Squares		df	Mean Square	F	Sig.					
4	Regression	1.317E12	4	3.292E11	27.480	.000 <sup>d</sup>					
	Residual	2.276E11	19	1.198E10							
	Total	1.544E12	23								
d. Predictors: (Constant), DER, PPropR, FAOE, SR											
e. Dependent Variable: Profit											
Coefficients <sup>a</sup>											
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
4	(Constant)	1779748.95	170618.7		10.43	0.00					
	DER	-408666.66	41854.75	-1.36	-9.76	0.00	-0.46	-0.91	-0.86	0.40	2.52
	PPropR	-2523638.76	290122.8	-1.92	-8.70	0.00	-0.09	-0.89	-0.77	0.16	6.26
	FAOE	-38191.55	5499.97	-1.33	-6.94	0.00	-0.03	-0.85	-0.61	0.21	4.70
	SR	35678.43	16923.27	0.29	2.11	0.05	0.08	0.44	0.19	0.41	2.42
a. Dependent Variable: Profit											

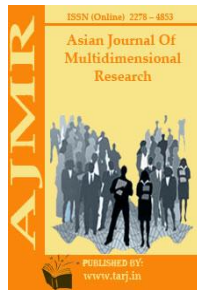
## CONCLUSION

The final Regression model with 4 independent variables (DER, PPropR, FAOE and SR) explains almost 82.2% of the variance of profitability in the automobile companies. Also, the standard errors of the estimate has been reduced to 109453.89680, which means that at 95% level, the margin of errors for any predicted value of capital structure on profitability can be calculated as  $\pm 214529.63$  ( $1.96 \times 109453.89$ ). The four regression coefficients, plus the constraints are significant at 0.05 levels. The impact of multi colinerarity in the 4 variables is substantial. They all have the tolerance value less than 0.41, indicating that over 58% of the variance is accounted for by the other variables in the equation. The ANOVA analysis provides the statistical test for overall model fit in terms of F Ratio. The total sum of squares (1.544) is the squared error that would accrue if the mean of capital structure has been used to predict the dependent variable. Using the values of DER, PPropR, FAOE and SR this errors can be

reduced by 85.29% (1.317/1.544). This reduction is deemed statistically significant with the F ratio of 27.480 and significance at level of 0.000<sup>d</sup>. With the above analysis it can be conclude that four variables i.e., DER, P<sub>PropR</sub>, FAOE and SR explains the impact of capital structure over profitability in automobile companies.

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## **IMPACT OF CAPITAL STRUCTURE OVER PROFITABILITY IN INDIAN TELECOM SECTOR**

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### **ABSTRACT**

*The capital structure decision is crucial for any business organization. The decision is important because of the need to maximize returns to various organizational constituencies, and also because of the impact such a decision has on a firm's ability to deal with its competitive environment. The capital structure of a firm is actually a mix of different securities. This paper seeks to investigate the relationship between capital structure and profitability of telecom industry by selecting 4 major players of the sector for a six-year period i.e., 2011-12 to 2016-17. Regression analysis is used in the estimation of functions relating the profitability in relation to capital structure. The results reveal a significantly positive relation between profitability and the 3 variables and ratio of i.e., NOP, Ke and Kd in telecom industry.*

**KEYWORDS:** Profitability, Capital Structure, Ke, Kd, NOP.



## INTRODUCTION

A number of theories have been advanced in explaining the capital structure of firms. Despite the theoretical appeal of capital structure, researchers in financial management have not found the optimal capital structure. The best that academics and practitioners have been able to achieve are prescriptions that satisfy short-term goals. For example, the lack of a consensus about what would qualify as optimal capital structure has necessitated the need for this research. A better understanding of the issues at hand requires a look at the concept of capital structure and its effect on firm profitability. This paper examines the relationship between capital structure and profitability of telecom industry during the period 2011-12 to 2016-17. The next section gives a review of the extant literature on the subject followed by the data and justifies the choice of the variables used in the analysis. The model used in the analysis is then estimated. The subsequent section presents and discusses the results of the empirical analysis. Finally, the last section summarizes the findings of the research and also concludes the discussion.

## REVIEWS OF LITERATURE

With relatively little evidence available on the interaction between capital structure and product market structure, some researchers have recently started investigating this relationship. Brander and Lewis (1986), Maksimovic (1988), Ravid (1988) and Bolton and Scharfstein (1990) variously offer a theoretical framework for the linkage between capital structure and market structure. On a broader front, Harris and Raviv(1991) and Phillips (1995) provide surveys of both the theoretical and empirical research on the relationship between capital structure and market structure, while studies in the US by Krishnaswamy, Mangla and Rathinasamy (1992), Chevalier (1993) and Phillips (1995) investigate the empirical relationship between capital structure and market structure. In a recent study, Rathinasamy, Krishnaswamy and Mantripragada (2000) examine this issue in an international context using data from forty-seven countries. Firms can also issue dozens of distinct securities in countless combinations to maximize overall market value (Abor, 2005). The best that academics and practitioners have been able to achieve are prescriptions that satisfy short-term goals (Abor, 2005).

Myers (1984) and Myers and Majluf (1984) developed the concept of optimal capital structure based on the notion of asymmetric information. firms initially rely on internally generated funds (e.g., retained earnings) where there is no existence of information asymmetry. Firms then turn to debt if additional funds are required and finally they issue equity to cover any remaining capital requirements. The order of preferences reflects the relative costs of various financing options (Abor, 2005, p. 440). The pecking order hypothesis suggests that firms are willing to sell equity when the market overvalues it (Myers, 1984; Chittenden et al., 1996). Myers and Majluf (1984) maintain that firms would prefer internal sources to costly external finance. Thus, according to the pecking order hypothesis, firms that are profitable and generate high earnings are expected to use less debt capital than those that do not generate high earnings. Chiang, Chan, and Hui (2002) collected data related to 18 developers and the other 17 contractors from Hong Kong by using DataStream (an electronic financial database). Their empirical results found through regression analysis indicate that profitability and capital structure are interrelated. Abor (2005) took a sample of 22 firms listed on Ghana Stock Exchange over a five-year period (1998-2002). He found i) a positive relationship between the ratio of short-term debt to total assets and return on equity, ii) a negative relationship between the ratio of long-term debt to total assets and return on equity, and iii) a positive association between the ratio of total debt to total assets and return on equity.

## RESEARCH METHODOLOGY

To accomplish the above objective of the study the following research methodology is proposed.

**Source of data:** For the purpose of study secondary data will be taken into consideration. Secondary data were collected from annual report and websites of selected automobile industries. In addition, magazines, newspapers and other reports of selected automobile company will be used.

**Selection of Samples** The sample of the major companies amongst the telecom industries is included in the study. In Indian telecom industry major four players are Bharti Airtel, Idea cellular, Tata communications and Reliance communications. Thus these companies are included in the study.

**Collection of Data:** The secondary data of the companies for a period of 2011-12 to 2016-17 were taken from the annual report of the companies.

**Data Type:** For achieving the objective of this study and to conduct the investigation, data was collected secondary sources mainly from annual reports.

## DATA ANALYSIS

The data from the selected 4 companies were gathered and presented in table as under:

**TABLE-1: THE CAPITAL STRUCTURE RATIOS OF SELECTED COMPANIES (IN CRORES)**

		Kd	Ke	Kr	Net Sales	Net profit	operating profit	expenses	capital employed	Total assets	Equity share capital	EPS	Debt/Loan	reserve and surpluses
Bharti Airtel services limited	2011-12	11.9034	15.09	6.02828	41603.8	5730	6956.29	27926.9	49429.6	80323.7	1898.8	1.509	11729.4	47530.8
	2012-13	11.5454	13.42	4.87716	45350.9	5096.3	6454.87	31850.7	54146.2	87883.2	1898.8	1.342	14311.3	52247.4
	2013-14	15.439	16.69	5.15351	49918.5	6600.2	8377.47	33619.7	66728.1	98204.1	1998.7	1.669	12368.1	64729.3
	2014-15	8.62375	33.02	8.65261	55496.4	13200.5	15655.3	36065.3	78272.9	12642.4	1998.7	3.302	25099.3	76274.2
	2015-16	0.0752	18.88	4.57687	60300.2	7546.5	10039.8	61748.5	84446.8	16193.9	1998.7	1.888	49600.2	82448.1
	2016-17	1.41001	24.84	5.00438	62276.3	9925.6	-8509.5	-38351.7	10120.7	19074.2	1998.7	2.484	54613.9	99208.6
Idea Cellular	2011-12	0	1.7427	5.98127	19275.3	576.53	842.265	15009.5	12934.5	30984.1	3308.84	0.174	9930.29	9625.69
	2012-13	0	2.4783	7.64683	22043.4	818.25	1288.63	16930.4	14019.9	34426.6	3314.32	0.247	12626.6	10705.6
	2013-14	0	5.0968	13.7768	26110.4	1689.3	2605.28	18893.8	15584.4	43988.4	3319.63	0.509	20288.9	12264.7

	2014-15	0	7.94	15.6169	31252.1	2809.83	4339.08	21606.1	21890.1	57675.8	3597.84	0.794	19072.5	18292.3
	2015-16	0	7.35	12.5037	35772.5	2632.85	4070.85	23909.1	24765.2	78655.2	3600.5	0.735	41243.5	21164.7
	2016-17	7.27365	2.31	4.13963	35256.5	834.31	-1419	25183.8	23723.8	95762.4	3605.32	0.231	55142.2	20118.4
TAT A Com	2011-12	14.4009	6.01	24.9979	4091.77	171.34	265.125	4005.75	7136.96	10856.1	285	6.01	1353.18	6851.97
	2012-13	10.5109	16.68	65.7381	4416.12	475.24	656.69	4298	7516.42	10700.8	285	16.68	1138.72	7231.42
	2013-14	7.80602	19.03	71.3568	4330.05	542.43	803.48	4118.21	7885.6	11529.1	285	19.03	762.36	7600.61
	2014-15	3.34163	23.67	83.6258	4316.03	674.92	1003.27	4035.57	8351.83	11732.9	285	23.67	755.62	8066.83
	2015-16	3.65911	13.78	45.6093	4790.32	392.68	604.94	4372.52	8895.74	12522	285	13.78	855.48	8610.74
	2016-17	3.54105	24.2	76.8878	5068.15	689.83	1204.84	4670.22	9255.21	13145.3	285	24.2	866.41	8970.21
Relia nce	2011-12	4.53844	7.6	1.78799	11110	156	155	11708	44898	85706	1032	0.76	27873	43866
	2012-13	7.21063	30.2	9.70614	11267	624	624	12196	33142	75936	1032	3.02	27404	32110
	2013-14	6.83487	35.4	11.8864	11176	730	-758	13203	31767	77264	1032	3.54	26277	30735
	2014-15	6.44592	6.6	2.3711	10801	-154	1340	12765	35871	75352	1244	0.66	26063	34627
	2015-16	7.10348	15.4	7.31039	9993	-379	-1627	11941	27450	74060	1244	1.54	28845	26206
	2016-17	11.7955	7.28	39.6511	8823	-1796	-3855	13009	24084	73889	1244	7.28	20423	22840

### Data Analysis

As per the objective, for measuring that which of the cost or other rate have an impact over the profitability, the data was gathered and the following hypothesis were made:

H1= attributes configuring the profitability and cost of capital of the company have significant impact over the net profit of the company.

To test the above hypothesis the data for the 6 year period of all 4 selected companies were gathered and analysed by using multiple regression method and the results are as under:

**TABLE-6.9: MULTIPLE REGRESSION ANALYSIS**

<b>A. Descriptive Statistics</b>			
	Mean	Std. Deviation	N
Net_profit	2040.9042	3350.77738	24
Kd	7.6510	4.27117	24
Ke	14.7787	9.85699	24
Kr	22.2870	26.27723	24
Sales	23951.6154	19710.85983	24
NOP	2543.6225	4271.54124	24
Exp	18809.0417	14147.53487	24
CE	33058.4346	26792.06899	24
TA	67487.5321	47730.89841	24
EQuity	1711.5354	1199.09574	24
EPS	5.6273	7.68796	24
DEBT	20360.0963	16871.69483	24
R_S	31346.8983	26607.14064	24

<b>B. Correlations</b>														
		NP	Kd	Ke	Kr	Sales	NOP	Exp	CE	TA	Equity	EP S	Debt	R_S
Pe ars on Co rre lat io n	NP													
	Kd	.072												
	Ke	.338	-.286											
	Kr	-.295	-.143	.231										
	Sales	.711	-.095	.109	-.580									
	NOP	.986	.028	.264	-.289	.719								
	Exp	.685	-.174	.108	-.591	.945	.690							
	CE	.603	-.189	.373	-.555	.846	.579	.848						
	TA	.441	-.293	.256	-.649	.822	.414	.852	.938					
	Equity	.226	.050	-.480	-.622	.567	.265	.502	.176	.337				
	EPS	-.232	-.198	.350	.978	-.532	-.229	-.541	-.450	-.575	-.702			
	Debt	.106	-.461	.009	-.632	.593	.102	.652	.609	.837	.502	-.606		
	R_S	.597	-.193	.397	-.531	.826	.571	.831	.999	.929	.132	-.421	.591	
Si g. (1- tai le d)	NP	.												
	Kd	.370	.											
	Ke	.053	.088	.										
	Kr	.081	.253	.139	.									
	Sales	.000	.329	.306	.001	.								
	NOP	.000	.448	.106	.085	.000	.							
	Exp	.000	.208	.307	.001	.000	.000	.						
	CE	.001	.188	.036	.002	.000	.002	.000	.					
TA	.015	.082	.114	.000	.000	.022	.000	.000	.					

	Equity	.144	.408	.009	.001	.002	.105	.006	.205	.053	.			
	EPS	.137	.177	.047	.000	.004	.141	.003	.014	.002	.000	.		
	Debt	.310	.012	.482	.000	.001	.318	.000	.001	.000	.006	.001	.	
	R_S	.001	.184	.027	.004	.000	.002	.000	.000	.000	.269	.020	.001	.
N		24	24	24	24	24	24	24	24	24	24	24	24	24

**C. Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
3	.992 <sup>c</sup>	.984	.982	450.04804	.005	6.553	1	20	.019

c. Predictors: (Constant), NOP, Ke, Kd

**D. ANOVA<sup>d</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
3	Regression	2.542E8	3	84728814.572	418.325	.000 <sup>c</sup>
	Residual	4050864.815	20	202543.241		
	Total	2.582E8	23			

c. Predictors: (Constant), NOP, Ke, Kd  
d. Dependent Variable: Net\_profit

**E. Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
3	(Constant)	-857.239	274.815		-3.119	.005			
	NOP	.750	.023	.956	32.704	.000	.986	.991	.916
	Ke	36.484	10.363	.107	3.521	.002	.338	.619	.099
	Kd	59.069	23.074	.075	2.560	.019	.072	.497	.072

a. Dependent Variable: Net\_profit

**CONCLUSION**

The final Regression model with 3 independent variables (NOP, Ke and Kd ) explains almost 98.2% of the variance of net profit. Also, the standard errors of the estimate have been reduced to 450.04804. The 3 regression coefficients, plus the constraints are significant at 0.05 levels. The impact of multi colinearity in the 3 variables is substantial. They all have the tolerance value less than 0.589, indicating that over 41% of the variance is accounted for by the other variables in the equation.

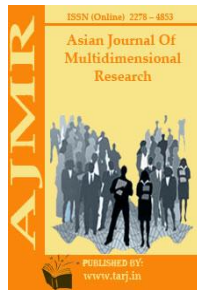
The ANOVA analysis provides the statistical test for overall model fit in terms of F Ratio. The total sum of squares (2.582E8) is the squared error that would accrue if the mean of companies ratios were been used to predict the dependent variable (net profit). Using the values of NOP, Ke and Kd this errors can be reduced by 98.45% (2.542E8/2.582E8). This reduction is deemed statistically significant with the F ratio of 418.325 and significance at level of 0.000c. With the above analysis it can be conclude that 3 variables i.e., NOP, Ke and Kd explains the profitability of telecom industry.

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## **IDENTIFICATION AND ANALYSIS OF TOPOGRAPHIC FEATURES OF AIZAWL CITY**

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### **ABSTRACT**

*Geomorphology is the scientific study of the earth surface. It has been described as the earth-shape-science which is concerned primarily with the form of the earth. Geomorphology was considered as the study of various types of landforms and their origins. It is the study of the landforms, their description and interpretation. It is important not only as an academic discipline but it has more practical applications in the various fields. Geomorphology is the study of the relationship between geological structures and the landscape surface features as well as the processes which change the features by erosion and deposition. Regarding the State of Mizoram, as the terrain is very immature in response to recent tectonism, topographical features show prominent reliefs. The major geomorphic elements observed in the area are topographic highs and depressions, flats and slopes sculptured on the topographic surface in a linear fashion. In Mizoram the topographic depressions are in all cases in accordance with the normal first order structural elements, but the topographic highs are recorded both in the structural highs and depressions. Relief features of the State is imparted by roughly north-south trending steep, mostly anticlinal, longitudinal, parallel to sub-parallel hill ranges and synclinal narrow valleys with series of parallel hummocks or topographic highs. In general, the western limbs of the anticlines are steeper than the western limbs. Faulting in many cases, produced steep fault scarps, especially along the steep dipping fault planes. The other geomorphic*



*elements are the high dissected ridges with the formation of deep gorges, spurs, keels and cols, which developed due to intense erosion. The difference of elevation between valley floors and hill tops greatly varies from west to east and the steep hill ranges are more towards east than to west.*

**KEYWORDS:** *Tectonic, Lithology, Fault, Ridges, Slopes.*

## **INTRODUCTION:**

Geomorphology is the scientific study of the earth surface. It has been described as the earth-shape-science which is concerned primarily with the form of the earth. Geomorphology was considered as the study of various types of landforms and their origins. It is the study of the landforms, their description and interpretation. It is important not only as an academic discipline but it has more practical applications in the various fields. Geomorphology is the study of the relationship between geological structures and the landscape surface features as well as the processes which change the features by erosion and deposition.

Regarding the State of Mizoram, as the terrain is very immature in response to recent tectonism, topographical features show prominent reliefs. The major geomorphic elements observed in the area are topographic highs and depressions, flats and slopes sculptured on the topographic surface in a linear fashion. In Mizoram the topographic depressions are in all cases in accordance with the normal first order structural elements, but the topographic highs are recorded both in the structural highs and depressions.

Relief features of the State is imparted by roughly north-south trending steep, mostly anticlinal, longitudinal, parallel to sub-parallel hill ranges and synclinal narrow valleys with series of parallel hummocks or topographic highs. In general, the western limbs of the anticlines are steeper than the western limbs. Faulting in many cases, produced steep fault scarps, especially along the steep dipping fault planes.

The other geomorphic elements are the high dissected ridges with the formation of deep gorges, spurs, keels and cols, which developed due to intense erosion. The difference of elevation between valley floors and hill tops greatly varies from west to east and the steep hill ranges are more towards east than to west.

The basic objectives of the present study are-

1. To identify the uneven topographic features of the city,
2. To understand the general geology of the study area,
3. To study the lithological units of the study area.

## **TOPOGRAPHY**

The study area is characterized mainly by big hill ridge crossing the central part of the city which originated from Tahreuh tlang near Chamring village. It stretches towards the northwest till Maubuang village. From here it extends the length of the hill towards northerly direction up to Aizawl city and its entire length is about 45.3 km. This ridge line varies in height. This long hill ridge terminates at Bawngkawn saddle. It attains a height of 1614m near Chamring which is the highest peak of this hill ridge. The total length of this ridge within the study area is about 20km.

Another ridge line originates from Zokhawsang and extends in the northern side through Zemabawk, Durtlang and continues towards north crossing Sihphir and Neihbawi.

Aizawl city is characterized by various low and high undulating hillocks of different dimensions. The prominent hills within the study areas are Hlimen tlang 1179 meters, Tlangnuam 1156 meters, Pharbawk tlang 1045 meters which are in the south of the city. Other small hill is Maubawk tlang 1005 meters which is lying in the western side of the city. Tuikhuahtlang 1140 meters, Shivaji Tilah 1010 meters, Laipuitlang 1188 meters are in the heart of the city. Some high elevation on this ridge which are located in the north of the city are Buaiahmun tlang 1383, Leitan tlang 1372 and Neihbawi tlang 1441 meters which is the highest peak in the study area.

Aizawl city is located on the north-south elongated hill like human backbone acting as the main hill range from which many hill ranges and slopes are extending towards the eastern and western direction as spinal code joined by ribs. The areas of topography is undulating and conspicuously by the presence of north-south trending linear hill ridge with steep slope representing a very rugged and immature topography. Normally, the western slope is steeper than the eastern slope. The slope are generally varies from 30°- 45° forming concave shape in the middle but it steeper near the banks of the streams and streamlets.

The topography of the study area is characterized by many scarp lands especially around the hill ridge. The scarps are precipice or overhanging cliff which are generally made up of hard rocks. The altitude of the city areas varies from 800m to 1440m above mean sea level. Some areas like eastern slope of Tlangnuam; western slope of Chaltlang, Durtlang and Sihphir; and also southern facing slope of Nghaki lunglen tlang and Laipuitlang are very steep with cliff formation and these areas are practically unsuitable for human habitation. The hill slopes are dissected by a number of stream and local nallahs forming wide and deep gullies due to destructive works of the rills, storm waters on both sides of the brooks or streams at the toe.

### **Geo-Tectonic evolution**

Mizoram comprises a belt of elongated folds with north-south trends. They are southward extension of Himalaya Mountain which runs towards the Andaman and Nicobar Island. This folded belt lies to the west of the Arakan Yoma subduction zone. The area is very much interesting from the point of view of structure, tectonic evolution and nature of sediments. The north-south direction of parallel folded belt of the region has developed with the compressive stress field generated by the eastward drift of the Indian plate during the Cenozoic era of the late Tertiary period.

The character of folding and group of rocks which exposed on the surface of the ground indicated that there was feeble rotation of the plate which is drifted eastward. Evan (1964) stated that the region evolved after the regional uplift of Barail group of sediments and thus related the with the plate behavior in the subduction zone west of Arakan Yoma, after the spreading of Indian Ocean.

Nandy (1982) recasted the Surma basin of Mizoram is apart; is related to the eastward subduction of the Indian plate along the Arakan Yoma structure during Eocene time and the subsequent development of the Indo-Burma orogenic belt. With the knowledge of regional tectonic setting of Surma basin and with the result got from the photo geological and remote sensing studies help the knowledge of the geodynamic of the fold belt.

K.Sarkar et al of GSI presumed the region of Mizoram forms apart of the Neogene Surma basin to the west of Arakan Yoma subduction collision zone. The region represents the northward extension of the Sumatra-Java-Trench the eastern margin of the Indian plate. The folded belt of the region is composition of a series of longitudinal folds arranged enechelon. The anticlines are long, narrow and tight but the intervening synclines are broad and gentle. The natures of folding have supported tectonic movement for the development of the region.

The above observation and investigation revealed that the north-south direction of the hill range of Aizawl city has been formed due to compression action along with other parallel hill ranges of the region. As described by Nandy the rocks containing fossils were presumed to have laid down in relatively shallow water as would have prevailed in deltaic environment.

It is also believe that during tectonic uplift the anticline of Aizawl city suffered seriously and displaced which has resulted the western facing high scarp of Zarkawt hill, Chanmari – Chaltlang, and also Bawngkawn – Durtlang scarp land. In same manner, eastward scarp land of Ngaizel and southern facing Laipuitlang and Zemabawk cliff seems to be caused by tectonic activities during late tertiary period.

### Geomorphology

Mizoram being a hilly topography, a ridge line runs through almost the whole length of Aizawl city area in a north-south line with several spurs oriented mostly in the east-west direction. It is typified by a number of low and high small hills of diverse extent. Many hillocks which are found in the city area are highly dissected with a sharp ridge, steep slope, along with scarp land at various places and some places are marks by gentle and low dissected hummocks. A limited number of small flat land has been found along the streams and a narrow area of flat land lying between the spurs. The whole city area is uneven topography and the geomorphic elements present in this area are knolls, saddles, spurs, precipice etc. The terrain is very rugged and is geologically soft nature of rocks. The entire study area can be divided into four geomorphic units on the basis of their relative heights in relation to mean sea level and nature of the topography.

<i>Geomorphological unit</i>	<i>Area in km</i>	<i>Percentage</i>
High Structural Hills	4.65	3.60
Medium Structural Hills	61.47	47.66
Low Structural Hills	62.51	48.46
Valley Fills	0.36	0.28
Total	128.98	100.00

*Sources: Mizoram Remote Sensing Application Centre, Aizawl, Mizoram.*

Structural hills constitute the main geomorphic class and dominate the area. Structural hills as the name implies, is structural origin, associated with folding, faulting and other tectonic processes, The areas coverage of various structural hills are-

#### **High Structural Hills:**

North- south direction of high structural hills of more than 1200 meters height is found in the northern part of the city. It covers 4.65 km<sup>2</sup> (3.60%) of the total area of the city. On this high structural hill range, a number of hillocks are located around Doordarshan Kendra, Durtlang, Sihphir and Neihbawi. Among these high hillocks, two small hills like Doordarshan Kendra and Durtlang cover about 52,26% of the total area of high structural hills and other hillocks on the

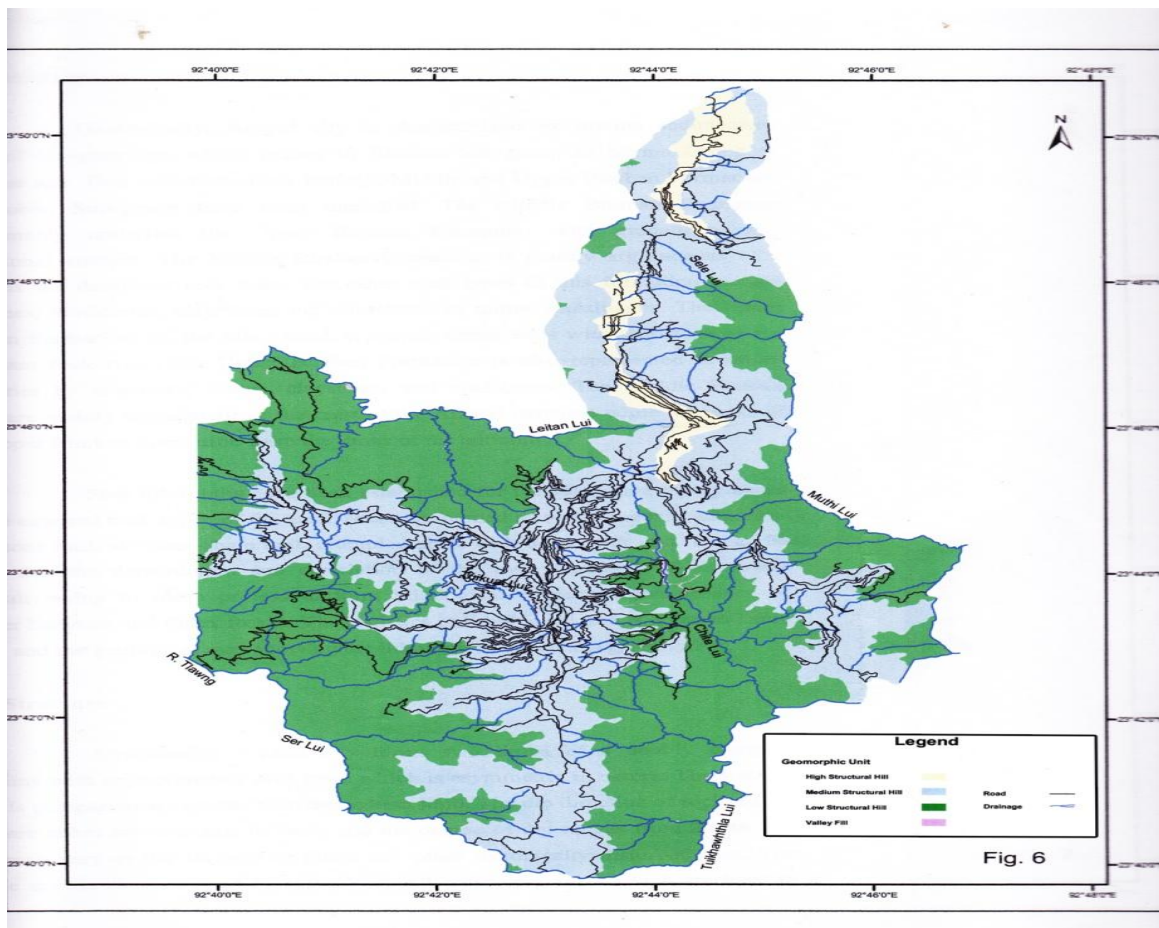
same hill range like Sihphir and Neihbawi occupies around 47.74% of the entire area of high structural hill.

### ***Medium Structural Hills:***

Height of medium structural hills is between 800-1200 metres which covers 61.49 km<sup>2</sup> (46.66%) of the total area of the city. Medium structural hills has been found below the high structural hills and runs through almost the entire city area at the central part of the study area in north-south direction with a number of spurs oriented mainly in the east-west line. The main ridge line covers 75.35% of the entire area of medium structural hills. Rugged hilly terrain drag out from Leitan toward south east cover about 11.47% and the ridge of land that project out from Tuikual toward northwest is 13.8% of the total area of medium structural hills respectively.

### ***Low Structural Hills:***

Low structural hills includes below 800 metres with regard to mean sea level which covers 62.51 km<sup>2</sup> (48.46%) of the entire area of the investigated area. The low structural hills are stretch northwest to southeast in the southwestern side of the city which occupies an area of about 29.05% of the area of low structural hills. Other areas of low structural hills are present in the south east and eastern side of the city which covers 32% and 8.21% of the total area of low structural hills in the city. 4.83% of the area of low structural hills was lying on the west bank of Muthi lui in the northern side of the study area. One more low Structural hills has been protracted along the south of Leitan lui which covers 25.12% of the area of low structural hills.



**Valley fills:**

Valley fills is of fluvial origin characterized by the unconsolidated sediment deposits by the rivers or streams in a narrow fluvial valley. It is found mainly near the mouth of river Leitan at the western side of the city and river Chite at the eastern side of the city. Valley fill is only 0.36 km<sup>2</sup> (0.28%) of the geomorphic unit of the city.

**Lithology:**

The elongated hill on which Aizawl city situated is stratified layers of sedimentary rocks. The rocks present in the areas are mostly fairly compact siltstones with subordinated shale bands belonging to the bhuvan sub-group of Surma Group of tertiary formation. The terrain and geological formation is very young and immature of not more than 40 – 20 million years old in response to recent serious tectonic activities and prominent reliefs are evident in the topographic features.

**Litho-units:**

Geological condition of Aizawl city is characterized by marine sedimentary rocks of neogene age. Two types of rocks formation has been identified by Geological Survey of India are Middle Bhuvan and Upper Bhuvan formation of bhuvan subgroup<sup>16</sup>. The fractures are folded into almost north-south trending anticline and syncline and affected by longitudinal, oblique and transverse faults of varying magnitude.

The Middle Bhuvan formation is predominantly argillaceous with shale as the principal rock type and are exposed along the crest of the Aizawl anticline. The middle bhuvan formation includes siltstone, mudstones, claystone and sandstone as minor constituents. The Upper Bhuvan formation, on the other hand, is mainly arenaceous with sandstone as the dominant rock types. It is also represented in small quantities by siltstone, shale, claystones and mudstones. The upper bhuvan formation forms the limb of the anticline. The arenaceous sediments are imprinted primary structures indicating shallow marine to deltaic environment.

Within the study area five litho-units have been identified purely based on the exposed rocks types of the area. The litho-units are i) Sandstone unit; ii) Shale-sandstone unit; iii) Siltstone-shale unit; iv) Crumpled shale unit; and v) Gravel-silt unit<sup>17</sup>. The siltstones are generally gray in colour, massive, hard and well bedded. The shale bands or beds are either thinly bedded and contain one or two meters thick bands and these are thinly laminated splintery shale.

Due to the absence of marker horizons, index fossils and uniform litho-character it is extremely difficult to make differentiation of litho-unit. The statistics of litho-unit here as under-

**Litho-Unit Statistics**

<i>Rock Types</i>	<i>Area in km<sup>2</sup></i>	<i>Percentage</i>
Sandstones	50.83	39.41
Shale-sandstone	29.24	22.67
Siltstone-shale	19.26	14.93
Crumpled shale	29.30	22.72
Gravel and silt	0.36	0.28
Total	128.98	100.00

*Sources: Mizoram Remote Sensing Application Centre*

***Sandstone:***

One of the litho-units is sandstone which covers 50.83 km<sup>2</sup> (39.41%) of the entire area of the city and this rocks type of sandstone stretch out north-south direction. The lithology of sandstone extends from eastern part of Sihphir (23° 47' 05" N : 92° 44' 50" E), Sihphir vengthar, Durtlang, Leitan, Zuangtui, Zemabawk North and Zemabawk (23° 42' 32" N : 92° 45' 50" E). This area concealed about 29.15 km<sup>2</sup> of the sandstone unit in the city.

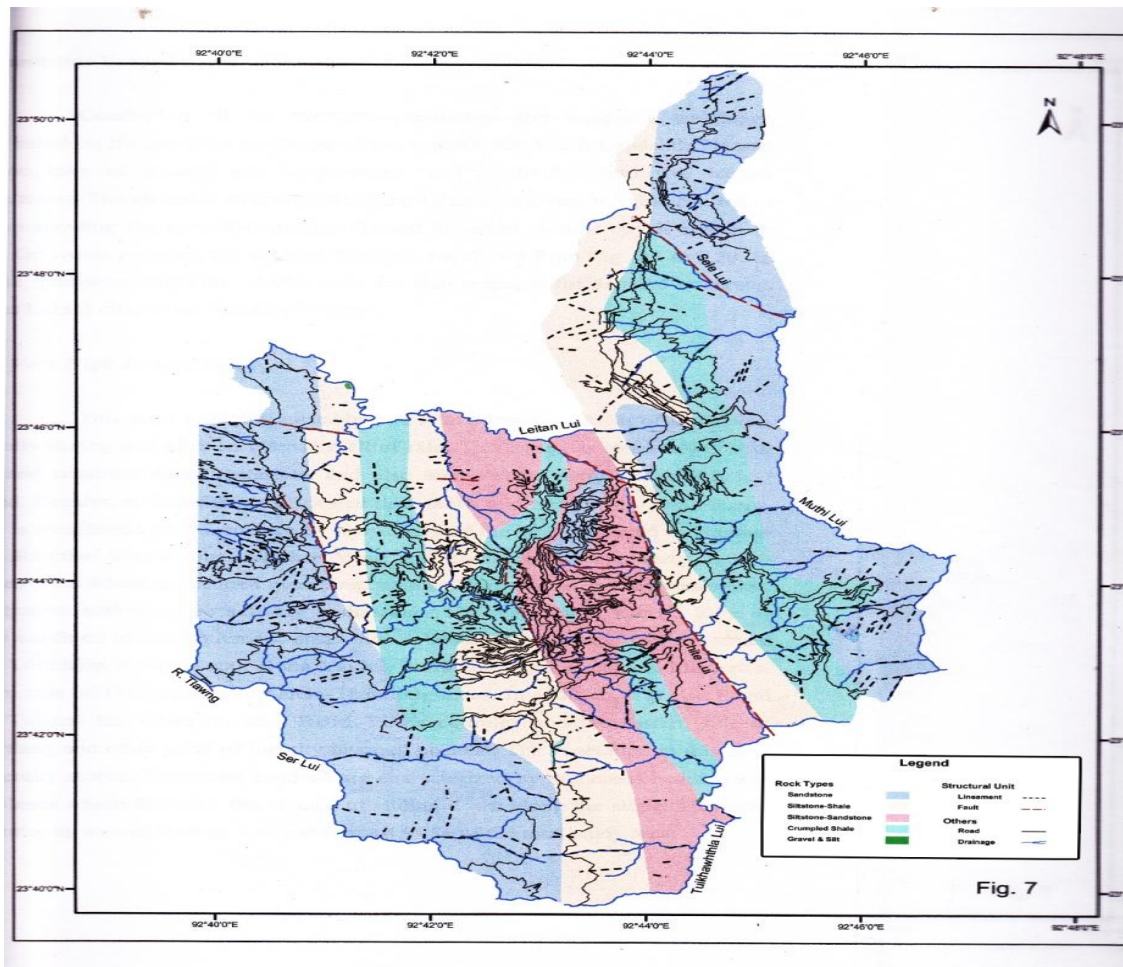
Another vast area drags out from south to north in the westernmost side of the city which encrust about 20.25 km<sup>2</sup> of the sandstone of the study area. The lithology of sandstone cover western part of Rangvamual, Sakawrtuichhun, Luangmual, Tanhril, Lawipui, Maubawk, Tlangnuam ang Hlimen localities. Small area of sandstone has been located at and around north east side of Bawngkawn, south-west Leitan which covers around 1.43 km<sup>2</sup> of the entire area of sandstone.

***Siltstone-Shale:***

The lithology of siltstone-shale covers about 29.24 km<sup>2</sup> (22.67%) of the city. This litho-unit has been located at four places in the study region. The largest area covers 11.86 km<sup>2</sup> which is identified on the western side of Sihphir, Durtlang vengthar, durtlang and Leitan localities. From Durtlang, the litho-unit of this extends through the localities of Thuampui, Falkland and Zemabawk until it reach Tuikhawhthla lui.

The second largest area of siltstone-shale has been identified in the southern side of the city which covers 8.89 km<sup>2</sup> of the aggregate area of this litho-unit. It extends from north to south and gone through Bawngkawn, Nursery, eastern area of Tlangnuam localities. The lithology of siltstone-shale cut across at the centre of Saikhamakawn and it was occupying some western parts of Melthum and eastern section of Hlimen.

The third largest area of siltstone-shale unit tract down in the west of the city and stretch out from Rangvamual through the western side of Chaltlang, Chawlhmmun Zonuam and Lawipui. It covers 4.30 km<sup>2</sup> of the whole area of siltstone-shale area. The category of this lithology prolonged north-south direction. The smallest area of siltstone-shale in the city has been elongated southward which runs through the central part of Chaltlang, Vaivakawn, Zotlang, Zonuam and Chawnpui. It covers only 4.10 km<sup>2</sup> of the entire area of siltstone-shale unit of the study area.



### ***Siltstone-Sandstone:***

Siltstone-sandstone extends northwest to southeast direction in the central part of the city which concealed about 19.26 km<sup>2</sup> (154.92%) of the study area. It is located at two places. The larger areas of siltstone-sandstone in the study area passing through Bawngkawn locality following Chite lui till it reach up to Tuikhawthla lui. It covers 16.71 km<sup>2</sup> of the total area of siltstone-sandstone unit in the city. Other smaller of siltstone-sandstone in the study region cover about only 2.55 km<sup>2</sup> which are marked at eastern part of Chaltlang, Chanmari west, south east Vaivakawn and also occupying trival area of western area of Hunthar veng.

### ***Crumple shale:***

The lithology of crumple shale is presented in the city and the entire area under the litho-unit of crumple shale has been recorded as 29.30 km<sup>2</sup> (22.72%) of the whole area of the investigated area. It is ferret out at three places in the city. The biggest area of crumple shale is extends north-south direction and passing through the eastern part of Durtlang vengthar, Durtlang, Leitan, at the eastern side of Bawngkawn, Zuangtui, Thuampui, northg east side of Falkland and central part of Zemabawk. It covers around 16.40 km<sup>2</sup> of the total area of crumple shale. Other small area of crumple shale has been fall between Leitan lui (23° 41' 53" N : 92° 41' 20" E) to Tlangnuam veng and encrust about 10.60 km<sup>2</sup> of crumple shale in the study area. Small area

about 2.30 km<sup>2</sup> has been found in the space between ITI veng (23° 41' 15" N : 92° 44' 30" E) and eastern part of Saikhamakawn (23° 43' 10" N : 92° 43' 10" E).

#### **Gravel and Silt:**

Gravel and silt has been tracked down on the bank of Sairang lui which is about 0.36 km<sup>2</sup> (0.28%) of the whole area of the study region.

The lithology of the study area has been divided into five groups. One of the categories crumpled shale is the highest rating its weight has been assumed as ten and shale-sandstone unit is on a scale of nine which is the highest rating in the parameter of lithology. The weight of siltstone-sandstone and sandstone are six and four respectively. Regarding the criterion, faults and lineaments are presumed as eight although but the rating scale depend on the length of buffer distance on either side of the faults and lineaments.

In regard to slope, chance of possibility of landslides are increasing as slope degrees more and more up to forty degrees with sixty weight. In spite of increasing weight to eight out of ten between forty and sixty degrees category weight has been reduced to only five a higher degrees above sixty. Moreover, there are other relevant criterions such as old occurrences of landslides, condition of vegetation cover, the vicinity of road cutting or excavation of materials, dip slope relation and drainage texture are predisposed and vulnerable areas to landslides.

#### **Slopes:**

The slope denotes indication of some small portion of land surface from the horizontal one. The representation and analysis of slope have great significance in landslides study. The degree of slope controls the amount of run-off, velocity of streams, erosion, transportation and deposition. The analysis of slope degree in the study area and the same has been related with environmental hazards and management of landslides.

The degree of slope has been conveniently classified into five categories viz Low degree of slope (0 – 10); Moderate degree of slope (10 - 20); Moderately high degree of slope (20 – 40); High degree of slope (40 – 60) and; very high degree of slope (above 60). The hill ridge passing through the city at the central part from north to south direction and a number of spurs extends from the main ridge line. There are many gullies, rivulets and gorges in between the structural spurs. The hill side slopes are generally steep to very steep slopes with soft nature of rocks and a more or less continuous line of very steep slopes are common within the study area. The following are the slope statistics of the study area calculated by Mizoram Remote Sensing Satellite Application Centre

#### **Slope Statistics**

<i>Degree of Slope</i>	<i>Area in km<sup>2</sup></i>	<i>Percentage</i>
0-10	11.70	9.07
10-20	29.90	23.19
20-40	4.55	3.52
40-60	82.48	63.95
Above 60	0.35	0.27
Total	128.98	100.00

*Sources: Mizoram Remote Sensing Application Centre*

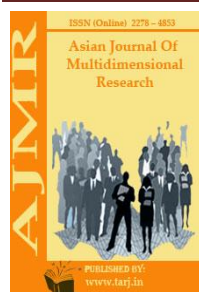


For the purpose of analysis, five groups of slope degree have been taken in the present study. The above table showing distribution of slope in the city reveals that 11,70 (19,07%) area in square kilometers has been covers by low degree of slope; 29,91 (23.19%) of its area in square km has moderate degree of slope; 4.55 (3.52%) of its area in square km under moderately high degree of slope. Besides these, vast areas not less than 82.48 (63.95%) and smaller but not negligible area as 0.35 (0.27%) in square km are high degree and very high degree of slope in the study area respectively. High degree of slope occupies the largest area more than half of the city which indicates the state capital is under the high risk zone to landslide.

Normally the westward facing slope is steeper than the eastern slope. The slope angles are various and forming concave shape in the middle but slope sharply nearby the bank of the streams. The western aspect of the main ridge line around knoll of High school, western side of Chaltlang, Durtlang and some parts of Bawngkawn areas are characterized by very steep slope while western side of the city, for example some areas of Luangmual, parts of Tanhril and Mizoram University Campus are distinctive features of low and gentle slope. Southward slope of Hangi Lunglen tlang, south-eastward escarpment in Durtlang south and eastward facing overhanging cliff at Kulikawn are dangerous steep slope with very high degree of slopes. Localities of Salem, Mualpui, ITI and some other small pocket of lands are low degree and gentle slope in eastern part of the city.

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## **BIOSYNTHESIS OF SILVER NANOPARTICLES FROM CERTAIN BACTERIA ISOLATED IN MAJOR SOIL TYPES OF THIRUVARUR DISTRICT**

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### **ABSTRACT**

*Silver nano particles is an eco friendly easy one step, nontoxic and inexpensive approach in medical industry. It acted as a reducing as well as stabilizing agent of materials. The present study summarized the biosynthesis and characterization of AGNPs using the bacillus sp., Enterococcus sp., and Pseudomonas sp. And its antibacterial activity. The AGNPs were showed excellent antibacterial activity against clinically isolated pathogens. The maximum zone were recorded in the higher concentration (100µl) of bacillus sp. AGNPs particle against E.coli (28mm), K.pneumoniae (24mm), Lactobacillus sp (27mm), A.niger (20mm), A.terreus (20mm) and Penicillium sp (25mm) were recorded respectively. In the same way Enterococcus sp was 28, 30, 26, 16, 22, 25mm zone in E.coli, K.pneumoniae, Lactobacillus sp., A.niger, A.terreus and Penicillium sp. Against 100µl concentration. Where Pseudomonas sp. Against E.coli, K.pneumoniae, Lactobacillus sp., A.niger, A.terreus and Penicillium sp. was 26, 20, 24, 18, 24 and 12 mm diameter were recorded correspondingly.*

**KEYWORDS:** Silver Nano Particles, A.Niger, Biosynthesis, Nontoxic And Inexpensive

## INTRODUCTION

Nanoparticles serve as the fundamental building blocks for various nanotechnology applications. Nanotechnology and alongside nanostructured materials, play an ever increasing role in science, research and development as well as also in every day's life, as more and more products based on nanostructured materials are introduced to the market (Eckhardt *et al.*, 2013). Nanotechnology deals with materials with dimensions of nanometers, i.e. nanostructured materials. The sizes of nanometer dimensions determined the physical and chemical properties of materials undergo extreme changes, which open up a wide range of future, but partly already realized applications (Nagarajan, 2008).

Silver nanoparticles are one of the promising products in the nanotechnology industry. The development of consistent processes for the synthesis of silver nanoparticles is an important aspect of current nanotechnology research. Silver nanoparticles can be synthesized by several physical, chemical and biological methods. One of such promising process is green synthesis. However for the past few years, various rapid chemical methods have been replaced by green synthesis because of avoiding toxicity of the process and increased quality (Gandhi and Khan, 2016).

Silver nanoparticles have unique optical, electrical, and thermal properties and are incorporated into products that range from photovoltaic to biological and chemical sensors, including pastes, conductive inks and fillers which utilize silver nanoparticles for their high electrical conductivity, stabilization and low sintering temperatures. Due to optical properties of nanoparticles, these are mainly used in molecular diagnostics and photonic devices. An increasingly application is the use of silver nanoparticles for antimicrobial coatings, many textiles, wound dressing and biomedical devices contain silver nanoparticles that continuously release a low level of silver ions to provide protection against bacteria (Irvani, 2011; Kumar and Ghosh, 2016).

It is used for purification and quality management of air, imaging, and drug delivery system. Biologically synthesized silver nanoparticles have many applications like coatings for solar energy absorption and intercalation material for electrical batteries, as optical receptors, as catalysts in chemical reactions, for biolabelling and as antimicrobials due to the antibacterial activity. Silver nanoparticles are cytotoxic they have tremendous applications in the field of high sensitivity bimolecular detection and diagnostics, antimicrobials and therapeutics, catalysis and microelectronics. Potential application of silver nanoparticles like diagnostic biomedical optical imaging, biological implants (like heart valves) and medical application like wound dressings, contraceptive devices, surgical instruments and bone prostheses. Many major consumer goods manufacturers the household products by utilizing the antibacterial properties of silver nanoparticles. These products include nanosilver lined refrigerators, air conditioners and washing machines (Mohanty *et al.*, 2012; Mulvaney, 1996; Shrivadtava *et al.*, 2007).

## MATERIALS AND METHODS

### *Culture Collection*

*Bacillus sp.*, *Enterococcus sp.* and *P.aeruginosa* were isolated from major soil types from Thiruvavur district and maintained on nutrient agar slants and preserved at 20°C.

### ***Synthesis of Silver Nanoparticles***

Sterile nutrient broth medium was inoculated with *Bacillus* sp. *Enterococcus* sp. and *P.aeruginosa* and incubated at 40°C in an incubator shaker. The growth was measured periodically at 600 nm using spectrophotometer until the stationary phase. Once the stationary phase is reached, the culture was centrifuged at 5000 rpm. Tubes containing the supernatant were added with 1 and 3 mM AgNO<sub>3</sub> (Sigma, USA) solution separately and incubated in light for 2h. Tubes with only AgNO<sub>3</sub> without supernatant, only the supernatant and only with biomass were maintained as controls. After incubation, the extracellular synthesis of AgNPs was monitored visually by observing the change in color of the culture medium. Unless otherwise stated, three independent runs were made for all experiments (Fang *et al.*, 2005; Viithiya *et al.*, 2014)

### ***Antimicrobial Activity Of AgNPs Particle***

Antimicrobial activity was performed with synthesized silver nanoparticles by Well diffusion method against three bacteria (*E.coli*, *Klebisella pneumoniae* and *Lactobacillus* sp.) and three fungi (*Aspergillus niger*, *Aspergillus terreus* and *Penicillium* sp.). The bacterial and fungal cultures were brought into broth culture for antimicrobial assay. Approximately 7 mm diameter of well was made on Nutrient agar (bacteria) and potato dextrose agar (fungi) plate with the help of sterilized cork borer. The cultures were uniformly spread on solid culture media with the help of sterilized glass spreader. 25, 50, 75 and 100µl of synthesized AgNPs were poured into the well, and then the plates were incubated for 37°C for 24 hrs and the zones of inhibition were measured (Jeong and Yeo, 2005)

### ***Characterization Of Silver Nanoparticles (Gudikandula AND Singara Charya, 2016)***

The stability of the produced AgNPs was studied by observing the UV–Vis absorption spectrum. The particle distribution size of AgNPs was measured using dynamic light scattering particle size analyzer (DLS- ciLas Nano DS).

## **RESULTS**

### ***Biosynthesis Of Silver Nanoparticle***

The biosynthesis of silver nanoparticles synthesized from selected bacteria as *Bacillus* sp., *Enterococcus* sp. and *Pseudomonas* sp. (Plate I).

### ***Antibacterial Activity Of AgNPs Nanoparticles***

#### ***Bacillus* sp. synthesized AgNPs nanoparticles**

Three bacterial species were choosing the antibacterial studies against the AgNPs nanoparticles. The maximum zone of inhibition were recorded in *E.coli* as 20, 22, 24 and 28 mm diameter in zone of inhibition of four different concentration of 25, 50, 75 and 100 µl extracts as compared to the *Lactobacillus* sp. was 19, 20, 22 and 24 mm diameter and the *K.pneumoniae* of 21, 23, 25 and 27mm diameter zone was recorded respectively (Table 1).

#### ***Enterococcus* sp. synthesized AgNPs nanoparticles**

The maximum zone of inhibition recorded in *K.pneumoniae* 21, 24, 28 and 30 mm diameter in 25, 50, 75 and 100 µl of *Enterococcus* sp. AgNPs nanoparticle extracts. In *Lactobacillus* sp. 20, 21, 24 and 26 mm zone were recorded in 25, 50, 75 and 100 µl concentration and 19, 21, 25 and 28 mm in *E.coli* recorded in 25, 50, 75 and 100 µl concentration respectively (Table 1).

***Pseudomonas sp. synthesized AgNPs nanoparticles***

The maximum zone of inhibition as 19, 20, 21 and 24 mm was recorded in *Pseudomonas sp.* AgNPs nanoparticle extracts were determined. The minimum growth of inhibition was *E.coli* in 15, 20, 22 and 26 mm diameter were recorded in 25, 50, 75 and 100 µl concentration and *K.pneumoniae* of 17, 19, 20 and 20 mm zone of inhibition correspondingly (Table 1).

***Antifungal Activity Of AgNPs Against Fungi******Bacillus sp.***

The maximum zone of inhibition was determined in *Penicillium sp.* of 20, 22, 22 and 25 mm in 25, 50, 75 and 100 µl of concentration. Where *A.niger* of 15, 15, 16 and 20 mm diameter and *A.terreus* as 15, 16, 18 and 20 mm of diameter of 25, 50, 75 and 100 µl concentration of AgNPs nanoparticles was recorded respectively (Table 2).

***Enterococcus sp.***

*Penicillium sp.* was observed in maximum zone of inhibition as 20, 21, 33 and 25 mm of 25, 50, 75 and 100 µl concentrations. The moderate zone was determined *A.terreus* as 12, 16, 18 and 20 mm diameter of 25, 50, 75 and 100 µl concentration and the minimum zone as *A.niger* of 11, 10, 15 and 16 mm zone of inhibition was recorded respectively (Table 2).

***Pseudomonas sp.***

The higher concentration of sample in 100µl in *A.niger* (18 mm), *A.terreus* (24 mm) and *Penicillium sp.* (21 mm) as followed by 75 µl concentration of *A.niger*, *A.terreus* and *Penicillium sp.* as 15, 20 and 2 mm diameter zone were recorded. In the same time 50 µl concentration 14, 16 and 19 mm diameter in *A.niger*, *A.terreus* and *Penicillium sp.* and 12, 12 and 12 mm zone were recorded in 25 µl concentrations of *Pseudomonas sp.* samples (Table 2).

***Qualitative Bioactive Compound Analysis Of Agnps Nanoparticle***

The qualitative bioactive compounds analyzed in *Bacillus sp.* AgNPs nanoparticle present in alkaloids, saponins, flavonoids, tannin, phenol, steroids, terpenoids, anthroquinone and reducing sugar. Where the *Enterococcus sp.* and *Pseudomonas sp.* as determined in alkaloids, saponin, flavonoids, tannin, steroids and terpenoids were present (Table 3).

***Characterization Studies On Uv Spectrophotometer Analysis Of Bacillus Sp.***

UV-visible spectroscopy is one of the most widely used techniques for structural characterization of silver nanoparticles. The absorption spectrum (Fig. 3) of the pale yellow-brown silver colloids prepared by silver nitrate reduction showed by band with maximum 480 nm.

**TABLE 1: ANTIBACTERIAL ACTIVITY OF AGNPS NANOPARTICLES AGAINST BACTERIA**

S. No	AgNPs particle	Concentration (µl)	Zone of inhibition (mm)		
			<i>E.coli</i>	<i>K.pneumoniae</i>	<i>Lactobacillis sp.</i>
1	<i>Bacillus sp.</i>	25	20	19	21
		50	22	20	23
		75	24	22	25
		100	28	24	27
		25	19	21	20
2	<i>Enterococcus sp.</i>	50	21	24	21
		75	25	28	24
		100	28	30	26
3	<i>Pseudomonas sp.</i>	25	15	17	19
		50	20	19	20
		75	22	20	21
		100	26	20	24

**TABLE 2: ANTIFUNGAL ACTIVITY OF AGNPS NANOPARTICLES AGAINST FUNGI**

S. No	AgNPs particle	Concentration (µl)	Zone of inhibition (mm)		
			<i>A.niger</i>	<i>A.terreus</i>	<i>Penicillium sp.</i>
1	<i>Bacillus sp.</i>	25	15	11	12
		50	15	12	14

		75	16	15	15
		100	20	16	18
		25	15	12	12
2	<i>Enterococcus</i> sp.	50	16	16	16
		75	18	18	20
		100	20	22	24
		25	20	20	12
3	<i>Pseudomonas</i> sp.	50	22	21	19
		75	22	23	20
		100	25	25	21

**TABLE 3: QUALITATIVE BIOACTIVE COMPOUND ANALYSIS OF AGNPS NANOPARTICLE**

S. No	Name of the test	<i>Bacillus</i> sp.	<i>Enterococcus</i> sp.	<i>Pseudomonas</i> sp.
1.	Alkaloids	+	+	+
2.	Saponins	++	++	++
3.	Flavonoids	+++	++	++
4.	Tannin	+++	++	++
5.	Phenol	+	-	-
6.	Steroids	+	+	+
7.	Terpenoids	++	+	+
8.	Protein	-	-	-

9.	Anthroquinone	+	-	-
10.	Reducing sugar	++	-	+

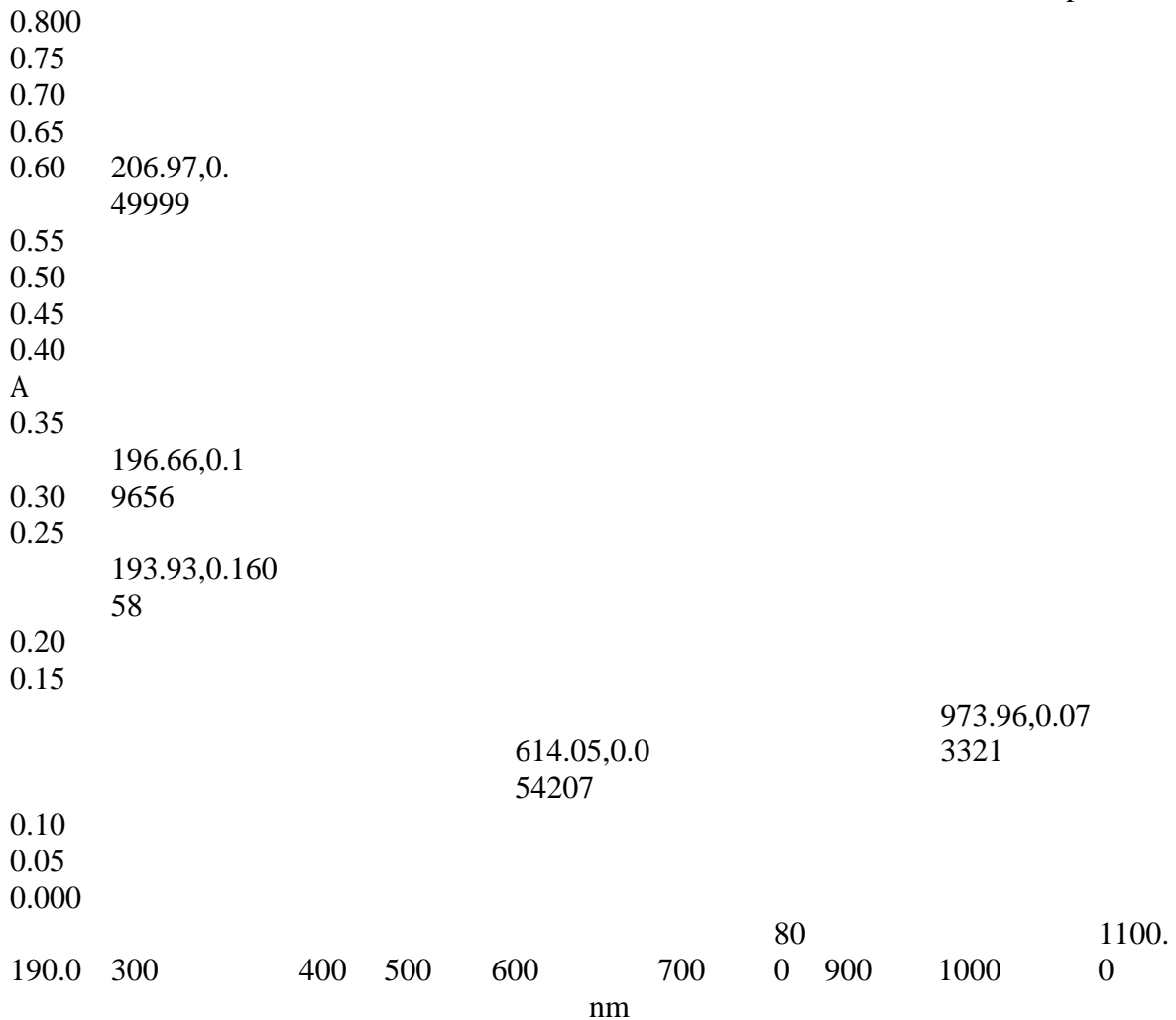
*UV Visible Spectrum Analysis Of Bacillus Sp. With Silver Nitrate*

ACIC  
St. Joseph's College, Trichy-2

Date: 10/31/2017

Spectrum Name: UV-UDC18  
.SP

UV-Vis Spectrum



Instrument Model: Lambda 35  
Data Interval: 1.0000 nm

Scan Speed: 480.00  
nm/min



## DISCUSSION

The formation of AgNPs was characterized with the development of colour, which was produced as a result of the reduction of silver ion by biomolecules present in the cell-free extracts. The intensity of the colour increased as the bio-reduction of silver ions progressed and stabilized when the reaction was completed. The formation of AgNPs was facilitated by the cell-free extracts within a period 10 min, with the dark brown colour which stabilized in 20 min (Jeevan *et al.*, 2012). Several colours, including light yellow, yellow brown and dark brown, have been reported for colloidal solutions of AgNPs (Das *et al.*, 2014; Emeka *et al.*, 2014; Lateef *et al.*, 2015; Netala *et al.*, 2016). The variations in colours have been ascribed to the activities of different types of biomolecules that act as bioreductants in the transformation of silver metal to nanoparticles of different sizes and shapes that affect the surface plasmon resonance of the particles. The excitation of surface plasmon vibrations in metal nanoparticles leads to the development of colour (Mulvaney, 1996).

In the present investigation, *Bacillus* sp., *Enterococcus* sp. and *Pseudomonas* sp. was observed the successful production of silver particle and inhibition of *E.coli*, *K.pneumoniae*, *Lactobacillus* sp., *A.niger*, *A.terreus* and *Penicillium* sp. has more inhibition zone were recorded. Similarly, the nonpathogenic bacterium *Enterococcus faecalis* was found successful in producing gold nanoparticles of different size ranging from 1-120 nm in distribution and quite stable in the solution. Since the standardization of *Enterococcus faecalis* culture supernatant used for the biosynthesis of Gold nanoparticles were determined by Colony forming unit (CFU/ml). While using this standardized culture in the extracellular synthesis of gold nanoparticle is initially confirmed by visual observation, the bacterium *Enterococcus faecalis* incubated with broth containing 20 mM hydroauric chloride solution (v/v) at 37°C for 24 hrs at pH value 7.4. The hydroauric chloride ions were reduced during the exposure to bacterial biomass and as a result biotransformation took place. The reaction solution turned from pale yellow to deep red color indicating the formation of gold nanoparticles (Ashajyothi and Chandrakanth, 2014). Control experiments without biomass addition stayed pale yellow in color.

The present study the synthesized nanoparticles were characterized by UV-Vis absorption spectra of the biosynthesized AgNPs. Some researchers, the biosynthesized AgNPs displayed surface plasmon resonance in the range of 420-442 nm, which is within the range of values previously reported for AgNPs (Emeka *et al.*, 2014; Lateef *et al.*, 2017, Lateef and Adeeyo, 2015). However, using cell-free extract of a strain of *E. faecium*, Chandrakanth *et al.* (2014) reported the formation of AgNPs, which absorbed maximally at 309 nm. The particles obtained in the present study were stable without significant changes in absorption spectra when stored for about three months at room temperature.

## CONCLUSION

The silver nanoparticle for biological application very vast approaches with resurgence of interest. In the utility of silver as a broad based antimicrobial agent has led to the development of thousand of products that incorporate silver nanoparticle to prevent bacterial growth of surfaces.

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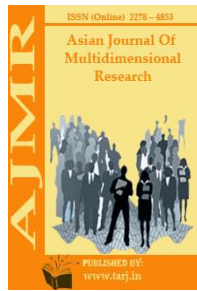
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**SPIRITUALITY AND HOPE IN RELATION TO POST-TRAUMATIC GROWTH AMONG FLOOD SURVIVORS: A CROSS-SECTIONAL STUDY**

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**ABSTRACT**

*Post-traumatic growth refers to a process of self-exploration and self-discovery that will help you overcome the unfortunate events that have shattered your inner universe. This paper investigates how spirituality and hope predict post-traumatic growth in survivors of a natural disaster. A total of 300 adults who were present in Kashmir at the time of 2014 flood completed self-reported questionnaires after the disaster. Spirituality questionnaire, Hope scale and Posttraumatic growth inventory were administered to the participants to collect the data. The participants reported symptoms of Hope, Spirituality and Posttraumatic growth. Hope and spirituality were found to be positively associated with post-traumatic growth after a natural disaster. The result shows that spirituality is positively related to post-traumatic growth. Hope was significantly related to post traumatic growth. **Conclusion:** Post traumatic Growth is positively related to Spirituality and Hope after natural disaster.*

**KEYWORDS:** *Natural Disaster, Post-traumatic. Growth, Hope, Spirituality, Correlation.*

## INTRODUCTION

Kashmir is known for its beauty and rich heritage. The valley has many lakes, rivers, and glaciers and it is surrounded by the great Himalayan range and the PirPanjal from north and south respectively.

In 2014 the valley suffered a disastrous flood across various districts. Due to heavy rainfall, the water level in Jhelum and Chenab rivers raised above the danger mark which caused a heavy loss to lives and properties of several people. Around 277 people in India and about 280 people in Pakistan had died due to the floods by 24 September 2014. The major feature of the terrible flood was the loss of thousands of lives and properties as well as grief which resulted in depression, anxiety, posttraumatic stress disorder (PTSD) which is a common condition caused by emotional distress a person faced after exposing or surviving a traumatic event and results in feelings of total helplessness (Durand & Barlow, 2003). However, recently various researchers have started focusing on the positive aspects of disaster by exploring a positive aspect of trauma, referred to as Post-Traumatic Growth (PTG). The present study aimed at examining the role of spirituality and hope in developing posttraumatic growth among the flood victims.

The term Posttraumatic growth is fairly new but the notion has existed for a long time. When an individual struggles and survives through devastating life events he or she develops a positive psychological change that is referred to as Post-traumatic growth (Taku, Calhoun, Tedeschi, Gil-Rivas, Kilmer, & Cann, 2007). Various researchers used different terms to illustrate post-traumatic growth, such as positive psychological changes (Yalom & Lieberman, 1991); perceived benefits or construing benefits (Calhoun & Tedeschi, 1991; McMillen, Zuravin, & Rideout, 1995); stress-related growth (Park, Cohen, & Murch, 1996); positive by-products (McMillen, Howard, Nower & Chung, 2001); discovery of meaning (Bower, Kemeny, Taylor, & Fahey, 1998); and positive emotions (Folkman & Moskowitz, 2000). Findings from the above-mentioned literature have suggested that traumatic events may not always necessarily result in negative and depressing impacts on a person. Traumatic events help a person to stand strong and develop new competencies in life, to grow and change in a positive way to become a better person. Thus, PTG is a subjective discernment and assessment of a particular traumatic event. A study showed that spirituality (Kimhi, Eshel, Zysberg & Hantman, 2010), gratitude (Vernon, Dillon & Steiner, 2009) and hope (Jenmori, 2006) are important aspects affecting PTG. In a study conducted by Kimhi et al (2010), it was revealed that post-traumatic growth can be acquired by searching something positive to survive through difficult times.

A number of studies have shown that spirituality and religiosity plays a vital role in dealing with traumatic events and physical illness (Koenig, 1998). Spiritual belief provides a sense of interconnectedness and firm faith on the transcendence that Almighty will help in surviving through the devastating life events. People who are more spiritual and indulge in religious activities are more optimistic and strong and are able to tolerate the traumatic life events more positively and bravely. According to Bert (2011) people who want to make significant impacts on their lives gives more importance to religious and spiritual beliefs. Spirituality and religion can provide a strength that people need to deal with environmental pressures, as well as provide them with guidance and support in their efforts to tolerate each and every painful and traumatic event (Koenig, 1998; Bert, 2011).

Apart from spirituality, hope is another important predictor of posttraumatic growth. When a person struggles in life it also develops a sense of hopefulness (Pilkington, 1999). Suffering and

hope emerge side by side which helps an individual to understand and face the negative situation in a more positive way (Frankl, 1959). Snyder, Ilardi, Cheavens, Michael, Yamhure, and Sympson (2000) proposed two major factors of hope that are interrelated with each other: agency and pathway, where the agency is the capability to find various possible alternatives to achieve a particular desired goal. On the other hand, the pathway depicts the way in which an individual thinks and works to develop a logical method to achieve that goal. Snyder, Harris, Anderson, Holleran, Irving, and Sigman et al. (1991) believed that a motivational force is very essential to push an individual in a particular direction to achieve the goals. Agency helps an individual to find out alternative methods to achieve the desired goal whenever there are barriers to achieve it (Irving et al., 1998). From the literature outlined above, it can be hypothesized that spirituality and hope are good predictors for post-traumatic growth among survivors of the 2014 flood in Kashmir.

## METHOD

This study was conducted after a deadly flood of 2014 due to terrific rainfall in Srinagar and Anantnag districts of Kashmir. A total number of 300 Muslim adult victims of the flood were drawn from a large population as a sample of the study. They have lost their loved ones, properties, houses as well as their mental peace. The data was collected by administering posttraumatic growth inventory, spirituality and hope scale individually on all the participants. Post Traumatic Growth Inventory (PTGI) developed by Tedeschi & Calhoun, 1996 is a 21 item measure generally used to examine the positive mental change as a result of coping to a traumatic event (Shakespeare-Finch, Martinek, Tedeschi, & Calhoun, 2013). This inventory is based on five broad domains that are, personal strengths, and interpersonal relationships, appreciation of life, spirituality, and life priorities (Tedeschi & Calhoun, 1996). It is based on a 6 point Likert scale ranging from 0 (I do not experience this change as a result of my crisis) to 5 (I experienced this change to a very great degree as a result of my crisis). The range of possible scores on the test is 0–105. The Hope Scale developed by Snyder, Harris, Anderson, Holleran, Irving, and Sigmon (1991) is a 12-item; self-report questionnaire used to determine dispositional hope among the flood victims. The scale consists of 12 items, four are based on Pathways thoughts (i.e., perceived ability to meet goals, for example, "*I can think of many ways to get out of a difficult situation*") and four Agency thoughts (i.e., perception of movement toward goals, like "I energetically pursue my goals"), two separate scores measure agency and pathways independently by totaling their respective items and a hope score that is created by summing the agency and pathway items. Responses were obtained on an eight-point Likert rating scale, where 1 represents *Definitely false*, 2- *Mostly false*, 3-*Somewhat false*, 4- *Slightly false*, 5- *Slightly true*, 6- *Somewhat true*, 7- *Mostly true* and 8- *Definitely true*. The Hope Scale has displayed excellent internal consistency, test-retest reliability, and construct validity in previous research (Babyak, Snyder, & Yoshinobu, 1993; Snyder, Harris, Anderson, Holleran, Irving, & Sigmon 1991). Lastly, the spirituality questionnaire is a self-administered questionnaire developed by Hardt and Schultz (2012). This questionnaire consisted of 20 items and is based on four broad dimensions or sub-scales- i) Belief in God, ii) Search for meaning, iii) Mindfulness and iv) Feeling of security. Each subscale consists of 5 items which are to be answered on a five-point Likert scale with the categories 1="not true at all", 2="hardly true", 3="don't know", 4="rather true" and 5="absolutely true". Prior to the data collection, a rapport was established with the participants to draw their keen interest in giving responses and they were requested to cooperate. It was informed to the participants that their responses would be kept confidential.

**Results:****TABLE 1: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE STUDY POPULATION**

VARIABLES	CATEGORIES	FREQUENCY	PERCENTAGE
<b>Age</b>	18-27	107	35.7
	28-37	123	41.0
	38-47	58	19.3
	48-60	12	4.0
<b>Gender</b>	Male	151	50.3
	female	149	49.7
<b>Marital Status</b>	Single	131	43.7
	married	169	56.3
<b>Education</b>	Illiterate	15	5.0
	Primary	41	13.6
	Secondary	106	35.3
	Graduate	81	27
	P.G and Above	57	19
<b>Residence</b>	Rural	104	34.7
	urban	196	65.3
<b>Family Type</b>	Nuclear	132	44.0
	joint	168	56.0
<b>TOTAL</b>		<b>300</b>	<b>300</b>

**TABLE 2: THE RELATIONSHIP BETWEEN SPIRITUALITY, HOPE AND POSTTRAUMATIC GROWTH**

Post-traumatic Growth	Coef.	St.Err	t-value	p-value	Sig.
<b>Hope</b>	0.594	0.112	5.30	0.000	***
<b>Spirituality</b>	0.432	0.060	7.22	0.000	***
_cons	-1.479	9.016	-0.16	0.870	
Mean dependent var					
	79.653	SD dependent var		9.390	
Number of obs					
	300.000				
F-test					
	48.065	Prob> F		0.000	
*** p<0.01, ** p<0.05, * p<0.1					

Quantitative data analyses used Pearson Product Moment Correlation to see the relationship of spirituality and hope with posttraumatic growth.

**Table 1** is depicting the demographic details of the participants included in the study. There were 151 males and 149 females with the age range of 18 to 60 years where majority of the participants 41% lies within 28 to 37 years of age. 56.3% of the participants were married as in India the standard age of marriage is around 21 years for males and 18 years for females. 35.3% of the participants have secondary level of education. 65.3% participants belonged to sub urban area and majority of 56% lived in joint families as in the culture of Kashmir the joint family system is still prevailing. People are attached to their values.

**Table 2** shows the correlation between spirituality, Hope and post-traumatic growth which was found to be significant. The table shows that significant positive correlation was seen between Hope and post-traumatic growth ( $r= 0.594, p<0.01$ ) and Spirituality and post-traumatic growth ( $r= 0.432, p<0.01$ ).

## DISCUSSION

When an individual survives a devastating life situation in the form of a disaster or trauma, it is not easy to get back to normal life. People feel depress, anxious and hopeless that leads to the development of posttraumatic stress disorder. Though, in such negative life situations, people use the coping process to have an optimistic attitude to continue their life in a more positive manner. The appearance of optimism, respect for life, better attitudes toward others and also a better spiritual life are some of the changes that people can feel due to positive attitude (Linley & Joseph, 2004). This study showed that both spirituality and hope are significantly correlated with posttraumatic growth. There is literature available on the idea that spirituality plays an essential role as a source of strength to live a better life for those who are experiencing a painful incident (Peres, Almeida, Nasello, & Koenig, 2007; Koenig, 1998; Bert, 2011). Subandi (2009) explored that negative life event can result in positive change in the life of the survivor. After surviving through devastating life events, experiences of suffering become meaningful to the people to restructure their present lives. Spiritual and religious practices lead to the development of hope among the survivors. Hope helps in motivating an individual towards the attainment of a positive goal that is posttraumatic growth. If an individual is not hopeful achievement of growth is not possible. Hope provides a sense of optimistic behaviour and an individual feels confident that he or she can be able to survive through negative life events and can achieve growth. Both the variables: spirituality and hope are useful in attaining a sense of posttraumatic growth after surviving the traumatic life event.

## LIMITATIONS:

The weakness of this study is that it focused on the variables spirituality and hope which originated from within an individual. This study overlooks the wider social perspective. Social support is an influencing variable that can have significant effects on the development of posttraumatic growth. During the time of disaster victims receive physical, financial, social and psychological aids from various government and non-government organizations which helps the survivors to return to the normal life more easily and effectively. Urbayatun (2012) conducted a study on the survivors of the earthquake in Bantul, which was located in the Southern area of Yogyakarta. The results of the study showed that social support highly influenced PTG. Social support was an essential arbiter between stress caused by disaster-coping strategy and PTG.



There is a need that any similar future research should include not only personal factors but also social factors such as social support.

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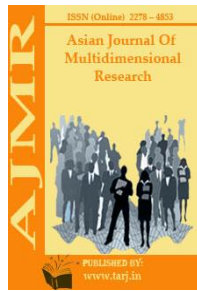
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## **IS DEMONETIZATION REALLY IMPACT EFFICIENCY OF BANKING SECTOR – AN EMPIRICAL STUDY OF BANKS IN INDIA**

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### **ABSTRACT**

*Efficiency is a matter for continuing a business for long run either it is in public sector or in private sector. Higher efficiency level only can give higher return or profitability. The issue of demonetization is a hot topic for discussion and debate in India from recent past since the announcement of the recent demonetization in November 2016. In this regards the present study has been conducted to analyze the trend in efficiency level during the pre and post-demonetization phase from April 2014 to March 2018 by using data envelopment analysis. To analyze the technical efficiency of banking sector, total assets, total expenses and net NPA consider as input variables and total income as output variable which includes interest income and non-interest income. The study measures efficiency both under CCR model and BCC model for the each four years and for the two periods of pre and post- demonetization with the average data. A comparative study has also been performed with t-test between the two periods and between two banks group of public and private sector. The present study concludes that during post-demonetization period efficiency of banks have been degenerating compare to pre-demonetization period, though there is no significant difference in efficiency of banks between pre and post-demonetization period. The study also finds that there is significant difference in efficiency of banks between public and private sector under both the models.*

**KEYWORDS:** Data Envelopment Analysis, Demonetization, Private Sector Banks, Public Sector Banks, Technical Efficiency.

**JEL Classification:** G21, G29.

## 1. INTRODUCTION

There are several eminent economists who have not supported the government decision of demonetization of two higher denomination currencies together. On the other side, there are several eminent economists who have heartily supported and actively participated in implementing this as a step towards getting rid of corrupt, illegal, unaccounted money. Black money or unaccounted money was money that was not declared as income to the income tax authorities (Verma & Jain, 2017). The decision of demonetization was believed to have been taken to limit the enormous corruption and unrecorded or black money, and control the fake currency that often finances terror activities. The result of the demonetization was a situation of sufferings and distress with people standing in long queues in bank for exchanging their old currencies. Due to these the same also affected in other banking business and services viz., disbursement of loan, new investment policy etc.

This is not the first time that demonetization decision has been taken in India. Similar action was implemented twice before in 1946 and 1978. In 1946, the currency notes of ₹ 1,000 and ₹ 10,000 were removed from circulation. The second came in 1978 with ban the currency of ₹ 1000, ₹ 5000 and ₹ 10,000 out of circulation. Both the ban really did not have much adverse impact, as the currency of such higher denomination was not accessible to the common people and affected only the privileged few (Kulkarni & Tapas, 2017). Other countries have also tried it before and have experienced consequences of doing this.

With respect to several positive and negative views of the respected economists and experts, the researchers may also believe that the process of recent demonetization may have impact on the efficiency level of banking industry. The present study is an initiative to analyze the same.

## 2. REVIEW OF LITERATURE

The application of Data Envelopment Analysis (DEA) can be found in several industries since its inception in 1978 (by Chames, Cooper and Rhodes) both in public sector and private sector. This is a new concept of whether demonetization decision affects any efficiency level in banking sector or not. Here, researchers have surveyed the literature of the application of DEA to acknowledge that the DEA has been used as an efficiency assessment tool. The researcher also put lights on the literature review of demonetization effects in Indian and the global economy and its reforms.

### *Efficiency measures in banking sector*

Among available several techniques, as used in economy, financial institutes including banks and also in some cases corporate financial systems, including cumulative input and output measures in the perspectives of related net operation considerations, the DEA technique is observed to be of larger use with effective and realistic outcome in Efficiency measures. Mention may be made of some well known studies in this respect as below.

Saha & Ravisankar (2000) have suggested that in Indian context DEA could be a suitable approach towards measuring efficiency of banks. Among the variables deposits and advances etc. are output variables and number of branch and number of staffs etc. are input variables. Yue (1992) has demonstrated the use of DEA to find out the relative efficiencies of 60 commercial banks in Missouri for the period 1984 to 1990. Two alternative models of DEA have been used for evaluation: CCR model and the additive DEA model followed by window analysis of the efficiencies obtained. Burgstaller (2013) in his studies considered total funds, fixed assets and

total costs as inputs and outputs produced comprise total loans, other earning assets and non-interest income to measure efficiency in regional banking market through DEA. Sinha & Jain (2015) in their study uses owned funds, deposits, borrowings and employee cost as inputs, and advances, investments and other income as outputs to measure potential gains from merger of SBI with its associates.

Using DEA, Maity & Sahu (2017) measure performance of SBI and associates for 2011-2016 with three output variables (deposits, advance and total income) and four input variables (branches, ATMs, assets and gross NPA). Bhattacharyya et al. (1997) have used DEA to calculate efficiency of service provision for individual banks of public, private and foreign-owned, for a period of six years from 1986 to 1991. Das & Ghosh (2006) have examined the performance of banks during post-reform period 1992-2002 in India. Medium-sized public sector banks (PSBs) have found performing at a higher level of technical efficiency. Kumar & Gulati (2008) have evaluated the extent of overall technical efficiency (OTE), pure technical efficiency (PTE), and scale efficiency (SE) in Indian PSBs using cross-sectional data for 27 banks in the year 2004-2005.

Angelidis & Lyroudi (2006) have examined productivity of 100 large Italian banks during 2001-2002 by using DEA. They employed DEA to find Malmquist indices of total productivity change which is then put to use in examining productivity change of the financial institutions of the most recent member of European Union countries. Valadkhani & Moffat (2009) have measured the efficiencies through DEA of 10 major financial institutions in Botswana during 2001-2006. Elyasiani & Mehdiian (1995) have investigated the trends in technical efficiency and technological change for large and small US commercial banks during 1979-1986. Feroze (2012) has employed DEA to assess the efficiency of DCCBs in Kerala during 2005-2009. The empirical results of the study revealed that the level of efficiency in DCBs was 74 percent and the magnitude of inefficiency was 26 percent. 6 DCBs obtained efficiency score equal to 1 and formed the efficient frontier.

### ***Demonetization effects in Indian and the Global economy***

Mali (2016) has talked about the reasons of demonetization in India and major effects of it. He then reported that due to demonetization online retail stores temporarily stopped cash on delivery facility, disbursement rate of microfinance institute slowed down, Micro Businesses were affected adversely and e-wallet firms gained good business. At last, he gave a concluding remark that in spite of affecting some sectors favorably and adversely, demonetization will aid to control black money in the country in long run. Chauhan & Kaushik (2017) have analyzed the impact of demonetization on Indian Stock market and found that there is no significant impact of demonetization on the stock market. Goel et al. (2018) have analyzed the impact of demonetization and studied the extent to which it has been successful in controlling existence of black money and other problems existing in Indian economy at present.

Kulkarni & Singhal (2018) have analyzed short term and long term impact of demonetization on economy, its various Industrial sectors, specific companies and overall impact on society. During the preliminary analysis, it was revealed that the benefits could be relatively long lasting when compared with the short term losses. Solanki & Tank (2018) have analyzed the trend of the selected sector-wise indices after demonetization by trend analysis. With the result of T-test, they found that there is no significant difference between the selected sector wise indices before and after demonetization.

Ramdurg & Basavaraj (2016) have thrown the light on the history of the demonetization in the world as well as in India. They showed that Zimbabwe, Soviet Union, Myanmar, Australia, Ghana, Nigeria, Zaire, Pakistan and North Korea have also fallen in queue of using demonetization as a measure to cure their economy; some for controlling hyperinflation, some for curbing black money and corruption and some for removing counterfeit currency. In India, as well, it is the third time that demonetization had to be introduced and this time it had been done with multiple objectives which were required to be satisfied.

They further did the analysis of pros and cons of the demonetization move and finally concluded that it should not be repeated albeit its benefits for the economy and now such measures should be taken which can sustain the dividends of the demonetization exercise in long run. Kulkarni & Tapas (2017) have investigated the theoretical points of why demonetization is supposed to be carried out. It also explains the theoretical costs and benefits of this decision and explains the Indian situation. They also explained the demonetization data of three other countries of Russia, Australia and Zimbabwe. According to them, only time can tell whether it was a completely successful attempt or not.

The above studies show that there has been wide use of DEA applications to measure efficiency of financial institutions or banks by considering different parameters as input variables and output variables. The literature reviews have not found any concrete empirical study to measure banks efficiency during pre-demonetization and post-demonetization period. This study is an initiative to investigate the effect of demonetization on the bank efficiency level.

### **Objectives and Hypotheses of the study**

The study tries to reveal the extent to which efficiency of Indian banks had been affected over the years due to recent demonetization. The following are specific objectives of the present study:

1. To assess the technical efficiency of Indian Banks during demonetization period.
2. To examine the significant difference in efficiency between pre and post-demonetization period.
3. To examine the significant difference in efficiency between public and private sector banks.

Based on the previous discussion and research objectives, the following testable hypotheses are developed for the study.

Hypothesis-I:

Null Hypothesis ( $H_0$ ): Demonetization does not affect the technical efficiency of banking sector in India.

Hypothesis-II:

Null Hypothesis ( $H_0$ ): There is no significant difference in bank efficiency between the two periods of pre and post-demonetization.

Hypothesis-III:

Null Hypothesis ( $H_0$ ): There is no significant difference in efficiency level between public and private sector banks.

### 3. DATA AND METHODOLOGY

#### Data

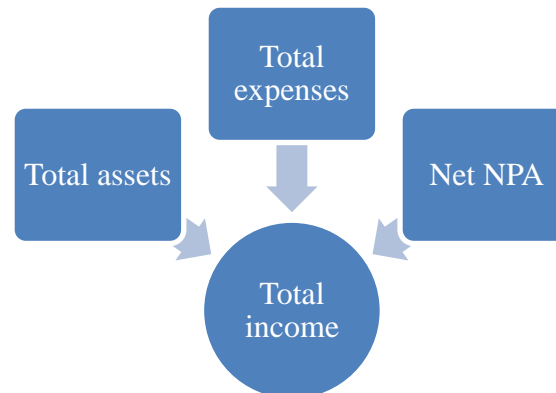
The entire research is exclusively based on secondary data. The data have been collected from various annual reports of Reserve Bank of India (RBI). The study covers for a period of 4 years from April 2014 to March 2018. Selection of bank is performed on the basis of quantum of total income as on March 2018. Here total income includes interest income and other income of the banks.

On the basis of quantum of total income the researchers have consider total twelve banks; six from public sector and another six from private sector. The twelve banks cover 65.5 % of total income of all 93 scheduled commercial banks (SCBs). On the basis of the selected twelve banks a conclusion has been drawn.

#### Variables of the study

To analyze the data using DEA, the present study considers one output variable and three input variables. After a careful review of earlier literature and considering present research objectives the study selected the following four variables. Here, we would like to assert that the choice of the variables followed two criteria: relevance and availability.

Input and Output Variables:



Input Variable 1: Total Assets

Total assets represent the size of banking business which makes revenue for bank. Bank's total assets include cash, balances with RBI, balance with banks in India and outside India, money at call and short notice, investments including advances, fixed assets etc.

Input Variable 2: Total Expenses

Total expenses include interest on deposits (term or saving) expenses and operating expenses and Provisions and Contingencies. This operating expense includes all operational costs, viz. employee costs, administrative costs, advertisement, rent, stationery etc.

Input Variable 3: Net NPA

Net NPA shows the actual burden of banks after adjustment of provision against NPA. Increase NPAs stops banks to take expansion decision and it adjusts as expenses/ losses with the revenue generated and due to advances getting blocked, the credibility of bank decreases, not only by amount of NPA but also due to opportunity cost of profits foregone by doing same investment in

other return earning project/asset. According to Sharma & Chhabra (2017), it does not generate any income for the banks, and on the other hand, the banks are required to make provisions for such NPAs out of the current profits.

#### Output Variable 1: Total Income

This is the output variable in the present study to measure the efficiency level of banks. Here total income includes interest income and non-interest income. Higher income reflects higher efficiency and profitability.

### Research Methodology

DEA is defined as a nonparametric, linear programming technique for efficiency measurement of a decision making unit (DMU) by comparing it to other homogenous units with multiple inputs and multiple outputs. It has two models: CCR model under constant return scale (CRS) assumption, named after its developers Charnes, Cooper, and Rhodes (1978) and BCC model under variable return scale (VRS) assumption, named after its developers Banker, Charnes and Cooper (1984). To analyze the efficiency of banks (i.e., DMUs) these two models have been used. DMUs on the efficient frontier have an efficiency score of 1. Lower scores indicate low-efficiency level or inefficient.

OTE equal to one indicates, these banks are efficient and lie on the efficient frontier under CRS assumption based on CCR model. Further, PTE equal to one also indicates, these banks are efficient and lie on the efficient frontier under VRS assumption based on BCC model.

In the present study, researchers have considered input-oriented model. The input-oriented models object at minimizing the inputs consumed by the DMUs for the same target of output levels. MaxDEA 5.2 package has been used to measure the technical efficiency of banks through DEA. At last by applying t-test significant difference in efficiency between pre and post-demonetization period and further between public and private sector have been tested.

## 4. RESULTS AND DISCUSSIONS

Before going for analyzing the data, the researchers present here the descriptive statistics in table 1 with means, minimum, maximum values and standard deviations of an output variable (total income) and three input variables (total assets, total expenses and net NPA). To initiate the econometric study in terms of DEA, the first step is to check isotonicity assumptions (Golany & Roll, 1989). Table 2 shows Pearson Correlation among all input and output variables to check the assumptions of "isotonicity" relationship. The correlation matrix results as presented in Table 2 does not violate the isotonicity assumptions. Positive correlations among all of them satisfy the isotonicity assumptions to run the DEA.

As recommended by Golany & Roll (1989) and Drake & Howcroft (1994), DMUs number should be at least twice the total number of input and output factors. Here, DMUs number is twelve i.e., more than twice the number of input and output factors in this analysis. Therefore, in the present analysis, proposed DEA model has high construct validity.

[Insert table 1 here]

[Insert table 2 here]

In DEA, technical efficiency (TE) can be viewed from two perspectives. First, input-oriented TE focuses on the possibility of reducing inputs to produce given output levels. And the Second one,



output-oriented TE considers the possible expansion in outputs for a given set of input quantities. In a number of studies, analysis has tended to select input-oriented models because many organizations or institutions have particular orders to fill and, hence, the input quantities appear to be the primary decision variables, although this argument may not be as strong in all industries or institutions. In some cases, the firms may be given a fixed quantity of resources and asked to produce as much output as possible. In this case, an output oriented model would be more appropriate. Essentially, one should select according to which quantities (inputs or outputs) the managers have most control over.

[Insert table 3 here]

[Insert table 4 here]

The TE measure corresponding to CRS assumption represents OTE which measures inefficiencies due to the input/output configuration and as well as the size of operations. The efficiency measure corresponding to VRS assumption represents pure PTE which measures inefficiencies due to only managerial underperformance (Kumar & Gulati, 2008). The relationship  $SE = OTE / PTE$  provide a measure of scale efficiency. Scores are 1 for efficient banks (on the frontier) and lower for relatively inefficient ones.

Table 3 and 4 summarize the DEA results. The entire period has been split into two phases as 2014-2015 and 2015-2016 representing the pre-demonetization phase and 2016-2017 and 2017-2018 representing the post-demonetization phase. The input-oriented efficiency scores of the twelve selected banks obtained from CCR and BCC models for the pre-demonetization period of 2014-2015 and 2015-2016 have been presented in table 3 and for the post-demonetization period of 2016-2017 and 2017-2018 have been presented in table 4. Efficiency scores for each selected bank are calculated over the total time period of 2014-2015, 2015-2016, 2016-2017 and 2017-2018 to check the trend in TE. Then average efficiency scores have been calculated of each year so that a conclusion can be drawn.

The input-oriented efficiency scores of twelve selected banks obtained from CCR model and BCC model have been presented in the table year wise from 2014-2015 to 2017-2018. The results obtained by employing the CCR and BCC model on each year data reveal subtle fluctuations in the efficiency scores of all the banks. The average score of OTE in 2015-2016 and 2016-2017 at approx. 90 % level. However, the efficiency level has reduced from 93.61 % level in 2014-2015 to 86.18 % level in 2017-2018. This signifies that efficiency of banks has been degenerating during post-demonetization period compare to pre-demonetization period. Also in 2014-2015, five private banks are efficient and in 2017-2018 only two private banks are efficient under CCR model. No PSBs find efficient under CCR model in both the periods.

Table 5 presents the results obtained with the average data of two years of all the input and output variables during the period of pre-demonetization phase and post-demonetization phase respectively. The columns labeled CCR and BCC indicate the efficiency scores of the twelve banks with CRS and VRS assumptions respectively. The table also presents the average efficiency scores and standard deviation with minimum and maximum efficiency scores. Table 5 provides three banks are efficient under CCR model and are on the efficient frontier have an efficiency score of 1 during pre-demonetization phase with overall average TE score 91.43 % of all the twelve banks. During post-demonetization phase, two banks are efficient and are on the efficient frontier have an efficiency score of 1 with overall average TE score 87.83 % of all the twelve banks. They have equal OTE and PTE and thus presenting CRS. Table 5 also signifies

that efficiency of banks have been degenerating during post-demonetization period compare to pre-demonetization period under both the models. Under CCR model it reduces from 91.43 % to 87.83 % and under BCC model it reduces from 93.61 % to 91.60 %. These appear that efficiency level of Indian banks degenerating and number of efficient bank reduces due to elapse of time. This finding also implies that Indian banks can reduce inputs by at least 8.57 % during pre-demonetization phase and 12.17 % during post-demonetization phase and still generate the identical level of outputs or increase the level of output to 1.094 (1/0.9143) times and 1.139 (1/0.8783) times respectively with the same level of inputs. During pre and post-demonetization phase only three inefficient banks present increasing returns to scale (IRS) that can increase the scales to effectively improve efficiency.

**[Insert table 5 here]**

Lastly, the analysis of t-test between the two periods finds that the test is not significant ( $p > 0.05$ ) and there is no significant difference in TE of banks between pre and post-demonetization period. Though there is no significant difference between the two phases, however mean score of TE of pre-demonetization phase comparatively in a better position than post-demonetization phase by 3.60 % (91.43-87.83). The study also finds that there is a significant difference (at 1 % level of significance) in TE between public and private sector in both pre and post-demonetization period both under CCR and BCC model. Further, the study also shows that efficiency of private bank group is comparatively better than public sector. This result contradicts with the findings of Sathye (2003) that the efficiency of private group is paradoxically lower than that of public and foreign banks in India.

## 5. CONCLUSION

Demonetization would affect the growth of the country and this step will help the economy in upliftment (Goel et al., 2018). International bodies like IMF and World Bank have accepted its long term impact to be good. Due to demonetization, the biggest beneficiary is banking sector, because of the increase in deposits which will result in substantial liquidity with the banks and increases the net interest income and the net earnings of the banks. The present study has measures technical efficiency of banking sector during pre and post-demonetization period by applying DEA. The researchers conclude that the efficiency level in banking sector is degenerating due to elapse of time during the period of study. The primary reasons may be due to demonetization effects in the Indian economy. The recent downward trend of efficiency level during the period of study is for short term only. The Short term losses through demonetization could potentially yield long term gain (Kulkarni & Singhal, 2018). Notwithstanding the overall sector shows tremendous resilience during the period of demonetization with mean efficiency not falling below 86 percent in any of the years. In long term, demonetization proved to be a successful measure initiated by the government (Goel et al., 2018).

The main limitation of this study is that sample banks and input-output selection. Despite these limitations, this research can be used as the model by other researchers, government, financial regulators, banks and policymakers to proper utilization of resources and escalate efficiency of banks.

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## TABLES

**TABLE 1: DESCRIPTIVE STATISTICS (AVERAGE DATA FOR THE FOUR YEARS OF THE STUDY) (AMOUNT IN ₹ BILLION)**

Banks	Total Income	Total Expenses	Total Assets	Net NPA
BANK OF BARODA	489.2	496.8	7003.1	172.6
BANK OF INDIA	457.4	487.4	6161.2	237.6
CANARA BANK	485.8	493.9	5753.4	199.4
PUNJAB NATIONAL BANK	546.8	576.5	6892.2	330.5
STATE BANK OF INDIA	2107.2	2039.8	26416.0	631.3
UNION BANK OF INDIA	367.0	370.9	4316.1	160.3
AXIS BANK LIMITED	518.0	469.1	5736.4	72.6
HDFC BANK LTD.	763.8	627.4	8147.7	16.7
ICICI BANK LIMITED	688.4	594.7	7544.5	180.6
INDUSIND BANK LTD	170.0	143.7	1637.4	4.3
KOTAK MAHINDRA BANK LTD.	189.3	160.7	1944.5	13.1

YES BANK LTD.	189.8	159.6	2072.3	6.9
Mean	581.1	551.7	6968.7	168.8
Standard Deviation	516.4	499.6	6524.4	179.9
Minimum	170.0	143.7	1637.4	4.3
Maximum	2107.2	2039.8	26416.0	631.3

Source: Researchers calculation from RBI data

**TABLE 2: CORRELATION AMONG THE INPUT AND OUTPUT FACTORS**

	Total Income	Total Expenses	Total Assets	Net NPA
Total Income	1			
Total Expenses	0.9956	1		
Total Assets	0.9955	0.9988	1	
Net NPA	0.8436	0.8860	0.8762	1

Source: Researcher's calculation

**TABLE 3: SHOWING YEAR-WISE OVERALL TECHNICAL EFFICIENCY (OTE), PURE TECHNICAL EFFICIENCY (PTE) AND SCALE EFFICIENCY (SE) SCORES OF PRE-DEMONETIZATION PERIOD**

Bank/ DMUs	2014-2015			2015-2016		
	OTE	PTE	SE	OTE	PTE	SE
BANK OF BARODA	0.8808	0.8826	0.9980	0.7487	0.7537	0.9933
BANK OF INDIA	0.8480	0.8497	0.9981	0.7392	0.7662	0.9647
CANARA BANK	0.8760	0.9003	0.9730	0.8330	0.9119	0.9135
PUNJAB NATIONAL BANK	0.8756	0.8863	0.9878	0.7830	0.8283	0.9454
STATE BANK OF INDIA	0.8866	1	0.8866	0.8720	1	0.8720
UNION BANK OF INDIA	0.8790	0.9403	0.9348	0.8726	0.9001	0.9694
AXIS BANK LIMITED	0.9871	0.9892	0.9979	0.9881	0.9906	0.9975
HDFC BANK LTD.	1	1	1	1	1	1
ICICI BANK LIMITED	1	1	1	0.9691	0.9846	0.9843
INDUSIND BANK LTD	1	1	1	1	1	1
KOTAK MAHINDRA BANK LTD.	1	1	1	0.9495	0.9566	0.9926
YES BANK LTD.	1	1	1	1	1	1
Mean	0.9361	0.9540	0.9813	0.8963	0.9243	0.9694

Source: Researchers calculation from RBI data

**TABLE 4: SHOWING YEAR-WISE OVERALL TECHNICAL EFFICIENCY (OTE), PURE TECHNICAL EFFICIENCY (PTE) AND SCALE EFFICIENCY (SE) SCORES OF POST-DEMONETIZATION PERIOD**

Bank/ DMUs	2016-2017			2017-2018		
	OTE	PTE	SE	OTE	PTE	SE
BANK OF BARODA	0.8456	0.8494	0.9955	0.7792	0.7824	0.9958
BANK OF INDIA	0.7948	0.7990	0.9948	0.7328	0.7733	0.9476
CANARA BANK	0.8518	0.8686	0.9807	0.7859	0.8458	0.9292
PUNJAB NATIONAL BANK	0.8415	0.8441	0.9970	0.7471	0.8113	0.9209
STATE BANK OF INDIA	0.8647	1	0.8647	0.8079	1	0.8079
UNION BANK OF INDIA	0.8446	0.8508	0.9927	0.7789	0.8244	0.9448
AXIS BANK LIMITED	0.9036	0.9748	0.9269	0.8378	0.8966	0.9344
HDFC BANK LTD.	1	1	1	1	1	1.0000
ICICI BANK LIMITED	0.9622	1	0.9622	0.9044	0.9091	0.9949
INDUSIND BANK LTD	1	1	1	1	1	1.0000
KOTAK MAHINDRA BANK LTD.	0.9945	1	0.9945	0.9890	1	0.9890
YES BANK LTD.	0.9880	1	0.9880	0.9791	0.9947	0.9843
Mean	0.9076	0.9322	0.9747	0.8618	0.9031	0.9541

Source: Researchers calculation from RBI data

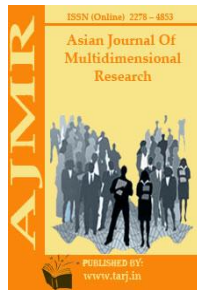
**TABLE 5: EFFICIENCY SCORES DURING PRE AND POST-DEMONETIZATION PERIOD**

Bank/ DMUs	Pre-demonetization phase				Post-demonetization phase			
	OTE (CCR)	PTE (BCC)	SE	Return to Scale	OTE (CCR)	PTE (BCC)	SE	Return to Scale
BANK OF BARODA	0.8080	0.810	0.997	IRS	0.810	0.8143	0.995	IRS
BANK OF INDIA	0.7877	0.790	0.996	IRS	0.762	0.7701	0.990	DRS
CANARA BANK	0.8437	0.906	0.930	DRS	0.811	0.8606	0.942	DRS
PUNJAB NATIONAL BANK	0.8276	0.856	0.966	DRS	0.763	0.935	0.935	DRS
STATE BANK OF INDIA	0.8800	0.880	0.880	DRS	0.829	0.8154	0.829	DRS
UNION BANK OF INDIA	0.8800	0.920	0.955	DRS	0.791	1	0.942	DRS
Group Mean	0.8378	0.880	0.954		0.794	0.8396	0.939	
AXIS BANK LIMITED	0.9882	0.991	0.996	IRS	0.869	0.8500	0.928	DRS
		0.9882	0.996	IRS	0.869	0.9363	0.928	DRS

HDFC BANK LTD.	1	1	1	CRS	1	1	1	CRS
ICICI BANK LIMITED	0.9837	0.985	0.998	DRS	0.932	0.9573	0.973	DRS
INDUSIND BANK LTD	1	1	1	CRS	2	1	1	CRS
KOTAK MAHINDRA BANK LTD.	0.9727	0.973	0.999	DRS	0.990	1	0.990	IRS
YES BANK LTD.	1	1	1	CRS	0.979	0.9988	0.980	IRS
Group Mean Overall	0.9908	0.991	0.999		0.962	0.9821	0.979	
Mean	0.9143	0.936	0.976		0	0.9160	0.959	
Standard Deviation	0.0842	0.078	0.038		3	0.0894	0.048	
Minimum	0.7877	0.790	0.880		0	0.7701	0.829	
Maximum	1	1	1		0.762	1	1	
T-test between two phase					0.976			
T - value					4	0.5858		
Sig.					0.169			
T-test between the two groups					7	0.2820		
T - value	9.5187	3.457			6.971			
Sig.	.000*	2	0.009		1	3.8376		
		.000*	*		.000*	0.004*		

Source: Researchers calculation from RBI data

\* Significant at 1% level of significance



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**ADOPTION OF E-LEARNING AS A SUPPLEMENT AND AN ALTERNATIVE TO TRADITIONAL CLASSROOM COURSES: A SYSTEMATIC REVIEW**

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**ABSTRACT**

*The purpose of the paper is to synthesise the literature of e-learning adoption to determine the factors and barriers affecting adoption of e-learning as a supplement and as an alternative to traditional classroom courses. The paper categorises and summarises studies conducted from the perspective of various stakeholders in e-learning through a thematic analysis of extensive literature published. The study has found common as well as unique barriers and factors influencing the adoption of e-learning across different types of e-learning usage (Blended learning, Mobile learning and Online courses) as well as role of the user (User as a technology adopter, user as a learner and user as a consumer). The study will be useful for developing guidelines for adoption of e-learning.*

**KEYWORDS:** *E-Learning, Blended Learning, Mobile Learning, Online Courses, Adoption, Barriers, Literature Review*



## 1. INTRODUCTION

There is a steady growth in the use of e-learning across the world. E-learning allows easier access to quality education and is a cost-effective medium too. The E-learning sector is growing at an increasing rate of 7.07% and is expected to reach US\$ 65.41 billion by 2023 (Research and Markets, 2018). Numerous research studies have been conducted to understand the adoption of e-learning by stakeholders in education sector and the barriers associated with the adoption process. A gap in literature was found as previous literature review studies have not compared the difference in barriers and factors of adoption across different e-learning types. The purposes of the paper are twofold, first to identify the challenges and factors affecting e-learning adoption through an extensive review of literature and then to thematically analyse the literature to categorize and summarise it.

E-learning can be defined as the practice of using internet or other electronic tools to deliver the instructional materials. (Atkinson, Howells, Reilly, & Ross, 2012). The tools and methods used to deliver e-learning vary and hence different types of e-learning have been identified. This study tries to differentiate various e-learning types based on the purpose it serves to the learners and determine the barriers and factors to its adoption. Accordingly, e-learning has been categorized as: 'supplement to classroom-learning' and 'alternative to classroom-learning' depending on whether it can be used to facilitate classroom-learning or used as an alternative to classroom-learning. Further e-learning as supplement has been further categorized as 'Blended learning' (tools and methods used inside classroom for assisting in teaching. e.g. Projectors) and 'Mobile learning' (tools and methods that allow continuous access to learning outside the class. e.g. Whatsapp group).

## 2. RESEARCH METHODOLOGY

Extensive literature was collected from various sources including peer-reviewed journals, conference proceedings and published thesis. Considering the fast progress of technology, only papers published in the last four years (2014-2018) were considered for the literature review. A total of 54 papers were selected for literature review which were relevant to the topic. Studies were carried in developed as well as developing countries, stakeholders included students, instructors, tutors, farmers, employees etc. A summary of the literature on e-learning adoption has been reproduced. Literature has been classified based on the type of e-learning method as Blended learning, Mobile learning and Online courses. Also, studies have been segregated on how the users are considered as technology adopter, learner or as a consumer. (Liu, Y., Han, S., & Li, H., 2010)

### 3. Factors affecting e-learning adoption

Several studies were conducted to determine adoption of e-learning in general without specifying the type of e-learning method. These studies are reproduced below:

#### 3.1. Users as a technology adopter

Technology adoption model (TAM) and models adapted from TAM have been used by researchers to determine the factors affecting adoption of e-learning. Most of the studies have used intention to use e-learning to determine actual use with one study measuring the actual use. Table 1 summarizes the factors that had a significant or insignificant effect on adoption of e-learning.

Table 1.

FACTORS AFFECTING ADOPTION OF E-LEARNING

	Behavioural Intention		Actual use
	Significant	Insignificant	Significant
Boshaghi & Nematizadeh, 2014	Perceived usefulness		
	Perceived ease of use		
	Subjective norm		
Lee, Choi & Lee, 2014	Instructor characteristics		
	Teaching materials		
	Design of learning content		
	Playfulness		
	Perceived usefulness		
Boateng et al., 2016	Perceived ease of use		
	Perceived usefulness		
	Attitude towards technology use		
	Perceived ease of use		
Abbas, 2016	Computer self-efficacy		
	Interpersonal influence		
	External influence		
	Instructor quality		
	Perceived ease of use		
Wang, 2016	Perceived usefulness		
	Performance expectancy		Intention to use e-learning
	Perceived ease of use		Facilitating conditions
Jovic, Stankovic & Neskovic, 2017	Social influence		
	Perceived usefulness		
	Perceived ease of use		
Tarhini et al., 2017	E-learning design		
	Performance expectancy	Expectations	
	Social influence	Facilitating conditions	
	Habit	Price value	
	Hedonic motivation		
	Self-efficacy		
	Perceived ease of use		
Trust			

### 3.2.Users as learners

Several studies were conducted to determine the barriers to adoption of e-learning. **Ali, Uppal & Gulliver, 2017** conducted a review of literature grouped the barriers into four categories: 'Technology barriers', 'Pedagogy barriers', 'Individual barriers' and 'Enabling Conditions'. **Balakrishnan et al., 2014** surveyed sixty e-learner farmers in India and found that 'technology' constraint was the biggest perceived barrier. 'Social' constraints were perceived as moderate barriers while 'economic' and 'psychological' constraints were less significant. **Naresh, Reddy & Pricilda, 2016** found significant difference in e-learning readiness based on student's demographic variables including 'gender', 'educational background', 'internet usage', 'awareness level' and 'knowledge about e-learning'.

### 3.3.Users as consumers

**Agrawal, Agrawal & Agrawal, 2016** surveyed students in India and found 'supportive', 'System Quality', 'Instructor's perspective', 'Learner's perspective', 'Information quality', and 'Service quality' as the perceived factors affecting e-learning. **Baker & Unni, 2018** studied difference in perception and satisfaction towards e-learning among developed and developing nations. The study found no statistically significant difference between the two groups. **Fleming, Becker & Newton, 2017** in a study with employees of Australian rail organization found that age has no significant impact on employee's future intention to use or satisfaction with e-learning. **Al-Joodeh, Poursalimi & Lagzian, 2017** found 'educational quality' and 'service quality' have a significant, positive impact on satisfaction and acceptance of e-learning among university students in Iraq. **Wang & Lin, 2014** found 'perceived usefulness', 'perceived ease of use', 'quality of textbooks', 'richness of e-learning textbooks', 'accuracy of e-learning textbooks', 'quality of textbooks', 'user's prior experience' and 'interaction of textbooks' to affect adoption of e-learning. **Toufaily, 2018** developed a dynamic model to understand perceived value of e-learning. Different 'get' and 'give'-value components were determined based on the stage of learning of the students, The 'Get components' included 'Functional value', 'Conditional value' and 'Epistemic value' (Prior to the experience), 'Functional value', 'Belonging value' and 'Emotional value' (During the experience) and 'Functional value', 'Personal value' and 'Epistemic value' (After the experience). The various Give components include 'Functional value' and 'Social value' (Prior to the experience), 'Functional value', 'Belonging value', 'Emotional value' and 'Personal value' (During the experience) and 'Functional value' and 'Belonging value' (After the experience).

## 4. Blended learning

Research has been conducted on adoption of various blended learning methods like use of ICT, Flipped learning and other blended learning methods. They have been summarised below.

### 4.1.User as technology adopter

Studies used Technology adoption model (TAM) and Diffusion of innovation theory to determine the factors affecting adoption of blended learning. **Laher & Boshoff, 2017** found that there is a significant difference in attitude across different grades, with students from lower grade reported higher level of perceived enjoyment. The same was true for PEOU, PU, and overall attitude. Table 2 summarizes the factors that have a significant influence on behavioural intention (BI) as well as Actual use.

	Behavioural intention		Actual use	Continued usage
	Significant	Insignificant	Significant	Significant
Sumak, Polancic & Hericko, 2010	Performance expectancy			
	Social influence			
Sharma, Chandel & Govindaluri, 2014	Website credibility			
	Perceived usefulness			
	Perceived ease of use			
Lwoga & Komba, 2015			Self-efficacy	Performance expectancy
				Perceived ease of use
				Social influence
				Self-efficacy
				Actual usage
Tsai et al., 2017	Information quality			
	System quality			
	Service quality			
	Perceived ease of use			
	Perceived usefulness			
Barclay, Donalds & Osei-Bryson, 2018	Access to computers	University climate		
	System availability	Instructor engagement		
	Social norms			

#### 4.2. User as a learner

**Ekberg & Gao, 2018** interviewed teachers teaching six different subjects in Sweden. It was found that 'teaching preparation' and 'perspective of teaching' were biggest barriers of ICT adoption. 'Lack of provision for ICT training' in institute was also a major barrier. **Lichy, Khvatova & Pon, 2014** found 'lack of awareness', 'lack of incentive to learn', 'lack of knowledge', and 'lack of willingness to adopt' as the major barriers. **Rose & Kadvekar, 2015** interviewed directors and educators of higher education institutes in Pune, India. The study found challenges such as 'awareness', 'Existing ICT', 'training and mentoring', 'influencers' and

'planning'. **Verma, 2016** states that 'teacher factor', 'Inadequate of internet connectivity', 'digital divide', 'inadequate funding, management attitudes', 'energy related' and 'low tele-density' are the barriers to adoption of ICT.

#### 4.3. User as consumer

**Kim & Park, 2017** compared learner's and instructor's perception towards ICT adoption in Indonesia. In the case of instructors, the major factors influencing 'Self-efficacy' included 'computer experience' and 'personal innovativeness'. 'Performance expectation' is influenced by 'influence of computer experience'. 'Self efficacy' and 'performance expectation' in turn influence intention to use ICT. In the case of students, 'system quality' and 'service quality' have major impact on 'performance expectation' which has a direct influence on intention to use ICT. **Dang et al., 2016** surveyed students enrolled in a course using blended learning method in United States. The study found that 'instructor characteristics' (both males and females), computer 'self-efficacy' (only females), and 'facilitating conditions' (both males and females) are significant determinants of 'perceived accomplishment' and 'perceived enjoyment'. Also, 'Perceived accomplishment' and 'Perceived enjoyment' were found to be significant predictors of satisfaction towards using blended learning. **Arif & Rafiq, 2017** found no significant difference in demographics (gender, discipline, age group and geographic location) in terms of satisfaction from web-based services. The study also found that PU and PEOU significantly predicted satisfaction with web-based services.

### 5. Mobile learning

Mobile learning includes technologies which allow continuous access to learning without the constraints of location. Various mobile learning tools such as Wiki, e-mail, instant messaging tools, social networking tools and open learning resources can be used for learning. Studies carried out to determine the adoption of web 2.0 tools for learning are summarized below.

#### 5.1. Consumer as technology adopter

Theories such as Diffusion of innovation and Technology adoption model have been used to understand the factors affecting adoption of mobile learning. **Amirkhanpour, Kaufmann & Garcia-Gallego, 2014** surveyed students and educators to study e-learning practices in Cyprus. Among the communication tools, it was found that 'e-mail', 'Instant messaging' and 'short messaging tools' were the most popular while 'voice groups' had the least awareness. Among web collaboration tools, 'wiki' and 'online survey tools' were the most popular while respondents were least aware of collaborative white boards and mind-mapping, social bookmarking tools. Finally, among the productivity tools the most popular were social networking, collaboration platform and search engine tools. **Singh & Panigrahi, 2018** found that 'relative advantage' and 'compatibility' are the main factors affecting adoption of open learning resources. Also, 'compatibility' has a direct influence on 'relative advantage'. 'Subjective norm' has a significant influence on BI. The study also found that there was no significant impact of 'facilitating conditions' on BI. Many studies have used TAM to determine the factors affecting adoption of mobile learning. Table 3 summarizes the factors that have a significant influence on behavioural intention as well as Actual use.

	Behavioural Intention	
	Significant	Insignificant
Cheng, 2015	Navigation	
	Convenience	
	Compatibility	
	Perceived usefulness	
	Perceived ease of use	
	Perceived enjoyment	
Smeda, Shairatuddin & Wong, 2015	Perceived usefulness	
	Perceived ease of use	
	Attitude	
Wong et al., 2015	Learning compatibility	
	Performance expectancy	
	Effort expectancy	
	Copyright clearance	
	Mobility	
	Reachability	
	Convenience	
Yeap, Ramayah & Soto-Acosta, 2016	Attitude	
	Subjective norm	
	Perceived behavioural control	
Baksh, Mahmood & Sangi, 2017	Skill readiness	
	Self-efficacy	
	Perceived ease of use	
	Perceived usefulness	
	Prior experience	
Lubua, Semlambo & Pretorius, 2017	Perceived relevance	
	Ease of use	
	Perceived privacy	
AL-Shihi, Sharma & Sarrab, 2018	Flexibility in learning	
	Social learning	
	Efficiency learning	
	Enjoyment learning	
	Suitability learning	
	Economic learning	
Singh & Panigrahi, 2018	Relative advantage	Facilitating conditions
	Compatibility	
	Subjective norm	

## 5.2. User as a learner

**Lin et al., 2016** developed a model to measure mobile learning readiness. The model consists of 'optimism', 'self-directed learning' and 'm-learning self-efficacy'. **Maredia et al., 2017** conducted a randomized control field experiment to determine effectiveness of mobile video-based instruction compared to live demonstration. The study found no significant difference between 'mobile based instruction' and 'live demonstration' in encouraging understanding and learning in case of technologies that farmers already knew. The traditional method was found to be more effective in the case of inducing new technologies.

## 5.3. User as a consumer

**Everard & Pierre, 2014** conducted a study with college students enrolled in a face-to-face course using open textbook in Sweden. They found that students preferred traditional textbook as it allows them to highlight and write comments on the margin. The adoption of open textbook creates a disruption in their study habits and hence requires the students to endure through a learning phase to get accustomed to the features provided by open textbooks. **Loh et al., 2016** conducted a study on Australian college students and found that 'better learning outcomes' and 'perceived flexibility' are some of the advantages of e-learning. There are apprehensions about issues such as 'flexibility', 'self-motivation' issues, 'lack of face to face interaction', and encouragement for developing 'teamwork'. **Prabu, 2015** found that the use of social media tools such as 'online meetings', 'wikis', 'blogs', 'social news', 'games' and 'e-portfolio' was quite low. Further, the study found that 'social networking tools' and 'discussion forums' had higher perceived value as compared to 'course management' tools. **Al-Mukhaini, Al-Qayoudhi & Al-Badi, 2014** found that students find web 2.0 tools to be enjoyable, attractive, and useful for understanding topics related to the course they are pursuing. **Ifinedo, 2017** found that 'Perceived enjoyment', 'usefulness', 'confirmation', 'compatibility' and 'ease of use' positively affected student's satisfaction with using blogs for learning. Among the factors, 'perceived enjoyment' had the maximum effect on satisfaction.

## 6. Online Courses

Online courses provide a cost-effective alternative to classroom courses. Massive open online courses provide access to quality education to thousands of students. Studies on adoption of online courses are summarised below.

### 6.1. User as a technology adopter

Studies have used TAM to determine the factors affecting adoption of online courses. Table 4 summarizes the factors that have a significant influence on behavioural intention as well as Actual use.

Factors affecting adoption of MOOCs			
	Behavioural intention		Continued usage
	Significant	Insignificant	Significant
Tung & Chang, 2008	Compatibility		
	Perceived usefulness		
	Perceived ease of use		
	Perceived financial cost		

	Computer self-efficacy	Perceived reputation	
Huanhuan & Xu, 2015	Perceived usefulness	Willingness to use	
	Perceived ease of use and interactivity		
	Perceived cost		
Mikalef, Pappas & Giannakos, 2016	Perceived enjoyment		
	Self-efficacy		
	Effort expectancy		
	Social influence		
Mulik, Srivastava & Yajnik, 2018	Perceived usefulness		
	Perceived ease of use		
	Facilitating conditions		
	Social influence		
	Perceived value		
Scarpin, Mondini & Scarpin, 2018			Performance expectance
			Agility
			Utility
			Productivity

## 6.2. Users as consumers

**Chen, Lee & Hsiao, 2018** compared determinants of continuance intention of MOOC and non-MOOCs. The study surveyed university students in Taiwan. It was found that Satisfaction has the maximum effect on intention to continue online courses. It was also found that human-message interaction affects satisfaction. Further, similar effects of interaction and motivation were observed in both MOOC and non-MOOC platforms.

## 7. CONCLUSION

The paper attempted to determine the barriers and factors for adoption of e-learning as a supplement as well as an alternative to traditional face-to-face learning. Literature has been divided based on users as technology adopters, users as learners and users as consumers. Further, E-learning has been divided into three types: Blended learning, Web2.0 learning and Online courses.

The major barrier to adoption of e-learning was found to be 'Technological barrier'. Also, studies show that there is a significant difference in user-readiness based on demographic variables including 'gender', 'educational background', 'internet usage', 'awareness level' and 'knowledge about e-learning'. It is hence suggested that technological infrastructure must be developed to encourage adoption of e-learning. In the case of adoption of ICT, the major barriers were related to teaching preparation, lack of knowledge and willingness to adopt ICT. It can be inferred that training teachers with e-learning methods and creating incentive to use technology are important factors to increase adoption of ICT in learning. From the perspective of students,



focusing on improving system and service quality of ICT based learning is important. For mobile learning, 'self-efficacy', 'self-directed learning' and 'Optimism' are important user characteristics that influence its adoption. 'Lack of time' was the most important barrier in the adoption of online courses.

Next, users were considered as adopters of technology. It was found that original constructs of TAM viz. 'Perceived Usefulness' and 'Perceived ease of use' were significant predictors of behavioural intention to adopt technology for learning. Further, studies have extended TAM to include other variables to the adoption model. In the case of e-learning, 'Facilitating conditions', 'Self-efficacy' and 'Performance expectancy' are some of the additional factors affecting behavioural intention. The effect of 'Facilitating conditions' is insignificant in some studies which can be attributed to the exponential adoption of technological tools in the recent years. Studies conducted on adoption on ICT also confirmed the original TAM model. 'Social influence' and 'Self-efficacy' are some other factors affecting adoption of ICT. Studies show that external variables including 'University climate' and 'Instructor engagement' have no significant influence on adoption. In the context of mobile learning, 'Mobility', 'Flexibility in learning' and 'perceived enjoyment' are some major factors affecting behavioural intention. It was found that 'Facilitating conditions' has an insignificant effect on adoption. In the context of Online courses, 'Perceived value', 'Perceived cost' were some significant factors affecting behavioural intention. I was found that 'perceived reputation' and 'willingness to use' were insignificant in influencing behavioural intention. Continued use of online courses is affected by 'Performance expectancy' and 'Utility'.

Studies have also focussed on users as consumers. Perceived factors affecting e-learning include 'supportive', 'Learner's perspective', 'instructor's perspective', 'System and service quality' and 'information quality'. Further, studies found that there was no significant difference between users based on 'location' and 'age'. 'Perceived accomplishment' and 'perceived enjoyment' are major antecedents of Satisfaction with ICT based learning. Studies also reveal that there is no significant difference based on 'gender', 'discipline' and 'location' of the user. It was found that students find web 2.0 tools to be 'enjoyable', 'attractive', and 'useful for understanding topics related to the course they are pursuing'. It was found that 'perceived enjoyment', 'perceived ease of use', 'confirmation', 'compatibility', and 'usefulness' positively affect satisfaction with mobile learning. 'Better learning outcomes' and 'Perceived flexibility' are perceived advantages of mobile learning while it suffers from issues such as 'flexibility', 'self-motivation issues', 'face to face interaction', and 'encouragement for developing teamwork'. Among users of Online courses, 'human-message interaction' has the highest impact on satisfaction with MOOCs.

The purpose of the paper was to thematically analyse the literature on different e-learning types and hence the literature is not exhaustive. Nevertheless, effort was made to include studies with varied types of e-learning, demographic of the sample and study type to develop a holistic understanding of barriers and factors leading to adoption of e-learning. The study will be helpful for policy makers and enterprises in the e-learning industry to develop effective e-learning solutions.

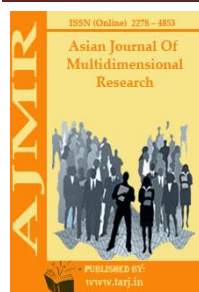
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## **ESCALATING FOOD SECURITY STATUS IN GUJRAT STATE OF INDIA**

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### **ABSTRACT**

*By using district-level secondary data, 2016 and indicator approach, the present study has developed a food security index for the districts associated with the State of Gujarat, India. The calculated FSI revealed that Ahmadabad district has the highest food security status, whereas Porbandar district has the lowest food security status. The estimated results show that there exists a significant food inequality across districts due to variation in socioeconomic variables. The study suggests that (i) creation of more job opportunities in non-farm would be critical to improve accessibility power of people to acquire food, (ii) food security would be sustainable as increase government expenditure in agriculture and rural development, public spending in agriculture and R &D, development of infrastructure and food- grain storage, and credit flow in the market (iii), and the government of India is required to adopt an effective mechanism to reduce marketing in order to control food price inflation.*

**KEYWORD:** *Food Security, Climate Change, Indicator Approach, Gujarat and India.*

## 1.0 INTRODUCTION

Climate related uncertainties manifesting as drought, floods, temperature fluctuation, and crop disease, posing the greatest challenge to agricultural production and food security (IFPRI, 2009 and Ahmad et al., 2011). There are significant indications of climate related problems already being recorded in the many regions, and resulted in net reductions of yield, particularly, in major parts of Africa and Asia (Ringler et al., 2010). Though it is now clear that climate change is adversely affecting to the most vulnerable occupation i.e., agriculture, but it is difficult to determine the actual scale or degree of the impact (Cline, 2007 and Arene and Anyaeji, 2010). The simulation results show that the world will need to produce 70 percent more food by 2025 than what is being produced today (FAO, 2009 & 2011). The situation is more critical for developing countries, including India (ADB, 2012). The short-term projection results show that food demand in India is expected to increase significantly (Nanda, 2018). The major influencing factors are continuously increasing population, climate change, income inequality, urbanization, and dietary changes (Praduman and Joshi, 2016). The agricultural statistics reveal that the total area under farming has declined from 159.59 million hectares in 2010-11 to 157.14 million hectares in 2015-16. During the same period, the number of operational holdings increased by 5.33 percent from 138 million in 2010-11 to 146 million in 2015-16 (Agricultural Census, 2015-16). Further, the area not available for cultivation is also continuously converting for industrial and domestic purposes (Ghosh and Sreerupa, 2007). The mean land size of operational holdings also declined from 1.5 hectares to 1.08 hectares. Nearly 87 percent of the land holdings in the country consisted of small and marginal holdings (0 to 2 hectares), while their share in the operated area was only 47.34 percent. This reflects that the pressure on the increasing farming population on agricultural land, which is a critical factor of production that is also limited in supply (Das et al., 2009 and Viswanathan et al., 2012). The other perpetual challenge for Indian agriculture is the availability of water (Gahukar, 2011). Major cereal crops like rice, wheat and sugarcane have a high-water requirement. However, more than 60 percent cropped area under rainfed conditions, erratic rainfall and continuously increasing temperature are adding an additional layer of water insecurity in the agro-based system (Inrahim and Ibrahim, 2009; Hasmi and Shakeel, 2012; Gregory et al., 2012 and Abraham, 2013).

### *1.1 Food Security and Indian Agricultural*

India has 2.1 percent arable land, 17 percent livestock production, 4.2 percent water resources and 17.6 percent of global population (GoI, 2017). It is bound to feed a second largest populated country (Karhad, 2014 and Karmakar, 2014). India's aims to achieve self-sufficiency in food production since 1970 (Leunufna and Evans, 2014). Its food production ensures the food security for everyone (Mallikarjuna, 2013). Despite that it is home for the largest number of food insecure people that counts 325 million malnourished people with an approximate 48 percent malnourished children under age five (NFHS, 2006). Every night nearly 320 million Indians have slept without food every night (Mârza et al., 2015 and McKune et al., 2015). More than one third population is estimated to be absolutely poor and many more suffering from chronic diseases (Nabb et al., 2013). Income and food poverty, distributional difficulties, income inequality, food-price inflation, regional disparities, and inefficient government mechanism are the main reasons for food insecurity in India (Omotesho et al., 2006 and Orewa and Iyangbe, 2010).

Therefore, there is a growing concern among the researchers and policymakers that how to feed food demand and sustains livelihoods of the continually increasing population, where natural resources are finite and rapidly deteriorating, and how to use natural resources efficiently to

make Indian agriculture sustainable (Scanlan, 2001; Rao and Rogers, 2006; Praduman and Surabhi, 2006; Palanisami et al., 2010; Ramsundar and Jaydeb, 2011; Ghate, 2012; Viswanathan et al., 2012 Sundaram, 2013; Kothari, 2013; Sajjad et al., 2014; Shukla et al., 2015).

With the above background, food security must be examined through holistic means to identify the multidimensional processes that intersect with economics, social relations, health, political structures, and the environment, which operate over different spatial and temporal scales. Strengthening food security and improving human development is a cohesive process. The present study has objectives (i) evaluate the food security status of districts associated with state of Gujarat, India, (ii) to evaluate degree of food security using quintile method, and (iii) to identify the critical indicators responsible for lower food security.

This study is divided into five sections. Section I, is Introduction which explains the concept of food security and also discusses some important food security studies of India. Section II gives a brief description of the study area, data sources and estimation method. Section III & IV include the results. Section V includes concluding observations and policy implications.

## 2.0 METHODS AND MATERIALS

### 2.1 Study Area

The state of Gujarat lies on the western coast of India between 20° 6 North latitude and 24° 42 North latitude and 68° 10 East longitude to 74° 28 East longitude. The length of Gujarat from north to south is approximately 590 kilometres and width from east to west is approximately 500 kilometres. The state is spread across an area of 196,024 square kilometres (six percent of the total geographical area of India), and it has a long coastline (1,663 kilometre) among India states (GoI, 2017). The state is bound by the Arabian Sea on the west and south-west, Rajasthan in the north and northeast, Maharashtra in the south and southeast and Madhya Pradesh in the east. The state has an international boundary with Pakistan in the north-west. The Gulf of Kutch and Gulf of Khambhat are situated on the Arabian Sea. Three perennial rivers- Narmada, Tapi and Mahi are located in south Gujarat. The state falls in the subtropical climate zone and experiences sub-humid climate in southern Gujarat (south of river Narmada), moderately humid climate in central Gujarat (between Narmada and Sabarmati rivers), humid and sultry climate in the coastal region (south facing coastal region in Sourashtra), dry climate in regions of central Gujarat (north of Ahmedabad and part of central Saurashtra) and arid and semi-arid climate in north Gujarat and Kutch. The average temperature varies across the state. The summer temperature varies between 25°C and 45°C, while the winter temperature ranges between 15°C and 35°C degrees (IMD, 2017). The average annual rainfall over the state varies widely from 300 mm in the western half of Kutch in 2, 100 mm in the southern part of Valsad district and the Dangs (IMD, 2017).

Gujarat has a population of 60.38 million in 2011 (Census, 2011) showing a decadal growth rate of 19.17 percent as compared to the all India growth rate of 17.64 percent. The sex ratio is 918 females over 1000 males. The literacy rate is 79.31 percent. Doha district has recorded a low literacy rate (45.15 percent), while Ahmedabad has recorded the highest (86.65 percent).

### 2.2 Data Sources

The present study uses district-wise data on food security sub-components, viz., food availability, food accessibility, and food stability in 2016-17. Food availability index consists eight indicators, viz., number of livestock per 1000 population, per capita availability of food grains, per capita availability of oilseeds, per capita availability of vegetables, per capita



availability of condiments & spices, , per capita availability of fruits, per capita consumption expenditure and agricultural labourers. For these indicators, data were collected from statistical abstract, Gujarat, 2016. Food accessibility index consists 11 indicators, viz., literacy rate, road length, case reserve ratio, urbanization, population density, sex ratio, population decadal growth rate, safe drinking water, access to electricity, secured housing condition and number of fair price shops. For these indicators, data were collected from census, 2011, Reserve Bank of India and statistical abstract, Gujarat, 2016. Finally, food stability consists nine indicators viz., yield of food-grains, yield of oilseeds, yield of condiments & spices, yield of vegetables, fertiliser consumption, storage capacity, cropping intensity, percentage of gross irrigated area to gross sown area and forest area. For these indicators, data were collected from statistical abstract, 2016 and directorate of economics and statistics, Gujarat, 2016.

### 2.3 Estimation method

Simple descriptive method, component analysis and composite Z-score technique which can be used for constructed food security index (Shakeel et al., 2012), which also applied aforesaid techniques to generate a food security index in India. In descriptive method, weight to each arbitrary variable is assigned by researcher's understanding (Kumar et al., 2015). It also displays positive and negative statistics in magnitude for estimating food security index. Therefore, interpretation of statistical inference appears complex and irrational. With these specifications, the present study used composite Z-score technique to estimate district-wise food security and associated indices. Because it has a greater reliability and produce better results than descriptive technique. It comprises weight for each variable that is assigned by the statistical technique (Ingener and Sudharshan, 1982). Hence, it is more reliable and scientific that reduce controversy of descriptive technique (Chinnadurai et al., 2012).

Food security contains food availability, food accessibility, food stability and food utilisation (Kumar et al., 2015). However, due to unavailability of food utilisation-related information at the district level for Gujarat, the present study could not include it. Thus, the food security index is measured as composite indices, food availability index (FAVI), food accessibility (FACI) and food stability (FSTI). Here, FSI is defined as a positive number that covers as many possible variables of food security. Although, there is no specific or scientific definition on FSI in existing literature. The present study assumes that FSI is a function of FAVI, FACI and FSTI, and specified as:

$$(FSI)_{st} = f\{(FAVI)_{st}, (FACI)_{st}, (FSTI)_{st}\} \quad (1)$$

Here FSI is food security index, FAVI, FACI and FSTI are food availability index, food accessibility index and food stability index, respectively. The components are separates as:

$$(FAVI)_{st} = f\{(X)1_{st}, (X)2_{st}, (X)8_{st}\} \quad (2)$$

$$(FACI)_{st} = f\{(Y)1_{st}, (Y)2_{st}, (X)11_{st}\} \quad (3)$$

$$(FSTI)_{st} = f\{(Z)1_{st}, (Z)2_{st}, (Z)9_{st}\} \quad (4)$$

Here, X, Y and Z are associated with FAVI, FACI and FSTI, respectively. *s* is the district and *t* is time period. Further, FAVI, FACI and FSTI would be linear sum of all standardisation values that is multiplied by assigned weight of corresponding variables that are given as:

$$(FAVI)_{st} = W_{1x} * (X)_{1,st} + W_{2x} * (X)_{2,st} + W_{3x} * (X)_{3,st} + W_{7x} * (X)_{8,st} \tag{5}$$

$$(FACI)_{st} = W_{1x} * (Y)_{1,st} + W_{2x} * (Y)_{2,st} + W_{3x} * (Y)_{3,st} + W_{7x} * (Y)_{11,st} \tag{6}$$

$$(FSTI)_{st} = W_{1x} * (Z)_{1,st} + W_{2x} * (Z)_{2,st} + W_{3x} * (Z)_{3,st} + W_{7x} * (Z)_{9,st} \tag{7}$$

Here,  $W_i$  is the weight that is assigned to each variable; X, Y, and Z are the standardisation-index for corresponding variables.

**2.3.1 Determination of Standardisation- index**

If expected value of a factor is positively related with food security, the standardisation- index as follow:

$$CZI_{ij} = \frac{K_{ij} - Min(X_{ij})}{Max(X_{ij}) - Min(X_{ij})} \tag{8}$$

Here,  $CZI_{ij}$  is composite Z- score for  $i^{th}$  variable, *j* is cross-sectional district.  $Min(X_{ij})$  and  $Max(X_{ij})$  are lowest and highest value in each series of a parameter across districts, respectively. If expected value of factor is negatively related with food security, the standardisation-index is calculated as:

$$CZI_{ij} = \frac{Max(X_{ij}) - K_{ij}}{Max(X_{ij}) - Min(X_{ij})} \tag{9}$$

**2.3.2 Determination of Weight**

Weight for each variable are estimated as:

$$W_i = \frac{K}{\sqrt{Var(CZI)}} \tag{10}$$

Here weight is ( $0 < W > 1$  and  $\sum_{i=1}^m W_i = 1$ ) that is assigned to  $i^{th}$  variable.  $Var(CZI)$  is statistical variation across standardisation-indices for all variables (Ingener ans Sudharshan, 1982). Weight reflects important of an individual variable. While K is calculated as:

$$K = \frac{1}{\left\{ \sum_{i=1}^n \left( \frac{1}{\sqrt{Var(Cid)}} \right) \right\}} \tag{11}$$

The present study included total 28 variables to estimate FVI, FACI and FSTI for 26 districts. Hence, aforementioned process is recursively used for each variable. Finally, district-wise FSI is calculated as:

$$(FSI)_{st} = \frac{(FAVI)_{st} + (FACI)_{st} + (FSTI)_{st}}{3} \tag{12}$$

Lastly, degree of food security status also assessed using quintile method. Districts were categorised into found categories namely, low (0- 25<sup>th</sup> percentile), medium (26<sup>th</sup> to 50<sup>th</sup> percentile), high (51<sup>st</sup> to 75<sup>th</sup> percentile) and very high (76<sup>th</sup> to 100<sup>th</sup> percentile).

#### ***2.4 Rational Selection of Indicators for Food Availability Index***

The food availability refers to stock food, fisheries and livestock products available in a district either available domestically or through commercial imports or food-aid programme (Babatunde et al., 2007). This component of food security is largely affected by agricultural productivity (Menezes, 2015). Further, livestock production is a crucial determinant for sustainable food security (Kumar et al., 2015). Calories and protein for people comes from livestock products who consumed meat, milk and eggs (Shakeel et al., 2012). Similarly, per capita availability of food-grain, oilseeds, condiment & spices, fruits, vegetables, milk and eggs are a good measurement for food security (Menezes, 2015). With these importance of the indicators of food security, food availability is captured using the indicators, namely; number of livestock per 1000 population, per capita availability of food grains, per capita availability of oilseeds, per capita availability of vegetables, per capita availability of condiments & spices, per capita availability of fruits, per capita consumption expenditure and agricultural labourers

#### ***2.5 Rational Selection of Indicators for Food Accessibility Index***

The food availability indicates the household's ability to buy or produce sufficient quantities of quality food (Ifeoman and Agwu, 2014). It is directly affected by the economic capacity through physical and financial assets, household's preferences and market situation (Sultana and Kiani, 2011). The food accessibility is captured using the indicators, namely; literacy rate, road length, case reserve ratio, urbanization, population density, sex ratio, population decadal growth rate, safe drinking water, access to electricity, secured housing condition and number of fair price shops.

#### ***2.5 Rational Selection of Indicators for Food Stability Index***

The component of stability in the food security estimation is part of availability and accessibility component, which is impacted by overall supply and demand for food-grains and other commodities in the food basket (Yu and You, 2013). This component refers to access food in a stable manner for a long-time (Mondal et al., 2015). The food stability is captured using the indicators, namely; yield of food-grains, yield of oilseeds, yield of condiments & spices, yield of vegetables, fertiliser consumption, storage capacity, cropping intensity, percentage of gross irrigated area to gross sown area and forest area.

### **3. RESULTS**

#### ***3.1 Food Availability Index (FAVI)***

The calculated results for food availability index revealed that The Dangs (0.4915) has highest food accessibility, whereas Navsari (0.0789) has lowest food availability among the districts of Gujarat (Table 1). It was found that highest per capita consumption (0.1341), and per capita availability of food grains (0.1332) & vegetable (0.1395) were major contributing indicators for higher food availability in The Dangs. Further, the lower per capita availability of oilseeds (0.0129), vegetables (0.0023) & fruits (0.0009), and livestock (0.0090) were major influencing factors for lower food availability in the Navsari.

**TABLE 1: DISTRICT WISE FOOD AVAILABILITY INDEX FOR GUJARAT**

Districts	Rank	Food Availability Index	Per Capita Consumption Expenditure	Per Capita Availability of Fruits	Agricultural Labourers	Per Capita Availability of Condiments and Spices	Per Capita Availability of Vegetables	Per Capita Availability of Oilseeds	Per Capita availability of Food grains	Livestock
The Dangs	1	0.06	0.00	0.04	0.11	0.01	0.00	0.00	0.04	0.05
Banas Kantha	2	0.05	0.01	0.04	0.08	0.02	0.01	0.00	0.08	0.02
Surendranagar	3	0.06	0.03	0.02	0.08	0.01	0.02	0.00	0.06	0.04
Sabar Kantha	4	0.05	0.01	0.02	0.09	0.02	0.01	0.00	0.06	0.05
Vadodara	5	0.07	0.06	0.02	0.08	0.04	0.04	0.05	0.00	0.06
Junagadh	6	0.07	0.02	0.01	0.09	0.02	0.03	0.01	0.07	0.05
Valsad	7	0.06	0.02	0.03	0.07	0.04	0.03	0.01	0.04	0.06
Kachchh	8	0.09	0.04	0.06	0.06	0.00	0.03	0.02	0.06	0.04
Ahmadabad	9	0.08	0.07	0.04	0.06	0.06	0.08	0.10	0.05	0.08
Anand	10	0.05	0.04	0.01	0.07	0.05	0.02	0.02	0.03	0.08
Panch Mahals	11	0.02	0.00	0.03	0.09	0.03	0.01	0.00	0.05	0.04
Bhavnagar	12	0.07	0.04	0.02	0.08	0.02	0.03	0.01	0.08	0.05
Dohad	13	0.00	0.00	0.06	0.11	0.04	0.00	0.00	0.04	0.00
Bharuch	14	0.07	0.04	0.01	0.07	0.02	0.03	0.01	0.01	0.07
Kheda	15	0.05	0.03	0.01	0.08	0.04	0.02	0.01	0.05	0.08
Rajkot	16	0.09	0.06	0.03	0.07	0.02	0.05	0.02	0.07	0.07
Mahesana	17	0.07	0.04	0.01	0.07	0.03	0.02	0.01	0.05	0.08
Tapi	18	0.06	0.01	0.01	0.12	0.02	0.00	0.00	0.02	0.03
Surat	19	0.10	0.07	0.09	0.00	0.10	0.08	0.04	0.03	0.08
Patan	20	0.05	0.02	0.01	0.08	0.01	0.01	0.00	0.04	0.04
Narmada	21	0.04	0.01	0.02	0.09	0.01	0.00	0.00	0.05	0.04
Gandhinagar	22	0.07	0.06	0.01	0.07	0.05	0.04	0.02	0.04	0.08
Porbandar	23	0.08	0.04	0.00	0.09	0.02	0.04	0.00	0.01	0.05
Amreli	24	0.08	0.01	0.00	0.09	0.01	0.02	0.00	0.05	0.05
Jamnagar	25	0.08	0.04	0.01	0.08	0.01	0.04	0.01	0.06	0.05
Navsari	26	0.07	0.02	0.00	0.09	0.04	0.02	0.01	0.03	0.08
Weight		0.12	0.12	0.13	0.12	0.11	0.14	0.13	0.11	0.11

Source: Author Estimation.

### 3.2 Food Accessibility Index (FACI)

Food accessibility has an important factor for food security. The calculated food accessibility index scores revealed that the Ahmadabad (0.812) has highest food accessibility, whereas Dohad (0.313) has lowest food accessibility among the districts in Gujarat (Table 2). It was found that the literacy rate (0.083), cash reserve ratio (0.101), urbanization (0.079), population density (0.064), and safe drinking water (0.072) and access to electricity (0.089) were major contributing indicators for higher food accessibility in the Ahmedabad. On the contrary, lower literacy rate (0.000), cash reserve ratio (0.002), urbanization (0.000), safe drinking water (0.000) and secured housing condition (0.000) were major influencing indicators for lower food accessibility in the Dohad in Gujarat.

**TABLE 2: DISTRICT WISE FOOD ACCESSIBILITY INDEX FOR GUJARAT**

District	Literacy rate	Road Length	Cash Reserve Ratio	Urbanization	Population density	Sex Ratio	Decadal growth rate	Safe drinking water	Secured Housing	Access to Electricity	Fair Price Shop	Food Accessibility Index	Rank
Ahmadabad	0.08	0.05	0.10	0.08	0.06	0.06	0.04	0.07	0.08	0.09	0.09	0.81	1
Surat	0.08	0.03	0.04	0.08	0.10	0.00	0.09	0.07	0.10	0.09	0.03	0.69	2
Rajkot	0.07	0.07	0.02	0.05	0.02	0.07	0.03	0.06	0.09	0.08	0.05	0.62	3
Bhavnagar	0.05	0.08	0.01	0.03	0.02	0.08	0.02	0.04	0.07	0.08	0.05	0.53	4
Vadodara	0.06	0.00	0.05	0.04	0.04	0.08	0.02	0.06	0.07	0.07	0.05	0.53	5
Kachchh	0.04	0.06	0.02	0.03	0.00	0.06	0.06	0.04	0.09	0.07	0.04	0.51	6
Gandhinagar	0.08	0.04	0.02	0.04	0.05	0.07	0.01	0.06	0.07	0.07	0.02	0.51	7
Mahesana	0.08	0.05	0.01	0.02	0.03	0.07	0.01	0.04	0.07	0.07	0.05	0.49	8
Anand	0.08	0.03	0.02	0.02	0.05	0.07	0.01	0.04	0.05	0.07	0.05	0.48	9
Junagadh	0.05	0.07	0.01	0.03	0.02	0.09	0.01	0.02	0.07	0.08	0.03	0.47	10
Jamnagar	0.05	0.06	0.01	0.04	0.01	0.08	0.01	0.04	0.08	0.07	0.02	0.47	11
Valsad	0.06	0.04	0.01	0.03	0.04	0.07	0.03	0.02	0.06	0.07	0.02	0.46	12
Kheda	0.08	0.05	0.01	0.02	0.04	0.08	0.01	0.03	0.05	0.05	0.05	0.44	13
Navsari	0.08	0.03	0.01	0.02	0.04	0.09	0.00	0.02	0.07	0.07	0.00	0.44	14
Bharuch	0.07	0.01	0.01	0.03	0.02	0.07	0.01	0.04	0.07	0.08	0.03	0.43	15
Amreli	0.05	0.05	0.00	0.02	0.01	0.09	0.00	0.01	0.08	0.08	0.03	0.43	16
Surendranagar	0.04	0.06	0.00	0.02	0.01	0.08	0.02	0.03	0.06	0.07	0.03	0.43	17
Porbandar	0.05	0.01	0.00	0.04	0.02	0.09	0.00	0.04	0.08	0.08	0.01	0.42	18
Sabar Kantha	0.05	0.06	0.00	0.01	0.02	0.09	0.02	0.01	0.05	0.08	0.03	0.41	19
Banas Kantha	0.02	0.08	0.00	0.01	0.02	0.08	0.04	0.01	0.05	0.02	0.07	0.40	20
The Dangs	0.05	0.04	0.00	0.00	0.01	0.11	0.04	0.00	0.06	0.00	0.07	0.38	21
Patan	0.04	0.04	0.00	0.01	0.01	0.08	0.01	0.02	0.05	0.05	0.03	0.36	22
Panch Mahals	0.04	0.05	0.00	0.01	0.03	0.09	0.03	0.00	0.02	0.07	0.03	0.36	23

Narmada	0.04	0.05	0.00	0.00	0.01	0.09	0.02	0.01	0.04	0.06	0.01	0.32	24
Tapi	0.03	0.02	0.00	0.00	0.02	0.12	0.01	0.01	0.06	0.05	0.01	0.32	25
Dohad	0.00	0.04	0.00	0.00	0.04	0.11	0.06	0.00	0.00	0.03	0.04	0.31	26
Weight	0.08	0.08	0.10	0.08	0.10	0.11	0.09	0.07	0.10	0.09	0.09		

Source: Author Estimation.

### 3.3 Food Stability Index (FSTI)

Food stability has critical indicator for food security. The calculated food stability index scores revealed that the Sabar Kantha(0.486) has highest food stability followed by Anand (0.475) and Banas Kantha (0.472), whereas the Porbandar (0.143) has lowest food stability followed by Amreli (0.159) and Jamnagar (0.208)in Gujarat, respectively (Table 4). It was found that higheryield of vegetables (0.112) was major contributing indicators for highest food stability in the Sabar Kantha. Further, the lowest yield of food grains (0.004), oilseeds (0.004), condiments and spices (0.003), fertiliser consumption (0.006) and forest area (0.003) were major influencing indicators for the lower food stability in the Porbandar.

**TABLE 3: DISTRICT WISE FOOD STABILITY INDEX FOR GUJARAT**

Districts	Yield of Food-grains	Yield of Oilseeds	Yield of Condiments and Spices	Fertiliser Consumption	Yield of Vegetables	Storage Capacity	Cropping Intensity	Forest Area	Percentage of Gross Irrigated Area to Gross Sown Area	Food Stability Index	Rank
Ahmadabad	0.08	0.05	0.10	0.08	0.06	0.06	0.04	0.07	0.08	0.09	4
Amreli	0.05	0.05	0.00	0.02	0.01	0.09	0.00	0.01	0.08	0.08	25
Anand	0.08	0.03	0.02	0.02	0.05	0.07	0.01	0.04	0.05	0.07	2
Banas Kantha	0.02	0.08	0.00	0.01	0.02	0.08	0.04	0.01	0.05	0.02	3
Bharuch	0.07	0.01	0.01	0.03	0.02	0.07	0.01	0.04	0.07	0.08	18
Bhavnagar	0.05	0.08	0.01	0.03	0.02	0.08	0.02	0.04	0.07	0.08	14
Dohad	0.00	0.04	0.00	0.00	0.04	0.11	0.06	0.00	0.00	0.03	10
Gandhinagar	0.08	0.04	0.02	0.04	0.05	0.07	0.01	0.06	0.07	0.07	8
Jamnagar	0.05	0.06	0.01	0.04	0.01	0.08	0.01	0.04	0.08	0.07	24
Junagadh	0.05	0.07	0.01	0.03	0.02	0.09	0.01	0.02	0.07	0.08	9
Kachchh	0.04	0.06	0.02	0.03	0.00	0.06	0.06	0.04	0.09	0.07	11
Kheda	0.08	0.05	0.01	0.02	0.04	0.08	0.01	0.03	0.05	0.05	6
Mahesana	0.08	0.05	0.01	0.02	0.03	0.07	0.01	0.04	0.07	0.07	7
Narmada	0.04	0.05	0.00	0.00	0.01	0.09	0.02	0.01	0.04	0.06	16
Navsari	0.08	0.03	0.01	0.02	0.04	0.09	0.00	0.02	0.07	0.07	21
Panch Mahals	0.04	0.05	0.00	0.01	0.03	0.09	0.03	0.00	0.02	0.07	19
Patan	0.04	0.04	0.00	0.01	0.01	0.08	0.01	0.02	0.05	0.05	22
Porbandar	0.05	0.01	0.00	0.04	0.02	0.09	0.00	0.04	0.08	0.08	26

Rajkot	0.07	0.07	0.02	0.05	0.02	0.07	0.03	0.06	0.09	0.08	12
Sabar Kantha	0.05	0.06	0.00	0.01	0.02	0.09	0.02	0.01	0.05	0.08	1
Surat	0.08	0.03	0.04	0.08	0.10	0.00	0.09	0.07	0.10	0.09	17
Surendranagar	0.04	0.06	0.00	0.02	0.01	0.08	0.02	0.03	0.06	0.07	13
Tapi	0.03	0.02	0.00	0.00	0.02	0.12	0.01	0.01	0.06	0.05	23
The Dangs	0.05	0.04	0.00	0.00	0.01	0.11	0.04	0.00	0.06	0.00	20
Vadodara	0.06	0.00	0.05	0.04	0.04	0.08	0.02	0.06	0.07	0.07	5
Valsad	0.06	0.04	0.01	0.03	0.04	0.07	0.03	0.02	0.06	0.07	15
Weight	0.090	0.119	0.094	0.104	0.112	0.104	0.125	0.133	0.118		

Source: Author Estimation

### 3.4 Food Security Index (FSI)

The food security index was calculated by combining food availability index, food accessibility index and food stability index (Table 4). The calculated FSI revealed that the Ahmadabad (0.507) has highest food security status, whereas Porbandar(0.236) has a lowest food security status. Further, the degree of food security status revealed that apart from the Ahmadabad, Surat, Sabar Kantha, Anand, Banas Kantha and Vadodara have the highest degree of food security, whereas apart from the Porbandar, Amreli, Tapi, Navsari, Patan, Narmada and Jamnagar have the lowest degree of food security.

**TABLE 4: DISTRICT WISE FOOD SECURITY INDEX FOR GUJARAT**

District	FAVI	FACI	FSTI	FSI	Rank	Degree of Food Security Status
Ahmadabad	0.06	0.04	0.01	0.03	1	Very High
Vadodara	0.06	0.00	0.05	0.04	2	Very High
Banas Kantha	0.05	0.04	0.00	0.00	3	Very High
Anand	0.03	0.02	0.00	0.00	4	Very High
Sabar Kantha	0.04	0.06	0.00	0.02	5	Very High
Surat	0.08	0.03	0.04	0.08	6	Very High
Rajkot	0.05	0.06	0.00	0.01	7	High
The Dangs	0.07	0.07	0.02	0.05	8	High
Junagadh	0.05	0.01	0.00	0.04	9	High
Kachchh	0.04	0.04	0.00	0.01	10	High
Mahesana	0.04	0.05	0.00	0.01	11	High
Kheda	0.08	0.03	0.01	0.02	12	High
Gandhinagar	0.04	0.05	0.00	0.00	13	Medium
Bhavnagar	0.08	0.05	0.01	0.02	14	Medium
Surendranagar	0.08	0.05	0.01	0.02	15	Medium
Valsad	0.04	0.06	0.02	0.03	16	Medium
Bharuch	0.05	0.07	0.01	0.03	17	Medium
Dohad	0.05	0.06	0.01	0.04	18	Medium
Panch Mahals	0.08	0.04	0.02	0.04	19	Medium
Jamnagar	0.00	0.04	0.00	0.00	20	Low
Narmada	0.05	0.08	0.01	0.03	21	Low

Patan	0.07	0.01	0.01	0.03	22	Low
Navsari	0.02	0.08	0.00	0.01	23	Low
Tapi	0.08	0.03	0.02	0.02	24	Low
Amreli	0.05	0.05	0.00	0.02	25	Low
Porbandar	0.08	0.05	0.10	0.08	26	Low

Source: Author Estimation.

### 3.6 Validation of Estimated District-wise Food Security Index

It is important to validate constructed index. It can be preferred as 'good' it is significantly correlated with its associate indices. Spearman's rank correlation coefficients reveal that FSI is positively associated with FAVI, FACI, and FSTI (Table 6). This also interpreted that food security depends on food availability, stability and accessibility. Thus, significant associated with its components (Shakeel et al., 2012). Food availability is positively associated with food stability. It infers that food stability improves as food production increases (Hasmi and Shakeel, 2012). Further, food stability is also positively associated with food availability.

**TABLE 5: SPEARMAN'S RANK CORRELATION STATISTICS**

Parameters	FSI	FAVI	FACI	FSTI
FSI	1	0.5358 <sup>NS</sup>	0.6979*	0.8146*
FAVI	0.5358*	1	-0.0609*	0.3556*
FACI	0.6979*	-0.0609*	1	1
FSTI	0.8146*	0.3556*	0.3329 <sup>NS</sup>	0.3329**

Source: Author Estimation. Note: \* and \*\* indicates that correlation coefficients are statistically significant at 0.01 and 0.05 significance level. FSI- food security index; FAVI- food availability index; FACI- food accessibility index and FSTI- food stability index.

The present study utilised a framework for evaluation of the whole food system (from crop production through to residual food availability) by normalising to consistent and relatively simplistic metrics (per person per day). This holistic approach is critical for identifying levers within the food system which can be targeted for improvements in food security and efficiency supply (Reay and Higgins, 2018). The present study results highlighted that the lower per capita availability of food grains, oilseeds, vegetables, fruits and condiments and spices were main influencing food indicators for the lower food availability among the district in Gujarat. Also, as per socio-economic indicators, the lower literacy rate, safe drinking water secured housing condition, urbanization and cash reserve ratio were main food accessibility indicator for the lower food accessibility in the studied districts of Gujarat state. Similarly, the lower yield of food grain, oilseeds, condiments & spices, forest area and fertiliser consumption were main food stability indicators for the lower food stability among the districts of Gujarat.

## 5. CONCLUSIONS AND POLICY IMPLICATIONS

The present study made an attempts to evaluate the status of food security in the districts associated with the state of Gujarat. It created a district-wise FSI uses a composite Z-index approach. FSI is most powerful tool to assess the situation of food security of a region, nation. Food security depends upon food availability, accessibility and stability (Rukhsana, 2011). It indicates that all components of food security are useful to maintain sustainable food security. The estimated results show that there exists a significant food inequality across districts due to



variation in socioeconomic variables (Menezes, 2015). As per estimated results, several policy recommendations are prescribed for sustainable food security as follows.

1. Indian policy makers essential to increase food productivity through cropping intensity, more irrigation facilities and bio-fertilisers, application of modern technology, high yielding varieties of seed in cultivation (Fuss et al., 2015; Lal, 2013 and Shukla et al., 2015).
2. Creation of more job opportunities in non-farm would be critical to improve accessibility power of peoples to acquire food (Kumar et al., 2015).
3. Food security would be sustainable as increase government expenditure in agriculture and rural development, public spending in agriculture and R& D, development of infrastructure and food-grain storage, and credit flow in the market (Bazga, 2015 and Menezes, 2015).
4. High income inequalities increase black marketing outside the market, which also increases food prices (Menezes, 2015). The government of India is required to adopt an effective mechanism to reduce black marketing in order to control food price inflation (Seaman et al., 2014).
5. Rapid urbanisation decreased arable land, subsequently total food production (Lal, 2013). Thus, it brought a serious threat to food security and acute hunger crisis in developing economies (Odowu, 2013). Extensive urbanization is caused for environmental degradation, and pressure on ecosystem services of land and water (Lal, 2013).
6. Agriculture is required, large quantity of water, which would adversely affect water availability in future (Misra, 2014). Therefore, it strongly suggested that water conservation, rainwater harvesting, watershed management scheme, and formation of artificial water recharge techniques needs to apply to complete the irrigation requirement (Shukla et al., 2015).

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## **HEALTH EQUITY: DETERMINANTS AND ISSUES IN INDIA**

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### **ABSTRACT**

*The concept of health equity has been under wider discussion these days as it is been linked to the Sustainable Development Goal 3 directly and indirectly to other goals also. This paper aims at defining and explaining the core idea of health equity as well as health disparities and their importance in a developing nation like India. The paper also looks into various socio economic determinants of health disparities and issues pertaining to them. In the final section the paper gives principles that can guide equity in health in developing countries as India and the step wise procedure that should be followed.*

**KEYWORDS:** *Health Equity, Health Disparities, Poverty, Social Inclusion, Health Care, Education.*

## INTRODUCTION

In a world where we are defining and applying the concept of “sustainable mankind”, the role of “equal opportunities” for basic needs of humans is at the center point. For making the planet sustainable in terms of environment as well as socially, provisions of basic needs must be made to every human being without economics, social or regional disparity. In such scenario, role of **health** is more important as good health is one of the basic need of humans living here. Health is provided through healthcare services which is a wider term and includes health infrastructure, health human capital, health knowledge, public support in terms of sanitation, water supply, housing, medicine availability and clean environment etc. The determinants of healthy world population include the social and economic environment, the physical environment and individual characteristics. Broadly this may include income and social status of individual, the education levels, physical environmental conditions, genetics, health services, gender etc.

The concept of economic and social equity has been widely discussed since Millennium Summit of the United Nations in 2000 and the introduction of Millennium Development Goals. The concept of equal and equity has also been defined different and “equal but differentiated targets” is a byproduct of these discussions only. Under MGDs , health was given an important role and it has continued in the Agenda 2030’s “ Sustainable Development Goals” also by considering health as inter-disciplinary concept. The basic idea of SDGs for health is removing health disparities in the world for achieving target of healthy populations. The SDG 3 talks clearly about equity on health economically, socially, regionally and at all ages as it is quotes as “Ensure Healthy Lives and Promote Well–Being for all at all Ages”. Economist as Amartya Sen has also talked about the importance of health equity in his paper as (Sen, 2002).Before moving towards how to achieve equity in health, we must discuss the meaning of health, health disparities, health equality and health equity.

Health means physical and mental health status and well-being, distinguished from health care. Health equality is different from health equity as it ignores the role of “different environment conditions for different populations”. Health disparities are differences in health or in the key determinants of health such as education, safe housing, and freedom from discrimination, that adversely affect marginalized or excluded groups. Health equity and health disparities are closely related to each other. Health equity is the ethical and human rights principle or value that motivates us to eliminate health disparities. (Braveman, 2006)

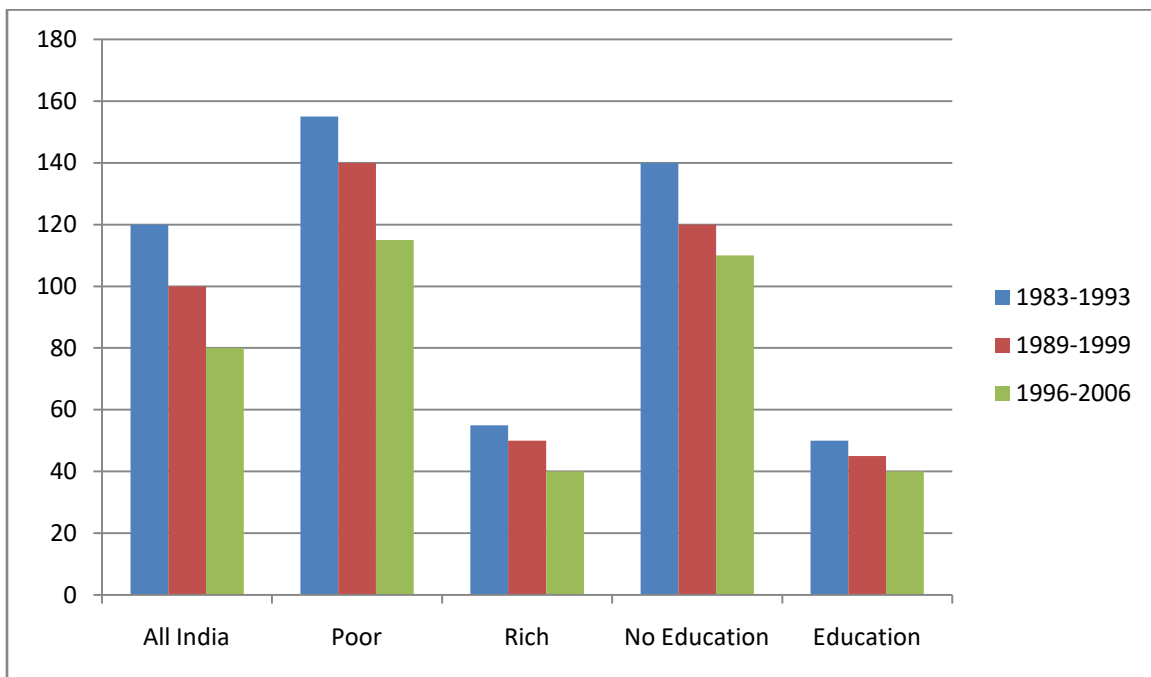
Health equity means that everyone has a “fair and just opportunity to be as healthy as possible.” This requires removing obstacles to health such as poverty, discrimination, and their consequences, including powerlessness and lack of access to good jobs with fair pay, quality education and housing, safe environments, and health care. For the purposes of measurement, health equity means reducing and ultimately eliminating disparities in health and its determinants that adversely affect excluded or marginalized groups. Opportunities to be healthy depend on the living and working conditions and other resources that enable people to be as healthy as possible. A fair and just opportunity to be healthy means that everyone has the opportunity to be as healthy as possible. Being as healthy as possible refers to the highest level of health that reasonably could be within an individual’s reach if society makes adequate efforts to provide opportunities.(Braveman et al., 2017)

Thus, health equity is a principle that promotes equal opportunities to pursue a life of their choice and be spared from extreme deprivation in health outcomes. The main message is that

equity is complementary to the pursuit of long-term prosperity. Institutions and policies that promote a level playing field— where all members of society have similar chances to become socially active, politically influential, and economically productive— contribute to sustainable growth and development and hence healthy population. (Braveman, 2013)

### HEALTH EQUITY IN INDIA

India accounts for a substantial share in global health indicators as Burden of Disease, Disability Adjusted Life Years, maternal and infant health, nutritional deficiencies, etc. Although, the time series data suggest a epidemiological transition since independence but the situation is still not good enough to put India in the map of healthy nations. Data as IMR,MMR , life expectancy etc shows substantial variations in health within India also. Although health outcomes have improved with time, they continue to be strongly determined by factors such as gender, caste, wealth, education, and geography. (Balarajan, Selvaraj, & Subramanian, 2011). Many of these disparities arise out of social, economical and political circumstances and other determinants which affect the distribution of health in India. Following table shows one of the inequalities existing in India for “mortality of under 5 year’s children” for various years.



**Figure 3: mortality under 5 years. Source: National Family Health Survey.**

The table is one of the examples showing disparities in child health between poor and rich and also between educated and no educated. Such examples show us the need for equitable deployment of resources in our country. Many of such examples have been shown in various studies as (Ghosh, 2014) (Mondal, 2013) and (Balarajan et al., 2011) etc. which proves that health disparities are wide in the nation under the name of social exclusion, skewed public funding, urban-rural divide etc.

### DETERMINANTS OF HEALTH EQUITY

The determinants of achieving equity in health may include social determinants as social inclusion of groups, educational spread, availability of quality health human capital , age factor



etc, economic factors as income levels, public spending on healthcare, insurance facilities and political determinants as problems of migration, corruption, conflict areas etc. One may note that removing determinants of health disparity leads to achieving factors of health equity only. The governmental and non governmental agencies must identify important factors underlying the disparities and start addressing them to achieve equity. Some of the major determinants in achieving health equity are discussed below.

## **SOCIAL DETERMINANTS OF HEALTH EQUITY**

Various social factors plays a vital role in creating equity in health and health care in a country specially as India. Such determinants affect individual's opportunities to good health directly and indirectly. Social factors may affect individuals' as well as group's ability or will to access the health care facilities as well as livelihood determinants. Following are some of the social determinants –

### **1. Social inclusion**

Social discrimination is one of major factor behind health discrimination especially in developing country like India. Discrimination is not necessarily conscious, intentional or personal; often it is built into institutional policies and practices. These can have inequitable effects whether or not any individual now consciously intends to discriminate. This is called structural or institutional discrimination. Evidence has revealed that unconscious bias in interpersonal interactions is strong, widespread and deeply rooted, and could potentially take a heavy toll on health, considering current knowledge of physiological mechanisms involved in responding to stress, particularly chronic stress. Conscious discrimination, although exist in India in the name of caste, gender, color, region, religion etc.

One of the major determinants, thus, in India for health equity is social inclusion of different groups of society (caste groups, religion etc). By doing so, health and health care services can be ensured to the socially and ethnically diverse population of India.

### **2. Educational opportunities**

More educational opportunities and higher education levels also plays an important role in terms of awareness of and access to fair and just opportunities to be healthy. There are many empirical evidences showing positive relationship between education level and health status worldwide.

### **3. The Urban-Rural convergence**

Health inequality is also visible from urban-rural divide in terms of investment in urban health more than rural, accessibility, affordability and utilization of health care. Health equity is attainable only by balanced regional development and funding approach.

### **4. Ensuring quality health physical and human capital resources with a regional, economical and social equity**

Health services must reach to the poorest of poorest without any regional and social bias.

## **5. Ensuring good and healthy lives for all at all ages**

Health equity must also be ensured for all age groups starting from infant and children to the elderly care. The public funding and policy making agencies must take into considerations the age divide.

## **6. Patriarchal choices**

The gender divides need also to be addressed properly.

Besides all these determinants of equitable health, we may also include individual determinants as access and empowerment in the social determinants list. The economic factors that will contribute to the health equity are –

### **1. Individual income and wealth**

Individual's capacity to pay and to afford the health care is a major determinant in achieving equity in health. For achieving this goal, overall economic activity and employment opportunities must be encouraged.

### **2. Public health expenditure**

More and equitable the government policies and funding, more equitable will be the health scenarios. The direction of public expenditure must be towards the deprived population. For e.g. more investment in rural sector.

### **3. Minimum out-of-pocket expenditure**

More the out-of-pocket expenditure more will be the burden on individual of health care and more inequity will be there. Government policies must address for insurance and universal health care policies to reduce this burden and give an affordable health services.

### **4. Public vs. Private health care**

The divide between public and private health services must also be gapped and should be made equitable in terms of cost, quality and access. Public health infrastructure must be addressed.

### **5. Encouragement of health insurance**

Private as well as public health insurance coverage must be encouraged to diminish micro disparities in economic system.

### **6. Affordable healthcare system**

Health care must be affordable for the poor and must also be taxed with income progressions.

Political determinants of equity in health means the political factors as corruption and health service delivery mechanisms that affect the health disparities in the nation. Being a diverse and large country various political bottlenecks arises when we are addressing the issue of equity. Some of them are discussed below.

### **1. Migration**

There are various empirical studies showing the health disparities of domestic and international migrants in India. Migration health equity is a case in itself and there is a need for proper policy framework for migrant health.

### **2. Regional health equity**

Backward and remote areas must be given priority in health policy funding.

### **3. Check on corruption**

Medical admission and health service utilization must be free from influential interference .

### **4. Conflict prone areas**

There is generally lack of health equity in conflict prone areas and international aid and help is required there.

Besides above points there are other determinants of health equity as physical environmental qualities, research and development of health sector, evidence based policy making and others. There should be equity not only in “access to health” but also in financing and financial risk protection side in order to remove health disparities completely from the system. Information asymmetry must be dealt with in this sector.

### **Advancing towards health equity**

The causes of some important health disparities—for example, disparities in premature birth—may not be known, making some reluctant to call them inequities. These important disparities should nevertheless be addressed in a health equity agenda because they put a socially disadvantaged group at further disadvantage with respect to their health, regardless of the causes. If the disparities are known to be rooted in social inequities in access to the opportunities and resources needed to be healthier, they can be referred to as health inequities.

So we should identify important disparities in health (including disparities known to be inequities and disparities whose causes are unknown or contested) that are of concern to key stakeholders, especially those affected. Identify social inequities in access to the resources and opportunities needed to be healthier that are likely to contribute to the health disparities. Countries like India should also change and implement policies, laws, systems, environments, and practices to reduce inequities in access to the opportunities and resources needed to be as healthy as possible. The ultimate goal is to eliminate disparities in health and its determinants while improving health for everyone. Only by reducing economic and other social inequities in the conditions needed for health can we succeed in reducing inequities in health in deep and lasting ways. So it is crucial to identify short- and intermediate-term outcome indicators that could be improved within the timeframe for a given initiative. The short- and intermediate-term indicators should be shown by previous research to be linked to health—that is, to be on pathways toward better health, particularly for socially disadvantaged populations. Not all indicators will be feasible to measure in all settings.

### **Some principle to achieve health equity**

Achieving health equity requires societal action to remove obstacles to health and increase opportunities to be healthier for everyone, focusing particularly on those who face the greatest social obstacles and have worse health. It also requires engaging excluded or marginalized groups in identifying and addressing their health equity goals. Policy, systems, and environmental improvements have great potential to prevent and reduce health inequities, but only if they explicitly focus on health equity and are well designed and implemented. Otherwise, such interventions may inadvertently widen health inequities. Opportunities to be healthy depend on the living and working conditions and other resources that enable people to be as healthy as possible. A population's opportunities to be as healthy as possible are measured by assessing the determinants of health—social and medical—that people experience across their lives. Also, pursuing health equity entails striving to improve everyone's health while focusing particularly on those with worse health and fewer resources to improve their health and finally, the pursuit of equity will never be finished. It requires constant, systematic, and devoted effort. A sustained commitment to improving health for all, and particularly for those most in need—must be a deeply held value throughout society.

### **Achievement of equity in India**

The heterogeneity in the scale and interplay of the substantial challenges to health care in the Indian states and districts needs contextually relevant solutions. India has made much progress in the past few years, with several innovative pilot programmes and initiatives in the public and private sectors, and the establishment of the National Rural Health Mission in 2005 being the most noteworthy government-led initiative (Balarajan et al., 2011). However, whether the National Rural Health Mission, Rashtriya Swasthya Bima Yojana and state-government-funded health insurance schemes will achieve their claims and overcome the challenges to achieving equity in health care remain to be seen. Some of good studies has proposed following principles for achieving health equity in diverse developing nations as India.

1. Equity metrics need to be integrate with health system management, assessment and evaluation cells.
2. Health system research must be promoted to increase health system database in the country that can help in efficient policy recommendations.
3. Priorities and implement health policies for the achievement of equity.
4. Successful achievement of equity in health needs cooperative efforts of multilateral organizations, national and local governments, non-governmental organizations, private sector, pharmaceutical industry, civil society, and research and academic institutions.
5. India's ineffective regulatory mechanisms and legal processes urgently need to be reformed, with effective implementation strategies.
6. Strong foundation of public health and primary care infrastructure is complementary to health equity.

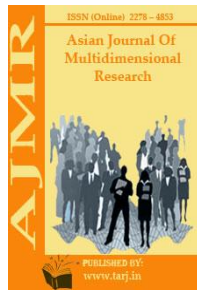
### **CONCLUSION**

Rapid economic growth provides a unique opportunity to increase financial commitments to support the public health system and health-systems research. India can also draw from its booming technology sector to innovate and strengthen the development of health information systems, which has already begun. Furthermore, an opportunity exists to harness the capability of

the domestic pharmaceutical industry by encouraging it to take greater responsibility for delivering equity in health care.

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## **E-LOYALTY: AN EMPIRICAL STUDY OF DELHI-NCR ONLINE ENVIRONMENT**

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### **ABSTRACT**

*Accepting to IMAI report, internet economy of India will raise 200US\$ by 2020 and will provide five percent to country GDP. India is currently second most internet user base with 391 million users. As stated in a study by Nelson, R. (2012) satisfied customer inclines to share their positive experience with other users. Thus the present study aims to explore the factor that impact satisfaction and how it successively affects e-loyalty in online environment amid youths in Delhi-NCR. A random sampling of 150 responses were gathered through Delhi-NCR and it took almost a month to complete the whole process in gathering and analyzing the data. The relevant data was analyzed using SPSS 2 and reliability of the data was confirmed and regression analysis was adopted to test the hypothesis. Result of the study yielded three independent factors namely site design, information quality and security influencing customer satisfaction, further security was discovered to be the most critical factor affecting customer satisfaction level, however e-service quality was found insignificant in developing customer satisfaction. Furthermore, it was found that customer satisfaction significantly impacts customer loyalty in online shopping. Overall, finding of the study presents a holistic approach that would guide effective managerial implication in understating customer satisfaction measures.*

**KEYWORDS:** Website Design, Information Quality, E-Service Quality, Security, Customer Satisfaction, E-Loyalty.

## INTRODUCTION

Accepting to IMAI report, internet economy of India will raise 200US\$ by 2020 and will provide five percent to country GDP. India is currently second most internet user base with 391 million users. The fierce competition and insecurity to sustain for longer in the online marketplace has strained the online company to shift their focus beyond the technical aspect and also take in account the behavioral dimension of customers.

Hence in order to remain competitive in online marketplace it requires to know popular methods to satisfy its customers. As stated that higher the number of satisfied customer higher the profitability (Guo et al., 2012) and without customer loyalty, even the well-designed business will get collapsed (Anderson & Srinivasan, 2003). Henceforth to understand the fundamental factors influencing satisfaction is of great meaning to e-commerce success (Patterson et al 1997; McKinney et al 2002).

Several past studies examines the antecedents of customer satisfaction and its relationship to e-loyalty (Anderson & Srinivasan, 2003; Guo et al., 2012; Pratminingsh, S.A. et al., 2013; Hila Ludin, & Cheng, 2014). Nevertheless, the empirical research on factor influencing customer satisfaction and its relationship to e-loyalty is very limited in context to developing countries such as India.

The study proposes to examine factors that influences customer satisfaction and its relationship to e-loyalty in online shopping, especially among the youth's ranging from 18-35-year-old. For the purpose of the study four independent factor namely information quality, security, website design and e-service quality as affecting customer satisfaction level in online environment.

## LITERATURE REVIEW

### CUSTOMER SATISFACTION

Satisfaction plays a very crucial role in keeping its customer intake in all form of business. Customer satisfaction can be defined as customer assessment of his/her feeling of pleasure or disappointment with the product performance in relative to his/her perceived expectation (Kotler, 2010). While Anderson, & Srinivasan, (2003). Defines satisfaction as gratification of customer experience. Syed &Norjaya, (2010) in their study suggested satisfied customer intent to do more shopping from the same retailer if their expectation were met by the product performance. Satisfaction in online context is also indicated as customer judgment between its offline experience and online experience of shopping (Tan et al., 2009). customer satisfaction is a critical factor for loyalty (Kotler, 2010). Understanding the measures that drives customer is of significant objective for any business, since satisfaction act as a gauging factor that helps at measuring business growth and performances (Alam&Yasin, 2010). As claimed by Anderson, R.E., & Srinivasan, S.S. (2003). in his study better the degree of satisfaction higher the level of loyalty.

Several of the past study is devoted towards examining the various factors that drives customer satisfaction in online shopping, and all of them have identified and indicated different factor to online customer satisfaction (Hizza et al. (2014); Guo et al., (2012); Mustafa, I.E. 2011).

For the purpose of this study, we have taken in account four independent factor namely site design, quality of service, security and information quality that may possibly influence customer satisfaction in online shopping context.

## WEBSITE DESIGN

Website design play a critical role in online shopping, it not only satisfies a customer to do its business easily but also leaves a great impression in customer mindset. The design feature of a site helps at shaping customer perception of the website and is of great importance for the beginners to perceive the site more reliable (Guo et al., 2012). As suggested by Cyr, D. (2008) satisfaction in online depends to the extent of site quality that is offered. Website design plays an important role in supporting its customer in locating the information easily. As suggested by Luo & Zhang. et al., (2012) in their study that a well-designed website lower the search time for information and avoid the possibility of mismatch, further in his study it was also stated that an effective website design adds value to customer experience which helps a low visible retailer to focus over the post purchase satisfaction process, which eventually maximizes customer satisfaction in return. Various of the past studies measures website design based on the several features such as Cyr, D. (2008) in his study identifies several attributes of website design namely visual design, information design and navigation design affecting customer satisfaction, outcome of the study indicated navigation design and information design to significantly influencing customer satisfaction, this is in alignment to the finding of (Guo et al., 2012; Mustafa, I.E. 2011). However, study by Hila Ludin, I.H, Bt., & Cheng, B.L. (2014) indicated a contradicting effect of website design on customer satisfaction. Based over the above studies, the first hypothesis is anticipated.

H1. The website design has a significant impact on customer satisfaction in India.

## INFORMATION QUALITY

The quality of information in online is related to the extent to which the information is reliable and authentic. Kateranttanakul (2002) in his study suggests, the reliability and authenticity of information tends to curtail the perceived risk which in result drives a customer to make a better decision and in return influence customer satisfaction. While, Park and Kim (2003) defines the the web information quality based on how customer sees the offered information. Several past studies aim to measures quality of web information, thus identifies several attributes such as Cheung & Lee. (2005) in their study identifies four dimensions of information quality i.e. accurateness, content, set-up and appropriateness. In another study Liu, X. et al., (2008) identifies four different dimensions of website information quality namely, information relevance, information completeness, information comprehensibility and information accuracy and has suggested that greater the level of information quality will lead to greater level of customer satisfaction in online shopping sites. This is in line with (Guo et al., 2012; Hila Ludin, I.H, Bt., & Cheng, B.L. 2014) result of which also disclosed the same impact.

The quality information plays a crucial role in customer purchasing process as this not only helps in saving time and effort but also ultimately helps in increasing customer level of satisfaction towards to the online retailer website. Taking in account the quality of website information the second hypothesis is postulated.

H2. The information quality has a positive impact on customer satisfaction in India.

## E-Service quality

E-service quality is defined as “overall customer evaluation and judgment regarding the excellent and quality of e-service delivery in the virtual market place” Santos, J. (2003). While, Parasuraman et al., (2005) refer e-service quality to “the extent to which a website facilitates



efficient and effective shopping, purchasing, and delivery of products and services". Service quality act as an interface between the buyer and seller. As suggested by Hila Ludin, I.H, Bt., & Cheng, B.L.(2014) service quality plays a critical role in maintaining customer loyalty towards to particular website. Online retailer who offers an efficient service quality are more privileged in understanding their customer expectations which in return enhances the customer satisfaction level (Khristianto, W. et al., 2012). The greatest challenge in online environment to seize customer low visibility by providing an exceptional service quality (Luo and Zhang. 2012; Hila Ludin& Cheng. 2014).

Several studies in past asserted an optimistic relationship between customer satisfaction and service quality (Kassim, N.M., & Abdullah, N.A. 2008; Guo et al., 2012). However Wu, K.W. (2011) in his study found an indirect impact of service quality on customer satisfaction. Based on the above studies third hypothesis is hypothesized.

H3. The E-service quality has a positive impact on customer satisfaction in India.

### **Security**

Security is the one of the major hurdle in electronic commerce development (Furnell, S.M. & Karweni, T 1999; Chou, D. et al. 1999; Dong-Her, S. et al., 2004). As stated by Jones, S. et al., (2000) internet is highly vulnerable and open to the world that the perceived risk of any financial fraud and data getting intercepted by any third party and put to use for any malicious purpose is very high. Security is expressed as the capability of a website in shielding consumer private information received through its electronic transactions from any fraudulent uses (Cheung, C.M.K., & Lee, M.K.O. 2005). A strong mechanism of security attributes reduces the perceived risk of customer which might drives customer satisfaction towards to a particular website. Chellappa R.K. (2002) in his study found that 61% of the online customer are willing to continue online transaction if they are assured that their private information are protected safely. Security in online environment is reflected with the type of payment method, data transmission mechanism and data store that it uses to keep customer data secure (Kolsaker, A. & Payne, C. 2002). Several, past studies endorses a convincing impact of security on customer satisfaction (Szymanski & Hise. 2000; Schaupp & Belanger. (2005). However, in contrary to the above positive impact of security the study by Hila Ludin, I.H, Bt., & Cheng, B.L. (2014) found security as insignificant towards e-satisfaction. Having a strong security system helps in reducing customer insecurity of losing control over its account. Hence the fourth hypothesis is proposed.

H4: The security has an optimistic impact on customer satisfaction in India.

### **E-loyalty**

Loyalty for success of any business is important, it becomes more significant and relevant when accusation of more customer alone cannot guarantee a long term success for any business organization (Flint, D.J et al., 2011). Customer loyalty is crucial in today-modern days for mainly two reasons, firstly customers are limited resources, it is easier to obtain purchase from an old customer than from a new customer (Rosenberg, L.J., & Czepiel, J.A 1983), secondly as suggested by Edvardsoon et al. 2000; Naidu et al in their empirical studies customer loyalty have a great impact on the success and profitability of the company. Previous researches mostly indicated a confident relationship between satisfaction and loyalty (Dick, A., & Basu, K. 1994; Anderson & Srinivasan, 2003; Pratminingsih, et al 2013; Hila Ludin & Cheng, 2014) however both the concept satisfaction and loyalty has been a subject of many confusion from both the

researcher and professional end (O' Malley 1998). Not all the researches agreed to same opinion that satisfaction is key determinant of loyalty. As demonstrated for instance by Reichheld, F.F. 1994 a customer who claims satisfied may still ceases to be loyal, conversely loyal customer is not always satisfied one although satisfied customer do tend to be loyal (Fornell, C. 1992; Oliver, R.L. 1999; Gommans et al., 2001). Previous studies on loyalty suggest several antecedents to customer loyalty. Anderson, R.E.& Srinivasan, S.S. (2003) on his study claims, higher the level of e-satisfaction will bring greater e-loyalty. This is in line with (Pratminingsih, S.A. et al. 2013; Hila Ludin, I.H, Bt., & Cheng, B.L. 2014). Thus the fifth hypothesis is proposed as.

H5: The customer satisfaction has a positive impact on E-loyalty in India.

## METHODOLOGY

Four independent factor namely website design, information quality, security and e-service quality was identified to be influencing customer satisfaction and customer satisfaction was examined to be influencing e-loyalty. A random sample size of 150 respondents were received from the age group of 18-35 across Delhi-NCR, scale adopted for data collection were considered reliable, as Cronbach's Alpha value for these constructs are above the recommended limit of 0.7 (Pallant, J.F. 2007). In order to analyze the data and examine the hypothesis SPSS 21 was used and linear regression was used to confirm the hypothetical relationship of variables.

### Analysis.

**TABLE 1: DEMOGRAPHIC**

Demographic value	Details	Frequency	e (%)
Gender	Male	106	71%
	female	44	29%
Age	18-23 year old	74	49%
	24-29 year old	67	45%
	30-35 year old	9	6%
Education Level	Under Graduate	23	15%
	Graduate	25	17%
	Post Graduate	99	66%
	Others	3	2%
Frequency of online shopping	At least once a week	19	13%
	Once a month	48	32%
	Once every 2-3 month	54	36%
	Once every 4-5 months	20	13%
	Twice a year	9	6%

Table 1 confirm the immediate demographic profile of the respondents from Delhi-NCR of which 71% respondents were found male and 29% of them were female. In terms of the age group, most of the respondents are between 18-23 (49%), Further in term of qualification of the 66% of respondent were post graduate. Additionally, the response to online purchase frequency, data indicates respondents of this study familiar to online shopping, as 36% of the respondents do online shopping once every 2-3 month, followed by 32% responded to once a month, whereas

13% of the respondents do online shopping every 4-5 month, 13% once a week and 6% twice a year.

**TABLE 2: DESCRIPTIVE STATISTICS**

Variables	Mean	Standard Deviation	Skewness	Kurtosis	Cronbach alpha
WebDes	3.8022	0.66622	-0.25	-0.459	0.837
Iqual	3.5867	0.73063	-0.47	0.479	0.829
Squal	3.7382	0.70841	1.506	7.881	0.848
Sec	3.48	0.8327	-0.121	-0.39	0.841
Cussat	3.7352	0.61693	0.045	-0.448	0.824
El	3.6689	0.79778	1.255	9.94	0.853
Valid N (listwise)	150				

Note: WebDes=Website design, Iqual=Information quality, Squal=Service quality, Sec=Security, Cussat=Customer Satisfaction, El=E-Loyalt

**TABLE 3: COEFFICIENT SUMMARY (CUSTOMER SATISFACTION AS DEPENDENT)**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.013	0.209		4.857	0		
	WebDes	0.227	0.068	0.245	3.348	0.001	0.51	1.962
	Iqual	0.169	0.062	0.2	2.709	0.008	0.499	2.003
	Squal	0.006	0.058	0.006	0.096	0.924	0.625	1.6
	Sec	0.354	0.047	0.478	7.536	0	0.681	1.469

Note: WebDes=Website design, Iqual=Information quality, Squal=Service quality, Sec=Security.

According to Bruin (2006), “tolerance value exhibits the percentage of variance in the predictor that cannot be accounted for by other predictors”. Tolerance values of more than 0.1 indicates that the variable has a high tolerance level suggesting the predictors are redundant. Based on the results depicted in table no 3, all independent variables have tolerance greater than 0.1. They are Website design (.510), security (.681), e-service quality (.625), and information quality (.499). Meanwhile, all the independent variables do not display any multi-collinearity problem. Variables inflation factors (VIF) are less than 10 for every independent variable (Robert, 2007). The VIF values for Website design (1.962), security (1.469), e-service quality (1.600) and information quality (2.003) are within limit.

Referring to Table no 3, the relationship between website design and customer satisfaction were found significant at 5% significance level hence H1 is accepted. The t-statistic for website design construct is 3.348 and beta coefficient is 0.245. Similarly information quality positively impact customer satisfaction with beta value 0.200 and t statistics is 2.709. Hence H2 is accepted. Furthermore service quality does not influence customer satisfaction. As the P value (0.924) greater than 0.05. Hence H3 is rejected. Whereas security and customer satisfaction indicated a positive relationship as beta value is 0.478 and t statistics 7.536. Hence H4 is accepted. Data analysis demonstrate security as a major variable to impact customer satisfaction among other considered variables.

**TABLE 4: COEFFICIENT (E LOYALTY AS DEPENDENT)**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.986	0.335		2.947	0.004
	cussat	0.718	0.088	0.555	8.125	0

Note: Cussat: Customer Satisfaction

In addition to the above analysis, the study further examines the impact of customer satisfaction on e-loyalty in table 4. The result of the analysis indicated a positive relationship between customer satisfaction and e-loyalty ( $p < 0.000$ ,  $\beta = 0.555$ ,  $t = 8.125$ ). Hence it is statistically proven that H5 is accepted.

#### DISCUSSION AND IMPLEMENTATION OF THE STUDY

Result of the first hypothesis is in line with (Liu, X. et al., 2008; Guo et al., 2012) who also establishes strong and positive impact of website design on customer satisfaction. This indicates that online companies should focus to offer an effective and well designed website to cater the need their users.

Result of the second hypothesis is in line with (Liu, X. et al., 2008, Delarosa, M.D and Susilo, S.N. 2013; Hila Ludin, I.H, Bt., & Cheng, B.L. 2014) who also showed a positive impact of information quality on customer satisfaction. This suggests that online site should provide an accurate and reliable information of the product/service at their site so to make it easy for their users to make purchase decision.

Finding of the third hypothesis indicated a contradictory result to following studies (Liu, X. et al 2008; Chang, H.H et al., 2009; Luo, J., Ba, S., and Zhang, H. 2012; Guo et al., 2012; Hila Ludin, I.H, Bt., & Cheng, B.L. 2014; Ting, O.S., et al. 2016). Notwithstanding to several previous studies supporting a positive relation, nevertheless finding of this study indicated no positive influence of e-service quality on customer satisfaction.

Result of the fourth hypothesis found is in line with (Schaupp, L, C. and Belanger, F. 2005; Liu, X. et al. 2008; Guo et al., 2012). Based on the findings it is suggested for online retailers to provide a trusted security system to its consumer so to form a trust among its website users.

The result of the fifth hypothesis in line of agreement to (Valvi et al. 2003; Lin et al. 2009; Mustafa, I.E. 2011 Hila Ludin, I.H, Bt., & Cheng, B.L. 2014; Pratminingsih, S.A. et al. 2013; Ting, O.S., et al. 2016). It is of crucial in online retailing to satisfy its customer in order to retain them to be loyal towards to the website. Based on the finding, customer's satisfaction does positively influence e-loyalty. Therefore, for online retailer to sustain and retain customer loyalty in such fierce competitive market place requires to pay more attentions towards to the factors that leads to customer satisfaction.

### **LIMITATIONS AND FUTURE STUDY**

Like other previous studies, this study is also bound to certain limitations. The first limitation of the study is the sample size of only 150 respondents, thus the result of the study might assert less validity of online shopping level of satisfaction and e-loyalty. The respondents for this study were mainly from Delhi-NCR only where future researchers are advised to increase the sample size and also it is advised to increase the geographical boundary to get more holistic result. Further for this study only the respondents ranging from 18-35-year-old was taken in account, thus might demonstrate less validity in its result. Future researchers are recommended to take in account different age group to have more substantial result.

### **CONCLUSION**

Three of the independent variable of online shopping features indicates a positive relationship with customer satisfaction namely, website design, information quality, security. Data analysis demonstrate security as a major variable to impact customer satisfaction among other considered variables. However, it was found that e-service quality does not influence customer satisfaction among Delhi-NCR online customers. Additionally, it was also found that customer satisfaction positively influences customer e-loyalty. Therefore, marketers or online retailers operating in India particularly Delhi-NCR can use this information in order to retain customer loyalty and also to fight for sustain in such fierce competition of online environment.

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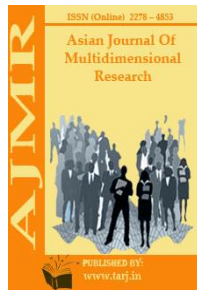
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## **RAILWAYS AS AN AGENT OF DEVELOPMENT IN JAMMU AND KASHMIR**

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### **ABSTRACT**

*Railway becomes an institution, which played an important role in the socio-economic development of the society. It becomes an agency, which promote development. It lead to employment generation, tourism, pilgrimage, industrial development etc. As a mean of transport, it not only transports goods and people but it connects the world. The introduction of Railway in the State of Jammu and Kashmir played an important role in the socio economic development. As the State is considered an economically backward and due weather situation it remain disconnected from the world, railway proliferation becomes an assets to for the development. The present research paper is going to discuss the role of railway in the socio –economic development of Jammu and Kashmir with special focus on employment, tourism, pilgrimage and social scenario. The present paper is based on the secondary sources of data.*

**KEYWORDS:** *Pilgrimage, Socio-Economic, Institution,*

## INTRODUCTION

Railways, considered as a backbone of the economic development. Railway as a mean of transport played an important role in the social, economic, cultural, and political aspect of the society. It not only transports people and goods but it connects the world. Railway becomes an institution, which played an important role in the overall development of the society. It touches every aspect of the society and connects different states, divisions, districts, regions and towns. In the 19<sup>th</sup> century with the development of steam engine, there occurred a revolution in the transport world. With the opening of first passenger railway between Liverpool and Manchester, in the world, a new age called, The Railway Age, has dawned<sup>1</sup>. The period from 1890 to 1914 can be called 'The Golden Age' of Railway' in Britain<sup>2</sup>. In India, the Britisher has introduced Railway during their regime for business and military purpose but indirectly it brought lot of changes in the social and economic scenario of the Indian society. Railway in India has developed due to the initiative by Lord Dalhousie in 1853. Iron and steam has civilized humankind let us give India the benefit of the discovery<sup>3</sup>. India was the largest colonial possession of Britain. No doubt, they built Railway for their own benefit but it lead to formation of modern India. The history of railroad depicted the growth and birth of modern India (Kholosa,1988). India provides a prominent example of railroad development in the world beyond Europe and North America<sup>4</sup>. Britisher would establish net of railroad over India and the result must be inappreciable (Karl Marx, 1853, New York Daily Tribune). The present paper is going to discuss the role of railway in the socio-economic development of the Jammu and Kashmir. The study is of State of Jammu and Kashmir, which involve the area where railway is fully functional that is from Banihall (Ramban) to Baramulla. The sources of data collection is secondary which includes census, railway records, research papers, journals and

**OBJECTIVES OF THE STUDY:** Following are the objectives of the study.

1. The present study involves the study of the role of railway in the economic development of Jammu and Kashmir.
2. The present study involves the study of role of railway in the social development of the Jammu and Kashmir.

### **Railway in India:**

The history of railway development in India starts in 1844 with the submission of proposal by the Mr. R. M. Stephenson and in 1853 the lord Dalhousie provide a comprehensive plan for the construction of railways in India and finally on 16<sup>th</sup> April, 1853 the first railway line, covering 21 miles was inaugurated between Bombay to Thane. On 15<sup>th</sup> August 1854, Eastern India got its first Railway from Howrah to Hoogly. On 1st July 1856, South India got its first Railway line opened between Vyasrpad and Wallajah Road, a distance of 63 miles. In the north a length of 119 miles was laid from Allahabad to Kanpur on 3<sup>rd</sup> March 1859. These were the small beginnings which is due course developed into a network of railway lines all over the country<sup>5</sup>. From 1849 to 1869 the different railway companies did the construction of railway line; and from 1869 to 1879 it was over taken by the State government; and from 1879 to 1900 under new guarantee system railway construction was again under private companies. Finally, in 1905, Railway board was constructed and in 1920, the Acworth committee had been formed which recommended the nationalization of the railway companies of India; and in 1944 entire railway nationalization be completed<sup>6</sup>. By 1880, the Indian Railway system had a route mileage of about 9000 miles. In the next 50 years, the railway network expanded vastly, and by 1900, the total

length of the network increased to 39835 km. The rate of growth decline during the next 50 years reaching 53,596 km in 1950-51. In the next 60 years, since the beginning of plan era, the route length increases to 64,000 km by 2011-12 an overall growth of about 20.53% and the Indian railway become the fourth largest railway system in terms of network in the world<sup>7</sup>. Today Indian railway occupies a unique place in the country's transport infrastructure managed by the Ministry of Railways. It becomes the second largest system in the world under single management with 7,500 Railway stations, 9549 locomotives, 55,339 passenger coaches, 2,39,321 freight cars, 64,600 route km operates 12,000 passenger trains and transport 2.8 million freight traffic and 25 million passengers daily<sup>8</sup>. With a workforce of 1.4 million, it is the seventh largest employer in the world and it is considered as the lifeline of the nation<sup>9</sup>. As after the independence, in order to secure economy, effectiveness and standardization of the financial administration, government of India starts regrouping of the Indian railway and it was first regrouped into six zones and these zones are further subdivided into division. Now Indian railway has 17 zones and 68 divisions. The northern zone of Indian railway established in 14<sup>th</sup> April 1952 having 5 divisions- Ambala, Ferozpur, Lucknow, Moradabad and Delhi. Northern Railway, the Jewel Set in the crown of Indian railway is missioned to vanquish distance and creates its own metaphor of existence. Formally established in 1952 but it remains a largest zone in term of route kilometre, even after the re-organization of IR into 16 zones and it includes Jammu and Kashmir, Punjab, Haryana, Himachal Pradesh, Uttaranchal, Uttar Pradesh, Delhi and Union Territory of Chandigarh<sup>10</sup>. Northern zone is considered as the shining star of India, as it has achieved its objective to cover vast distances and create a benchmark of success for other zone to follow. Beside the rough terrain and topography in the state like Jammu and Kashmir, it went on its mission to spread its tracks everywhere via out state.

### **RAILWAYS IN JAMMU AND KASHMIR**

The state of Jammu and Kashmir is like a crown on the map of India and it has known as the heart of Asia. The state of Jammu and Kashmir an erstwhile princely state is the north most state of India. It shares its border with the states of Himachal Pradesh and Punjab in the South, People's Republic of China in the North and East and Islamic Republic of Pakistan in the West and North West. It stretches between 32°.17'' to 36°.58'' North latitudes and 72°.26'' to 80°.30'' East longitudes. Thus, it wholly lies between northern and eastern hemisphere. It spread over an area of 2.22 lakh sq.kms out of which 83803 Sq. kms fall administered by Pakistan and 41500 sq kms is under the occupation of People's Republic of China (Islam, 2014:595). The state has divided into three provinces viz Jammu, Kashmir, and Ladkash with 22 districts and having population of 1, 25, 48,926 and the literacy rate is 68.74% (census 2011). Jammu, the winter capital of the State, situated in the south-east part of Jammu and Kashmir, covering an area of 12,378 sq.miles, sub-divided into 10 districts namely, Jammu, Kathua, Udhampur, Poonch, Rajouri, Doda, Ramban, Reasi and Samba, having population of 69,07,623 with literacy rate is 80.90 percent (census 2011). Kashmir valley lies in the northwest region between Pir-panjal and Zojila, the winter capital of the State, covering an area of 8,639 sq. miles, sub-divided into 10 district namely Srinagar, Budgam, Anantnang, Baramulla, Kupwara, Sopian, Pulwama, Bandipora, Ganderbal and Kulgam, having population of 5,35,08,111 (census 2011). Ladkash, lies in the north, covering an area 54,571 sq. miles, sub-divided into 2 district that is Kargil and Leh, having population 2, 90,49,2 (census 2011). As the three regions of the State are differ in their geography, politics, physical features, climate pattern, vegetation, geology, culture and many other aspects. The state is mostly agrarian and 70 percent of population of the state depends

upon agriculture for their livelihood and agriculture is considered as the backbone of the state's economy.

Connectivity plays an important role in the social, economic, political and cultural development of the region. As the state has surrounded by, the mountains expect in the south-West side. A major portion of the state's terrain is hilly and its height from the sea level varies from 3000 feet to 22740 feet. The state has road and air links with the rest of the country through south making it accessible from the South only<sup>11</sup>. As for As Kashmir valley is concerned which is surrounded by the mountains from all sides always covered by the snow expect for certain passes which raise three to four thousand meters above sea level. The surface of the valley is plain and abounds with spring, lakes and healthy resorts<sup>12</sup>. The road and air link is mostly affected due to weather condition and the valley remain disconnected from the rest of the country for months and it will affected the lives of the people. With a view to provide an alternative and reliable connectivity to Jammu and Kashmir, Government of India planned a 345 km long Railway line joining the Kashmir valley with the Indian railway network.

The Jammu Kashmir has brought on the railway map of India in 1970s, when the city of Jammu-Tawi has connected with Pathankote. It was dream of the Dogra ruler Maharaja Pratap Singh, to connect Jammu with Kashmir through railway line. It has first brought in 1898 but due to some political reasons it has put on hold for various year. In 1983, Prime Minister Mrs. Indira Gandhi kicked off the line from Jammu to Udhampur and after twenty years of time gap, on April 13, 2005 the Jammu-Udhampur line has inaugurated except valley. In 1994, the central government planned the 326 km long railway line joining Kashmir valley with the rest of country. The Jammu and Kashmir Railway comes under Firozpur division officially known as **JAMMU-UDHAMPUR-SRINAGAR –BARAMULLA RAILWAY LINK**. It starts from Jammu covering a distance of 326 km to Baramulla on the northwestern edge of Kashmir valley and constructed by different railway companies. This project had divided into four sections as shown in below table:

**Jammu and Kashmir: Plan of railway construction**

Legs	Distance (km)	Area	Year of completion
Leg "0"	53	Jammu to Udhampur	2005
Leg "1"	25	Udhampur to katra	2014
Leg "2"	148	Katra to Qazigund	Under construction
Leg "3"	119	Qazigund to Baramuala	2009

Source: Ministry of Railways

As the Jammu-Udhampur- katra- Qazigund- Baramulla line is the biggest project in the construction of mountain railways since independence and most difficult project undertaken on Indian sub-Continent. This whole project is divided into four legs that is Leg "0", leg "1", leg "2" and leg "3". The leg "0" include 53km distance covering Jammu to Udhampur Railway line which has its beginning from 1983 and after a gap of approximately 21 years it get completed in 2005. The work on Qazigund to Baramulla section which come under Leg "3" covering distance of 119 km which was completed in three phases- the first section from Anantanag to Rajwansher (66 km) was opened to public on 11<sup>th</sup> October, 2008 and second section from Rajwansher to Baramulla (35km) was opened on 14<sup>th</sup> February 2009 and final section from Qazigund to Anantanag (18 km) was opened to public on 28<sup>th</sup> October 2009. The section connected Qazigund to Banihal under leg "2" covering distance of 18km was inaugurated by the Prime Minister

Manmohan Singh in 2013. The Udhampur to Katra section which comes under leg "1" covering a distance of 25 km was opened on 4<sup>th</sup> July 2014 and inaugurated by the Prime Minister Narinder Modi<sup>13</sup>. The section from Katra to Banihal under leg "2" is still under construction. In 2002, this project has been declared as a project of national importance that it would be constructed irrespective of cost and it will provide all-weather and reliable connectivity to the state of Jammu and Kashmir with the rest of the country and it will lead to change the socio-economic scenario of the respective state.

### **RAILWAY AND ECONOMIC DEVELOPMENT IN JAMMU AND KASHMIR**

Railway has been considered as a backbone of economic development. It directly and indirectly leads to affect the economic scenario of the society. It leads to agricultural development, employment generation, industrial development, tourism development, pilgrimage development; urbanisation and educational development etc. Railway contributes to the Gross Domestic Product by enhancing trade, employment, tourism, Pilgrimage and industrialisation which lead to economic development. Railway is considered as the biggest industry, which contributes to the economic development through job creation, and accordingly large numbers of direct and indirect employment opportunities are associated with it. The proliferation of railway in any country or region leads to create employment directly in various fields like construction department, engineers have opportunities etc and by promoting agriculture, tourism, trade, and commerce will lead to increase employment indirectly.

In the state of Jammu and Kashmir, railway proliferation has become a major agency for economic development. It not only leads to transport people and goods but it leads to affect the economic scenario of the state by generating employment, increasing tourism, pilgrimage and through industrial and educational development. Railway in the state leads to the employment generation both in the Railway department and in other allied sectors. Tourism, which is considered as an asset to economic development, is also promoted by the railway proliferation in the State. With the coming of railways in the State, tourism has boosted as it provides a cheap, secure and safe journey to the people. As far as the Kashmir valley is considered, famous for various tourist spots and with the coming of railway which increases connectivity within and between the state leads to increase tourism as railway provides a cheap and safe journey. Railway has a catalytic role in the co-modification and commercialisation of Pilgrimage. The State of Jammu and Kashmir is famous for pilgrimage places and with the cheap and affordable means of transport, it has boosted. Railway in the state not only leads to tourism and pilgrimage development but it also leads to increase the trade of the state as it provides all-weather connectivity to the state with the rest of the country. With the development in tourism, trade, and pilgrimage due to cheap, affordable means of transport as Railway, it leads to generate revenue, increase the Gross Domestic Product, which leads to the economic development of the State. Education, Railway has an indirect impact on education by providing a cheap and timely service to the students and employees. No mass education has been possible without the service of modern means of transport<sup>14</sup>. The State of Jammu and Kashmir is still considered educationally backward. There are various regions, which are still without even road connectivity and it hinders them from getting education. With the coming of railway in the state, connectivity is enhanced and it also leads to the development of various access roads in the remotest areas of the state which enables students to attain their education as it provides a cheap and affordable service to them. Students from the remote areas are able to get higher education because of the facilities provided by the railway as students have no need to change their residence whether for education or employment they can easily reach their destination due to railway. It helps both to the students and to employees because it provides

cheap, safe, and timely service. Thus, with the railway introduction in the State educational scenario also get alter and it has lead to affect the economic standard of the people of the state.

### **RAILWAY AND SOCIAL DEVELOPMENT IN THE JAMMU AND KASHMIR**

Railway acts as an agent of **social transformation**<sup>15</sup>. Since different type of passengers with different caste, creed, religion, and having different economic status are travelling in train, met at railway stations and premises, intermingled with each other, discuss thing, transfer ideas, and develop sympathy and mutual understanding. Thus, railway breaks all social barriers, which broaden the views of the people with different outlook. Therefore, Railway promotes Unity and harmony among different social groups<sup>16</sup>. As Jammu and Kashmir is land of different culture, religion, communities etc or there exist Plurality and this contributes to the growth and development of the State. Railway has its endeavour to project the plurality of State through a well-connected railway network. Railway in Jammu and Kashmir plays an important role in the social development as Railway developed connectivity, which lead to development of communication among different regions. With the development of communication between regions and within in regions different people met and intermingled among themselves which affect their lives. It leads to affect their lives as people from different background and different religion, caste, and creed travel in a train. It affects language, customs, marriage, etc and other parts of life. The evils of strict caste system have considerably reduced through the closer contact of the people of different castes and creed on trains and platforms<sup>17</sup>. It leads to break old age isolation; bring new idea through the distribution of knowledge, removal of prejudices, superstitions and modification of old age customs and traditions<sup>18</sup>.

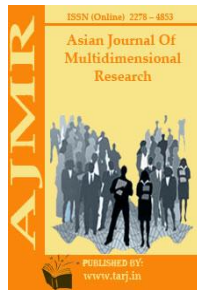
### **CONCLUSION**

With the availability of modern means of transport and communication, it become easy to travel and intermingled with the people from the different parts of the country. Therefore, railway becomes an institution, which played significant role of in cultural integration in India. Railway also represent as a symbol of unity in India. The Sumjhotah express running between India and Pakistan represent the symbol of unity between two nations. Thus, the whole discussion indicates that railway played an important role in the socio-economic development of the country and the State. It promotes employment, tourism, pilgrimage, agriculture, trade and commerce. It leads to the industrial growth, social development, cultural development, educational development, and many other changes. It has affected all most every sphere of the life and help in maintaining unity in diversity. Railway as institution leads modernisation of society. It works as an organisation that provides employment. By developing connectivity, it master the time and distance. It acts as an agent of change that mitigates all the differences of caste and creed. It developed the concept of equality between different religions, community, caste, and creed as different people travelling in one compartment of train. In short, railway has a sociological significance at it affect the social aspect of the society.

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## **IMPACT OF GOODS AND SERVICES TAX ON INDIAN ECONOMY**

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### **ABSTRACT**

*Goods and services tax is nothing new, but a well desired value added tax that covers both goods and services. Goods services tax is a tax that is levied on the value added to a purchased supply before it is sold again. Goods and services tax is defined as the giant indirect tax structure designed to support and enhance the economic growth of the country. Goods and services was based on the nation "one nation, one market, one tax ". Goods and services tax would change the current tax regime of production based taxation to a consumption based system. Goods and services Tax (GST) is essentially a tax only on value of addition at each stage. GST will be on the transaction value, i.e. taxes will be levied on the price actually paid or payable. Hence, resulting in the contribution of making the Indian economy stronger and powerful. GST is proposed system of indirect taxation in India merging most of the existing taxes into single system of taxation. The main purpose of this paper is to study Impact of Goods and Services Tax on Indian economy. This research paper highlights the positive and negative impact of the GST in the Indian tax system. This study was done based on secondary data collected from multiple sources of evidence, in addition to books journals websites and newspapers.*

**KEYWORDS:** *GST, SGST, CGST, Indian economy, economic growth, and Indirect tax.*



## INTRODUCTION

According to KAUTILYA in his book “Arathshastra “ the tax system of a country should be “liberal in assessment, ruthless in collection and The tax collector should collect taxes from a tax payer just like a honeybee collects from a flower in an expert manner without disturbing petals. .”To implement such feeling we need more tax reforms in our country. The main objective of Tax reform is to establish a tax system that is economically efficient and neutral in its application, attractive distribution and simple to administer.

France was the first country to implement the GST in 1954 and since then an estimated 160 countries have adopted this tax in some form or another. The idea of GST in India was mooted by Sri Vajpayee government in the year 2000. The GST Act was on 29<sup>th</sup> March 2017 and came in to force on 1<sup>st</sup> July 2017. The Govt. of India approved the GST Act to simplify the current multilayered federal state and local indirect tax structure. The GST bill unifies at least ten types of indirect taxes into one tax to be collected at the time of consumption of goods and services. The taxation laws will put an end to multiple taxes which are levied on different products, starting from the source of manufacturing to reaching the end consumer. GST Act works on fundamental principle of “ONE COUNTRY ONE TAX”.

## REVIEW OF LITERATURE:-

A number of research papers and articles provide a detailed insight on GST. The findings from the literature.

Dr. R. Vasanthagopal (2011) studied “GST in Indian: a big leap in the indirect taxation system and concluded that switching to seamless GST from current complicated indirect tax system in India. Will be a positive step in booming Indian economy. Success of GST will lead to its acceptance by more than 140 countries in the world and a new preferred indirect tax system in Asia also.

V. Bhaskar and J.V. M Sharma (2012) studied “the road map for implementation of goods and service tax”. He found that steps to be undertaken to implement comprehensive tax system that is GST. The authors have thrown light on the constitutional amendment required for implementation of GST in India.

S.M.A. Taqvi (2013) studied the challenges and opportunities of goods and service tax in India. He explained that GST is only indirect tax that directly affects all sectors and sections of our country. He also explained proposed GST model will be implemented parallel by the state and central government as state GST, central GST respectively.

H. Nithin Kumar (2014) studied “Goods and service tax- a way forward and concluded that implementation of GST in India help in removing economic distortion by current indirect tax system and expected to encourage unbiased tax structure which is indifferent to geographical locations.

S. Dani (2015) has suggested that GST administration is an irresolute endeavor to legitimize backhanded expense structure. Roughly more than 150 countries have executed GST system.

This legislature of India must examine the GST administration setup by different countries.

K.R. Srinivas (2016) in his article “Issues and challenges of GST in India” mentioned that central and state governments are empowered to levy respective taxes as per the Indian constitution. This is likely to change to complete scenario of present indirect taxation system.

**OBJECTIVES OF RESEARCH STUDY:**

The objective of the present study is to review the following:

- Why is GST being introduced in India?
- History of the GST in India
- Features of the GST regime
- GST Rates in India
- Impact of GST on Indian economy
- Positive and Negative of GST

**RESEARCH METHODOLOGY**

The main source of data used for the study is secondary data. The present study is conceptual survey with exploratory cum descriptive in nature. This research follows the analytical research methodology which is based on the quantitative data. The information related with study has been collected from websites, journals, magazines, newspapers and books.

**WHY IS GST BEING INTRODUCED IN INDIA?**

One of the main reason for GST being introduced in India is the tax burden that falls both on companies and consumers. With the current tax system, there are multiple taxes added at each stage of the supply chain, without taking credit for taxes paid at previous stages. As a result, the end cost of the product does not clearly show the actual cost of the product and how much tax was applied. This cascading structure is too complex and inefficient.

GST will integrate most taxes into a single one that will be applied to the sale and purchase of goods and services, with deductions for taxes paid at previous supply chain stages. This structure is predicted to be easier to track both for the government and business owners.

**HISTORY OF GST IN INDIA**

The implementation of the Goods and Services Tax (GST) in India was a historical move, as it marked a significant indirect tax reform in the country. The amalgamation of a large number of taxes (levied at a central and state level) into a single tax is expected to have big advantages.

One of the most important benefits of the move is the mitigation of double taxation or the elimination of the cascading effect of taxation. The initiative is now paving the way for a common national market. Indian goods are also expected to be more competitive in international and domestic markets post GST implementation.

From the viewpoint of the consumer, there would be a marked reduction in the overall tax burden that is currently in the range of 25% to 30%. The GST, due to its self-policing and transparent nature, is also easier to administer on an overall scale.

France is the first country in the world, which has implemented GST in 1954. Several countries have already established the Goods and Services Tax. In Australia, the system was introduced in 2000 to replace the Federal wholesale Tax. GST was implemented in New Zealand in 1986. A hidden Manufacturer's Sales Tax was replaced by GST in Canada, in the year 1991. In Singapore, GST was implemented in 1994. GST in a value-added tax in Malaysia that came into effect in 2015.

In India Finance Ministry has placed 122<sup>nd</sup> Constitution Amendment Bill in Lok Sabha in 19<sup>th</sup> December, 2014. The Government of India has appointed various committees, task force to give their views to introduce a vibrant and modern Indirect Tax Structure in India.

### FEATURES OF THE GST REGIME

The GST system is characterized by the following features:

- GST is applicable on the “supply” of services on goods as opposed to the earlier concept of taxation on goods manufacture, sale of goods, or service provision.
- GST is a destination-based tax structure unlike the origin-based structure that existed previously.
- CGST, IGST, and SGST/UTGST are levied at rates that would be mutually agreed upon by the states and centre.
- GST will replace the central taxes mentioned below:
  - Duties of Excise (medicinal and toilet needs)
  - Central Excise Duty
  - Additional Duties of Excise (Goods of Special Importance)
  - Additional Duties of Customs (CVD- countervailing Duty)
  - Service Tax
  - Special Additional Duty of Customs (SAD –Special Additional Duty)
  - Additional Duties of Excise (Textiles and Textile Products)
  - Cess and surcharges
- GST will subsume the following state taxes :-
  - . Central Sales Tax
  - Entry Tax
  - State Vat
  - State Vat
  - Luxury Tax
  - Purchase Tax
  - Entertainment Tax, except that levied by local entities.
  - Taxes on lotteries and gambling
  - Taxes of advertisements.
  - State cess and surcharges.

Recently the govt. of India brings down 99 percent of the goods under the 18 percent or lower GST slab. The GST council after its meeting on December 22nd had reduced the applicable GST rate on 23 items of mass consumption. The new rates that are applicable from today expected to bring down prices of consumer goods such as televisions, tyres, monitors movie tickets among others. Nearly 1250 goods and services have been categorized under the four tax slabs of 5, 12, 18, and 28 percent under the GST regime. A total of 17 items and six services have been reduces which will result in revenue impact of Rs.5,500 crores of the full fiscal. Taking cement and automobile parts away from the 28 percent slab would mean a combined revenue loss of Rs33,000 cores, which the council felt is “to steep” to be considered at this junction.

The following table reflects in rates applicable to the GST. :-

Commodities / Services	GST Rates
Items that are not listed in any other category, such as electrical appliances, oil, soaps, etc.	18%
All services like professional charges, fees, insurance, banking, restaurants, telecom, etc.,	18%
Essential farm produced mass consumption items such as wheat, rice, food grains, etc.,	Nil
Mass consumption and common use food items like mustard oil, tea, spices, etc., but not including processed foods	5%
Processed foods	12%
Cars and white goods	28%
De-merits and luxury goods and items that fall under the sin category, such as aerated drinks, tobacco, luxury cars, p0an masala, etc.	28%+CESS

### ROLE OF GST IN INDIA'S GDP

In a twisted fate of the country's GDP in the hands of upcoming GST regime, it has been assumed that the taxation rates are very much on the verge of disrupting the economic conditions as the chances of abnormal reactions are expected with newly incorporated taxation scheme and its tax rates. As the early announcement of the tax rates. As the early announcement of the tax rates may create a rush for exemptions and compliance relief can take a good toll while it was assumed that early sharing of the tax rate will also fluctuate the production of various industries in order to save from altered tax rate. Overall tax rates are exactly fixed what it has been thought on the long run, but as for now, it is supposed to be kept under the talks for betterment.

British lender HSBC said on 24th January 2018 that, waning effects from the GST impact will help push the Indian GDP growth to 7 percent in FY19. International Monetary Fund (IMF) has come out with an estimate of 7.4 percent growth on 22<sup>nd</sup> January 2018. "For India, economy growth in the next three years (FY18 – 20) by 6.5 percent, 7 percent and 7.6 percent," as told by the chief economist.

### IMPACT OF GST ON INDIAN ECONOMY

The idea behind implementing GST across country in 29 States and 7 Union Territories is that it would offer a win-win situation for everyone. Manufacturers and traders would benefit from fewer tax filings, transparent rules and easy book keeping. Consumers would be paying less for generate more revenues as revenue leaks would be plugged. Ground realities as we all know, vary .So, how has GST really impacted India?

GST- The Short-Term impact: - From the view point of the consumer, they pay more tax for most of the goods and services they consume. The majority of everyday consumables now draw the same or a slightly higher rate of tax. Furthermore, the GST implementation has a cost of compliance attached to it. It seems that this cost of compliance will be prohibitive and high for the small scale manufactures and traders, who have also protested against the same. They may end up pricing their goods at higher rates.

What the Future Looks Like: About the long-term benefits, it is expected that GST would not just mean a lower rate of taxes, but also minimum tax slabs. Countries where the goods and services Tax has helped in reforming the economy, apply only 2 or 3 rates – one being the mean

rate, a lower rate for essential commodities, and a higher tax rate for the luxurious commodities. Currently, in India, we have 5 slabs, with as many as 3 rates – an integrated rate, a central rate, and a state rate. In addition to these, cess is also levied. The fear of losing out on revenue has kept the government from gambling on fewer or lower rates. This is very unlikely to see a shift anytime soon; though the government has said that rates may be revisited once the RNR (revenue neutral rate) is reached.

The impact of GST on macroeconomic indicators is likely to be very positive in the medium-term. Inflation would be reduced as the cascading (tax on tax) effect of taxes would be eliminated. The revenue from the taxes for the government is very likely to increase with an extended tax net, and the fiscal deficit is expected to remain under the checks. Moreover, exports would grow, while FDI (Foreign Direct Investment) would also increase. The industry leaders believe that the country would climb several ladders in the ease of doing business with the implementation of the most important tax reform ever in the history of the country.

Overall on priority, it is up to the government to address the capacity building amongst the lesser-endowed participants, such as the small-scale manufactures and traders. Ways have to be found for lowering the overall compliance cost, and necessary changes may have to be made for the good of the masses. GST will become good and simple, only when the entire country works as a whole towards making it successful.

Indian economy is getting more globalizes over the past two decades. On bringing the GST into practice, there would be amalgamation of Central and State taxes into a single tax payment. It would also enhance the position of India in both, domestic as well as international market. It is likely to improve the country's tax to GDP ratio and also inhibit inflation. The positive and negative impact of GST on Indian economy are discussed below.

### **POSITIVE AND NEGATIVE IMPACT OF GST ON INDIAN ECONOMY**

GS is a game –changing reform for the Indian economy, as it will bring the net appreciate price of the goods and services. The various factors that have impacted Indian economy are increases competitiveness, Simple tax structure, economic union of Indian Uniform tax regime and greater tax revenues

GS is a indirect tax introduced, replacing multiple taxes. A well planned and implemented tax policy can bring about qualitative changes in tax system and leads to business reforms in a nation. GST has both positive and negative impact at micro level on the average Indian. GST, being a simplified tax policy, removes cascading effect of taxes leading to cheaper cost of various products. (Example –FMCG-Fast Moving Consumer Goods), more job opportunities, more transparency, reduction of tax burden on end consumers, improvement in Indian economy in long run, etc. On the contrary it may have few drawbacks such as initial inflation leading to higher prices of goods and services, rescheduling budget, higher compliance cost, etc. At a micro level, GST will greatly influence Indian economy, leading to increased FDI, increased in overall Government revenue, seamless flow of credits transparency in tax system, increased exports, etc, GST is expected to be a boon for nation like India.

### **POSITIVE IMPACT OF GST**

The positive impact is that more number of businesses has registered in GST and gradually there would be more GST compliance. This will help the Government to rationalize the tax rates. The tax rates may be come down. Another impact is that the inter-state movement of goods has

become hassle free with doing away with entry tax. Lastly many taxes have been subsumed in one single tax. So one nation, one tax will ease the process of business doing. Introduction of E-way bill would make it difficult to evade taxes and there would be honesty in businesses. This will enhance the morale of honest tax payers in the system.

### **Negative impact on GST**

The negative impact is that in some sectors, the cost has raised leading to negative growth. The government departments were not clear about the tax incidence in respect of ongoing works contracts leading to non-payments to contractors. But all these impacts are gradually diminishing.

### **CONCLUSION**

- GST will become good and simple, only when the entire country works as a whole towards making it successful.
- After implementation of GST in India, many taxes have been subsumed in one single tax. So one-nation, one-tax will ease the process of business doing.
- Various factors that have impacted Indian economy due to GST are Increases Competitiveness, Simple tax structure, Economic Union of Indian. Uniform Tax Regime and Greater Tax Revenues.
- From the viewpoint of the consumer, they pay more tax for most of the goods and services they consume.
- GST implementation has a cost of compliance that will be prohibitive and high for the small scale manufacturers and traders, who have also protested against the same.

“GST is a great step by Team India, great step towards transformation, great steps towards transparency”, -Prime Minister of India Shri. Narendra Modi.

### **LIMITATIONS OF THE STUDY**

The present study provides starting –point for further research in this field. This research can explain with respect to real benefits in India after successful implementation of GST

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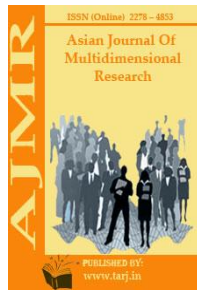
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#### **DECLARATION**

I declare that this paper is my own work and as not been submitted in any form for another degree or diploma at any University or other Institutes of territory education. Information derived from the published and unpublished work of others as been acknowledged.



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## **FINANCIAL STRUCTURE AND ECONOMIC GROWTH IN INDIA**

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### **ABSTRACT**

*Financial structure mainly deals with the presence of financial markets and institution in the financial system. Many economists consider that institutions are the key driver of economic growth, whereas others identify the role of financial markets. The present study first investigates the pattern of financial structure in India for different periods. An attempt is also made to empirically investigate the relative role of financial markets and institutions in determining economic growth of India. It is found that institutions had relatively dominated the financial system in India in early 1990s. However, in recent years, financial system has shown inclination towards financial markets in relation to institutions.*

**KEYWORDS:** *Financial structure, economic growth, regression models*



## INTRODUCTION

Financial structure mainly highlights the relative presence of financial institutions and markets in an economic system. A large body of literature tried to quantify the financial structure across the nations and empirically investigated the relative role of financial institutions and markets in determining economic growth. But the issue has remained debatable among academicians. Various studies argued that banks facilitate in mobilizing savings, identifying productive projects and monitoring firms especially in the early stage of development of an economy, and these relationships remain robust even in the presence of weak institutions. On the other hand, it is argued that markets provide the liquidity and hence mitigate the liquidity risk. Markets also help to diversify the portfolio and thus ameliorate the risk diversification problem.

Earlier studies argued that the financial system of Germany and Japan were relatively explained by banks while the market-based system had the dominance presence in the case of United State and United Kingdom (Weinstein & Yafeh, 1998; Wenger & Kaserer, 1998). Banks improve the capital allocation and corporate governance through acquiring information about firms' ex-ante and monitoring firms' ex-post (Diamond 1984). Banks also enhance investment efficiency and economic growth by managing various types of risks associated such as cross sectional, inter-temporal and liquidity risk (Allen & Gale 2000; Bencivenga & Smith 1991). In contrast to this, market-based view highlights that well-functioning markets motivate economic agents to research the working of firms and hence generate the information regarding the perspective returns of the firm. It provides useful information to the economic agents to allocate their funds (Holmstrom & Tirole, 1993). Jensen and Murphy (1990) identified that markets enhance corporate governance by easing takeovers and making it easier to tie managerial compensation to firm's performance. Markets also help to ameliorate the liquidity risk (Levine 1991). An important set of views on market-based or bank-based debate argues that banks are important for growth under some conditions, while markets are important in another condition known as hybrid view.

Boyd and Smith (1998) suggested that banks are particularly important at low levels of economic development. As income rises, however, countries may benefit by complementary the bank system with market-based system. Rajan and Zingales (1998) argued that bank-based systems have a comparative advantage in the economies with weak legal systems. For the countries with weak institutions, powerful banks can still force firms to reveal information and pay their debts. According to this view, economies attain more benefits from market-based system under the condition of well established legal and enforcement system (Levine 2002). In the initial stage of development, institutions can play significant role while as nation moves towards development, financial markets based system may emerge as the key source to boost the economic growth. In the skeptic environment, policymakers are always interested to identify the relative role of these two forces in determining the economic growth. The present study is an attempt to diagnose the nature of financial structure and its role in the economic growth of India.

In the empirical literature, studies could not produce the conclusive argument favoring the role of either bank-based system or market-based system in economic growth (IMF, 2012). However, some find that that the structure of the financial system can still matter after controlling for the effect of overall financial development on growth. When countries have inflexible judicial systems so that they are less able to adapt laws to changing economic conditions, the degree of bank orientation is positively correlated with long-term economic growth (Ergungor, 2008). The financial structure can also be defined for the level of operation, activities, competition and

efficiency with the banking system. (IMF defines the category of financial structure based on financial globalization, competition, financial buffers and non-traditional bank intermediation). Present study takes into account the broader definition of financial structure related to the bank-based system and market-based system.

Emerging Asian economies which are in the consolidation of process of development might have reaped the benefits of bank-based system on their initial stage and now looking towards market-based system for further strengthening their financial systems. Now it is well recognized that other than primitive factors like labour and capital, the peripheral factors also play a significant role in the economic growth. Among peripheral factors, the role of financial development and financial structure has been well acknowledged. In this direction, the present study is an attempt to depict the relative role of financial structure in the determination of economic growth of India. It is organized as follows: next section discusses the methodology utilized for measurement of financial structure and for econometric model specified for identifying the role of financial structure in economic growth. Third section portrays the financial structure of India for different periods. The results for role of financial structure indicators in economic growth are also presented here. In the last section, whole discussion is concluded.

## **METHODOLOGY**

The following methodology is adopted for measuring the financial structure, and identifying the relative role of financial structure in the determination of economic growth:

### **FINANCIAL STRUCTURE MEASUREMENT**

As per existing methodology, the nature of the financial structure is quantified in terms of score. The score of financial structure indicators highlights that whether an economy's financial system is market-based or institution-based. The present study utilizes prominent indicators of financial system such as structure activity, structure size and structure efficiency (developed by Levine, 2002) to generate the score of financial structure. The preferred indicator of financial structure is structure activity which indicates the activity of stock markets in relation to banks, and is defined as log of the ratio of value traded to bank credit.<sup>1</sup> Bank credit is the claims of banks on private sector as percentage of GDP. The structure size measures the size of stock markets compared with banks, and is defined as log of ratio of market capitalization to bank credit.<sup>2</sup> Structure efficiency identifies the relative efficiency of stock markets, and is defined as log of the product of interest rate spread and turnover ratio.<sup>3</sup> In terms of tools mentioned above for measuring financial structure indicators, high value of structure activity, size and efficiency implies that the country has relatively well developed stock markets rather than banks. Contrary to this, the small value signifies that the banking system is relatively more developed than the market-based system.

Financial structure has manifestation in terms of various indicators such as market capitalization (MC) as percentage of GDP, stock traded value ratio (STVR), turnover ratio (TR), credit provided by the banking sector to private sector as percentage of GDP and interest rate spread. Market capitalization as share of GDP defined as value of domestic equities traded on domestic exchanges to GDP measures the size of financial market (Levine & Zervos; 1998). Market activity is captured by stock traded value ratio (STVR) that is equal to value of domestic equities traded on domestic exchange to the GDP income (Kunt & Levine; 1999). It measures the value of stock transaction in relation to the size of the economy. It is frequently used to gauge market liquidity as it measures trading relative to economic activity. This indicator complements the

market capitalization ratio by matching market size with trading. Market efficiency is proxied by turnover ratio (TR) that is equal to value of trades of domestic equities on domestic exchanges as a share of the value of domestic equity or market capitalization. The turnover ratio is not a direct measure of trading costs or the ability to sell securities at posted prices rather it measures the trading relative to the size of market. It therefore reflects trading frictions and information that induces transaction. The interest rate spread, difference between lending rate to the private sector and the risk free government rate<sup>4</sup>, is a measure of financial institutions' efficiency. A small spread indicates that the market considers its best corporate customers at low level of risk. A negative rate indicates that the market reckons its best corporate clients less riskier than the government. The study takes into account the bank credit to private sector as percentage of GDP to capture the activities of financial institutions (Beck et al.; 1999). The individual financial structure indicators reflect the behaviour of markets in relation to banks.

### Financial Structure and Economic Growth

After identifying the financial structure, it is worthwhile to investigate the relative role of its components in explaining economic growth. Levine (2002) introduced the growth model with financial structure while considering controlling variables such as inflation, initial income, schooling, trade ratio, political stability, government size along-with financial structure indicators. The information on these variables is taken as conditional information set for economic growth. Ujunwa et al. (2012) utilized regression model to estimate the relationship between financial structure and economic growth. They utilized the individual indices for market-based system, institution-based system and aggregate financial development index in the growth equation. The study exploits principal component analysis (PCA) for transforming financial market related variables into a composite score to aggregate the performance of market-based system. Similarly, financial institutions related indicators are utilized for construction of bank-based performance for each country separately. Finally, all the financial development indicators are considered for aggregate view of performance of financial system in respective country. The role of financial structure in economic growth is addressed by following equation:

$$G = \alpha_1 + \beta_1(\text{BBV}) + \beta_2(\text{MBV}) + \beta_3(\text{FSV}) + \gamma_1 X + \varepsilon_1(1)$$

Where, G is the growth rate of real per-capita GDP. BBV is aggregate index of bank-based variables, MBV- index for financial markets related indicators, FSV- aggregate financial development index for all the select dimensions of financial system. X is the set of conditioning information, which comprises inflation, trade ratio, and capital formation per-capita. The present study is confined with the selection of controlling variables as consistent data for both markets as well as institutions is available from 1988 onwards. The conditional information set comprises the extraneous variables concerned with policy environments. The policy environment can be measured in many dimensions. To avoid the problem of losing the degree of freedom in regression model, we settle on three prominent dimensions of policy environment as information set. One dimension is concerned with external environment and quantified as total trade as percentage of nominal GDP. The second is related to the supply and demand gap in the economy, and measured as wholesale/ consumer price index. The third variable is the per-capita capital formation.  $\varepsilon_i$  is the usual error term. In sum, the study utilizes per-capita GDP, financial structure indicators (individuals and aggregate), per-capita capital formation, price index and trade ratio variables for modeling the existing phenomenon.

Different hypotheses regarding the financial structure and economic growth have been assessed by coefficient values in equation (1). The statistically significant  $\beta$  coefficient values incarnate information regarding the relative role of financial structure in economic growth.

### **Data sources**

The data on the variables mentioned above is extracted from secondary sources. The sample period of the study is very recent and ranges from 1988 to 2012. The data of select variables are sourced from national and international sources. The international sources include the World Bank publication (e.g. World Development Indicators, 2013), International Monetary Fund publications (e.g. International Financial Statistics 2013, CD ROM), Asian Development Bank publications (e.g. Key Indicators for Asia and Pacific, various issues). The national sources include the Government of India publications (e.g. Economic Surveys, National Accounts Statistics), Reserve Bank of India publications (e.g. Monthly Bulletin and Handbook of Statistics on Indian Economy). To get the better insight, it is divided into sub-periods of 1988-92, 1993-97, 1998-2002, 2003-07 and 2008-12. The period 2007-12 is marked as the recent years in study.

### **Financial Structure and Economic Growth: Empirical Evidences**

This section has two parts. First part consists of quantification of financial structure, and it accounts for the inter-temporal behavior of financial structure for the economies. Second part reports the results of regression models used for identifying the relative role of financial structure in the economic growth.

#### **Financial Structure of Emerging Asian Economies**

The performance of financial structure indicators for different periods is given as under.

#### **Performance of Individual Financial Structure Indicators**

The results of the financial structure indicators in terms of activity, size and efficiency are presented in the Table 1. The structure activity indicator computed as the log of the ratio of stock traded value to bank credit, has increased substantially over the period of time for India. It implies that role of financial markets in the financial system has increased in comparison to late 1980s. Indian system has shown inclination towards market-based system as its average value of structure activity indicator increased from negative 2.08 during 1988-92 to positive 0.05 during 1998-2002. In the recent years, financial institutions hold a greater presence in terms of activity in India (Table 1).

The efficiency indicator is measured as log of the product of interest rate spread and turnover ratio. In the recent period of study, India has shown a dip in the efficiency indicator. Indian financial structure indicators have shown a little bit of improvement after the global financial crisis period. The possible reason is that the country has gained meaningful lessons from the crisis and moved cautiously for the financial markets. Even banking institutions and investors were also aware about the uncertain environment and they tried their level best to minimize the asymmetry of information and moral hazard problems. A common belief holds that financial institutions are relatively stable than the financial markets in the presence of economic shocks particularly the financial crisis.

**TABLE 1: FINANCIAL STRUCTURE OF INDIA (AVERAGE VALUES)**

Period	Structure Size	Structure Activity	Structure Efficiency
1988-92	-1.37	-2.08	4.87
1993-97	-0.3	-1.26	4.85
1998-2002	-0.6	0.05	6.42
2003-07	0.22	0.02	5.86
2008-12	-0.04	-0.25	5.43

Source: Author's Computations

### Relation between Financial Structure and Economic Growth

In economic literature there is no specific and explicitly definition of the financial structure, however Levine (2002) utilized four indicators viz. structure size, structure activity, structure efficiency and aggregate financial structure. In the recent past, the role of financial structure in economic growth has been quantified with simple linear regression model comprising of indices for bank-based indicators, market-based indicators and clubbed financial development indicators (Ujunwa et al. 2012). The aggregate indices for market based system, bank based system and financial-services based system are computed by using the Principal Component Analysis (PCA) (see annex A for detail given in the end).

The results for existence of market-based view (MBV), bank-based view (BBV) and financial-services based view (FSV) in determining economic growth are presented in Table 3. It is found that with controlling variables trade ratio, inflation and per-capita capital formation, the coefficient values for bank based financial structure are positive however statistically insignificant for India. This result is consistent with the bank-based financial structure theory which posits that the unique role of banks in identifying good projects, mobilizing resources, monitoring managers and managing risks promotes economic growth. It is pronounced that the role of financial institutions is weighed more compared to financial markets at initial level of development of infrastructure facilities.

**TABLE 3: FINANCIAL STRUCTURE AND ECONOMIC GROWTH IN INDIA<sup>^</sup>**

Country	Constant	TRADE	FDI	MI	BI	LKP	WPI	R <sup>2</sup>	F-Statistic	DW Statistic
India	-62.36	-41.46	-0.09	-0.04	0.00	0.06	16.82	0.4596	0.0066	1.4391
P-value	0.01	0.03	0.18	0.70	0.22	0.10	0.02			

Source: Author's Computations, Note: <sup>^</sup> Dependent Variable (Growth in Real Per-capita GDP).

The coefficients of MBV are negative for India implying the financial markets have tendency to lower the economic growth, may be attributed to immature market. It is worth highlighting that both financial markets and institutions must perform their functions with supplement to each other for a stable financial system. The available figures for indices of both financial intermediaries (markets and institutions) indicate lower level of cohesiveness to each other. In such phenomenon of financially instability, it is somehow intuitive that the aggregate financial development may not contribute positively to the economic growth. The present model satisfies the criteria of overall goodness of fit.

## CONCLUSION

Based on the computed values of financial structure indicators it can be concluded that institutions had relatively dominated in the financial system of India in the early 1990s, however has shown inclination towards financial markets recently. For the role of financial structure in economic growth, the result seems consistent with the bank-based financial structure theory for India. For the policy implications, study stresses upon the balanced approach to both of the environments and underlines the scope of regulatory authority in creating stable financial systems.

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### Annex A: Aggregate Financial Structure Index

The use of factor analysis has got significant place as an empirical tool among regional and development economists for computing composite index. The principal components which explain more than 80 percent of communality variation are considered to get the representative composite score. The computed score of PCA is transformed for its mean value of 100 using the method developed by George (1980). Same approach was adopted by Fritz (1984) to compute the financial deepening index for Philippines.

To derive the aggregate index, two simultaneous equations in two unknowns; C (a scalar to normalize the index) and B (the correlation between two observed variables sharing one common factor) must be solved. With the standardized data the index value is assumed to be 0 at  $6\sigma$  and 100 at mean activity. Thus at mean:

$$F_{t(\text{average})} = \sum_{i=1}^n f_i (Z_i + b) \quad (2)$$

Where  $b=6$  for minimum value of index;  $F_{t(\text{min})} = 0$ ;

$$= \sum_{i=1}^n C \lambda_i (Z_i + 6) = 100 \quad (3)$$

The weight of each variable in constructing the index is defined by index coefficients  $g_i$  where

$$g_i = 100 \lambda_i / (6 \sum \lambda_i) \quad (4)$$

The overall index is

$$G_i = \sum_{i=1}^n g_i (Z_i + 6) \quad (5)$$

However in the index, k factors are required to achieve 90 percent explanation of the communality. The respective variables are weighted based on their relative contributions as measured by their eigenvalues ( $\omega$ 's). When k=2, then weight for individual variable is obtained as:

$$GI_{ij} = \sum_{i=1}^n g_i^1 (Z_i + 6) \frac{\omega_1}{\omega_1 + \omega_2} + \sum_{i=1}^n g_i^2 (Z_i + 6) \frac{\omega_2}{\omega_1 + \omega_2} \quad (6)$$

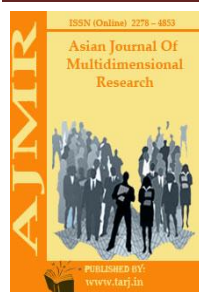
The above methodology enables us to get the aggregate financial structure index for market-based system, bank-based system and financial-services-based system.

#### Annex: Market Based, Bank Based and Financial Development Index for India

Year	FDI	MI	BI
1988	83.1	14.6	65.8
1989	84.9	-14.9	64.7
1990	84.2	2.2	64.4
1991	83.5	56.9	63.4
1992	83.8	116.7	74.4
1993	83.7	197.3	77.1
1994	85.1	221.7	91.9
1995	83.6	218.7	95.9
1996	90.0	72.2	96.2
1997	95.5	-34.1	100.5
1998	95.2	-64.1	100.6
1999	104.5	-130.0	103.1
2000	119.0	-411.7	104.8
2001	105.3	-215.4	106.0
2002	104.9	-140.4	113.5
2003	106.1	10.3	125.8
2004	107.2	107.1	124.3
2005	108.1	213.7	128.2
2006	112.4	309.8	126.0
2007	118.3	622.5	130.7
2008	115.5	169.7	120.2
2009	117.7	255.0	113.9
2010	112.9	385.9	105.4
2011	107.4	232.4	100.5
2012	108.3	303.7	102.8

Source: Authors' Computation, MI, BI, FDI: Indices are for market related, institutions related and financial services related variables, respectively.





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**SOCIAL EXCLUSION OF WOMEN DURING MENSTRUATION: A BIO-PSYCHOSOCIAL PERSPECTIVE OF MENSTRUAL HEALTH OF SLUM WOMEN IN INDIA**

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**ABSTRACT**

*This paper is an effort to empirically study the biological, social and psychological impact of menstruation on migrant women and girls of slums in urban India. Since migration leads to modification of cultural norms, this paper also explores the impact of menstruation in the light of migration and urban influence on the respondents who originally hail from Haryana state, which is the least friendly state for females in India. Menstruation is much more than a biological process by which a female body prepares itself for conception. In Indian parlance, menstruation has equal social implications as it has biological. Culture plays a dominant role and often leads to exclusion of girls during the period days and curtailment of freedom as the girl is able to conceive after menarche. An Indian woman is idealised as an epitome of sacrifice, and menarche is the first step towards womanhood which teaches ways to curtail her own self. There is a steep fall in the social status of a girl on reaching puberty. In Indian context, talking about sex is a taboo and reproductive health is not a priority matter in the families, thereby, girls often find themselves grappling with this natural biological phenomenon. They are treated as untouchables and also disfavoured with separate bedding, utensils, etc. Girls drop out from schools and are given in early marriage on reaching puberty.*

**KEYWORDS:** Social Exclusion, Menstruation, Cultural Dominance, Emancipation

**INTRODUCTION:**

The life of a woman comprises of many episodes which present distinct situations, sometimes leaving her startled at turns. She has been created biologically different from the male counterpart. Nature has bestowed some of its own qualities to woman. This endurance in woman is similar to the endurance that Mother Nature depicts. Both of them display a courageous oversight that enables them to endure the pain that becomes the basis of existence of the mankind. But more than often, these biological differences between men and women become discriminatory for women. Generally, the first chapter of the woman's story unfolds when she is born and the societal differences in expectations and upbringing decide the availability of opportunities and level of her development. Women, in almost all civilizations of the world are treated differently not just because they are biologically distinct from men, but because their biological differences are measured on the social yardstick, which is often not so friendly to women. As she learns to become adept to the so called ideal feminine ways practiced in her society, she is heralded by a major biological phenomenon called menstruation in which monthly discharge of blood from the uterus of nonpregnant women takes place from puberty to menopause. The age at menarche has fallen down from 16 years to 9-13 years in recent past. This is in contrast to the psychological strength and maturity of girls to face and accept this biological change. The girls many a times are not aware of menstruation and encounter the first episode as some major health problem, often shrugged in ignorance and embarrassment. Since in India, talking about sex is a taboo and reproductive health is not a priority in the families, girls often find themselves grappling with this natural biological phenomenon. They are treated as untouchables, and disfavoured with separate bedding, utensils, restriction to movements etc. As a result, girls tend to drop out from schools and are given in early marriage on reaching puberty. Apart from that, menstruation is shrouded in a mysterious obscurity, especially from males. The bodily discomfort due to shredding of uterus walls is certainly not so much, until it is aggravated by the unwanted practices associated with periods. The effects of the physiological stress are largely social and psychological and culture plays a predominant role in the treatment bestowed to menstruating girls. With menstruation, a new chapter of the girl's life unfolds-she is now eligible to procreate- which becomes the basis of justification of her very own existence. Is she aware and prepared to undergo this journey- her life certainly undergoes massive change which usher with menarche. Is it the nature's methodology to pre-empt her about the life ahead; and develop abilities to endure pain, shame, guilt, apathy, discrimination, sacrifice and tolerance. This marks the beginning of womanhood-the longest chapter of woman's life. This paper is an attempt to empirically understand the same biological, social, cultural and psychological milieu that women undergo due to menstruation cycle.

**STATEMENT OF THE PROBLEM:**

The study is based on migrant women of slums in Jammu city. The winter capital city of the J&K state is home to an estimated population of 1, 00,000 migrant workers. This migrant population is mainly driven to the city for economic reasons from the states like Bihar, U.P. Haryana, M.P., Chhattisgarh and Rajasthan. The locale of the study is Kalka Colony which is majorly inhabited by migrants from Haryana, Bihar and Chhattisgarh. Of these supplying states, Haryana is infamously known for its notorious sex ratio which is whooping 879 females per thousand males as per Census 2011. This data is enough to estimate the social and health condition of women in Haryana. It is understood that quality of life of women from Haryana is also not so overwhelming even in a distant land; thereby an attempt is being made to understand

the socio-psychological impact of menstruation and establish an association with the reproductive health of women folks from Haryana. Since migration is of permanent nature, people hailing from remote areas have adapted to the city life. This has also supposedly influenced the health and hygiene behaviour of people, particularly women for the benefit of this study. Life in a slum area is mired in a distinct demographic imbalance because such settings are characterised by inhuman living condition, lack of basic amenities and minuscule support from the government. Squatters and the people residing in these areas are often regarded as burden on cities and obstacle in the up gradation of the urban areas. This not only lowers the morale of the slum dwellers but also upsurges struggle in their day to day life. The living and socio-economic conditions have substantial bearing on the experience of girls during menstrual cycles in the form of availability of privacy, provision of washrooms, maintenance of hygiene etc. Since the binding provision of secrecy associated with periods is more at risk in slums than other places, the stigma associated with the same gets aggravated.

It was observed in the preliminary survey that the women of the community have very less knowledge regarding menstruation cycle. They always portrayed shame and embarrassment whenever any discussion on menstruation cycle was initiated, adhering to their commitment to socio-cultural norms of securing secrecy. This also becomes the basis of neglect of health factors among slum women. In the area under study, it is observed that menstruation health of women is conditioned by her social, cultural and economic status in the society. Many practices in the name of culture have lead to the decline in status of women. Menstrual health is also an equally important issue at the same level as reservation, education and property rights, concerning overall well being of women. But it is only lately that dialogue over menstrual health has started taking place. So, a need was felt to conduct a qualitative study about the biological, social and psychological aspects of menstruation cycle among urban women. This should form the basis of further descriptive studies and intervention for improving the psychosocial and mental health of women.

#### **OBJECTIVES OF THE STUDY:**

The study is concerned about the assessment of various factors associated with menstruation cycle in the migrant women in Jammu from Haryana community. The broad objectives of the study are as under:

1. To study the social implications of menstruation cycle.
2. To study the psychological impact of physical and social aspects of menstruation on the population under study.
3. To analyse the social exclusion meted out at women during menstruation cycle.
4. To give recommendations for possible intervention on issues concerning menstruation cycle.

#### **LITERATURE REVIEW:**

According to Garg & Anand (2015) 'Cultural norms and religious taboos on menstruation are often compounded by traditional associations with evil spirits, shame and embarrassment surrounding sexual reproduction. In some places, menstrual blood is believed to be dangerous and a malevolent person can do harm to a menstruating women by using black magic. Interestingly in Asia including India such beliefs are still practiced. However there seems to be no logical or scientific explanation for this. Such taboos about menstruation present in many

societies impact on women's emotional state, mentality and lifestyle and most importantly health. The challenge of addressing the socio-cultural taboos and beliefs in menstruation is further compounded by the fact that the women's knowledge levels and understandings of puberty, menstruation and reproductive health are very low'. Thus, there are incidences where unscientific practices are prevalent in India and lack of awareness amongst women has perpetuated the ills associated with menstruation and ultimately reproductive health. Such issues not just have psychological implications but also pose health hazards to them. Socially they are subject to restrictions and superstitious practices.

Geertz (2016) also asserts that periods lead to multiple difficulties for girls by stating that 'with the onset of puberty, outcomes for girls began to diverge and girls face increasing restrictions to their mobility and agency. They face significant barriers to a comfortable and dignified experience with menstrual hygiene management. 71% of girls in India report having no knowledge of menstruation before their first periods. Girls receive inadequate education on menstruation pre-menarche. Commercial pads are expensive for low income users, and low cost pads vary in reach and quality. Disposal solutions for menstrual waste are largely unexplored. Girls do not consistently have access to education on puberty and menstrual health. In India, girls often turn to their mothers for information and support, 70% of mothers consider menstruation "dirty and impure" further perpetuating taboos. Menstrual cycle may also cause low self esteem in girls, lack of dignity, non-prioritization of girl's education, absenteeism and environmental hazards due to improper disposal by women. This makes it clear that woman face double edged burden as her health, hygiene and development gets marginalised. Since it is the mother towards whom a girls turns to during times of her menarche, but she seldom gets that psychological support and strength. Instead she is treated like an untouchable and her freedom is curtailed. The episode of menarche is probably very distressful because a girl finds herself isolated and outcast from the childhood. Her childish innocence is not mature enough to gallop the sudden indifferent treatment meted out to her.

According to National Health and Family Survey(NFHS) 2016 of J & K state : 62% women still use cloth during menstruation cycle, only 49% use sanitary napkins and 20% use locally prepared napkins. Sanitary napkins are not accessible to all girls alike. Sanitary napkins take away much of the discomfort and also help to maintain hygiene. Menstruation blood is mainly considered unhygienic and impure but science regards that it is as impure or pure as the blood flowing in the veins. Regarding it impure is an age old phenomenon and this connotation also has religious sanction. A quote from bible states that (Leviticus 15:19-33)

"Whenever a woman has her menstrual period, she will be ceremonially unclean for seven days. Anyone who touches her during that time will be unclean until evening. Anything on which the woman lies or sits during the time of her period will be unclean. If any of you touch her bed, you must wash your clothes and bathe yourself in water, and you will remain unclean until evening. If you touch any object she has sat on, you must wash your clothes and bathe yourself in water, and you will remain unclean until evening. This includes her bed or any other object she has sat on; you will be unclean until evening if you touch it. If a man has sexual intercourse with her and her blood touches him, her menstrual impurity will be transmitted to him. He will remain unclean for seven days, and any bed on which he lies will be unclean. If a woman has a flow of blood for many days that is unrelated to her menstrual period, or if the blood continues beyond the normal period, she is ceremonially unclean. As during her menstrual period, the woman will be unclean as long as the discharge continues."

There is quite a possibility that practice of looking down upon menstruation as impure; may have further degraded the status of women who go through this process every month for seven continuous days. Though the status of women is low in comparison to men throughout India but Haryana state has an unexplainable aversion for female offspring. The recent past of Haryana bears testimony to the fact that girls are unwanted in this northern state. Legislative provisions and strict compliance though brought some relief but evils like foeticide, infanticide and sex selective abortions have high reportage from this state. Haryana is notoriously famous for its distorted proportion of females over males being among the states which remain the constant cause of concerns. Nagla M. (2013) also states that Haryana provides an ideal situation for exploring gender disparity in child health in India. It is a fairly well developed state with 3<sup>rd</sup> highest per capita income in India. It is also a state which has shown strong son preference. It has the most unbalanced sex ratio in India, which is a grim indicator of the persistence and severity of discrimination against girls and women. The strong preference for sons over daughters and resulting discrimination against daughters in India is well known, though the preference is not uniformly observed across different regions of the country. Knowledge of levels and patterns of sex differentials in ill-health, malnutrition and treatment is important.'

According to Rosenzweign (1943), in many primitive cultures menstruation has been ascribed to the cycles of the moon or tides. It has, moreover, been thought of as a dangerous condition requiring various taboos. Frazer in his "Golden Bough" cites countless restrictions imposed upon the menstruating women for the protection both of herself and the community. Even today there are cautions observed during the menstrual period which are directly descended from these earlier superstitions. The prohibition of bathing-originally intended to protect the local stream, used in common by the whole tribe, from contamination by menstrual blood- is a good example of such survival. In this sphere as elsewhere, however knowledge gradually replaces superstition and physiology and psychology elbow out lunar myths and tribal taboos.

According to Marvan M. (2003), most women experience changes surrounding the start of menstruation. These changes are influenced by socio cultural context. Consequently, certain changes are pronounced in some cultures than in others. Girls enter menarche with clear set of premenstrual expectations that may alter their menstrual cycle related experiences when they become postmenarcheal. A comparison of the results from urban and rural girls revealed that urban girls expected negative premenstrual changes more, while rural ones expected positive changes more. These differences suggest that the cultures in which girls are brought up have an impact on their expectations. Urban girls are more exposed to media which present a picture of menses as a debilitating event, while rural girls link menses with health because it is associated with the ability to have children.

According to Gupta, J. and Gupta, H. (2001), menstruation is a significant process that begins in the life of the girl at the time when she enters or is about to enter adolescence. The first menstruation is often horrifying and traumatic to an adolescent girl because it usually occurs without her knowing about it. In most instances, a sense of shame is born with puberty. Two factors which contribute to this feeling of humiliation and inferiority are a girl's discovery of her sexuality and the insinuation of the idea that menstrual blood is impure and polluting. The behavioural patterns in response to menarche are usually influenced by certain taboos, beliefs, myths and superstitions and, in the adolescent, they manifest themselves in fanciful and frightening suppositions such as: "periods are often foul, I am untouchable" or "menstrual blood is excrement which a women's body procedures and casts out".

The grim reality about evil practices associated with menstruation is that it has venomous done harm to the social status of women and it acts as an impediment to their claims for equal treatment. The cultural and traditional practices have resulted in such mental conditioning of women folk that discussion about menstrual issues in open forums results in embarrassment. The studies already conducted on this issue reveal about the horrific and discriminatory effect it has on women. There is a need to carry out exploration followed by description of the extent of social exclusion that is relegated to menstruation. The present study is an attempt in the same direction.

### **MATERIALS AND METHODS:**

This study is conducted with a qualitative approach to facilitate the analysis of multidimensional impact of menstruation. The research design is descriptive in nature and it also compliments the qualitative approach undertaken for the purpose of understanding the phenomenon at biological, social and psychological levels.

**Universe:** The universe is 40 women in the 19 households belonging to migrant population from Haryana state residing in the slum area of Jammu city.

**Sample:** Total sample size is 20 females in the age group of 13 to 45 years. The sampling technique used for the study is Quota Sampling in which equal weight is assigned to each household present in the area of study. Researcher used this sampling technique by first determining the universe selecting the sample in accordance with the objective and nature of study and time available. Accordingly researcher used quota sampling by including one woman from each household. This age group is selected as it is characterised by menarche and onset of reproductive age.

**Locale of the study:** The locale of the study is the slum area named as Kalka Colony located near lower Bahu Fort area in the Jammu city.

**Tools of data collection:** Semi-structured Interview schedule was used as a tool for data collection. The tool was administered by the researcher herself as part of the qualitative study. The questions in the interview schedule were selected on the basis of review of literature and pre-testing with the initial drafts of the tool. The tool was finalised in the third draft which was again edited after pre-testing in the field setting. The questions in the interview schedule were categorised in three domains. The first type of question indicate the understanding of the respondents about the physical aspects of menstruation cycle, the second set comprises of question regarding social implications of the menstruation cycle in the life of the respondents and the third category questions indicate psychological implications of menstruation.

**Analysis:** Analysis of the data collected was done using statistical procedures and by establishing interconnectedness among the responses.

### **Results**

The findings from the qualitative study are presented in the tabular format. In order to understand the nature of problem of this descriptive study, the responses mainly assisted in understanding the problem and explaining the phenomenon from the perspective of the qualitative study simultaneously.

<b>Table No: 1 Profile of Respondents</b>	<b>No of Respondents</b>	<b>Percentage</b>
<b><i>Age of Respondents (n=20)</i></b>		
13-18	4	20%
19-24	4	20%
25-30	6	30%
31-45	6	30%
<b><i>Religion</i></b>		
Hindu	20	100%
<b><i>Place of origin</i></b>		
Haryana	20	100%
<b><i>Occupation of Respondents</i></b>		
Housewife	12	60%
Labourer	7	35%
Teacher	1	5%
<b><i>Educational status of Respondents</i></b>		
Illiterate	8	40%
Middle school	7	35%
High school	3	15%
Higher Secondary School	2	10%

The information regarding profile of the respondents is presented in Table No: 1. The data about the age of respondents depicts that majority of women covered in the study are in the age group of 25-45 years (60%) and their mean age is 27.1 years which implies that they are in late adulthood and have been experiencing menstruation from at least past 10 years. All the respondents belong to Hindu religion. Majority of women are housewives (60%), followed by labourers (35%), only a few women (5%) work in the organised sector as Teacher. The educational status of the women is very poor as most of the women (40%) are illiterate, 35% have received education till middle school, 15% have done High school and only 10% have education till Higher secondary school.

<b>Table No: 2 Experience and perception of respondent about menstruation (N=20)</b>	<b>Number of respondents</b>	<b>Percentage</b>
<b><i>Prior knowledge of menstruation</i></b>	18	90%
Mother	8	40%
Media	5	25%
Sister	4	20%
Friends	3	15%
<b><i>Physical symptom associated with Menstruation</i></b>		
Abdominal Pain	20	100%
<b><i>Psychological symptom associated with Menstruation (multiple response)</i></b>		
Tension	10	40%
Frustration	8	32%
Anxiety	4	16%
Irritability	2	8%
Sleep disturbance	1	4%
<b><i>Opinion of Respondents about impurity associated with menstruation</i></b>		
Yes	19	95%
No	1	5%
<b><i>Reasons for belief associated with impurity (n=19)</i></b>		
Cultural Practice	12	63%
Menstruation blood is dirty	7	37%
<b><i>Type of protection used by respondents during periods</i></b>		
Napkins	11	55%
Cloth	9	45%
<b><i>Disposal mechanism used by respondents</i></b>		
Dump cloth/ napkin into Canal	20	100%
Dump cloth/ napkin into Dustbin	0	0%



<b><i>Opinion on maintenance of personal hygiene during menstruation cycle</i></b>		
Yes	20	100%
No	0	0%
<b><i>Ways of maintaining personal hygiene during menstruation cycle (multiple response)</i></b>		
Daily bath	19	95%
Use of clean cloth	4	20%
Using clean toilet	3	15%
Use of sanitary napkins	14	70%
<b><i>Embarrassment faced by respondents during menstruation cycle</i></b>		
Yes	20	100%
No	0	0%
<b><i>Reason for embarrassment faced by respondents during menstruation cycle(multiple response)</i></b>		
Scared of stains	9	45%
Problem in Disposal	9	45%
Problem in maintaining secrecy	4	20%
Bodily Discomfort	2	10%

Table No: 2 depict information regarding the experiences of the respondents associated with menstruation. Almost all the women (90%) stated that they did not have any prior knowledge about menstruation. Most of the girls (40%) gained knowledge about periods from their mothers, followed by media (25%), sisters (20%) and friends (15%). Almost all the respondents (90%) were not cautioned or prepared about periods and their reaction to the first period was shocking, loaded with discomfort and they were unable to handle the situation. The menstrual blood is accompanied with physical and psychological symptoms. As far as physical discomfort is concerned, it is manifested in form of abdominal pain which was reiterated by all the respondents (100%). At the same time the psychological symptoms occur in various forms like tension (40%), frustration (32%), anxiety (16%), irritability (8%) and sleep disturbance (4%).

When the respondents were enquired about their coping mechanism with respect to problems during menstruation, it was observed that only 55% respondents were using sanitary napkin and the rest (45%) were dependent on cloth protection. The disposal mechanism is also not environment friendly as all of them throw the used napkins and clothes in the canal flowing through their community which further merges with the main river Tawi. All the respondents

(100%) consented that Hygiene is an important consideration of menstruation and they maintain their hygiene by taking daily bath (95%), using sanitary napkins(70%), use of clean toilet (20% and use of clean cloth (15%). It was also observed during the study that notion of impurity is also associated with the menstrual cycle. Almost all the respondents (95%) considered themselves impure during menstruation for reasons like cultural practice of considering menstruation impure (reported by 60% respondents) and other respondents consider menstrual blood as dirty (40%). These are the myths that aggravate dysmenorrhoea or the discomfort associated with it. The women in the study see menstruation as an embarrassing situation and the main fear reported by 45% of respondents is that of getting blood stains on clothing and an equal percentage of respondents feared being caught while disposing sanitary napkins.

<b>Table No: 3</b> Restrictions imposed on respondents because of menstruation (N=20)	<b>Number of respondents</b>	<b>Percentage</b>
<i>Areas in which restriction is imposed on respondents (multiple response)</i>		
Visiting religious places and performing religious activities	20	100%
Dietary restriction	17	85%
Physical activities	10	50%
<i>Changes in life of respondents due to menstruation (multiple response)</i>		
Limited access to education	9	45%
Confinement at home	4	20%
End of childhood	8	40%
Special protection given by family members	13	65%
Restriction in having male friends	5	25%
Cause of early marriage	6	30%
Change in dressing pattern	4	20%
Increase in level of maturity	13	65%
Change in relationship	7	35%
<i>Person imposing restriction on respondents(multiple response)</i>		
Mother	16	80%
Father	1	5%
Yourself	6	30%
Teachers	0	
Friends	1	5%

<i>Attitude of respondents towards the socio-cultural norms attached to menstruation</i>		
Find them rational	7	35%
Find them irrational	7	35%
Feel indifferent	6	30%
<i>Response of respondents towards socio cultural norms</i>		
Express dissent	1	5%
Don't follow them	3	15%
Disagree but still follow	5	25%
Want to change them	1	5%
Follow them	10	50%

The respondents in the study reported that they face a number of restrictions owing to menstruation and majorly it is related to visiting religious places and performing religious activities (100%), followed by dietary restriction (85%) and undertaking physical activities (50%).

The qualitative analysis of the data collected from the respondents reveals that menstruation has not brought just physiological changes in their bodies but the social reality of women has also undergone change. Since menarche marks the beginning of reproductive age, majority of respondents (65%) expressed they are provided more protection by family members and an equal proportion of them stated that their experiences related to their social treatment after menstruation has increased their level of maturity. 45% respondents have been made to compromise their educational opportunities and 40% of them consider that their most beautiful phase of life, i.e. childhood came to an abrupt end due to menstruation. 35% respondents witnessed change in relationship with significant family members, 30% attributed that it also leads to early marriage of girls, whereas 20% respondents experienced confinement at home and restriction in dressing pattern. It is worthy to note that in the initial stage these restrictions are imposed by the mothers (80%) and then the girls themselves (30%) follow the societal rules and rituals related to menses. The mothers play a significant role in the life of adolescent girls and her role as a mother towards daughters is suppressive in nature after their menarche. Thus a physiological process of the body has many social implications on the lived experiences of a female in slum areas. In response to the restrictions imposed on them, the respondents felt irritation (50%), tension (35%) and frustration (15%).

The discrimination between boys and girls becomes loud and clear after menstruation. The incidences laden with, shame, guilt and embarrassment render envy in the minds of girls against males. All the respondents reported that they envy males because they look down upon girls due to change in the lifestyle of girls. Men consider them weak (55%) and impose restriction (45%) on them. Though with the passage of time, all the respondents have developed coping ability but every episode is preceded by anxiety and succeeded by a sigh of relief.

When the respondents were enquired about their attitude towards the socio-cultural norms associated with menses, 35% of respondents found them rational and the same percentage found them irrational; a significant number of women (30%) felt indifference towards the same. The respondents were also enquired about their response toward socio-cultural norms, majority of them (50%) followed them, 25% disagreed but followed the norms, 15% did not follow them, only 5% expressed their dissent and 5% wanted to change the norms.

## DISCUSSION

Menstruation cycle is one of the most important part of womanhood. Although, it is entirely a biological process but social and psychological implications on the life of women have turned it complex. Due to the direct relation of menstruation cycle with culture and religion, many women ignore the discriminations and restrictions imposed upon them. Mother is the prime informant about menstruation cycle who gives very vague and inappropriate knowledge to the daughters. It is not right to believe that women are orthodox and backward that's why they prefer cloth over sanitary napkins. As according to this study, sanitary napkins are expensive for low income users. Disposal mechanisms for menstrual waste into the canal which joins the river make the river polluted and unfit to use. The dearth of municipal dustbins in the slum areas leads to environment hazards.

All the women under study face restrictions in mobility and access with the onset of menstruation cycle like special care of security to girls, not to visit religious places, not to perform religious practices, difficulties in undertaking routine activities, change in food habits, change in dressing patterns and restriction in not having male friends. Everyone consider menstruation as impure and dirty due to taboos. All the restrictions are mostly imposed by mothers and elder women of the family. School and teachers have no role in providing information about menstruation cycle.

Many women consider menstruation cycle causes frustration, tension, anxiety, irritation and sleep disturbance. All of them envy boys as they do not have periods and consider them weak during periods. After having some experience of menstruation, women find it easy to cope with difficulties regarding menstruation cycle but if they are given proper information pre menarche, it would ease their coping abilities. Almost half of the women find socio cultural norms associated with menstruation cycle rational just because it manifests a strong relationship with culture and religion. Also due to low autonomy and status in the family; none of them have any choice other than to follow them.

The fact that sex education is not imparted to children in our country by both school and family, it leaves the girls unaware about menstruation. For girls, when they miss out on prior information about periods, the first episode of menstruation comes as a shock. Not being able to manage it well, it is also loaded with discomfort. The tender age of girls at the time of menarche, leaves a deep impact on their mental health, which is no less than a psychological trauma. It is being observed that their understanding about hygiene is limited only to their personal cleanliness and there is no awareness about environmental risks associated with improper disposal of non-biodegradable napkins. Since the sanitary napkins are made using plastic, their disposal in water bodies can lead to serious environmental risk. The slum area of Kalka colony falls under the municipal limits of Jammu city but no dustbin has been placed in the community by Municipal Corporation. The waste from the community is disposed in the canal, the only natural resource of the community. As per NDTV reports, Myles Ellege, Senior Director at RTI International, a

leading non-profit applied research and consulting organisation based in North Carolina, US, states that “The issue of managing menstrual waste is one that needs more attention... MHM (Menstrual Hygiene Management) is a neglected issue, and disposal is probably the most neglected topic in the MHM value chain,” Ellege told IANS in an email interview<sup>1</sup>. In the same report, it has been mentioned that estimated annual menstrual waste in India is 113000 tones.

1 *Indo-Asian News Service, in their report of June 5, 2017 titled ‘How Disposable Sanitary Napkins Affect Environment’, retrieved from <https://everylifecounts.ndtv.com/disposable-sanitary-napkins-affect-environment-13914>*

The study revealed that respondents cannot burn the used clothes and napkins as their culture prohibits putting menstrual blood to fire. The women belong to Haryanacommunity and the cultural practices of Haryana are upheld even after migration to Jammu. The myths associated with menstruation still find place in the modern society. The age old cultural tradition of practising untouchability during menstruation is prevalent even till date; completely on unscientific basis. It is still believed that menstruating women can contaminate food and hence are not permitted to perform routine activities of the house and religious offerings. They are socially excluded in their own household and this exclusion continues every month till they attain menopause. This ritual makes them accustomed to this exclusion and brings women to a point where they doubt their own purity and consider themselves as impure. However, as long as general hygiene measures are taken into account, no scientific test has shown menstruation as the reason for spoilage of any food in making<sup>2</sup>. The qualitative analysis of the responses explains that the restrictive practices are passed from one generation to another through mothers. Women have again proved to be the torch bearer of patriarchy.

As elsewhere mentioned in this paper by the researcher, women are expected to practice complete obscurity about menstruation from the male counterparts; and fear of stain and being caught while disposing the same puts the female folks in embarrassing situation. The embarrassment that the women under this study encounter is mainly because of the belief that it is a shameful event which needs to be hidden from others. This practice is exclusionary towards women as it is not acceptable to talk about menstruation in Indian social context. The practice of putting dietary restriction is also unscientific. They face restriction in including sour/ tangy food items like curd, pickle and tamarind in their diet as it is believed to hamper the cycle. Onset of Menstruation also calls for exclusion in various other ways which act as barrier in the development process of women and girls. Garg and Anand stated in their article titled ‘Menstruation related myths in India: strategies for combating it’, that as far as the exercise is concerned, many studies in India and elsewhere have revealed that many adolescent girls believe that doing exercise/physical activity during menses aggravate the dysmenorrhoea while in real exercise can help relieve the menstruating women with symptoms of premenstrual syndrome and dysmenorrhoea and relieve bloating. Exercise also causes a release of serotonin, making one feel much happier<sup>2</sup>. The women and girls under this study reported erratic practices associated with periods like not taking bath as that would lead to heavy bleeding, not to use makeup or see mirror.

## CONCLUSION:

Menstruation cannot be understood as a pure physiological phenomenon owing to the stringent social practices associated with it. The socio-cultural practices have acted against the status of women. The psychosocial impact of menstruation has proved to be detrimental to the

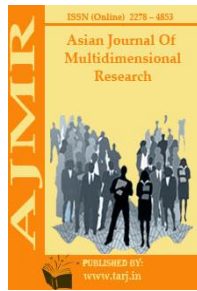
development of females. The reproductive powers have ended up in being associated with frailty on the part of women; whereas for males, it is regarded as a symbol of masculinity. The continuity of traditional malpractices have altered the entire ideological process of majority of women. It is important to target this social and self-

2 Suneela Garg and Tanu Anand (2015) *Menstruation related myths in India: strategies for combating it* : Department of Community Medicine, Maulana Azad Medical College, New Delhi, India Published in *Journal of Family Medicine and Primary Care*, 2015 Apr-Jun; 4(2): Pg. 184–186 -imposed exclusionary practice by helping women in detaching shame and guilt associated with menstruation. They need to be enabled to accept their bodies without being apologetic. Creating platforms for discussion can foster desired gender based equality and such discussion should compulsorily involve men.

They have to be made equal partners in bringing about empowerment of women. Awareness about menstruation management in health care system, supply of sanitary napkins, dietary supplements, community planning for waste disposal and access to health care should be strengthened to improve the menstrual health of women. If India supports WHO's goal of Health for All, then it needs to immediately address health and sanitation issues related to menstruation. Development of humans is a misnomer without the sustainability of environment, so menstrual waste management is also an important area of concern. There is also a pressing need of undertaking further action orientated research and planning interventions targeting the myths associated with it. The factors which lead to social exclusion of women during and because of menstruation need to be addressed at the individual, societal and national forums. Sensitization, awareness, focussed group discussions and mass media should also be constructively used in providing education to the masses about menstruation cycle and divulging myths associated with it. This will certainly come as a major respite for women and enable them to lead their daily lives with dignity and self-worth.

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## **AD HOC PUBLIC EMPLOYMENT**

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### **ABSTRACT**

*Ad hoc public employment has always been a subject matter of concern for the Judiciary from a long period of time. Affairs like mode of appointment, scale of pay, kind of work, time period of employment, regularization etc. related to such employees has been the elements of significance in the legal discourse. It was a challenge before the Courts to impart justice by balancing the rights of the numerous citizens not before the Court, as against the few before the Court. This article attempts to bring a coherence in the issues related to such matters through various judgments of the Courts. It also focuses on a paradigm shift in the views of the Hon'ble Apex Court through legal trends in this issue. Author tries analyze the landmark verdict given by the Supreme Court in Umadevi's case and draw various conclusions from the same.*

**KEYWORDS:** *Adhoc, Public Appointments, Back Door Entries, Regularization, Litigious Employment, Individualizing Justice, Employees, States Instrumentalities.*

## INTRODUCTION

“*Ad hoc*” is a Latin phrase, which literally means “*to this*”.<sup>1</sup> In contemporary language, it is used as “*arranged or done for a particular purpose only*”,<sup>2</sup> “*for a special case only, without general application*”.<sup>3</sup> In legal language also it wields the same essence, “*for this special purpose*.”<sup>4</sup> Whereas, a public employee is someone who works for the government, either in central government or local government.<sup>5</sup> *Ad hoc* appointments is a convenient way of entry, usually from backdoor, at times even in disregard of rules and regulations, are comparatively current innovations to service jurisprudence.

Under the Constitution of India, the right to employment is not a fundamental right. Whereas the Constitution of India confers power on the appropriate authorities to regulate the recruitment to the public services of the Union or any State<sup>6</sup> under Article 309, proviso of Article 309 or subject to law made by competent legislature by executive orders.<sup>7</sup> The creation and abolition of post is the privilege of the Executive. The Executive has the right to exercise this power by formulating the rules under the proviso of Article 309 or in the absence of such rules by issuing instructions.

But the power conferred with the executive under Article 309 has to be exercised in accordance with the other provisions of the Constitution of India, especially Part III, *i.e.* the Fundamental Rights. The drastic power under Article 309 of the Constitution is required to be exercised in a manner that it does not conflict with any other constitutionally guaranteed rights such as Article 14 and Article 16 of the Constitution.<sup>8</sup> The recruitment rules of employment covered by the regime of Article 309 of the Constitution can be either prospective or retrospective subject of course to the rule of non-arbitrariness.<sup>9</sup>

### **Status of *Ad hoc* employment prior to *Umadevi***<sup>10</sup>

Issues like mode of appointment, scale of pay, kind of work, time period of employment, regularization etc. related to *ad hoc* employees has been an element of concern for the judiciary from a long time. There has been a paradigm shift in the views of the judiciary related to irregular employment in a long course of time.

Initially, in the judgments of *Dhirendra Chamoli*,<sup>11</sup> *Bhagwati Prasad*<sup>12</sup> to *Piara Singh*<sup>13</sup>, the Hon’ble Supreme Court through expanding the scope of equality enshrined in the Constitution was of the view that the employees appointed on *ad hoc* basis should be treated at par with the regular employees in terms of payment of salaries and allowances and are to be regularized. Even in some cases, the Courts ordered the States and their instrumentalities to frame laws for regularization of such employees.<sup>14</sup> On several occasions, the schemes made by the State governments and their instrumentalities for regularization of such employees irrespective of their mode of appointment were ratified.<sup>15</sup>

With the changing situations resulting into drastic circumstances, there was a paradigm shift in the views of the Hon’ble Apex Court. In a judgment, the Apex Court was of the view that the infection of making *ad hoc* appointments arises either because the appointment authority resorts to it deliberately as a favour or to accommodate someone or for any extraneous reason ignoring the regular procedure provided as a pretext under emergency measure.<sup>16</sup> In an another judgment, the court took a strict stand and made a remark that, “*those who come by back door, should go through that door*”.<sup>17</sup> Further, the Hon’ble Supreme Court was of the view that no regularization is permissible in exercise of power conferred under Article 162 of the Constitution if the appointments have been made in contravention of the statutory rules.<sup>18</sup>



**An analysis of *Secy. State of Karnataka and others v. Umadevi and others*<sup>19</sup>**

*Secy. State of Karnataka and others v. Umadevi and others*<sup>20</sup> is a landmark balanced judgment of the Constitution Bench Hon'ble Supreme Court with reference to *ad hoc* employment. Every possible aspect related to irregular employment was taken into consideration. In this very judgment the Court held that equality in public employment is a basic feature of the Constitution of India and cannot be destroyed at any cost. The Hon'ble Apex Court also stressed on the unnecessary fiscal burden bought to the States on account of directions given by the Courts for regularization of employees which were employed purely on *ad hoc* basis and directed the High Courts on cautious exercise of power under Article 226 of the Constitution on such matters.

Some important conclusions that can be drawn from *Umadevi's* landmark judgment are:

- Continuance of contractual employees for long in public employment dehors the public employment scheme is bad.
- High Courts must not issue directions unless recruitment itself was made regularly and in terms of the Constitutional scheme.
- Courts do not interfere unduly with economic or financial arrangement of affairs of the State or its instrumentalities.
- Employee who had continued under the cover of an order of the Court under "*litigious employment*" or had been continued beyond the term of his appointment by the State, he would not hold any right to be made permanent in service on only basis of continuance, if not appointed following the due process of law. It is not open to the Court to prevent regular recruitment at the instance of such employees.
- Regularization cannot be a mode of recruitment and *ad hoc* employment can be made on a permanent vacancy only in contingency and the same should be followed by regular appointment as soon as possible.
- A one time regularization process to be conducted for irregular employees continuing in service for ten years without the cover of courts (*Litigious Employment*) on merits and principles laid down by this case.
- Earlier decisions of the Hon'ble Supreme Court counter to these principles will stand denuded.<sup>21</sup>

**Relevant cases on *Ad hoc* employment post *Umadevi*<sup>22</sup>**

In *Punjab Water Supply and Sewerage board v. Ranjodh Singh*,<sup>23</sup> the Court observed that, "*any departmental letter or executive instruction cannot prevail over statutory rule or Constitutional provisions. Any appointment thus made without following the procedure will be ultra vires.*"

In *State of Karnataka v. M.L. Kesari*,<sup>24</sup> the Hon'ble Apex Court noted that *Umadevi's* case casts a duty upon the government and its instrumentalities to take steps to regularize the services of those irregularly appointed, who had served for more than ten years without the protection of any interim orders by Courts or Tribunals.

In *Debabrata Dash v. J.P. Das*,<sup>25</sup> it was reiterated by the Court that appointment made on *Ad hoc* basis would always be sub ordinate to regular appointment.

Recently, the Division Bench of the Punjab and Haryana High Court<sup>26</sup> has upheld the regularization policy dated 29.07.2011 issued in accordance with *Umadevi's* judgment by taking the date of the judgment *i.e.* 10.04.2006 is the cutoff date. The later policies framed by the State of Haryana stand quashed being in violation of *Umadevi's* judgment and the Constitutional

scheme provided as under Article 14 and Article 16 of the Constitution of India while rejecting the application of the Doctrine of legitimate expectation and holding that no enforceable vested right in favour of the *Ad hoc*/ contractual/ work charge/ daily wages and part time basis workers.

## CONCLUSION

Regularization in public employment after backdoor entries without following a regular process of employment was a serious blow on the Constitutional scheme of public employment. It was not only a hazard to the rule of law, but also the mass infringement of fundamental right to equality in public employment of many aspiring citizens. It was a challenge before the Courts to impart justice by balancing the rights of the numerous not before the court as against few before the Court. And it was finally declared that “*in the name of individualizing justice, it is not possible for Court to shut it's eyes to the Constitutional scheme and the right of numerous as against few who are before court.*”<sup>27</sup> It can be hoped that latest judicial trends will stop the back door entries and help in cleansing the system of filling public employment posts through a regular process of employment.

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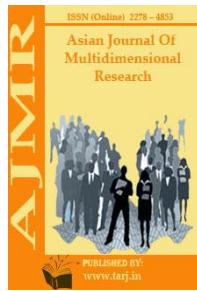
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## **NEED OF BHAGAVAD GITA CONCEPTS TO SOLVE EMOTIONAL AND INTELLECTUAL CONFLICT**

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### **ABSTRACT**

*Bhagavad means 'God' and 'Gita' means 'song'. 'Bhagavad Gita' therefore, can be translated as 'The song of our lord Krishna, one of many incarnations of the Lord, explains that he lives in each and every one of us, meaning that 'song of our Lord' is also the song that praises the beautiful divine within each one of us. It goes without saying that society is suffering from emotional and intellectual conflict. An intellectual conflict is a conflict of thoughts and ideas while an emotional conflict is a conflict of feelings. Intellectual conflicts start in our minds. Unlike opinions based on intellectual thoughts but feelings do not need a logical basis. For this reason, they cannot be reasoned away. Emotions affect how we see ourselves, our friend, family and people we love. Everybody is in dilemma that should listen to heart or brain. One can see that the Bhagavad-Gita takes a more comprehensive view about this. Arjuna like any other human being was confused for battle because he was to fight with his kith and kin. At present also men and women when they have to take difficult decisions that may often conflict with their long held opinions. Lord Krishna gave the knowledge and solution to Arjun for coming out this conflict. Not only in ancient time but in modern era also Lord Krishna morals and values can bring radical change for our society. This paper explores the ideas given by Lord Krishna to minimize the society's suffering regarding emotional & intellectual conflict. The novels have been taken The Serpent and The Rope, Bye Bye Blackbird and A Passage to India.*

**KEYWORDS:** 'God' and 'Gita' Means 'Song', Comprehensive

**INTRODUCTION:-**

“Mano matram jagat, mano kalpitam jagat” [In Sanskrit]

“The world is as the mind sees and feels it; the world is as the mind think of it” (as quoted by T.N.Sethumadhavan, 2010)

In Bhagavad Gita battle is shown between the two opposing sides: on the left side one hundred sons of Dhritrashtra and on the right side soldiers of the Pandava brothers. Arjuna starts feeling giddy when he sees his kith and kin are in the battle field. They are on the opposite side. Then emotional and intellectual conflicts arise in his mind. He says to Lord Krishna “Krishna, I seek no victory, or kingship or pleasures” (The Bhagavad Gita, P-25). Arjun thinks that it’s worthless to win over family for his own wealth and glory.

“We (Pandava brothers) sought kingships, delights and pleasures for the sake of those assembled to abandon their lives and fortunes in battle.” (The Bhagavad Gita, P-25)

Arjuna continued on to state that once the family was ruined and family duty was lost, only chaos was left to overcome what remained. He tried but all in vain. His mind was saying to do fight but his heart, emotions were stopping him to set his bow. He was suffering from emotional and intellectual conflict. Not only in social life but human being is facing this problem in personal life also.

Lord Krishna clears his doubt with the concept of Dharma. Dharma can mean ‘law of the universe’, ‘social and religious ruler’, or one’s own individual mission or purpose. On the Individual level, it can also mean a number of things .For example, in the Gita, Krishna points out to Arjuna that his Dharma is to be a warrior for fighting’s sake. His Dharma must be grounded in a proper purpose .Whatever role we are fulfilling at the moment is our Dharma at that moment.

**Intellectual and Emotional conflict in the novel the Serpent and the Rope**

In the novel ‘The Serpent and The Rope’ characters Rama, who is an Indian and Madeleine, a French girl is also facing this conflict. Rama, a young scholar, meets Madeleine at a university in France. Though they seem to be made for each other, both alike in temperament and character, at times they are divided, a huge gulf separating them. Rama’s trip back to India for his father’s illness forcibly reminds him of the underlying contrasts between India and Europe. This story shows that not only in Indian community but in all community these types of conflicts are available. Both husband and wife have to face their problems and find their own solutions. Rama is egotistical but Madeline is modest. There is misunderstanding between couple. Nobody is ready to fulfilling his or her duties. That is the base of Bhagavad Gita by Lord Krishna. Every person should focus on duties not results. They would not be estranged. This problem could be solved by ideas and solutions given by Lord Krishna.

**Intellectual and Emotional conflict in the novel Bye Bye Blackbird**

Bye-Bye Blackbird is the best example of identity crisis on one hand and the east-west encounter on the other hand. The problem of identity crisis is very common in our society. Especially when we talk about immigrants to the other countries, they suffer a lot for their physical, psychological, cultural and social identities. Bye Bye Blackbird by Anita Desai is novel of psychological conflict of the immigrants who suffer a mixed feeling of love and hate towards the country of their adoption. For lust of money, for getting good life style a lot of people go abroad.

But they get humiliated by foreigners. In modern era we are not able to take decisions that what is right and what is wrong for us. It is written in Gita that a person should be determined and invincible. He must know how to overcome on his weakness. Human beings must be able to take decision for them. This is not the problem of one people but whole society is burning with this problem.

### **Conflicts in the novel A Passage to India**

The novel 'A Passage to India' is written by E.M. Forster presents a true picture of conflicts between people, societies and countries. Moreover it concerns the relations between the English and the native population of India during the colonial period in which Britain ruled India. The main characters of the novel are Dr. Aziz, a Moslem doctor, Mrs. Moore, an elderly British woman, Adela Quested. Moreover, Right from the beginning till the end, the novel 'A Passage to India' shows Indian (East) as a holy nation, known for its ageless history, ruled by the British people (west). West cannot identify, understand and agree with the perfection of East. So there are always emotional, social, monetary and intellectual conflicts arise between east and west. This can be resolved by Lord Krishna views given in Bhagavad Gita that this world is like an inn. Nothing is permanent in this world. Human body is mortal. It is only soul that is immortal. Every materialistic thing will be destroyed one day. Lord Krishna begins his explanation by stating that all life on earth is indestructible, "Never have I not existed, nor you, nor there kings; and never in the further shall we cease to exist." (The Bhagavad Gita, P-31). If Arjuna loses his life, then he gains heaven and if he wins then he gains the earth; thus there is no need for Arjuna to fear for his own fate.

### **In Modern Era**

“Na tu evaham jatunasam na tvam neme Janadhipath

Na caiva na bhavisyamah sarve vayam atah param” [In Sanskrit]

(The Bhagavad Gita, P-31)

Certainly never at any time did I not exist, nor you, nor all these kings and certainly never shall we cease to exist in the future. All conflicts can be solved by teachings of Bhagavad Gita. It should be taught in school. It tells us the quality of good manager, good wife, good husband, good friend, good pupil and many more. In Bhagavad Gita, we can find the solution of every conflicts.

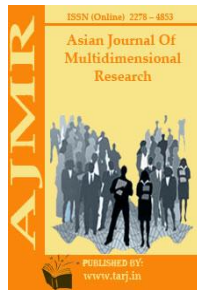
### **CONCLUSION**

The present generation of youth is currently experiencing a lot of stress, worries and tensions. They are suffering from lots of diseases. The teachings mentioned in the Bhagavad Gita can be used to help them to lead a quality life. The beautiful thing about Gita is that it does not advocate the follower to sacrifice anything in this material world. Lord Krishna's Bhagavad Gita is a true guide who turns human being weaknesses into strengths, share responsibilities, selecting right set of individuals and given the knowledge to solve emotional and intellectual conflict. So in this era also we can take the solution of any conflict from lord Krishna's Bhagavad Gita.

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## **RESEARCH STATUS OF PUBLIC ADMINISTRATION: RETROSPECT AND PROSPECTS**

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### **ABSTRACT**

*The present paper discusses the growth and development of Public Administration discipline in general and explores the research status of Public Administration on the basis of studies conducted by scholars of the Department of Public Administration, Kurukshetra University Kurukshetra and suggests suitable measures for improving the research status so that it may significantly contribute to the social sciences research. A close examination of the reports, thesis and dissertations clearly shows that most of the studies dealt with institutions and their working. The research has been mostly descriptive, seldom, prescriptive and has recommended half-hearted reforms in the administrative set-up. It has been aptly observed that their diagnosis of issues, challenges and problems are symptomatic, rarely clinical and generally shun radical prescriptions. The research studies focused on Politics, Rural Industrialization, Irrigation, Health, Public Enterprises, Agriculture, Cooperation, Planning, Social and Labour Welfare, Urban Governance, Women and Child Development, HRD, Poverty Alleviation, Environmental Administration, Housing, Informal Justice System, Drugs, Sports, Water Supply, Education, R.T.I, PRIs, Policing, Fish Farming etc. As many as 57.7 per cent studies were conducted covering state, 32 per cent on district level, 3.1 per cent each at national, inter-state and inter district levels. The studies were localized and ignored comparative aspects. In majority cases, average method was used and statistical techniques were hardly used to authenticate the conclusions drawn. There is an urgent need of theorization of Public Administration.*

**KEYWORDS:** *Descriptive, Prescriptive, Diagnosis, Symptomatic, Radical, Transformation, Authenticate, Theorization, Conservative, Prestigious, Sponsored, Cross-Fertilization, Enormous, Implanted, Mapping, Deteriorated, Initiatives, Modernization, Perspective, Liberalization, Reshaping, Globalization, Ethics, Elitism, Plagiarism, Transcended.*



## **INTRODUCTION**

Public Administration has emerged as an independent discipline. It has passed through different phases. The foundation phase started in 1887 was concerned with the concept of Public Administration which was the brain child of Woodrow Wilson who had indifferent process and resources for management of the state. It has been observed that Woodrow Wilson's contribution to Public Administration in its most formative period was weighty enough to be taken note by serious students of Public Administration. The universities in the United Kingdom being very cautious and conservative were wary of the developments in America. Moreover, the universities on the continent also had dragged their feet instead of keeping pace with some of the most prestigious American Universities.<sup>1</sup>

As regards teaching and research in Public Administration in India, Madras University had introduced a diploma course in Public Administration in 1937. It was followed by a diploma course in local self-government launched in 1938 by the University of Allahabad. The Department of Political Science, University of Lucknow offered a diploma course in Public Administration in 1945. The Nagpur University also joined this fraternity by starting a diploma course in local self-government. Efforts were also made in course of time by the Patna University, the Osmania University, the Aligarh Muslim University, etc. to introduce the diploma programmes in Public Administration. In 1954, the Indian Institute of Public Administration was established and within the Institute, the Indian School of Public Administration was also established in 1957. Master's diploma in Public Administration was started in 1959 by the Indian School of Public Administration. This Master's diploma programme was replaced by a training program for administrators in 1967. In the words of Prof. C. A. Perumal, "The Indian Institute of Public Administration functions as the Caaba of Public Administration in India. Its reports, surveys, seminars, training programmes, projects etc., have given a Philip to the study and research in Public Administration in India. One of our major objectives of Indian Institute of Public Administration is to promote a system of exchange of administrators and academicians. Though it sounds good in theory, it still remains an objective to be achieved..... The IIPA is also running a scholarly Journal called the Indian Journal of Public Administration which acts as a fora for the dissemination of knowledge in Public Administration."<sup>2</sup> According to the 64<sup>th</sup> Annual Report of IIPA 2017-18, the IIPA has continued its journey towards achieving a premier position one of the Central Governments foundational training and applied research institutes. Although its outreach into states has mainly been areas of ICT, impact assessments of Centrally Sponsored Schemes and urban management yet it has initiated closer ties with the states for research sponsorships and to take forward consumer welfare training and surveys. It has also supported research promotional and training activities at the state level. Besides, the Institute organizes Advanced Professional Programmes in Public Administration. So, the Institute has been regularly contributing in the field of training and research of Public Administration. The UGC and ICSSR have also made efforts to boost the research in the Public Administration through providing requisite funds for major and minor research projects, seminars, conferences and workshops as well as for grants for research publications. Even post doctoral fellowships are also being offered to attract the scholars having interest in the discipline in Public Administration.

In the words of Prof. Maheshwari, “The first wave in Public Administration in Indian Universities thus originated under the Institutional auspices of departments of Political Science and this institutional tutelage was not without advantage. There was cross- fertilization of Public Administration studies by insights drawn from sister disciplines, Political Science, History, Economics and Philosophy the linking of Political Science with Public Administration paved the way towards strengthening the interdisciplinary nature of Public Administration.”<sup>3</sup> It is interesting to note that after having introduced a diploma in Local-self government, a year later the Nagpur University started full fledged teaching in M.A. in Public Administration. For the first time a separate department i.e. the department of Public Administration and the Local-Self-Government was setup in the Nagpur University in 1950. Apart from Osmania, Punjab and Rajasthan Universities also set up independent department of Public Administration in 1963 and 1965 respectively for providing instructions for post graduate degrees. Since then the popularity of the subject increased year after year. It is worth noting that the recognition of theoretical knowledge and practical utility of the discipline is further in evidence in the mushroom growth of various kinds of diploma courses in one or the other segment of Public Administration which have been established either as regular day/evening courses or through correspondence by several universities and colleges affiliated to them as also by private agencies and institutions throughout the country. Efforts have also been made by the University Grants Commission and the Union Public Service Commission to recognize the identity of Public Administration as an independent discipline. Public Administration at the Post Graduate level with full fledged independent departments was being taught at thirteen universities and under graduate teaching was being done with or without separate departments in about fifteen universities. Further, the number rose to 50 universities and several hundred colleges. At present, teaching and research is being conducted through independent departments of Public Administration in about 300 universities, and there are about 225 UG colleges where Public Administration is being taught in India.

It has been observed that Public Administration has acquired an enormous relevance. The modern state is not merely a welfare state but has transcended practically all limits set by liberal democratic thought. The socialist doctrine and the exigencies of socio-economic transformation. With the expansion of both responsibilities and powers, the state impinges upon the life of the common masses more than ever before. In such a changing scenario it is indeed imperative that every citizen knows as to how the laws and administrative rules are framed and implanted. The operational part of machinery of government should also be made known to the citizens for whom the machinery operated. If they know and understand the functioning of government they would definitely be in a position to make it function within four corners of the laws and rules and keep it away from becoming high handed and irresponsible. Thus, to make the people know how administration is organized and carried on, teaching of Public Administration should start right from the schools to colleges and university levels. Not only this, but researches into every branch and aspect of Public Administration will go a long way in remedying the defects likely to arise as a result of the expansion of the administrative machinery for developmental purposes.<sup>4</sup>

### **The Present Paper**

The present paper has been devoted to discuss the development of teaching and research in Public Administration in India in general and examine the status of research in Public Administration discipline at Kurukshetra University Kurukshetra in particular and to suggest suitable measures for making the search more relevant, result oriented and fruitful.

It was in the year 1983 when the Kurukshetra University Kurukshetra had decided to provide for the subject of Public Administration. As it had to take some time to arrange for the required infrastructure to start it as an independent department, therefore, for the time being it was set up under the aegis of the department of Business Management. In 1985, the department of Public Administration was established in the Kurukshetra University Kurukshetra for teaching and research in the discipline of Public Administration. Since its establishment the department has completed 33 years of its academic journey and is counted among the well-established departments working in different parts of our country. The logic behind this has been that the faculty of the department comprised dedicated, sincere and hard-working teachers. Moreover, the department has regularly updated its syllabus to keep pace with the changing needs of our polity and administrative apparatus. It has significantly contributed in the different fields of research by way of guiding/supervising M.Phil. Dissertations, Ph.D. theses, Post-doctoral reports and submission of major and minor research projects, organizing workshops, seminars and research publications in the form of books, articles in national and international journals which constitute an important ingredient of any university teaching department. In view of its excellent contribution, the UGC had accorded SAP status by providing handsome amount for the development of department.

### **RESEARCH IN PUBLIC ADMINISTRATION**

It is an established fact that research plays an important role in the academic and professional growth of the discipline of Public administration. In fact, the strength of the discipline largely depends on the teaching and research. If the scholars in Public Administration sincerely engage themselves in fruitful and imaginative research, they can develop the discipline in its width and depth. But it would depend on their socio economic and political background. As most of the scholars hail from educated and middle-class background, therefore, it appears that they generally prefer to be part of Public Administration in India due to their earlier education and training in liberal democracy and elitism. Their studies/researches mostly deal with the working of institutions and their research is more or less descriptive, seldom prescriptive recommending half-hearted reforms in administrative setup. Besides, their diagnosis of the problems are symptomatic, clinical generally shunning any radical prescription. They are also silent spectators to the problems of social change and inequalities, keeping themselves busy tightening the loose nuts and bolts of Public Administrative machinery and discipline.<sup>5</sup>

Research in Public Administration helps the organizations in revising their policies, programmes, schemes and working procedures. that is why the highest priority has to be accorded to it by the universities and other research institutes. It is in this context that an attempt has been made to highlight the research achievements made by the department of Public Administration, Kurukshetra University Kurukshetra.

### **M.Phil. Programme**

The M.Phil. Programme in Public Administration was introduced during 1992-93 in Kurukshetra University Kurukshetra, which continued only for one session. However, it was reintroduced and is continued till date. A large number of M.Phil. degrees have been awarded to the M.Phil. Scholars. The research areas covered include: Women Education, IRDP, JRY, NRY, Public Enterprises, Labour And Social Security, Panchayati Raj, Urban Governance, Agriculture, PRMY, Food for Work, DRDA, RRBs, NABARD, Training Institutes, Small and Marginal Farmers, SGRYs, SGSY, Indra Awaas Yojna, Human Rights, Cooperatives, Metro Railways,

Welfare of SCs and BCs, Administrative Thoughts, 73<sup>rd</sup> and 74<sup>th</sup> Amendments, Primary and Secondary Education, etc.

### **Ph.D. Programme**

The Ph.D. Programme of the department of Public Administration has been gaining in numerical strength. As many as 97 candidates have been awarded Ph.D. degrees, Ph.D. registration of 13 candidates was cancelled due to one or the other reasons and the thesis of one candidate for the award of Ph.D. degree was rejected. One research report on women empowerment under Post Doctoral Fellowship was also completed and submitted to the UGC. Among the successful candidates whom the degrees were conferred, 57.7 per cent had conducted state level studies, 32 per cent district level and 3.1 per cent each at National, Inter-state and Inter-district levels. The Ph.D. research studies focused on Politics, Rural Industrialization, Irrigation Administration, Public Health Administration, Public Enterprises, Farming, Agriculture And Bureaucracy, Cooperatives, Planning, Social And Labour Welfare Administration, Urban Local Self-Government, Women And Child Development, Women Empowerment, HRD, Poverty Alleviation, Environmental Administration, RTI, PRIs, Policing, Personnel Administration In University Libraries, Role Of Voluntary Organizations, Citizen And Administration, Women And Judicial Process, Women Leadership In PRIs, Politicians and Administrators Relations, Rural Development Administration, Desert Development, Dimensions of Bureaucratic Corruption, Administration of SC Welfare, Administrative Culture, Organization and Working of Agricultural Marketing Board, MPLADs, Electricity and RD, Behavioral Pattern, Performance of Food Corporation for India, Disaster Management, State Control over PRIs, Working of Reformatory Homes, Child Labour, Capacity Building of Development Personnel, Official-Non Officials, Police Administration, Public Relations, Family Welfare, Lok-Adalts, Measuring Effectiveness of E-Governance, District Planning Committee, Organization And Working of State Transport, Implementation of MGNREGA, Job Satisfaction, Human Rights, etc. It has been aptly observed that due to lack of adequate teaching staff both the teaching and research suffered a lot. Had there been sufficient staff as per UGC recommendations, the things would have been different and there might have been much more research.

### **Research Projects**

As regards research projects, the teachers in the Department of Public Administration of K.U.K. have also completed major and minor research projects. The major research projects were on: Tribal Development in Rajasthan; Socio-Economic Development of SCs in Haryana; Utilization of Village Common Land in Haryana and Rajasthan; Rural Leadership; Mapping of Informal Justice System in Haryana; Child Labour in Haryana, H.P. and Punjab; and Welfare Policy and Programmes for SCs in Haryana. The minor research projects include Urban Local Government; IRDP; Evaluation of Fish Farmers Development Agencies and Water Supply and Sanitation. These projects were funded by the ICSSR and the UGC.

A close examination of the research contribution made by the faculty clearly shows that no doubt they have significantly contributed in the field of research in the discipline of Public Administration. However, the initiatives taken by the senior faculty has been a motivating force for the junior faculty to guide/supervise and conduct much more research for the development of Public Administration subject.

**Suggestions**

From the foregoing discussion, it is inferred that there is enough scope for improvement in research in the field of Public Administration. Following suggestions may be useful to make research in the Department of Public Administration more relevant and useful:

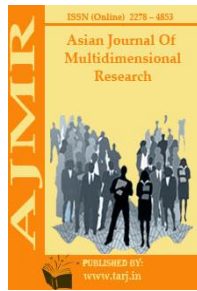
1. Over the years, the teaching staff position has deteriorated as mostly the vacant positions have not been filled. In such a situation, it was difficult for the teaching staff to meet the challenges emerged because of inadequacy of the teachers. If we want to establish good standard of teaching and research and to maintain the established standard, the government must look into the genuine need and demand and should immediately provide sufficient funds to the university so that the problem of staff could be solved by filling the vacant posts.
2. There should not be any compromise with regard to quality of research in public administration. The teachers should maintain the research standards by not allowing their researchers to use simple methods and techniques of data collection and the analysis thereof. The latest research techniques must be learnt and properly adopted to provide scientific base to research and to explore the less explored areas of research.
3. To develop and increase interest in research, report writing ought to be made mandatory for each and every candidate desirous to obtain Master of Arts in Public Administration. Each topic of the research should be timely and based on field data.
4. There is no denying the fact that the ICSSR and the UGC are sponsoring research workshops, however, these institutions must make it sure that workshops on research methodology must be funded and refunded followed by effective monitoring and evaluation of the effect of the workshops organized time and again so as to raise the level of research.
5. For the development of faculty, sufficient opportunities should be given to the teachers to undergo advanced courses in research methodology and in Public Administration in India and abroad to enable them for broader exposure to the advanced research.
6. The teachers guiding/supervising Ph.D. scholars should not allow their scholars to confine only to the use of simple average methods but should ask them to go in for comparative perspective/cross cultural research socially and administratively relevant having focus on the problems being faced by the people in the context of processes of modernization, politicization and economic liberalization.
7. The orientation of M.Phil. towards research only and M.Phil. scholars should focus on less explored topics of research so that some benefit of their research should accrue to the general masses. The scholars must not be allowed to select such topics on which enough research work has already been done. Plagiarism at any cost should not be allowed. Infringement of copy rights must be checked right from the very beginning with ultimate motive of maintaining the high standard of original research.
8. Last but not the least the teachers should be motivated to take research projects and preference should be given to such projects as can contribute by selecting topics of Comparative research in Public Administration. As there are less explored areas of research where more attention is to be paid. These include Policy Analysis, Public and Private Partnership, Role of IT in Policy Implementation of Agriculture, Industry and Rural Transformation, MIS in state and local government, State Property Tax Policies, Reshaping

Public Bureaucracy, Bureaucratic Culture, Organizational Change, Ethics and Public Officials, Role of Government Services, Socio-Psychological Aspects, Crisis Management, Impact of Globalization, Public Service Delivery, Judicial Activism, Corporate Governance, Education in Public Administration, Media and Administration, Subsidy Occupations, Air Service Administration, Impact of Malls on Small Business, New Public Management, Civil Society and Administration, Land Reforms and Administration, Impact of Crop Insurance, Tourism Management, Traffic Administration, Impact of Decentralized Planning, Sustainable Development, Toll Administration, etc.

Every suggested measure by the scholars has to be based on authenticity, reasoning and logic and should focus on actions to be taken at different levels including government, agencies, NGOs, media, community, etc. While suggesting, it must be kept in mind that as to what should be the type of actions, how the actions should be taken, where the actions are to be implemented and for whom these are to be taken. It will enable the concerned to forcefully implement the suggestions given.

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**SUSTAINABLE DEVELOPMENT AND GENDER EQUALITY–  
A CASE STUDY ON ROLE OF NGO**

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**ABSTRACT**

*The sustainable development goal (SDG) 2030 agenda was adopted by United Nations Development Summit which held at 25<sup>th</sup> sept. 2015. A set of 17 goals for sustainable development being included in the agenda in order to end poverty, discrimination, injustice, climate change, equality all over the world by 2030. Sustainable development goal (SDG) #5 refers to the gender equality and women's empowerment. It clearly advocates women and girls, everywhere, must have equal rights and opportunity, and be able to live free of violence and discrimination. Though women empowerment and equality is one of the 17 goals of sustainable development, but it is most crucial for inclusive growth and development of all dimensions. For achieving this goal non-government organisations can play an active role as they works at grassroots levels with women, human rights organizations and individual activists. Wherever they document violence and discrimination against women; can mobilize action to support efforts and stop these abuses. This is a case study of NGO operating in the district of Barabanki in the state of UP for women empowerment and financial inclusion. The aim of this study is to look at whether or not this NGO have the potential to empower women and create gender equality in its region. The analysis is based on qualitative, semi-structured interviews conducted on site and data published by NGO. The conclusion from the study is that NGO play an important role in gender equality and women empowerment, not only through directly providing opportunities to earn livelihood, but also by raising awareness of the importance of education, advocacy and by preparing them to be self-dependent. With an active action on sustainable development goal (SDG) #5, every*

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*part of the world can make progress towards sustainable development by 2030, leaving no one behind.*

**KEYWORDS:** *Sustainable Development Goals, gender equality, women empowerment*

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## **INTRODUCTION**

Women empowerment and financial inclusion is vital to sustainable development as it is integral for the realization of human rights and equality for all. The core objective of women empowerment is creation of society where women and men enjoy the same opportunities, rights and obligations in all spheres of life. Equality between men and women can only be established when both the genders have equal access to power and influence; have fair access for financial independence at work place or at entrepreneurial venture; having equal opportunities to education and the chance to fulfil personal ambitions, interests and skills; equal share of responsibilities of home and children and zero tolerance to any form of coercion, intimidation and gender-based violence both at work and at home.

However the matter of concern is that where gender inequality persists, it is mostly seen as excluded or disadvantaged women with respect to decision-making and access to economic and social resources. Therefore a crucial aspect of popularising gender equality is the empowering women, with a focus on identifying and redressing of power imbalances and giving women more autonomy to manage their own lives. This would encourage them to make their own decisions and actively involved in achievement and attainment of their own reproductive and sexual health. Gender equality and women's empowerment do not mean that men and women become the same; only that access to opportunities and life chances is neither dependent on, nor constrained by, their gender.

## **BACKGROUND**

There are number of non-government organisations in the state of Uttar Pradesh working at grassroots level for the eradication of social and economic problems of the society. After analysing the issues and concerns with gender equality in India especially at Uttar Pradesh, researcher studied the profile of five NGOs at Lucknow and Barabanki districts of UP that are actively engaged in empowerment of women. Among them Sarathi Development Foundation is one that operating in many districts of Uttar Pradesh. Sarathi is running multiple projects at the rural and urban areas for the gender equality and women empowerment being their priority, hence contributing to the achievement of sustainable development and gender equality.

## **RESEARCH QUESTIONS**

- What are NGOs doing to provide or/and improve gender equality and women empowerment?
- How do NGOs look at their own role to provide or/and improve gender equality and women empowerment?
  - What opinions do NGOs have on the effort made by the Government to provide or/and improve gender equality and women empowerment?
- What is the overall analysis of the NGO studied and its possibilities to provide or/and improve gender equality and women empowerment?



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## METHODOLOGY

The present study is based on both primary and secondary data. The primary data is gathered using the survey method and personal interview from an NGO functioning at Barabanki district. The selected beneficiaries for the present study are from villages at Barabanki district. The selected villages for the study are Kesarwa and Khajoor and NGO is; Sarathi Development Foundation. Secondary data is collected from the website and publications of NGO.

### Issues and Concerns of Sustainable Development

Gender inequality is considered as most widespread inequality and injustice prevailed in human history, eradicating this inequality will constitute to be the biggest movement of change of human history. Discrimination and violence has been faced by women all around the world since ages. Gap in gender equality has been observed in the all the sector throughout the world.

Studies revealed some alarming facts- girls enrolled in primary school in south Asia was 74 girls per 100 boys in year 1992 and this figures remains the same in year 2012. Another study in the relevant field discloses that in 155 countries of the world having at least one law that impedes women right for access to economic and social opportunities. The constitution of women in national parliaments around the world is only 23.7%. The gender pay gap amounts \$160 trillion to global economy. One in three women round the world experiences some form of physical or sexual violence or abuse in their lifetimes.

### Gender equality challenges in Uttar Pradesh

With 199 million people, Uttar Pradesh is the most populous state in India and is home to about 16% of the total population of India. The sex ratio at birth (878 girls to 1,000 boys) in the state has increased just by one percentage point in the past years and it continues to be far lower than the national average of 909 (2011-13). The overall literacy rate for those ages seven and above has improved over the past decade in Uttar Pradesh but continues to be far below the national average of 74% (2011). The difference between the 77% literacy rate of men and the 57% rate of women in the state is high, when compared to the national average which for men is 82% and for women 65%. Besides being a very populous state, Uttar Pradesh also has some of the poorest development indicators, especially with regard to the status of women and girls. The percentage of ever-married women who have experienced spousal physical or sexual violence is higher in Uttar Pradesh (42%) than in the entire country (37%). In the state, more than three-fifths of women (64%) who have only daughters have a desire for more children, compared to one-fourth of the women who already have two sons. A significant number of girls still get married before the legal age of 18. According to the National Family Health Survey-3 (NFHS-3), 59% of 20 to 24-year-old women were married before their 18th birthday. Early marriage is more prevalent in rural areas where 68% of women ages 20-24 had married before 18 and one-third had married before 15 years of age. Only one-third of the total girls' ages 15-17 are in school and 72% of girls discontinue their schooling in rural areas as per NFHS-3. According to Census 2011, women's rate of participation in the Uttar Pradesh workforce is very low (17%) and varies widely across the districts.

Demographic Profile of Uttar Pradesh at Glance		
Indicators	Estimates (year)	
Sex ratio at birth (girls per 1000 males)	87 (2006-08)	88(2011-13)
Literacy Rate	56(2001)	68(2011)
Male Literacy rate	68(2001)	77(2011)
Female Literacy Rate	43 (2001)	57(2011)

Source: Censuses, Office of Registrar General

### About the organisation

**Sarathi Development Foundation** is a professionally managed development organization registered under Societies Registration Act and is engaged in development services both at micro and macro level since 1998. For the last two decades organisation has been involved in providing technical resource support and grassroots level services. The organisation is actively providing its services in northern India with the support and assistance of range of agencies such as UNICEF, International Labour Organization, World Bank, Government, International NGOs and other civil societies. The existence and role is rooted in grassroots realities and opportunities to work for overall development of people in rural and urban areas.

The organisation aims at “People Based and Gender Sensitive Development”. This guides them to work with a clear focus on community based and community managed models having children, adolescent girls and women in center of development processes. Community based programming and ownership, cross cutting sectorial issues, convergence with government services & system, communication for behavioural change & development and capacity building for sustainability are essential parts of their models.

The efficient and smooth running of operation would not been possible without the dedicated team, quoted Mr. Akhilesh Tiwari (source). The following members constitute the Sarathi team:

Category	Numbers
Grass root facilitation team (Field Coordinators and Community facilitators )	222
Project Coordination, Convergence and Field support staff (District & Block level Coordinators)	47
Programme management, Monitoring & Technical Support Team (Program Manager, Programme Associate, Training Associate)	4
Administration and Accounts (Accountants ,Caretakers and Office Assistant)	5
Consultant and Advisors	3
Master Trainers	105
<b>Total</b>	<b>386</b>

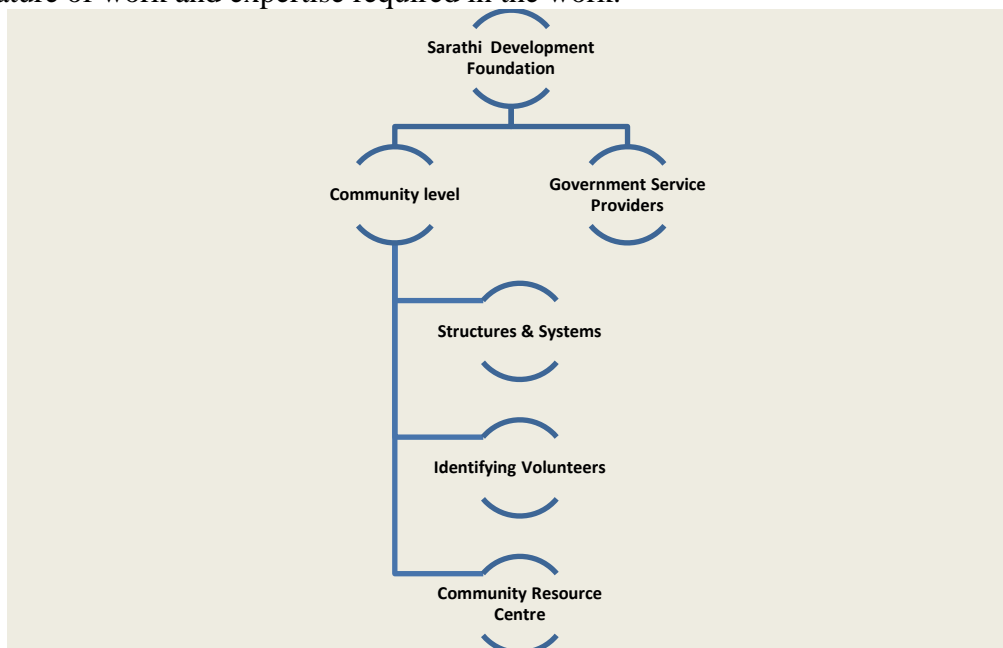
Source: sarathidevfo.org

### Functioning of NGO:

In order to get the clear view of working of the NGO, Mr. Akhilesh Tiwari director of Sarathi Development Foundation being contacted to get an appointment for the interview. After almost a month long time, Mr. Akhilesh gave appointment in the month of September this year. Answering the question about purpose of NGO, Mr. Tiwari said; “Every person has potential to make change”. This is the belief of the Sarathi. Keeping this in mind they are working towards making people self-sufficient. Their target groups are women, children and adolescent girls. The continuing projects of the organisation are: Saloni in Barabanki for the education of adolescent girls, Sankalp at Fatehpur for water sanitation and health. Self-help groups in Lucknow and

Barabanki, Project Asha for women awareness and HIV/AIDs project for truckers. The foundation worked as core group in Polio project of government under their Health projects.

To ensure the efficiency of the projects, the foundation worked on pre-described structure. The figure below indicates the working model of Sarathi Development Foundation. The NGO works at community level as well as govt. level. To work at community level foundation picks the targeted group according to field survey. There is well defined structure and system in the organisation for working, where volunteers being identified from the target group. These volunteers were provided with adequate training ranging from a month to few months depending upon nature of work and expertise required in the work.



*Source: Primary Source*

There are clear levels of authorities; every person at each level is answerable to immediate higher authority. Field staff has to submit its report on daily basis. Frequent meetings of staff members and beneficiaries are conducted. Volunteers are selected from the targeted population to better convey and share the issues at grassroots level. They also help the organisation to follow up its projects in future. Being the trained personnel within the community they continue to look after projects even without direct supervision from NGO. In order to assure efficiency of the projects the organisation works in same locality for a long period of time instead of working at multiple sites. There are community resource centres where meetings of centre head, area coordinator, volunteers being organised at least two times a month to check the performance of ongoing projects. Training of volunteers and supply of resources to the site are provided from these resource centres.

### **Funding of Sarathi**

One of the biggest hurdles faced by most of the NGOs in performing their function is lack of funds. The government releases fund for specific project only that too is quite uncertain as government funding depends upon priorities of ruling government. The non-government organisations though working on no profit basis still they have to recover their running expenses as well as salary and remuneration to staff and volunteers. Sarathi is fortunate enough to get support from various national and international agencies. They work in partnership with

UNICEF Lucknow, Catholic relief Services. World vision as their knowledge partner and funded by CSR (corporate social funding) for its projects.

### **Field Trip- Kesarwa and Khajoor Villages at Barabanki District**

To assess the performance of NGO in achieving gender equality and sustainable development, a visit to site being planned with the assistance of director of Sarathi Development foundation. The area coordinator of Barabanki district Ms. Pushplata accompanied to the site at village Kesarwa and Khajoor at the end of sept. this year. Kesarwa and Khajoor are the villages in district Barabanki and a few kms to Tata Motors Deva road Lucknow. Both the villages are having population of around 800-1000 people. Each one of the village have a school up to class eight. Sarathi foundation is running programmes for women and girls in these villages. Namely Saloni, BalPatrakar, Bal Bandhu and Self-help groups. Personal interview being conducted with the girls of Saloni project, BalBandhu, Bal Patrakar and member of self-help groups.

- **Girl Education (Saloni):** Programme Saloni aims at bringing back to school to those girls who dropout from the school. There are presently twenty-five adolescent girls at village Kesarwa associated with this project. There is one school in this Village that is up to class eight. To pursue further studies children need to go nearby intercollege which five kilometres away from the village. That makes parents restrict their daughters to continue further education. All these 25 girls in Saloni are dropouts after class 8<sup>th</sup>. Before starting project in the area, Sarathi's area coordinator first met the respected people of the village and convinces them about the importance of education for girls. With the support of village people the project Saloni initiated in the village. Saloni is a girl who is aware about her rights in the society and is concerned about her health and hygiene. A teacher named Priyanka is supervising the project at the village level and encouraging girls to convince their parents to re-enrol them in school. With effort of Sarathi five girls are re-enrolled in nearby intercollege. Besides knowledge of regular subjects, girls are being in taught about the self-respect, self-awareness, and health issues.
- **Bal Bandhu:** Balbandhu are the volunteer from the targeted group. Bal Bandhu project is operating at both the villages. They have been picked by the Sarathi among the target population and training is being provided to them at the resource centre. They are very helpful in bringing out the girls from their homes and encourage them join the Sarathi's projects. They too help in assuring the full attendance of girls at the classroom every day. They provide great help in understanding of problems of adolescent girls and bringing out the solution of their problem.
- **Child Reporter (BalPatrakar):** In order to empower the voice of young girls, Sarathi started the Bal Patrakar concept. The interested children having passion of writing are being selected. They have been provided with a material for writing and been told to express their views about the village school, Pradhan, problems of their village in a form of poem, story, article and drawing etc. Sarathi associate them with media group to publish their matter. It has two purposes, first the talent of children to express their view gets medium of expression, secondly actual problems at the grassroots level can be understood.
- **Self Help Group:**

Sarathi actively involved in creation of self-help groups. There are three SHGs in Keserwa and two in Khajoor village. The purpose is to empower women by making them financially independent and extend their support to the group members and to their families. Sarathi only

supervises the activities of SHGs. They make their own records and manage their bank account. A SHG has one president (Adhyaksh), one Secretary (Sachev), one treasurer (Koshaadhyaksh) and members. Regular meetings of presidents of SHGs operating in village Barabanki being organised at resource centre to follow up the working of SHGs.

### **ANALYSIS AND DISCUSSION**

A common pattern in both the villages when it comes to empowering women is that they both in some ways facing same problems. Both the villages in question agree on the fact that the role of NGO in awareness rising among beneficiaries is highly important, because many beneficiaries do not know need for women empowerment.

The aim of this study to examine whether or not NGO has the potential to improve gender equality and women empowerment and looking at its own contribution and its opinion about the effort made by the Government. From the interviews it has been revealed that NGOs exist, because the Government of India does not do enough when it comes to providing gender equality and women empowerment at grass root level. Government releases funds for particular purposes that too depend upon the priorities of ruling government. The funding is neither regular nor there is any system to follow up the development in long run, hence, NGOs have come up with different approaches. The Sarathi works as service provider to the government and help in successful implementation of government's schemes. Over the time, the Government of India has however taken a more active role in women empowerment issues and this made NGOs to change their focus from providing financial assistance to awareness rising, advocacy and preparing them to be self-dependent. Hence, one is able to see that the studied NGO have found their niche in awareness rising and this is an area where NGO have potential to change the situation. As interview with beneficiaries of both villages mentioned; it is important that the mentality of people change and people have to know their own rights in order to make use of them. In addition to this studied NGO is providing non-formal schooling to girls and empowering women through creation of SHGs. From the theoretical framework and the analysis it can be observed that there are many problems with NGO in performing its work. A theme with the NGO studied is that it regard its work as important even though there is some issues with funding and government support, yet it consider itself as medium to bring change in the society and helpful to government in framing its policies. When it comes to the effort made by the Government, the studied NGO agree on the fact that the Government has done a lot when it comes to women empowerment, but that is not enough because the implementation of government policies is poor.

The personal interview with the beneficiaries of NGO reveals the fact that NGO plays an important role in making them aware about their rights and providing encouragement to be self-sufficient. The adolescent girls of Saloni group now know the importance of education in life. The child reporter and BalBandhu scheme develops the skill of journalism and leadership among the children at very young age. The member of self-help groups realises the importance of savings and cooperation. The frequent meeting at resource centre provides the guidance to utilise their money efficiently.

**Bottlenecks:**

The major bottlenecks on the way of creating gender equal society is the attitude of people, availability of resources at rural level and attitude of parents towards girls' education. The personal interview conducted with the beneficiaries reveals the fact that:

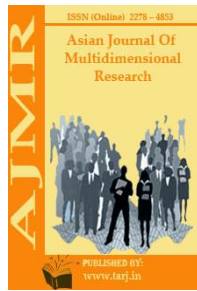
- Rural areas in country don't have resources to generate income. The women of self-help groups contribute their savings but unable to utilise them in productive manner. Most of the funding from government issued for SHGs are being utilised for fulfilling personal liabilities instead of generating income.
- The attitude of parents towards girl education is not positive. Though with the effort of NGO they agreed to send them to Saloni project within the village, only five girls being re-enrolled in nearby inter college in last two years.
- The monthly family income of beneficiaries range from 4000-5000, with around 7-9 members in family. The insufficiency to earn decent livelihood is the root cause of all the issues.

**CONCLUSION**

The overall conclusions from the study are that NGO have the potential to improve the situation of women through rising awareness of gender issues, advocacy and through imparting education to girls. But according to the studied NGO the main responsibility lies with the Government, which right now does not do enough when it comes to women empowerment and poverty elimination. The government needs to focus attention towards development of resources of income generation at rural level. The need of the hour is; government and NGOs should work together and complement each other for the achievement of common goal of sustainable development and gender equality.

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## **IMPACT AND ANALYSIS OF HORTICULTURE GARDENING ON HUMAN HEALTH**

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### **ABSTRACT**

*There is increasing evidence that horticulture nurtures substantial human health benefits. Studies reported a wide range of health outcomes, such as reductions in depression, anxiety, and body mass index, as well as increases in life satisfaction, quality of life, and sense of community. The present study studied the impact of horticulture on human health. The present study used the data of the different reports to substantiate the analysis. The estimates showed a significant positive effect of gardening and fruit consumption on the health outcomes. This study has provided robust evidence for the positive effects of gardening and fruit consumption on human health. A regular dose of gardening can improve public health.*

**KEYWORDS:** *Horticulture, Gardening, Health, Consumption*

## 2. INTRODUCTION

Globally, the ubiquity of the so-called lifestyle diseases, such as heart disease<sup>1</sup>, stroke<sup>2</sup>, depression<sup>3</sup>, diabetes<sup>4</sup>, and obesity<sup>5</sup> are becoming a major public health issue (Caballero, 2007; Janssen et al., 2005; Moussavi et al., 2007). It is, for example, estimated that worldwide, approximately 415 and 350 million people presently suffer from diabetes and depression, respectively, and hence both are costly to national health care budgets (IDF (International Diabetes Federation), 2015; WHO (World Health Organization), 2016). Unfortunately, this trend is expected to continue for the foreseeable future as a high number and proportion of the world's population will be living in urban areas (Seto et al., 2012). Indeed, urban living is associated with various adverse health consequences, such as high-fat diets, sedentary lifestyles, and increased levels of social and psychological stress and environmental pollutants (Clougherty et al., 2007; Lambert et al., 2015; Peer et al., 2003; Sodjinou et al., 2008). As a consequence, promoting health of urban populations has become one of the most challenging issues of the 21st century (Dye, 2008; Tzoulas et al., 2007). Nature in cities can play a key role in achieving a healthy society (Groenewegen et al., 2006; Tzoulas et al., 2007). Indeed, there is mounting evidence that direct experience with natural environments offers a wide range of health benefits (Hartig et al., 2014; Keniger et al., 2013; Soga and Gaston, 2016). Louv (2005) argued that a decrease in contact with nature results in a number of health and behavioral problems, especially for children, which in sum can constitute a nature-deficit disorder. Recent studies suggest that daily contact with nature has a long-lasting and deep impact on health, including on depression and anxiety symptoms (Beyer et al., 2014), birth weight (Dadvand et al., 2012), diabetes, and obesity (Lachowycz and Jones, 2011), circulatory and heart disease (Maas et al., 2009), and longevity (Takano et al., 2002). It is therefore increasingly recognized that a regular contact with nature can promote human health and be used as a form of preventive medicine (Groenewegen et al., 2006). Gardening is arguably one of the most common ways of interacting with nature and indeed is enjoyed as a popular pastime in many countries. In the UK, there are estimated to be 27 million people, approximately 40% of the total population, who actively participate in gardening (Bisgrove and Hadley, 2002). Likewise, it is estimated that in the US, 117 million people, one in three, participate in gardening (Statista, 2015), and that in Japan, 32 million people, one in four, participate in daily gardening as a hobby (Statistics Bureau, Ministry of Internal Affairs and Communications, 2011). Gardening requires, at most, a relatively small piece of land, and in many parts of the world, such gardens are today common. In the UK, it is estimated that 22.7 million households (87%) have access to a domestic garden, which comprise 432,924 ha of land in total (Davies et al., 2009). Mathieu et al. (2007) also showed that more than a third of the land in the city of Dunedin, New Zealand, was used for domestic gardens. Alongside domestic gardens, allotment and community gardens, pieces of land with plots rented by an individual or group to grow plants for non-commercial use also offer places in which people can participate in gardening. The city of Stockholm, Sweden, for example, contains approximately 10,000 allotment plots, which occupy 210 ha of land and involve 24,000 people (c.f. Barthel et al., 2010). Given the scale of gardening activities, and the apparent feasibility of accommodating them in cities and towns, these have great potential for limiting the ongoing loss of human-nature interaction—the extinction of experience (Soga and Gaston, 2016; Soga et al., 2016). There is increasing awareness among researchers and health practitioners of the potential health benefits derived from gardening activities (Clatworthy et al., 2013; Genter et al., 2015; Wang and MacMillan, 2013). Indeed, previous studies have shown that gardening increases individual's life satisfaction, vigor, psychological wellbeing, positive affects, sense of community, and



cognitive function (Gigliotti and Jarrott, 2005; Gonzalez et al., 2010; van den Berg et al., 2010; Wakefield et al., 2007; Wichrowski et al., 2005; Wood et al., 2016). Reductions in stress, anger, fatigue, and depression and anxiety symptoms have also been documented (Rodiek, 2002; Wichrowski et al., 2005; Wilson and Christensen, 2011; Wood et al., 2016). In consequence, engagement with gardening has increasingly been recognized as not only a cost-effective health intervention (Clatworthy et al., 2013) but also a treatment or occupational therapy for those with psychological health issues, so-called “horticultural therapy” (Gonzalez et al., 2010, 2011a). Despite this, surprisingly, to date no meta-analysis has been conducted to assess the consistency of the positive effects of gardening on health. There have recently been two systematic reviews of studies exploring the association between gardening and health (Genter et al., 2015; Wang and MacMillan, 2013). However, since they presented no quantitative synthesis and only focused on health benefits of allotment gardening (Wang and MacMillan, 2013) and for elderly people (Genter et al., 2015), respectively, more comprehensive and convincing evidence is still wanting. Here, we present a formal meta-analysis<sup>6</sup> of research examining the effects of gardening on health.

Studies in health care settings show a link between nature and healing. Nature contact may serve to supplement or augment medical treatment and therapy. Both passive exposure to landscapes and more active interactions with nature provide mental and physiological benefits that contribute to healing and therapy.

### **2.1 Healing Gardens and Therapeutic Horticulture**

Acting on research findings, healthcare facilities such as hospitals, nursing homes, and rehabilitation centers have begun to install healing gardens for patients, visitors and staff. In addition to contributing to the healing and therapy process, gardens are intended to help address the mental stress, information overload, and emotional distress that visitors may experience when assisting a loved one in a healthcare facility. Gardens may also serve as restorative environments for healthcare employees.

Studies inform garden design by evaluating how specific pathways, plantings, and other features influence levels of interaction with the garden, duration of stay, and therapeutic benefits. Hospitals and care facilities may design healing gardens for a target population and purpose, such as Alzheimer's<sup>7</sup> patients or children with physical disabilities. Observations of patients undergoing treatment for stress-related diseases suggests that gardens are most beneficial when they provide distinct areas for passive reflection and emotional recovery, as well as social interaction, physical activity, and sensory stimulation.

A survey of visitors to four hospital gardens found that respondents most commonly mentioned multiple nature elements of gardens - trees, greenery, flowers, and water - as having positive benefits on their moods. A study of a pediatric hospital's healing gardens demonstrated that having play features, pathways, and shading encouraged higher levels of physical activity for visitors and children. Meanwhile staff preferred garden areas that provided visual and auditory privacy. Other studies support the need for distinct garden spaces for staff - spaces where they can enjoy breaks without encountering visitors and patients.

### **2.2 Horticulture Therapy**

Providing gardens and other natural settings for the general purpose of facilitating healing and wellbeing is known as therapeutic horticulture<sup>8</sup>, including the examples provided above.

Horticultural therapy is the use of prescribed nature activity or experience by a trained professional to aid recovery from specific mental or physical ailments. Therapeutic treatment can take place in healthcare facilities or in community settings. Horticultural therapists engage their patients in gardening activities as individuals or in group settings. They guide activities that provide physical exercise or therapy, social interaction, or cognitive development to meet clinically defined goals.

A systematic review of over 240 scientific studies found reliable evidence to support horticultural therapy as an intervention for a variety of conditions, from cerebral palsy to schizophrenia. In one study patients with chronic musculoskeletal pain who participated in a 4-week horticultural therapy program experienced an increase in mental and physical health, as well as an improved ability to cope with chronic pain.

After just one horticultural therapy session, patients recovering from cardiac surgery experienced marked improvement in their mood, and stress reduction. Beyond treating acute health conditions, research shows that horticultural therapy can also benefit individuals trying to overcome emotional or physical trauma. In one study adults with diagnosed depression participated in a therapeutic horticulture program and showed significant beneficial change in mental health aspects of anxiety, mood, and depression.

## 2.3 Mental Health, Function, and Therapy

### 2.3.1 Children and Attention Deficit

Over 2 million children in the U.S. have been diagnosed with attention-deficit/hyperactivity disorders (ADHD)<sup>9</sup>. Such a child has reduced attention capacity, which can have detrimental effects on social, cognitive, and psychological growth. Studies at the University of Illinois have tested nature-based activity and ADHD outcomes. In the first study parents judged that attention deficit symptoms were more manageable after doing activities in green settings than after activities in other settings (Table 1). Also, the greener a child's play area, the less severe his or her attention deficit symptoms; children who played in windowless indoor settings had significantly more severe symptoms than those who played in grassy, outdoor spaces (with or without trees). Though the greenness of a child's home was unrelated to their ADHD severity, more green in their play setting was related to better outcomes.

**TABLE 1**

Likely setting	Best	Worst
Green (e.g fishing, soccer)	85%	15%
Ambiguous (Rollerblading, Playing outside)	56%	44%
Not Green (Video games, TV, Mobile Phones)	43%	57%

In a follow up study green outdoor activities reduced symptoms significantly more than did either built outdoor activities or indoor activities. A third study found that children with ADHD concentrated better after a walk in the park than after a downtown walk or a neighborhood walk. Exposure to ordinary natural settings in the course of common after-school and weekend activities may be widely effective in reducing attention deficit symptoms in children. "Green time" may be an important supplement to traditional medicinal and behavioral treatments.

### 2.3.2 Depression

Depression, like stress, occurs at any age and can be ameliorated through improving social connections (to decrease the feeling of isolation) and exercise, both of which are encouraged by the presence of nearby green outdoor spaces. A multi-study review found that those who exercise in natural environments reported greater enjoyment and satisfaction and declared a greater intent to repeat the activity at a later date. Compared to being indoors, exercising in natural environments was associated with more positive mental states, such as greater feelings of revitalization and positive engagement, decreases in tension, confusion, anger, and depression, and increased energy.

Exposure to natural light, in particular morning light, appears to be effective in treating patients with seasonal affective disorder (SAD)<sup>10</sup>. Outdoor walks are one way to access natural lighting.

Studies investigating major depression disorder (MDD)<sup>11</sup> have shown that an exercise program can be just as effective as antidepressants in reducing depression among patients, and that a 50-minute walk in a natural area (compared to a built setting) may increase memory span and elevate moods. Patients with clinical depression who participated in therapeutic gardening activities for 3 months experienced a reduction in severity of depression and increased attentional capacity that lasted up to three months after the conclusion of the program.

### 2.3.3 Mental Stress and Cancer Patients

Clinical reports note a loss of concentration and increased distractibility in patients undergoing cancer treatment, including those with breast cancer. There is a correlation between cognitive function and cancer diagnosis. A decreased ability to direct attention may begin before treatment actually starts. Treatment planning following diagnosis can be mentally demanding and stressful, leading to attentional fatigue.

Participating in activities and/or interacting with natural environments have been found to ameliorate and help stave off the attentional fatigue both before and after breast cancer treatment or surgery. A qualitative study compared the meaning of gardening in daily life for those with and without cancer and found that - though dependent on past gardening experiences, individual interests, and current circumstances - gardening can be used as a potential coping strategy for stressful life experiences.

Further, nature may have a preventative effect on cancer generation and development. Studies show that people doing forest bathing<sup>12</sup> trips in Japan show an increase in natural killer cell activity, the number of beneficial cells, and the release of anticancer proteins.

### 2.3.4 Psychiatric Patients

Studies investigating the effects of nature and gardening on psychiatric patients display a range of results, from general mood improvement to specific illness. For example, horticultural therapy was effective in decreasing the levels of anxiety, depression, and stress among participants diagnosed with psychiatric illness. In another study placing flowering plants in a ward increased socializing and food consumption in severely withdrawn schizophrenic<sup>13</sup> patients.

The smells, colors, and handling of soil by patients during horticulture activities may be particularly important and can improve life satisfaction, well-being, and self-concept in mentally ill patients.

Finally, when comparing intensive therapy patients in rooms with translucent windows to ones without windows, those patients with windows had less sleep disturbance, improved memory and orientation, as well as fewer hallucinations and delusions, providing more normalcy and connection to the outside world.

### **2.3.5 Dementia**

Dementia<sup>14</sup> patients experience multiple disorders, including memory impairment, intellectual decline, temporal and spatial disorientation, impaired ability to communicate and make logical decisions, and decreased tolerance to high and moderate levels of stimulation. Dementia care poses a financial burden on society at par with cancer and heart disease. Recent studies report that, in both adult day settings and nursing homes for those with dementia, there are positive correlations of well-being and enhanced competence following passive and active interaction with nature. Dementia patients are sensitive to environments and natural surroundings can provide prosthetic support to compensate for limited cognitive capabilities. Studies note decreased aggression, improved socialization, and increased social competencies, as the natural environment provides cues of what is comfortably familiar due to reminiscence and nostalgia. Additionally, outdoor nature-based activity contributes to improved sleep patterns, balanced hormones, and decreased agitation in dementia patients.

Overall quality of life measures for dementia patients, their family members, and staff appear to improve at long-term care facilities with therapeutic gardens. Access to gardens has been shown to reduce incidents of dangerous behavior and aggression for dementia patients. Gardens can also evoke memories that reconnect patients to the real world. Additionally, residents with high use of wander gardens<sup>15</sup> have a decreased use of high-dosage anti-psychotic medications. Gardening activities may help improve mobility and dexterity, confidence and social skills in dementia and stroke patients. Finally, gardening can be used as a preventative measure to help reduce the onset of dementia, gardening on a daily basis was found to reduce risk factors for dementia by 36%.

Design for dementia care is important; there is a distinct association between measures of health and how spaces are designed. A space needs to promote functionality and well-being, but also be safely open and free. Recommended design features for outdoor spaces for dementia patients include: looped pathways; tree groves or sites to act as landmarks for orientation; non-toxic plants; even, well-lit paths with handrails; seating areas with the illusion of privacy; and low key fragrances and color to soothe, rather than negatively stimulate.

### **2.3.6 Elder Care**

Some of the earliest research about nearby nature and human benefits focused on benefits to the elderly. Studies continue as most industrialized nations have aging populations, and face increased need for providing care as people get older. The University of Helsinki summarized the potential mental, emotional, and social benefits experienced when the elderly participate in gardening and horticulture.

## **2.4 Physical Health and Therapy**

### **2.4.1 Obesity and Active Living**

The CDC<sup>16</sup> (Centers for Disease Control and Prevention) reports that more than one-third of U.S. adults (35.7%) are obese, and the estimated annual medical cost of obesity in the U.S. was \$147 billion in 2008 U.S. dollars. Obesity leads to increased risk of chronic diseases, such as asthma<sup>17</sup>,

Type II diabetes<sup>18</sup>, cardiovascular disease, some cancers<sup>19</sup>, osteoarthritis<sup>20</sup>, and can affect body image, social stigmatization and discrimination, which can lead to depression.

One lifestyle change that can help with weight control is routine physical activity, sometimes termed active living. Studies found that the creation or improvement of a park or open space was shown to lead to a 25.6% increase in nearby residents exercising three or more days a week and a 48.4% increase in frequency of physical activity. Also, park access increases aerobic capacity by 5.1%, reduces body fat, improves flexibility, and increases perceived energy. Aerobic exercise<sup>21</sup> in a natural environment may lead to greater gains in lowering blood pressure, stress, and depression compared with exercise in non-green urban settings.

#### **2.4.2 Stress**

People experience stress at all ages, however it is especially prominent later in life due to physical, psychological, and social changes that include chronic disease, disability, loss of loved ones, and fixed incomes. Stress can affect people's perceptions of their well-being, causing them to have diminished mental health. Physical activity has also been linked to improved mental health and stress coping. Studies have connected park use to decreased stress levels and improved moods. In one study participants showed fewer stress symptoms the longer they stayed in the park.

Simply viewing nature can help. Following a stressful activity, young adults sitting in a room with a views of trees showed reduced blood pressure and feelings of stress compared to those in a viewless room. Lab and clinical investigations have found that within five minutes of viewing a nature setting positive changes in blood pressure, heart activity, muscle tension, and brain electrical activity occur.

A study of brain activity, using alpha rhythms<sup>22</sup> as a measure, showed that participants were most awake and relaxed while looking at plants with flowers, rather than empty pots. In a companion study EEG<sup>23</sup> (electrical brain activity) indicated more relaxation when viewing greenery compared to looking at a concrete structure.

#### **2.4.3 Disabilities and Elder Care**

Much of the research of green effects on mobility, dexterity, and disabilities focuses on the elderly. Preliminary studies have reported the benefits of horticultural therapy and garden settings in reduction of pain, improvement in attention, lessening of stress, modulation of agitation, lowering of medicines, antipsychotics and reduction of falls.

Outdoors gardening or activities improves exposure to sunlight, which can increase bone density, due to increased vitamin D absorption, as well as improves circadian rhythms<sup>24</sup> and sleep cycles. Gardening activity can also help increase bone mineral density as well as improve musculoskeletal function.

### **2.5 Recovery, Resilience, and Rehabilitation**

#### **2.5.1 Crisis Recovery and Resilience**

Efforts to recover and rebuild often follow soon after a major disaster or crisis, at both personal and community levels. Nature can have a rehabilitating effect on individuals. A study of people recovering from significant personal crises found that experiences in nature had a powerful positive influence on recovery. Individuals place positive symbolic value on trees and natural landscapes after a catastrophe; familiar, green, restorative places can ease trauma and discomfort.

Historically, gardening was an expression of the will to be “resistant and resilient” during World War I, as gardens were created by soldiers in battle trenches. The book, *Defiant Gardens*, describes how people created gardens within the extreme conditions of World War II: Jews in Warsaw ghettos<sup>25</sup>, prisoners of war, and Japanese-Americans in internment camps.

The act of working together as a community to build something and help it grow can improve attitudes and social ties, heal and create new memories, and provide an outlet for grief. Community greening can encourage diversity and facilitate reconciliation between ethnic and social groups. Additionally, community greening can address economic and environmental damage following events like tsunamis and hurricanes, by providing food and restoring the landscape. Gardening can also aid in the resettlement process as it has been shown to help asylum seekers and refugee families cope with the trauma of relocating and acclimating to a new environment, especially as gardening can provide the opportunity to restore cultural traditions and familiar foods.

### **2.5.2 Prisons and Jails**

Drawing from a small set of studies about gardening projects within prisons, nature may be a tool for rehabilitation. Inmates have shown enhanced self-esteem and sense of accomplishment, as well as decreased hostility and a feeling of experiencing success. Female inmates who participated in a Master Gardener program reported higher self-esteem and life satisfaction, particularly those who previously abused drugs or alcohol.

The benefits of these programs may extend to life after release. Participants in the Green House Program, a horticulture program at Rikers Island<sup>26</sup> Prison (New York), had a recidivism rate (number of released criminals that commit another offense and return to prison) of 25%, compared to the overall recidivism rate of 65%.<sup>87</sup> The Sustainable Prisons Project (based in Washington State) facilitates conservation science research within prisons. Offenders raise endangered frogs and butterflies, propagate native plants for prairie restoration, assist with beekeeping to learn about bee colony collapse, and participate in research. While the program’s benefits have not been empirically assessed, informal evaluations of the program suggest that inmates become motivated learners.

Studies of youth offenders offer hope for behavioral improvements. Studies show that youth offenders involved in horticulture training learn about responsibility, social skills, problem solving, and better decision-making. Researchers concluded that such a program can be a tool to improve social bonding, and be effective in causing attitude changes and increasing perceptions of self-image, pride, and ability to succeed. Similarly, a study of a gardening program at a juvenile detention facility found improved social skills, increased self-esteem, anxiety reduction, increased patience, and an improved ability to delay gratification.

## **2.6 Nature and the Healthcare Industry**

### **2.6.2 Prescriptions for Parks and Trails**

Ever more studies confirm the relationship between neighborhood open space and physical activity. Even short doses of outdoor exercise in natural settings are shown to improve mental health. Researchers have yet to define exact dosages and frequencies for outdoor activity to address specific ailments. Yet, organizations and health care providers now recognize the benefits of nature activity and some are working to develop goal-oriented prescriptions for individual use of parks and trails.

The Golden Gate Parks Foundation<sup>27</sup> launched a program, encouraging health care providers to issue park prescriptions<sup>28</sup> to establish and monitor goals for outdoor activity as a preventative health measure for patients.

### 3. MATERIALS AND METHODOLOGY

#### 3.1 Terminology

As defined by the WHO (1948), health is “a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity,” we interpret “health” in a broad sense to include physical and psychological wellbeing. Positive effects on health are thus not simply the amelioration of symptoms associated with chronic illness (e.g. depression, anxiety, obesity) but include the presence of positive emotions (e.g. quality of life, life satisfaction, sense of community, happiness) and the absence of negative emotions (e.g. anger, loneliness, confusion), and the state of being able to perform the normal actions of daily life without the hindrance of both physical and psychological dysfunction. Increased physical activity level was also included as a positive health outcome, as it has proven to be a good indicator of risk for obesity-related diseases (Janssen et al., 2005). We use the term “gardening” for “an activity in which people grow, cultivate, and take care of plants (flowers and vegetables) for non-commercial use,” which is not simply limited to an activity in domestic gardens but includes that in allotment and community gardens. In this study, horticultural therapy, a practice of engaging patients in gardening activities to improve their physical, psychological, and social health, was also considered as a form of gardening.

#### 3.2 Systematic review and inclusion criteria

We focused on studies that collected data on people's health outcomes in the context of gardening were published in peer-reviewed scientific journals after 2001. This study followed the PRISMA<sup>29</sup> statement (Moher et al., 2009). We performed the search, assessed eligibility, and extracted data. Literature search was conducted using the PubMed<sup>30</sup> database in January 2017. We also ran similar queries on Google Scholar in January 2017 to identify studies that had previously been missed. Studies identified through PubMed and Google Scholar were screened on title, abstract, or both, and 34 full-articles were assessed for eligibility.

To be included in our meta-analysis, a study had to (1) conduct a quantitative survey rather than a qualitative one, (2) focus on outdoor gardening, (3) have control (before participating in gardening or non-gardeners) and treatment groups (after participating in gardening or gardeners), (4) report sample size and mean and standard deviation (SD) or error (SE) of health outcomes both for the control and treatment groups.

The standardized mean difference Hedges' *d* (Hedges and Olkin, 1985) was used as the effect size metric for comparing mean differences in health outcomes between the treatment and control groups:

$$d = (M_t - M_c) \frac{J}{S}$$

Where, *M<sub>t</sub>* and *M<sub>c</sub>* are the mean values of the response variable (health outcomes) in the treatment and control groups, respectively, and *S* and *J* are the pooled SD of both groups and a term that corrects for bias due to small sample size, respectively. Here, positive effect sizes indicate that health condition is better in the treatment groups than in the control groups; we

reversed the sign of health outcomes where higher values meant a less healthy condition (e.g. depression, anxiety, stress).

To our knowledge, this meta-analysis is the first to provide a quantitative synthesis of the evidence that gardening is beneficial for human health. Overall, the results suggest that participating in gardening activities has a significant positive impact on health. Indeed, the positive association with gardening was observed for a wide range of health outcomes, such as reductions in depression and anxiety symptoms, stress, mood disturbance, and BMI, as well as increases in quality of life, sense of community, physical activity levels, and cognitive function.

### 3.3 Data extraction

We finally included 12 articles. Basic information was collected for these studies, including the first author's name, year and name of publication, country of origin, and details of settings (duration and types of gardening), participants (mean age, female ratio, and health condition), and types of health outcomes measured. We also extracted mean values of health outcomes, sample size (n), and SD for both the control and treatment groups. If a single study reported data on more than one health outcome, then we considered each comparison between the control and treatment groups (hereafter comparison) independently. For studies that measured health outcomes during gardening on multiple occasions, we used only data points at the start (control) and end (treatment).

## 4. CONCLUSIONS

Our meta-analysis has provided robust evidence for the positive effects of gardening on health. With an increasing demand for reduction of health care costs worldwide, our findings have important policy implications. The results presented here suggest that gardening can improve physical, psychological, and social health, which can, from a long-term perspective, alleviate and prevent various health issues facing today's society. We therefore suggest that government and health organizations should consider gardening as a beneficial health intervention and encourage people to participate in regular exercise in gardens. To do so, policy makers need to increase people's opportunity and motivation to engage with gardening activities. The former requires enough spaces where people can enjoy gardening, and the latter needs the various advantages of gardening to be made apparent to a broad audience. Because gardens are accessible spaces for all kinds of people, including children, elderly people, and those with a disability, and relatively easily and quickly implemented in urban areas as a "land-sharing" strategy (Soga et al., 2015; Stott et al., 2015), we believe that such actions and policies would at the same time contribute greatly to redressing health inequalities.

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TABLE 2

S / N	Study	Country	Participants	Percent age of female	Mean Age	Gardening Type	Health Outcome
1	Amit (2016)	India	18 households	-	-	Kitchen gardens	General health, stress
2	Ghanbari et.al (2015)	Iran	50 females with depression	100	20.6	Horticulture therapy	Depression
3	Gigliotti and Jarrot et. al (2005)	USA	48 people with dementia	45.8	80	Horticulture therapy	Positive affect
4	Gonzalez et. al (2011)	Norway	46 people with depression	78.3	46.3	Horticulture therapy	Depression, Anxiety and Stress
5	Hayashi et al. (2008)	Japan	61 people with Depression	63.9	46	Short term experimental gardening	mood, tension, depression
6	Kam and Siu (2010)	China	24 people with psychological illness	29.2	44.3	Horticulture therapy	Depression. Anxiety Stress
7	Kim et. al (2012)	South Korea	24 students with intellectual disabilities	58.3	8.5	Horticulture therapy	Attention and sociability
8	Kotozaki (2014)	Japan	45 women	100	46.5	Horticulture therapy	Self esteem, sense of community, general health
9	Rodiek (2002)	USA	17 women	100	84.7	Short term experimental gardening	Mood, stress
10	Wood et. al (2016)	UK	269 people	43.5	55.6	Daily gardening	Self esteem, general health, mood, BMI
11	Zick et al. (2013)	USA	514 people	49.8	43.9	Daily gardening	Body Mass Index, General health
12	M. Soga et. al (2017)	World wide	Meta Analysis	-	-	Gardening	General Health, Depression, Stress, Anxiety

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## Annexure

### A.1

Study	Treatment			Control			Health outcome	Outco me types	Garde ning types	Compa rison types	Partic ipant types
	Sam ple size	Mea n of outc ome	SD of outc ome	Sam ple size	Mea n of outc ome	SD of outc ome					
Ghanb		10.6	9.8	25	21.8	8.36	Depressi	Wellb	Thera	Before	Patien

ari et al. 2015	25				5		on	eing	py	/ after garden ing	ts
Gigliotti and Jarrott 2005	48	2.43	0.74	48	1.9	0.65	Positive affect	Wellbeing	Therapy	Gardeners/ non-gardeners	Patients
Gigliotti et al. 2004	13	2.43	0.55	13	2.06	0.49	Positive affect	Wellbeing	Therapy	Gardeners/ non-gardeners	Patients
Gonzalez et al. 2010	28	73.6	18.6	28	63.4	23	Cognitive function	Health	Therapy	Before / after garden ing	Patients
Gonzalez et al. 2010	28	7.3	1.6	28	4.5	2.1	Restorativeness (being away)	Wellbeing	Therapy	Before / after garden ing	Patients
Gonzalez et al. 2010	28	7.1	1.9	28	3.4	2.3	Restorativeness (fascination)	Wellbeing	Therapy	Before / after garden ing	Patients
Gonzalez et al. 2010	28	11.8	3.3	28	13.4	3.2	Rumination	Wellbeing	Therapy	Before / after garden ing	Patients
Gonzalez et al. 2011	18	50.2	7.5	18	48.8	6.8	Existential issues	Wellbeing	Therapy	Before / after garden ing	Patients
Gonzalez et al. 2011	28	44.6	7.5	28	43.6	6.6	Existential issues	Wellbeing	Therapy	Before / after garden ing	Patients
Gonzalez et al. 2011	46	18.8	7.8	46	25.4	7.9	Depression	Wellbeing	Therapy	Before / after garden ing	Patients
Gonzalez et al. 2011	46	51.4	9.3	46	55.9	10.4	Anxiety	Wellbeing	Therapy	Before / after garden ing	Patients

Gonzalez et al. 2011	46	2.51	0.79	46	2.25	0.82	Positive affect	Wellbeing	Therapy	Before / after gardening	Patients
Gonzalez et al. 2011	46	13	2.3	46	14.1	2.3	Stress	Wellbeing	Therapy	Before / after gardening	Patients
Hayashi et al. 2008	11	15.4	10.7	11	35.8	11.9	Mood	Wellbeing	Non-therapy	Before / after gardening	Non-patients
Hayashi et al. 2008	11	7.3	2.16	11	10.2	2.92	Tension	Wellbeing	Non-therapy	Before / after gardening	Non-patients
Hayashi et al. 2008	11	10.9	3.35	11	12.4	4.02	Depression	Wellbeing	Non-therapy	Before / after gardening	Non-patients
Hayashi et al. 2008	11	8.5	2.93	11	11.6	3.76	Anger	Wellbeing	Non-therapy	Before / after gardening	Non-patients
Hayashi et al. 2008	11	25.4	3.36	11	26.4	2.23	Vigor	Wellbeing	Non-therapy	Before / after gardening	Non-patients
Hayashi et al. 2008	11	11.8	4.02	11	11.6	3.86	Fatigue	Wellbeing	Non-therapy	Before / after gardening	Non-patients
Hayashi et al. 2008	11	10.3	2.57	11	13.6	3.15	Confusion	Wellbeing	Non-therapy	Before / after gardening	Non-patients
Kam and Siu 2010	10	-9	7.62	12	0.67	7.1	Anxiety	Wellbeing	Therapy	Gardeners/ non-gardeners	Patients
Kam and Siu 2010	10	-9.2	9.15	12	-1.17	8.33	Depression	Wellbeing	Therapy	Gardeners/ non-gardeners	Patients

Kam and Siu 2010	10	0.6	14.21	12	1.5	6.07	Quality of life	Wellbeing	Therapy	Gardeners/non-gardeners	Patients
Kam and Siu 2010	10	-6	5.33	12	-0.5	6.79	Stress	Wellbeing	Therapy	Gardeners/non-gardeners	Patients
Kim et al. 2012	12	31.1	21.82	12	34.4	21.82	Cognitive function	Health	Therapy	Gardeners/non-gardeners	Patients
Kim et al. 2012	12	36	9.7	12	18.5	9.7	Sociability	Health	Therapy	Gardeners/non-gardeners	Patients
Kotozaki 2014	22	4.41	4.34	22	7.59	4.62	Depression	Wellbeing	Therapy	Before / after gardening	Non-patients
Kotozaki 2014	22	2.14	3.52	22	4.82	4.6	General health	Health	Therapy	Before / after gardening	Non-patients
Kotozaki 2014	22	32.36	3.92	22	30.95	3.3	Self-esteem	Wellbeing	Therapy	Before / after gardening	Non-patients
Kotozaki 2014	22	56.95	9.41	22	49.09	12.84	Sense of community	Wellbeing	Therapy	Before / after gardening	Non-patients
Min et al. 2014	21	3.56	0.61	21	3.07	0.71	Psychological wellbeing	Wellbeing	Therapy	Before / after gardening	Non-patients
Min et al. 2014	21	3.61	0.33	21	3.45	0.34	Hope	Wellbeing	Therapy	Before / after gardening	Non-patients
Park et al.	14	0.96	0.1	28	0.92	0.1	Bone mineral	Health	Non-therap	Gardeners/	Non-patien

2009							density (hip)		y	non-gardeners	ts
Park et al. 2009	14	1.24	0.3	28	1.13	0.2	Bone mineral density (spine)	Health	Non-therapy	Gardeners/non-gardeners	Non-patients
Rodiek 2002	6	3.5	6.02	10	1.5	7	Anxiety	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
Rodiek 2002	6	1.67	2.73	10	0.4	3.37	Mood	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
Rodiek 2002	6	0	0.89	10	-0.3	4.14	Mood	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
Rodiek 2002	6	0.59	0.46	8	0.22	0.22	Salivary cortisol	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
Sommefeld et al. 2010	156	4.09	0.84	103	3.77	0.99	General health	Health	Non-therapy	Gardeners/non-gardeners	Non-patients
Sommefeld et al. 2010	158	36.06	4.7	103	34.4	5.57	Life satisfaction	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
Sommefeld et al. 2010	158	2.34	0.56	102	2.05	0.59	Physical activity	Health	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg	14	1.22	0.41	16	1.35	0.42	Mood	Wellbeing	Non-therapy	Gardeners/non-	Non-patients

and Custers 2011										gardeners	
van den Berg and Custers 2011	14	3.7	0.48	16	3.21	0.7	Mood	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg and Custers 2011	14	5.24	2.26	16	6.37	2.22	Salivary cortisol	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg et al. 2010	121	0.55	0.71	63	0.54	0.74	Chronic illnesses	Health	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg et al. 2010	121	3.32	0.79	63	3.24	0.78	General health	Health	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg et al. 2010	121	0.61	0.91	63	0.92	1.34	GP consults	Health	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg et al. 2010	121	2.63	2.32	63	3.19	2.35	Health complaints	Health	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg et al. 2010	121	2.26	0.43	63	2.12	0.48	Life satisfaction	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg et al. 2010	121	0.45	0.72	63	0.65	0.85	Loneliness	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients



van den Berg et al. 2010	121	1.26	0.32	63	1.27	0.38	Physical constraints	Health	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg et al. 2010	121	7.23	3.04	63	6.89	2.99	Social contacts	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg et al. 2010	121	2.53	1.15	63	2.77	1.13	Stress	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg et al. 2010	121	5.8	1.53	63	4.9	2.15	Physical activity	Health	Non-therapy	Gardeners/non-gardeners	Non-patients
Waliczek et al. 2005	220	45.88	6.77	223	43.69	7.65	Life satisfaction	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
Wichrowski et al. 2005	59	1.9	4.1	59	4.24	5.68	Anger	Wellbeing	Therapy	Before / after gardening	Patients
Wichrowski et al. 2005	59	4.1	3.39	59	5.83	3.77	Confusion	Wellbeing	Therapy	Before / after gardening	Patients
Wichrowski et al. 2005	59	2.71	5.66	59	5.8	6.89	Depression	Wellbeing	Therapy	Before / after gardening	Patients
Wichrowski et al. 2005	59	6	6.14	59	9.47	5.79	Fatigue	Wellbeing	Therapy	Before / after gardening	Patients
Wichrowski et al. 2005	59	1.6	24.8	59	19.3	24.5	Mood	Wellbeing	Therapy	Before / after gardening	Patients

Wichrowski et al. 2005	59	74.1	13.6	59	79.2	14.7	Heart rate	Wellbeing	Therapy	Before / after gardening	Patients
Wichrowski et al. 2005	59	4.86	5.81	59	9.02	6.51	Tension	Wellbeing	Therapy	Before / after gardening	Patients
Wichrowski et al. 2005	59	18	6.11	59	15.1	5.65	Vigor	Wellbeing	Therapy	Before / after gardening	Patients
Wilson and Christensen 2011	172	5.49	5.43	31	7.97	6.29	Depression	Wellbeing	Non-therapy	Gardeners/ non-gardeners	Patients
Wood et al. (in press)	136	39.3	3.8	133	39.9	4.1	Anger	Wellbeing	Non-therapy	Gardeners/ non-gardeners	Non-patients
Wood et al. (in press)	136	25.5	3.5	133	27	5	Body mass index	Health	Non-therapy	Gardeners/ non-gardeners	Non-patients
Wood et al. (in press)	136	35.7	3.8	133	36.4	4.4	Confusion	Wellbeing	Non-therapy	Gardeners/ non-gardeners	Non-patients
Wood et al. (in press)	136	38.1	1.9	133	39.1	3	Depression	Wellbeing	Non-therapy	Gardeners/ non-gardeners	Non-patients
Wood et al. (in press)	136	38.8	5.1	133	41.1	6.2	Fatigue	Wellbeing	Non-therapy	Gardeners/ non-gardeners	Non-patients
Wood et al. (in press)	136	9	3.7	133	11.1	4.9	General health	Health	Non-therapy	Gardeners/ non-gardeners	Non-patients

										ers	
Wood et al. (in press)	136	143.7	16.9	133	152.4	19.7	Mood	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
Wood et al. (in press)	136	32.8	3.9	133	31.4	4.2	Self-esteem	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
Wood et al. (in press)	136	33.4	3.2	133	34.1	4.1	Tension	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
Wood et al. (in press)	136	41.6	5.9	133	38.1	6.7	Vigor	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
Zick et al. (2013)	77	25.1	4.63	182	25.63	4.63	Body mass index (men)	Health	Non-therapy	Gardeners/non-gardeners	Non-patients
Zick et al. (2013)	121	23.86	5.22	134	25.16	5.55	Body mass index (women)	Health	Non-therapy	Gardeners/non-gardeners	Non-patients

## A.2

Study	Treatment			Control			Health outcome	Outcome types	Gardening types	Comparison types	Participant types
	Sample size	Mean of outcome	SD of outcome	Sample size	Mean of outcome	SD of outcome					
Sommerfeld et al. 2010	156	4.09	0.84	103	3.77	0.99	General health	Health	Non-therapy	Gardeners/non-gardeners	Non-patients

Sommerfeld et al. 2010	158	36.06	4.7	103	34.4	5.57	Life satisfaction	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
Sommerfeld et al. 2010	158	2.34	0.56	102	2.05	0.59	Physical activity	Health	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg and Custers 2011	14	1.22	0.41	16	1.35	0.42	Mood	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg and Custers 2011	14	3.7	0.48	16	3.21	0.7	Mood	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg and Custers 2011	14	5.24	2.26	16	6.37	2.22	Salivary cortisol	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg et al. 2010	121	0.55	0.71	63	0.54	0.74	Chronic illnesses	Health	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg et al. 2010	121	3.32	0.79	63	3.24	0.78	General health	Health	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg et al. 2010	121	0.61	0.91	63	0.92	1.34	GP consultations	Health	Non-therapy	Gardeners/non-gardeners	Non-patients

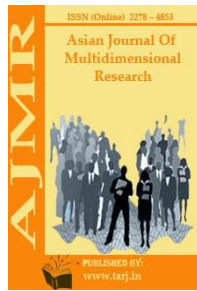
van den Berg et al. 2010	121	2.63	2.32	63	3.19	2.35	Health complaints	Health	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg et al. 2010	121	2.26	0.43	63	2.12	0.48	Life satisfaction	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg et al. 2010	121	0.45	0.72	63	0.65	0.85	Loneliness	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg et al. 2010	121	1.26	0.32	63	1.27	0.38	Physical constraints	Health	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg et al. 2010	121	7.23	3.04	63	6.89	2.99	Social contacts	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg et al. 2010	121	2.53	1.15	63	2.77	1.13	Stress	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
van den Berg et al. 2010	121	5.8	1.53	63	4.9	2.15	Physical activity	Health	Non-therapy	Gardeners/non-gardeners	Non-patients
Waliczek et al. 2005	220	45.88	6.77	223	43.69	7.65	Life satisfaction	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
Wichrowski et	59	1.9	4.1	59	4.24	5.68	Anger	Wellbeing	Therapy	Before/after	Patients

al. 2005										gardeni ng	
Wichro wski et al. 2005	59	4.1	3.39	59	5.83	3.77	Confu sion	Wellb eing	Thera py	Before/ after gardeni ng	Patien ts
Wichro wski et al. 2005	59	2.71	5.66	59	5.8	6.89	Depre ssion	Wellb eing	Thera py	Before/ after gardeni ng	Patien ts
Wichro wski et al. 2005	59	6	6.14	59	9.47	5.79	Fatigu e	Wellb eing	Thera py	Before/ after gardeni ng	Patien ts
Wichro wski et al. 2005	59	1.6	24.8	59	19.3	24.5	Mood	Wellb eing	Thera py	Before/ after gardeni ng	Patien ts
Wichro wski et al. 2005	59	74.1	13.6	59	79.2	14.7	Heart rate	Wellb eing	Thera py	Before/ after gardeni ng	Patien ts
Wichro wski et al. 2005	59	4.86	5.81	59	9.02	6.51	Tensio n	Wellb eing	Thera py	Before/ after gardeni ng	Patien ts
Wichro wski et al. 2005	59	18	6.11	59	15.1	5.65	Vigor	Wellb eing	Thera py	Before/ after gardeni ng	Patien ts
Wilson and Christe nsen 2011	172	5.49	5.43	31	7.97	6.29	Depre ssion	Wellb eing	Non- therap y	Garden ers/ non- garden ers	Patien ts
Wood et al. (2016)	136	39.3	3.8	133	39.9	4.1	Anger	Wellb eing	Non- therap y	Garden ers/ non- garden ers	Non- patien ts

Wood et al. (2016)	136	25.5	3.5	133	27	5	Body mass index	Health	Non-therapy	Gardeners/non-gardeners	Non-patients
Wood et al. (2016)	136	35.7	3.8	133	36.4	4.4	Confusion	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
Wood et al. (2016)	136	38.1	1.9	133	39.1	3	Depression	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
Wood et al. (2016)	136	38.8	5.1	133	41.1	6.2	Fatigue	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
Wood et al. (2016)	136	9	3.7	133	11.1	4.9	General health	Health	Non-therapy	Gardeners/non-gardeners	Non-patients
Wood et al. (2016)	136	143.7	16.9	133	152.4	19.7	Mood	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
Wood et al. (2016)	136	32.8	3.9	133	31.4	4.2	Self-esteem	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
Wood et al. (2016)	136	33.4	3.2	133	34.1	4.1	Tension	Wellbeing	Non-therapy	Gardeners/non-gardeners	Non-patients
Wood et al.	136	41.6	5.9	133	38.1	6.7	Vigor	Wellbeing	Non-therapy	Gardeners/	Non-patients

(2016)									y	non-gardeners	ts
Zick et al. (2013)	77	25.1	4.63	182	25.63	4.63	Body mass index (men)	Health	Non-therapy	Gardeners/non-gardeners	Non-patients
Zick et al. (2013)	121	23.86	5.22	134	25.16	5.55	Body mass index (women)	Health	Non-therapy	Gardeners/non-gardeners	Non-patients





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**UNLOCKING THE POTENTIAL OF FAITH-BASED ORGANISATIONS:  
A THEORETICAL PERSPECTIVE**

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**ABSTRACT**

*FBOs have historically been marching ahead in the field of social welfare and service. Even today, religion and faith are important vehicles of the socio-economic development. The FBO's entry into the domain of social welfare has substantiated their role and relevance but in the absence of serious and scientific efforts to explore their potentials, working style and value pattern, much need to be desired. This paper, here, is an effort towards this direction. It analyzes the position of the FBOs under the broad categories of the voluntary sector, provides a conceptual definition of faith based organizations proceeded by the definition of faith, explores the theoretical linkages between the Public Administration and Faith-based Organizations. The paper concludes that FBOs play a significant role in changing taboos and regressive social norms and values, catalyzing social action and providing relief and charitable services in ways that encompass groups beyond their own followers. It is the right time to take such FBOs seriously. In fact, they influence people, their values, attitude and behaviour. Faith offers hope, brings meaning to the lives of millions and is a significant source of inspiration for meaningful life. There should be a paradigm shift in understanding the context in which faith and religion are significant for people and development.*

**KEYWORDS:** *Historically, Socio-Economic, Inspiration*

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## INTRODUCTION

Public Administration, as a process, is an indispensable task for the growth, survival and public order in the society. It, by and large, reflects in all those activities which are undertaken to regulate and control the conduct of the individuals, groups, institutions and organisations. Its role has acquired paramount significance in the context of geometrical increase in the varieties, numbers and complexities of functions and tasks performed by the modern welfare state. But, there is a wide gulf between aspirations of the people and performance of the administrative apparatuses. Khan and Zafarullah (1987: 689), therefore, have opined that “the government of developing country, however big with its tentacles stretched far and wide, is alone unable to look into every aspect of human life”. Their vision, in fact, remind that the tasks of development, justice, welfare, security, law and order are herculean in nature, and government alone cannot tackle the problems of widespread poverty, illiteracy, increasing rate of unemployment and underemployment, alarming population explosion, malnutrition, child labour, pollution, gender inequality, violence and crime, etc. So, when the government functions are increasing in breadth and depth, popular participation by numerous organisations, which lie beyond the domain of government, bearing the nomenclatures of – Third Sector, Civil Society Organisations (CSOs), Non Governmental Organisations (NGOs), Voluntary Organisations (VOs) and recently the Faith Based Organisations (FBOs) – becomes *sine qua non*. With regard to the FBOs’ role in the holistic development process, especially in India, has remained less explored. That is why this area is not only ignored but also could not get rapt attention by the policy makers, academics and researchers, as it deserved. Thus, while recognising the paramount importance of these organisations, the UNFPA (2008:7) remarks:

At a time when basic needs are becoming increasingly harder to provide for more than half of the world’s population, we can no longer avoid acknowledging these parallel faith-based actions and development interventions that reach so many and provide so much.

The FBO’s entry into the domain of basic health and child care services, education and training opportunities, generating employment and charitable services has substantiated their role and relevance but in the absence of serious and scientific efforts to explore their potentials, working style and value pattern much need to be desired. This paper, here, is an effort towards this direction. Before going ahead, it would be appropriate to understand the broad categories of the voluntary sector and an analysis of the position of the FBOs under this taxonomy.

### **Classification of the Voluntary Sector and Status of the FBOs**

There is no doubt that the FBOs are the part and parcel of the all organisations working under the umbrella of the Third Sector/ CSOs/ NGOs. To know better, it would be appropriate to understand the types of the NGOs, preferably called Voluntary Sector. In fact, there is no unanimity over the terms like NGOs, VOs, CSOs and FBOs etc. It would be reasonable to understand the taxonomy of such organisations. Tondon, (2001, pp. 2-9) has tried to map the diversity of voluntary sector and classified them as under:

- 1) Traditional Associations
- 2) Religious Associations
- 3) Social Movements
- 4) Membership Associations
- 5) Intermediary Associations

So, there are various categories of Voluntary Sector/ Civil Society under the domain of Third Sector which make significant contribution to attain the objectives of development. The FBOs fall under the taxonomy of 'Religious Associations' and they are more important to accomplish the task of development because they have close rapport with the beneficiaries. Besides this, they exhibit certain features which help them to earn their distinguished position. These include - strong ties with local communities, compassion, commitment and dedication to work, highly motivated volunteers, long term and sustainable presence and above all they provide spiritual and more holistic development. In fact, the FBOs are "a significant and distinctive part of civil society. They are often poor people's most trusted institutions and have historically played an essential role in providing services and relief to poor people" DFID (2005). In a similar vein, a report entitled 'Faith and Voluntary Action' brought out by Grieve, Jochum, Pratten, and Steel, (2007:53), emphasised:

FBOs are integral to civil society; that is they are part of associational life, they are part of the space and place for dialogue within civil society, and they contribute to negotiating collective notions of what a 'good society' might look like.

Here, it is important to note that FBOs exhibit many characteristics similar to other organizations of civil society. They also operate within similar "political, social and economic contexts" (Ferris, 2005: 323). In spite of it, there is a notable difference. Besides other things, the FBOs are "motivated by faith, a constituency broader than social provisioning to include lobbying and advocacy activities" (ibid: 316). In fact, the FBOs are the very oldest forms of civil society that exists.

FBOs have historically been marching ahead in the field of social welfare and service. And even today, religion and faith an important vehicle of the socio-economic development. In fact, in some perspective, "FBOs are among some of the oldest providers of services and care to their communities. Elsewhere, they have emerged as fairly new phenomena in response to the rise of identity politics and the limitations of state-based welfare provision" (Tadros, 2010:1). The increasing participation of FBOs in development issues across the globe in recent times, is an acknowledgement that they make a unique contribution to social service delivery as well as in other aspects of development, "including conflict resolution and reconciliation; humanitarian assistance and disaster relief; environmental protection and conservation; politics and social movements; and social welfare and development" (Lunn, 2009: 943). The notion of the FBOs becomes categorical clear after the perusal of its definitions, preceded by the meaning of the concept of faith.

### **Conceptual Definitions of Faith and FBOs**

After having a summarised discussion about their distinguished place in the civil society, it becomes imperative to understand the FBOs conceptually. Developing a commonly accepted definition of the FBOs has proven elusive. The problem revolves round the fact that 'one size does not fit for all'. What works in one country does not prevail in other countries. What sort of organisations should be included within the category of FBOs is another problem faced by the scholars. So, before going ahead, it would be necessary to define the Faith and the FBOs in conceptual terms.

Generally, faith is considered as a individual doctrine of moral and spiritual values and religion is an institutional manifestation of these values. Lunn (2009:10), cited in Ershammar (2010), defines religion as "an institutionalised system of beliefs and practices concerning the

supernatural realm (...) and faith as the human trust or belief in a transcendent reality (although the word faith is also applied in non-religious contexts)". Clark (2005: 11) opined that faith is a more 'amorphous' category which extends beyond the major or established religions. According to him "it includes political philosophies with religious elements...modern sects or movements...and traditional or indigenous belief systems... which blend elements of mainstream religion with local and traditional beliefs and practices".

Understanding and defining the term FBO is very complicated task. This term has not yet gained popular currency in India. It has its origin in USA. In fact, the term FBO, encompasses a variety of organizations embedded in different religions:

FBOs are products of completely different world faiths. Even within each faith there exist highly diverse strains, whether we are talking about the Catholics, Methodists, Baptists, Anglicans, Reformed, Lutherans or Adventists in Christianity or Sunnis, Tablighis, Shi'as, Sufis, Wahabis/ Salafis in Islam... Furthermore, there are radically different interpretations of faith in different cultural, social, political and geographic contexts. For example, FBOs in Europe are more like secular NGOs than like churches or mosques in Africa. Islamic agencies are different in sub-Saharan Africa than the Middle East. (James, 2009:4)

While discussing the problems with defining FBOs, Jeavons (2004:140) has admitted that "the public debates about the purposes, roles, operations, and funding of these organizations—and the research conducted on them—are made much more complicated, and often less helpful, by the ambiguity and confusion of the terms and concepts". Sider and Unruh (2004: 109-110) echoed the same vein "the current catch-all term *faith-based organizations* confuses and divides because no clear definition exists of what it means to be 'faith-based'... Some interpret the term to include the broadest possible swath of agencies with any and all connection to religion, whereas others see it as excluding all but those agencies that are religious in a narrow sense". Therefore, it is fairly vital to explore a proper understanding of what an FBO means.

Berger (2003:16) in her study uses the term 'Religious NGOs (RNGOs), rather than the more general term FBO. She defines RNGOs as:

Formal organisations whose identity and mission are self-consciously derived from the teachings of one or more spiritual traditions and which operate on a non-profit, independent, voluntary basis to promote and realize collectively articulated ideas about the public good at the national or international level.

Like Berger, Scott (2003:1) also adopted an exclusive approach. He emphasized (a) the linkage of FBO to an organized faith community, (b) the presence of a particular religious ideology, and (c) staff and volunteers drawn from a particular religious group.

In contrast, A White House Paper (2001:3) takes a broader view, including both religious and secular organizations, referring to "faith-based grassroots groups (FBGG)... [involving networks]...of local congregations...small non profit organizations (both religious and secular)...and neighbourhood groups that spring up to respond to a crisis". In similar vein Clarke (2008:6) gives an all encompassing definition of FBO as "any organisation that derives inspiration and guidance for its activities from the teachings and principles of the faith or from a particular interpretation or school of thought within that faith". However, these all encompassing definitions fail to articulate the on-going role of faith in FBOs' developmental activities.

The above referred definitions of the FBOs represent two view points. The one is narrow view, whereby the functions and activities of religious organisations are included under the term FBO.

Another view point is broader, which includes the tasks, activities, functions and working of any organisation (which derives its motivation from particular ideology or teachings of particular set of beliefs), irrespective of affiliation to any particular doctrine of religion.

The meaning of the FBO has different connotations in India. Instead of FBO, Copley (2000:71) has used the term Indic Faith Based Voluntary Organisations (IFBVOs) for Indian FBOs. He defined IFBVOs as:

Those drawing their ideological leanings from Indic faiths, that is, faith having their origin in the Indian subcontinent: their leanings are specified in their vision, mission, or organisational literature. Most of these organisations are headed by teachers or gurus and / or their disciples.

So, faith Based Organisations are those organisations which have sublime faith in specific norms and ethics, principles, spiritual precepts and ideology to attain common purpose for the noble cause of the humanity.

### **SIGNIFICANCE OF THE AREA OF STUDY**

Ban Ki-moon, Secretary-General, United Nations, opined that “I have long believed that when governments and civil society work toward a common goal, transformational change is possible. Faiths and religions are a central part of that equation.”

The above statement by Ban Ki-moon undoubtedly reflects that the climate for FBOs in development is changing. Contrary to common notion, the role of religion based faith organisations is gaining momentum. James (2011:1) has rightly pin pointed:

Instead of the predicted decline in religion, in most parts of the world, it is increasing. Many are realising that the past secular materialistic approaches are failing to deliver the hoped for change. Faith is once again under the spotlight.

There is a global resurgence of interest in the development role of faiths even in such non-spiritual organisations as the World Bank and UNO. In 2001, the World Bank set up a ‘Directorate on Faith’ now called the ‘Development Dialogue on Values and Ethics’. The World Bank (2006:3) recently acknowledged that “religion is a central part of the international system...even if it wished to do so; the Bank could not entirely sidestep the faith engagement”.

In USA, the recent phenomenal popularity of FBOs in development discourse, started in 1980 when Ronald Reagan assumed office as the US president and mobilized the ‘Christian right’ to derive support for his domestic and foreign policies, especially his policy against communism. Subsequently, the influential US welfare reform of 1996, known as the ‘Charitable Choice legislation,’ gave FBOs the power to operate much like their secular counterparts while retaining their religious identity. The establishment of the ‘Office of Faith-Based and Community Initiative’ by President George Bush in 2001 gave further impetus to role FBOs in development. This momentum continued with the new administration led by President Barack Obama who reinvigorated the FBOs’ involvement in development with the launch of the ‘Office of Faith-Based and Neighbourhood Partnerships’ which aimed to strengthen the capacity of FBOs, stressing the crucial role they play in social service delivery. Faith thus becomes an important issue for development from two points of view:

At the local level, faith plays an important role in people’s lives and thus has ramifications for development work being done at any given locale. At the international level a growing

number of FBOs are engaged in delivering development projects around the world. (Hoffstaeder, 2011:4)

In UK, the Department for International Development's DFID, (2009:134) White Paper promised to double funding to FBOs, reflecting "recognition [of the] . . . unique contribution that they can make in both delivering development on the ground, and connecting with communities here and abroad".

In UK, the DFID has commissioned a study on the role of faith and faith groups in development and launched a long term research program of up to £3.5 million on the relationship between faiths and development.

The Dutch government has created a 'Policy Platform Knowledge Forum on Religion and Development Policy. They have annual thematic discussions between the Minister for Development and FBO leaders in the Netherlands.

Moreover, Clarke and Jennings (2008:2) consider the Millennium Declaration (2000) and the Millennium Development Goals to lie at the heart of the new engagement with religion and faith, because "faith communities and organizations to which they give rise are ... seen as important actors in galvanizing the moral commitment on which the MDGs depend and in popularizing them in local churches, mosques and synagogues".

Discussing this global resurgence of the FBOs in development arena, Tomalin, (2012:691) declared that "in a socio-political climate that can no longer ignore religions, for good or for bad, the FBO has acquired a significance that would have been difficult to predict even 20 years ago". Comparing the contribution of the FBOs in development with the UN, a report by Karam (2011:11) clearly admitted that "in fact, from the perspective of faith communities, it is the UN that is the newcomer to development. While many religions have been engaged in social welfare for hundreds, if not thousands, of years, the UN is less than a century old".

The significant role of faith linked activities in the development process at the international level leaves much to be achieved in India. In developed countries, particularly in USA and UK, there are specific policy initiatives in the area of the development propelled by the FBOs. The concept of governance for development in the discipline of Public Administration is becoming popular in which both state actors and non-state actors are called upon to deliver public services for bringing out socio-economic changes in the lives of the people. Therefore, this is an area which is emerging in India, and yet has not still acquired popular currency in public policy circles. Thus, the area undertaken is still unexplored.

It is believed that the present study may be useful for motivating the people to the noble cause of social service. The findings of the study and the policy suggestions, it is hoped, shall go for a long way in improving the process of rendering the services by FBOs.

### **Potential Advantages of FBOs**

FBOs play a significant role in process of development and there has in recent years been renewed interest in these because of their perceived advantages. A number of authors (Clark, 2008, James 2009 and Tadros, 2010) have highlighted the potential benefits of FBOs.

In fact, throughout the history of mankind, FBOs have acted as drivers of socio-economic change and have participated actively in the development of a socially inclusive society. Therefore, an attempt has been made to understand the perceived advantages of the FBOs:

- **Unique Reach**

FBOs are known to have enormous outreach potential. DFID (2009) asserts that “Faith-based networks rival those of the government and private sector in their ability to reach poor people sometimes untouched by secular institutions”. In fact, the faith based mechanism is the easiest instrument for the government for extending services to so called ‘hard to reach’ groups.

- **Long Term Sustainability**

FBOs are considered generally more sustainable than CSOs. James (2003:3) has regarded FBOs as “a crucial repository of long-term social capital”. In fact, for centuries faith groups have proven their sustainability and demonstrated their commitment for the selfless service of the humanity. They do so voluntarily and over long periods.

- **Credibility and Trust**

FBOs enjoy the abiding trust of communities. Faith groups fully dedicated and committed to community which results in confidence and trust. Thomas (2005:225) asserts that in poor communities, people “often voiced a much higher degree of confidence in religious leaders and organisations than with their own corrupt government, public sector welfare services, and ... secular NGOs”. Dilulio (2002:56) states that religious service providers, because of their religious sensibilities, “often go above and beyond the call of duty with clients or act in ways that inspire an unusual degree of trust among program beneficiaries”.

### **Ethical and Moral Values**

FBOs are often seen as being “repositories of transmitters of social values” (Jochum, Prattez & Wilding, 2007:17). FBOs inculcate the ethical and moral values such as discipline and commitment, selfless service, love and compassion, inclusion, stewardship, generosity, integrity and justice. Tsele (2001:210) has emphasized the importance of FBOs because they see people as “subjects of their lives”, rather than “objects of development”. Realizing the value based potential of the FBOs, Aram (2013:47) notes that “the amazing, frequent transnational, local–global connect, and the ‘value’-inspired means–ends matrix is what faith communities bring to this human development partnership” .

- **Strong and Well Connected Networks**

FBOs have exceptionally strong, highly organised, well connected and influential networks which can mobilize in difficult and depressive circumstances. Their networks have a notable ability to mobilise and communicate. Berger (2003:37) remarks:

Through their connections to extensive networks of believers—representing a wealth of social, financial, cultural, and spiritual capital— RNGOs [Religious NGOs] embody the means through which to reach and mobilize significant portions of the world’s population. Religious non-governmental organizations represent a unique concern with the spiritual and moral

capacities of those they seek to serve-capacities at the root of people's ability to transform their own condition and that of those around them.

- **Spiritual Fuel for Development**

FBOs take up a holistic approach in development since "their theories about change do not only concern outward, social but also inner and personal transformation" (Tyndale, 2006:172). Almost all faith asserts that- prayer always results in an unexpected power to development. James (2011:6) asserts that "for many FBOs spiritual faith provides the fuel for action. They seek to meet people's needs holistically, spiritual as well as physical and emotional needs". He enlists three more contentious 'spiritual' advantages to the table in the form of 'spiritual teaching', 'hope, meaning and purpose' and 'transcending power'. Thus, FBOs caters both the spiritual and material needs of human- being.

- **Highly Motivated Staff**

FBO's volunteers always remains on their toes for human assistance. Love for human beings is the source of motivation for them. The volunteers of FBOs are characterized as good hearted, generous, committed people who come to their volunteer activities with energy and positive attitude. Hilary Benn, the then UK Secretary of State for International Development wrote: "As I visit communities around the world I am always struck by the extent to which it is faith which inspires people to do something to help their fellow human beings" (DFID, 2005). In fact, it is their faith in humanity that brings hope and guts to conquer their fear and inability.

- **Social Mobilization**

FBOs have unmatched capacity to mobilize, recruit, train, and retain volunteers. This helps them to undertake welfare activities. To quote:

Apart from the range of critical—often life-saving—social services provided by faith-based organizations, religious communities are also capable of unparalleled social mobilization. ...In times in which traditional secular development is confronting its strongest set of resource challenges, these capabilities cannot be underestimated. Given the realities of service provision, resource mobilization, and political presence, it becomes clear that being knowledgeable of the work of FBOs is necessary if we are to take seriously the fundamental dimensions of social development and social capital as we consider the imperatives of future development agendas". (Karam, 2011:4)

- **Tolerance and Social Cohesiveness**

The FBOs provide a platform to the people to share their experiences, interests and aspirations which help to achieve increased tolerance, social cohesion and understanding. Kofi Annan recognized that "In every great faith and tradition one can find the values of tolerance and mutual understanding." (Kofi Annan, 2001)

- **Financial Independence**

FBOs have the ability to access required funds for development. Most of FBOs raise their income through voluntary contributions from members, land and property. Financial independence equips them with stability and security. Moreover, one can find a strong cost effective element in the working of FBOs.



The above narrated potential advantages of the FBOs have convinced us that they can make immense contribution for the upliftment of the society. In this regard, there is no denying of the fact that there is a strong history across faith traditions of responding to social need. Faith-based organization's involvement in development activities is vast and diverse.

## CONCLUSION

The significant role of faith linked activities in the development process at the international level leaves much to be achieved in India. In developed countries, particularly in USA and UK, there are specific policy initiatives in the area of the development propelled by the FBOs. FBOs are amongst the oldest type of organisations engaged in human services and hold a unique position in the voluntary sector. They have always been at the forefront of meeting social needs and launching vibrant and dynamic campaigns for social justice, inclusive development and Good Governance.

They are supplementing the government's efforts to achieve the goals of socio-economic change and development. FBOs, both in the past and present, play a significant role in changing taboos and regressive social norms and values, catalyzing social action and providing relief and charitable services in ways that encompass groups beyond their own followers. It is the right time to take such FBOs seriously. In fact, they positively influence people, their values, attitude and behaviour. Faith offers hope, brings meaning to the lives of millions and is a significant source of inspiration. There should be a paradigm shift in understanding the context in which faith and religion are significant for people and development.

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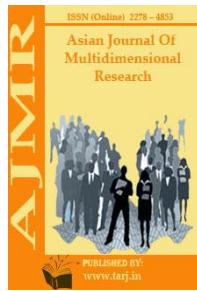
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## IS SOCIAL NETWORK MARKETING A DISRUPTION TO TRADITIONAL MARKETING?

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### ABSTRACT

*With the ever increasing customer base on the social media, most individuals and companies are getting attracted towards social networks and more focus is being given on activities concerned with branding, promotion and marketing on Social networks. There is a substantial increase in the users of Smartphone across the globe in accordance with cheaper data rates. Most of the people are connected through Social Networking platforms. Also there is an increase in usage of technology in day to day business operations leading to improvement in operational efficiency thereby reducing cost drastically. In order to survive in an emerging globalized world where technology plays very crucial role, businesses needs to adapt quickly to changing technological needs. The Internet and social media in particular have changed how consumers and marketers communicate. Social media, especially social networking sites, provide a virtual space for people to communicate through the Internet, which also might be an important agent of consumer socialization. Top social networking sites like Facebook, WhatsApp, Twitter, LinkedIn and many others, are being used for various usages at organizational and personal level. Due to disruptive technologies related to telecommunication and smartphones, lot of people and companies are part of social networks. Our paper tries to compare different aspects of social media platforms and their comparative analysis on number of customers, their rating, and*

*number of reviews on different platforms. Also it tries to find out relationship between various factors and their dependency and significance on each other.*

**KEYWORDS:** *Traditional Marketing, Social Network Marketing, Disruptive Technology*

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## **INTRODUCTION**

In rapid changes in marketing strategies, Social Network Marketing (SNM) is becoming a vital aspect in promoting businesses. Research has shown that potential Internet users are doubtful and indecisive to use and accept SNM (Social Network Marketing) system. Therefore, there is a need for researchers to identify some of the factors that determine user's unwillingness to accept and use the system.

A Wikipedia definition on Social network states "A social network is a social structure made up of a set of social actors (such as individuals or organizations) and a set of the dyadic ties between these actors."

The social network perspective provides a set of methods for analyzing the structure of whole social entities as well as a variety of theories explaining the patterns observed in these structures.

Social media marketing is the continuous process of diverting and gaining website traffic or attention through social media sites.

Social networking websites allows individual persons to interact with one another and build relationships. When different companies join these social channels, consumers can interact with them directly without any intermediary. These interactions can be more personal to users than traditional methods of marketing & advertising.

Through social networking sites, companies can be in touch with individual followers. This personal interaction can instill a feeling of loyalty into followers and potential customers. Also, by choosing whom to follow on these sites, products can reach a very narrow target audience focusing on selected customers.

As the internet penetration is increasing day by day, use of social networks has also increased in a rapid manner. Urban and Rural population is becoming part of social networks like Facebook, Twitter, and LinkedIn etc. Marketers have to focus on promoting their brands and products through social networking sites. Multi-National Companies have already adopted the model of promoting their products/ services through social networks. Small business firms are yet to start looking at marketing through social networks. Even after this, smaller businesses are doubtful about the feasibility of using social networks, the cost and expenditure that these firms are going to incur on social networking sites, and the returns that they are going to get after use of social network marketing. These are some of the research questions that a normal researcher will have.

The ardent of WEB 2.0 technologies has opened up so many ways of connecting, communicating and marketing online through use of social network sites.

The development in social network marketing have created vast potentials by reducing costs of the product and service delivery, increasing production volume, improving product and service qualities and extending geographical boundaries in bringing consumers and business owners together, handling customer queries and feedback.

Drucker (1991) described the economy of the future (new economy) as “network society” which means key social structures and activities are organized around electronically processed information.

Some of the interesting facts about social media:

- Twitter is the fastest growing age community in the 55-64-year age bracket
- Out of total users, 189 million users of Facebook’s are on mobile
- Between 18-34 US age group adults in US, YouTube reaches more than any cable network
- At every second, 2 new members are joining LinkedIn
- In a global scenario, 93% of marketers use social media (Facebook in particular) for their business promotions.

There are fascinating tools on Social Network Marketing which provide platform for:

1. Information sharing
2. Picture / Video Sharing
3. Discussion Boards
4. Wall Postings
5. Weblogs
6. Wikis
7. Podcasts
8. E-mailing
9. Instant Messaging
10. Music Sharing
11. Voice Over Internet Protocol (VOIP)

According to Nickson (2009), evolution of social networks started from a Bulletin Board System (BBS) at Friendster. Bulletin Board System is an online meeting place for people with same interest. Six Degrees was one of the first web-based social network site, which was launched in 1997 (Dick Stroud, 2008). It allowed users to create their profiles, invite friends, organize different groups and search for other users (Boyd and Ellison, 2007).

LinkedIn, which was introduced in 2003, is a networking resource for business people, who want to connect to professionals from different parts of the world (Nickson, 2009).

Largest social networking site in the world, Facebook began in 2004 as Harvard-only SNS’s (Cassidy, 2006). It has various features of developers to build “Applications”, which allows users to personalize their profile and perform other tasks.

Return on Investment can be generated through social media platforms. According to leading e-commerce platform ‘shopify.com’ quotes that 86% of sales are earned using Facebook and other social media platforms (Facebook conversation rate = 1.85%). For increasing sales figure, you need the right budget, the right audience/community and right social campaigns. Also companies should know how to analyze their content strategy and use their insights properly.

This can be achieved either by recruiting an in-house team of professionals or by hiring an expert agency (gurus/ninjas/ experts). CONTENT is an extremely important factor on social platforms, and courtesy should be given to the sources from where it is taken.

Most of the businesses start working with social media expecting to see a big return on investment in initial time hoping that new customers will come in droves, and will reflect in different benefits with huge revenue generation. But in real life this doesn't work out immediately. It takes ample time to build momentum with social media, and the benefits aren't always as obvious as we would like.

There are multiple risks of not using social network marketing:

1. Not having online presence or presenting a poorly designed website can put the business at a serious disadvantage especially in consumer centric sectors such as retail, export and tourism.
2. Ignoring technology or adopting solutions which are not an appropriate fit can leave the business crippled and without the competitive edge it needs to survive in the market today.

An increasing number of SMEs today lack an organized central database of customers and sales records. This makes it difficult to carry out marketing and communication related activities while a significant portion of the target segment remains unaddressed.

### **LITERATURE REVIEW:**

Social network marketing has been found as one of the most effective tool used in businesses today. The explosion of Internet usage has drawn the attention of researchers towards social network marketing.

Boyd and Ellison (2007) described social network sites as a web or internet-based service that allows individual persons to “1) build and manage a public or semi-public profile within a restricted bounded system, 2) To articulate list of other users that share and connect together, and 3) View and traverse their list of different connections and also those made by others within the system.”

Internet marketing is a branch of e-commerce that deals with online advertisement and marketing. E-commerce is a broader term which covers internet business activities encompassing Customer Relationship Management (CRM), Supply chain management (SCM), e-tailing, search engine optimization, portals and online auctions (Chippand Ismail, 2004).

Glen (2010) in his research paper suggested that even before a company opens an account and becomes active on the social media sites or website; it is instrumental to consider what each platform offers and how an enterprise can benefit from using it.

In the past some research had been carried out in various sectors like Pharmaceutical, restaurant and construction companies on the use of social network marketing as a way of integrating business activities to consumers' needs and demands (Kevin, 2009, Gupta and Udupa, 2011). “One of the first pharmaceutical companies to adopt social network marketing in the United States, in 2008, was Merck. Merck set up a page on Facebook to promote its Gardasil vaccine followed by GlaxoSmithKline, which also made use of video sharing site (YouTube) to launch a promotional campaign for their products and services” (Gupta and Udupa, 2011).

Kevin (2009) in his study describes on how small and medium enterprises can make use of social network sites, such as Facebook to generate revenue. He carefully analyzed how Facebook can be a valuable marketing tool for generating business revenue and improvement in direct sales. Online SN's also provide advertisers the opportunity to reach their target consumers.

Internet advertising can be classified into 2 types, namely, intrusive advertisement and non-intrusive advertisement (Winer, 2009). Intrusive advertisement is where consumers are interrupted like pop-ups, banners and spam mails or messages. In non-intrusive advertisement a consumer has to activate his/her account before participating in such a communication. It includes internet presence sites, e-mail and social network applications.

Online advertising avoidance can be described as all activities by online users that differentially diminish their exposure to advertisement content (Speck and Elliott, 1997). It generally occurs by cognitive, behavioral and mechanical means. Many studies have reported consumer mistrust of online advertisement and strong preferences toward online advertisement avoidance (Shavitt et al., 1998). Some consumers presume that advertisement contributes to the cost of purchases, and believe that products that are not advertised are of better value. They also believe that, most of the advertised products are more captivating than being informative (Homer, 2006).

Research findings by McNamara (2007) showed that 30 percent of frequent online social networks users trust their peer's opinions when making a major business transaction decision online, while very few i.e. about 10 percent trust advertisements.

Another research conducted by a company named Fors (2008) on an Information Technology usage found that the company encouraged its employees to use Facebook, as one of the social networks applications, to enhance communication within the company, and to attract more customers. To ensure adequate compliance with this, the CEO of the company declared every Friday as a Facebook day. CEO went further by creating a blog which makes conversations among the employees of the companies more interesting. All these steps taken by the CEO proved fruitful as the company recorded more sales in the same period.

#### **RESEARCH METHODOLOGY:**

The study of Social Network Marketing is important because the outcome will help business organization to formulate their marketing strategies to improve their operations at present and in the future. The Indian regulators, industry bodies and e-commerce players recognize the challenges faced by SMEs and are doing their bit in enabling thousands of SME sellers to explore a new channel. Some of the initiatives that the Indian government's is taking for SMEs are: Make in India, Digital India and Skill India

Some Key factors for Social Networks adoption among Business Enterprises can be

1. Increase in revenues customer experience
2. Cost effective medium to grow sales
3. Cost effective for business expansion
4. Geographic reach- national and international
5. Cost effective for business profitability
6. Lower marketing and distribution spend
7. Shorter time to market

For the research purpose data from secondary sources is collected considering number of users of social media across world and in India. We tried to find out the pattern and relationship between users at global level and country level and tried to establish relationship between 2 factors.

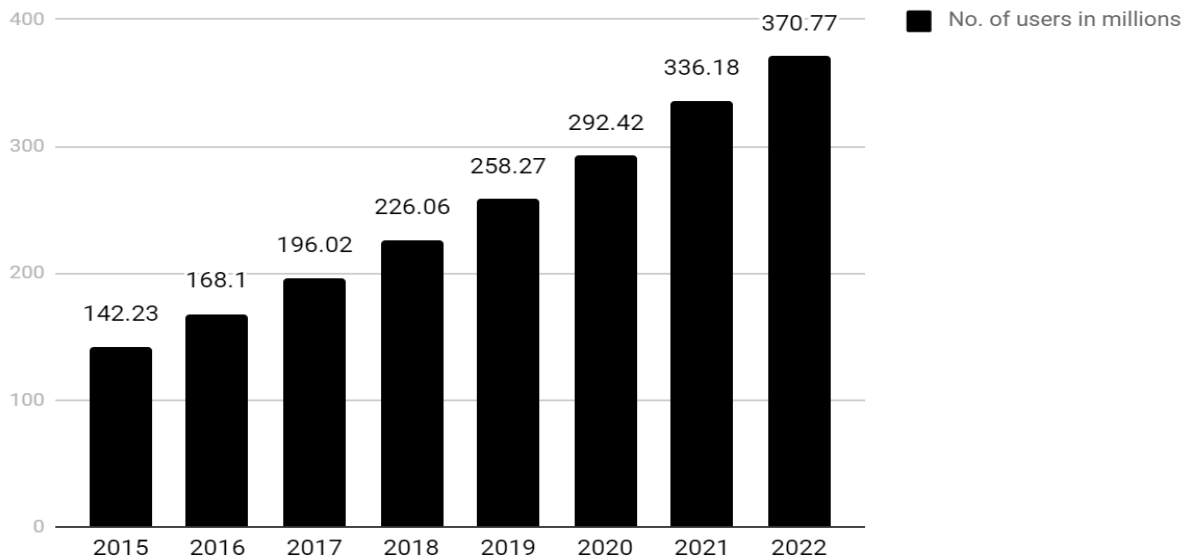


Following table indicates various social platforms, their users, the purpose of use and their reviews and ratings.

<b><u>Sr. No.</u></b>	<b><u>App name</u></b>	<b><u>Purpose for it is used</u></b>	<b><u>followers /Subscribers/download</u></b>	<b><u>Rating</u></b>	<b><u>Number of reviews</u></b>
1	Hike Messenger: Stickers, hidden chat, timeline	Chatting	100 M+	4.3	2 M
2	ShareChat- WhatsApp Status, Videos, Shayari, News	Chatting, sharing videos, jokes, GIFs, shayaris etc.	50 M+	4.5	717 K
3	All Social Networking in One App 2018	Most of the apps can be used	100 K+	4.5	2 K
4	Facebook	Share posts	1 B+	4.1	82 M
5	Facebook messenger	messaging	100 M+	4.4	2 M
6	Snapchat	Chatting, videos, pics, stories etc.	500 M+	4.1	18 M
7	Vibe Messenger	chatting	500 M+	4.4	12 M
8	Line: Free Calls& Messages	Free calls and messages	500 M+	4.2	11 M
9	LinkedIn Lite: Easy Job Search, Jobs & Networking	Job Search & Networking	1 M+	4.6	13 K
10	SHAREit - Transfer & Share	Share videos, wallpapers, music etc.	500 M+	4.6	9 M
11	WhatsApp Messenger	Chatting, videos, pics, GIFs etc.	1 B+	4.4	79 M
12	WeChat	Chatting, calls, video calls	100 M+	4.2	5 M
13	Instagram	Like, capture and share pics	1 B+	4.5	75 M
14	LinkedIn Lite: Easy Job Search, Jobs & Networking	Find jobs, companies & business contacts	100 M+	4.2	1 M
15	Twitter	Join conversations, live streams etc.	500 M+	4.3	12 M

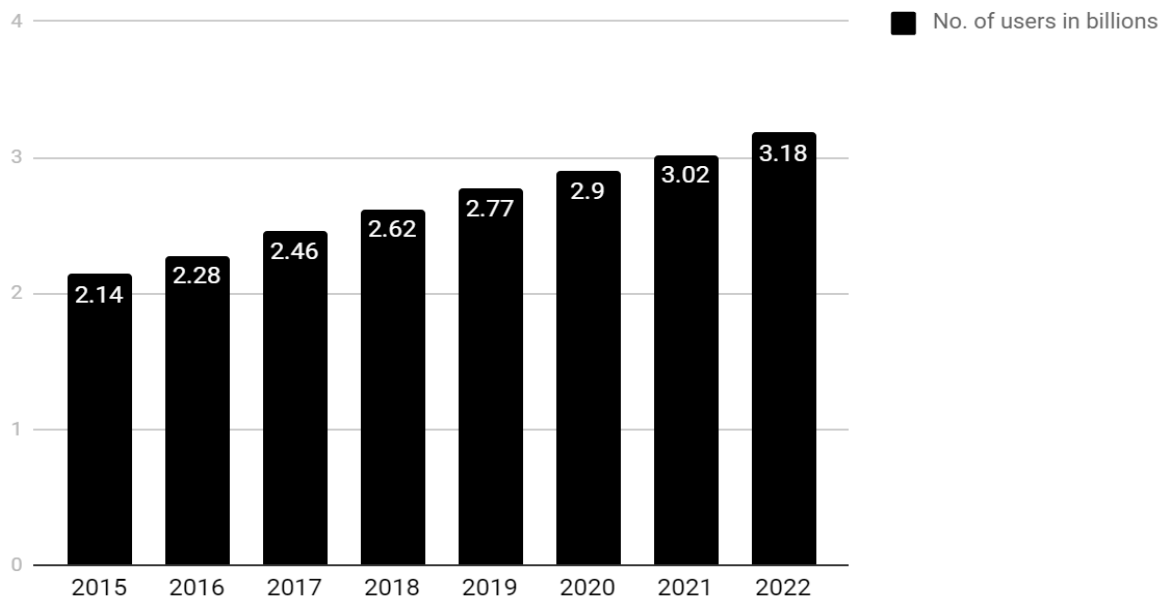
**Table: Authors own from different secondary sources**

## Number of Social Network users in India (in Millions)



**Fig: Growth of number of Social Network users in India (Source: <https://www.statista.com/statistics/278407/number-of-social-network-users-in-india/>)**

## Number of Social Network users worldwide (in Billions)



## Data Analysis:

Year	2015	2016	2017	2018	2019	2020	2021	2022	Top 3 Social Networking sites
No. of Users (Worldwide)	2140	2280	2460	2620	2770	2900	3020	3180	Facebook, Youtube and Instagram
No. of Users (India)	142	168	196	226	258	292	336	370	Facebook, Pinterest and Twitter

**Correlation Table:**

	<i>No. of Users (Worldwide)</i>	<i>No. of Users (India)</i>
No. of Users (Worldwide)	1	
No. of Users (India)	0.99222193	1

Fig. Correlation between no. of users worldwide and in India

The correlation coefficient between number of users in India and worldwide is .9922 which indicated that there is a very strong positive correlation between them. The pace at which number of users of social media are increasing in globe, at the same proportion even Indian users are increasing.

**Regression Table:**

<i>Regression Statistics</i>									
Multiple R	0.99222193								
R Square	0.984504359								
Adjusted R Square	0.981921752								
Standard Error	10.83847108								
Observations	8								
<i>ANOVA</i>									
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>gnificance F</i>				
Regression	1	44781.16527	44781.17	381.2057	1.17E-06				
Residual	6	704.8347318	117.4725						
Total	7	45486							
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>lower 95%</i>	<i>Upper 95%</i>	<i>lower 95.0%</i>	<i>pper 95.0%</i>	
Intercept	-339.2204791	30.34463605	-11.1789	3.06E-05	-413.471	-264.97	-413.471	-264.97	
No. of Users (Worldwide)	0.220017025	0.011268773	19.52449	1.17E-06	0.192443	0.247591	0.192443	0.247591	

Fig.: Regression between no. of users worldwide and in India

In order to get the relationship between 2 variables i.e. number of global users and number of Indian users using social media, we used regression equation which can be derived as:

$$Y = 0.22 X - 339.22$$

Here Y acts as a dependent variable indicating number of users in India, X is an independent variable indicating number of global users. Y intercept is -339.22 and slope coefficient is .22. Also looking at the result we can conclude that 98% of the variation in Indian users is explained by global users and remaining factors may have a very slight variance explained in dependent variables.

### **CONCLUSION AND SUGGESTIONS:**

Looking at the above study we can firmly say that business enterprises have no option but to be a part of social network if they want to in the race. Companies have to create their social media profile and manage their ratings, feedback and customer complaints through social media. It will drastically reduce their expenditure for traditional marketing. So Social Network Marketing is good option for Traditional marketing.

Here are some of the suggestions for the smaller business organizations on how to be a part of Social media and how to manage it.

1. Creating a page of Facebook for your business and start promoting your product and services via all means of communication
2. Using Twitter you can connect to your customers and followers on a more real time basis.
3. Professional services can be utilized using LinkedIn as it has got immense potential. Some persons and companies use it for promotion of their products and services. HR companies use it for hiring/ recruiting new talent.
4. Instagram has more than 200 million users globally of which 35 % of the user's log in multiple times. More than 40 million photos are posted per day.
5. Google+: Though it is not that popular, this page is given top priority by Google. You profile is searchable and reachable on Google.
6. YouTube: A video sharing platforms with highest number of users. YouTube has been referred as the 'Second TV of reality'. Lot of marketers are heading to YouTube for promotion and advertising.

### **LIMITATIONS AND FURTHER SCOPE OF THE RESEARCH:**

The research paper tries to study according to number of users at global and Indian level. But under our study, we have not covered any other factors contributing the user base. Also every country has limitations on their IT infrastructure i.e. speed of the data transmission, data cost, awareness of social networks and so on. So these factors can be considered for the further study in future to realize the contribution of various factors to the users of social media.

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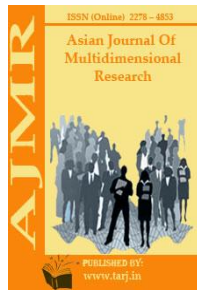
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## EXPERIENCE OF TRAINING AND EFFICIENCY ACTIVITY IN EDUCATION SYSTEM

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### ABSTRACT

*The article examines some theoretical issues of improving the efficiency of educational services and business activities. And also, it contains scientific conclusions and practical recommendations for improving the provision of educational services in higher education institutions operating in the Republic of Uzbekistan. At the same time, higher education institutions can also provide educational services or entrepreneurship activities at the expense of sponsorship funds. Therefore, a complex system of additional complementary indicators is required for a comprehensive assessment of the educational process of higher education institutions and the analysis of their results. As a result, there is a question whether the university is able to provide educational services in terms of competitive, quality, cost and service level in state and market conditions. If so, how? In the case of entrepreneurial activity, entrepreneurial activity is initiated by entrepreneurs in accordance with existing laws, It is understood that activity which ensures a certain degree of profit by producing and selling goods (works, services) that meet the needs.*

**KEYWORDS:** *Entrepreneurship, Educational Services, Management Of Higher Education, Quality Of Education, Indicators Of Educational Efficiency, Estimates Of Educational Institutions.*

## INTRODUCTION

Activation of entrepreneurial activity in higher education institutions led to a rise in competition between state and private higher education institutions called higher education sector segments in the market economy and modernization of the economy.

State higher education institutions vary from private educational institutions to the following characteristics:

1. Existence of large-scale indirect and indirect indicators and actions, controlling and regulating the educational activities;
2. Scheduling planning, targeted use of funds and strict financial control over the spending of budgetary funds;
3. The cost principle of budget financing should not be retained as a result of its activities.

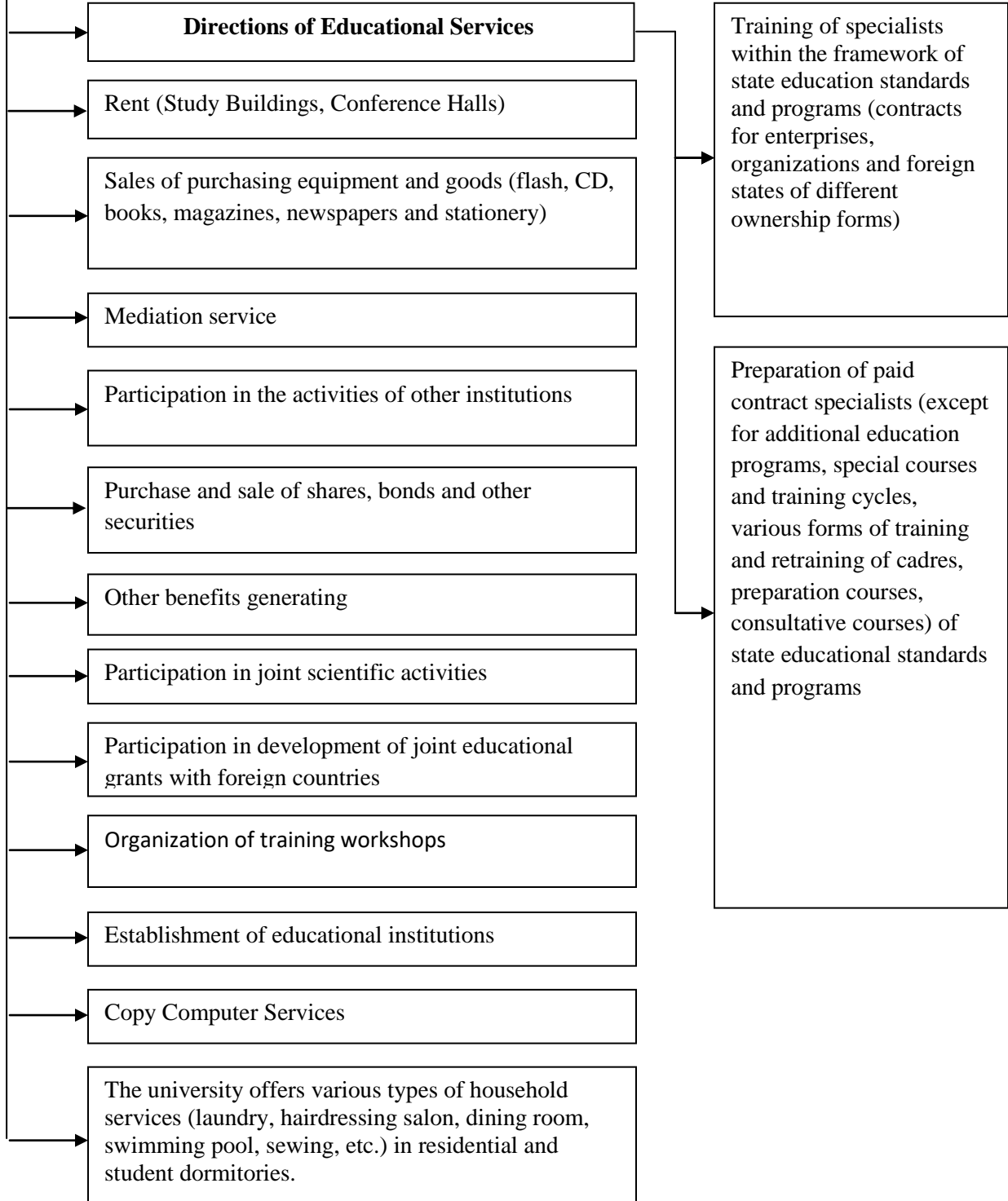
according to the economic essence of the concept of entrepreneurship, entrepreneurial activity, we can come to the following conclusions:

1. Entrepreneurship is a separate form of income-generating economic activity, based on an independent, innovative approach to production, the supply of goods (services) on the market.
2. Entrepreneurial activity based on entrepreneurial efficiency lies in the entrepreneurial activity of a person who takes full advantage of the opportunities and takes full responsibility for his actions.
3. The purpose of an entrepreneur is to generate income through production, work, service and delivery to the commodity (s), and to become conscious of himself as a person in the public.
4. Focusing on entrepreneurial activity, the level of thinking - includes the time before the idea of business started and the decision making.
5. Entrepreneur, as the main subjects of entrepreneurial activity, may be involved in this process with other participants - consumers, government, partners, and hired workers.
6. Entrepreneurship activities are goods, works and services.
7. Entrepreneurship differs depending on two main principles based on common principles: private and state.

The research has allowed the universities to identify and clarify a number of deficiencies that are inherent in the definition of business activity. In contrast to the existing concepts and definitions, we make the following clarification:

**Comparative analysis of educational services and business activities in higher education institutions**

**Directions of business activity**





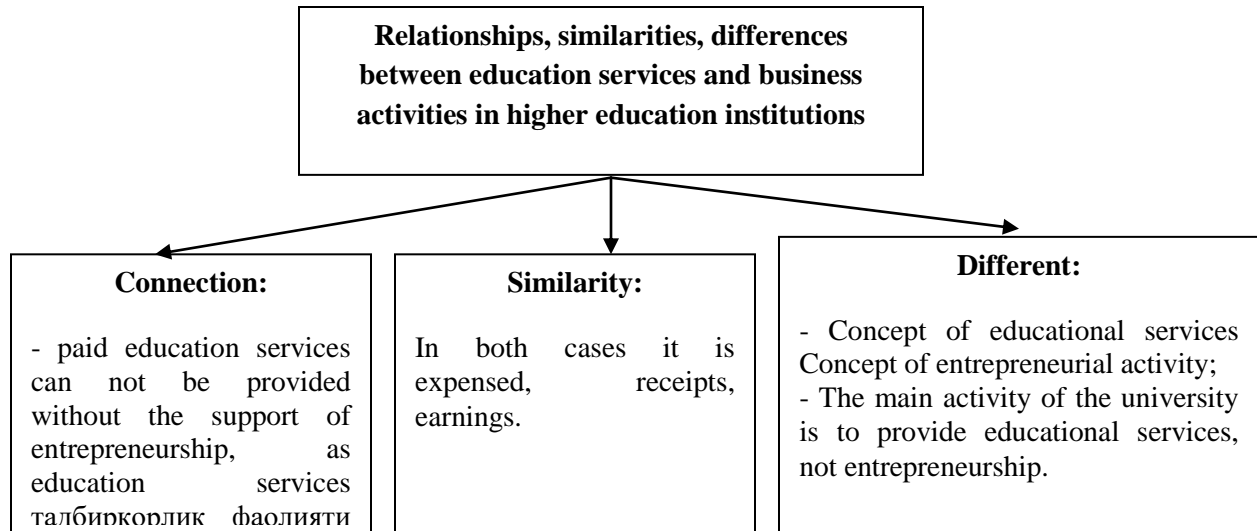
\* Note. This image was created by the author as a result of research.

### Picture 1. Comparative analysis of educational services and business activities in higher education institutions

"When state-owned higher education institutions are called entrepreneurial entrepreneurship, it is understood that initiative, independent, risk-based, and income-generating activities, we would consider reasonable to describe. However, in our opinion, maximization of off-budget revenues is not the main goal of the state higher educational institutions.

It is important to note that the difference between educational services and entrepreneurship is that the study of the sides of the similarities and relationships makes it possible to fully understand the meaning of these concepts (Figures 1 and 2).

At the same time, higher education institutions can also provide educational services or entrepreneurship activities at the expense of sponsorship funds. However, sponsorship funds are not part of the proceeds from educational services or entrepreneurship, but can be financed by sponsorship funds.



\*\* Note. This image was created by the author as a result of research.

### Picture 2. Relationship, similarity, differentiation between education services and entrepreneurship activities in higher education institutions

Having summarized the above points, we describe a few concepts. Education services are understood by the knowledge of the intelligentsia of the knowledge-makers associated with the benefit-generating process aimed at satisfying the long-term needs of the individual, government, society and other subjects of education. This definition has several advantages.

Before defining entrepreneurial activity in higher education institutions, we focus on its overall definition. There are also enough points in this regard. In our research, we find that it is expedient to describe entrepreneurial activity based on the definition of **M. Pardaev** and **J.I. Israilov** as follows: In the case of entrepreneurial activity, entrepreneurial activity is initiated by entrepreneurs in accordance with existing laws, It is understood that activity which ensures a certain degree of profit by producing and selling goods (works, services) that meet the needs. [1]

The meaning of this definition was the basis for the definition of entrepreneurial activity in higher education.

It should be noted that the main task of the state higher educational institutions and the purpose of the state is to create human resources, to train highly qualified specialists in the market. Therefore, a complex system of additional complementary indicators is required for a comprehensive assessment of the educational process of higher education institutions and the analysis of their results.

Our goal is to use the results of the assessment, not the evaluation of the higher education institution. Based on the results of the research, we find it expedient to highlight the effectiveness of higher education institutions in the following approaches:

1. Economic - Higher Educational Institution is evaluated as an economic entity by using the data of financial indicators of accounting and other financial and economic accounting, without consideration of high socio-economic significance;
2. Registrar - the quality of the educational process and the quality of education services in the higher education institution is assessed on the basis of minimum requirements and regulatory actions (eg. licensing, attestation and accreditation) from the State and the territory concerned;
3. Rating - individual indicators are evaluated. The result will help the potential consumers of educational services offered to the market and the higher education institutions to choose the type of higher education institution;
4. Quality - The management quality of higher education institution is based on ISO-9000 [2], the development and implementation of the system of certification and evaluation of higher education institutions.

Studies show that productivity assessment is based on an analysis of factors (financial, scientific, technical, or qualitative) based on competitive advantage over current available methods of evaluation. The ability to effectively manage and direct the university's internal reserves is crucial in terms of competitive advantage. As a result, there is a question whether the university is able to provide educational services in terms of competitive, quality, cost and service level in state and market conditions. If so, how?

Summarizing the aforementioned, a system of indicators that demonstrates the effectiveness of educational services and entrepreneurship has been developed. It was concluded that these indicators should be separately identified in education services and in entrepreneurial activity. The names and the ways to detect them are given in the table below (Table 1).

**TABLE 1. A SYSTEM OF INDICATORS THAT REFLECTS THE EFFICIENCY OF EDUCATIONAL SERVICES AND ENTREPRENEURIAL ACTIVITY**

<b>№</b>	<b>Index name</b>	<b>Way of calculation</b>	<b>Meaning</b>
<b>Indicators of the effectiveness of educational services</b>			
1.	Profitability of education services costs (T <sub>xφ</sub> )	$T_{xp} = \frac{T_{x\phi} * 100}{T_{xx}}$ where T <sub>xφ</sub> -benefits from educational services; T <sub>xx</sub> -education costs	100 How much does it cost to pay for educational services?

2.	Efficiency of teaching staff ( $T_{mc}$ )	$T_{mc} = \frac{T_{xt}}{T_{xbx}}$ here $T_{xt}$ -earnings from education services; $T_{xbx}$ -employees engaged in educational services	The earnings per employee of the educational services provider
3.	The ratio of the volume of educational services to the total number of teaching staff ( $T_{xny}$ )	$T_{xny} = \frac{T_{xt}}{T_{bpy}}$ Here $T_{xt}$ -earnings from education services; $T_{bpy}$ -the number of general-professor teachers employed in education	The amount of educational services that corresponds to one professor-teacher
4.	The level of coverage of teachers by teachers ( $T_{xkd}$ )	$T_{xkd} = \frac{T_{xbx} * 100}{T_{xny}}$ where: $T_{xbx}$ -the number of staff trained in educational services; $T_{bpy}$ -the number of general-professor teachers employed in education	How many percentage of co-lecturers are responsible for creating educational services
<b>Indicators of efficiency of entrepreneurial activity</b>			
1.	Profitability of business activity in education ( $T_{fp}$ )	$T_{fp} = \frac{T_{af} * 100}{T_{fx}}$ here $T_{af}$ -profit from business; $T_{fx}$ -business expenses	100 how much does it cost to invest in entrepreneurial business
2.	Effective workforce education ( $T_{fxc}$ )	$T_{fxc} = \frac{T_{xt}}{T_{bpy}}$ here $T_{xt}$ -business income; $T_{bpy}$ -the number of general-professor teachers employed in education	Profit from entrepreneurship that is relevant to one instructor in education
3.	The degree of involvement of the faculty members in the teaching staff ( $T_{fkd}$ )	$T_{fkd} = \frac{T_{fbx} * 100}{T_{xbx}}$ where $T_{fbx}$ -the number of employees who are tailor-made; $T_{bpy}$ -the general professor-teachers working in education <b>сонн</b>	How many percentage of professors and teachers are involved in organizing entrepreneurship

\* **Source:** Developed by the author.

The problem of determining the factors influencing the formation of competitive edge of higher education institutions does not fully solve the problem. At the same time, it primarily requires the modification of the notion of the purpose of evaluation and the elaboration of the basis for

the accepted and perceived indicators and the selection of evidence-based selection and evaluation of these factors. Therefore, we believe it is necessary to develop a mechanism for assessing the reliability, objectivity, optimality, frequency and transparency of results. These indicators should also allow for adequate managerial decision-making, management accounting (planning, monitoring, monitoring). The system of performance indicators should, on the one hand, be a full-fledged institution's goal and objective, balancing of the other, and practical implementation (statistical information that broadly informs).

Developing a scientifically-based methodology for developing a higher education institution.

In addition, the efficiency of education and entrepreneurship activities are also dependent on their costs and on income. This is because the earnings of higher education institutions are as follows:

- 1) budgetary funds;
- 2) extra-budgetary funds.

However, it is important to focus on the following specific aspects:

1. The basic principle of expenditure of budget means is their purposefulness and timeliness. Higher educational institutions do not have the right to use budget funds for unspent purposes in the budget. The budget of the higher education institution budget includes their closed list, which includes the following: salaries of the staff; contributions to non-budgetary funds; transfers to the public (pensions, stigmatization, pensions, compensation and other social benefits); travel and other compensatory payments; the goods to be purchased, the works to be done, and the services provided.

It should be noted that the cost estimate is pre-made and can not be changed. However, above mentioned expenditures are made according to the norms of expenditure (budget) expressed in certain amount of money as a measure of absolute need satisfaction. In practice, the following types of paid norms are used: [3]:

- Norms based on natural wealth utilization (nutrition, purchase of technical equipment, soft inventory, etc.). These norms represent the expression of monetary norms in money;
- aggregate individual payments - wages, pensions, scholarships, travel expenses and others;
- norms generated with the help of experimental-statistical methodology and budgetary capacities on the basis of generalization of expenditure indicators in previous periods.

Budgetary norms may vary by many factors. For example, the change in the system of prices and tariffs, the growth of wages in the national economy, and the appearance of additional images on financing the costs of higher education.

General human values are the most important conditions for the achievement of the state policy objectives aimed at the concrete goals of education in the light of the centuries-old scientific and cultural traditions of the Uzbek people, the development of modern culture, economy, science, technology and society.

Given the positive effectiveness of marginal income approach in managing business activities in higher education institutions, we consider it appropriate to systematize costs as follows: [4].

Correct Expenditure (TX) - costs associated with the learning process. These expenses are included in the salary of the professor-teacher, the salaries of the teaching staff, social insurance and the allocation for the supply.

1. Conditional Direct Expenditure (SCC) - these are the costs associated with the organization of the educational process and the implementation of the direct learning process. Examples of the costs of publishing educational literature, publication of methodological and disseminating materials are the costs of departments and deans.

2. Indirect costs of the learning process (BX) are the costs of the technical staff who are involved in the learning process: education department, library, computing center, methodological department, innovation department, administrative and management unit.

3. Indirect expenses of the University (UBX) - these are the costs of maintaining higher education institution's overall economic activity.

## CONCLUSION

Research on improving the efficiency of services and entrepreneurship in the education system has allowed the following conclusions:

1. In the conditions of modernization and further development of the economy, the importance of entrepreneurship in higher education institutions should be improved. In order to do so, higher education institutions need to revive the commercialization of innovative developments.

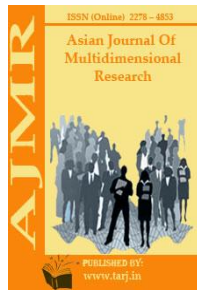
2. Given the different approaches to business activities in economic literature, this article outlines the concept of authorship in order to formulate a single approach to it.

3. In the system of higher education a system of indicators that demonstrates the effectiveness of educational services and entrepreneurship has been developed and recommended for use in practice.

4. The use of marginalized income management in internationally administered educational services in higher education institutions is scientifically justified by the classification of direct and indirect costs into four groups of higher education.

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## **TECHNOLOGY OF MANUFACTURING SOLAR CELLS WITH CLUSTERS OF Ni ATOMS**

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### **ABSTRACT**

*The possibility of self-organization of micro-particles of impurity atoms of nickel in silicon at certain thermodynamic conditions is introduced in this paper. It was revealed that the concentration and distribution of micro-particles in the bulk of the sample is essentially uniform. Research of state of nickel atoms in the samples was carried out by infrared microscope at room temperature. The results of investigations showed that in samples doped at 1220 °C no formation of clusters of Ni in the lattice of Si was documented and perhaps it is due to the limited resolution of the infrared microscope. The doped samples were subjected to additional low-temperature annealing at  $T=600\text{ °C}\div 1200\text{ °C}$  during  $t=1\div 3$  hours in air. Then, after removing about 50 microns from the surface, all samples were subjected to optical polishing for further infrared microscope investigation. It was found, that in the course of additional annealing the self-organization of micro-particles of impurity eventually occurs.*

**KEYWORDS:** *Nanoscale structures, self-organization, clusters, impurity atoms, Ni clusters, single crystalline silicon, contact, nanophotonics, doping duration.*

## 1. INTRODUCTION

One of the novel and promising methods for producing nanoscale structures in the crystal lattice of semiconductor is the self-organization of nanoclusters of impurity atoms jointly with lattice defects since this technique of producing nanoscale structures in compare to the existing methods of molecular-beam epitaxy that requires complex and expensive equipment, has the following advantages [1,2]: makes it possible to produce nanoscale structures through the entire bulk of the crystal; makes it possible to easily manage the structure, composition, distribution of nanoscale structures and their ordering; this method permits to obtain magnetic nanoclusters with the ability to control their magnetic moment, i.e. novel magnetic semiconductor materials [3,4] ; makes it possible to control the charge state of nanoclusters in the broad range ( $N+(-)n$ , где  $n>3$ ), thus producing multiply charged centers in the semiconductor, which might serve as the foundation for promising novel material for nanophotonics [5,6].

## 2. Main Body

### 2.1 Theoretical analysis

Over the past few years, there has been a widespread interest among experts in the field of nanotechnology and nanoelectronics all over the world in the technology of self-organizing impurity clusters with manageable structures and magnetic properties. In this respect one can note some interesting results related to implanting Co and Ge ions on Si, ion implantation in other semiconductor materials [7,8]. As we have heard, the technology of self-organization of clusters of impurity atoms by using the diffusion technologies currently is not sufficiently studied. Diffusion technology for producing nanoscale structures is not only a more affordable and cheap technique, allowing large-scale production, but also gives the ability to synthesize nanoscale structures of various type (2D, 1D, 0D), as well as specify the distribution and density over the bulk of the crystal [9,10].

Therefore, the main objective of this research is to demonstrate that under certain doping conditions one can witness shaping of clusters which also gives us the opportunity to manage parameters of those clusters.

### 2.2. Experimental part

Our group developed a special technique for doping, the so-called "low-temperature doping" of semiconductors. This method of doping is based upon the diffusion process which is carried out in stages by gradually increasing temperature ranging from room temperature to the diffusion temperature.

The native sample and dopant respectively (pure metallic Nickel of certain weight (to be determined by ampoule volume)) are put into evacuated quartz ampoules (pressure  $\sim 10^{-6}$  mm. of mercury column), which are inserted into the diffusion furnace at  $T=300\text{K}$ . Shortly thereafter starting from  $T = 300 \text{ K}$  the furnace temperature at the location of the ampoule is gradually increased at a rate of  $5 \text{ }^\circ\text{C} / \text{min}$  and preheated to the temperature on intermediate processing and this temperature is retained to a certain period, then the furnace temperature is increased quickly at the rate  $t=(15\div 20) \text{ C/min}$ . and so up to the diffusion temperature ( $1523 \text{ }^\circ\text{C}$ ) and the samples were retained under this temperature during 40 minutes. After having completed all the above stages the ampoules are removed from the furnace and cooled off. Such doping conditions ensure embedding maximum concentration of Ni in the Si lattice and uniform doping through the entire bulk of the crystal.

We used a single crystalline silicon of both n- and p-type with phosphorus concentration  $N_P=10^{13} \div 10^{17} \text{ cm}^{-3}$  and the boron concentration  $N_B=10^{14} \div 10^{17} \text{ cm}^{-3}$ . The native samples had a minimal dislocations density which was  $N_D < 10^2 \text{ cm}^{-2}$ . Selection of impurities of different concentrations was dictated by necessity to determine what a role a type and concentration of impurity atoms do eventually play in shaping a cluster. The samples were doped as per by the above technology.

After diffusion the samples were subjected to low-temperature annealing, thereafter they were polished for visual inspection of the state and structure of impurity atoms of Ni in the lattice by the infrared microscope INFRA-N and AFM. The experimental studies have shown evidence that under strict doping and annealing technological requirements (doping duration, sample cooling rate and annealing temperature) the experimental results are 100% reproducible.

### 2.3. The results and discussion

Research of state of nickel atoms in the samples was carried out by infrared microscope at room temperature. The results of investigations showed that in samples doped at 1220 °C no formation of clusters of Ni in the lattice of Si was documented and perhaps it is due to the limited resolution of the infrared microscope.

The doped samples were subjected to additional low-temperature annealing at  $T=600 \text{ °C} \div 1200 \text{ °C}$  during  $t=1 \div 3$  hours in air. Then, after removing about 50 microns from the surface, all samples were subjected to optical polishing for further infrared microscope investigation.

The results evidenced that in all samples that were subjected to low temperature annealing occurs clustering of Ni atoms in the lattice of Si. However, it is important to note the following facts:

- 1) The geometric dimensions of the clusters increase with decreasing annealing temperature and varies from  $0,5 \div 0,2$  microns to  $2 \div 5$  microns;
- 2) The density of clusters decreases as the temperature of annealing decreases;
- 3) clusters are distributed fairly evenly over the entire surface;
- 4) the size, density and distribution of clusters does not depend on the type and concentration of initial impurity atoms.

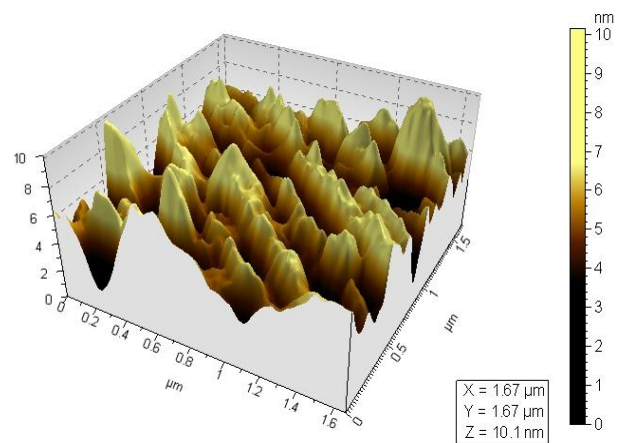
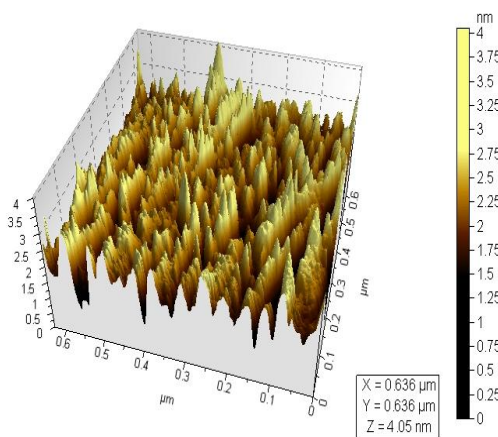
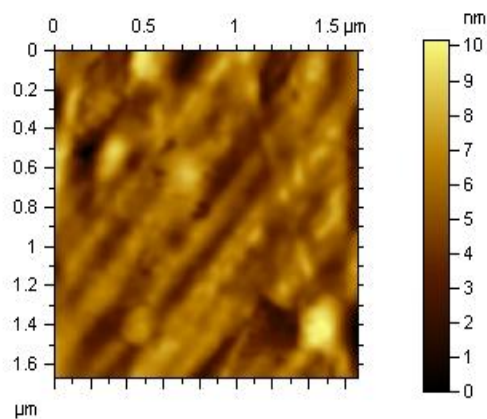
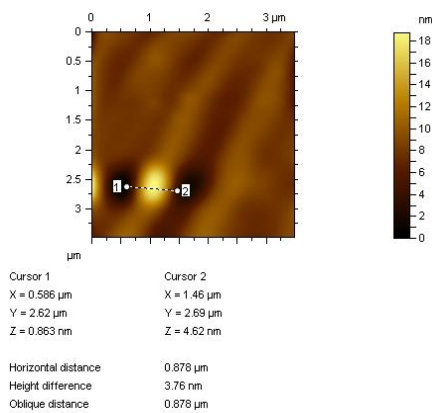
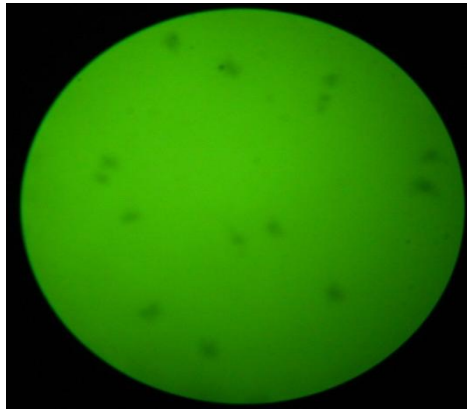
So, the next task was to demonstrate that these clusters consist of Ni atoms as well as to determine the distribution of the clusters in the bulk, i.e. whether they are distributed on the surface or the entire bulk of the crystal.

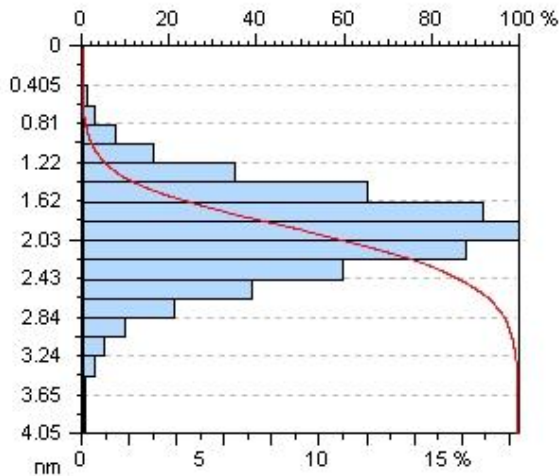
To answer these questions, we conducted X-ray microprobe analysis on Jeol Super Probe YXA-8800R/RL analyzer. It had been revealed that the micro-particles consist of Ni atoms and Si at ratio 60% to 40%, respectively. It should be noted that nickel does not appear across the entire silicon surface but in some areas, i.e. in locations where the clusters are formed (determined by infrared microscope). This leads us to conclude that under certain conditions of low temperature annealing one can really witness self-organizational formation of nickel atoms into cluster.

To examine the character of distribution of micro-particles in the bulk, the samples were subjected to surface polishing resulting in  $15 \div 20$  microns off each. After every step of grinding the samples were polished and studied under infra infrared microscope INFRA-N and Atomic force microscopy. The practice continued until the removal of more than a half of the thickness of the samples (about  $350 \div 300$  microns). As evidenced by the results of investigations, the size, density and distribution of micro-particles across the crystal is almost uniform, i.e., only coordinates of their location on the surface does changes. This implies that the formation and

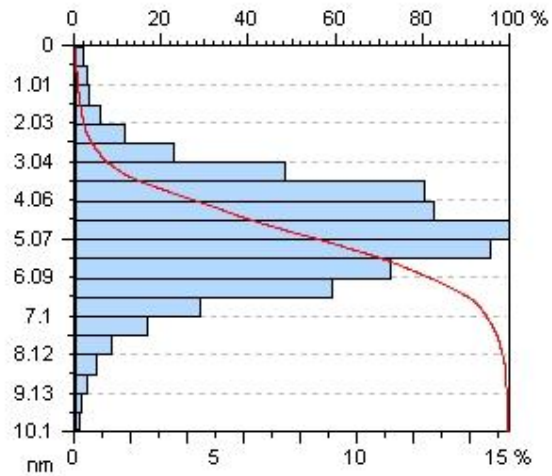


self-organization of clusters occurs over the entire volume of the crystal, and they are fairly uniformly distributed. The above data allowed us to calculate the concentration of clusters. The calculations show that their concentrations vary in the range of  $N=10^9 \div 10^{10} \text{ cm}^{-3}$  to  $N=10^{12} \div 10^{13} \text{ cm}^{-3}$ . The results indicate that, under certain conditions of doping and heat treatment one can evidence self-organization of clusters of Ni impurity atoms throughout the entire volume of the crystal. There is the possibility to control their size, concentration and distribution (Figure 1.).





**Figure 1.** Microphotograph of micro-particles of Ni atoms in Si. Magnification: x1000.



**Figure 2.** The state of micro-particles of Ni atoms in Si after additional annealing at  $T = 880$  °C during 3 hours. Magnification: x1000.

Interesting results were obtained at additional low-temperature treatment at  $T=880$ °C. Thus, ordering of impurity clusters of nickel atoms in silicon occurs as a function of time of annealing (Figure 2).

As shown by the results of studies such ordering of clusters of impurity atoms occurs throughout the crystal. It was figured out that as the temperature of additional annealing increases the ordering of clusters collapses again and they become evenly distributed again.

### 3. CONCLUSIONS

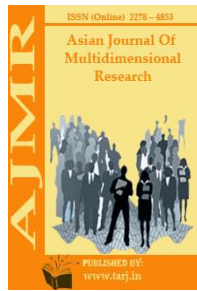
The experience evidenced that in silicon samples doped by Ni under the technology of staged diffusion and after additional low-temperature annealing, one can witness self-assembly of clusters of impurity atoms of Ni in the lattice of Si. By controlling the annealing temperature one can change the cluster sizes in the wide range  $d = 0,2 \div 5$  microns, their distribution in the bulk, as well as their concentration whereas at  $T = 880$  °C a unique phenomenon, i.e. ordering of clusters occurs.

Formation of clusters and their parameters are practically independent of the type and concentration of the initial impurity atoms, which allows us to conclude that the initial impurity atoms do not play a role in the formation of clusters. Physical mechanisms of the formation of clusters and their ordering, as well as the structure of clusters require more detailed research and investigation. Of great practical interest is the possibility to use such clusters as micro- and nano-Schottky barriers in the development of a novel class of microelectronic devices and integrated photocells.

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## **FULFILLMENT OF CORPORATE SOCIAL RESPONSIBILITY BY INDIAN COMPANIES: A STUDY**

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### **ABSTRACT**

*A company is known as an artificial person and responsible citizen of a nation. As a natural person is supposed to be proved as valuable assets for his society so as a company is expected in same way. Corporate social responsibility is a new concept which emerges over a period of time. It means that a corporate decision should be taken by analyzing the impact of those decisions and actions on the social system. Present study makes an attempt to analyze the CSR initiatives taken by selected companies. Companies for the purpose of this study are selected on the basis of their fund providence in the year 2017-18. Selected companies are Reliance Industries Limited, TCS, ONGC, Indian Oil and HDFC bank limited. The study found that Reliance Industries shows highest motivation in social upliftment by contributing 771 crore for CSR activities. ONGC contribute 500 crore, TCS 400 core, Indian Oil 374 crore and HDFC bank 328 crore. The study concluded that corporate social responsibility should not be taken as an obligation by businesses but they must take initiative willingly to uplift the society and it should be a vital part of their internal policies. Business and society are complimentary and dependent to each other so as society is providing valuable resource to business so also business must work by considering the impact of their action on all stakeholders.*

**KEYWORDS:** *Corporate, Initiatives, Responsibility*

**INTRODUCTION:**

The concept of corporate social responsibility starts from the business. So, firstly it is evident here to know what is called a business? A business is an organization or an economic system in which goods and services are exchanged for one another for economic benefits. The first and foremost objective of a business is that it must run in such a way that it is profitable. For running a business successfully it gathers inputs from society which are in the form of raw material, finance, human resource, technology, power and fuel etc. by processing the inputs it produce output which is sold to customers and by this it earn revenue. Here one thing is clear that a business organization cannot exist in vacuum. It depends on society and in return society gets goods and services which fulfill their needs and desires. Now question arises that when the existence of a business is totally depends on society because it is obtaining huge resources from society that is it does not have any responsibility in return towards its stakeholders? Whether it is not obliged and responsible for uplifting the society? This is the fundamental thought from which the concept of corporate social responsibility originates.

To whom the corporate are responsible: CSR practices are incorporated by incorporations in their policies which make it sure that the impact of business activities must not be harmful for its stakeholders. Stakeholder is a wider term which includes company's shareholders, government, customers, employees, society and environment in which it operates. It means that a company is operating in such a way its activities must not impact negatively but it contributes to the upliftment of society and environment. Responsibility of companies is explained as follow.

Towards itself: firstly, a company is responsible for itself. It is a notion that a company must be profitable and well operating because only that it will be able to uplift the society and fulfill obligations for its stakeholders. For this purpose it should make appropriate policies and strategies so that it run efficiently and proved to be a going and progressing concern.

Towards the other stakeholders: a company which is showing a responsible behavior towards its employees building long lasting human assets. Employees will have a feeling of belongingness and high morale. **Shareholders:** are the people who invest their valuable money in the company. Finance is lifeblood of a business and it is provided by shareholders. So in return a company must provide them with adequate and timely return on their capital along with capital appreciation. **Environment:** it is the surrounding in which we all live. The activities of business must not affect environment negatively. It must not pollute soil, water, air and sound. Rather it should work for making environment neat and clean. **Customers:** customer is the king of the market. It is like God for every business. Customers are the people who demand company's products. So a company should provide safe, good quality and economic products to its customers. **Society:** company progress and flourish by obtaining resources from society so it must work for its upliftment. It should provide ample employment opportunities and uplift standard of living of the people.

CSR in Indian companies: India is the first company in the world to make CSR mandatory by law by making an amendment to the company act, 2013 in April 2014. Businesses are required to invest their profits in areas such as education, poverty eradication, gender equality and hunger. The amendment is notified in schedule 7 of the companies act. It advocates that companies with net worth of 500 crore ( 4.96 billion) or more, an annual turnover of ( 9.92 billion) or more or an annual profit of 50 million or more during a financial year, should provide 2% of average net profit of past three year towards CSR.

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**LITERATURE REVIEW:**

**Archie B. Carroll (1999)** in his article describes definition of CSR by some eminent proponents of CSR. **Bowen (1953)** defined CSR as follow, “it refers to the obligation of businessmen to pursue those policies, to make those decisions, or to follow those lines of actions which are desirable in terms of the objective and value of our society”. **Keith Devis (1960)** defined “it refers to businessmen decisions and actions taken for reasons at least partially beyond the firm’s direct economic and technical interest”. **William C Fredrick** defined CSR as “social responsibility means that businessmen should oversee the operation of an economic system that fulfils the expectations of the public and this means in turn that the economy’s means of production should be employed in such a way that production and distribution should enhance total socio-economic welfare”. **Joseph W. McGuire (1960)** in his book “business and society (1963), stated “the idea of social responsibility supposes that the corporation has not only economic and legal obligation but also certain obligations to society which extend beyond these obligations”. **Keith Devis and Robert Blomstrom (1966)** stated that social responsibility refers to a person’s obligation to consider the effects of his decisions and actions on the whole social system. Businessmen apply social responsibility when they consider the need and interest of others who may be affected by business actions. In so doing, they look beyond their firm’s narrow economic and technical interest. **Clarence C. Walton (1967)** in their book titled corporate social responsibility defined “the new concept of social responsibility recognizes the intimacy of relationship between the corporation and society and realizes that such relationships must be kept in mind by top managers as the corporation and the related groups pursue their respective goals. **Professor Walich (1972)** “I take responsibility to mean a condition in which the corporation is at least in some measures a free agent. To the extent that any of the foregoing social objectives are imposed on the corporation by law, the corporation exercises no responsibility when it implements them. **Jules Backman (1975)** identified some examples of CSR. Such as employment of minority groups, reduction in pollution, improve the community, improved medical care, improved industrial health and safety. These and other programs designed to improve the quality of life are covered by the broad umbrella of social responsibility.

**Carroll (1979)** defined that “the responsibility of business encompasses the economic, legal, ethical and discretionary expectations that society has of organization at a given point of time”. This definition says that firstly a business is an economic unit. Its first obligation is to produce and sell the goods and services which society wants and sell them at a profit. A business can be helpful for society if it is profitable itself. Secondly society also expects business to obey the law. Society expects that business should earn profit within the legal requirement set by the society’s legal system. Thirdly the ethical responsibility represents the kinds of behavior and ethical norms that society expects business to follow. The last one represents the voluntary roles that business assumes but for which society does not provide clear expectation. These are depends on corporation’s individual choice.

**Mc Williams and Siegel (2001)** outlined a supply and demand model of CSR. Based on this framework, research hypothesized that a firm’s level of CSR will depend on its size, level of diversification, research and development, advertising, government sales, consumer income, labor market conditions, and stage in the industry life cycle. Study concluded that there is an ideal level of CSR which managers can determine via cost benefit analyze and found that there was a neutral relationship between CSR and financial performance.

### The pyramid of corporate social responsibility:



Philanthropic responsibility: be a good corporate citizen, contribute resources to the community and improve quality of life.

Ethical responsibility: be ethical, obligation to do what is right, just and fair. Avoid harm.

Legal responsibility: obey the law; law is society's codification of right and wrong. Play by the rule of game.

Economic responsibility: be profitable, the foundation on which all other rest.

#### **RESEARCH METHODOLOGY:** Objective of the study:

- To understand the origin of CSR concept.
- To analyze CSR funding of top 5 Indian CSR fund giving companies.

Sample and analysis: for the purpose of this study top 5 companies on the basis of their fund providence are selected. These 5 companies are Reliance Industries, HDFC bank limited, ONGC, Indian oil and TCS. Their last year (2017-18) data is taken from their annual reports to identify in which activities and how much funds are allocated by them and how these are helpful in social upliftment.

#### **A brief profile of top 5 companies with CSR fund in India during financial year 2017-18:**

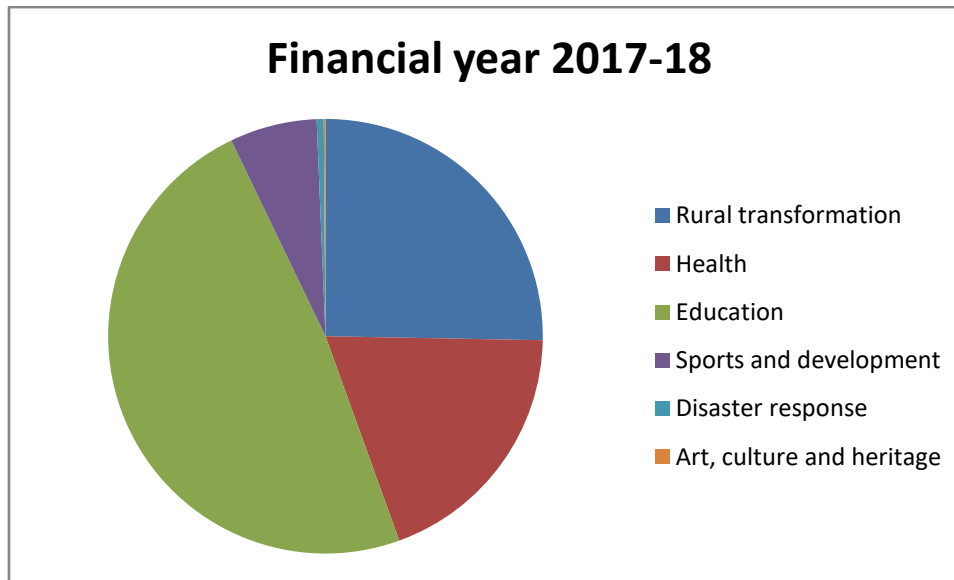
**Reliance Industries Ltd.:** it is a multinational company having its operations worldwide. It was founded in 1977 (42 year ago) by Dhirubhai Ambani. It is an Indian conglomerate holding company headquartered in Mumbai, India. Reliance is one of the most profitable companies in India. It is largest publically traded company by market capitalization and second largest as measured by revenue after the Indian Oil Corporation. The traded products of Reliance are petroleum, natural gas, petrochemicals, textiles, retail, telecom and media.

#### CSR funding in 2017-18 by Reliance Industries Limited:

**TABLE 1**

CSR expenditure ( in crore)	Financial year 2017-18
Rural transformation	195
Health	148
Education	373
Sports and development	50

Disaster response	4
Art, culture and heritage	1
Total	771



It is evident from the table 1 that Reliance Industries spent 771 crore on CSR activities in previous year 2017-18. Pie chart depicts that major part is spent on education sector which is (373 crore) after that then rural transformation (195 cr) and health (148 cr.). Least amount is spent on disaster management (4 crore) and on art, culture and heritage (1 crore).

#### **Tata Consultancy Services:**

It is an Indian multinational information technology services, consulting company. Having its headquarter in Mumbai. It was founded in 1968 (51 year ago) by JRD Tata and F.C Kohli. The area served was worldwide (46 year ago) and provide consulting and outsourcing service. Its parent company is Tata group and subsidiaries are TCS China, TRDDC. It is one of the largest companies by market capitalization.

**TABLE 2**

<b>category</b>	<b>Expenditure in crore</b>
Health and wellness	136
Education and skill building	91
Environment and sustainability	1
Contribution to TCS foundation	172
total	400



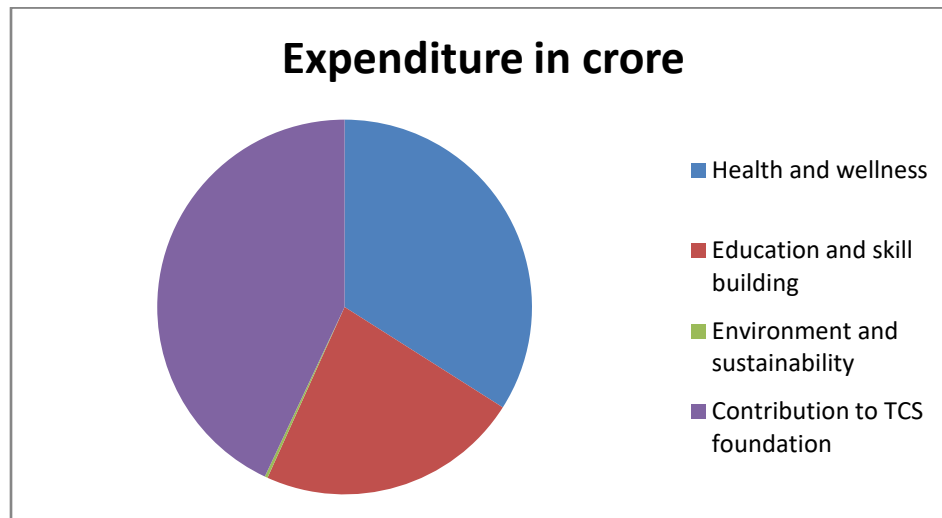


Table 2 depicts the CSR spending of TCS in f.y 2017-18. It is evident from the table that major part is contributed towards TCS foundation (172 cr) and health and wellness (136). Least part is contributed to environment and sustainability.

**ONGC ( Oil and natural gas corporation):** ONGC is an Indian multinational oil and gas company shifted its head office from Dehradun to New Delhi. It is a public sector undertaking of Government of India under the control of Ministry of Petroleum and natural gas. It produces nearly 70% of India's crude oil and it is largest oil and gas exploration and Production Company. ONGC spending on CSR is as follow

Paid up capital	64166.31 million
Revenue form operations	850041M
Profit after tax	199453
Total spending on CSR as %age of PAT	2.52%

List of activities on which above stated expense is allocated:

Promoting healthcare	Including preventive healthcare, sanitation and making available safe drinking water
Promoting education	Special education and employment vocation skills specially among children, women, elderly and differently able and livelihood enhancement projects
Ensuring environmental sustainability	Ecological balance, protection of flora and fauna, animal welfare, agro forestry, conservation of natural resources and maintaining quality of soil, air and water
Rural development projects	Setting up homes and hostels for women, orphans, old age homes and day care centers.
Protection of national heritage	Art and culture including restoration of buildings and sites of historical importance
Training and promote	Rural sports, regionally recognized sports, Paralympics sports and Olympic sports

**HDFC:** HDFC bank limited (Housing development finance corporation) is an Indian banking and financial services company H.Q in Mumbai. It is a private sector banking company founded in 1994 (24 year ago) and serving in Indian only. HDFC is India largest private sector lender by assets and also in market capitalization. It was ranked 69<sup>th</sup> in 2016 Brandz top 100 most valuable global brand. Its CSR funding is as follow:

Paid up capital	5190180534
Total turnover	95461.7 crore
Total profit after tax	17486.8 crore
Total spending on CSR	374 core (2.04% of average net profit of past 3 year.

List of activities on which above amount is spent by HDFC bank:

- ✓ Rural development
- ✓ Promotion of education
- ✓ Skill training and livelihood enhancement
- ✓ Healthcare and hygiene
- ✓ Financial literacy and inclusion

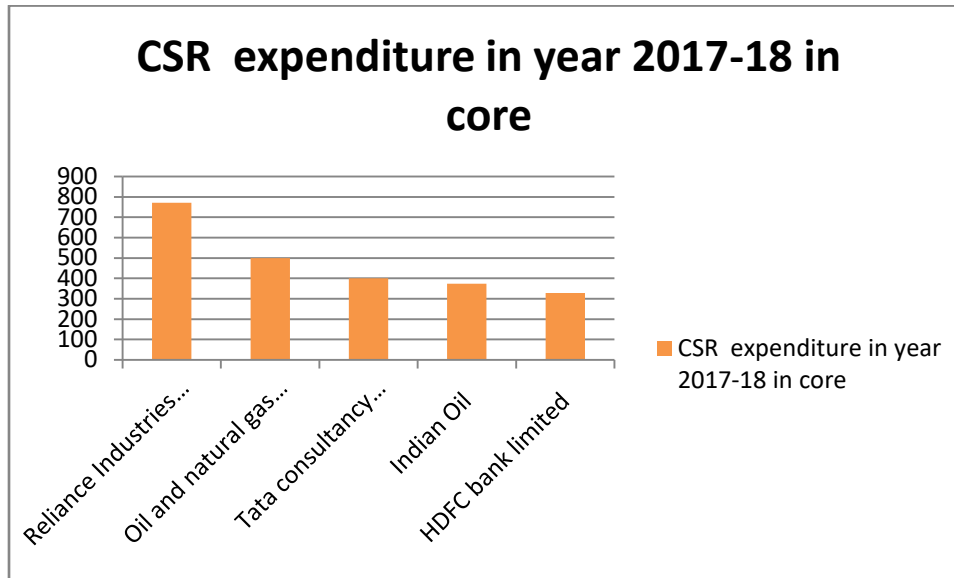
**Indian Oil:** it is an Indian state owned oil and gas company with registered office at Mumbai. It is a state owned company founded in 1964 ( 55 years ago) with products petroleum, natural gas and other petrochemicals and serving area in India, Sri Lanka, Middle east Mauritius. It is India's largest downstream oil company, with a workforce of more than 33000 employees. CSR funding is as follow:

Average net profit of Indian Oil in the last 3 year was 16397.11 crore. Total budget for CSR in 2017-18 was 331.05 crore and the activities on which this amount is allocated is as follow

- ✓ Healthcare
- ✓ Environment sustainability
- ✓ Education
- ✓ Skill development
- ✓ Art and culture
- ✓ Sports and others

#### A comparison of all companies:

Name of the company	CSR expenditure in year 2017-18 in core
Reliance Industries limited	771
Oil and natural gas corporation	500
Tata consultancy service	400
Indian Oil	374
HDFC bank limited	328



### FINDINGS AND CONCLUSION:

study finds that the concept of CSR emerges over a period of time. In 1960 various eminent authors who were proponent of this thought provide their precious thoughts and definitions on social responsibility. Those days are gone when business was viewed just as an economic entity and its sole motive was to earn profit by selling its offerings. The modern era has changed this thought of business and now business is not only an economic unit but it is a responsible citizen who has obligation to do something for the welfare of the society. This study explained the CSR initiative by top 5 Indian companies in the last financial year 2017-18. Above table depict that Reliance Industries shows highest motivation in social upliftment by contributing 771 crore for CSR activities. ONGC contribute 500 crore, TCS 400 core, Indian Oil 374 crore and HDFC bank 328 crore. In conclusion in can be said that corporate social responsibility should not be taken as an obligation by businesses but they must take initiative willingly to uplift the society and it should be a vital part of their internal policies. Business and society are complimentary and dependent to each other so as society is providing valuable resource to business so also business must work by considering the impact of their action on all stakeholders.

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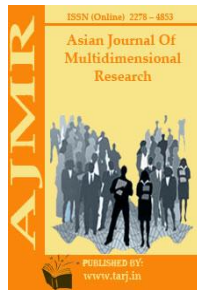
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## DEMONETIZATION, ECONOMIC RESTRUCTURING AND MONETARY SUSTAINABILITY IN WAR PRONE AFGHANISTAN

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### ABSTRACT

*Demonetization is a transitory economic intervention for currency regulation in the economy where a ban is imposed on legal currency circulation in the economy. This study analyses the impact of demonetization on the economic conditions of war-prone Afghanistan. The data for analysis is taken from World Bank database, Da Afghanistan Bank, Central Statistics Organization (CSO) and IMF websites for the period 2002 to 2017. T-test, GVA, Trend Forecasting and OLS are used in the analyzing the data. The present study showed the impact of demonetization on different sector of Afghanistan economy. The gross value added of Afghanistan in post demonetization showed a fluctuation trend in agriculture sector in long-run, in some year it's slightly decreasing compared to the previews years, but in the initial years demonetization impact is highly positive. As per the t-test analysis the positive effect of demonetization on GDP is significant in long-run. Through regression analysis and trend projection, we found that there is a linear trend in GDP i.e. GDP is increasing over the time. Findings suggest that Demonetization brought economic growth, as well as progress in financial sector through reforms and developments in formulation of monetary policy and fiscal policy in Afghanistan. The study will provide useful insights to Central Bank of Afghanistan, policy makers, and contribute to the general body of Knowledge.*

**KEYWORDS:** *Demonetization, Sustainability, Economic intervention, Economic Growth monetary Policy.*

## I. INTRODUCTION

Demonetization is the process of banning a legal currency circulation in the economy of a country. Therefore it refers to the process of deciding that the existing currency, banknotes and coins can no longer use for exchange of goods and services. It occurs when the government of a country decides to bring changes in their national currency the current form of money is pulled from circulation and retired often to be replaced with the new banknotes and coins. Demonetization has old roots in Afghanistan. In this paper, we consider the recent demonetization that happened in late 2002 in the country. There was the official Afghani which had been issued prior to the Taliban rule by previous regimes, as well as the government in exile. After the Taliban rule and the new established official government in Afghanistan the existing currency were still in circulation and people were using it for exchanging of goods and services. There were three versions of domestic currency in circulation during the days of the Taliban and after. Additionally, two other versions of the currency issued by private individuals were also been in circulation. The uncontrolled and excessive printing and issuing of these currencies had greatly eroded its value and also eroded the values of all deposits and contracts denominated in Afghani. Demonetization was needed to introduce a single new currency as quickly as possible so as to gain control and stabilize its value and to facilitate recovery and economic growth in the country. Since the value of the old Afghani had been seriously eroded by inflation the largest denomination (Afs10, 000) was worth about 25 US cents--and people had to carry around large bundles of cash for even small purchases, Da Afghanistan bank (DAB) and ministry of finance (MoF) proposed to the Transitional Government to demonetize the old Afghani bank notes into new Afghani bank notes (demonetization). A program for printing and introducing the new currency was announced on September 04, 2002 and was made effective from October 07, 2002 (by Decree No 142, dated October 06, 2002). It was decided that one new Afghani would replace 1,000 old ones. Historically, several countries in different parts of the world--advanced economies as well as developing countries have been subjected to high or hyperinflation greatly reducing the value of their currencies. Afghanistan is no exception. Afghanistan's problems were in some respects, even more daunting than those in the other countries. In order to ensure proper control over the supply of the new currency and thus of its value, the transitional government followed the practice of other countries and gave the central bank i.e., DAB a full authority over the issuance of currency. This ended the problem of multiple issuers. This would make transactions much simpler and the need to carry around bundles of bills to buy basic goods, and would set the stage for the central bank's effective control of the money supply. The New Afghani was demonetized at a ratio of 1 to 1000 of the old Afghani. Since the conversion, the Afghani has remained remarkably stable and the economy has rebounded.

### **The most important benefits of demonetization discarding the three zeros**

- Eliminating the circulation of multiple regional currencies in the country.
- Better aligning the value of the new currency (after dropping zeros) with Afghanistan's major trading partners and neighboring countries specially Iran, Pakistan and India.
- Bringing a general simplification in expressing and recording the monetary values which has been exceedingly useful for practical reasons, for Example, bread now costs (6-12) AFN and a kilo of rice now costs (30-45) AFN.
- Eliminating technical and operational problems arising from the use of figures with multiple zeros.

In macroeconomic sense, the major benefits of stabilizing and preserving the value of the new currency by prudently limiting the growth in its supply may be recounted as follows...

- Stabilizing the value of the currency improves the ability of economic agents to evaluate options and thus promotes greater economic efficiency and growth.
- Stabilizing the value of the currency better preserves the value of wealth held in monetary form and thus promotes savings.
- Transition to moderate levels of inflation helps restore the credibility of the Afghani both locally and in world markets.

### **Issues and implications of demonetization**

The dropping of three zeros has created some controversy and in some quarters, there has been some misunderstanding about its implications. Some people mistakenly think that dropping three zeros has reduced the value of their claims denominated in Afghani. However, the old Afghani of 2002 had already lost considerable value on account of high inflation well before the three zeros were removed. Some have argued that deposits they made many years ago or contracts they entered into many years ago lost value because of the demonetization to the old Afghani. Actually this is not the case. Value was lost, but it was as a result of too many people printing too much currency. It was lost because of the inflation that had taken place before the introduction of the new Afghani. This is lamentable. However, it would be very unfair, as well as financially infeasible, to restore the value lost to inflation to selected groups of people. Everyone holding old Afghanis or claims denominated in old Afghanis suffered losses equally as a result of earlier inflation, and the DAB is committed to avoiding such situations in the future. The zeros-removal operation is not expected to have either favorable or an unfavorable effect on exchange rates or interest rates, apart from its positive impact on expectations, since the main factors determining the general level of exchange rates and interest rates are the economic fundamentals and the currency stabilization programs. Experience from around the world supports this conclusion. About 49 countries have removed zeros from their currencies so far. Brazil deleted 18 zeros in 6 operations, Argentina 13 zeros in 4 operations, Israel 9 zeros in 4 operations, Poland 4 zeros in 1 operation, Greece 3 zeros in 1 operation. Note that very few countries have eliminated fewer than 3 zeros in any demonetization program. Recently, New Turkish Lira was introduced (effective January 1, 2005) dropping as many as six zeros! Transition to new currency units in these countries has been performed along with a stabilization program in general, usually with successful results in terms of reduced inflation, more rapid growth, and greater exchange rate stability. The currency conversion signals that the failed old policies are definitively ended and stable, pro-growth policies are being put in place. In sum three zeros is typically the minimum level of currency change in the demonetization process. There is nothing unusual or extreme in what was done in Afghanistan. All prices, currency denominations, and contractual agreements were impacted, equally and symmetrically so that there was no loss in value at the time of replacing 1.000 old Afghanis with one new one.

### **II. LITERATURE REVIEW:**

Demonetizations have both short-run and long run impacts on the living conditions of the people and economy in general. In the short-run it may cause shortage of liquid cash and can have negative impacts on the life of people and its impact felt by every citizen in India more in social sector and worst effects was on the poor and common man but on the other hand demonetization will have a positive impact on the people and will prove to be beneficial to the Indian economy

(Samuel, Saxena, 2017; A Dash 2017; Dhandayuthapani, Vishnupriya, 2017). (Singh, 2017; Mali 2016) demonetization has created some positive and negative impacts on different sectors but in long-run it will defiantly has positive impacts on controlling black money and counterfeit currency. On the other hand Singh opines that demonetization had negative impact on various sectors of Indian economy. At the first place it impacted the common man because of shortage of money in day to day transactions. But he thinks that once the new currency is circulated, these problems will be resolved. According to Singh and Singh (2017) demonetization in the short-term brought about non cash availability and decrease in the supply of money in the economy. It also reduced the household consumption. But in the long term it will affect the income level, and it may reduce the GDP of India hampering the economic Growth. Thus, it has both short-term and long term affects on the GDP. Similarly Ganesan, Gajendranayagam (2017) they say that the gross value added of India is slightly decreased in post demonetization compare to pre-demonetization period in short-run, he reveals there is a positive impact of demonetization on GDP in the long-run. India has experience demonetization in the year 2016. Various aspects of demonetization short-run and long-run impacts of demonetization have been studied in the existence literatures, but in Afghanistan scenario there is huge gap to be addressed, Afghanistan is still experimenting the transition phase. The low level of economic growth, unemployment, inflation, unstable prices, lack of responsible and accountable regulations for credit control and interest rates are the most important theme where the researcher can carry out the study on Demonetization, Economic restructuring and monetary sustainability in war prone Afghanistan so that in one hand it could fill the gap by contributing to the body of knowledge and on the other hand it could serve as reference for the policy makers in developing countries especially in Afghanistan for the central bank, in the future to develop better policies for the concerned government.

### Research Questions:

1. What has been the economic growth in Afghanistan over the years?
2. Why was demonetization introduced in Afghanistan?
3. How has demonetization affected economic growth sector-wise?
4. How the economy performing post demonetization?

### III. OBJECTIVES OF THE STUDY:

1. To analyze the impact of demonetization on GDP in the long-run.
2. To study Afghanistan's economic growth pre and post demonetization..

We have framed the following hypothesis for the study based on the research question and the literature review.

**H<sub>0</sub>:** there is no difference in GDP before and after demonetization in the long run.

### IV. RESEARCH METHODOLOGY

The present study is diagnostic and analytical as well. The data used in this paper is from secondary source, main source of data has been collected from Da Afghanistan Bank (DAB), central statistics organization (CSO.af) and supporting information is taken from DAB annual reports, World Bank, IMF and different websites. We provide summary statistics for describing the GDP data in different sectors of the economy. The present study referred annual GDP data for all major sectors of Afghanistan economy during 2002 till 2017. In order to study the impact of demonetization on the economy, we categorized the data period into two phases viz., pre-



demonetization period (2002-03) and post-demonetization period (2003 to 2017). We computed changes in gross domestic product (GVA) for all the sectors in the post demonetization period, using the formula,  $GVA = \Delta GDP = GDP_{(t)} - GDP_{(t-1)}$

We performed t-test in order to test the null hypothesis that there is no significant change in GDP between pre and post period. It is mathematically expressed as,

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{\sigma_1^2}{N_1} - \frac{\sigma_2^2}{N_2}}}$$

Where  $\bar{X}_1$  = stand for post average GDP

$\bar{X}_2$  = Stand for Pre average GDP

$\sigma_1^2$  = variance of post demonetization GDP

$\sigma_2^2$  = Variance of pre demonetization GDP

$N_1$  = post number of years

$N_2$  = pre number of years

### Linear Regression And Trend Analysis:

We have performed linear regression and 3years moving average analysis of GDP to analyze the historical trend, to fit a mean regression line and to forecast GDP over time.

The OLS regression used in the study is represented below.

OLS method:

$$Y = \alpha + \beta X$$

Where  $\alpha$  = GDP when  $X = 0$

$\beta$  = rate of change of GDP over time.

$Y$  = change in GDP

$X$  = time

## V. RESULTS AND DISCUSSION

**TABLE 1 SUMMARY STATISTICS OF GDP FOR THE PERIOD (2002-2003 TO 2017-2018)**

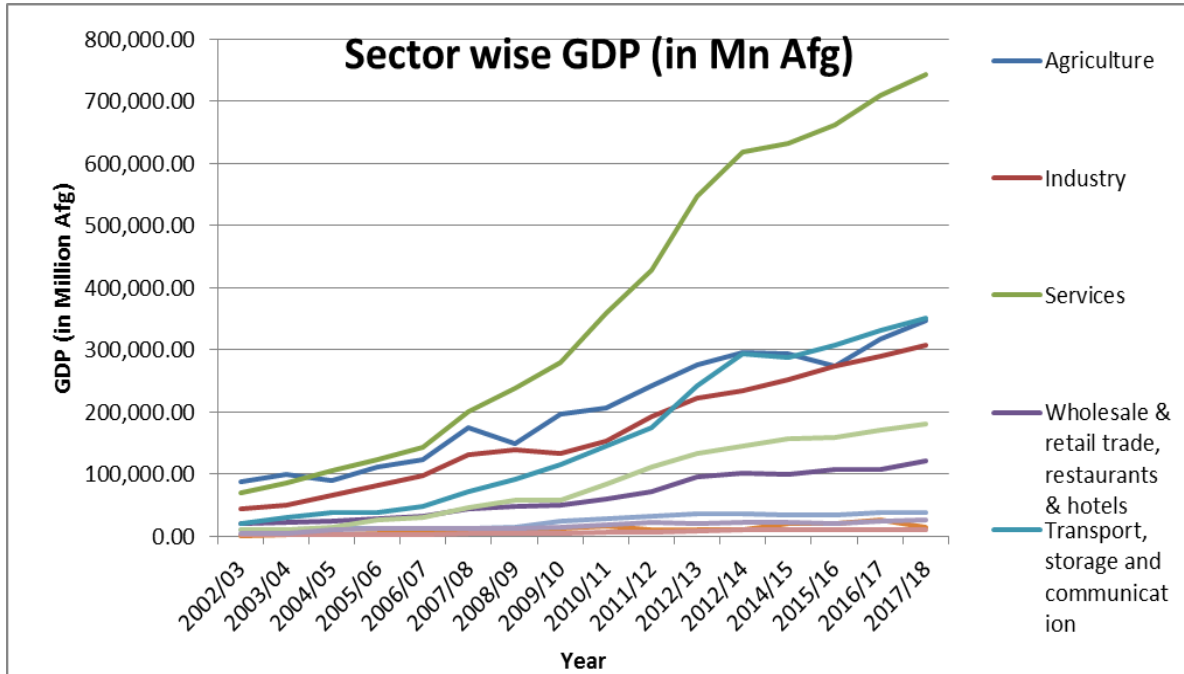
sectors	mean	St.d	median	max	min	skewness	kurtosis
<b>Agriculture</b>	205141.4	85737.5	202072.3	346268.5	87425.5	0.0	-1.5
<b>Industry</b>	166996.0	85341.5	146118.1	307529.3	43373.2	0.2	-1.3
<b>Services</b>	371503.7	238725.4	319399.2	743136.6	69162.0	0.2	-1.7
<b>Wholesale &amp; retail trade, restaurants</b>	64545.5	34274.9	54745.4	120498.8	20350.0	0.2	-1.6

<b>Transport, storage and communication</b>	161838.3	117911.1	131138.4	350827.5	20274.1	0.3	-1.6
<b>Finance, insurance, real estate</b>	11042.8	7180.4	9870.7	27165.0	1288.7	0.7	-0.1
<b>Ownership of dwellings</b>	24246.0	11096.4	25838.0	38980.5	10650.0	0.0	-2.0
<b>Community, social and personal service</b>	6154.1	3068.7	5339.0	10500.6	2160.2	0.2	-1.7
<b>Producers of Government Services</b>	87207.7	60894.3	71461.2	180711.3	10000.0	0.2	-1.7
<b>Other services</b>	16469.2	6664.2	16495.3	27160.4	4439.0	-0.3	-1.0

**Source:** Computed Data from (CSO.af)

The above table shows the summary statistic of the Afghanistan GDP in different sectors which contribute economic growth in the country, in which service sector has the highest contribution with an average value of 371503.7 million AFN, a maximum value of 741503.7 million AFN in the year 2017/18 and minimum value 69162.0 million AFN in the year 2002/2003. The next sector with the second highest contribution after service sector is agriculture with the average value of 205141.4 million AFN, minimum value of 87425.5 million AFN in the year 2002-2003 and maximum value of 346268.5 million AFN in the year 2017-2018. Industry sector with average of 166996.0 million AFN, minimum value of 43373.2 million AFN in the year 2002-2003 and maximum value of 307529.3 million AFN in the year 2017-2018 fill the third position contributing Afghanistan GDP. Transport, storage and communication with average of 161838.3 million AFN, minimum value of 20274.1 million AFN in the year 2002-2003 and maximum value of 350827 million AFN in the year 2017-2018 is the fourth position. Producers of government services with the average value of 87207.7, minimum value of 10000.0 in the year 2002-2003 and maximum value of 180711.3 in the year 2017-2018 are in the fifth position. Whole sale, retail trade and restaurants with average value of 64545.5, minimum value of 20350 in the year 2002-2003 and maximum value of 120498 in the year 2017-2018 are in the sixth position. Ownership of dwellings with the average value of 24246.0, minimum value of 10650.0 in the year 2002-2003 and maximum value of 38980.5 in the year 2017-2018 are in the seventh position contributing economic growth. Other service with the average value of 16469, minimum value of 4439.0 in the year 2002-2003 and maximum value of 27160.4 in the year 2017-2018 are in the 8<sup>th</sup> position. Finance, insurance and real estate with average value of 11042.8, minimum value of 1288.7 in the year 2002-2003 and maximum value of 27165.0 in the year 2017-2018 are in the 9<sup>th</sup> position. Community, social and personal service with average value of 6154.1, minimum value of 2160.2 in the year 2002-2003 and maximum value of 10500.6 in the year 2017-2018 has the less contribution to Afghanistan economy growth.

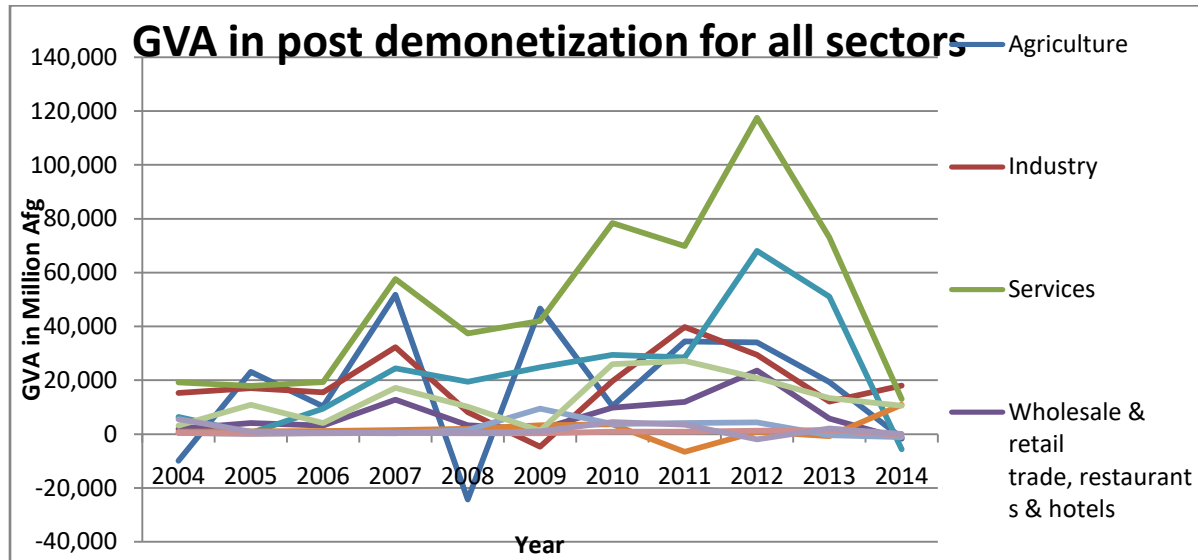
Chart 1



Source: Computed Data from (CSO.af)

The above chart shows the economic growth of Afghanistan in different sectors of economy such as Agriculture, Industry, Service, wholesale and retail trade restaurants and hotels, transport, storage and communication start from the year 2002-2003 and end up the year 2017-2018. The service sector shows the highest increasing trend among other sectors compare to previous years, thus there is highly positive impact of demonetization in this sector. The agriculture sector shows slow increasing trend in the short-run but in long run it also shows positive impact coming to the industry sector it shows less positive in initial years but in long-run the trend show more positive. Industry sector, transport, storage and communication sector also has less positive impact compare to service and agriculture sectors. The remaining sectors show that there is no impact of demonetization because the trend is in same level in short-run and long run as well.

Chart 2



The above graph shows Service sector is in increasing trend comparing to previous year thus there is a highly positive impact of service sector on gross value added. Coming to agriculture sector it show fluctuation from 2004 it shows increasing above 20,000 in 2005-2006 there a decrease below 20,000 from 2006 again the trend increase to positive above 40,000, end of 2007-2008 the trend moves toward negative -20,000 then again in 2008 the trend is increasing toward positive, in 2009 again there is decrease in trend below 20,000, in 2010 again it grows and decrease in 2014. So the situation of agriculture sector was in fluctuation which shows positive and negative impact on gross value added. Industry sector shows that there was no impact until 2006 from 2006 there is positive impact the trend goes above 20,000, in 2009 there is a negative impact of GVA in this sector below 0, after the 2009 it has a positive impact on gross value added. Transport storage and communication also shows that there is a positive impact of demonetization on gross value added in the long-run. Finance, insurance, real estate and business ownership of dwellings and other utility shows, that there is no significant change on impact of demonetization. However, Finance, insurance, Real Estate showed decreasing trend as compared to previous years. So there is a negative impact on Finance, insurance, Real Estate and Professional Services. Though there are changes in various sectors of Afghanistan economy, but these are not significantly impacted Afghanistan economy. The following analysis has proved the hypothesis.

### Results of Hypothesis Testing

$$H_0: \overline{X_{pre}} = \overline{X_{Post}} = 0$$

T-Test results for GDP for all sectors TABLE 2

Sector	Mean	Std. deviation	Std. Error Mean	t statistic	df	p-value
Agriculture	212989.116	82798.519	21378.48565	5.873	14	0.000
Industry	175237.564	81743.197	21106.00276	6.248	14	0.000
Services	391659.854	232999.623	60160.24399	5.361	14	0.000
Wholesale & retail trade,	67491.915	33379.417	8618.528332	5.470	14	0.000

restaurants						
Transport, storage and communication	171275.945	115779.078	29894.02948	5.051	14	0.000
Finance, insurance, real estate	11693.125	6944.721	1793.119168	5.802	14	0.000
Ownership of dwellings	25152.428	10871.679	2807.055469	5.166	14	0.000
Community, social and personal service	6420.338	2985.051	770.7367802	5.527	14	0.000
Producers of Government Services	92354.894	59425.838	15343.68527	5.367	14	0.000
Other services	17271.176	6089.396	1572.275321	8.162	14	0.000

**Source:** Computed Data from (CSO.af)

The above table shows the results of t-test of comparing the means of gross domestic product before and after demonetization. If  $\bar{X}_1$  represent average pre demonetization GDP and  $\bar{X}_2$  represent average post demonetization GDP data. The t-test calculation shows that there is significance difference between the pre and post and the mean value in the long run as the null is rejected for all sectors. For example, in Agriculture sector the mean value is 212989.116 the significance value is greater than the p-value hence the null hypothesis is rejected. Like that for all the sectors t-test proved that there is significance difference between  $\bar{X}_1$  and  $\bar{X}_2$  in the long run so the null hypothesis is rejected for all the sectors of economy contributing GDP in the long run.

**TABLE 3 TREND PREDICTIONS**

Year	Agriculture sector Predicted Value	Industry Sector Predicted Value	Service Sector Predicted Value
2002	68515.73	29090.688	-10201.01
2003	86733.39	47478.032	40692.985
2004	104951.05	65865.376	91586.98
2005	123168.71	84252.72	142480.975
2006	141386.37	102640.064	193374.97
2007	159604.03	121027.408	244268.965
2008	177821.69	139414.752	295162.96
2009	196039.35	157802.096	346056.955
2010	214257.01	176189.44	396950.95
2011	232474.67	194576.784	447844.945
2012	250692.33	212964.128	498738.94
2013	268909.99	231351.472	549632.935
2014	287127.65	249738.816	600526.93
2015	305345.31	268126.16	651420.925
2016	323562.97	286513.504	702314.92
2017	341780.63	304900.848	753208.915
2018	<b>359998.29</b>	<b>323288.192</b>	<b>804102.91</b>
2019	<b>378215.95</b>	<b>341675.536</b>	<b>854996.905</b>
2020	<b>396433.61</b>	<b>360062.88</b>	<b>905890.9</b>

**Source:** Computed Data from (CSO.af)

The above table shows that GDP has a liner trend. The GDP is increasing linearly with time; every year GDP is increase by the beta value which is 18,217.66 Million AFN. And the estimated value for 20018 is 359998.29 Million AFN. The estimated value for 2019 is 378215.95 Million AFN. And the estimated value for 2020 is 396433.61 Million AFN. For agriculture sector, in the industry sector GDP is increasing by the beta value of 18387.344 Million AFN. The estimated value for 2018 is 323288.192 Million AFN, the estimated value for 2019 is 341675.536 Million AFN and estimated value for the year 2020 is 360062.88 Million AFN. In the service sector GDP is increasing by beta value of 508993.995 Million AFN. And the estimated value for 2018 is 804102.9 Million AFN, the estimated value for 2019 is 854996.905 Million AFN and the estimated value for 2020 is 905890.9 Million AFN

Chart 3

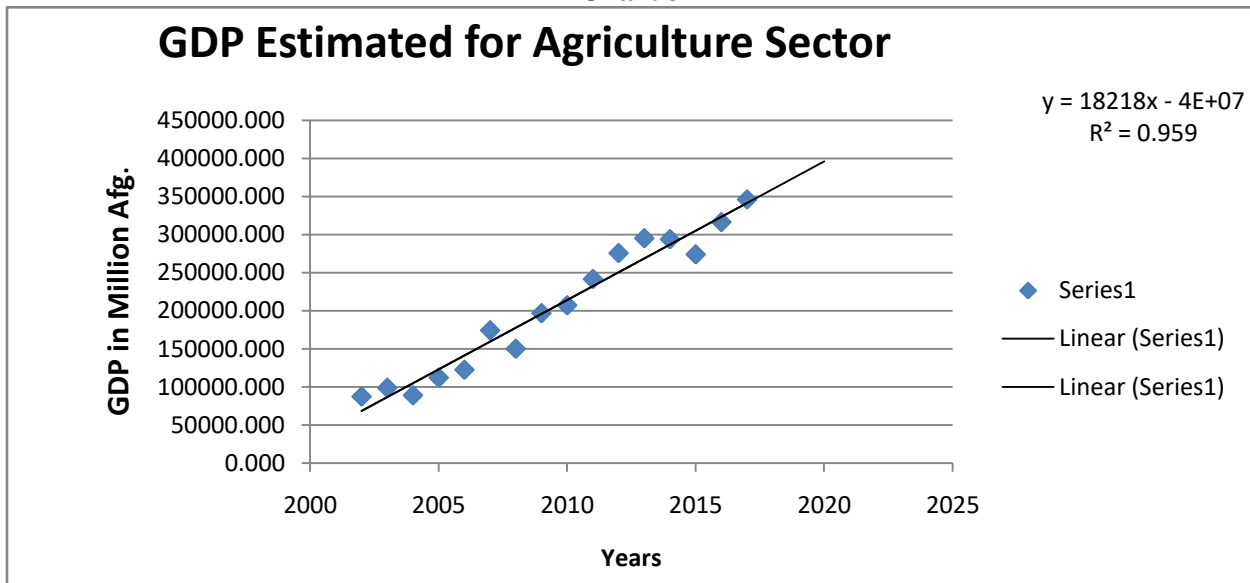


Chart 4

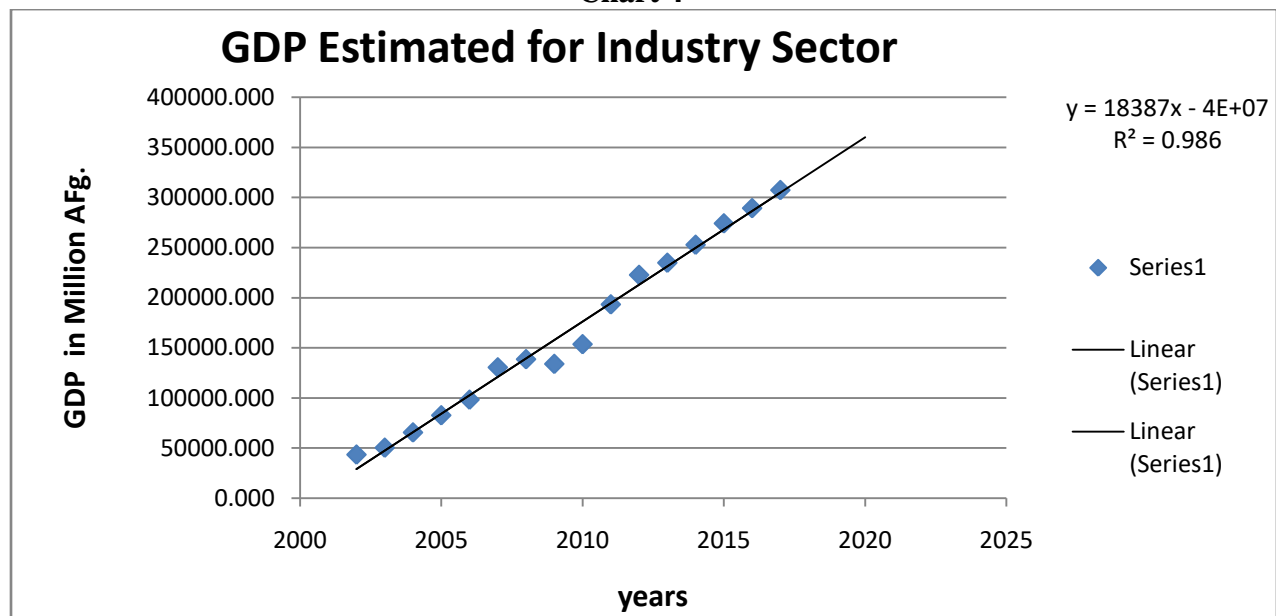
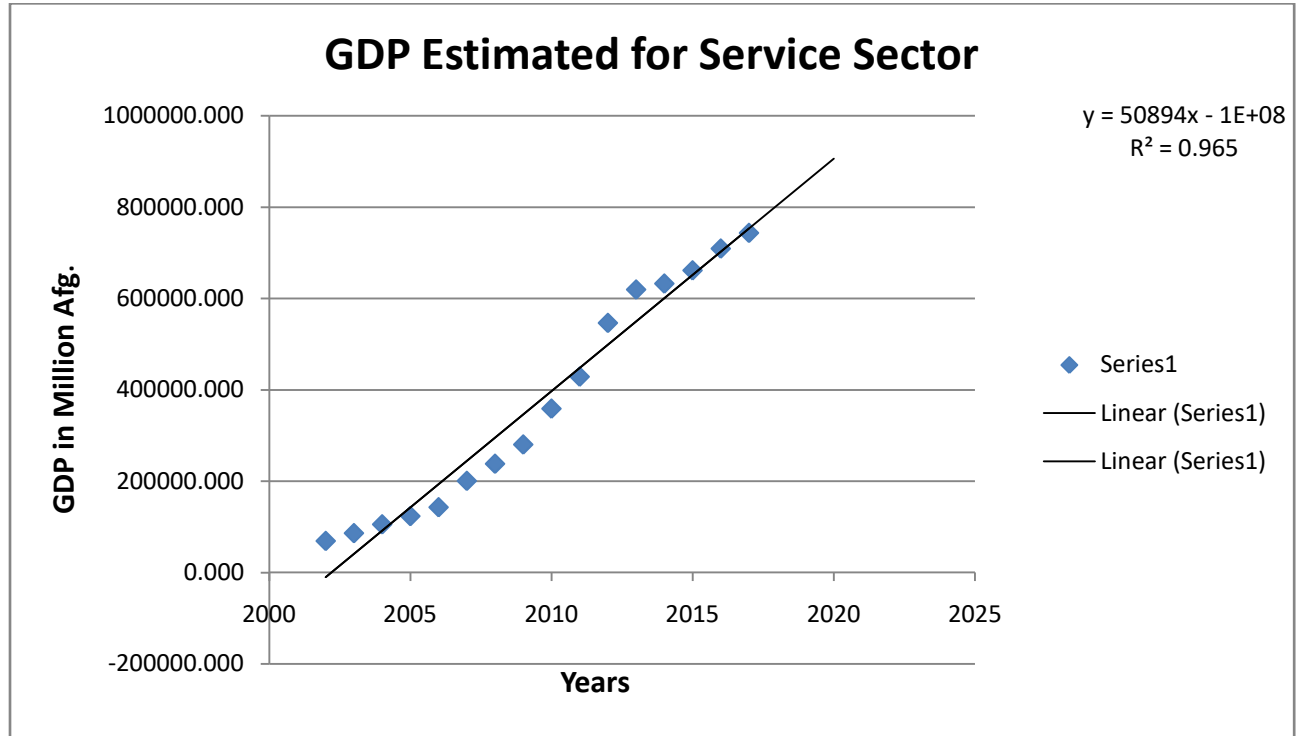


Chart 5



For analyzing the GDP trend and to fit a mean regression of GDP, we performed liner regression. The regression results are discussed below.

#### Liner Regression using OLS method

Sector	Intercept	Beta	R <sup>2</sup> square	F-statistic	p-value
Agriculture	-36403240*	18217.657*	0.9594053	330.8723886	<0.05
Industry	-36782372*	18387.344	0.9864533	1019.462606	<0.05
Service	-101899979	50893.995*	0.9658169	395.5595062	<0.05

**Source:** Computed Data from (CSO.af)

The table shows the results of liner regression. For agriculture and service beta value is significant with R<sup>2</sup> of 0.95 and 0.96 respectively. For industry sector beta is not significant. Beta measure the rate of change in GDP for unit change in year. For agriculture sector GDP increases by 18217.657 Million AFN every year, same for industry sector GDP increase by 1838.344 Million AFN, for service sector GDP increases by 50893.995 Million AFN.

#### VI. FINDINGS AND CONCLUSION

Demonetization in Afghanistan was a positive movement it successfully achieved its targets after a decade of internal, external wars and foreign interference in the country, being many types of money and counterfeit currency in circulation Da Afghanistan Bank and its policy plays pivotal role in demonetization introducing of single new currency as quickly as possible so as to gain control and stabilize its value and to facilitate recovery and economic growth. In deed for the

first time after decades they become able to take the control of currency in circulation. The present study showed the impact of demonetization on different sector of Afghanistan economy. The gross value added of Afghanistan in post demonetization showed a fluctuation trend in agriculture sector in long-run, in some year it's slightly decreasing compare to the previews years, but in the initial years demonetization impact is highly positive. As per the t-test analysis the positive effect of demonetization on GDP is significant in long-run. Through regression analysis and trend projection, we found that there is a linear trend in GDP i.e. GDP is increasing over the time. For agriculture and service sector beta value is highly significance and positive. For industry sector beta is not significance through regression analysis. So based on our finding we can say that the currency demonetization was one of the most successful programs implemented by the new Government and along with a prudent monetary policy to limit new inflation it is the basis for the remarkable economic progress achieved in recent years.

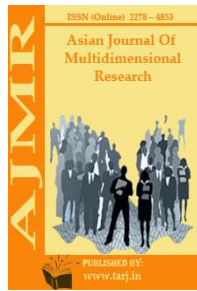
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## AN MDA APPROACH FOR EARLY IDENTIFICATION OF FIRMS REQUIRING CORPORATE DEBT RESTRUCTURING

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### ABSTRACT

*When firms fail, their creditors usually suffer losses, so anything which increases the likelihood of corporate failures can heighten the risks faced by banking and financial system. This brunt was faced by banks and financial institutions in the beginning of 2000s when Indian corporates faced increasing challenges in meeting their debt servicing obligations. As high corporate debt overhang poses a risk to banks' balance sheets and financial stability due to increasing nonperforming loans (NPLs) and corporate bankruptcies (Goretti and Souto, 2013), RBI introduced an out-of-court restructuring programme in the form of 'Corporate Debt Restructuring' in 2001. Ever since, corporate loan restructured by banks and financial institutions witnessed an increasing trend. Although, huge amount of debt has been restructured by banks over the years, the data by RBI in 2015 indicated that the assets quality of Scheduled Commercial Banks (SCBs) was continuously deteriorating. Therefore, it makes sense to devise a system so that it is possible to identify firms that will need debt restructuring support due to high risk of being financially distressed in near future and thereby. The objective of this paper is to identify variables that are able to estimate the probability of a company of being financially distressed. The results indicate that profit before interest & taxes to sales, price to book value, debt-equity ratio, current ratio and asset turnover ratio were most significant predictors for firms requiring debt restructuring.*

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**KEYWORDS:** *Debt Restructuring, Financial Distress, Discriminant Analysis*

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## INTRODUCTION

When firms fail, their creditors usually suffer losses, so anything which increases the likelihood of corporate failures can heighten the risks faced by banking and financial system. This brunt was faced by banks and financial institutions in the beginning of 2000s when Indian corporates faced increasing challenges in meeting their debt servicing obligations. As high corporate debt overhang poses a risk to banks' balance sheets and financial stability due to increasing nonperforming loans (NPLs) and corporate bankruptcies (Goretti and Souto, 2013), RBI introduced an out-of-court restructuring programme in the form of 'Corporate Debt Restructuring' in 2001. Ever since, corporate loan restructured by banks and financial institutions witnessed an increasing trend. It increased from Rs. 1319 Cr. in 2004 to Rs. 270051 Cr. at the end of 2016. However, major restructuring (94% of the aggregate) happened after the global financial crisis of 2008(RBI Website). Moreover, data from the CDR Cell shows that 50 entities from iron and steel industry, with a total debt of Rs 53580 Cr., account for over 21 per cent of the total restructuring at the end of March 2016, which is highest in terms of number of cases as well as in terms of volume. Although, huge amount of debt has been restructured by banks over the years, the data by RBI in its Financial Stability Report, June 2015 indicated that the assets quality of Scheduled Commercial Banks (SCBs) was continuously deteriorating. The gross non-performing advances (GNPAs) of SCBs as percentage of gross advances increased to 4.6 per cent from 4.5 per cent between September 2014 and March 2015. As per the RBI data, the total stressed advances of banks stood at around Rs. 10 lakh cr. at the end of March, 2017.

While, a section of the stake holders see debt restructuring as a solution for impaired assets, contrarians feel that it is nothing but throwing good money after bad money. In this context preventing failures of industrial units assumes importance. Therefore, it makes sense to devise a system so that it is possible to identify firms that will need debt restructuring support due to high risk of being financially distressed in near future and thereby. The objective of this paper is to identify variables that are able to estimate the probability of a company of being financially distressed. The results will be useful in early identification of firms that may become financially distressed and will enable the debtors and creditors in taking adequate efforts for timely restructuring so as to minimize the costs associated with insolvency and forced liquidation. The remainder of the paper is organized into three sections. The first part provides an overview of the financial distress and relevant literature, part two presents in detail the research methodology and data used in the study and last part presents an analysis of the results, discussion and conclusion.

### 1. Financial Distress

Over the years various researchers have defined the term "financial distress" on the basis of **occurrence of an event** or in the form of a process that encompasses several events. The term "financial distress" is used to depict the financial situation of a company that is confronted by a transitory lack of liquidity and troubles that emerge in fulfilling financial commitments on time and to the full extent. Very often, terms such as failure, default, bankruptcy, or distressed restructuring are used to describe the situation of financial distress. However, as the largest loss and increasing financial problems for an organization happen several periods before this event occurs, therefore picking a single negative event for defining financial distress as a whole may be wrong and will create biases.

Beaver (1966) made one of the pioneer researches in the field of financial distress and explained that it can take many types of appearances which may include an overdraft from the bank account, bond default, nonpayment of dividend or bankruptcy. Altman (1968) explained different levels of financial distress by distinguishing stock based insolvency from flow based insolvency. The former occurs when the net worth of the firm becomes negative due to lower value of the assets in comparison to the total debts of the firm. Flow based insolvency occurs when the cash flows are insufficient to meet contractual obligations on due date.

Wruck (1990), Brown, James and Mooradian (1992) and Andrade & Kaplan (1998) considered a firm as financial distress when they took corrective action so as to avoid an actual or anticipated default on contractual debt obligations as they become due. Financial distress occurs when firms suffer continuous losses as a result of which there is un-even increase in liabilities combined with a contraction in the value of total assets (Van Gestel et al., 2006). According to Jahur&Quadir (2012) financial distress is the inability of a firm to pay its current obligations on the dates they are due. All these definitions of financial distress explain financial distress in the form of occurrence of an event. The next group of definition explains financial distress in the form of process encompassing several events.

The research community developed an interest in viewing **financial distress as a process** rather than an event, when Gordon (1971) highlighted that financial distress is only one state of the process and it is followed by failure and restructuring. A company would enter this state when its total debt is more than the total assets and at the same time its income generating capacity is also becoming weak. Gilbert, Menon, & Schwartz (1990) explained that financial distress is different from bankruptcy. A firm in financial distress may have losses and poor performance consistently for few years and for this situation bankruptcy could be one of the possible outcomes. Before bankruptcy, the firm can take several steps such as restructuring of debt so as to improve its solvency position or to merge with other firm so as to discontinue as an independent business entity. Similarly, Whitaker (1999) also had an opinion that financial distress cannot be determined in terms of a single event. He argued that the terms 'default' and 'financial distress' cannot be used inter-changeably because there could be a vast majority of undesirable features and losses during the time preceding default or bankruptcy.

According to Turetsky&MacEwen (2001) financial distress is a progression of subsequent stages where each stage has its distress point and continues until the next point is reached. An unpredictable and significant decrease in cash flows can be identified in the form of onset of financial distress. If this stage is followed by a reduction in dividend it is a signal of the next stage i.e. defaults. The subsequent stages might be troubled debt restructuring and potential bankruptcy. Outecheva (2007) developed an integrative framework for the analysis of financial distress. He illustrated that how seemingly analogous words of financial distress, insolvency, failure, bankruptcy, and distressed restructuring can be well rooted into financial distress theory. He analyzed mechanisms running in each single stage and explained that financial distress has a dynamic nature and a company passes through separate stages while moving in and out of financial trouble. Each stage has specific attributes and contributes differently to corporate failure.

Purnanandam (2008) explained that financial distress exists somewhere between the states of solvency and insolvency for a firm. He further pointed out that when the firm misses interest payments or violates debt covenants then it is financially distressed, however, the actual transformation from a solvent to an insolvent state happens only on the date when the value of

assets is lower than the face value of debt. This definition makes a clear distinction between financial distress from default and possible bankruptcy. A company can be distressed without defaulting; however, default and bankruptcy are not possible without the preceding period of financial distress. According to Adeyemi (2011), financial distress can be defined as a situation in which an institution is having operational, managerial and financial difficulties.

In India, the term financial distress has generally been addressed as industrial sickness. Sick Industrial Companies Act (Special Provisions) Act (SICA) of 1985, which was enacted with the objective of determining sickness in industrial units, defined a sick industrial unit as one that had existed for at least five years and had incurred accumulated losses equal to or exceeding its entire net worth at the end of any financial year. However, researchers and practitioners have voiced their dissatisfaction over this definition of sickness. For example, Anant, Gangopadhyay & Goswami (1992) believed that the time taken for declaring a company as industrially sick is too long and it impairs the probability of restructuring. Yadav (1996) pointed out that the criterion of 100 percent erosion of net worth is too much for a unit to be declared sick and is responsible for the delay in rehabilitation process which should actually start when the erosion of peak net worth crosses 10-15 percent mark. Dholakia (1989) also shared a similar view that the criterion of recurring cash losses used by the government and financial institutions to identify sick unit results in delays in the identification of sick units. In the year 2014, Reserve Bank of India (RBI) came up with a framework for early recognition of distress that explain financial distress in the form of assets that produce less than economically possible and also deteriorate quickly in value.

### 1.1 Prediction of Financial Distress:

Prediction of financial distress has always been an area of interest for the academicians and researchers. Many researchers have used different statistical techniques and diverse set of financial ratios in order to develop a model for prediction of financial distress.

Beaver (1966) initiated the interest of academic world to the development of models for the prediction of financial distress by using univariate statistical analysis methodology for classifying bankrupt and non-bankrupt firms. He studied a sample of 79 failed and 79 non-failed firms by using thirty different ratios which were grouped into six categories: debt to total assets, liquid assets to total assets, liquid assets to current debt, turnover ratios, net income and cash flow. This study concluded that cash flow to debt ratio was the single best predictor of financial distress. However, his study has been criticized for its dependence on a single ratio rather than addressing a number of other important factors that may indicate future corporate distress. As a result, the interest in Multivariate Discriminant Analysis (MDA) models dominated the distress prediction models.

Altman (1968) used MDA technique on a sample of 33 bankrupt and 33 non-bankrupt manufacturing firms. By analyzing twenty two financial ratios he developed the following discriminant function:  $Z = 0.012 X_1 + 0.014 X_2 + 0.033 X_3 + 0.006 X_4 + 0.999 X_5$ . Here  $X_1$  = Working capital/Total assets,  $X_2$  = Retained earnings/Total assets,  $X_3$  = Earnings before interest and tax/Total assets,  $X_4$  = Market value of equity/Book value of total debt,  $X_5$  = Sales/Total assets. He concluded that a Z score of 2.675 was the best cut-off point that maintained minimum misclassification and was most helpful for discriminating between bankrupt and non-bankrupt firms.

Taffler (1984) developed a model for distribution enterprises as the characteristics of such firms are significantly different from the manufacturing firms. Altman, Hartzell and Peck (1998) made

a further revision to the original Altman model and developed an enhanced Z" score model. This model was applied to firms from emerging market economies specifically Mexican firms that had issued Eurobonds dominated in US dollar. Sunti&Nittayagasetwat (1999) looked into the financial distress prediction from a different angle. The significance of their model was to link a firm's financial characteristics and its sensitivity to macro-economic conditions. Charitou, Neophytou&Charalambous (2004) examined the incremental information content of operating cash flows in predicting financial distress in UK. Using neural networks and logit methodology on a matched pair of 51 failed and non-failed UK public over the period 1988- 97, the results indicated that a model which includes a cash flow, a profitability and a financial leverage variable produced an overall classification accuracy of 83% one year prior to the failure.

Beaver, McNichols&Rhie (2005) constructed a multivariate prediction model that estimates the probability of bankruptcy reorganisation for closely held firms. Firm size, asset profitability, the number of secured creditors, the presence of free assets, and the number of unsecured creditors were significant in prediction of bankruptcy reorganization. Campbell, Hilscher&Szilagyi (2008) included a set of market variables to enhance the timeliness and power of distress prediction models. They examined the determinants of failure as well as the pricing of financially distressed stocks with a high probability of failure through a logit model that included accounting and market variables. In addition to a set of two accounting variables, several market variables were tested: the monthly log excess return on each firm's equity relative to the market index, the standard deviation of each firm's daily stock return over the past three months, the relative size of each firm measured as the log ratio of its market capitalisation to that of the market index, and the firm's log price per share. Christidis& Gregory (2010) followed Campbell et al. (2008) and tested three market variables in a distress prediction model for UK quoted companies that included a set of accounting variables also. As to the market variables, they replaced book value of assets with market values and tested whether log semi-annual excess returns over the FTSE All Share Index and firm stock returns' standard deviation (calculated over a six-month period) can enhance the predictive power of the model. Their findings suggested that market values have the ability to increase the accuracy of the distress prediction model. A number of other studies have also been conducted in recent years for prediction of corporate financial distress include Avramov, Chordia, Jostova&Philipov (2013); Lin, Liang, Yeh& Huang (2014); Geng, Bose, & Chen, (2015); Altman, Iwanicz-Drozdowska, Laitinen&Suvas (2017) to name a few.

In India, Gupta (1979) was a pioneer in the field of distress and sickness prediction for Indian industries by using ratios analysis tool. He took a sample of 41 cotton textile companies of which 20 were sick and 21 non-sick. He studied 56 financial ratios classified into broad categories through a simple non parametric test. To minimize the misclassification rate he recommended four ratios namely earnings before depreciation, interest and tax to sales, cash flow to sales, cash flow to total assets and earnings before interest and tax to total assets as most important in predicting sickness. Paranjape (1980) tested a sample consisting of 54 sick and non-sick firms. He tested 16 financial ratios and found that four variables i.e. raw materials consumes to sales, inventory to current assets, retained earnings to total assets and earnings before interest and tax to total liabilities discriminates better between sick and non-sick firms. Srivastava (1986) established a management information system and a discriminant model to predict sickness. He highlighted the usefulness of signals such as variations in working capitals and imbalances in bank borrowings as indicators of the health of a unit. Industrial Credit and Investment Corporation of India (1998) developed a default prediction model for the purpose of evaluating a

firm before granting loan. The discriminant model classified a firm into bad or good based on its profitability and future cash flows. The model used financial variables such as net worth to total assets, retained earnings to total assets, working capital to total assets and profit before interest and tax to total debt plus net worth. Bandyopadhyay (2006) developed a Z-score model for Indian firms for predicting bond default one year in advance. He used a sample of 104 listed corporations from CRISIL and developed discriminant model as well as a Logit model by taking certain financial and non-financial variables. The six financial ratios were: working capital to total assets, cash profit to total assets, solvency ratio, operating profit to total assets, sales to total assets and market value of equity to book value of liabilities. Bhunia & Sarkar (2011) conducted a study on financial Distress based on Multiple Discriminant Analysis by taking a sample of sixty-four private sector pharmaceutical companies. They analyzed sixteen financial ratios and final discriminant function was constructed with seven ratios namely, funds slow to total liabilities, cash flow to total debt, total debts to total assets, working capital to total assets, retained earnings to total assets, earnings before interest and tax to total assets and net income to sales which were found to be significant in discriminating power. Mondal and Roy (2013) developed a model for prediction of sickness in Indian Steel Industry by using cluster analysis and stepwise logistic regression. Their final model contained seven financial ratios and the study concluded that earning power (measured by rate of growth of profit after tax) and capital structure (measured by debt equity ratio) are most important predictors of corporate distress.

Other studies have also been conducted in the recent years that mostly replicate the earlier studies or make an application of Altman's Z score model for prediction of distress in different industries. Swaminathan & Nedunchezian (2016); Raj & Dinakar (2017).

## 2. METHODOLOGY & DATA:

**2.1 Discriminant Analysis:** In the present research, Discriminant Analysis (DA) has been used to discriminate between distressed firms that went through debt restructuring and healthy firms. DA is used primarily to predict membership in two or more mutually exclusive groups. First, it considers that any firm is characterized by a vector  $X$  the elements of which are  $n$  independent variables  $x$  (predictors). For the two population (distressed and healthy firms), it is assumed that independent variables are distributed within each group according to multivariate normal distribution with different means but equal dispersion matrices. The objective of this method is to obtain the linear combination of independent variables that maximizes the variance between two groups relative to within group variance. The method estimates a discriminant function that is coefficient vector  $A$ ,  $(a_1, a_2, \dots, a_n)$  and a constant term  $a_0$ . Classification is done by a linear discriminant function:

$$y = a_1x_1 + a_2x_2 + \dots + a_nx_n$$

Where,  $x_i = i$ -th classification variable (financial ratio)

$b_i =$  coefficient value of  $x_i$

$y =$  the discriminant score of the firm

The discriminant function transforms the individual values of  $x_i$  into a single discriminant score  $y$ , which is then used to classify the firm into distressed or healthy group. Of course, this classification will not proceed without error, and it is possible that a firm with high  $y$  score may be distressed and a firm with low  $y$  score may be belonging to a healthy group. A model is considered to be good when its prediction error is low.

**2.2 Data:** For identification of major variables that can predict distress, 10 companies from Iron and Steel Industry that were given CDR support over 2003-2012 and 10 matching healthy companies from the same industry during the same period were taken for the study. The 10 companies that were given CDR support were selected on the basis of thorough search of articles in financial newspaper using the terms 'debt recast', 'corporate debt restructuring', 'CDR' etc. Thereafter, the exact date of Letter of Approval was confirmed from the filings of these companies in Bombay Stock Exchange (BSE). This methodology has been adopted from Rastogi and Majumdar (2016). For selecting matching healthy companies, firstly, all the companies in iron and steel industry were sorted on the basis of EPS in the years in which distressed firms under study were given CDR support, and, thereafter, such companies from top 25% that had similar asset size as of distressed company was considered a healthy company. The data for discriminant analysis has been taken for two years prior to distress. This was done so as to identify variables that have the ability to discriminate between distressed and healthy companies at least two years prior to actual distress. Data for these companies has been collected from corporate database package called PROWESS provided by CMIE.

**2.3 Variables:** Some of the prominent ratios used in previous studies on bankruptcy prediction are working capital to total assets, total debt to total assets, current assets to current liabilities, EBIT to total assets, net income to total assets, cash flow to total debt, quick assets to current liabilities, cash flow to sales, retained earnings to total assets, sales to total assets, gross profit to total asset, net income to shareholder's equity, cash to total assets, profit before tax to sales, sales to inventory, quick assets to total assets etc. (Liang, Lu, Tsai, & Shih, 2016).

For the purpose of current study some selected ratios have been used as indicators of the financial status of the firm which are most important with reference to a manufacturing company. These ratios are Current Ratio (CA/CL), Quick Ratio (QA/CL), PBIT to Sales (PBIT/S), PAT to Sales (PAT/S), Return on Assets (ROA), Return on Capital Employed (ROCE), Debt-Equity Ratio (D/E), Debt to Total Assets (D/TA), Interest Coverage Ratio (ICR), Asset Turnover Ratio (ATR), Inventory Turnover Ratio (ITR), Price to Book Value (P/BV), Operating Cash flow to Sales (OCF/S) and Operating Cash flow to Interest (OCF/I).

### **2.3.1 Explanation of Variables:**

CA/CL, QA/CL

These set of ratios measure investment in current assets and liquidity of the firm. A survey of internal credit rating models of Indian banks revealed that most of the banks rate the borrower's liquidity position on the basis of current ratio (Jayadev, 2006). Current ratio is the relationship between current assets and current liabilities. A fall in the current ratio over a period indicates that the borrower has withdrawn or diverted the funds and the support for current assets financing is no longer available. RBI (2015) on NPAs shows that diversion of funds is the primary reason for accounts becoming NPAs. If these practices continue for a longer period, the borrower may encounter the problem of liquidity and if the bank fails to take necessary monitoring steps, this diversion of funds leads to default and the account will be recognized as NPA and will ultimately require debt restructuring support. Therefore, a fall in the current ratio is a symptom of liquidity problem leading to default.



**PBIT/S, PAT/S**

These variables measure the relationship between operating profit and sales of a firm and show the margin left after meeting manufacturing costs. It measures the efficiency of production as well as pricing. The general expectation is that a firm should earn sufficient profit on sales value. If adequate profits are not earned on sales there will be difficulty in meeting the operating expenses and no returns will be available to the managers. Higher operating margin indicates availability of cash flows for repayment of debt obligations and the chances of default are less.

**ROA, ROCE**

Return on assets and return on capital employed is a clear indicator of a firm's ability to earn when compared to the value of assets and capital employed in business. These variables exhibit an industry's potentiality for optimizing the return on investment in various assets. Greater return will indicate bright chance for revival and restructuring than facing liquidation.

**D/E, D/TA**

These ratios indicate the solvency position of a firm and are a standard form of expression of financial risk. Debt-equity ratio is the relationship between total debt and net worth of the company. Total debt is defined as sum of secured loans, unsecured loans, and current liabilities. A high ratio (more than 2) indicates that the entity is managed by debt funds and any decline in operating cash flows due to business risk factors may force the firm to delay on paying the debt service obligations. Persistence of this situation for a longer time leads to default.

**ICR**

It is the relationship between profitability of a firm and its interest payment obligations. Here, profitability is defined as earnings before interest and tax. This ratio indicates the number of times protection is available out of earnings for the outstanding interest amount. A fall in ratio below one leads a firm to default on interest payments.

**ATR, ITR**

The assets turnover ratio is a standard financial ratio illustrating the sales generating ability of the firm's assets. It is a measure of management's capacity to deal with competitive conditions. Similarly, inventory turnover ratio measures investment and hence costs associated with inventory carried by the firm. Lower the investment per rupee of sales, lower the cost of operation and hence the improvement in profitability and viability of business units.

**P/BV**

The price-to-book ratio is a ratio used to compare a stock's market value to its book value. A lower P/BV ratio could mean that the stock is undervalued. However, it could also mean that something is fundamentally wrong with the company. Due to accounting conventions on treatment of certain costs, the market value of equity is typically higher than the book value of a company, producing a P/BV ratio above one. Under certain circumstances of financial distress, bankruptcy or expected plunges in earnings power, a company's P/BV ratio can dive below 1.

**OCF/S, OCF/I**

Cash flow from operations measures ability of the firm to generate cash from operations and normally used as alternative to accounting based income. It is also free from accounting and

financial policies of the firm. These ratios are a better indicator of ability of a firm to meet its liabilities of different nature on time.

### 3. Analysis and Results:

Table 1 presents a summary statistics of these ratios that were collected for all the distressed companies and healthy companies for a period of two years prior to the year in which debt restructuring support was given to the distressed firms and are given in.

It is observed that the mean for explanatory variables in the distressed firm group shows a poor performance when compared to the healthy group. The mean of profitability ratios for firms which are distressed is with a negative sign whereas the average for healthy firms shows a higher average profit margin. Also, for the solvency ratios, namely the debt equity ratio, the mean is less than 1 for healthy firms, indicating low leveraging whereas for distressed firms the average is significantly higher than 1. Similarly, the mean of interest coverage ratio is negative for distressed companies indicating their inability to meet interest payment whereas; it is greater than 1 for healthy companies.

**TABLE – 1: DESCRIPTIVE STATISTICS OF FINANCIAL RATIOS**

Financial Ratio	Distressed Firms		Healthy firms	
	Mean	Std. Dev.	Mean	Std. Dev.
CA/CL	1.01	0.54	1.91	1.19
QA/CL	0.58	0.36	1.21	0.87
PBIT/S	3.45	16.3	17.7	12.5
PAT/S	-8.82	44.5	8.89	7.79
ROA	-1.35	8.46	9.62	8.11
ROCE	-4.71	14.3	14.6	10.3
D/E	6.58	19.1	0.73	0.69
D/TA	0.73	0.19	0.21	0.14
ICR	-0.33	1.17	71.9	184.8
ATR	0.64	0.43	1.33	0.94
ITR	6.99	5.77	8.67	8.51
P/BV	0.57	1.19	2.07	2.89
OCF/S	7.32	5.06	24.62	7.83
OCF/I	-0.33	1.17	71.99	184.8

We have applied Multivariate Discriminant Analysis (MDA) technique using these ratios so as to identify the most important variables that help in discriminating between distressed firms and healthy firms. The analysis involves running discriminant analysis on the 20 companies in the dataset for estimated sample. The following linear discriminant function was obtained:

$$Y = 0.269 * \text{PBIT/Sales} + 0.514 * \text{Price/BV} + 0.471 * \text{CR} - 0.485 * \text{DE} + 0.756 * \text{ATR}$$

The output of discriminant analysis is further analyzed and output of the discriminant analysis is presented in the Table – 2.

**TABLE – 2: OUTPUT OF THE DISCRIMINANT ANALYSIS  
EIGENVALUES**

Function	Eigen value	% of Variance	Cumulative %	Canonical Correlation
1	1.139 <sup>a</sup>	100.0	100.0	.730

a. First 1 canonical discriminant functions were used in the analysis.

**Wilks' Lambda**

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	.467	25.475	5	.000

**Standardized Canonical Discriminant Function Coefficients**

	Function
	1
PBIT/S	0.269
P/BV	0.514
CA/CL	0.471
D/E	-0.485
ATR	0.756

An eigenvalue indicates the proportion of variance explained. A large eigenvalue is associated with a strong function. The canonical correlation indicates the degree of association between the dependent variable and the explanatory variables. A high correlation is a sign of a function that discriminates well. The present correlation of 0.73 is considerably high (1.00 is perfect) and explains that the association between dependent variable i.e. group membership and independent variables is 73%.

Wilks' Lambda is the ratio of within-groups sums of squares to the total sums of squares. This is the proportion of the total variance in the discriminant scores not explained by differences among groups. A lambda of 1.00 occurs when observed group means are equal (all the variance is explained by factors other than difference between those means), while a small lambda occurs when within-groups variability is small compared to the total variability. A small lambda indicates that group means appear to differ. The associated significance value indicates whether the difference is significant. Here, the Lambda of 0.467 has a significant value (Sig. = 0.000); thus, the group means appear to differ. The group centroid of discriminant score for debt restructured firms was -1.164 and for healthy firms it was 1.164.

**TABLE – 3: CLASSIFICATION RESULTS FOR DISCRIMINANT ANALYSIS**

		Actual group	Predicted Group Membership		Total
			Distressed Firms	Healthy Firms	
Cross-validated	Count	Distressed Firms	9	1	10
		Healthy Firms	2	8	10
	%	Distressed Firms	90%	10%	100.0
		Healthy Firms	20%	80%	100.0

a. Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.

b. 90% of original grouped cases correctly classified.

c. 90% of cross-validated grouped cases correctly classified.

The model obtained above was cross validated and Table – 3 shows the model validation classification accuracy. The model has a predictive ability of 90 percent. It is able to correctly classify 90 percent of debt restructured firms and 80 percent of healthy firms. The Type I error i.e. misclassification of a distressed firm as healthy firm is 10 percent. Whereas the Type II error of misclassification of a healthy firm as distressed firm is 20 percent. On the basis of values of individual financial ratio as indicated in the discriminant function it was observed that the firms with discriminant scores between -3.73 to -0.58, were of debt restructured group, between 0.26 and 2.64 were of healthy group and the scores between -0.59 to 0.25 were in-determinable.

### 3. CONCLUSION:

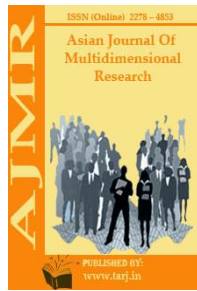
The overall analysis highlights that PBIT/S, P/BV, CA/CL, D/E, ATR are the most important variables in discriminating between a distressed firm and a healthy firm. Profit before Interest & Taxes to Sales has a positive sign which indicates that a firm that has higher profitability is less likely to get distressed in comparison to a firm with low profitability. Similarly, a positive sign of Price to Book Value indicates that healthy firms were perceived as better investment prospect had high share prices and firms that were distressed had low share prices. A negative sign of debt-equity ratio indicates that the lower this ratio, the greater will be the chances of being healthy. The distressed firms were over-leveraged and therefore they required debt restructuring. Also, a positive sign of current ratio in the discriminant function indicates that the better the liquidity position of a firm, the greater will be its chances of remaining healthy. A firm with adequate liquidity pays its bills on time and services its other short-term obligations on time. Since the firms in this study are of iron and steel industry which is a manufacturing sector, asset turnover ratio was also found to be a significant variable in discriminating between a healthy firm and a distressed firm.

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## **THE BUSINESS BENEFITS OF GOOD OCCUPATIONAL HEALTH AND SAFETY IN CONSTRUCTION INDUSTRY**

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### **ABSTRACT**

*In a market economy methods of economic incentives should be based on the laws of market mechanisms of management. The basic principle of economic incentives is the provision of effective methods that influence to economic interests of employers and provide cost benefits. In the simplest case the results evaluated in terms of value, should exceed ongoing cost reduction in construction industry. Today economically possible to reduce accident rate or zero rate injures by promoting safe technologies and work conditions. Accident preventive measures like site induction, differentiation of insurance rates, highly qualified inspection, fining system and high level of decision making in a very short period of time provides business benefits to construction industry via economic and social instruments. Requirements for labor protection and objectives for improvement in working conditions can be only solution both companies economic even financial cost and social benefits of workers on site. This research sets out to assess the definitions, and to ascertain what should be included in the scope used to both value the construction industry and to define its role to the budget of the construction project [1].*

**KEYWORDS:** *Health and Safety, Construction, Accident, Injure, Economic cost, Effect*

## 1. INTRODUCTION

This paper presents a novel method of good occupational Health and Safety on global challenge to the sustainable development of society and civilization. The new effective strategy emphasizes that activities are aimed reducing construction cost with accident prevention on site. The economic approach relies on cost benefits analyses to save money, time and other. The starting points of well planning activities are the needs of society and workers in construction industry. These needs are reflected in the statistics of industrial injuries, near misses, occupational diseases and pension statistics, as well as other studies that provide best working conditions. Accident information and classification by the construction company's notice board are also helping to prevent all sorts of hazard in workplaces. When well-prepared construction sites focus on economic aspects of the companies.

The main objective is necessary maintain inspection for labor protection use as a basic regulation for their effective activities. Inspectors can get immediate loss information enterprises as a result of morbidity, injury and staff turnover. Over time labor protection can accumulate information, for example, on the economic impact of working conditions in various construction industries. Construction industry, third high risk of getting injured sector after (agriculture fishing, forestry; transport) occupations, as well as types of work and production functions can be different accidents anyway. Striving for efficiency and effectiveness, labor protection districts correlate their resources and skill with the needs of customers to develop safety regulations as international standards.

In the last few years there has been a growing interest in choosing a control method in the process of observation. The most important matters is the economic factors influencing to employee and the individual enterprises. When striving for efficiency and effectiveness, the main form of activity is control over factors of labor safety at the stage of designing and managing production facilities, working with machines and equipment, and with good construction management. Quite recently, considerable attention has been paid voiding cost reduction of the project work caused by bad working conditions [2].

## 2. METHODS

In this paper work we used theoretical approach and secondary source data from the various cases, web sites, and researches on this field. We started by investigating this research with data collection and study some scholars in this field. The major objective of this study was to investigate different types of costs of accidents that contractors incur which can be avoided via efficient health and safety regulation. The direct and indirect costs lead to costs of the project and have financial impact on contractors. The reductions of these costs are the expected benefits that lead to improved health and safety performance. This will help organize good process and lead towards accident prevention on sites. Following financial instruments clear clarification about value of the well prepared occupational health and safety.

## 3. LITERATURE REVIEW

**Cost benefit analysis (CBA)** is defined as a methodology for valuing costs and benefits that enables broad comparisons to be made (Snell, 1997, Preez, 2004) and imposes an accounting framework that prescribes classes of benefits and costs to consider, means to measure them, and approaches for aggregating them (Pearce, 1988). It has traditionally focused on efficiency, on providing policy makers with an indication of the magnitude of net benefits associated with a



particular project or policy (Moore, 1995) and is an economic technique that produces information intended to improve the quality of public policies (Kopp et al., 1997).

### Direct Costs

Direct cost is defined as those actual costs that can be directly attributable to injuries and fatalities (Tang et al., 2004). It refers to expenditure on insurance; damage to buildings and equipment's or vehicles; damage to the product; cost of health or expenditure on medical care; cost of investigation; legal costs; death; permanent disability; worker illness; losses of current production; pains as well as discomfort associated with accidents (Everett et al.,1996, HSE, 2006, Oxenburg and Marlow, 2005, Tang et al.,2004 and Mossink, 2002).

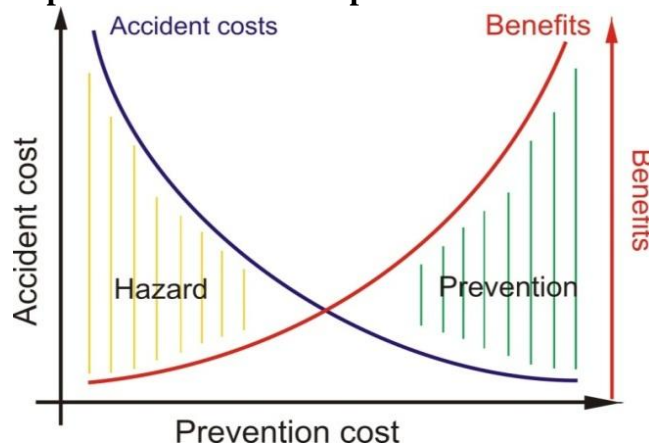
### Indirect Costs

Indirect costs refer to costs that may not be covered by insurance and are the less tangible costs (Ferret and Hughes, 2007) that result from accident. They are classified by HSE as those costs incurred by the diversion of time to deal with the consequences of an accident, which also can affect productivity and these, include: cleaning up; hire costs of temporary equipment; waste disposal; temporary labor; costs of advising and consulting experts; lost time, sick pay, overtime working and temporary labor; and; loss of business reputation (Everett et al.,1996, HSE, 2006, Oxenburg and Marlow, 2005, Tang et al.,2004 and Mossink, 2002).

### Effects of accident costs

As demonstrated above, accidents in the construction industry have great consequences not only on the employers but also on the workers, co-workers, families and the society. Construction work is intrinsically hazardous, but inadequate task planning, poor safety training, lack of safety incentives, insufficient incident investigation and poor safety management- play a major role in this poor level of safety within construction (Lee and Hipline, 2003). Figure 1 below illustrates the effect of accident costs. The costs of accidents in the industry has a significant effect on not only in the industry but the worker and the society as further illustrated in fig. 1 below [3].

**Figure1**  
**Relationship of accident cost and prevention cost in construction**



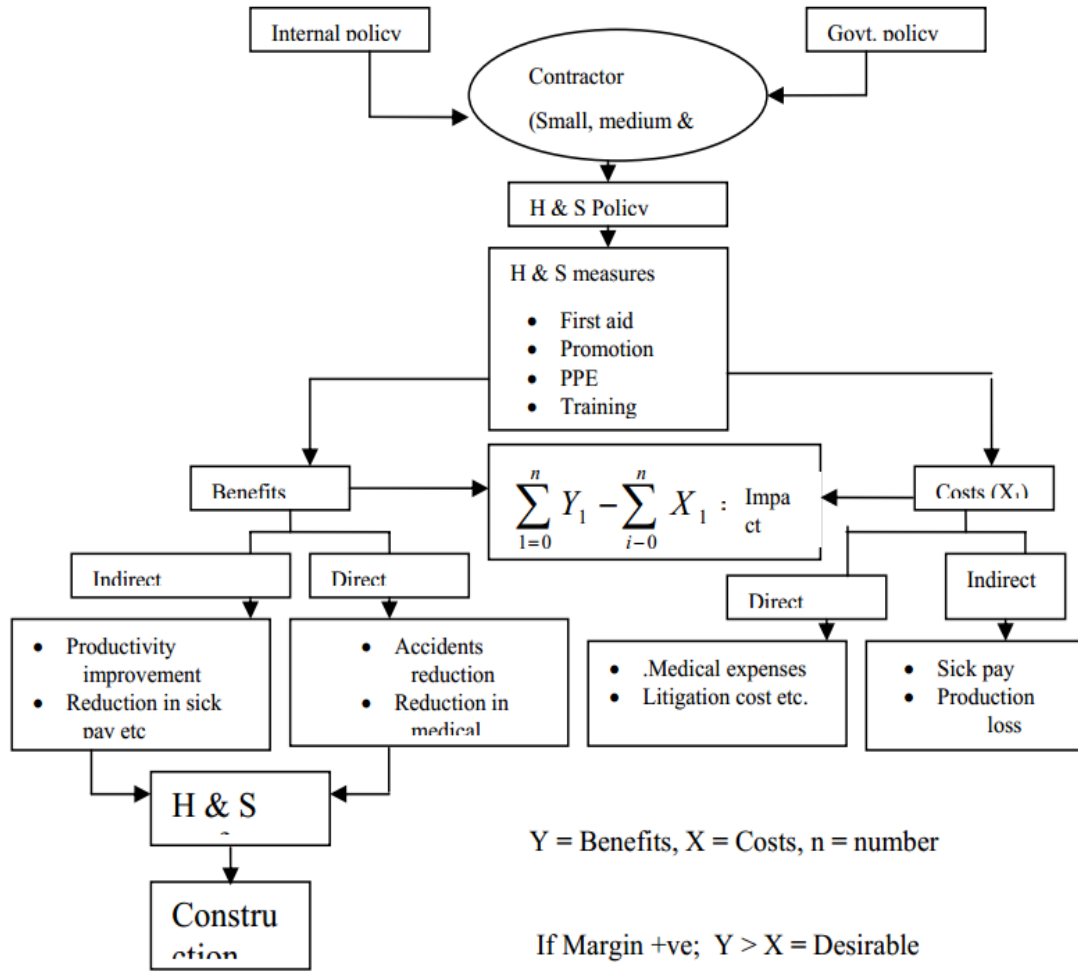
What Are Financial Costs? Financial costs of construction accidents represent the losses incurred by the private investors, such as contractors, due to the occurrence of construction site accidents. In financial analysis, market prices are always used to represent benefits and costs (Tang, 1996). There are a number of studies concerning accident costs (e.g. Heinrich et al, 1980; Lee, 1991;

Levitt and Same son, 1993). The following financial losses were used in the research carried out by Tang, Lee and Wong 1997):

**4. RESULTS**

The results show that there are options fundamental innovations on simultaneously creative production potentials are also cost effective analysis methods in construction industry.

**Figure 2**  
**Cost benefit analysis of health and safety regulation [4]**



Y = Benefits, X = Costs, n = number

If Margin +ve; Y > X = Desirable

If Margin -ve; X > Y = Undesirable

These innovations are hard to predict and companies may not always succeed finding while insufficient safety regulations. Firstly, insurance services on promoting reduce accidents and cost benefits of the workers have been entrusted with the next tasks: Ensuring social protection of the insured and the economic interest of policyholders in reducing occupational risk and reimbursement of harm caused to the life and health of the insured. The method is an effective way to improve cost reduction benefits on production environment will only work if it implies an economic benefit.

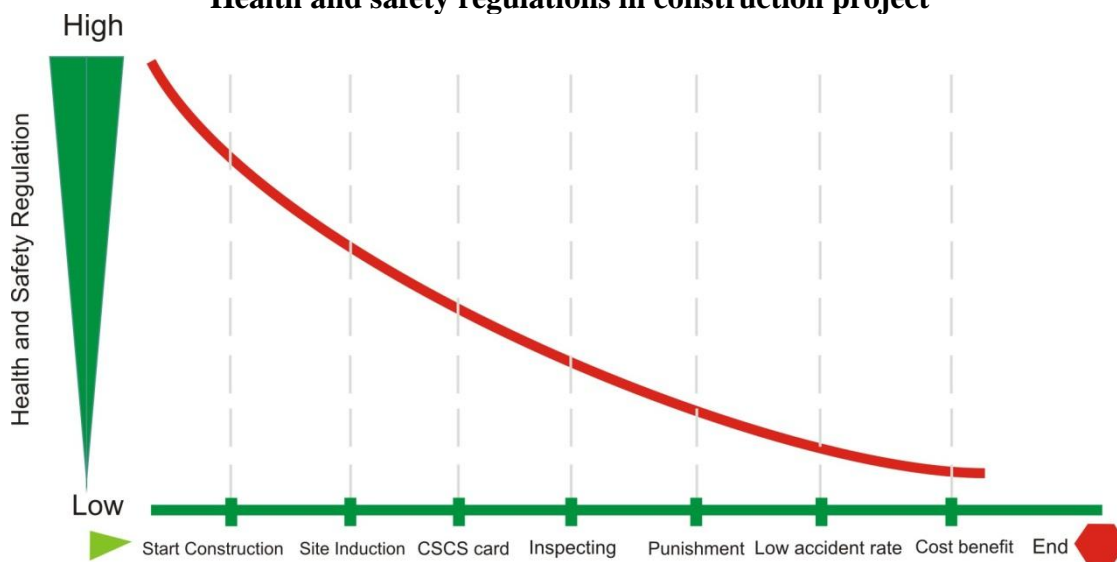
One of the big advantages of accidents in the construction industry represent a substantial ongoing cost to the employers, workers and society (Haslam, et al 2004). The costs of accidents incurred by various contractors (Figure 2) on account of accidents are divided into three sections. We can analyze cost and benefits all time come along all times.

Another approach of components on safety cost is breakdown form fill in the total cost of safety in a building project. Construction projects that are selected five main costs of safety items as mentioned as below:

- Cost of Safety Management
- Cost of Safety Procedures
- Cost of Building Safety
- Cost of Site Safety
- Cost of Workers' Safety

**Figure 3**

**Health and safety regulations in construction project**



The most surprising aspect of the figure is to provide a percentage format for the safety costs. The subject matter was discussed among selected level of risk at site. While high level of safety regulations implemented into construction site economic benefits will be more than 20-25 per cents of the total cost of the project (Figure 3). Drawn from the discussion stated that there are five main sections in the calculation of the percentage of the costs and safety costs for a building project.

To distinguish between these sections construction companies think that if they decide how much they can spend, calculate the benefits in order to improve working conditions we need to consider the cost of investment the value of their benefits. Typically, a business process can be safer or safer through modifications such as swapping equipment, ventilation, and modifications systems, machines, more moderate business trips, attached supplementary warranties, etc.

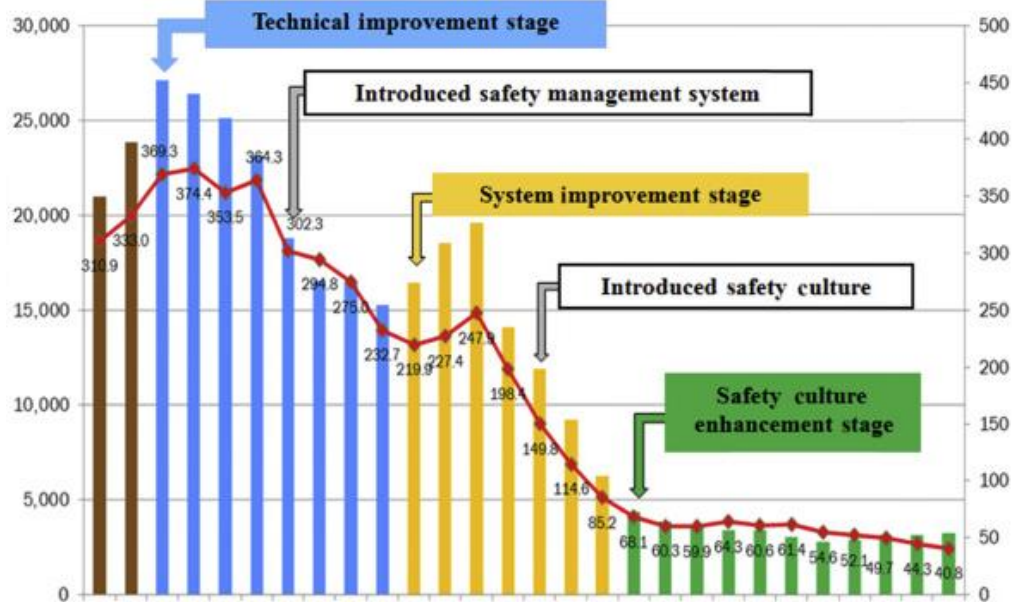
Why is OSH an essential part of good business? Occupational safety and health:

- helps demonstrate that a business is socially responsible,
- protects and enhances brand image and brand value,

- helps maximize the productivity of workers,
- enhances employees' commitment to the business
- builds a more competent, healthier workforce,
- reduces business costs and disruption,
- enables enterprises to meet customers' OSH expectations, and
- Encourages the workforce to stay longer in active life [5].

The most striking result to emerge from the figure 4 is that implementation of good safety regulations promotes following effectiveness in construction. As for the applications of international standards influences reduction of accident rates at work places. It means good organized construction management causes direct effect of economic costs.

**Figure 4**  
**Safety implementation stages of cost reduction in construction**



The results were corrected for the background readings and then averaged before the safety system in construction effect of investment funds appears in the form of economic losses that may arise as a result of an accident or hazards that can occur very frequently. This is a serious psychological aspect that encourages companies to invest in attracting real income-generating activities, rather than increasing their safety. However, health and safety "savings" are incorrect and cost serious to the business. For example, long-term economic damages that arise from the risks must be covered before the construction phase started. It means well prepared investments provide exact cost cuts as indicated figure 4. Certain expenses by project management provide next business benefits of the company:

### 1. Cost of Safety Management

- Safety and Health Officer
- Safety Supervisor/promoter
- Trainer
- AGT (Authorized Gas Tester)
- AESP (Authorized Entrant & Standby Person) (for confined space)

- Traffic Management Officer (TMO)
- Scaffolding Inspector

## **2. Cost of Safety Procedures**

- Green card
- Levi CIDB
- Courses and seminars
- Worker's training
- Qualifications examination
- Bon Insurance
- Accident Insurance
- Cover All Risk Insurance (CAR)
- Detention Fund

## **3. Cost of Building Safety**

- Safety promotion
- Safety signage
- Lighting
- Ventilation
- Waste (unscheduled/schedule)

## **4. Cost of Site Safety**

- Scaffolding
- Fence (hoarding)
- Net
- Shoring
- Confine Space
- Fire Fighting Equipment

## **5. Cost of Workers' Safety**

- Safety helmet
- Safety boots
- Eye protection devices
- Safety belt
- First aid kits
- Safety gloves
- Dust mask
- Ear Plug [6]

The resulting solution was gently mixed with company investments and comparison potential losses. This process uses existing equipment, materials, and methods investment costs are straightforward and directly provided clear workstations.

**TABLE 1 DISTINCTIONS IN THE COST OF OCCUPATIONAL ACCIDENTS [7]**

<b>Distinction</b>	<b>Criteria</b>	<b>Significance</b>
economic/ noneconomic	whether the cost takes the form of damage to goods or services that have or can be given prices	determines the economic case for intervention, apart from the ethical and public health case
internal/external	whether the cost is paid by the economic unit that generates it	determines the gap between the economic incentive to the individual decision-maker and the corresponding incentive to society
fixed/variable	whether the cost remains constant despite changes in the incidence and severity of injuries and illnesses	determines the economic incentive for an individual decision-maker to take measures to reduce incidence or severity rates
direct/indirect or visible/invisible	whether the cost is measured and allocated through routine accounting methods	determines whether the decision maker will perceive the economic incentives that actually exist

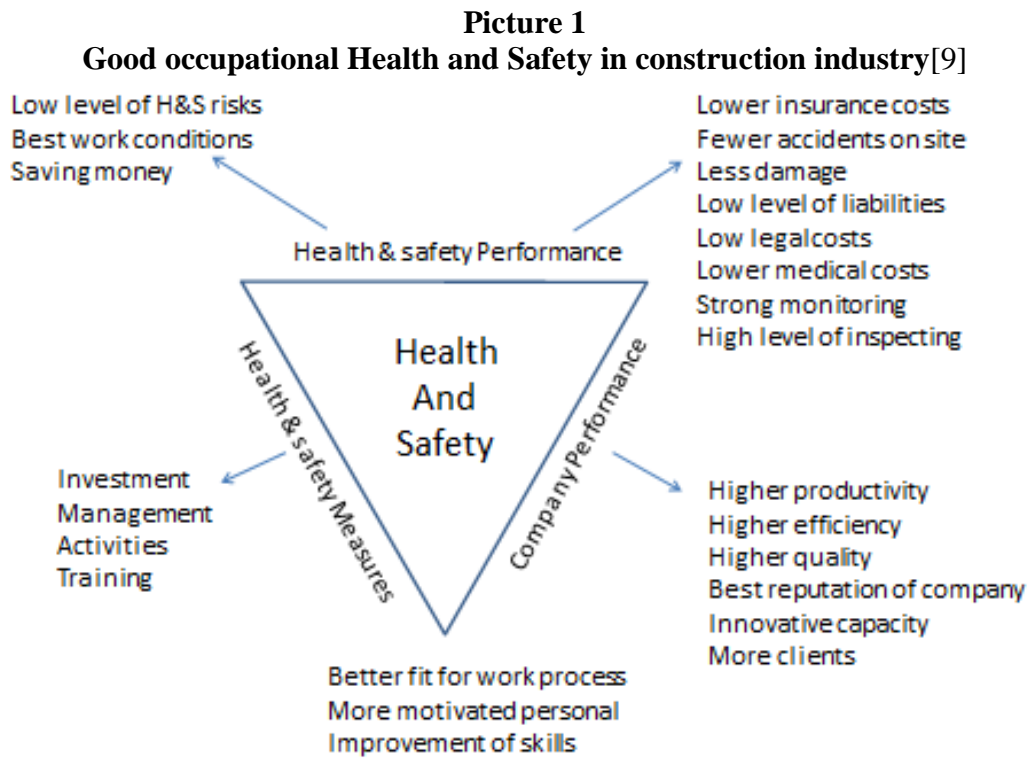
These results suggest that understanding the importance of good site safety it is often easier to examine the potential impact of project cost. Payments to employees, contractors or visitors to the site that impede employees, safety and health indicators (HSE), executions and fines, the risk of imprisonment, legal costs and, of course, goodwill damage to the iceberg surface can lead to possible consequences or poor protection. During the working time unexpected variables and invisible factors with common criteria's influences cost benefits (table 1).

## 5. DISCUSSION

The main concern of the paper was to improve the working environment and wait for results this improvement is primarily related to the value of a specific business or problem. Therefore, economic factors affect the role of the administration any situation, as well as the effectiveness and efficiency of the control methodology. In the development following program are the subdivisions of the labor migration environment created for the Employment Office:

- 1) Improving an economically productive working environment for the enterprise
- 2) Profitable business environment in terms of national economy
- 3) Economically insufficient improvements in working conditions [8]

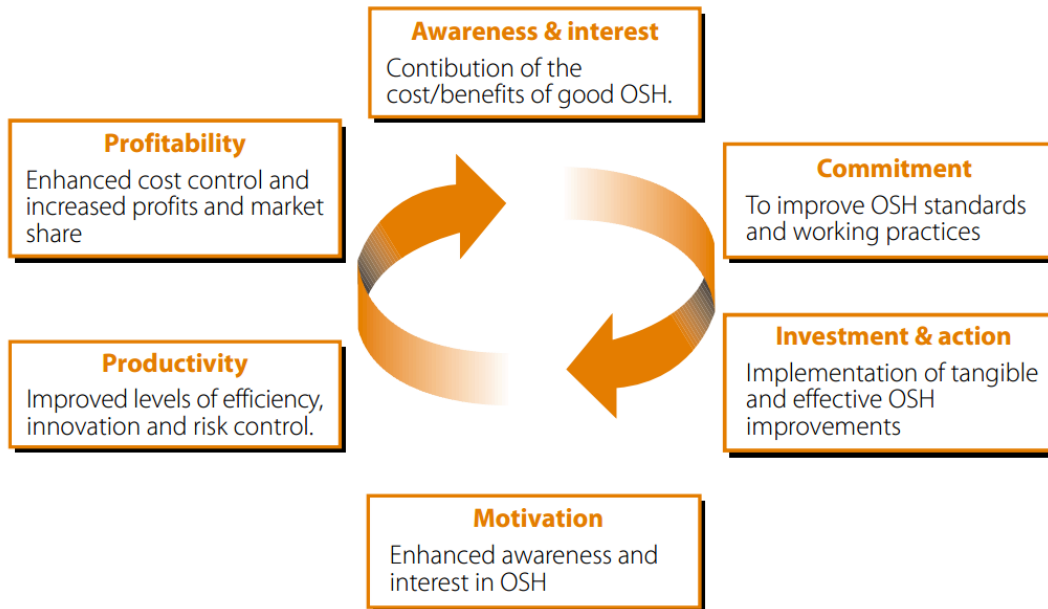
We have addressed not only governments affect or setting economic effects but also controlling the norms and regulations they should be done as far as possible. It is necessary to develop economically new methods of economic management.



We have also considered the consequences of economic approach helps to improve and develop contractors work in the field of labor protection and better understanding with representatives of inspected companies. However, safety improvements will cost to financial statements of the projects. Usually, they are not only paying for the costs and they do not think about the benefits and resources, as a result of measures to improve labor protection (Picture 1). Because money is measurement of the contractors. It is very important benefits they have and the overall look of the fund Occupational safety regulations are one of the traditional ways of motivation evidence of good safety.

The originality of our solution lies in the fact that economic efficiency of workplace must be systematically distributed safety and improvement of working conditions. The economic efficiency of measures aimed at improving working conditions and improving labor protection (economic benefits) is determined by the amount of damage (industrial outcomes) of industrial injuries and occupational diseases; Increase the profits of the enterprise through increased labor productivity; reducing costs for incentives and compensating for adverse conditions. Increase in the company's income depends on the decrease in production costs due to labor productivity, and the increase in the efficiency of the workforce in a more favorable manner. Improved working conditions can be achieved by following example.

**Picture 2**  
**Economic benefits of well-organized health and safety regulations[10]**



To our knowledge, this is the first study to deal with the ILO standards every construction projects should have an Occupational Safety and Health Administration Inspectors on site. They are responsible for clarify information on expenses and benefits, labor protection during the workplaces. Successes and failures of the Inspector are often explained the effectiveness of practical models and methods for other sites or construction companies. The present study was designed to determine the effect of modern businesses approach should not resort to the principle of "labor protection is always beneficial" because it is related with continuously money expenses of companies. The economic approach is practically applied and is not economically viable in all cases the benefits gained from occupational safety measures are rarely sufficient. In this case, arguments in the field where protection is required referring to health or law by government. Effects of circular benefits of good safety regulation protect construction company economic cut zones (Picture 2) [11].

## CONCLUSION

Summing up the results, it can be concluded that working conditions and cost-effectiveness are very important for both communities and construction project personals. This is not a recent issue of companies all over the world. Advanced economies and the International Labor Organization regulations and practical activities are more effective in this area. On the other hand, we talk about the various complexities economic impacts, precise estimation of results and calculation of the consequences. The most obvious finding to emerge from this study is about safety issues which understandable and common every day. It is not hard job to obey safety rules and requirements during the work places.

Preventing any hazard and unexpected risks take measures to improve the situation for economic benefits of the any project. The next conclusions can be drawn from the present study is Occupational Safety and Health Department should work in different ways and at different levels of economic factors for labor and company protection. The central authorities should special pay attention to the detail economic issues, the cost and revenue analysis of standard settings



development of new methods of economic incentives. Finally, there is a need for basic legislation for the organization of labor protection and occupational safety. While many other countries have recognized this need and are legitimate at the moment, but the practice still requires much intentions [12].

Taken together, these results suggest that best way for the business benefits of good occupational health and safety in construction industry is implementation of innovated methods to reduce accident rate or regular safety investment into construction projects before the entrance to the site. Safety investment is aimed at protecting the health and physical integrity of workers and the material assets of the contractor. Following three safety investment components will keep company benefits economic via cost and time:

#### *1. Safety administration personnel*

- Site staff and head office staff: according to law, a contractor has to employ safety officers and safety supervisors on site to monitor safety-related matters;
- Some large contractors will also employ safety managers / senior safety officers to direct and coordinate site safety staff;
- The salary of these personnel and their supporting staff (e.g. clerks, typists) are part of the safety investment;

#### *2. Safety equipment*

- Purchasing of safety boots, goggles, helmets, safety fences, first-aid facilities, etc which are related to the provision of safety on site;

#### *3. Safety training and promotion*

- Safety training courses are organized by contractors for their employees;
- Safety promotion includes the printing of pamphlets and posters, the production of safety advertising banners and boards, organization of safety campaign and monetary rewarding of individual workers who achieve a good safety standard of work, etc.

#### *4. Penalties for who has a high level of accident rate intention on site*

- issuing score system fine regulations and rules;
- issuing CSCS card entrance to site [12].

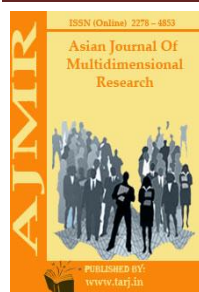
Economic impact is not just the goal of the activity, but only one aspect of their assessment. Given the economic effectiveness of measures, competent authorities and employers can more effectively fulfill the social and economic consequences of environmental pollution, occupational disease, accidents and natural disasters.

The economic effectiveness of project protection measures should not be the sole instruments for the expediency of the activity. Although economic calculations have shown that the measure is ineffective, it can be done because of great economic and social benefits. The advantage of economic impact on the company is a secondary importance rather than the social approaches. Because human being is protected from all hazards in the very past history which does mean that, in modern globalization and integration process will never lose their role in business.

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## A STUDY OF MARGINALISED IDENTITY IN WERTENBAKER'S PLAYS

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### ABSTRACT

*The purpose of this research paper is to discuss and analyse the situation of contemporary women and their long held silence; how it finds a voice in the male dominated society of patriarchal dominance. The very plays being discussed in the research paper is "New Anatomies" through which the author tries to delineate her very feminist view point of how a female voice is being created. It is the story of historical woman of repute Isabelle Eberhardt, who hailing from a male domineering strata of societal set-up; in order to shake off the manacles of male dominance and authority, ventures into the world disguising herself into a male's attire. The focus of the paper is onto how female character like Isabelle and other radical female characters in the play existing in the salon, try to subvert the very gender roles by the construction of new identity or gender structure. The very radical women like her try to form a new anatomy by donning the cap of male attire, hence the title of the play is "New Anatomy." The research paper also takes up for study the play "Grace of Mary Giles", wherein the playwright shows the working of male dominance in shaping the life of women protagonist and the women's protest to the male dominated society.*

**KEYWORDS:** *Marginalisation, Identity Loss, Reaffirmation Of Identities*

### INTRODUCTION

Timeberlake's first feminist writing is *New Anatomies* published in 1981, where she dramatizes the life of a reputed historical French writer Isabelle Eberhardt who transmuted herself into the life and role of an Arab man named as Si Mahmoud who lives among Algerians. Not only Isabelle rather other female characters in the play also don the attire and robes of men in the play but Isabelle is unique in her very personality as she doesn't only wear the clothes of men but also her very persona reflects the unique soul searching for a new freedom, liberty from all the oppressions of the heart, soul and body. She sets out on a journey to escape from the atrocities of

male dominance and also in her search for new found freedom, she overthrows the very constraints of religion, morality, culture and sexuality. Hence she loiters on the desert of Sahara, overwhelming with her newly found freedom. The situation is similar with eastern nations who have been plundered, looted and exploited like her.

Isabelle is truly a marginal character in the sense that she experiences the dictates of male dominance and wants to assert herself. She is a character who wants to find her own identity, who is not meek or silent spectator looking at the situation dumb founded rather she is an active character who after observing all the scenario feels the utmost urge of transforming it or at least transforming her own situation. As Peacock opines, “New Anatomies establish new structure gender” in which as Peacock believes: “both men and women can find new ways of living equitably together.” (1)

Wertebaker’s feminist character Isabelle defies all cultural, sexual, religious overtones of her societal set up and thus challenges and subverts the sexual stereotypes hence fixed in the society. The playwright urges the need of bringing Isabelle to the forefront of the stage as she is “Sexually conscious woman” as Carlson holds (2). Let us first see the biographical not of Isabelle, she was born to Alexander TrophimowskyEberhardt who was Russian and her mother was Anna Eberhardt who had German descent. She was born in Geneva. Her father was a nihilist and her father influenced her personality to a great extent. She was an adventurer who set out on a journey to French North Africa and visited a number of countries. She also ventured into the Sahara Desert where she was banned being known that she is a woman. That’s how being restricted and under the restrictions of male dominated norms, she set out the journey being into the fake gender of a male named hence Si Mahmoud. Later she dies in 1904 at the tender age of twenty-seven.

The play opens up just some time before her demise. She is seen attired as a man in the trial. She is attired in black cloak of an Arab man. She is toothless and seems to have lost her hair. She seems suffering from Malaria Her very mannerism is that of a man, she sticks out cigarettes and smokes. By and large in the Act I and Scene I she uses offensive language as of a man and is very confident. Her very façade of masculine mannerism seems to be so in-depth that it reflects so natural and spontaneous that it is difficult to tell she is in fact a female. She also urges upon her need to sleep with a young man.

As per ClayComb (2004): Isabelle’s dressing as a man signifies both her abiding to the patriarchal norms and helping in promoting it also and on the other hand it also is a form of rebellion, wherein she overthrows the gender roles and questions the male dominance by seeking her own liberty in the form of a manly dressed lady by hiding her own gender and roaming with flamboyance of a male’s persona.

But her very domain into the Arabian masculine disguise lets her assimilate the very Arabian or Muslim culture which impinges upon the freedom of women as compared to western or European culture where women are shut down into the very narrow walls of their domestic sphere, the very harem culture and its isolation and seclusion: not even allowing men to enter into the very periphery. Thus though Islamic culture is for equality and tolerance, the space given to womenfolk is quite parochial, hence the question arises on why the Muslim friends of Isabelle even after knowing her actual true identity, accept her into Islam, being blind to her actual gender and accepting her as man only. Wertebaker picks up the issue of women’s oppression quite differently, she compares the plight of women with that of east, wherein both are meted

with not so fair treatment. East and eastern women are oppressed by the coloniser as well as the pangs of patriarchy. Women like Isabelle however those women who are erudite are welcome and venerated in eastern culture irrespective of their ethnic difference and diversity. The very reason of Isabelle's moving to the heart of desert is to find a space of her own where societal norms don't apply, where the religion holds no spite, no priest or clergy can instruct you to behave or not to behave a particular way, she can have her own way of life; away from the trials and tribulations of religious, social and cultural dictates of patriarchal venom that relegate women to a secondary position and push them to the very periphery of centre-stage.

Wertenbaker as she has been travelling east to west and vice versa has oodles of experience in her kitty that is why she knows well how the two cultures work and in what way. She knows that the very east has been an exploited and oppressed one whereas it has its own patriarchy which has never left a stone unturned to exploit the women of its culture. Whereas the west although is educated, advanced and progressive has also not treated women in the right way as the condition of women like Isabelle is quite derogatory over there, where they have never been treated equal not meted out with prejudice tilted in favour of men. Hence she runs away from such a cumbersome culture to seek her own way of freedom by entering the east where she is welcome and venerated being advanced and knowledgeable, despite the fact that her feminine identity is known. Even marriage which is considered as a perfect form of social acceptance and something which is supposed right for every women is disparaged by Isabelle. She though shares a romantic relationship with her step brother in her teens but denies getting married as a form of social and patriarchal protest.

Wertenbaker has been a staunch feminist writer, in play after play she has proved her mettle for being a strong champion of women's rights. She has vehemently spoken about the women's cause in another of her play named as *The Grace of Mary Traverse* written in 1985 and considered as magnum opus for the playwright. It is the story of a lady Mary Traverse who in order to over throw the very ideals and norms of patriarchal set up of society and to find her own identity, undertakes an odyssey on the streets of London like Isabelle. Being the daughter of a very affluent merchant, she was always under the complete surveillance of her father so she has been kept indoors without letting her know to experience the external world. Curious to know the realities of the external world, she wants to know the world out the shut windows and doors of her protected house.

In the Play, Wertenbaker seems to be focusing on the role of identity on the basis of gender discrimination in the western society. She talks of masculinity and feminine in order to define gender. Males have since beginning of civilisation deemed themselves as powerful hence as Kate Millet propounds:

“Aggression, intelligence, force and efficiency in the male; passivity, ignorance, docility, “virtue” and ineffectuality in the female”.(3)

That is why in the first scene of the play when it opens, Mary is seen in the presence of her merchant father. Her father observes her while she enacts the scene of talking to a man. She is facing to a chair which is empty but speaking to the chair with animation as if someone is sitting over there. The subject of her conversation to the imagined man is nature; a very trivial matter for a conversation. Whereas her father does not allow her to express her desires apart from just starting a conversation. He is of the opinion that women should be submissive and docile. He affirms: -

“To be agreeable, a young woman must make the other person say interesting things” (GMT 68). Her father further advises her: “: “A compliment must be received in silence” (GMT 70)

Thus her father moulds her personality as per his own will and dictates. Even in the matter of education, her father does not allow her to follow her own dreams rather forces her to study what he thinks she should study. She is interested in studying politics however Giles is critical of her studying politics as he is of the view that politics is for men not apt for women. That is why she says: But Papa, you won't let me study politics. And I'd so like to” (GMT 69). Lorber opines in this context:

“Gender inequality can also take the form of girls getting less education than boys of the same social class.” (4)

Coaxed by Mrs Temptwell, Mary is curious to know about the outside world, that is why she asks pertinent questions about the girl in number fourteen. Mrs Temptwell tempts her into a journey on the forbidden streets of London. She seeks assurance from Mrs. Temptwell regarding initiating her journey on the streets of London which she affirms. These streets of London are prohibited to her as her father has banned her entry into those streets of London as he does not want she should roam over there. But she is bold enough to have her own way that is why she travels on the streets of London, as she wants to satisfy her thirst of curiosity about the outdoor world. But once she is out on the streets of London, she encounters with men with pervert mentality who consider women as objects of gratification of their lust nothing more.

Her first encounter shuddered her, it was encounter with Lord Gordon who is so shocked by Mary's neglect that he cries:

“How dare someone like you ignore me. You!” (GMT 78)... “I 'll make you frightened. I 'll how you my strength. Come here to the light post.”

He tries to overpower Mary sexually in an attempt to prove his manhood over her. Sophie, a poor peasant girl, intervenes in order to save her from him and in the bafflement, she is raped instead of Mary. What sort of society is this where a man needs to prove his manhood over the issue that he cannot cope up with the matter of a lady's neglect? Where is the society heading to that a man rapes up a woman because he cannot get himself the centre of attention? These questions are arisen in the play by the playwright and we experience the women's plight is getting worsened day after day. On Rapes, it is to be noted that:

“In the case of rape and sexual harassment today, any woman could be the target of male violence, although some women may at times be more vulnerable. [...] At the time of the witch-hunts we find an analogous picture. It was perhaps easier to accuse those women who were more vulnerable such as the old, widowed and poor, and those who stepped outside the socially-accepted stereotype, although the persecutions were based on a religious and inherently male supremacist ideology which saw all women as a threat and as potential 'witches'(5)

Thus concluding the analysis of Wertenbaker as the writer concerned with marginalised identities we can affirm for sure that the writer is having in-depth insights into the plight of women and in the post-structural study we can be sure that she has rightly brought the readers and the audience the condition of women in just way. Her plays are open for discussion on feminist analysis as she brings forth the issues of women in terms of her loss of identity, feminine docility, subjugation and she makes her plays a vehicle to articulate the long held

silence of women through protest as in the case of Isabells or in case of Mary. Her female characters have the grit to bid adieu to the patriarchal set up; by protesting against the system.

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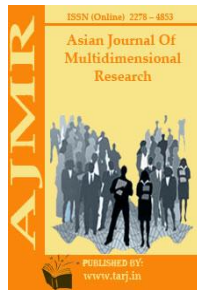
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## MODELLING TRANSMISSION OF HIV WITH TREATMENT FUNCTION INCLUDING OPPORTUNISTIC INFECTIONS USING SIR MODEL

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### ABSTRACT

*In this paper, we introduce the SIR model to study the transmission of infectious disease HIV. The model has been modified by including the saturated type of incidence function and introducing compartment opportunistic infections [23]. The viral, fungal or parasitic infections can be opportunistic. They occur in patients with an immune system that has been compromised and are secondary to another condition such as HIV-AIDS. The basic reproduction number  $R_0$  is obtained by using the Jacobian matrix method. The model has two equilibrium points: disease-free and endemic equilibrium and the local stability of the equilibrium points are discussed using Lyapunov function. The disease-free equilibrium is locally asymptotically stable if  $R_0 \leq 1$ . The number of infections rises resulting in endemic and is found to be globally asymptotically stable.*

**KEYWORDS:** SIR, COVID-19, Epidemic, Basic Reproduction Number

### 1. INTRODUCTION

Many mathematicians and scientists have been modelling the propagation mechanisms of infectious diseases [15-17] using differential equations. Many deterministic models have been developed and applied to several infectious diseases [4,5,7,8,20].

Disease transmission modelling is based on the compartment model theory. The total population is divided into different compartments based on an individual's stage [24]. The SIR model, based on compartment theory, developed by Kermack and McKendrick's, introduced three compartments called as  $S(t)$ ,  $I(t)$  and  $R(t)$ , which denote the number of susceptible individuals, contagious (infected/infectious) and recovered/removed individuals at a time  $t$ , respectively. This model is suitable for diseases which grant permanent immunity after recovery or individual is removed from the system.



The transmission of the disease is defined by using the incidence rate. The bilinear incidence rate  $\beta S(t)$  ( $\beta$  is the transmission rate of the disease) has been studied [13,14] with the assumption that a susceptible population is large. If the population is saturated with infected individuals, then the number of contacts between infected individuals and susceptible individuals may decrease due to the quarantine of infectious individuals or protective measures taken by susceptible individuals, hence the rate of infection may depend non-linearly to  $S(t)$  or  $I(t)$  [2,3]. The different kind of saturated incidence function depending on susceptible and infected  $\beta S/(1+\alpha S)$  or  $\beta S/(1+\alpha I)$  [18], Beddington–DeAngelis incidence function  $\beta S/(1+\alpha S+\beta I)$  [1,3], Crowley-Martin incidence function  $\beta S/(1+\alpha S+\beta I+\alpha\beta SI)$  [26,6,19] the specific non-linear incidence function  $\beta S/(1+\alpha S+\beta I+\gamma SI)$  [10,11,12] and the non-monotone incidence function  $\beta S/(1+\alpha I^2)$  [25] has been studied.

In this paper, we modify the SIR model to study the dynamics of infectious diseases typically HIV by considering a distinct compartment of opportunistic infection [23] and the incidence function to be saturated instead of bilinear. The paper is organised as follows: In section 2, we state the mathematical equations of the model. The basic reproduction number computed and the stability of equilibrium points using Lyapunov function is discussed in section 3. Section 4 discusses the importance of the parameters related to opportunistic infection and removal rate graphically using numerical solution followed by the conclusion as section 5.

## 2. Mathematical Formulation

We consider the SIR model to define the HIV disease with the opportunistic infection, where the total initial population is divided into three compartments namely,  $S(t)$  susceptible,  $I(t)$  contagious and  $R(t)$  removed where  $t$  is the time variable. Let  $N$  be the total population in the system at any time  $t$ ,  $S(t)$  denotes the number of susceptible to be infected at any time  $t$ . The population moves from the compartment of susceptible  $S$  to the compartment of infected  $I$  depending on the number of contacts infected multiplied by the probability of infection  $\beta$  where  $\beta I/N$  is the average number of contacts infected with a disease in per unit time  $t$ . Here, we consider the saturated incidence rate  $\beta I/(1+\tau S)$ , to include inhibition due to awareness among susceptible [18]. The infected  $I$  are removed with a rate  $\gamma$ . The removed means individuals who will never return into the class  $S$  (susceptible). The individuals move from infected compartment to opportunistic infected  $O$  with a rate  $\alpha$ , the reciprocal  $\alpha^{-1}$  is called the average opportunistic infectious period.  $\lambda$  is called recruitment rate while  $\mu$  is the average rate of mortality.  $\lambda$  and  $\mu$  describe a model with vital dynamics (endemic model), which has an inflow of births into the class  $S$  at a rate  $\lambda$  and outflow (deceased) from any compartment  $C$  at a rate  $\mu C$ . This model is based on the assumptions proposed by [14, 15]. The population size is constant and large enough so that we can consider the population of each compartment as a continuous model. It is assumed that all individuals have the same contact rate in the population with equal birth and death rate.

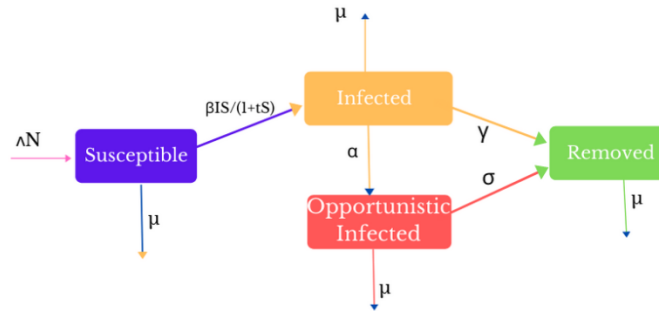


Fig. 1: HIV with Opportunistic Infection

The governing differential equations are:

$$\frac{dS}{dt} = \Lambda N - \frac{\beta S(t)I(t)}{N(1 + \tau S(t))} - \mu S(t) \tag{1}$$

$$\frac{dI}{dt} = \frac{\beta S(t)I(t)}{N(1 + \tau S(t))} - (\mu + \gamma + \alpha)I(t) \tag{2}$$

$$\frac{dO}{dt} = \alpha I(t) - \mu O - \sigma O \tag{3}$$

$$\frac{dR}{dt} = \sigma O + \gamma I(t) - \mu R(t) \tag{4}$$

Where  $N(t) = S(t) + I(t) + O(t) + R(t)$ , (5)

$S(0)=S_0 \geq 0, I(0)=I_0 \geq 0, O(0)=O_0 \geq 0, R(0)=R_0 \geq 0.$

The equations (1) - (5) are re-written using dimensionless variables:

$S' = S/N, I'=I/N, O'=O/N, R'=R/N$ , then omitting dashes, we obtain

$$\frac{dS}{dt} = \Lambda - \frac{\beta S(t)I(t)}{1 + \tau S(t)} - \mu S(t) \tag{6}$$

$$\frac{dI}{dt} = \frac{\beta S(t)I(t)}{1 + \tau S(t)} - (\mu + \gamma + \alpha)I(t) \tag{7}$$

$$\frac{dO}{dt} = \alpha I(t) - \mu O - \sigma O \tag{8}$$

$$\frac{dR}{dt} = \sigma O + \gamma I(t) - \mu R(t) \tag{9}$$

Where  $1 = S(t) + I(t) + O(t) + R(t)$ . (10)

### 3. Disease Dynamics

On adding Eqn. (6)-(9) and using (10), we obtain

$$\frac{dS}{dt} + \frac{dI}{dt} + \frac{dO}{dt} + \frac{dR}{dt} = 0$$

For, disease free (from (6)),  $\Lambda - \mu S(t)=0$ , Therefore,  $(\frac{\Lambda}{\mu}, 0, 0, 0)$  is the Disease Free Equilibrium (DFE) point.

$$\sup_{t \rightarrow \infty} (S + I + O + R) \leq \frac{\Lambda}{\mu}$$

Hence, the feasible region for the system is:

$$\Omega = \left\{ (S + I + O + R): S > 0, I \geq 0, O \geq 0, R \geq 0, S + I + O + R \leq \frac{\Lambda}{\mu} \right\}$$

The reproduction number can be computed using the Jacobian Matrix method. The characteristic polynomial is:

$$\frac{(\lambda + \mu)^2(\lambda + \mu + \sigma)(-\beta\Lambda + (\alpha + \gamma + \lambda + \mu)(\mu + \Lambda\tau))}{\mu + \Lambda\tau}$$

The Eigenvalues are:

$$\lambda_1 = -\mu, \lambda_2 = -\mu, \lambda_3 = -\mu - \sigma, \\ \lambda_4 = \frac{\beta\Lambda - \alpha\mu - \gamma\mu - \mu^2 - \alpha\Lambda\tau - \gamma\Lambda\tau - \Lambda\mu\tau}{\mu + \Lambda\tau}$$

For a system to have equilibrium points as locally asymptotically stable then all Eigenvalues must be negative. ( $\lambda_1, \lambda_2, \lambda_3$  are negative as  $\mu > 0$  and  $\sigma > 0$ )

$$\frac{\beta\Lambda - \alpha\mu - \gamma\mu - \mu^2 - \alpha\Lambda\tau - \gamma\Lambda\tau - \Lambda\mu\tau}{\mu + \Lambda\tau} < 0$$

$$R_0 = \frac{\Lambda\beta}{(\alpha + \gamma + \mu)(\mu + \Lambda\tau)}$$

Therefore, the DFE, (6) - (10) is globally asymptotically stable in  $\Omega$  if  $R_0 \leq 1$  and is unstable if  $R_0 > 1$  [21,22] where  $\Omega = (S^*, I^*, O^*, R^*)$

The number of infected individuals in an endemic state depends on the basic reproduction number  $R_0$ . For endemic equilibrium, the disease must not become extinct. We solve the above equation algebraically and then find the conditions of the existence of endemic equilibrium.

$$S^* = \frac{\Lambda}{-\Lambda\tau + R_0(\mu + \Lambda\tau)} \\ I^* = \frac{(-1 + R_0)\Lambda(\mu + \Lambda\tau)}{(\alpha + \gamma + \mu)(-\Lambda\tau + R_0(\mu + \Lambda\tau))} \\ O^* = \frac{(-1 + R_0)\alpha\Lambda(\mu + \Lambda\tau)}{(\alpha + \gamma + \mu)(\mu + \sigma)(-\Lambda\tau + R_0(\mu + \Lambda\tau))} \\ R^* = \frac{(-1 + R_0)\Lambda(\alpha\sigma + \gamma(\mu + \sigma))(\mu + \Lambda\tau)}{\mu(\alpha + \gamma + \mu)(\mu + \sigma)(-\Lambda\tau + R_0(\mu + \Lambda\tau))}$$

Thus, DFE point  $(\Lambda/\mu, 0, 0, 0)$  of (6) - (10) is globally asymptotically stable in  $\Omega$  if  $R_0 \leq 1$  and is unstable if  $R_0 > 1$ .

Now, we find the stability of the endemic equilibrium. We consider equation (6) and (7) only, as these equations are independent of terms  $O$  and  $R$ .

Consider a Lyapunov function:

$$V = \frac{1}{2}(S - S^*)^2 - \frac{1}{2}(I - I^*)^2$$

$$\dot{V} = (S - S^*)\dot{S} + (I - I^*)\dot{I}$$

Substituting the value of  $\dot{S}, \dot{I}, S^*$  and  $I^*$  from equation (6) and (7), and

$$\Lambda = \frac{\beta S^* I^*}{1 + \tau S^*} - \mu S^* \text{ and}$$

$$\mu + \gamma + \alpha = \beta \frac{S^* I^*}{1 + \tau S^*}$$

We obtain,

$$\dot{V} = -\mu(S - S^*)^2 - \frac{\beta I^*(S - S^*)^2}{(1 + \tau S)(1 + \tau S^*)} - \frac{\beta S(I - I^*)(S - S^*)}{(1 + \tau S)(1 + \tau S^*)} - \frac{\tau \beta S S^*(S - S^*)(S - S^*)}{(1 + \tau S)(1 + \tau S^*)}$$

$$- \frac{\beta I(I - I^*)(S - S^*)}{(1 + \tau S)(1 + \tau S^*)}$$

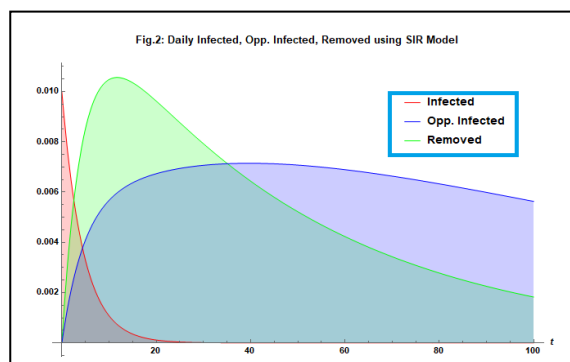
So,  $\dot{V} \leq 0$  for  $I < I^*$  and  $S < S^*$  and also for  $S = S^*, I = I^*, V = 0$ .

Therefore, by La Salle’s Invariance principle [9], the endemic system is globally asymptotically stable.

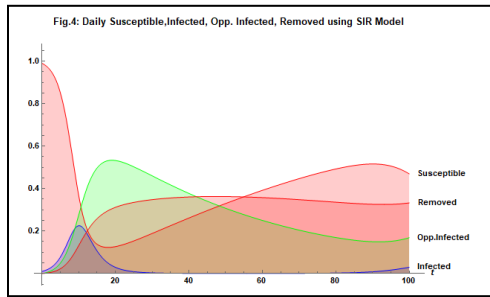
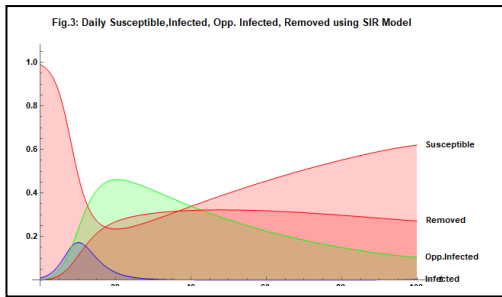
#### 4. Numerical Discussion

The dimensionless equations (6) to (10) are solved numerically using the NDSolve function of Wolfram Mathematica. The numerical solutions of  $S, I, O$  and  $R$  are plotted for different values of parameters.

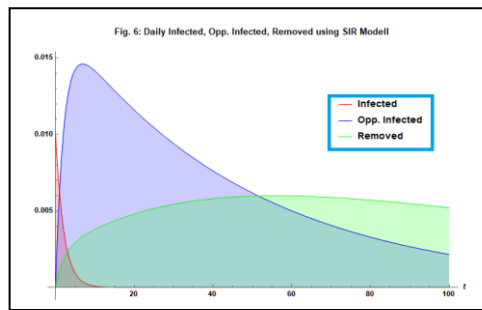
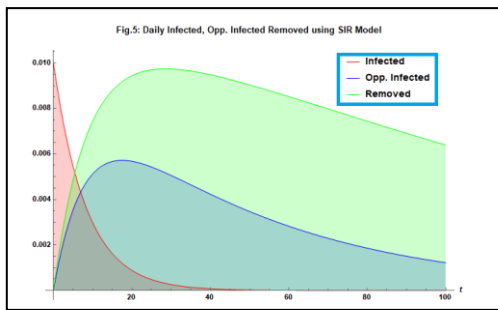
A general set of solutions of  $S(t), I(t), O(t), R(t)$  for the parameters:  $t = 100, \Lambda = \mu = .01, R_0 = 0.5, \gamma = .13, \alpha = 0.3, \tau = .5, \sigma = .011$  (Fig.2). The infection  $I(t)$  decreases while Opportunistic infected attains the peak and reduces. There is steady removal of the individuals from the system either directly from the infected compartment or from the opportunistic infection compartment (Fig2).



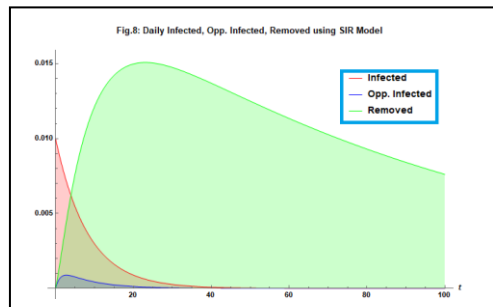
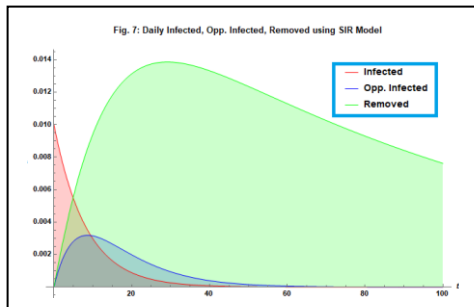
The graphs for different values of  $\tau = 0.1$  and  $0.8$  (Fig. 3-4) are plotted. As  $\tau$  factor measures the inhibitory or protective measures taken by the susceptible, the graph of susceptible for  $\tau = 0.8$  saturates quickly and then begin to rise again to saturate quickly as compared to (Fig.3).



The individual move from infected to the opportunistic infected compartment with a rate  $\alpha$  say, with a value of 0.1 and 0.8 (Fig. 5-6), as the value of  $\alpha$  is increased, the peak of opportunistic infected rises and so is the removed. More is the movement from infected to opportunistic infected, more will be removed. By giving proper treatment to individuals of HIV infected,  $\alpha$  can be controlled which indicates that the peak of the removed graph is reduced.



Finally, we vary the  $\sigma$ , the rate with which the opportunistic infected individuals are removed. Fig. 7 ( $\sigma = 0.1$ ) and Fig. 8 ( $\sigma = 0.8$ ), clearly that by increasing  $\sigma$  the peak values of opportunistic infected are decreased and the removed peak value is increased.



### 5. CONCLUSION

The SIR model is modified by including saturated transmission function and opportunistic infections compartment for the transmission of infectious disease (typically HIV) have been studied. The model has a disease-free equilibrium which is locally stable for  $R_0 \leq 1$  and endemic equilibrium which is stable for  $R_0 > 1$ . The algebraic solutions are obtained and stability of endemic equilibrium using Lyapunov function suggests wiping out of the population. Hence, treatment measures aimed for reducing  $R_0$  below 1 must be intensified to control opportunistic infections and ultimately the removal population.

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