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HOUSEHOLD MEMBERS' MIGRATION AND RICE PRODUCTIVITY

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ABSTRACT

Food security in Nepal can be assured by increasing rice production. However, the rate of out-migration has significantly impacted the fluctuations of rice production. Migration has both positive and negative impacts on the agricultural sector of Nepal. This retrospective study analyzed the impact of household members' migration on rice productivity in the Chitwan Valley of Nepal. The multivariate line a regression analysis was used to predict the outcome of independent predictors on the dependent variable. The results showed that migration had a significant contribution to rice productivity ($b=0.050$, $p<0.05$). Similarly, the size of the family, land ownership and use of technology such as irrigation, chemical fertilizers, and thresher/harvester positively contributed to the rice productivity ($p<0.05$). Above all, the study depicts that migration had a positive impact on rice productivity which can be further improved by empowering female household members in decision-making in regards to rice productivity, timely availability of seed, and proper use of technologies.

KEYWORDS: *Migration, Rice Production, Agriculture, Technologies.*

INTRODUCTION

Sustainable Development Goal (SDG) 2 i.e. "end hunger, achieve food security and improved nutrition, and promote sustainable agriculture" can be achieved through agricultural transformation (UN, 2015). Nepal, a landlocked country in South Asia is challenged to meet this goal due to declining per capita arable land, limited use and access to advanced technologies as well as other resources (Choudhary et al., 2022).

Rice is the major staple cereal in Nepal with a demand of 4.08 million tons annually (TEPC, 2020). However, the rice yield in Nepal is low in South Asia. In the last decade, rice production was the lowest during 2006/07 and 2009/10 due to early drought and late monsoon rain which late increased during 2013/14 (Poudel, 2021). In 2018, about 5.6 million tons rice was produced annually. Since, the production was not sufficient to meet the demand of the population, Nepal imported 0.75 million tons of milled rice in 2019 (MOALD, 2020). Rice production is carried out on nearly 1.50 million ha in Nepal (MoALD, 2019). According to (Gairhe et al., 2021), the import of rice has increased from 24.48 to 38.11 percent per annum. Agriculture production systems based on rice are widely carried out in the Terai region of Nepal (Subedi et al., 2020). However, due to in-adequate knowledge on the use of resources, the lack of modern technology use have resulted in low yield. Despite the sufficient area for rice productivity, Nepal is unable to meet the demand of the population. The major cause behind this is due to lack of labor resulting from youth out-migration, followed by constraints of credit, subsistence-oriented farming, and insurance (Maharjan, 2013). When the rate of migration is high, only the children and elderly are left out in villages. Young, energetic, and physically capable adults migrate to earn foreign currency (Singh et al., 2015).

Migration is an important livelihood strategy for low- and middle-income countries such as Nepal (Kunwar,2021). There are several studies depicting the impact of migration on agricultural production. Nepal is an agricultural country and farming is the traditional occupation of Nepalese. However, in the present context, both out-migration and emigration have heightened for better education, employment opportunities, transportation, communication, and easy life (Rigg et al., 2016).

Remittances account for a significant share of overall household income (K. Sapkota, 2017). In the neighboring country India, the remittance-receiving household was found using advanced technologies such as improved varieties of rice and transplanting techniques (Singh et al., 2012). In another study, remittances were commonly used for foods and goods while less used for agricultural purposes (Jaquet et al.,2016). Similar findings were observed in a study conducted in Nepal where a large proportion of remittance was used for consumption purposes while only 5% was used for agriculture purposes (Khanal et al., 2015). Since rice is a major staple food crop, those not having access to rice are considered as not having proper food despite the availability of other food options (Gartaula et al., 2012). Out-migration has resulted in labor shortages, with amajor effect on food security and food sovereignty contributing to a vicious cycle with a greater impact on the agriculture sector (Brown, 2020). Evidence of the effect of migration on agriculture productivity in Nepal exists. However, there is scarce information on the impact of migration specifically on rice productivity. Thus, this paper provides insights into the impact of household members' migration on rice productivity.

METHODOLOGY

The main purpose of this study was to assess the consequences of previous out-migration (migration of 10 years from 2006 to 2015) for recent agricultural activities in the past 2015. The study was carried out in western Chitwan valley. A baseline survey of 3372 households were carried out before the data collection of this study (DFID Agriculture survey, 2015) which was narrowed to 2214 households in the Department for International Development (DFID) Agriculture survey that was completed in 5 seasons of data collection. Out of the DFID agricultural survey, 1462 (66.6%) rice-producing households of two seasons were selected for this study.

The predictor's values were primarily derived from retrospective data of migration from 2006 to 2015 to reduce the potential for endogeneity with agricultural activities in 2015. So, all control variables used in 6 models were from 2015. The six forms of migration such as number of migrants during last 10 years, total months of migration during last 10 years, number of international male migrants, international female migrants, domestic male migrants and domestic female migrants were used for predicting productivity in the last 12 months in 2015. With using the large number of control variables that account for many household characteristics, un-instrumental measures of migration were also included as predictors to interpret the cause nature of the effect as in the study by (Gray, 2009). The analysis for this study was done through SPSS version 26 in which descriptive statistics such as frequency, mean, and standard deviation were used to analyze the socio-demographic characteristics of the households. Similarly, multivariate linear regression analysis was used to predict the outcome of independent predictors on the dependent variable.

So, this study implemented household and community level data from multiple surveys collected by Chitwan Valley Family Study (CVFS). Various surveys used were household registry (refreshed in every 6 months), Agriculture and Remittance calendar, 2015 (Baseline survey of 10 years) and DFID Agriculture Survey, 2015 (the major source of my survey data). The only one outcome variable productivity of rice was calculated on the basis of conversion of given area kattha into hectare and production kg into ton. The productivity calculated was further improved by power transformation as IDF Normal i.e. Inverse distribution function normal to make the distribution normal. In case of major explanatory variables number of migrants, total months of migration, no. of international male and female migrants and domestic male and female migrants were taken from Agriculture and Remittance Calendar, 2015 (Base line survey of 10 years). These variables were transformed into recode and square root forms so as to increase normal distribution of data. All the number of migrants which were constructed by counting the number of household members living away home during period of ten years. Similarly, total month of migration was obtained counting total months of absentees for each household members during the same period of time. Demographic measures such as male per hectare (idf. Normal) and female per hectare were obtained by dividing number of living male and female above 15 years per hectare to total land owned (farm size). So, the unit of labor power was labor per hectare during analysis of data. Average age (average of age for whole family members above 15 years) and family size both were taken from household registry. Most of the variables under explanatory variables were the characteristics of farm household during 2015 so as to fulfill research objectives.

RESULTS

TABLE 1. DESCRIPTIVE STATISTICS OF VARIABLES (N=1462 HOUSEHOLDS)

Variables	Definition	Descriptive Statistics					
		N	Mean	Std. Deviation	Minimum	Maximum	Range
Independent variables							
Number of migrants	Migrants in number In last 10 years	1462	2.57	2.32	0	19	19
Total month of migration	Months of out migration in last 10 years	1462	116.9631	118.53	0.00	1308.00	1308.00
Number of international male migrants	Migrants in number (15 and above)	1462	0.92	0.92	0	6	6
Number of international female migrants	Migrants in number (15 and above)	1462	0.15	0.46	0	6	6
Number of domestic male migrants	Migrants in number (15 and above)	1462	0.74	1.00	0	9	9
Number of domestic female migrants	Migrants in number (15 and above)	1462	0.74	1.01	0	7	7
Dependent variable							
Productivity	Tones per hectare	1462	4.3284	1.56751	0.78	19.10	18.32
Demographic Characteristics							
Number of working age male and female/hec	Labor/hec (living15 and above)	1462	13.12661	18.86	0.925	295.858	294.933
Number of working age male/hec	Male/hec (living15 and above)	1462	5.20991	9.60	0.000	177.515	177.515
Number of working age female/hec	Female/hec (living15 and above)	1462	7.91670	12.32	0.000	236.686	236.686
Average age of household members (15 and above)	Average of age for houshold members in years	1462	36.311	7.61	20.7	77.0	56.3
Family size	Total household members	1462	6.33	2.77	1	20	19
Socio-Economic Characteristics							
Land owned (Farm size)	Hectare	1462	0.4085	0.45	0.00	3.38	3.38
Quality of Cultivated land							
khet Only	1 if Yes, 0 otherwise	1462	0.761	0.43	0.0	1.0	1.0
Bari only	1 if Yes, 0 otherwise	1462	0.157	0.36	0.0	1.0	1.0
Khet_Bari_both_72	1 if Yes, 0 otherwise	1462	0.082	0.27	0.0	1.0	1.0
Number of parcel of cultivated land	Parcels in number	1462	1.58	0.81	1	6	5

1 hectare =1.5 bigha = 30 kattha

Table 1 Continued

Variables	Definition	Descriptive Statistics					
		N	Mean	Std. Deviation	Minimum	Maximum	Range
Average of Education	Average of education (15 and above)	1426	7.78	2.79	0	16	16
Livestock ownership	Number of standardized units in LSU	1462	1.69958	1.66	0.000	31.980	31.980
Farm income	Income in Rs.	1462	12104.06	120559.04	0	4006194	4006194
Quality of house							
Single family house	1 if Yes, 0 otherwise	1462	0.9015	0.30	0.00	1.00	1.00
Multi-family house	1 if Yes, 0 otherwise	1462	0.0985	0.30	0.00	1.00	1.00
Ethnicity							
Brahmin/Chhetri	1 if Yes, 0 otherwise	1462	0.4323	0.50	0.00	1.00	1.00
Hill_Janajati	1 if Yes, 0 otherwise	1462	0.1710	0.38	0.00	1.00	1.00
Dalit	1 if Yes, 0 otherwise	1462	0.1265	0.33	0.00	1.00	1.00
Newar	1 if Yes, 0 otherwise	1462	0.0451	0.21	0.00	1.00	1.00
Terai_Janajati	1 if Yes, 0 otherwise	1462	0.2250	0.42	0.00	1.00	1.00
Technology use in Production							
Availability of irrigation (times)	0 to 2 times	1462	1.69	0.53	0	2	2
Pesticides/Herbicides use (times)	0 to 2 times	1462	0.3413	0.54	0.00	2.00	2.00
Chemical fertilizer use (times)	0 to 2 times	1462	1.65	0.59	0	2	2
Vitamins use (times)	0 to 2 times	1462	0.2134	0.45	0.00	2.00	2.00
Tractor use (times)	0 to 2 times	1462	1.0841	0.31	0.00	2.00	2.00
Improved seed use	1 if Yes, 0 otherwise	1462	0.21	0.41	0	1	1
Thresher/Hervester use during production	1 if Yes, 0 otherwise	1462	0.90	0.30	0	1	1
Neighborhood Characteristics							
Proximity to urban center Narayangarh	Distance hours by bus	1462	1.14	0.57	0	4	4

1 hectare =1.5 bigha =
30 kattha

The different measures of the migration such as the number of migrants, the total number of migrants, international male migrants, international female migrants, domestic male migrants, and domestic female migrants were the major explanatory variables. The average number of overall household migrants was 2.57±2.32 with a maximum of 19 migrants from an individual household. The average total month of migration was 116.96±118.93 months among the overall household. The maximum migration month was 1308 months from an individual household.

The average number of male international migrants from the overall household was 0.92±0.92 members with a maximum of 6 male members having international migration from an individual household. The average number of female international migrants from the overall household was0.15±0.46 members with a maximum of 6 female members having international migration from an individual household. The average number of male domestic migrants from the overall household was 0.74±1.0 members to a maximum of 9 male members having domestic migration from an individual household. The average number of female domestic migrants from an overall household was 0.74 members to a maximum of 7 female members having domestic migration from an individual household.

Rice productivity was the main outcome variable for the study analysis. In the research area it was reported that the average rice productivity was 4.32 tons per hector. The overall average number of working-age males and females 15 years and above per hector was 13.12. The average number of working males aged 15 years and above per hector was 5.2. The average number of working females aged 15 years and above per hector was 7.9. The average age of household members 15 years and above was 36.3 years among the household.

The average family size among the household was 6.33±2.77 members. The average size of land owned by the household was 0.40±0.45 hectares. About the quality of cultivated land, 76 percent was Khet, 15 percent Bari and 9 percent both khet and bari. The average number of the parcel of land was 1.58±0.81 among the households. The average educational qualification was 7.78±7.97 completed among the households. The average number of livestock owned by household was 1.69±1.66 standardized livestock unit (LSU).

In case of the house quality, 90 percent of the households were of single family whereas still 10 percent were of multi- family house. For ethnicity, 43 percent were Brahmin/Chhetri, 17 percent Hill janajati, 12 percent Dalit, 4 percent Newar and 22 percent Terai Janajati in the research area. So, the Brahmin/ Chhetri was the dominant group in the area.
Considering the use of technologies, the average irrigation times among the household was 1.69±0.53. The average use of chemical fertilizer was 0.21±0.45 times. In case of neighborhood characteristics, on an average the accessibility to urban center (Narayangarh) was 1.14±0.57 hours by bus from each household

TABLE 2 ESTIMATION EFFECT OF OUT MIGRATION AND STATUS ON RICE PRODUCTIVITY IN CHITWAN, NEPAL

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Productivity tons/hec (idf Normal)						
Number of migrants (Recode numbers)	0.050(2.113)**					
Total month of migration (10 years-square root)		0.019(2.178)**				
Numbers of international male migrants (Recoded)			-0.005(-0.105)			

Numbers of international female migrants (Recoded)				0.123(1.291)		
Numbers of Domestic male migrants (Recoded)					0.077(1.6)	
Numbers of Domestic female migrants (Recoded)						0.115(2.386)**
Demographic characteristics						
Number of working age male/hec (idf normal)	0.012(2.621)**	0.013(2.811)**	0.013(2.705)**	0.013(2.702)	0.012(2.579)**	0.012(2.553)**
Number of working age female/hec	0.013(3.792)***	0.013(3.787)***	0.014(3.993)***	0.014(3.98)***	0.014(3.938)***	0.013(3.841)***
Average age 15 and above (years)	-0.009(-1.784)*	-0.01(-1.821)*	-0.01(-1.934)*	-0.01(-1.962)**	-0.01(-1.906)*	-0.01(-1.924)*
Family size (Recode numbers)	-0.12(-2.788)**	-0.12(-2.811)**	-0.072(-1.851)**	-0.085(-2.23)**	-0.093(-2.385)**	-0.114(-2.795)**
Socio-economic Characteristics						
Livestock ownership (LSU Recode)	0.031(0.877)	0.03(0.852)	0.027(0.764)	0.029(0.835)	0.029(0.815)	0.029(0.832)
Land_ownership (hec-Idf Normal)	0.328(3.044)**	0.32(2.96)**	0.369(3.453)**	0.352(3.293)**	0.348(3.263)**	0.341(3.201)**
Quality of cultivated land (Ref=Khet and Bari both)						
Khet only (Yes=1)	0.439(2.948)**	0.444(2.98)**	0.443(2.969)**	0.445(2.986)**	0.449(3.016)**	0.437(2.94)**
Bari only (Yes=1)	0.571(3.202)**	0.568(3.185)**	0.571(3.197)**	0.572(3.205)**	0.577(3.235)**	0.574(3.224)**
Average of Education (years)	-0.019(-1.101)	-0.019(-1.136)	-0.021(-1.255)	-0.021(-1.199)	-0.02(-1.163)	-0.02(-1.173)
Number of Parcels of cultivated land (Numbers)	-0.175(-2.779)**	-0.171(-2.709)**	-0.174(-2.748)**	-0.172(-2.716)**	-0.175(-2.772)**	-0.179(-2.837)**
Farm income (in Rs-idf normal)	0.0000005327(1.262)	0.0000005595(1.324)	0.0000005101(1.207)	0.0000005253 (1.243)	0.0000005009(1.186)	0.0000005174 (1.227)

Quality of house (Ref=Multi family)						
single_family (Yes=1)	-0.053(-0.398)	-0.061(-0.458)	-0.068(-0.505)	-0.069(-0.511)	-0.073(-0.543)	-0.064(-0.476)
Intercept	3.793(9.105***)	3.755(8.994)***	3.834(9.163)***	3.831(9.197)***	3.814(9.156)	3.863(9.281)
Model F	7.926	7.938	7.723	7.798	7.839	7.982
Regression degree of freedom	25	25	25	25	25	25
Residual degree of freedom	1398	1398	1398	1398	1398	1398
Adjusted R Square	10.80%	10.90%	10.60%	10.70%	10.70%	10.90%
t-static ***=p<0.001; **=p<0.05; *p<0.1		**Figure in the parenthesis are B(t) value**		**1 hectare=1.5 bigha=30 kattha**		

Table 2
continued

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Productivity tons/hec (idf Normal)						
Ethnicity (Ref=Brahmin/Chhetri)						
Hill_Janajati	-0.254(-2.198)**	-0.246(-2.122)**	-0.267(-2.305)**	-0.268(-2.318)**	-0.25(-2.155)**	-0.244(-2.11)**
Dalit	-0.732(-5.457)***	-0.738(-5.499)***	-0.728(-5.414)***	-0.73(-5.435)***	-0.73(-5.441)***	-0.719(-5.357)***
Newar	0.056(0.291)	0.057(0.294)	0.039(0.203)	0.049(0.253)	0.048(0.251)	0.057(0.298)
Terai_Janajati	-0.454(-4.165)***	-0.451(-4.138)***	-0.472(-4.335)***	-0.467(-4.292)***	-0.459(-4.209)***	-0.452(-4.147)***
Technology use in production						
Availability of irrigation (times)	0.307(4.097)***	0.306(4.088)***	0.306(4.079)***	0.306(4.081)***	0.304(4.056)***	0.306(4.088)***
Chemical fertilizer use (times)	0.141(2.011)**	0.136(1.951)**	0.132(1.887)*	0.135(1.937)*	0.138(1.971)**	0.135(1.937)*
Pesticides/Herbicides use (times)	0.042(0.439)	0.04(0.425)*	0.055(0.577)	0.051(0.542)	0.049(0.515)	0.046(0.489)
Vitamins use (times)	-0.003(-0.028)	0(-0.001)	-0.016(-0.139)	-0.01(-0.087)	-0.014(-0.119)	-0.017(-0.144)
Tractor use (times)	0.177(1.327)	0.178(1.334)	0.18(1.349)	0.18(1.352)	0.182(1.367)	0.172(1.289)
Improved seed use (Yes=1)	-0.05(-0.5)	-0.051(-0.513)	-0.044(-0.441)	-0.046(-0.463)	-0.046(-0.465)	-0.049(-0.491)
Thresher/Hervester use during production (Yes=1)	0.334(2.326)**	0.326(2.27)**	0.335(2.323)**	0.338(2.35)**	0.342(2.376)**	0.338(2.357)**
Neighborhood Characteristics						
Proximity to urban center Narayangarh (hrs-idf. Normal)	-0.576(-3.093)**	-0.557(-3.007)***	-0.526(-2.831)**	-0.534(-2.884)**	-0.559(-3.006)**	-0.547(-2.959)**

Intercept	3.793(9.105***)	3.755(8.994)***	3.834(9.163)***	3.831(9.197)***	3.814(9.156)	3.863(9.281)
Model F	7.926	7.938	7.723	7.798	7.839	7.982
Regression degree of freedom	25	25	25	25	25	25
Residual degree of freedom	1398	1398	1398	1398	1398	1398
Adjusted R Square	10.80%	10.90%	10.60%	10.70%	10.70%	10.90%
t-static ***=p<0.001; **=p<0.05; *p<0.1		**Figure in the parenthesis are B(t) value**		**1 hectare=1.5 bigha=30 kattha**		

Table 2 shows the multiple linear regression analysis from six models with different measures in the prediction indicator regarding household migration. There was a significant increase in the rice productivity with the status of migration in model 1 having increase in 0.050 productivity tons per hector per one member from a household having migration (b=0.050, p<0.05) to that of household having non-migrant. Similarly, from model 2 there was a significant increase in the rice productivity by 0.019 tons per hector having increase in one migration month per individual household (b=0.019, p<0.005). Model 6 shows the positive contribution of domestic female migrants for the increase in rice productivity by 0.115 tons per hector per one female household member having domestic migration (b=0.115, p<0.05). Household migration measures such as international male & female and domestic male out migration in model 3,4 and 5 did not had any significant contribution regarding the increase or decrease in the rice productivity. The overall models support that having out migration throughout the period of time had increment in rice productivity in the past 12 months at Chitwan District of Nepal.

The number of both working age male and female had positive contribution towards increase in the rice productivity as shown in model 1-6 (p<0.05). Similarly, the size of the family had a significant role in contribution for increasing the rice productivity as shown in overall model 1- 6 (p<0.05). Similarly, the household owning a land also had a significant contribution for the increase in rice productivity for overall models tested with different measures of out migration (p<0.05). The household having livestock did not had any significant contribution regarding the rice productivity. The household having either a khet or a bari showed significant contribution in the increment of rice productivity (P<0.05).The household having members with an average age of 15 years and above also had contribution for the increment of rice productivity having all of the coefficients positive throughout the models (p<0.05) model 4.The household having number of parcels of cultivated land had a significant negative effect in the rice productivity from overall models (p<0.05).The distance from household and the land/field had a significant negative effect in the decrease of rice productivity as shown in overall models 1-6(p<0.05).

The household migration having ethnicity such as hill Janajati, Dalit and Terai Janajati had negative effect in decrease of rice productivity compared to the household having Brahmin/ Chhetri group (p<0.05). There was no significant contribution of the Newar group from a household for the increment in rice productivity.

Irrigation availability among the technology used for rice productivity was a strong significant component for contributing in the increment of rice productivity in overall six models (p<0.0001). Use of chemical fertilizer regarding rice productivity had a positive contribution in the increase of rice productivity (p<0.05). Likewise, use of thresher/harvester during crop production also

positively contributed for the increment in rice productivity ($p<0.05$).

DISCUSSION

Migration has become an easy pathway for people to seek job opportunities and better life style with benefits of remittances. However, migration has changed the agricultural pattern of the country. This study explored the impact of migration on rice productivity along with other factors.

The result of this study provided evidences that rice productivity was found to be significantly increased among household having migrant workers as compared to non- migrants. However, the finding was contrasted in a nationally representative study which showed that migration negatively affected agriculture yield as remittances were not used for agricultural purpose as well (Tuladhar et al., 2014). It is obvious that migration decreases the labor force for agricultural purposes which in turn reduce the production rate. Moreover, at present people are influenced by western culture which makes them feel farming is outdated occupation carried out by uneducated people. This leads them to use remittances in fulfillment of materialistic aspect rather than advancement in agricultural technologies. However, in this study the rice production was high despite there was migration. The positive contribution despite the migration could be possible because of good practice regarding organic rice farming in Chitwan district as shown by (Sapkota et al., 2021). Further, possible reason could be the active involvement of the female household members in agricultural production, availability of greater land ownership or increase in farm size, or utilization of remittances in technological advancement for rice production.

Gender plays vital role in the agricultural production. In present study, both male and female had a positive contribution in rice production. The finding was supported by (Thapa et al., 2020) in which female workers engaged in unskilled work such as uprooting, weeding while male was involved in land preparation, threshing and others. This finding was contrasted in study by (Medagbe et al., 2020) in which male farmers were more engaged in rice production with high labor time as compared to female farmers. Similarly, positive contribution of male in rice production was observed in study by (Addison et al., 2016). This difference might be due to different country context.

A significant increase in rice productivity was observed among household with greater land ownership or increase in farm size in the research area. Similar findings were presented in study by (Hall et al., 2014). Private land owner had higher rice production as compared to rented land (Untari & Irene Herdjiono, 2020). The size of the family had a significant role in contribution for increasing the rice productivity in present study. This finding was supported by (Sapkota et al., 2021) in which the number of family members had positive and statistically significant effect on the production of rice.

Considering the use of technology, this study depicted that irrigation was a strong predictor to contribute in rice production. Study in Ghana also showed that rice production was more in irrigation farming as compared to rain fed production (Bidzakinetal.,2018). The partial irrigation also showed increased production of rice along with reduction in risk of household rice deficit (Sareth et al., 2020). Further, this study showed that use of chemical fertilizers had positive contribution in rice productivity which was also supported by findings from (Basnet, 2009). However, another study did not find significant effects of chemical fertilizers on rice productivity

in relation to migration status of household members (Bhandari & Ghimire, 2016).

Present study lacks information about the use of remittances in the field of rice production which could be a future scope in the field of research. Further, findings of this study are based on one part of Terai region of Nepal which raises questions on the generalization to other parts of the country but this research finding provides better generalization opportunities to other South Asian countries having similar living conditions.

CONCLUSION

Agriculture is the traditional occupation of Nepalese society. This study shows that positive contribution of household members' migration towards rice productivity. In addition, Socio demographic factors such as family size, land ownership, gender, and use of irrigation, chemical fertilizers and others also showed positive contribution towards the rice production. It would be better if emphasis is given on promotion of advanced technologies among those with land ownership, training and empowerment of household members particularly females in agricultural sector can boost the rice productivity in Nepal.

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