ISSN (Online) : 2278 - 4853

Asian Journal of Multidimensional Research

AJMR

Published by :
www.tarj.in

AJMR

ISSN (online) : 2278-4853

Editor-in-Chief : Dr. Esha Jain

Impact Factor	:	SJIF 2021 = 7.699
Frequency	:	Monthly
Country	:	India
Language	:	English
Start Year	:	2012

Published by : www.tarj.in

Indexed/ Listed at : Ulrich's Periodicals Directory, ProQuest, U.S.A.

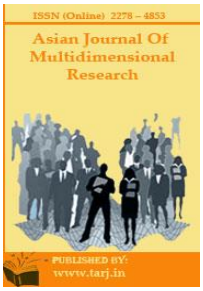
E-mail id: tarjjournals@gmail.com

VISION

The vision of the journals is to provide an academic platform to scholars all over the world to publish their novel, original, empirical and high quality research work. It propose to encourage research relating to latest trends and practices in international business, finance, banking, service marketing, human resource management, corporate governance, social responsibility and emerging paradigms in allied areas of management. It intends to reach the researcher's with plethora of knowledge to generate a pool of research content and propose problem solving models to address the current and emerging issues at the national and international level. Further, it aims to share and disseminate the empirical research findings with academia, industry, policy makers, and consultants with an approach to incorporate the research recommendations for the benefit of one and all.

A Publication of TRANS Asian Research Journals

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853



Published by: TRANS Asian Research Journals
AJMR:
Asian Journal of Multidimensional Research
(A Double Blind Refereed & Reviewed International Journal)

MATHEMATICAL MODEL FOR SWARM SOM BASED EFFICIENT TRAFFIC CONTROL

Sarika Saini*

*Assistant Professor,
DAV Centenary College,
Faridabad, India.

ABSTRACT

This paper delineates an intelligent model for dynamic self-organizing traffic control. We have made use of the self-organizing map (SOM) converter and the synchronization phenomenon in between two non-linear Kuramoto oscillators coupled together to derive the model. The object is to develop an adaptive, decentralized and proficient traffic control which can even function well with only local traffic information.

KEYWORDS: *Traffic Information, Accidents And Air Pollution, Decision Making.*

INTRODUCTION

As a result of the great number of people and goods travelling through streets and avenues of large cities, traffic congestion, accidents and air pollution have constituted some of the main preoccupations of modern societies. In order to attenuate such problems, traffic signals have been employed for traffic controls. However, there is a lack of computerized devices that could be of help in taking decisions. More recently, so called intelligent methods like fuzzy logic, and Automatic Neural Networks have been used in the development of traffic control. We have to keep on trying developing the decentralized efficient traffic control systems with decision making capabilities to reduce the time delay and enhance the safety at the same time.

BASIC ARCHITECTURE OF THE PROPOSED MODEL

The basic four components of the architecture block have been described below:

(1) TSCS: It stands for Traffic Signal Control System. It enable rapid creation of real-time systems with limited involvement of programmers and control expertise.

(2) SIMULATOR: The simulator is used to verify and test TSCS to ensure that TSCS is able to handle the situation in practical.

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

(3) MP: Stands for Map Converter. The road network is obtained by satellite image or from the image of spider-cams. This information can be used as input for TSCS for calculation purpose which, in turn, is sent to the simulator for verification and testing.

(4) VS: Vehicle sensors are developed to calculate the number of vehicles, corresponding velocity and length of the vehicles passing through the roads.

A block diagram of the architecture has been provided below:

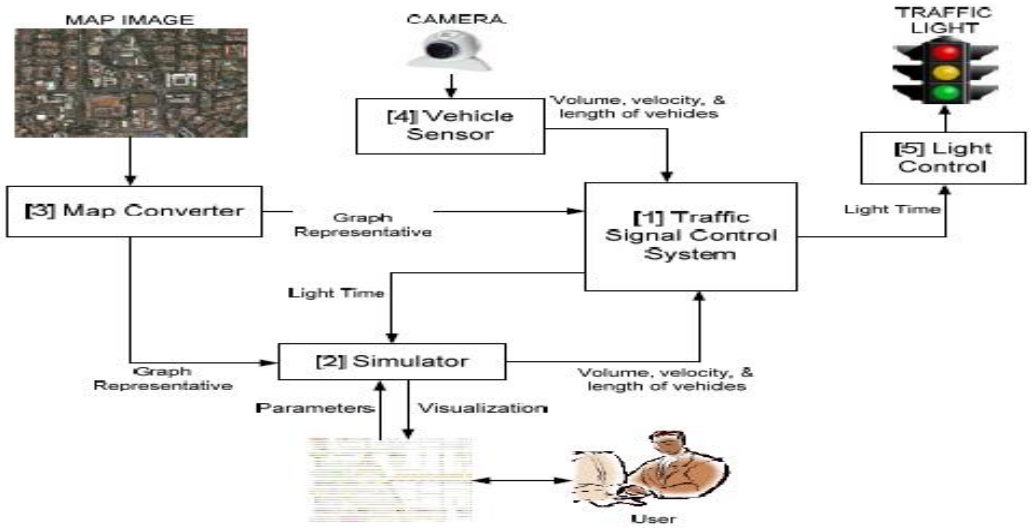


FIG1: SOM BASED TRAFFIC CONTROL ARCHITECTURE

BASICS OF SOM

Self-organized Mapping is an abstract mathematical model which is used in Artificial neural network to facilitate learning from experience. Hence these kind of neural systems don't require a sophisticated or so to say, precise or predefined mathematical model but they can adapt themselves from the past records. In contrast with supervised traditional learning, there is no direct teacher. Self-organization often involves both correlative and competition learning. It makes use of the preliminary learning rule in the light of synaptic weight (w) as in given by Hebbian ,

$$\frac{\partial w_{ij}(t)}{\partial t} = \alpha x_i(t) y_i(t)$$

[α→ Positive learning rate satisfying the condition 0< α<1

x→Input to the neural system

y→ Output from the system]

The SOM uses a set of artificial neurons, arranged in a 2-D hexagonal rectangular or grid, to form a discrete input space-mapping, $X \in R^n$. At the start of the learning, all the weights {W1,W2, ...,Wm} are initialized to small random quantities. Wi is the weight vector associated to neuron i and is a vector of the same dimension – n – of the input, m is the total number of neurons, and let ri be the

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

location vector of neuron i on the grid. Then the algorithm repeats the steps shown in Algorithm below, where η(ν, k, t) is the neighborhood function, and Ω is the set of neuron indexes. Since Gaussian normal function can be used to represent any probability density function, hence it's preferred to represent the neighborhood function with Gaussian form as follows:

$$\eta(\nu, k, t) = exp[-\frac{\|\mathbf{r}_\nu - \mathbf{r}_k\|^2}{2\sigma(t)^2}$$

The generic algorithm of SOM has been depicted below:

1. At each time t, present an input $\mathbf{x}(t)$, and select the winner,

$$\nu(t) = \arg\min_{k \in \Omega} \| \mathbf{x}(t) - \mathbf{w}_k(t) \|$$

2. Update the weights of the winner and its neighbours,

$$\Delta \mathbf{w}_k(t) = \alpha(t)\eta(\nu, k, t)[\mathbf{x}(t) - \mathbf{w}_\nu(t)]$$

until the map converges

The SOM algorithm quantizes the clusters of the input space and produces a map that preserves a well-defined topology.

SOPHISTICATED CO-ORDINATION MODEL USING SWARM SOM

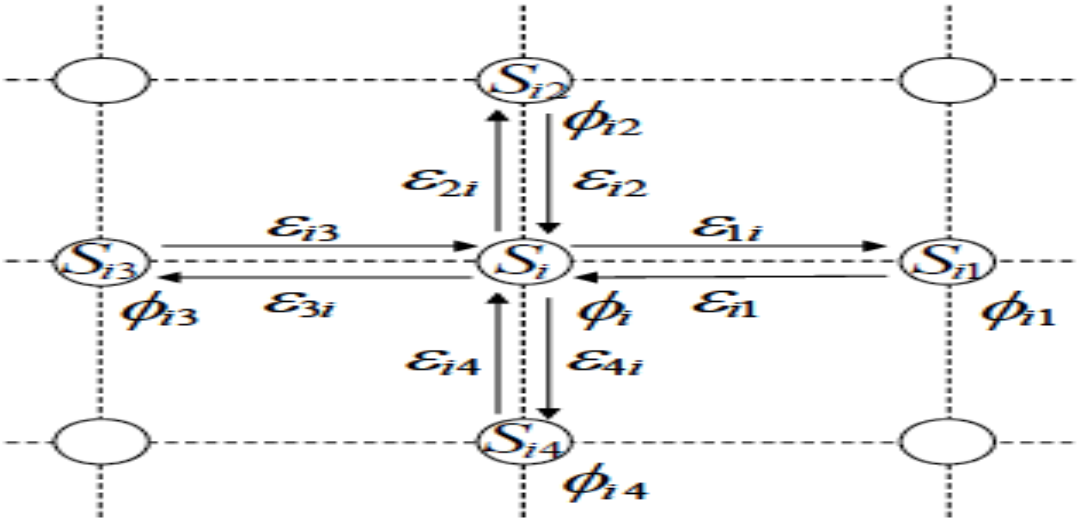


FIG 2: PROPOSED NETWORK MODEL

The junctions of the roads have been represented in a sophisticated way by means of bidirectional graph. The analogical self-organization is observed in nonlinear coupled oscillators and it's termed as "synchronization", where oscillators having different frequencies spontaneously lock to a same phase. Let the terms be defined before kicking off the discussion in detail:

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

$S_i (1 \le i \le N)$, →Denotes the junctions;

ϕ_i →Phase of S_i (Cycle Signal);

$\phi_{ij} (j \in \{1,2,\ldots, n_i\})$ →Phase of S_{ij} ;

S_{ij} →Neighbor of S_i ;

n_i →Number of signals associated with S_i ;

ε_{ij} is the flow of the vehicles (normalized) and can be defined as

$$\varepsilon_{ij} = \frac{1}{\rho_{im} Ti} \int_t^{t+T_i} \rho_{ij}(t)dt$$

$$\rho_{im} = const. \qquad \text{---------(1)}$$

Where ρ_{im} is capacity and $\rho_{ij}(t)$ is density of the lane between S_i and S_{ij} in interval $[t, t+T_i]$.

As per Fig 2 which depicts the architecture of the network, it's clear that phase of S_i will be altered due the presence of S_{ij} .We are going to handle this with the analogy of coupled oscillator-models proposed by Kuramoto and the phase equation is generally given as:

$$\dot{\phi}_i(t) = \omega_i + \frac{K}{n_i} \sum_{j=1}^{n_i} \Gamma_i(\phi_i, \phi_{ij}) \qquad \text{---------(2)}$$

$\Gamma_i(\phi_i, \phi_{ij})$ is called the Fourier component, generally defined with sin term.

Equation 2 satisfies the constraint equation as follows:

$$\Gamma_i(\phi_i + 2\pi, \phi_{ij}) = \Gamma_i(\phi_i, \phi_{ij} + 2\pi) = \Gamma_i(\phi_i, \phi_{ij}) \qquad \text{------(3)}$$

Replacing the flow of the vehicles as the coupling constant in between the virtual oscillators and writing the Fourier term in form of sinusoid, equation (2) can be modified as

$$\dot{\phi}_i(t) = \omega_i + \frac{K}{n_i} \sum_{j=1}^{n_i} \varepsilon_{ij} \sin(\phi_{ij} - \phi_i) \qquad \text{--------(4)}$$

As per Euler's famous formula,

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

$$\sin x = \frac{e^{ix} - e^{-ix}}{2i}$$

Applying the same in equation (4),

$$\dot{\phi}_i(t) = \omega_i + \frac{K}{2i}\left(e^{-i\phi_i} \sum_{j=1}^{n_i} \frac{\varepsilon_{ij}}{n_i} e^{i\phi_{ij}} - e^{i\phi_i} \sum_{j=1}^{n_i} \frac{\varepsilon_{ij}}{n_i} e^{-i\phi_{ij}} \right) \quad \text{--------(5)}$$

For the sake of simplicity, let's define two parameters as follows:

$$A_i = \sum_{j=1}^{n_i} \frac{\varepsilon_{ij}}{n_i} e^{i\phi_{ij}} \quad \text{--------(6)}$$

&

$$B_i = \sum_{j=1}^{n_i} \frac{\varepsilon_{ij}}{n_i} e^{-i\phi_{ij}} \quad \text{---------(7)}$$

Hence, equation(5) takes the form of the following:

$$\dot{\phi}_i(t) = \omega_i + \frac{K}{2i}\left(e^{-i\phi_i} A_i - e^{i\phi_i} B_i \right) \quad \text{----------(7)}$$

Writing this equation in terms of Sin and Cos utilizing Euler's equations,

$$\dot{\phi}_i(t) = \omega_i + \frac{K}{2i}\left((\cos\phi_i (A_i - B_i) - i \sin\phi_i (A_i + B_i)) \right) \quad \text{-------(8)}$$

From the definition of Ai and Bi,

$$A_i + B_i = 2\sum_{j=1}^{n_i} \frac{\varepsilon_{ij}}{n_i} \cos\phi_{ij} \quad \text{--------(9)}$$

$$A_i - B_i = 2\sum_{j=1}^{n_i} \frac{\varepsilon_{ij}}{n_i} i \sin\phi_{ij} \quad \text{-------(10)}$$

Let two more parameters be defined as

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

$$a_i = \sum_{j=1}^{n_i} \frac{\varepsilon_{ij}}{n_i} \cos\phi_{ij} \quad \text{-------(11)}$$

$$b_i = \sum_{j=1}^{n_i} \frac{\varepsilon_{ij}}{n_i} \sin\phi_{ij} \quad \text{--------(12)}$$

So, equation (8) can be rearranged into the following form:

$$\dot{\phi}_i(t) = \omega_i + K(b_i \cos\phi_i - a_i \sin\phi_i) \quad \text{--------(13)}$$

General time domain phase representation of Kuramoto's coupled oscillator is

$$\dot{\phi}_i(t) = \omega_i + \sigma_i K \sin(\bar{\phi}_i - \phi_i) \quad \text{--------(14)}$$

Equating (13) and (14),

$$\sigma_i \sin(\bar{\phi}_i - \phi_i) = b_i \cos\phi_i - a_i \sin\phi_i \quad \text{-------(15)}$$

With trigonometric tricks, we can deduce the following relations as well:

$$\sigma_i = \sqrt{a_i^2 + b_i^2} \quad \text{-------(16)}$$

$$\bar{\phi}_i = \arctan\left(\frac{b_i}{a_i}\right) \quad \text{----------(17)}$$

Equation (17) represents expression for the weighted phase.

LIGHT CONTROL OF THE TRAFFIC

Let the important parameters be defined in controlling traffic lights:

CYCLE LENGTH/TIME: the time required full signal phase i.e one complete round of red, yellow and green lights to be on.

GREEN SPLIT: the proportion of green time allocated for each direction during one cycle.

OFFSEt : the relative difference time between starting point of green signal on consecutive nodes.

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

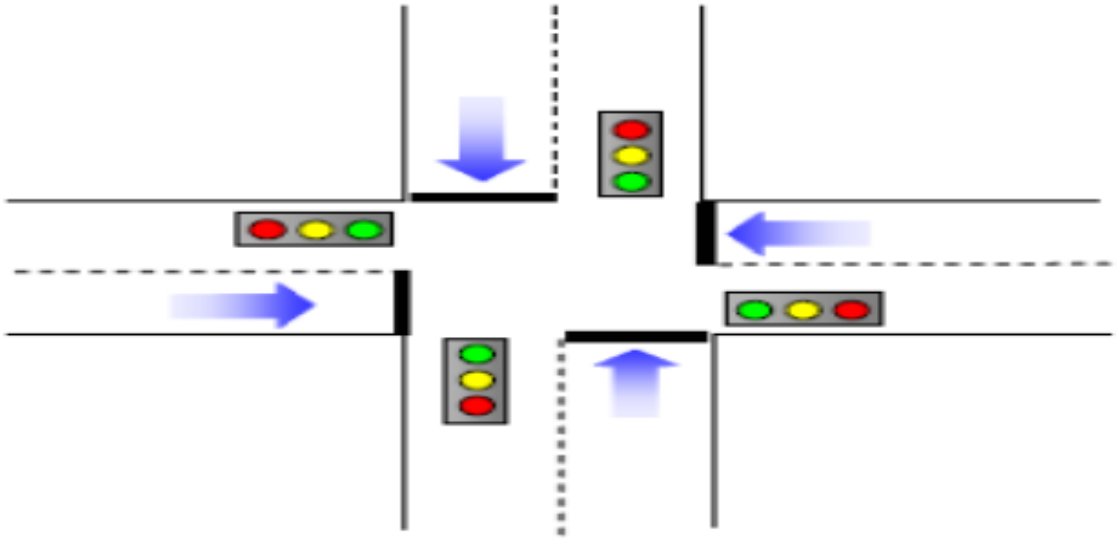


FIG 3: GENERIC TRAFFIC LIGHT MODEL

In figure 4 below, a vehicle moves from left to right (from junction 1 to junction 4). If the traffic light at junction 1 is green, then junction 1 will coordinate with junction 2 to regulate the offset. The coordination will let vehicles pass through without halting at junction 2. Thus it'll help vehicles to obtain optimal speed.

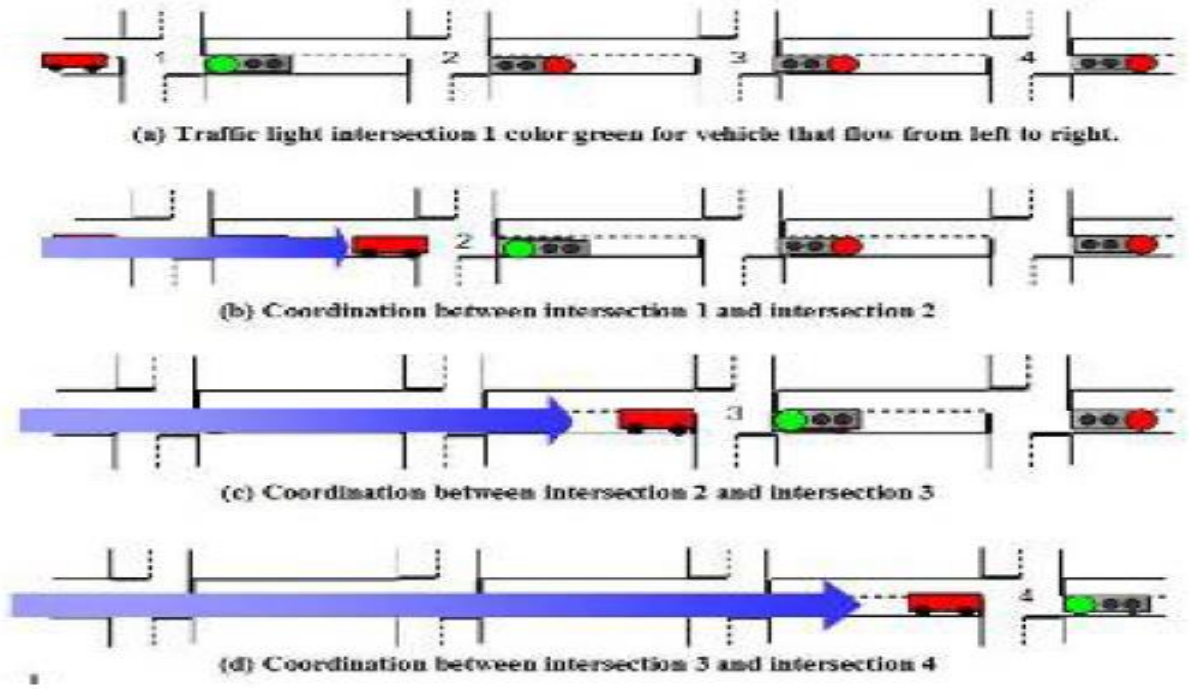


FIG 4: COORDINATION BETWEEN NODES FOR ACHIEVING OPTIMUM VELOCITY OF VEHICLES

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

SELF-REGULATION OF THE OFFSET

Let ψ_i be the phase difference in between ϕ_i and $\bar{\phi}_i$.

So,

$$\psi_i = \bar{\phi}_i - \phi_i \text{-------(18)}$$

Now we need to find the approximated value of the natural frequency of the average value of weighted phase.

Considering the dynamics of the Oscilator S_{ij} and S_i,

$$\dot{\phi}_{ij}(t) = \omega_{ij} + \frac{K}{n_i}\varepsilon_{ji}\sin(\phi_i - \phi_{ij}) + f_{ij} \text{-----(19)}$$

f_{ij} denotes the mutual influence of both neighboring oscillators.

Assuming the average influence of the surrounding oscillators of Si, equation (19) can be written as

$$\dot{\phi}_{ij}(t) = \omega_{ij} + K\varepsilon_{ji}\sin(\phi_i - \phi_{ij}) + \Delta f_{ij} \text{-------(20)}$$

Where

$$\Delta f_{ij} = f_{ij} - \frac{n_i - 1}{n_i}K\varepsilon_{ji}\sin(\phi_i - \phi_{ij}) \text{------(21)}$$

If $\bar{\omega}_i$ is the resulting compromising frequency of these Kuramoto oscillators when their phases are in-sync, then assuming local entrainment, we can write,

$$\dot{\phi}_i = \dot{\phi}_{ij} = \bar{\omega}_i \text{-----(22)}$$

Now from equation (4) and equation (20), we can write,

$$\bar{\omega}_i = \frac{1}{1 + \frac{1}{n_i}\sum_{j=1}^{n_i}\frac{\varepsilon_{ij}}{\varepsilon_{ji}}}\left(\omega_i + \frac{1}{n_i}\sum_{j=1}^{n_i}\frac{\varepsilon_{ij}}{\varepsilon_{ji}}(\omega_{ij} + \Delta f_{ij})\right) \text{-------(23)}$$

Since Δf_{ij} is negligible, equation (23) can be approximated as

$$\bar{\omega}_i \cong \frac{1}{1 + \frac{1}{n_i}\sum_{j=1}^{n_i}\frac{\varepsilon_{ij}}{\varepsilon_{ji}}}\left(\omega_i + \frac{1}{n_i}\sum_{j=1}^{n_i}\frac{\varepsilon_{ij}}{\varepsilon_{ji}}(\omega_{ij})\right) \text{------(24)}$$

Considering time derivative of $\bar{\phi}_i$ from equation (17),

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

$$\dot{\bar{\phi}}_i = \sum_{j=1}^{n_i} \frac{\partial \bar{\phi}_i}{\partial \phi_{ij}} \dot{\phi}_{ij}$$

$$= \frac{\sum_{j=1}^{n_i} \left[\left(\varepsilon_{ij}^2 + \varepsilon_{ij} \sum_{k \neq j} \varepsilon_{ik} \cos\left(\phi_{ij} - \phi_{ik}\right) \right) \dot{\phi}_{ij} \right]}{\sum_{j=1}^{n_i} \left(\varepsilon_{ij}^2 + \varepsilon_{ij} \sum_{k \neq j} \varepsilon_{ik} \cos\left(\phi_{ij} - \phi_{ik}\right) \right)} \quad \text{--------(25)}$$

When S_i and S_{ij} are mutually entrained, we have

$$\dot{\bar{\phi}}_i = \frac{\sum_{j=1}^{n_i} \left(\varepsilon_{ij}^2 + \varepsilon_{ij} \sum_{k \neq j} \varepsilon_{ik} \cos\left(\phi_{ij} - \phi_{ik}\right) \right)}{\sum_{j=1}^{n_i} \left(\varepsilon_{ij}^2 + \varepsilon_{ij} \sum_{k \neq j} \varepsilon_{ik} \cos\left(\phi_{ij} - \phi_{ik}\right) \right)} \bar{\omega}_i$$

$$= \bar{\omega}_i \quad \text{-------(26)}$$

In steady state, we can substitute equation (22) into equation (25), to obtain the approximated value of the natural frequency for the weighted phase as

$$\hat{\Omega}_i = \bar{\omega}_i \quad \text{------(27)}$$

Then equation(18) can be dynamically represented as

$$\dot{\psi}_i = \Omega_i - \omega_i - \sigma_i K \sin \psi_i \quad \text{-------(28)}$$

Where Ω_i is the natural frequency of the average value of weighted phase.

From fixed point dynamics of equation (19),a stable fixed point exists if and only if

$$\left| \frac{\Omega_i - \omega_i}{\sigma_i K} \right| \leq 1. \quad \text{-------(29)}$$

Under the constraint imposed in equation 29, the condition for phase-synchronization can be defined as

$$\psi_i = \arcsin\left(\frac{\Omega_i - \omega_i}{\sigma_i K} \right) \quad \text{-------(30)}$$

REFERENCES

[1] Self-Organizing Maps By Teuvo Kohonen

[2] Traffic Control and Transport Planning:: A Fuzzy Sets and Neural Networks ... By Dušan B. Teodorović, Katarina Vukadinović, Katarina Vukadinovic

[3] Self-organizing Map Formation: Foundations of Neural Computation By Klaus Obermayer, Terrence Joseph Sejnowski

[4] Knowledge-based Intelligent Information and Engineering Systems ..., Part 1 By Ignac Lovrek, Robert J. Howlett, L. C. Jain

[5] Kohonen Maps edited by E. Oja, Samuel Kaski

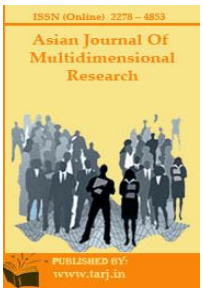
[6] Self-organizing Neural Networks: Recent Advances and Applications ; with 27 ... By Udo Seiffert, L. C. Jain

[7] Macroscopic Models for Vehicular Flows and Crowd Dynamics: Theory and ... By Massimiliano Daniele Rosini

[8] Small Worlds: The Dynamics of Networks Between Order and Randomness By Duncan J. Watts

A Publication of TRANS Asian Research Journals

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853



Published by: TRANS Asian Research Journals
AJMR:
Asian Journal of Multidimensional Research
(A Double Blind Refereed & Reviewed International Journal)

MANAGING CUSTOMER RELATIONSHIPS: A COMPARATIVE EVALUATION OF PUBLIC AND PRIVATE SECTOR BANKS

Dr. Sneha Ravindra Kanade*; Prof. Khushbu Singla Goyal**

*Assistant Professor,
Krupanidhi School of Management,
Bangalore, India.
**Assistant Professor,
Krupanidhi School of Management,
Bangalore, India.

ABSTRACT

CRM is a management approach that enables organizations to identify, attract, and increase retention of profitable customers through improved relationship management. However, successful customer relationship management focuses on understanding the needs and desires of the customers and is achieved by placing these needs at the heart of the business by integrating them with the organization's strategy, people, technology and business processes. The study tries to find out challenges of attracting the new customers and retaining the existing ones, building and maintaining strong and lasting relationships with customers and understanding the needs & wants of customers. The CRM is one such tool which helps in meeting the customer's expectations according to their changing needs. While analyzing the CRM Implementation in both the sectors, it was found that the Private Sector Banks have been able to implement the CRM practices more effectively when compared to their Public Sector counterparts. This indicates that strategically speaking, the Private Sector Banks have been more innovative in understanding their customers and in building good relations with them.

KEYWORDS: *CRM, Private Banks, Public Banks, Relationship Management.*

INTRODUCTION

Over the years, Indian banks have expanded to cover a large geographic & functional area to meet the developmental needs. They have been managing a world of information about customers - their profiles, location, etc. They have a close relationship with their customers and a good knowledge of their needs, requirements and cash positions. Though this offers them a unique advantage, they face a fundamental problem. During the period of planned economic development, the bank products

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

were bought in India and not sold. What our banks, especially those in the public sector lack are the marketing attitude. Marketing is a customer-oriented operation. What is needed is the effort on their part to improve their service image and exploit their large customer information base effectively to communicate product availability. Achieving customer focus requires leveraging existing customer information to gain a deeper insight into the relationship a customer has with the institution, and improving customer service-related processes so that the services are quick, error free and convenient for the customers. Furthermore, banks need to have very strong in-house research and market intelligence units in order to face the future challenges of competition, especially customer retention. Marketing is a question of demand (customers) and supply (financial products & services, customer services through various delivery channels). Both demand and supply have to be understood in the context of geographic locations and competitor analysis to undertake focused marketing (advertising) efforts. Focusing on region-specific campaigns rather than national media campaigns would be a better strategy for a diverse country like India.

Customer relationship management (CRM) solutions, if implemented and integrated correctly, can help significantly in improving customer satisfaction levels. Data warehousing can help in providing better transaction experiences for customers over different transaction channels. This is because data warehousing helps bring all the transactions coming from different channels under the same roof. Data mining helps banks analyze and measure customer transaction patterns and behavior. This can help a lot in improving service levels and finding new business opportunities. It must be noted, however, that customer-centric banking also involves many risks. The banking industry world over is being thrust into a wild new world of privacy controversy. The banks need to set up serious governance systems for privacy risk management. It must be remembered that customer privacy issues threaten to compromise the use of information technology which is at the very centre of and customer relationship management. The critical issue for banks is that they will not be able to safeguard customer privacy completely without undermining the most exciting innovations in banking. These innovations promise huge benefits, both for customers and providers. But to capture them, financial services companies and their customers will have to make some critical trade-offs. When the stakes are so high, nothing can be left to chance, which is why banks must immediately begin developing comprehensive approaches to the privacy issue. Traditionally, few people changed their banks unless serious problems occurred. In the past there was, to certain extent, a committed, often inherited relationship between a customer and his/her bank. The philosophy, culture and organization of financial institutions were grounded in this assumption and reflected in their marketing policies, which were product and transaction-oriented, reactionary, focused on discrete rather than continuous activities. Today, financial institutions can no longer rely on these committed relationships or established marketing techniques to attract and retain customers. As markets break down into heterogeneous segments, a more precisely targeted marketing technique is required, which creates a dialogue with smaller groups of customers and identifies individual needs. Also, before the Internet revolution, consumers largely selected their banks based on how convenient the location of bank's branches was to their homes or offices. With the advent of new technologies in the business of bank, such as Internet banking and ATMs, now customers can freely chose any bank for their transactions. Thus, the customer base of banks has increased, and so has the choices of customers for selecting the banks. This situation coupled with the pressures of competitive and dynamic markets has contributed to the growth of CRM in the banking Sector.

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

REVIEW OF LITERATURE

Gummerson (1996) explored the extent of application of relationship marketing in banking sector. According to his findings, the service users hold good image of the company if it provides effective CRM services. He found that poor relationship marketing caused discontinuation of services by many customers. The same concept applies to Indian customers too. Service industry players need to put thrust on this area to maintain profits on a sustainable basis.

Jain and Dhar (2003) studied the determinants of customer relationship management effectiveness in India. They used in-depth interviews focused on behavioural dimensions of relationships. It was found that customer relationship management emerged as a core business process for maintaining and enhancing the competitive edge in modern business affairs. In the area of bank services, the issue of customer relationship management holds much importance. Many a times, it is the CRM that becomes the deciding factor while selection of services. Customer loyalty is directly related to the CRM efforts made by the service sector companies.

Campbell 2003; Rowley 2004; Minna and Aino, 2005 studied that an analytical CRM system requires Knowledge Management (KM) applications in CRM systems to improve the strategic efficiency of CRM through acquiring and sharing knowledge about customers. The importance of interface between KM and CRM systems in banks has been highlighted. They found out the criticality of this interface to understand and operationalise this interface in parallel contexts of systems, people and processes. The same author further suggests that customer data may be used as a platform for CRM systems for communicating, creating loyalty, customer service, trust cultivation and relationship maintenance in banks. The same may also act as a platform for KM processes in banks like knowledge creation, sharing, dissemination and exploitation.

Bose (2002) has outlined a CRM development plan based on the development life –cycle approach involving acquisition, analysis and use of knowledge about customers so as to sell more goods and services and to do it more efficiently. An integration of technologies, working together, such as data warehouse. Website internet/extranet, phone support systems, accounting, sales marketing and sales has been called for by the author. The analytic functions desired have been proposed to be fulfilled by separate systems such as decision support systems and expert systems.

A similar approach is suggested by Lee and Hong (2002) to create an organization-wide KM infrastructure in banks in the model, database, data warehouse, and digital library, data mining and online analytical process (OLAP) are suggested as being the tools to capture and develop knowledge. The model, however, is general to organizational KM rather than specific to customer knowledge creation. He proposes that data mining/analysis tools and a knowledgebase should be the function of a CRM system, but did not go further to illustrate how such a system can be developed.

Taylor and Hunter (2002) found that the European customer support and service markets like banks are still largely focused on call centers, particularly in the UK. Very few practitioners are making optimum use of their client database, because they are failing to update, quantify and qualify the information collated about the clients.

Harvey (2001) suggested that CRM systems fail to have the transformational impact in banks widely promised by the software industry and expected by the business community. Gartner's report by saying that 65 per cent of CRM implementations results in failure. Most CRM systems are used to

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

improve customer-facing operations. He argued in line with Harvey that 80 per cent of CRM implementations fail, and academics express skepticism about the viability of interpreting customer data in such a way that it generates useful insights into customer and user behavior.

Leffingwell and Karakostas, (2000) studied and found that CRM is more than another IS project, CRM is a complex process which is driven by the requirements (needs) of the organization and the customer. It is imperative that the development and implementation of CRM picks up on the requirements of both organization and customer, and that these are wedded into the software developed so that the business processes required happen and realize value for the organization and satisfaction for the customer.

Schroeck (2001) quoted that the most effective way to create an integrated CRM environment is by implementing a customer data warehouse Critical for successful CRM in banks is that data mining 'needs to have relevance to the underlying business processes' (Berson et. al., 1999). This suggests that data about a client's interaction with an organization does not only come from the sales and marketing area. Clients interact with various people and departments at various different levels. Client data does not simply appear. It has to be generated and collected from somewhere, the sales and marketing is only one source of data.

Day, (2000) observed that Client data in banks in a CRM system is used by all who come in contact with a customer, and mainly by the sales and marketing areas underlining 'an important facet of a market-related capability is sharing knowledge with all employees who come in contact with customer' CRM is basically the endpoint of understanding requirements and interaction with customers to provide the customer with a high level of service they need, want and demand.

STATEMENT OF THE PROBLEM

CRM is a management approach that enables organizations to identify, attract, and increase retention of profitable customers through improved relationship management. However, successful customer relationship management focuses on understanding the needs and desires of the customers and is achieved by placing these needs at the heart of the business by integrating them with the organization's strategy, people, technology and business processes. Many banks have used CRM tools to acquire more customers and to improve relationships with them. While, Banks are realizing that the magical formulae for attaining success in such a competitive environment is to focus on maintaining relationship with customers. Long-term customers are more likely to become a referral source and more comfortable with the service.

There are several loopholes in the existing tactical CRM strategies in the Indian banking sector. Some of the issues are as follows:

Issue 1: Challenges of attracting the new customers and retaining the existing ones.

Issue 2: Building and maintaining strong and lasting relationships with customers.

Issue 3: Understanding the needs & wants of customers.

The longer a relationship the better a bank can understand customer needs and it is a greater opportunity to retain with the service of the bank. However, in today's banking environment, it is becoming difficult to build and maintain strong and lasting relationships with customers. Therefore

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

customer perception feedback regarding the service level of private banks as well as public sector bank is essential in retaining existing customers and attracting potential ones.

OBJECTIVES OF STUDY

1. To evaluate the customer satisfaction index of Private Banks vs. Public Sector Banks.
2. To ascertain customer perception towards CRM practices in Private Banks & Public Sector Banks.
3. To comprehend CRM practices in Private Banks vs. Public Sector Banks.
4. To analyse the working styles, structures, economic objectives of various public banks in comparison to private banks.
5. To suggest a model for successful CRM implementation Private Banks & Public Sector Banks

RESEARCH DESIGN

TYPE OF RESEARCH

The study is descriptive in nature.

POPULATION

Employees & customers of various private & public banks in Bangalore.

SAMPLE SIZE

The sample for the study is limited to 111 respondents.

SAMPLING UNIT

For this study the respondents is the customers & employees working in banks.

TYPE OF SAMPLING

Simple random sampling method is used for the study.

TOOLS OF DATA COLLECTION

PRIMARY DATA

Primary data is collected using a structured questionnaire as well as personal interview method.

SECONDARY DATA

The secondary data for this work is obtained from company magazines and brochures, website, newspapers, internet, text books, reports and other promotional materials.

HYPOTHESES STATED FOR THE STUDY

HYPOTHESIS:

NULL HYPOTHESIS (H_0): Income level of customer and customer perception towards CRM practices are independent of each other.

ALTERNATIVE HYPOTHESIS (H_1): Income level of customer and customer perception towards CRM practices are dependent of each other.

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

DATA ANALYSIS AND INTERPRETATION

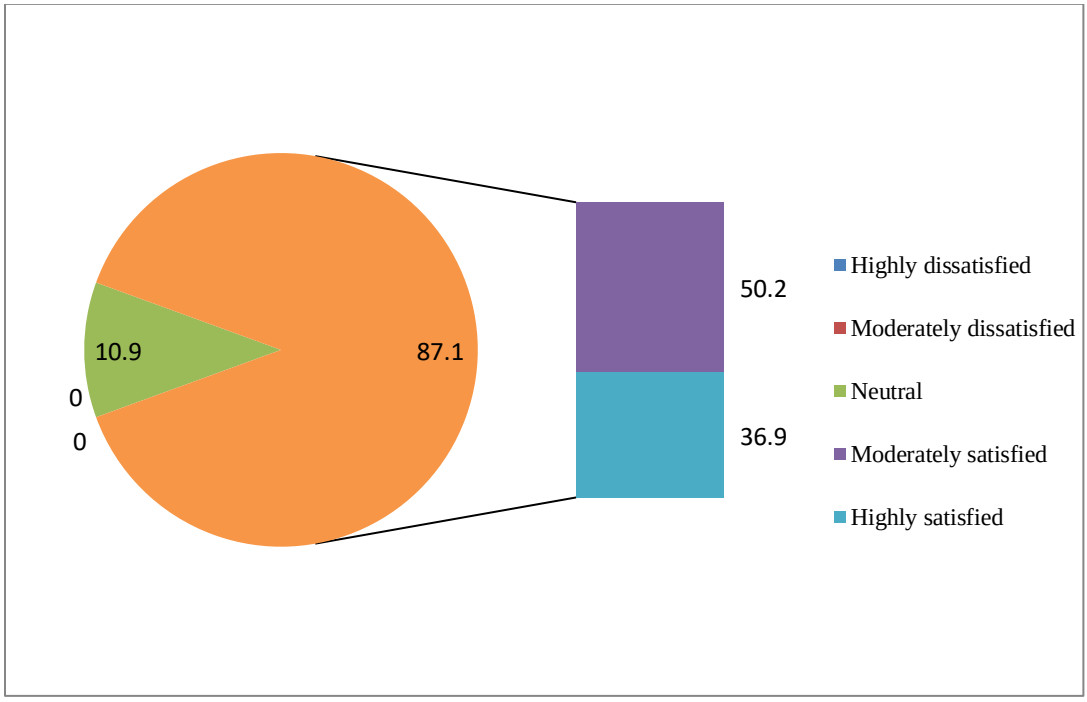
INTERACTIVE MANAGEMENT

TABLE NO: 4.1

	TYPE OF BANK		TYPE OF BANK	
	PUBLIC BANK		PRIVATE BANK	
1.Interactive Management	**Respondent**	**Percentage**	**Respondent**	**Percentage**
Highly dissatisfied	0	0	0	0
Moderately dissatisfied	0	0	0	0
Neutral	12	10.9	0	0
Moderately satisfied	58	50.2	49	44.1
Highly satisfied	41	36.9	62	55.9

PUBLIC BANK

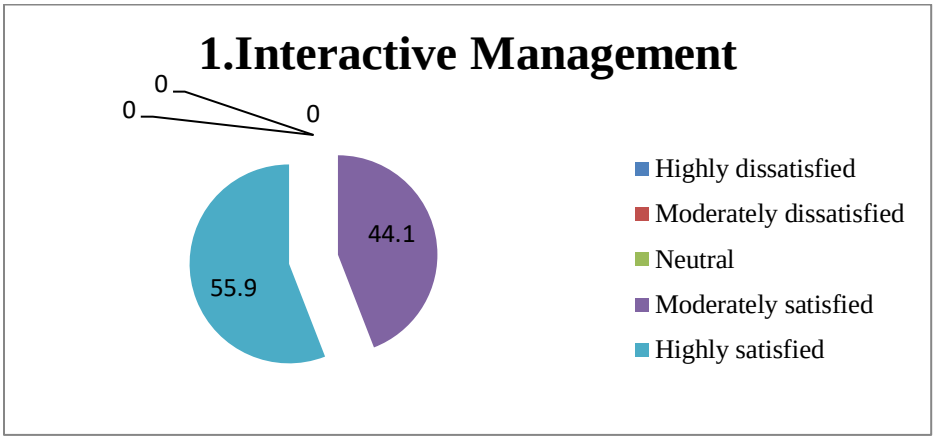
FIGURE 1.1:



AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

PRIVATE BAN

FIGURE 2.2



ANALYSIS

Response from various respondents indicates that Bank initiative with customer plays very important role. Comparing Public and Private Banks it is observed that in Public Bank only36.9% of respondents is very Highly Satisfied where as in case of Private Banks it is 55.9 %.

INTERPRETATION

From the above figures and table it can be observed that the interactive management is better in private banks than in public banks. It is due to the transparency and better CRM practices offered by the private banks.

NULL HYPOTHESIS (H0): Income level of customer and customer perception towards CRM practices are independent of each other.

ALTERNATIVE HYPOTHESIS (H1): Income level of customer and customer perception towards CRM practices are dependent of each other.

Chi-square tests to check whether the income level of customer and customer perception towards CRM practices are independent of each other. (SPSS Version 21)

CHI-SQUARE TESTS

	Value	**Df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	4.51	3	.211
Likelihood Ratio	4.564	3	.207
Linear-by-Linear Association	1.124	1	.289
N of Valid Cases	110		

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

DISCUSSIONS

From the above table it is found that the significance level of Chi-Square is 0.211.As it is more than 0.05, Null Hypothesis (H0): Income level of customer and customer perception towards CRM practices are independent of each other is accepted. It was found Income level of customer and customer perceptions towards CRM practices are independent of each other. We accept Null Hypothesis in this context and reject Alternative Hypothesis. Some of the factors influencing the people to select the banks are mentioned below:

1. People belong to rural area used to open an account in Public Sector Bank as they don't have Private Sector Banks in their vicinity.

2. People prefer to open account in a bank which gives high rate of return or interest, whether it's a Private or Public Sector Banks.

3. Location of the banks plays another important role in preferring the bank, people most likely to open an account in the bank whichever is nearby for them or near their home.

4. Number of branches also plays another important role in deciding the banks to open the account.

FINDINGS, SUGGESTIONS AND CONCLUSION

FINDINGS

INTERACTIVE MANAGEMENT

Response from various respondents indicates that Bank initiative with customer plays very important role. Comparing Public and Private Banks it is observed that in Public Bank only 37 % of respondents are very Highly Satisfied where as in case of Private Banks it is 55.6 %.Calculating and understanding the Chi Value that is 6.877 and p value 0.032 it shows that this factors is significant and need to be focused by Public Banks

EMPOWERMENT TO CUSTOMERS

Response from various respondents indicates that Empowerment to customers is still have a neutral response .Comparing Public and Private Banks it is observed that in Public Bank customer 54.3 % of respondents are neutral where as in case of Private Banks it is 28.9 %.Calculating and understanding the Chi Value that is 17.806 and p value 0.0 it shows that this factors is significant and need to be focused by both Public Banks and Private banks.

UNDERSTANDING CUSTOMER EXPECTATION

Response from various respondents indicates that customers from both banks are moderately dissatisfied. Comparing Public and Private Banks it is observed that in Public Bank 52.2 % of respondents are moderately dissatisfied where as in case of Private Banks it is 51.1%.Calculating and understanding the Chi Value that is 4.670 and p value 0.097 it shows that this factor is significant and need to be focused by both banks.

PRESENCE OF INTERNET FACILITY WITHOUT RISK

Response from various respondents indicates that though now both Public and Private sector Bank provide this facility but risk factors play still an important concern. Comparing Public and Private Banks it is observed that in Public Bank 56.5 % of respondents are neutral where as in case of

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

Private Banks it is 28.9 %.Calculating and understanding the Chi Value that is 14.888 and p value 0.002 it shows that this factor is significant and need to be focused. Above details shows that respondent from Private Banks feel higher risk while using internet facility from bank as compared to Public bank customers.

LOAN AND RELATED FACILITIES WITH CLEAR AND STANDARD TERMS AND CONDITIONS

Response from various respondents indicates that Bank initiative with customer plays very important role. Comparing Public and Private Banks it is observed that in Public Bank only 56.5 % of respondents are neutral where as in case of Private Banks it is 28.9 %.Calculating and understanding the Chi Value that is 14.666 and p value 0.032 it shows that this factor is significant and need to be focused by Private Banks. Though it is easy to get loan in Private Banks but still respondent feel those Public banks terms and conditions are clearer and they follow the same where as in case of Private Banks respondent feel that terms and conditions changes fast with subject to market conditions.

SUGGESTIONS

P-FACTORS IN IMPLEMENTATION

For implementing CRM, the company has to start with three P-factors namely people, processes, and planning. The P factors affect sales, productivity, service, and profitability. The well management of the banks and right mix of these factors will lead.

PEOPLE FACTOR

- Positive interaction among employees, customers, and vendors will create a successful enterprise.
- Contact with the customers and vendors will create a successful enterprise. Contact with the customers and vendors are essential in order to understand their likes and dislikes of a company's product and the way for further improvement of company's business.
- The next people factor is employees. If there are complaints from employees about the customers, vendors, other departments as well as complaints about employees from the side of customers, the gaps have to be bridged before starting a CRM initiative.
- The importance of people's change favourable towards the work and interaction with each other is a valuable contributor for the successful implementation with each other is a valuable contributor for the successful implementation of the CRM concept.
- Establishing a consistent process of reviewing and resolving the issues will create a good image on the company's management. The perception of employees, customers, on the bank also reflects on a positive mood.

PROCESS FACTOR

- The CRM success is also influenced by the process factor.
- Before introducing a new technology, the bank management needs to review their business and workflow processes.

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

- In reviewing the workflow, it is essential to look at the natural flow of orders, product and information. It is also important to note at the source of order namely internet, the mail or the call centre and continues through the shipment of product. This will facilitate to notice any bottlenecks, employee conflicts and inter departmental issues. Once these are mitigated, the next step is to document the procedures, policies and processes.

PLANNING FACTOR

- Planning is a particular kind of decision-making that addresses the specific future that managers desire for their organizations. A well-developed plan will give the managers to stretch boundaries and achieve organization goals.

Addressing the P factors will reflect on small gains initially and latter there will be tremendous growth in profitability. There will be a rise in profits, decline in cost, satisfactory customers and motivating employees.

Based on 20/80 rule, I propose to maintain the "Top" 1% of the customers, "Big" 4% of the big customers, "Medium" 15% of the customers and "Small" the rest of the 80% customers.

For business development and planning purpose, we should also include the customer groups:

INACTIVE - those used to be our customers but they have no longer had any business with Fund Services in the past 1 year;

PROSPECT - potential customers who have contacted us and expressed the interest to use our service(s).

SUSPECT - those who have never contacted us but we think they may need our services. In essence, we should come up with a pyramid similar to below:

- **CUSTOMER TARGETING**

After we segmented our customer base, we can now focus our resources to provide new or improved services to the preferred segment(s), say the upper 20% of the customers. The next question now becomes: what these customers value as the improved services?

- **CUSTOMER VALUE IMPROVEMENT STRATEGIES**

A) IDENTIFY CUSTOMER VALUE

- Find out what these customers value most;
- Deliver such value to satisfy them (or exceed their expectations);
- Nurture the existing relationship;
- Keep them as our loyal customers all the time.

To find out what are the services valued most by the targeted 20% of the customers; we need to conduct face-to-case interview sessions with the customers individually to solicit their direct feedback. Having said so, I recommend that a standard questionnaire to be designed to facilitate the interview sessions. By doing so, we allow the flexibility to obtain any unsolicited input from customers yet we can also set the scope of the interview so that we can have a common and meaningful base to further our investigations.

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

B) DECIDE AND DEVELOP VALUE IMPROVEMENT INITIATIVES

After we find out the customer expectation and value gap, we have to plan the detailed actions to bridge the gaps.

C) IMPLEMENT IMPROVEMENT INITIATIVES

After we work out the improvement initiatives, we have to form task force(s) to implement them.

- **ON-GOING CUSTOMER VALUE IMPROVEMENT**

On an on-going basis, we need to review the existing operation to actively identify opportunities to deliver further customer value. The areas to be reviewed are suggested below.

❖ **ANALYZE CUSTOMER TOUCH POINTS**

As customers form the perception about what we are through the contacts we made during the business encounter. We therefore have to review the customer touch points regularly to identify critical moments for service improvements.

❖ **PERFORM CUSTOMER-BASED ACCOUNTING**

Customer profitability is an important dimension to reflect how important a customer is. Due to the diversified product line nature of Fund Services, it is sometimes difficult for the management to tell how profitable a customer is in total. I therefore suggest Fund Services to develop its customer-based accounting on profitability and/or AUM for each of its customers in order to manage the customer relationship appropriately. It is recommended such to be updated and reviewed regularly say, quarterly.

❖ **EVALUATE CUSTOMER LIFETIME VALUE**

As mentioned, the cost to acquire new customers is very high and that Fund Services has to invest on customer retention programs to keep customer loyal. Thus, it is suggested Fund Services start to collect the marketing cost data together with the historical profit data for its customers so as to arrive at the expected

- **THE TOTAL AND COMPREHENSIVE APPROACH TO IMPLEMENT THE INITIATIVE**

In order to improve the rate of success, the Bank needs to take a systematic and comprehensive approach to implement this Initiative.

- Operations and
- Information Technology

CONCLUSION

In an attempt to be more profitable, the banks have become competitive and more customer – oriented. This new orientation has compelled them to take a more pragmatic approach for conducting the business. The CRM is one such tool which helps in meeting the customer's expectations according to their changing needs.

While analyzing the CRM Implementation in both the sectors, it was found that the Private Sector

Banks have been able to implement the CRM practices more effectively when compared to their Public Sector counterparts. This indicates that strategically speaking, the Private Sector Banks have been more innovative in understanding their customers and in building good relations with them.

A micro analysis reveals that the Public Sector Banks have highest scores in terms of reliability and assurance whereas the Private Sector Banks have lower in terms of tangibility, reliability and assurance. This indicates that the banks are in a dire need to make proper strategies to improve their working. This will make the banks more efficient in serving the customers and in maintaining the long term relations with them.

The analysis of the results received suggests that the banks (whether Public or Private) are equally affected by the kind of CRM initiatives they undertake. The banks are now under tremendous pressure to retain the older customers because of the competition in the Banking Sector. This would not only ensure better customer relations but also loyalty among them, which is very critical and important in today's competitive world.

REFERENCES

1. Anand, S (2008), Customer Relationship Management in Indian Banks, Journal of Professional Banker, Dec. 2008 pp 66-70

2. Alis, O.F., Karakurt, E., & Melli, P., 2000, Data Mining for Database Marketing at Bank,Proceeding of the International Seminar "Data Mining 2000", WIT Publications.

3. A.P Malhotra: - " Electronic Banking " IBA Bulletin sp.issue (1999-2000) PP 16-19

4. Beckett-Camarata, E.J., Camarata, M.R., Barker, R.T., 1998, Integrating Internal and External Customer Relationships Through Relationship Management: A Strategic Response to a Changing Global Environment, Journal of Business Research, 41, pg71-81.

5. Bholanath Dutta, CRM in Financial Services Marketing, Journal of Marketing Mastermind, Sept 2008.

6. Beckett-Camarata, E.J., Camarata, M.R., Barker, R.T., 1998, Integrating Internal and Berry, M.J.A. & Linoff G.S., 2000, Mastering Data Mining: The Art and Science of Customer Relationship Management, John Wiley & Sons, Inc.

7. Berry, M.J.A. & Linoff G.S., 2000, Mastering Data Mining: The Art and Science of Customer Relationship Management, John Wiley & Sons, Inc.pg 100-112

8. Berry (1995), Sheth and Parvatiyar (1995) journal on web.

9. Cabena, P., Choi H.H., Kim I.S., Otsuka S., Reinschmidt J. & Saarenvirta G.,1999,Intelligent Miner for Data Applications Guide, IBM Redbooks, pg 240-260

10. Cook, W.D., & Hababou, M., 2001, Sales Performance Measurement in Bank Branches, Omega, 29, 299 –307.

11. Couldwell, C., 1998, A Data Day Battle, Computing, 64–66.

12. Ryals, L., & Knox, S., 2001, Cross-Functional Issues in the Implementation of Relationship Marketing Through Customer Relationship Management, Management Journal, Vol. 19, No. 5, pp. 534–542.

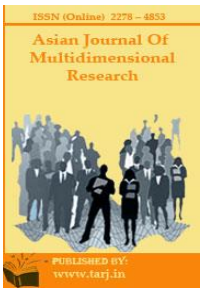
13. R.Mehana: -E –Banking –P38-43.

14. Sarangapani, A (2008), Customer Relationship Management in Banking Sector, Journal of Professional Banker May 2008 pp 39-47.

15. Sheth JN (2001), Conceptual Framework of Customer Relationship in Customer Relationship Management – Emerging Concepts, Tools and Applications, Tata.

A Publication of TRANS Asian Research Journals

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853



Published by: TRANS Asian Research Journals
AJMR:
Asian Journal of Multidimensional Research
(A Double Blind Refereed & Reviewed International Journal)

A STUDY OF ABILITY GROUPING AT PRIMARY LEVEL CASE OF A PRIVATE SCHOOL

Shuchita Mahajan*

ABSTRACT

The study investigated the effects of ability grouping at primary level in a private school. Ability grouping is the practice of placing students of similar academic ability level within the same group for instruction. The researcher tried to find out which approach of grouping would work best for the students at primary level-mixed ability approach or ability grouping. It was a descriptive research both quantitative and qualitative in nature. The sample consisted of 57 students of low ability group, 55 students of high ability group and 7 teachers teaching both these groups. The data was collected by using academic records of students, developing rating scales and conducting informal interviews with the teachers. The findings revealed that after grouping there was no significant improvement in the academic performance of both the groups but there was a vast disparity in classroom behavior and hence mixed ability grouping was better suited at primary level.

KEYWORDS: *ability grouping, mixed grouping.*

INTRODUCTION

Teachers often group students in different ways to cope with the diversity within the classroom. There are majorly two ways in which students can be grouped for an effective teaching learning process, either by forming ability groups or mixed ability groups where ability refers to the individual's potential to perform. Generally in schools it is seen as the competence to do well in school worksheets/tests i.e. the academic performance.

Ability grouping is the practice of placing students of similar academic ability level within the same group for instruction Groups are typically small, consisting of fewer students. Kulik (1992) defined ability grouping as "the separation of same-grade school children into groups or classes that differ markedly in school aptitude" External and/or internal test scores and school records [and teacher assessments/ recommendations] are used to make judgments about the composition of the various groups.

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

Ability grouping is also known as "homogeneous grouping". The theory behind the use of homogeneous grouping is to increase student achievement by reducing the differences in student ability levels; thus, addressing the individual needs of students by placing them with peers who have similar needs. Teachers are able to better direct lessons toward the specific ability level of the students in each class and can work at a pace commensurate with their ability. Teachers will analyze individual student errors and develop specific strategies to correct those errors Furthermore, higher-achieving students can benefit from an increased pace while lower-achieving students do not find themselves competing with more able peers. Thus it boosts their self-confidence, encourages their participation level and determination. The key distinction was noted as following the same curriculum and making adjustments to the ability groups as needed.

Mixed ability grouping refers to grouping together students of different abilities in the same classroom. The term mixed ability grouping is also known as "heterogeneous grouping". Heterogeneous groups stem from the education precept that a positive interdependence can arise from students with varied learning levels working together and helping each other to reach an instructional goal.

The purpose of mixed ability grouping is for children to benefit by their intellectual and social interaction with other students of their group that have different social behavior and ability to learn. Students work together by sharing resources and encouraging other's efforts to achieve and complete tasks (Johnson &Johnson, 2006).The role of high ability students as role models for other students is very crucial. Pupils could help, inspire and motivate each other. By creating a learning environment that encourages cooperation within the group, such as cooperative learning, teachers can create an optimal situation for all. Slavin (1986) revealed that cooperative learning promotes higher achievement, higher-order levels of thinking, communication skills, improved motivation, positive self- esteem, social awareness, and tolerance for individual differences.

REVIEW OF RELATED LITERATURE

The researchers have studied the academic, the psychological and the socialization effects of grouping children on the basis of their abilities.

The literature review had revealed that there were mainly two schools of thought on the subject of ability grouping. One school of thought postulated that ability grouping is an organizational strategy that increases learning opportunities for both high ability and low ability learners (Bowles & Gintis, 1982; Abadzi, 1994; Kelly, 1990; Good & Brophy, 1991). According to this school, placing slow learners in a separate group from fast learners allows teachers to adjust their teaching to the learning pace and learning styles of each group.

A contrasting view is held by the school of thought who maintains that ability grouping places low ability learners at a disadvantage, and encourages social stratification among learners of different abilities (Oakes, 1982; Makunde, 1986; Marjoribanks, 1986; Meijnen, 1991; Carpenter & Darmody, 1989). The low ability children seem to benefit from learning in mixed ability classes, whereas high ability children do not appear to suffer.

There are mixed reactions regarding which form of classroom organization is best suited to the interest of students with different abilities.

RESEARCH CONTEXT

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

The study is conducted in a private school in Delhi. The school was earlier following mixed ability approach. However, since the current academic session, ability grouping practice had been introduced. Students belonging to the same grade were grouped into two different sections based on their academic performance of the previous classes. Thus the method of grouping reflected the principles of ability grouping. All the low ability (La) learners were placed in 'A' section and the high ability (Ha) learners were placed in 'B' section. Thus A section comprises of presumably less able students "weak" students, as opposed to B section which consists of comparatively high ability students or "bright" students.

The study comprised of 1st 2nd and 3rd class students. The teacher student ratio is 1:20. Same set of teachers teach both the higher and lower ability groups. The intentions and objectives of the school for introducing ability grouping in classrooms was to raise the standards of academic achievement in low achievers by providing more individual attention, reinforcement of concepts, targeting pace and content of instructions according to the needs of students with similar skill levels. To further improve the academic performance of high achievers by increasing the pace, raising the level of instruction, providing opportunity to perform challenging and advanced tasks. To support the above purpose teachers were required to modify their pedagogy to suit different needs of La and Ha group.

RESEARCH OBJECTIVES

1) To compare the academic performance of students in both groups before and after introduction of ability grouping.
2) To identify and compare the overall behaviour of students in high ability and low ability groups.
3) To determine whether grouping students according to their abilities had any discernible effect on pupil's attainment (academically and behaviour wise) or was mixed ability approach a better option at the primary level.

RESEARCH STRATEGY

The present research is a case study of a private school. It is a descriptive research both quantitative and qualitative in nature.

The study was conducted at two levels

1) Examining and comparing previous year and current year academic records of students of both groups for all 3 classes (across the years).
2) Identifying and comparing the overall behaviour of learners in both groups for all 3 classes based on the observations of their subject teachers and class teachers (across the sections).

SAMPLE

The sample consisted of students of 1st 2nd and 3rd standard having 2 sections each i.e. La group and Ha group. There were a total of 57 students in La group and total of 55 students in Ha group. There were total of seven teachers who were teaching the sample students.

TOOLS

1. The academic records of students were used to compare their academic performance before ability grouping and after ability grouping.

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

STATISTICAL ANALYSIS

- Means and standard deviation were computed separately for the two groups for previous year and the current year.
- The t-tests were conducted to test the significance of difference between means of last year and in the current year for each group.

2. Self developed rating scales were prepared and informal interviews were conducted with the teachers.

The statements on which students had to be rated were based on various categories which were observed inside and outside the classroom that are classroom conduct, discipline, attention in the class, work assigned, notebook evaluation, seriousness towards homework, overall attitude towards studies, participation, group influence. These parameters were decided by the researcher after a lot of observations and study of general behaviour displayed by children of this age. The teacher's responses for each statement were converted into scores. The scores for all the statements included in a category were added, and then the total scores were compared for both the groups. The higher the score the better was the group's behaviour and similarly the lower the scores, lower was the performance.

ANALYSIS AND INTERPRETATION

COMPARISON OF ACADEMIC PERFORMANCES

The current academic performance of students in both the groups was compared with their last year's academic performance.

CLASS 1

LA GROUP

	Last year	Current year
Mean	82.10526	79.78947
Std dev	21.67665	22.66563

t value = 0.75

HA GROUP

	Last year	Current year
Mean	125.1176	124.5294
Std dev	7.201409	7.151203

t value =0.8

CLASS 2

LA GROUP

	Last year	Current year
Mean	109.6	112.8

HA GROUP

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

Std dev	21.1	22

t value =0.65
t value =0.6

	Last year	Current year
Mean	154.5	156.3
Std dev	10.4	9

CLASS 3

LA GROUP
HA GROUP

	Last year	Current year
Mean	114.2	112.6
Std dev	13	10.1

	Last year	Current year
Mean	154.8	155.4
Std dev	7.6	6.2

t value =0.67 t value=0.8

On comparing the academic performances, it can be observed that there has not been any significant improvement in the academic scores of both the groups before and after ability grouping.

The La learners of class 1 and class 3 have shown a down fall in their scores after the grouping, this indicates that students were better off in mixed groups last year; however class 2 La group students have shown some improvement in their scores after grouping.

The Ha learners of class 2 and class 3 have shown only slight improvement in their academic scores, whereas the Ha learners of class 1 have shown a slight decrease in their scores after being grouped.

The scores of both groups after ability grouping are more or less similar to the scores the students attained when in mixed groups.

COMPARISON OF OVERALL BEHAVIOUR

The analysis of the qualitative data revealed that after being grouped into different sections based on their abilities, there was a vast difference in the classroom behaviour of La students and Ha students.

The level of disparity between the La learners and Ha learners with respect to overall behaviour was greater in 1st and 3rd standard and less in 2nd standard.

As per the feedback given by the teachers on rating scale and in informal interviews it was noted that the La learners lacked discipline, proper classroom conduct and were inattentive in the class which

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

affected teaching learning process. Whereas Ha learners displayed an appropriate classroom conduct and remained attentive in class.

Similarly in terms of neatness, efficiency in work and attitude towards studies, Ha learners scored quite high as compared with La learners. Lack of seriousness and sincerity towards work and casual attitude towards work were seen by the teachers in La classrooms.

On the categories of participation and group influence, teachers believed that Ha group was more enthusiastic and motivated to take initiative, responsibility and to participate in inter class activities and the La group had to be coaxed and encouraged to take interest in class activities. There was lack of motivation and enthusiasm to participate, exchange ideas in La classrooms. The main reason according to teachers was the absence of mixed groups. They believed that Ha students could have acted as role models for La students had they been grouped together and could motivate and encourage participations and discussions in classrooms.

FINDINGS OF THE STUDY

The evidence shows that the negative aspects of ability grouping outweighed it's so professed positive aspects in the particular case study. The findings of this research pointed to the fact that neither the Ha group nor the La group benefited from ability grouping in terms of improvement in the academic performance as was intended by the school. Actually the finding revealed that ability grouping disadvantaged La learners as far as classroom behaviour and learning environment in La classrooms was concerned.

The responses revealed that after grouping the La group was characterized by a greater number of interruptions, more off-task behaviour, and a greater amount of time spent by the teacher managing student behaviour and attention. More time was required to promote proper student behaviour over the development of critical thinking and independent learning.

However Ha group across classes were settled and disciplined, "effective teaching" was possible. The instruction of Ha learners was characterized by teacher spending more time in group discussions, encouraging children to participate in activities and making them do more advanced worksheets. Teachers reported spending less time addressing disciplinary issues in Ha classrooms than in La classrooms.

The above analysis of overall behaviour of students in both groups across classes shows that being in a particular ability group led to an identifiable pattern of behaviour. Teachers attributed these disciplinary problems to the practice of ability grouping. There was a consensus among teachers that such behavioural problems were not witnessed last year in mixed groups and it was quite easy to manage the discipline issues in mixed groups. It was easy for the teachers to encourage good and appropriate behaviour among students as both La and Ha learners studied together. They believed that Ha students could have acted as role models for La students, had they been grouped together and could motivate and encourage participations and discussions in classrooms.

School should engage in some serious reflection on this practice and should follow mixed ability approach in classrooms as was followed last year especially within the context of primary level students.

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

EDUCATIONAL IMPLICATIONS

1. Mixed ability approach at primary level should be preferred as mixed grouping provides more flexibility and interaction among the students. At the primary stage it is difficult and incorrect to divide students based on their abilities. Every student should get the chance to participate in a rich curriculum and challenging courses. Children learn what they live. If they are segregated by ability and skill for most of the day, an hour's lesson on respecting diversity is not likely to have a major impact.

Various techniques can be used such as

- **COOPERATIVE LEARNING**

Students work in groups to complete tasks collectively toward academic goals and learning cooperatively capitalize on one another's resources and skills, working together and helping each other to learn. Students can engage in activities such as ''orally rehearsing material, explaining material to others, discovering solutions, and debating and discussing content and procedural issues'' (Lou et al., 1996, p. 425)

- **PEER TUTORING**

Teachers can arrange for students to help one another and become educational resources and sources of support. Children of same age and mental levels can help one another in knowledge construction, sharing of ideas and experiences.

2. Even if school intends to practise ability grouping, it is maximally effective when done for only one or two subjects, with students remaining in heterogeneous classes most of the day.

If ability grouping is followed following considerations should be kept in mind.

- Grouping should be used in tandem with other provisions: curriculum modification, alternative choice of materials, pedagogical techniques of teachers should reflect sensitivity and understanding of the individual needs for this group.
- Teachers must vary the level and pace of instruction according to student's levels of readiness and learning rates. Grouping plan should allow for frequent reassessment of students placement and for easy reassignment to another group based on student progress. A very careful monitoring, close team work and co-operative planning among teachers is required.
- The basis of ability should be more exhaustive taking into consideration- creativity, interests, aptitudes and attitudes of students
- More activity based teaching learning method should be practiced, as children benefit from interactive methods
- To enhance teaching competence of the low ability as well as high ability group, short duration in service training, should be arranged for the teachers. Teachers should be sensitised to the individual needs of low ability students.

Peer influence plays an important role especially at the primary level. Vygotsky stated that learning awakens in children a variety of internal developmental processes that can operate only when they interact with more competent people in their environment and in cooperation with their peers

(Vygotsky, 1978). Vygotsky theorized that when children scaffold each other, they modify a task and offer assistance to each other to help complete the task.

Children cognitively and socially excel from their peer interactions as well as the importance of peer collaboration in the lives of young children. When children of mixed knowledge levels interact in collaboration, they are able to communicate on a level that they are able to understand and share with each other. As the children listen to and respond to each other's ideas and contributions to the interaction, they are able to reinforce their understandings, thereby extending their cognitive abilities.

REFERENCES

Adodo S.O& Agbayewa J.O (2011). Effect of homogenous and heterogeneous ability grouping class teaching on student's interest, attitude and achievement in integrated science. Retrieved fromhttp://www.academicjournals.org/ijpc/PDF/Pdf2011/March/Adodo%20 and%20Agbayewa.pdf dated on 27 October 2012.

Allan, Susan. (1991). Ability Grouping Research Reviews: What Do They Say about Grouping and the Gifted? Retrieved from http://personalweb.donet.com/~eprice/sdallan.htm dated on 24 November 2012.

Best & Kahn. (1989). *Research in Education* (Sixth ed.). New Jersey: Prentice Hall.

Bharti. (1998). Ability grouping: a study of its psychological effects. Unpublished, M.Ed Dissertation. Department of education, Delhi University.

Chisaka, B.C. (2003). Some Effects of Ability Grouping In Harare Secondary Schools: A Case Study. Retrieved from http://www.ajol.info/index.php/saje/article/view/24930 dated on 11 October 2012.

Colamarino, Gina. (2012). The impact of ability grouping on the academic growth of at –risk students. Retrieved from http://gradworks.umi.com/33/36/3336656.html dated on 22 October 2012

Gamoran, Adam. (2002).Standards, inequality and ability grouping in schools. Retrieved from http://www.ces.ed.ac.uk/PDF%20Files/Brief025.pdf dated on 17 October 2012.

Gillham, Bill. (2005). Case study research methods.British Library Cataloguing-in-publishing data.

Hopkin, Gary. (2006). Is Ability Grouping the Way to Go -Or Should It Go Away? Retrieved from http://www.educationworld.com/a_admin/admin/admin009.shtml dated on 22 January 2013.

Patton, Michael.(1980). Qualitative evaluation and research methods. Newbury Park: Sage Publications.

Slavin, R. E. (1990). Achievement effects of ability grouping in secondary schools: a best evidence synthesis. Retrieved

fromhttp://www.jstor.org/discover/10.2307/1170761?uid=3738256&uid=2129&uid=2&uid=70&uid=4&sid=21102333928707 dated on 19 January 2013.

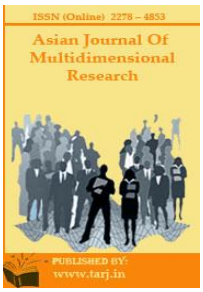
Whitburn.J. (2001). Effective classroom organization in primary schools: mathematics. Retrieved from

http://www.ingentaconnect.com/content/routledg/core/2001/00000027/00000003/art00006 dated on 24 October 2012.

Whitburn.J. (2001). Classroom organisation in primary mathematics teaching: the challenges of diversity. Retrieved fromhttp://www.nfer.ac.uk/nfer/PRE_PDF_Files/03_29_05.pdf dated on 21 November 2012.

A Publication of TRANS Asian Research Journals

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853



Published by: TRANS Asian Research Journals
AJMR:
Asian Journal of Multidimensional Research
(A Double Blind Refereed & Reviewed International Journal)

IMPACT OF AGRICULTURAL & ALLIED PRODUCTS ON GDP AND PRODUCTIVITY IN INDIA - AN ANALYSIS

Mr. R. Shankar*; Dr. E. Nixon Amirtharaj**

*Assistant Professor,
Dr. SNS Rajalakshmi College of Arts and Science,
Coimbatore.
**Assistant Professor,
Hindusthan College of Arts and Science,
Chennai, India.

ABSTRACT

India, country which is based on agriculture and its allied products for its Gross Domestic product. Agriculture plays a vital role in Indian economy. However, it is based on productivity or yield, which is depends on credit facility given by the government. This study is mainly concentrated on the growth and composition of Agricultural credit, Agricultural GDP and Agricultural Productivity in India. The result shows the positive growth along with the significant impact by agricultural GDP on Total GDP and Agricultural Credit on Agricultural productivity in India.

KEYWORDS: *Agricultural Credit, Agricultural GDP, Agricultural Productivity And Total GDP.*

INTRODUCTION

India is basically an agricultural country and agricultural development is important because it provides economic sustenance and builds up a strong industrial base. Rural finance is a matter of credit concern in a developing economy like India where 70 percent of the population depends upon agriculture. The demand for agricultural credit arises due to i) Lack of simultaneity between the realization of income and act of expenditure; ii) Lumpiness of investment in fixed capital formation; and iii) Stochastic surges in capital needs and saving that accompany technological innovations. Credit, as one of the critical non-land inputs, has two-dimensions from the viewpoint of its contribution to the augmentation of agricultural growth viz., availability of credit (the quantum) and the distribution in agriculture credit. India has adopted three pronged strategy for developing

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

agriculture credit, over the years, viz (i) Promoting of institutional structure, (ii) Directing lending, and (iii) Concessional or subsidies credit. Increasing commercialization and globalization also require expanded and improved infrastructure.

The evolution of institutional credit to agriculture could be broadly classified into four distinct phases - 1904-1969 (predominance of co-operatives and setting up of RBI), 1969-1975 [nationalization of commercial banks and setting up of Regional Rural Banks (RRBs)], 1975 1990 (setting up of NABARD) and from 1991 onwards (financial sector reforms). With the increase in agricultural productivity, a significant increase in the Gross Domestic Product of Agricultural and its allied products is inevitable. The growth rate has imposed a major improvement in the total GDP of the nation.

PROBLEM FOCUSSED

The National Agricultural Policy not only envisages faster agricultural growth at 4 per cent a year, but also its equitable spread across regions and classes of farmers. At the same time, some important provisions of the WTO agreements have the potential of increasing India's share in world trade of agricultural commodities. All these translate into higher credit demand and acceleration in its growth, as well as cost-effective mechanisms for its delivery. The genesis of institutional involvement in the sphere of agricultural credit could be traced back to the enactment of the Cooperative Societies Act in 1904. The establishment of the RBI in 1935 reinforced the process of institutional development for agricultural credit.

The RBI is perhaps the first central bank in the world to have taken interest in the matters related to agriculture and agricultural credit, and it continues to do so. Over the years, rural credit system has been suffering from a number of bottlenecks. Since the days of Rural Credit Survey Committee (1954), India has come to a long way in its search for an appropriate rural banking set- up. Since then one committee after another has examined this problem. The proper rural agricultural financing has its concerned impact on its productivity. The production level and yield has been consistently affected by the major issue, i.e., finance. With the regular provision of finance, the production as well as GDP of agriculture will be increased. Thus, this study has been made to identify the consequence of agricultural credit on agricultural yield in India.

SAMPLE OF EARLIER STUDIES

- A.Ranga Reddy (2004)[1], studied that the National Commission on Agriculture (1976) projected that the actual requirements of credit for agriculture would be Rs.9, 400 crore by 1985. But, the Planning Commission target for 1984-85 was Rs. 5415 crores, while actual disbursement of credit was Rs. 6167 crores in 1985-85. Although Planning Commission's target figure for 1984-85 was surpassed by the actual disbursement, the National Commission's projected figure was not achieved.
- Balakrishnama Naidu et,al (2013)[2], made a study to identify the impact of agricultural credit towards agricultural area, production and yield in India. They found rather than credit, there are other factors namely rainfall, irrigation facility and seeds quality too will influence agricultural productivity. They further suggested that, the timely credit may boos the level of yield.

- Prof Ratan Lal et,al (2014)[3], made an empirical study on agricultural credit in India with both primary and secondary data. Their study recommends that The co-operative credit structure needs revamping to improve the efficiency of the credit delivery system in rural areas. Merging and revamping of RRBs that are predominantly located in tribal/backward regions is seen as a potentially significant institutional arrangement for financing the hitherto unreached population.

OBJECTIVES

The objectives of the study are

- To analyse the growth of Agricultural and Allied Products in India.
- To identify the impact of Agriculture and Allied Products on GDP in India.
- To examine the consequence of Agricultural credit on Agricultural productivity in India.

HYPOTHESES OF THE STUDY

H_{01}: GDP of Agriculture and Allied Products has no positive Trend with Total GDP in India.

H_{02}: Agriculture and Allied Products has no impact on Gross Domestic Product in India.

H_{03}: Agricultural Credit has No impact on Agricultural Productivity in India.

RESEARCH METHODOLOGY

SOURCES OF DATA

The study is based on secondary data and the reliable data for the study has been compiled from the Statistical Handbook of Indian Economy 2013 of Reserve Bank of India , All India Rural Credit Survey Report and various databases of Central and State Government of India.

PERIOD OF STUDY

The study period is 10 years from 2003-2004 to 2012-2013.

TOOLS USED

The collected data have been used for analysis with the help of statistical tools namely Annual Growth Rate, Cubic Trend Equation and Regression.

LIMITATIONS OF THE STUDY

The major limitations of the study are;

- The study is made only in consideration with India and not applicable to any part of the globe.
- The study fully depends on the secondary data, which has its own limitations.

ANALYSIS

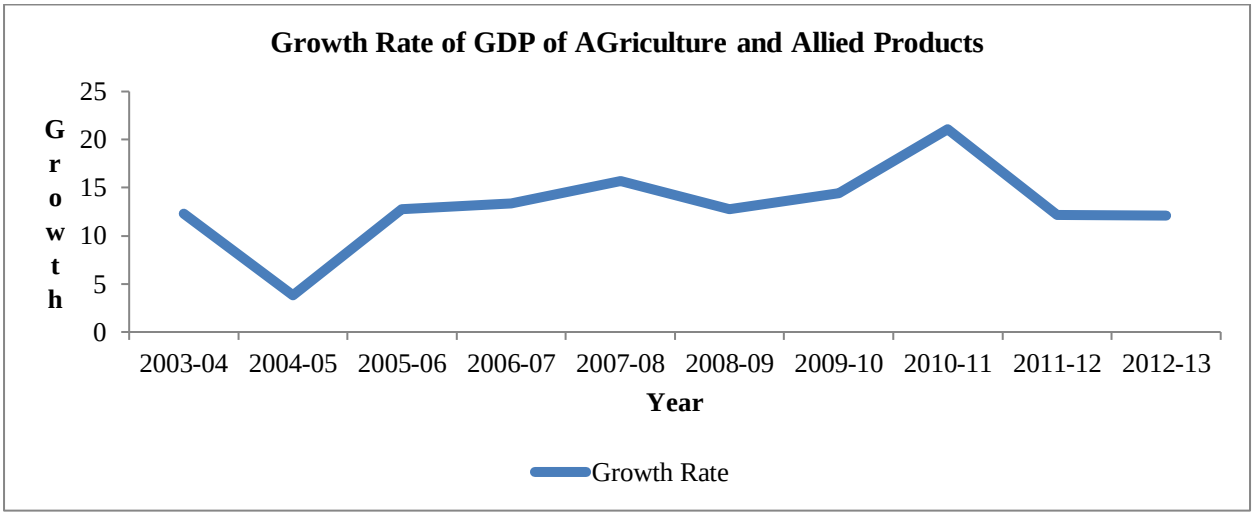
TABLE -1 GROWTH OF AGRICULTURAL AND ALLIED PRODUCTS GDP IN INDIA DURING 2003-2004 TO 2012-2013
(INR Crores)

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

Year	Total GDP (at current prices)	GDP of Agri and Allied Products (at current prices)	% Share	Growth Rate
2003-04	2622216	544667	20.77	12.28
2004-05	2971464	565426	19.03	3.81
2005-06	3390503	637772	18.81	12.79
2006-07	3953276	722984	18.29	13.36
2007-08	4582086	836518	18.26	15.70
2008-09	5303567	943204	17.78	12.75
2009-10	6108903	1079365	17.67	14.44
2010-11	7266966	1306942	17.98	21.08
2011-12	8353495	1465753	17.55	12.15
2012-13	9461979	1643145	17.37	12.10

Source : Collected and Compiled from Statistical Handbook of RBI 2013

EXHIBIT - 1



Source : Collected and Compiled from Statistical Handbook of RBI 2013

The table 1 and Exhibit 1 represents the Growth Rate of Agricultural GDP along with the Total GDP of India and Per cent contribution provided by Agricultural and Allied products to Total GDP of India during 2003-2004 to 2012-2013. The initial fall down and a constant flow and final reach after a sudden increase in growth rate shows the fluctuational flow during the study period.

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

CUBIC TREND EQUATION ANALYSIS

H_{01}: GDP of Agriculture and Allied Products has no positive Trend with Total GDP in India

TABLE - 2CUBIC TREND EQUATION ANALYSIS OF GDP OF AGRICULTURE AND ALLIED PRODUCTS DURING 2003-2004 TO 2012-2013

MODEL SUMMARY AND PARAMETER ESTIMATES

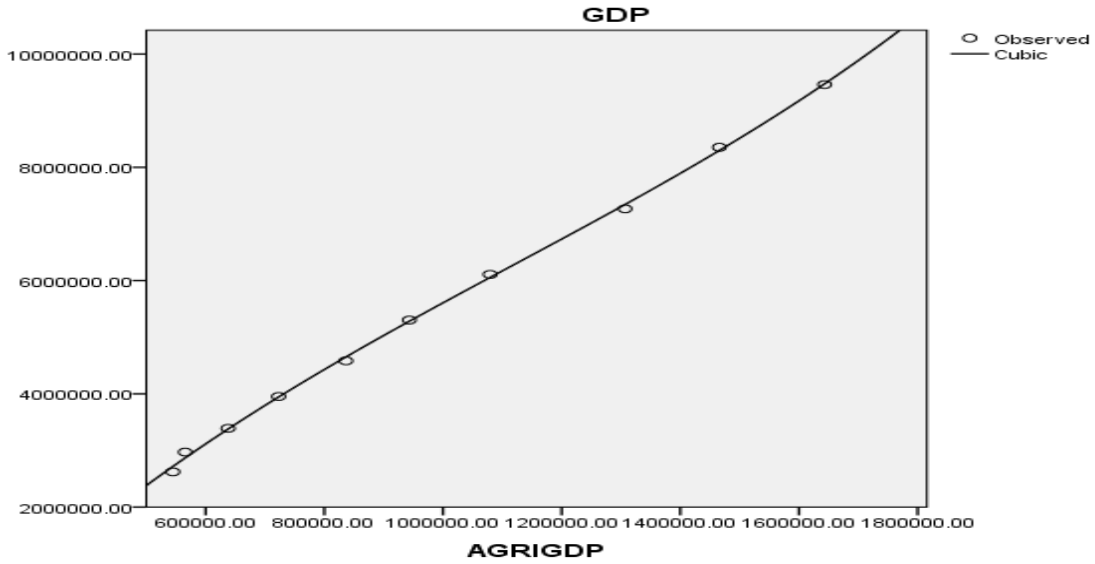
Equation	Model Summary					Parameter Estimates			
	R Square	F	df1	df2	Sig.	Constant	b1	b2	b3
Cubic	.999	2659.869	3	6	.000	2498430.681	12.303	-5.978	1.780

Independent variable : AGRIGDP.

Dependent Variable: GDP

$$Y_{GDP} = 2498430.681 + 12.303t - 5.978t^2 + 1.780t^3$$

EXHIBIT – 2CUBIC TREND GRAPH OF GDP OF AGRICULTURE AND ALLIED PRODUCTS DURING 2003-2004 TO 2013-2014



The table 2 and Exhibit 2 indicate the Cubic Trend Equation analysis of GDP of Agricultural and Allied Products during the study period 2003-2004 to 2013-2014. The p value along with the equation derived is significant at 5 per cent level and hence the null hypothesis is rejected and confirmed that there is a positive trend of GDP of Agriculture and Allied Products with Total GDP in India.

REGRESSION ANALYSIS

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853

H_{02}: Agriculture and Allied Products has no impact on Gross Domestic Product in India

TABLE - 3REGRESSION ANALYSIS OF GDP AND AGRICULTURE AND ALLIED PRODUCTS DURING 2003-2004 TO 2012-2013

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F	P value	Sig / Non-Sig
1	.999[a]	.998	.998	97286.89	5236.1	.000	Significant

Predictors: (Constant), AGRIGDP

Table – 3 intimates the Regression Analysis of Agriculture and Allied Products and GDP of India during 2003-2004 to 2013-2014. The R^2 value of 0.998 shows the significant contribution imposed by Agriculture and Allied Products to GDP of India. The F value (5236.1), which is higher than the table value with the p value (0.000), is significant at 5 per cent level. Hence, the null hypothesis is rejected and there is significant consequence imposed by Agriculture and Allied Products on GDP in India.

H_{03}: Agricultural Credit has No impact on Agricultural Productivity in India

TABLE – 4 REGRESSION ANALYSIS OF AGRICULTURAL CREDIT AND AGRICULTURE PRODUCTION DURING 2003-2004 TO 2012-2013

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F	P value	Sig / Non-Sig
1	.678[a]	.734	.788	79878.89	654.8	.000	Significant

Predictors: (Constant), AGRICRT

Table – 4 intimates the Regression Analysis of Agricultural Credit and Agriculture Productivity of India during 2003-2004 to 2013-2014. The R^2 value of 0.734 shows the significant contribution imposed by Agriculture and Allied Products to GDP of India. The F value (654.8), which is higher than the table value with the p value (0.000), is significant at 5 per cent level. Hence, the null hypothesis is rejected and there is significant consequence imposed by Agricultural Credit on Agricultural Production in India.

SUGGESTIONS

The suggestions based on findings are;

- The Agricultural Productivity should be increased to maximise the contribution of Agriculture to GDP in India, which is the backbone of the nation for a very long time.
- The rural credit provisions can further be increased by Co-Operatives and Regional Rural Banks with modified interest rates to mitigate the burden of beneficiaries.
- Timely and simplified credit distribution to needy will boost productivity.

CONCLUSION

It is revealed by the result that there is a significant consequence imposed by Agriculture on GDP and Agricultural Credit on Agricultural Productivity. It is climate or other macro and micro economic determinants influence the agricultural productivity apart from credit. But finance stands at the top to serve for the welfare of the productivity. It is also revealed by the many surveys that the credit being distributed is misused and hence, it is impossible to clearly identify the impact of credit on productivity in India. However, timely availability of credit is inherent in agricultural productivity.

REFERENCE

1. A. Ranga Reddy (2004), Rural Banking and overdues management, Mittal publication; New Delhi, P. 74-75

2. Balakrishnama Naidu et,al (2013), Impact of Agricultural Credit on Agricultural Production and Productivity, Asia-Pacific Journal of Social –Sciences, ISSN 0975-5942, Vol-V, Jan-June 2013, PP.173-179.

3. Prof Ratan Lal et,al (2014), Agriculture Credit in India: An Analytical Study, International Journal of Latest Trends in Engineering and Technology (IJLTET), ISSN: 2278-621X, Vol. 3 Issue 3 January 2014, pp. 326 – 335.

4. J.B. Sharma and B. Prasad(1971), " An assessment of production credit needs in developing agriculture economies, 26(4), 1971. P. 503- 511.

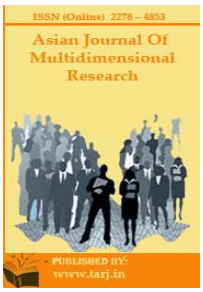
5. Naryanan(1987), "Problems of agriculture loans", Kurukshetra, 35(7): 17-18.

6. Statistical Handbook of Indian Economy 2013.

7. All India Rural Credit Survey Report.

A Publication of TRANS Asian Research Journals

AJMR
Asian Journal of Multidimensional Research
Vol. 4 Issue 7, July 2015, ISSN 2278-4853



Published by: TRANS Asian Research Journals
AJMR:
Asian Journal of Multidimensional Research
(A Double Blind Refereed & Reviewed International Journal)

SOCIO-ECONOMIC VARIABLES HELPING IN TETANUS 1 AND TETANUS 2 DURING PREGNANCY: A STUDY OF EXCLUSION OF MUSLIM WOMEN IN ALIGARH

Madhatullah Khan Sherwani*; Krishna Agrawal**

*Working with J N Medical College & Hospital,
AMU Aligarh, (U.P.), INDIA
Email id: madhatullah@gmail.com &

**Associate Professor,
Deptt. Of Sociology, Shri Varshney College,
Aligarh (UP), INDIA

ABSTRACT

This paper examines social exclusion among Muslim women focusing on Tetanus 1 and Tetanus 2 during pregnancy in terms of access to the basic health care. Various dimensions have been examined in the study such as: socio-economic variable among Muslim women. Health based social exclusion is a process of deprivation of an individual or community from health care system due to variety of reasons including inadequate infrastructure, non-access, lack of awareness or even non-acceptability and socio-economic condition of the family.

Data was collected from 300 respondents selected through random sampling from 19 wards of Aligarh city. Muslim women had less access to health care centres during pregnancy at the time of Tetanus 1 and Tetanus 2 vaccination. Lack of awareness and socio-economic barriers were the main hurdle. Special programmes are necessary for the inclusion of the excluded group to move up from the vicious circle of exclusion.

KEYWORDS: *Social Exclusion, Health, Socio-Economic Variables, Tetanus 1 and 2.*

INTRODUCTION

Social exclusion has been defined as a process through which individuals or groups are wholly or partially excluded from full participation in the society in which they live on the basis of gender, caste, region or religion. It is a multidimensional process expressed in multiple spheres of life, not just in economy or politics. Earlier focus was only on education as an important component of human capital. Lately, improvement in health constitute an important element of what has come to

be known as 'pro-poor' economic growth strategies that have the potential of enhancing economic growth (MHFW, 2005).

Health is an important aspect in every individual's life. Without health we cannot imagine a happy life. The concept of health based social exclusion can be defined as a process in which individual or communities are wholly or partially excluded from health care system due to inadequate infrastructure, non-accessibility, lack of awareness and non-acceptability in a systematic way from the society in which they live (Ghana, 2007). Health inequalities refers to the differences in health experience and health outcomes between different population groups according to socio-economic status, geographical area, age, disability, gender or ethnic group. People who experience one or more of material disadvantage, lower educational attainment and/or insecure employment are likely to experience worse health than the rest of the population (NHSS, 2003).
Health based social exclusion is a dimension of social exclusion especially in the case of Mother-child health. Mother-Child health narrates the story of the health conditions of the family (Williams, 1976). Child is the future and mother is the protector of the future. Excluded class is unable to access health care like other dimensions of social exclusion. There may be many ways of health based social exclusion viz. Infrastructure, access, awareness, and acceptability. Infrastructure: This is a important indicator of health based social exclusion. This indicator puts questions on the government for the availability of health care centers in that particular area. Access: This indicator depends on the individual or group's accessibility to the available health infrastructure. It shows the limit of individuals or groups to access the health care system. Awareness: This indicator has relation with the literacy of the individual or groups and mode of imparting information about health awareness by the government for particular individuals and groups. Acceptability: This is another important aspect of health based social exclusion. It has relation with tradition, culture, religion, individual will etc. These may be the main cause for not accepting the available form of health care system. The level of significant moves around these four factors and show the relevance to the tetanus during the pregnancy.

Ill health of the people increases poverty in two ways. (1) It reduces production wholly or partially of the sick. Therefore, it has direct influence on earning. In other words, ill health has inverse relationship with earning. Unhealthy people cannot participate fully in earning. It means that it reduces earning of the household as well as country. (2) There is an adverse impact of ill health on the saving of the people. People are forced to spend their savings on poor health or borrow money on high interest or sale their assets (MHFW, 2005).

Religion-related exclusion broadly covers two forms of exclusions. First, the exclusion of people from the domain of religious liberty and equality. Second, the exclusion of people from the wider, nonreligious domain of liberty and equality (citizenship rights). It can be called a religion based exclusion and it occurs when a person’s religion or religious identity is seen to be sufficient ground for excluding him/her from the legal, economic and political benefits/rights available more generally (Bhargava, 2004).

Muslims are identified as a vulnerable group in India by Sachar Committee Report. It is clear that while the average levels of consumption are positively associated with the size of towns for all SRCs, the condition of Muslims in relative terms is the worst in smaller towns with <50,000 and 50,000 to <2 lakh population size. In fact, the mean per capita expenditures for Muslims is slightly

lower than that of SCs/STs in the smaller towns across India. In urban areas, the largest proportion of Muslims falls in the range of Rs.400-Rs.500, and about half of them are in the range of Rs.300 to Rs.600. Less than 20% of urban Muslims have a spending capacity equivalent to or higher than the national average of Rs.1050. While the condition of SCs/STs and OBCs is somewhat better, the status of General category Hindus is substantially better as more than 50 % have capacity to spend above the national average (SCR, 2005). Social exclusion in terms of poverty of Muslims in urban areas is higher than rural areas because Muslims are more prone to live in urban areas.

The castes system among Indian muslims are as *Ashraf-Ajlaf* divide. Scholarly writings on caste among Indian Muslims generally note the division that is often made between the so-called 'noble' castes or *ashraf* and those labeled as inferior, or *razil, kamin* or *ajlaf*. The *ashraf-ajlaf* division is not the invention of modern social scientists, for it is repeatedly mentioned in medieval works of *ashraf* scholars themselves. To these writers, Muslims of Arab, Central Asian, Iranian and Afghan extraction were superior in social status than local converts. This owed not just to racial differences, with local converts generally being dark-skinned and the *ashraf* lighter complexioned, but also to the fact that the *ashraf* belonged to the dominant political elites, while the bulk of the *ajlaf* remained associated with ancestral professions as artisans and peasants which were looked down upon as inferior and demeaning (Sikand) & (Nayar, K.R. 2007).

TABLE 1: MATERNAL CARE INDICATORS BY STATE PERCENTAGE OF LIVE BIRTHS DURING THE FOUR YEARS PRECEDING THE SURVEY IN INDIA, 1992-93

State	Percentage receiving antenatal care	Percentage receiving two doses of tetanus toxoid vaccine1	Percentage receiving iron / folic tablets
India	62.3	53.3	50.5
U P	44.7	37.4	29.5
Kerala	97.3	89.89	91.2

(Source: IIPSB, 1995: 242-243).

Above table 1 shows that the percentage of live births for which mothers received antenatal care is 62.3% in India. Kerala is the ideal with 97.3% in the country while Uttar Pradesh is at the bottom with 44.7% which is lower than national percentage. In tetanus toxoid vaccine Uttar Pradesh stands with 37.4% that indicates poor coverage and Kerala shows high coverage with 89.89%. Coverage of Kerala is more than double than that of Uttar Pradesh. Uttar Pradesh is also below national level 53.3%. The percentage of live births for which mothers received Iron folic acid is 29.5% in Uttar Pradesh which is more than three times lesser than Kerala i.e. 91.2%. National level is 50.5% for taking iron folic acid tablets that is also higher than Uttar Pradesh.

TABLE 2: INTERIM HUMAN DEVELOPMENT INDEX: 2000-01

District	Human Development Index		Percentage of Safe Delivery	Index	Percentage of Children with Complete Immunization	Index	Health Index
	Rank	Value					
Aligarh	25	0.556	40.3	0.403	43.1	0.431	0.417

(Retrived in 2010 http://planning.up.nic.in/apd/HDR-ENGLISH.pdf)

In table -2 human development index 2000-01 of Aligarh shows little bit improvement in the ranking from 30th in 1991 to 25th in 2000-01. Human development index value is still low 0.556. Only 40.3% pregnant women get safe delivery. Still large part of the pregnant women did not get safe delivery i.e.59.7%. Percentage of children with complete immunization is 43.1% means 56.9% children are still unable to get complete immunization.

Area of the Study and collection of data-

The factors, focused in the study are: 1. Father's Education, 2. Mother's Education, 3. Income, 4. Sex, 5. Castes, 6. Occupation, 7. Size of the family, 8. Type of family, 9. Number of children, 10. Poverty, 11. Migration, 12. House Ownership, 13. Housing Condition, 14. Mother's age at the time of marriage, 15. Mother's age at the time of delivery, 16. Drinking water, 17. Separate Kitchen, 18. Sanitation. The study illustrates relation of aforementioned factors with access to Health care system in Aligarh that has been explained by the following indicators of Mother-Child health among Muslims. 1- Tetanus 1, 2- Tetanus 2.

The mother and her Child have been considered as a single unit of the study. The Data have been collected using schedule from every twentieth Muslim household having mother and her child less than one year of age. Using stratified random sampling technique a sample of 300 respondents has been taken from the wards having Muslim population. Out of that 123 respondents were *Ashrafs* viz. 1. Skeikh, 2. Syed, 3. Mugal, and 4. Pathan and 177 were *Ajlafs* viz. 1. Thakur, 2. Bhisti, 3. Teli, 4. Fakir, 5. Saifi, 6. Julaha, 7. Mehwati, 8. Madari, 9. Rangraz, 10. Machwara, 11. Qureshi, 12. Nai, 13. Dhobi, 14. Tiagi, 15. Merasi, 16. Manihar, 17. Kumhar, 18. Kaungra, 19. Jhoja, 20. Barhai, and 21. Bhatyara. 200 respondents were from Muslim dominating wards and 100 respondents were taken from non-Muslim dominating ward.

Tools and Techniques-

Logistic (binary) regression has been used. It is a statistical analysis most frequently used for models. Collected data have been tabulated in Excel and for statistical computation SPSS (version 14) has been used. In running the logit we get a value of Wald and significance. Value of significance is compared with alpha (.05). If the value of significance is greater than alpha, then there exists no a significant relationship, otherwise there is significant relationship between the variables under study (STDG: 2007).

Analysis of Primary Data-

Hypothesis 1: There is no significant relation between Tetanus 1 and Caste , Father's Education, Mother's Education, Father's Occupation, Marital Status, Below Poverty Line, Mother's Income, Mother's age at the time of delivery < 21 year, Mother's age at the time of Marriage < 18 year, Type of Toilet , Type of Migration, Pucca House, House Ownership, Separate Kitchen, Running Water, Type of Family, and Share Sanitation.

Table 3, column 6 shows the level of significance. This value has to be compared with the critical value which is **0.05 (alpha)**. If the value of significance is greater than alpha, then there exists no significant relation, otherwise there is significant relation between the variables under study. Beta indicates both positive and negative relation between variables. High value of Wald reveals the strong and low value reveals weak relation between variables. There is significant positive relation of Caste, Mother's Education, and Pucca House due to accessibility, better housing conditions and

awareness. On the contrary, Below Poverty Line has negative relation due to non-accessibility with Tetanus 1. Therefore, the null hypothesis is rejected. Remaining variables i.e.: Father's Education, Father's Occupation, Marital Status, Mother's Income, Mother's age at the time of delivery < 21 year, Mother's age at the time of Marriage < 18 year, Type of Toilet, Type of Migration, District Migration, State Migration, House Ownership, Separate Kitchen, Running Water, Type of Family, and Share Sanitation have insignificant relationship with Tetanus 1. Poor people have low or no access to Tetanus 1, therefore, it has an inverse relation.

TABLE-3: TETANUS-1 AND SOCIO-ECONOMIC VARIABLES

Variables	B	S.E.	Wald	Df	Sig.	Exp(B)
Caste	**1.019**	**.414**	**6.064**	**1**	**.014**	**2.770**
Father's Education	.303	.213	2.022	1	.155	1.354
Mother's Education	**.524**	**.259**	**4.074**	**1**	**.044**	**1.688**
Father's Occupation	-.334	.226	2.188	1	.139	.716
Marital Status	.030	.398	.006	1	.940	1.030
Below Poverty Line	**-1.124**	**.318**	**12.486**	**1**	**.000**	**.325**
Mother's Income	-.429	.514	.696	1	.404	.651
Mother's age at the time of delivery < 21 year	.395	.447	.779	1	.377	1.484
Mother's age at the time of Marriage < 18 year	-.491	.333	2.176	1	.140	.612
Type of Toilet	.352	.219	2.598	1	.107	1.422
Type of Migration	-.135	.197	.472	1	.492	.874
District Migration	.500	.563	.789	1	.374	1.649
State Migration	-.188	.906	.043	1	.836	.829
Pucca House	**.680**	**.346**	**3.863**	**1**	**.049**	**1.973**
House Ownership	.380	.410	.857	1	.354	1.462
Separate Kitchen	-.380	.368	1.067	1	.302	.684
Running Water	-.559	.335	2.782	1	.095	.572
Type of Family	-.506	.441	1.318	1	.251	.603
Share Sanitation	-.153	.354	.187	1	.665	.858
Constant	1.250	1.825	.469	1	.493	3.491

Above table can be described as follows:

Caste: The positive relationship between Tetanus 1 and caste has been found in the study. may be described as follows. It may be explained that *Ashraf* women has better access to the health care system and visit the health centre for Tetanus 1 vaccine in the early period of pregnancy owing to better education or income or both in comparison to *Ajlaf* women . Therefore, it may be argued that higher the caste, higher the Tetanus 1 vaccination taken by mother. This variable shows a higher value of Wald. **Mother's education**: Educated mothers go to hospital during the early period of pregnancy. Therefore, education of mothers and Tetanus 1 vaccination move together in the same direction. **Pucca house**: Housing condition is the indicator of a good income and education. Thus they have better access to the health care system. It means that the good condition of the house is an indicator of the high level of Tetanus 1 vaccination taken.

On the other hand, Tetanus 1 has a negative relationship with **below poverty line**. Below poverty line has a high value of Wald. Beta indicates inverse relationship between Tetanus 1 and below poverty line. Poor households have limited options. Therefore, they do not go to the health centre for Tetanus 1 during pregnancy. In other words, households living below the poverty line do not take tetanus 1 vaccination.

Hypothesis 2: There is no significant relation between Tetanus 2 and Caste, Father's Education, Mother's Education, Father's Occupation, Marital Status, Below Poverty Line, Mother's Income, Mother's age at the time of delivery < 21 year, Mother's age at the time of Marriage < 18 year, Type of Toilet, Type of Migration, District Migration, State Migration, Pucca House, House Ownership, Separate Kitchen, Running Water, Type of Family, and Share Sanitation.

Table- 4 shows that Mother's Education and Pucca House have positive significant relations due to education and better housing conditions with Tetanus-1 vaccine. Therefore, null hypothesis is rejected.

Second dose can be taken by pregnant women only in two conditions after Tetanus-1. One: at the time of first pregnancy. Two: if the gap between last pregnancy and current pregnancy is more than 36 months. Both the variables are positively significant with Tetanus-2 vaccine.

TABLE-4: TETANUS-2 AND SOCIO-ECONOMIC VARIABLES

Variables	B	S.E.	Wald	Df	Sig.	Exp(B)
Caste	.254	.564	.202	1	.653	1.289
Father's Education	-.143	.339	.177	1	.674	.867
Mother's Education	**.867**	**.353**	**6.033**	**1**	**.014**	**2.379**
Father's Occupation	-.198	.336	.347	1	.556	.821
Marital Status	1.749	2.641	.439	1	.508	5.751
Below Poverty Line	-.575	.497	1.335	1	.248	.563
Mother's Income	2.143	5.036	.181	1	.670	8.528
Mother's age at the time of delivery < 21 year	.478	.615	.605	1	.437	1.613
Mother's age at the time of Marriage < 18 year	-.711	.542	1.718	1	.190	.491
Type of Toilet	.170	.311	.299	1	.585	1.185
Type of Migration	.133	.313	.180	1	.672	1.142
District Migration	.482	.842	.328	1	.567	1.620
State Migration	-2.375	1.701	1.951	1	.162	.093
Pucca House	**1.167**	**.577**	**4.097**	**1**	**.043**	**3.213**
House Ownership	-.312	.708	.193	1	.660	.732
Separate Kitchen	-.187	.562	.110	1	.740	.830
Running Water	-.897	.521	2.968	1	.085	.408
Type of Family	-1.100	.734	2.243	1	.134	.333
Share Sanitation	.575	.634	.823	1	.364	1.778
Constant	-5.065	10.603	.228	1	.633	.006

Above table can be described as follows:

Mother's Education: Education plays an important role to take Tetanus-2 vaccine.Table-5 shows that there is a strong relationship between the second dose of Tetanus vaccine and **mother's**

Education owing to awareness about vaccination. It indicates that a mother's education is necessary to take a second dose of Tetanus.

Pucca House: Those households whose housing condition is better also happen to come from better income groups. The possibility of these households taking tetanus-2 vaccination is higher than those who are from inferior housing conditions.

Therefore, four socio-economic indicators i.e., caste, mother's education, pucca house and below poverty line are significant with tetanus-1, out of which only two socio-economic indicators i.e., mother's education and pucca house are significant with tetanus-2. These two socio-economic indicators are found most important to avail the vaccination facilities available to the households.

CONCLUSION-

In India, caste is the unique feature to identify the deprived section in the society. In the current scenario religion is increasingly being recognized as another important basis to identify socially excluded class particularly the Muslims. The view has been strongly advocated by the several government reports viz. Sachar Committee report and Ranganathan Misra Report. India has a big bag of poverty. Poor health plays an important role in increasing the bag of poverty. Poor people do not have access to the health care system due to limited options of earning. They spend a substantial amount of time on their subsistence. Therefore, they do not get money and time to go to health care centers. Identification of vulnerable groups is vital for all round development. As per data available in the Sachar Committee Report. the condition of Muslims are vulnerable in India. In some indicators Muslims are poorer than STs in general but in particular some cases are in danger or at the edge of extreme. Identification of these cases and immediate action is required for the social safety net.

Tetanus-1 is significant with caste, mother's education, pucca house & below poverty line, on the contrary, Tetanus-2 is significant with mother's education & pucca house. In both the cases, mother's education and pucca house are commonly significant variables that affect both tetanus doses. Therefore, awareness and standard of living of the households are an important variable to continue the access to healthcare services. On the other hand, caste and below poverty line affect only the first dose of Tetanus. It means that caste and standard of living which is slightly above the below poverty line help households to start looking for healthcare services around them.

Limitations of the Study-

There is some limitations of the study as it is mainly based on the primary data. Collection of data of Mother-Child of whole Muslim community of Aligarh city is difficult. Due to limited resources data has been collected from every twentieth household. So collected data may not be representative of Mother-Child health of whole Muslim community of Aligarh city. There may be a chance of difference in the actual situation and recorded data. But utmost care has been taken to make the data closest to real representation of the Mother-Child of whole Muslim community.

In the collection of data cross questioning has been used to get right answers to the questions. In spite of that it is possible that the household representative might have manipulated the answers of the questions to hide the actual situation of the family and Mother-Child health condition.

Health and poverty have strong inverse relationships with each other. An increase in investment in health can reduce poverty from the world. Government should take some inclusive steps to reduce

poverty in India, and include health as a prime weapon against poverty. Special assistance programme is required to reduce the health based exclusion of Muslim women through counseling of families, treatment of the patient and facilitating the whole family.

REFERENCES-

- Bhargava, Rajeev. 2004. "*Inclusion and exclusion in South Asia: The Role of Religion*",?: UNDP.
- Ghana. 2007. "*From Exclusion to an Inclusive Society*", Nairobi: HDRO, (http://hdr.undp.org/en/media/country_presentation_ghana.ppt#261, 2, what is Social Exclusion).
- IIPSB (Indian Institution of Public Service Bombay). 1995. "*National Family Health Survey 1992-93,*" Bombay: IIPSB.
- MHHDC (Mahbub-ul Haq Human development Center). 2005. *Human Development in South Asia 2004: The health challenge.* Karachi: OUP,
- MHFW. (2005). Report of the National Commission on Macroeconomics and Health. New Delhi: Government of India.
- Nayar, K.R. 2007. "*Social exclusion, caste & health: a review based on the social determinants framework"*, Indian J Med Res 126, pp 355-363 (http://www.icmr.nic.in/ijmr/2007/october/1012.pdf).
- NHSS (National Healthy School Standard). 2003. "*Reducing Health Inequalities and Promoting Social Inclusion*", ?: Govt. of UK.
- SCR. (2006). Social, Economic and Educational Status of the Muslim Community of India. New Delhi: Government of India.
- STDG (Science & Technology Dictionaries & Glossaries). 2007. "*Common Concepts in Statistics*", ?: Babylon Translation Software (http://dictionary.babylon.com/Logistic_(binary)_regression).
- Sikand, Yoginder Singh. "*Caste in Indian Muslim Society*", New Delhi: Centre for Studies of Indian Muslims (http://stateless.freehosting.net/Caste%20in%20Indian%20Muslim%20Society.htm).
- UNDP (United Nation Development Programme). 2005. "*Human Development Report 2004 Cultural liberty in today's diverse world*", ?: UNDP, (http://hdr.undp.org/en/media/hdr04_complete.pdf).
- UNICEF. 2009. "*Unit for Children*", ?:? (http://www.unicef.org/health/).
- WHO (World Health Organization). 2006. "*The World Health Report: 2005: Make every Mother and Child Count*", Geneva: World Health Organization.

- Williams, Cicely D. and Derrick B. Jelliffe. 1976. "*Mother and Child Health Delivering the Services*". London: Oxford University Press. UNDP (United Nations Development Programme). 2004. "*HUMAN DEVELOPMENT REPORT 2004 Cultural liberty in today's diverse world*", ?: ? (http://hdr.undp.org/en/media/hdr04_complete.pdf).

Editorial Board

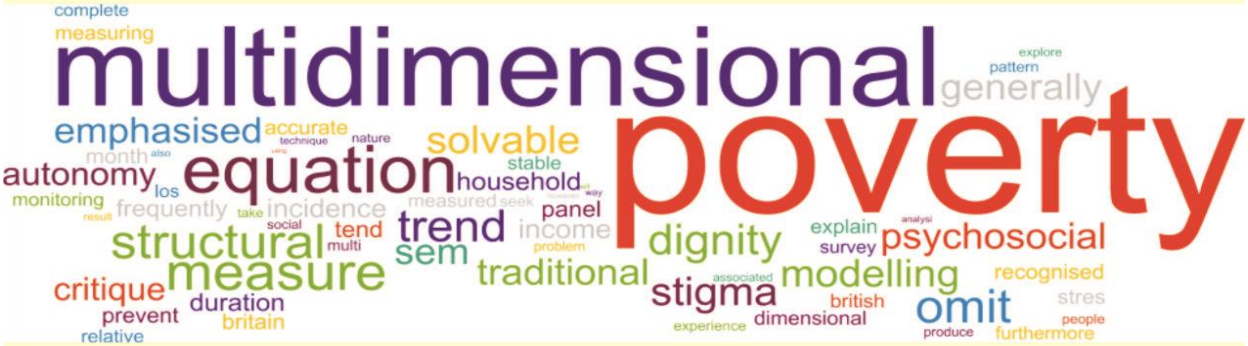
Review Process

Each research paper/article submitted to the journal is subject to the following reviewing process:

1. Each research paper/article will be initially evaluated by the editor to check the quality of the research article for the journal. The editor may make use of ithenticate/Viper software to examine the originality of research articles received.
2. The articles passed through screening at this level will be forwarded to two referees for blind peer review.
3. At this stage, two referees will carefully review the research article, each of whom will make a recommendation to publish the article in its present form/modify/reject.
4. The review process may take one/two months.
5. In case of acceptance of the article, journal reserves the right of making amendments in the final draft of the research paper to suit the journal's standard and requirement.

Categories

- Business Management
- Social Science and Humanities
- Education
- Information Technology
- Scientific Fields



Published by

Trans Asian Research Journals

SCO 34, Ist Floor, HUDA Market,
Near Red Cross, Jagadhri - 135 003 (Haryana) INDIA
Website : www.tarj.in

Our other publications :
Trans Asian Journal of Marketing & Management Research (TAJMMR)
ISSN (online) : 2279-0667