International Journal of Recent Technology and Engineering (IJRTE)
ISSN: 2277-3878 (Online), Volume-8 Issue-6, March 2020

Micro-Level Determinants of Livelihood Diversification in The Rural Areas of Tinsukia District of India

Parswa Jyoti Neog, Pranjal Protim Buragohain

Abstract- Livelihood diversification is a strategy to avoid the risk associated with shocks and to improve livelihood security. Different socio-economic and demographic factors influence the decision of livelihood diversification of households. An attempt has been made in this paper to identify the determinants of livelihood diversification of the rural people using primary data collected from 255 households of Tinsukia, one of the remote districts of India. This study, by employing the logistic regression model reveals that, at less than 10 percent probability level among 11 variables, six variables namely Age of the household Head (AGEH), Type of the Family (FAMILYT) Size of the Family (FAMILYS), Monthly Per Capita Income (MPCI), Access to Credit (CREDIT) and remittance (REMIT) are significant determinant of livelihood diversification. This study will help to formulate proper development policies on the part of various concerned authorities for supporting diversification in the rural areas.

Keywords: demographic factors, diversification, livelihood, livelihood security, logistic regression.

.

I. INTRODUCTION

Livelihood is a broad concept that includes various aspects of human life. Income is the main component of livelihood and besides this, it also involves the social institutions, gender relations, and property rights required to support and to sustain a given standard of living [1]. Diversification is viewed as a livelihood strategy for most of the rural areas in developing countries. The rural people normally instead of specializing in a particular activity, diversify their productive activities to incorporate a variety of other productive areas in order to secure livelihood.

Manuscript received on February 10, 2020.
Revised Manuscript received on February 20, 2020.
Manuscript published on March 30, 2020.
* Correspondence Author
Parswa Jyoti Neog*, M.Phil. Research Scholar, Department of Economics, Dibrugarh University, Assam-786004, India.
E-mail: assam.parswa@gmail.com. Mobile: 7002613385
Dr. Pranjal Protim Buragohain, Associate Professor, Department of Economics, Dibrugarh University, Assam-786004, India.
E-mail: pranjalprotim@dibru.ac.in.

The word diversification is not a simple term and the process of diversification is common to all the countries in the process of development. Diversification may be due to the "survival strategy' adopted by poor people to overcome the risk involved in their income earning capacity or accumulation strategy adopted by the rich farmers to accumulate more wealth and income [2]. Thus, diversification is a deliberate strategy adopted by a household to avoid the risk associated with the fluctuation of income or to manage risks associated with the shocks [4] or to efficiently use the available resources. Livelihood diversification among rural households is very important due to the pressure of population growth, shrinking of land holdings size and environmental degradation. In several studies, livelihood diversification was measured using a vector of shares of income earned from various sources [3].

Both push factors and pull factors may be involved in spurring on the process of livelihood diversification [4]. Asfaw et al. [3] in their study recognizes some push factors of livelihood diversification such as risk management and variability of income, adapting to heterogeneous agro-ecological production conditions, etc. [5]. Several factors such as risk strategies, coping behaviour to shocks, seasonality, market imperfection, etc. determine diversification of activities. An effort has been made in this paper, to find out the influencing factors which determine the diversification of livelihood activities in the study area.

II. OBJECTIVES

The main objective of our study is to identify the factors that determine households' participation in livelihood diversification.

III. METHODOLOGY

In this study, to calculate Livelihood Diversification at the household level, Inverse Herfindahl–Hirschman Diversity Index (IHDI) was used. IHDI helps to measure diversity and it is generally used to estimate the distribution of market share. To measure diversity by using IHDI the number of elements studied and their proportional distribution are taken into consideration [6]. Following formula gives us the value of the index-

$$D = \left[\frac{1}{\sum a_j^2}\right]_i$$

Where, D = Diversification index,

a_j = Share of livelihood activity j to household's total income.

The minimum value of the index is 1 and the maximum value is the total number of income sources.

If a household earns income from a single source then the value of the index will be one and if a household earns income from different sources then the value of this index will be greater than one. The highest possible value of the index is attained if the household earns an equal amount of income from each source.

To identify the influencing factors i.e., the determinants of livelihood diversification decision, a binary logistic regression model was estimated by taking into consideration 11 explanatory variables. The logistic regression model can be explained as follows:

$$\text{Pi} = \text{E}\left(\frac{Y_i}{X_i}\right) = \frac{1}{1+e^{-(\beta_0+\beta_1 X_i)}} \quad (1)$$

Where Pi represents the probability of participation of ith household in livelihood diversification whose value ranges from 0 to 1;

Equation (1) can be rewritten for ease of exposition as follows:

$$\text{Pi} = \text{E}\left(\frac{Y_i}{X_i}\right) = \frac{1}{1+e^{-Z_i}} \quad (2)$$

Where,

$Z_i = \beta_0 + \sum_{i=1}^{m} \beta_i X_i$, i= 1,2,3….m

β_0 and β_i are the intercept and slope parameters respectively.

Since the probability of a household's participation in livelihood diversification is represented by Pi, then the probability of not participating in livelihood diversification by a household is represented by 1-Pi, which can be written as:

$$1\text{- Pi} = \frac{1}{1+e^{Z_i}} \quad (3)$$

From (1) and (3) we get,

$$e^{Z_i} = \frac{\text{Pi}}{1-\text{Pi}} = \frac{1+e^{Z_i}}{1+e^{-Z_i}} \quad (4)$$

Now $\frac{\text{Pi}}{1-\text{Pi}}$ is the ratio of the probability of household's participation to the probability of household's not participation in livelihood diversification. Thus, it represents the odds ratio in favor of a given household's participation in livelihood diversification.

Finally, natural logarithm of (4) gives the logit model as follows:

$$L_i = \ln\left(\frac{Pi}{1-Pi}\right) = \beta_0 + \beta_1 X_i \quad (5)$$

Thus, the complete logit model can be written as-

$$L_i = \beta_0 + \beta_1 X_i + U_i \quad (6)$$

Household's participation in livelihood diversification is the dependent variable in this study, which takes the value 1 if a household diversifies its income sources and 0 otherwise. The factors which are considered as influential factors of livelihood diversification i.e., the independent variables are namely, Household Head's Age, Sex, Education, Family Size, Type of Family, Credit, Remittance, Dependency Ratio of The Households, Value of Economic Status Index, and Economically Active Adults. A brief explanation of these independent variables is given below.

AGE: The effect of Age of the households on livelihood diversity is ambiguous. Some research study suggests that the age of the household head negatively affects livelihood diversification [9], [10], [11]. Capability to engage in multiple sources of income declines with the increase in age [9]. Further, well established and experienced older household head may also become more resistant towards diversification of livelihood activities [10]. On the other hand, it is also possible that with an increase in age more experience and accumulation of assets may allow the household to manage diversified income portfolios [12]. Thus, it is left as an empirical question to be verified in a particular context.

SEX: Sex of the household head positively affects a household's livelihood diversification [11]. Gender inequalities are apparent in livelihood diversification with the predominance of males [13]. So, the sex of the household head is considered as an explanatory variable in the model. The male household head has a better livelihood diversification option than females. This may be due to the fact that the responsibility of the household works is more on the part of the female household head in comparison to male household head and traveling for searching jobs is not very common among the females in the rural areas of study area. In this study, a positive effect of the sex of the household head is expected on livelihood diversification.

EDUCATION: The role of education as a determinant of livelihood diversification has been highlighted in the literature. Many researchers [8], [11], [14], [15], [16], [17], [18] have identified that household head's education level and livelihood diversification are positively correlated. Educated persons are more able to diversify livelihood activities than uneducated persons [14].

FAMILY SIZE (FAMILYS): Researchers found a positive influence of Family size on livelihood diversification [19], [10], [17], [15]. This is due to the fact that a large number of family members can practice multiple activities [11].

FAMILY TYPE (FAMILYT): The type of family is either joint or nuclear. A joint family comprises of more numbers of members than a nuclear family. Hence, it is expected that joint families will engage in more activities than a nuclear family.

CREDIT (CR): It has been identified by many researchers that, with credit market imperfections, the lack of access to credit may act as a constraint to diversification of livelihood activities [1], [20]. Anshiso [19] found a positive and significant influence of credit on diversification. Besides this, Smith et al. [21] found that lack of credit is a constraint to potential diversification. It is therefore expected that credit will have a negative significant influence on livelihood diversification. As a proxy to measuring access to credit, a dummy variable has been included in the model whether the household has received any external finance or not.

REMITTANCE (REMITA): Researchers found that diversification is positively related to remittance. The probability of diversification of rural farmers into activities apart from agriculture increases with the increase in the chance of receiving remittance, and this helps the farmers to expand the income activities [19], [22].

DEPENDENCY RATIO OF THE HOUSEHOLDS (DR): The dependency ratio is taken in the model as an explanatory variable, which is expected to have a negative impact on the diversification of livelihood activities.

With a higher dependency ratio, a household faces the problem of lower availability of labour and a lower incentive to participate in diversified activities [23]. Thus, the dependency ratio is supposed to be negatively correlated with livelihood diversity.

ECONOMIC STATUS (ES): To account for the influence of household economic status on livelihood diversification, we construct a proxy index called Economic Status Index by following Goyal [24]. The economic status of a household is expected to influence diversification negatively. This is expected because with an increase in economic status households' members may want to engage in a more specialized activity instead of diversifying livelihood activities.

ECONOMICALLY ACTIVE ADULTS (EAA): In this study, the number of economically active adults of the age group 15 to 59 was taken as an explanatory variable. The number of economically active adults is expected to demonstrate a positive relation with diversification. A household having relatively more economically active family members from the total household's size is more diversified [19].

MONTHLY PER CAPITA INCOME (MPCI): In this study, an attempt has been made to understand the effects of monthly per capita income on livelihood diversification. This study expects that Monthly per capita income will demonstrate a positive correlation with livelihood diversification. It is because with higher income household members may find it easy to involve in different livelihood activities. With the paucity of income, a household finds it difficult to participate in multiple livelihood activities. The availability of adequate income helps a household to overcome financial constraints and further it helps to engage in different activities to earn income [8], [10].

The description of the variables considered for the analysis is given in table-I.

Table-I: Variables in the Equation

	Name of the Variables	DESCRIPTION	VALUE	Type of Variable
Dependent Variable	Livelihood Diversification	Diversification status of Households	0= Not Diversified 1= Diversified	Categorical
Independent Variables	AGE	Present Age of The Household Head	Different Quantitative or measurable values	Quantitative
	SEX	Sex of House Hold Head	0= Male; 1= Female	Categorical
	EDUCATION	Education of The Household Head	1= if 10th passed; 0 = otherwise	Categorical
	FAMILYS	Family Size in Numbers	Different Quantitative or measurable values	Quantitative
	FAMILYT	Type of Family	0= Nuclear; 1= Joint	Categorical
	CR	Access to credit	0= otherwise; 1=Yes	Categorical
	REMITTA	Economic Support to Household	0= otherwise; 1=Yes	Categorical
	DR	Dependency Ratio of The Households	Different Quantitative or measurable values	Quantitative
	ES	Value of Economic Status Index	Different Quantitative or measurable values	Quantitative
	EAA	Economically Active Adults; in numbers.	Different Quantitative or measurable values	Quantitative
	MPCI	Monthly Per Capita Income	Different Quantitative or measurable values	Quantitative

A. Estimation Procedure

The empirical model used in this study is given below:

$$\text{Ln}\left(\frac{\hat{Y}}{1-\hat{Y}}\right) = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \beta_9X_9 + \beta_{10}X_{10} + \beta_{11}X_{11} + u$$

Where,

$\hat{Y}$ = Probability of household's participation in livelihood diversification, which is coded by 1;

$1-\hat{Y}$ = Probability of household's no participation in livelihood diversification, which is coded by 0

α= Intercept term

$\beta1, \beta2, \beta3\ldots$ are the coefficients of the explanatory variables

u = disturbance term

X_1 = AGEH; X_2 = SEXH; X_3 = EDUCAT; X_4 = FAMILYS; X_5 = FAMILYT; X_6 = CR; X_7 = REMITTA; X_8 = DR; X_9 = ES; X_{10} = EAA; X_{11} = MPCI

IV. RESULTS AND DISCUSSION

Based on the Inverse Herfindahl index, households are categorized as diversified and not diversified. Following table shows distribution of households according to their diversification status-

Table-II: distribution of households according to the diversification status

Diversification Status	Frequency	Percentage
Not Diversified	85	33.33
Diversified	170	66.66
Total	255	100

Source: Field study

According to the survey result, 33 percent households have not diversified their livelihood. On the other hand, 66 percent households have diversified their livelihood.

As mentioned in the methodology part to identify the influencing factors of livelihood diversification a binary logistic regression model was applied. The results of the binary logistic regression model are given in the following table-III.

Table-III: logit estimates of determinants of diversification

Variables	B	Wald	Sig.	Exp(B)
SEX	-.147	.059	.808	.863
AGE	-.048***	7.626	.006	.953
EDUCATION	-.185	.118	.731	.831
FAMILYT	.672*	3.298	.069	1.959
FAMILYS	1.059***	15.806	.000	2.884
DERATIO	-.006	1.889	.169	.994
EAA	.062	.029	.865	1.064
MPCI	2.408***	9.174	.002	11.107
CREDIT	-.714*	3.330	.068	.490
REMIT	2.099**	4.722	.030	8.154
ESI	.705	.142	.707	2.024
Constant	-9.867	12.842	.000	.000
-2 Log likelihood = 193.406 Cox & Snell R Square = 0.402 Nagelkerke R Square = 0.559				

Source: Computed from primary data

Note: *Significant at 10 % level ** Significant at 5% level *** Significant at 1% level

The result of the logistic regression model revealed that Age of the household Head (AGE), Type of the Family (FAMILYT) Size of the Family (FAMILYS), Monthly Per Capita Income (MPCI), Access to Credit (CREDIT) and remittance (REMIT) are significant determinants of livelihood diversification in the study area, whereas the rest five explanatory variables are insignificant. The results are discussed below:

Age: The results indicate that Household Head's Age is negatively correlated with household's participation in livelihood diversification and the result is significant at less than 1 percent significance level. This means that with the increase in age of the household head the probability of household's participation in livelihood diversification will decline. This is because young household heads are better educated than the older households in the study area as well as young households head prefer to use new technologies which allows them to work more efficiently and to engage in more than one activity. The result of the model also reveals that the odds ratio in favor of households' participation in livelihood diversification decreases by a factor of 0.953 with the increase in household head's age by one year. The result is analogous to the earlier findings of Gebru at el. [25].

Type of Family (FAMILYT): It has been observed from the table-II that at a level of significance less than 10 percent, Type of Family had a positive influence on households' livelihood diversification decision. This may be due to the fact that joint families are consist of an extra labour force and hence they can have access to different income sources and a higher amount of income can be earned. This result implies that households with nuclear families are less likely to diversify their livelihood than joint families. The odds ratio of 1.959 for type of the family indicates that for a household with a joint family the probability of diversification increases by a factor of 1.959.

Size of the Family (FAMILYS): From table-II it is clear to us that at less than 1 percent level of significance, households' participation in livelihood diversification is positively correlated with Size of Family. The implication is that households with smaller family sizes are less likely and households with higher family sizes are more likely to diversify their livelihood. The result also reveals, with the increase in family size by one unit, the probability of households' livelihood diversification increases by a factor of 2.884. The result is similar to the earlier findings of Anshiso & Shiferaw [18]; Ahmed et al. [26].

Monthly Per Capita Income (MPCI): From the result of the regression model it was seen that at less than 1 percent level of significance, Monthly Per Capita Income is a positive determinant of household's participation in diversification of livelihood activities. This result implies that households with higher Monthly Per Capita Income are more likely to diversify their livelihood than households with relatively less Monthly Per Capita Income. The odds ratio for Monthly Per Capita Income shows that with one unit increase in monthly percapita income there will be an increase by a factor of 11.107 in the probability of households' participation in livelihood diversification.

Access to Credit (CREDIT): As the result reveals, the probability of participation in livelihood diversification decreases by a factor of 0.49 as a household gets access to credit. It was observed from the regression result that at less than 10 percent significant level, access to credit had a negative influence on the households' participation in livelihood diversification. This result demonstrates that households with access to credit are less likely to diversify their livelihood activities. This result is analogous to the findings obtained by Saikia [23] and Asfir [10]. This might be due to households who already have a less risky source of income have better access to credit and use the same for housing or purchasing other durable assets. And the households who do not have access to credit possess a diversified portfolio of activities to secure livelihood.

Remittance (REMIT): Remittance is positively correlated with the livelihood diversification decision of households at less than 5 percent significance level. Thus the probability of a given household's participation in livelihood diversification increases with the increase in the chance of getting remittance. A similar result was found by Gebru et al. [25] and Anshiso & Shiferaw [19].

V. FINDINGS AND CONCLUSION

This study was carried out to identify the determinants of livelihood diversifications of rural households. To come up with the final result and implication of the study, a binomial logistic regression model was employed for analyzing the cross-sectional data that was collected from a total of 255 rural households of the Tinsukia district of India.

Retrieval Number: F9002038620/2020©BEIESP
DOI:10.35940/ijrte.F9002.038620
Journal Website: www.ijrte.org

Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication

Determinants of livelihood diversification can vary from area to area, across time and individuals. In this study, various factors have been found to be statistically significant which influence a household's decision regarding participation in livelihood diversification. Factors like Age of the household Head (AGE) and CREDIT had demonstrated a negative but significant influence on household's participation in diversification of livelihood activities; while, factors like Type of the Family (FAMILYT) Size of the Family (FAMILYS), Monthly Per Capita Income (MPCI), and remittance (REMIT) had shown a significant positive influence on household's participation in diversification of livelihood activities.

ACKNOWLEDGMENT

We pay our heartiest thanks to all the respondents for their patience and support during the interrogative period, love and respect to all who have helped us directly or indirectly from the beginning to the end of my research work.

REFERENCES

1. Ellis, F. (1998). Household strategies and rural livelihood diversification. *Journal of Development Studies*, 35(1), 1–38. https://doi.org/10.1080/00220389808422553
2. Kumar, S. (2002). 'Does "participation" in common pool resource management help the poor? A social cost-benefit analysis of joint forest management in Jharkhand, India. World Development 30(5): 763-782
3. Asfaw, S., McCarthy, N., Paolantonio, A., Cavatassi, R., Reda, M. A., & Lipper, L. (2019). Livelihood Diversification and Vulnerability to Poverty in Rural Malawi. *SSRN Electronic Journal*, 15. https://doi.org/10.2139/ssrn.3305894
4. Hussein, K., & Nelson, J. (1998). Sustainable Livelihoods and Livelihood Diversification. *IDS Working Paper Number 69*. Brighton: Institute of Development Studies.
5. Lipper, L., Cavatassi, R., & Keleman, A. (2010). The contribution of Plant Genetic Resources for Food and Agriculture to food security and sustainable agricultural development. The Second State of the World of Plant Genetic Resources for Food and Agriculture. FAO, Rome
6. Motsholapheko, M.R., Kgathi, D.L., & Vanderpost, C. (2012). Rural livelihood diversification: A household adaptive strategy against flood variability in the Okavango Delta, Botswana, Agrekon, 51:4, 41-62, DOI: 10.1080/03031853.2012.741204.
7. Sharma, R. (2016). Rural Livelihood Diversity and its Impact on Livelihood Outcome. *The Indian Economic Journal*, 64(1–4), 203–217. https://doi.org/10.1177/0019466216653535
8. Gecho, Y. (2017). Rural Farm Households' Income Diversification: The Case of Wolaita Zone, Southern Ethiopia. Social Sciences, 6(2), 45. https://doi.org/10.11648/j.ss.20170602.12
9. Kassie G, Kim S, Francisco P, Fellizar J (2017). Determinant factors of livelihood diversification: Evidence from Ethiopia. Cogent Social Sciences 3:1369490. https://doi.org/10.1080/23311886.2017.1369490
10. Asfir, S. (2016). Determinants of Rural Households Livelihood Strategies: Evidence from Western Ethiopia. *Journal of Economics and Sustainable Development*, 7(15):103-109.
11. Wondim, A. K. (2019). Determinants and challenges of rural livelihood diversification in Ethiopia: Qualitative review. *Journal of Agricultural Extension and Rural Development*, 11(2), 17–24. https://doi.org/10.5897/jaerd2018.0979
12. Minot, N., Epprecht, M., Anh, T. T. T., & Trung, Q.L. (2006): Income Diversification and Poverty in the Northern Uplands of Vietnam. *IFPRI Research Report*, 145: 1-111. Washington, D.C.
13. Ellis, F. (2000). Rural Livelihoods and Diversity in Developing Countries. Oxford: Oxford University Press.
14. Debele, B., & Desta, G. (2016). Livelihood diversification: strategies, Determinants and Challenges for Pastoral and Agro-Pastoral Communities of Bale Zone, Ethiopia. *International Review of Social Sciences and Humanities*, 11(2):37-51
15. Mentamo, M., & Geda, N. (2016). Livelihood diversification under severe food insecurity scenario among smallholder farmers in Kadida Gamela District, Southern Ethiopia. Kontakt 18(4):289-295.
16. Aababbo, Y., & Sawore, A. (2016). Assessing Determinant Factors of Income Diversification among Rural Farm Households in Ethiopia: The Case of Leemo and Anileemo Districts, Hadiya Zone, South Nation Nationalities People Region. *International Journal of Science and Research (IJSR)*, 5(12):100-110
17. Tamerat, T. (2016). Livelihood Resources and Determinants in Tigray Region of Ethiopia. *International Journal of Lean Thinking*, 7(2):57-66
18. Demissie, A., & Legesse, B. (2013). Determinants of income diversification among rural households: The case of smallholder farmers in Fedis district, Eastern hararghe zone, Ethiopia. *Journal Development Agricultural Economics*, 5(3):120-128.
19. Anshiso, D. (2016). Determinants of Rural Livelihood Diversification : The Case of Rural Households in Lemmo District, Hadiyya Zone of Southern. 7(5), 32–39.
20. Reardon, T. (1997). Using Evidence of Household Income Diversification to Inform Study of the Rural Non-farm Labour Market in Africa. World Development, 25(5), 735-747. http://dx.doi.org/10.1016/S0305-750X(96)00137-4
21. Smith, D.R., Gordon, A., Meadows, K., & Zwick, K. (2001). Livelihood diversification in Uganda: patterns and determinants of change across Mtwo rural districts, Food Policy 26
22. Adugna, E., & Wagayehu, B. (2012). Determinants of livelihood strategies in Wolaita, Southern Ethiopia: *Agricultural Research and Reviews*, Vol. 1(5), pp. 153 -161.
23. Saikia, S. (2016): Agricultural Diversification In Assam: A study of the Brahmaputra Valley, *Ph.D. Thesis*, Dibrugarh University.
24. Goyal, C.K. (2014). An Investigation into Financial Inclusion among the Rural Households in Assam. *Ph D. Thesis*, Gauhati University, Assam.
25. Gebru, G. W., Ichoku, H. E., & Phil-Eze, P. O. (2018). Choices and implications of livelihood diversification strategies on smallholder farmers' income in Saesietsaeda Emba District, Eastern Tigray Region of Ethiopia. *Journal of Agricultural Extension and Rural Development*, 10(8), 165-174.
26. Ahmed, M., Bhandari, H., Gordoncillo, P., Quicoy, C., & Carnaje, G. (2018). Factors affecting extent of rural livelihood diversification in selected areas of Bangladesh. *SAARC Journal of Agriculture*, 16(1), 7–21. https://doi.org/10.3329/sja.v16i1.37419

AUTHORS PROFILE

Parswa Jyoti Neog is an M.Phil. Research scholar in the Department of Economics, Dibrugarh University, Dibrugarh, Assam. He received BA degree in economics from Duliajan College under Dibrugarh University. He completed master's degree in economics from Dibrugarh University, Dibrugarh, Assam, India. His area of interest is in Development Economics, Econometrics, Mathematical Economics and Environmental Economics. He is interested in academics and research. He has written original research articles and participated in various national and international seminars and conferences. He has also teaching experience in economics at Dibrugarh Hanumanbux Surajmal Kanoi Commerce College and Arunachal University of Studies.

Dr. Pranjal Protim Buragohain is an Associate Professor in the Department of Economics, Dibrugarh University, Assam. He obtained his Post graduate degree in economics from Department of economics, Dibrugarh University, Dibrugarh, Assam, India. He also holds PhD degree from Dibrugarh University. He published several papers in peer-reviewed refereed journals. He has also written a few books for the undergraduate students. He has a research interest in development economics with particular focus on human development. Besides this, Regional Economic Development, Institutional Economics, Econometrics are also included in his area of interest. He has completed two research projects under sponsorship of University Grant Commission.