A STATISTICAL STUDY ON SOCIO DEMOGRAPHIC AND ECONOMIC CONDITION OF RURAL ASSAM WITH SPECIAL REFERENCE TO BARPETA DISTRICT

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Abstract

This paper is all about describing the social environment, economic condition and demographic situation of the villages under study. Taking account of various villages and comparing them will actually lead to the idea of improving certain section those of which are yet to be brought up. A few important sectors like 'economic statuses, 'socio-cultural status' and 'demographic profile' has been discussed statistically in the said work. This study has been conducted through a survey in few villages of Barpeta District of Assam during 1st June to 15th August 2023. Data is primary in nature and Multi-stage Sampling Technique is used. The collected data were analysed through software like SPSS, R etc. and analysis was done using, graphs and diagram, statistical tests like Chi-square, Multinomial Logistic Regression.

Conclusion drawn on the basis of the study will clearly pave the way for further development of backward sections of selected villages.

1. INTRODUCTION

Assam's rural areas have earned quite a number of reputations in context with cultural diversity, natural environment, handiworks, industries, etc. But still the villages are considered as underdeveloped and needs constant vigilance for keeping it par with the other developed areas. Reasons might me due to availability of scarce resources, limited labours, improper implementation of Government projects and schemes etc. The existing drawbacks and limitations forbid it to unfold the true capacity of these rural areas. This study was originated with the sole aim of studying the scenario of the rural areas of Assam by considering five villages namely Guwagacha, Majgaon, Pora Bhoral, Pata Gaon and Bahbari, all of which lies in the Barpeta district. The condition of rural areas of Assam is studied by considering variables related to social-demographic and economic issues.

When talking about development, it does not mean change of the rural areas as much as urban areas or to convert all the rural areas to urban areas. This study is initiated just to examine all the facilities at approachable distance while keeping the natural environment intact in rural areas. The overall view of this work is to analyse and achieve statements describing the factors influencing poverty, unemployment etc. This kind of study will give a clear view of the prevailing position of rural areas and hoped that it will further enhance positive changes in the present condition of the rural areas.

Here we briefly discuss the socio-economic and demographic status of some areas to get an idea about this field through some articles as below-

Green et.al (2022) in an article entitled "Association between economic wellbeing and ethnicity, socioeconomic status, and remoteness during the COVID-19 pandemic" conducted a cross sectional study in Australia found that income loss is significantly associated with those people which has low economic status. In this survey the authors used 1211 individuals to find the results. Here the author used Descriptive and Inferential statistics. Ingen et.al (2022) in an article "Neighbourhood-level socio-demographic characteristics and risk of COVID-19 incidence and mortality in Ontario, Canada: A population-based study" conclude that socio demographic factors immigration, housing, race and socio economic characteristics are related to covid-19 pandemic in Ontario (Canada). Islam and Mustaquim (2014) in their paper "Socio economic status of rural population an income level analysis" found that Rs. 500 is the per capita income of 44.8% population and Rs. 2000 is the per capita income of only 4.34% population. In this paper they studied the socio-economic status of five different income groups in rural areas of West Bengal. In this paper they collected primary data of 80 household to see the socio economic status of the Udaypur village of Malda District. In this study percentage method is used. Masthi, et.al (2013) in their paper "An Exploratory Study on Socio Economic Status Scales in a Rural and Urban Setting" analysed that 67%   people belonged to high class in rural areas and 50% people belonged to high class in urban areas when Standard of Living index was applied to study the economic status of medical college which is situated in Bangalore. In this paper they used statistical tools Spearman's Rank correlation. Mehrotra,S. et.al (2007) in his study observed that reforming of bank increased bank profitability but at the cost of the poor and backward regions. Jandhyala, BG T (2002) in the study examines the extent of household expenditure on education. Coppard, D (2001) reviewed the

national significance of the Rural Non-Farm Economy (RNFE) focussing on workforce and enterprise data.

2. OBJECTIVE

Socio-Economic status plays the most important role in the progress of a region. So the main goal of this study is to analyze the prevailing situation of the villages. This study is initiated just to analyse all the various aspects of socio-economic and demographic life in rural areas of the aforesaid villages. The overall view of this work is to analyse and achieve statements describing the factors influencing poverty, unemployment, living condition etc. This kind of study will give a clear view of the prevailing situation of rural areas and hoped that it will further enhance positive changes in the present condition of the rural areas. The overall objective is to create longitudinal panel data set. However, the specific objectives are as below:

a) To examine the socio-economic and demographic status of the region and compare these statuses among the selected villages.

b) To examine the living condition of the selected places and study the factors influencing the region's living condition.

3. METHODOLOGY

The study is conducted in five villages namely Guwagacha, Bahbari (in Barnagar block), Majgaon, Pota Gaon and Pora Bhoral (in Sarupeta block) under Barpeta district which is our first stage units (f.s.u.). These villages were chosen conveniently by the method of Convenient Sampling. Since the study is intended to trace out the rural environment of the locality so these villages are selected. In the second state units (s.s.u.) households were selected by using the simple random sampling. Further the number of households from each village is selected by the method of proportional allocation under the Stratified Random Sampling. Appropriate questionnaire and schedule were prepared to collect the data to conduct the survey in these villages regarding social, demography, economy condition. The goals and

objectives were taken care of while framing the questions. Then from each generated household data were collected through the approved questionnaire.

Data collected were entered in MS Excel and SPSS. Throughout this study the data visualisation were done appropriately. These data were then analysed by various statistical tools like Chi-Square test to test the association between the variables and multinomial logistic regression is used to fit the data. Following figure 1 depicts the process of data extraction, analyzation, and conclusion of the analysis.
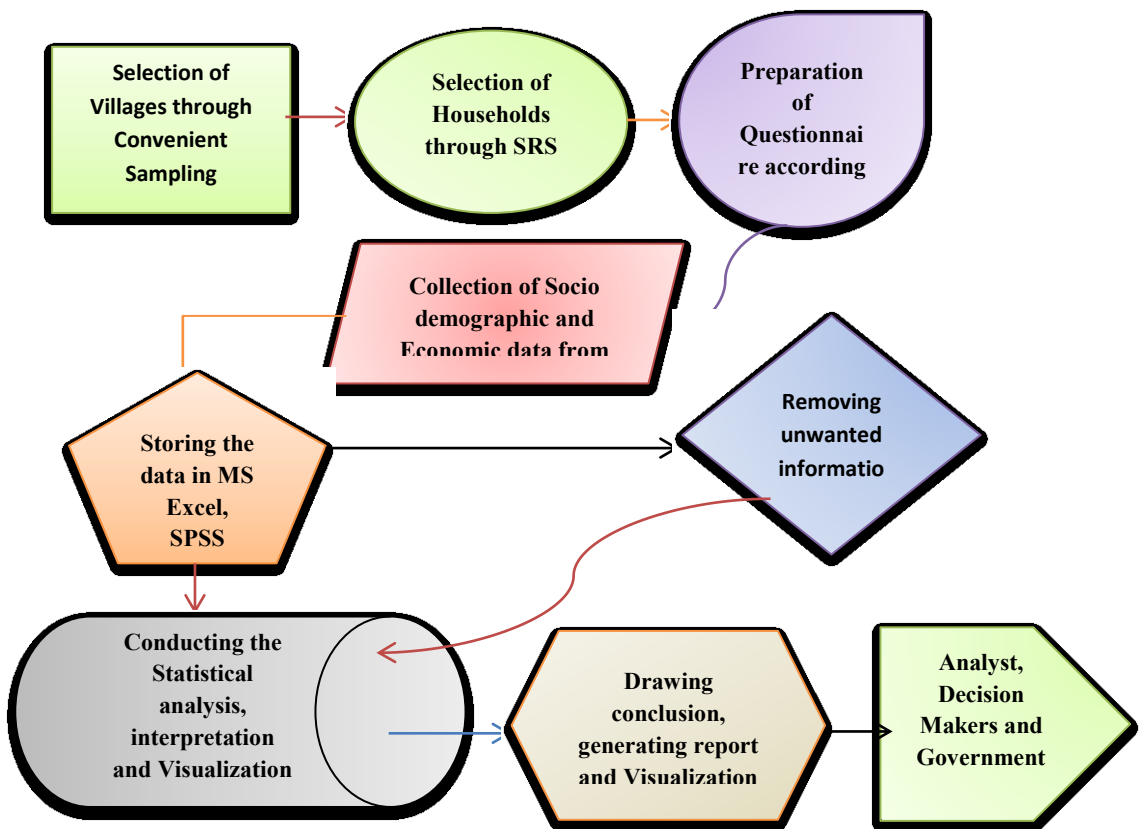

Figure 1: Theoretical Model for the study

4. DESCRIPTION OF STUDY VARIABLES

Out of the total household of the villages chosen for the study. We allocated number of samples to each village using sampling method. We collected the data according to the questionnaire prepared beforehand. Variables that have been used in analysis and interpretation are described below.

Table 1: Depicts the detailed information of the variables collected from the villages

Dataset	Data Type	Description
Village	String	Specific Village
Family Size	Numeric	Total number of members in each household
Males	Numeric	Total number of male members in each household
Females	Numeric	Total number of female members in each household
Below 18	Numeric	Members in the household below 18 years
Between 18-60	Numeric	Members in the household between 18-60 years
Above 60	Numeric	Members in the household above 60 years
Married	Numeric	Total number of married members in the household
Unmarried	Numeric	Total number of unmarried members in the household
Others	Numeric	Others include divorced, widow, etc members of the household
Caste	String	Caste of the head of the household
Religion	String	Religion of the head of the head of the household
Employed member	Numeric	Total number of employed members in the household
Occupations	String	Occupation of the employed members in the household
Type of employement	String	Type of occupation of the employed members
Unemployed Members	Numeric	No. of Unemployed Members in the household

Dependent males	Numeric	No. of dependent males in the household
House type	String	Type of house of the family
Govt. House	String	Whether the household received Govt. house or not
Govt. Toilet	String	Whether the household received Govt. toilet or not
Municipality water	String	Whether the household receives municipality water or not
BPL/APL	String	Whether the household has APL or BPL
Mode of cooking	String	Whether the household uses LPG, Firewood or both for cooking purpose
Handset	Numeric	No. of handset in each household
Govt. Schemes	String	Govt. Schemes each household received
No. of govt. schemes	Numeric	Total no. of govt. schemes of each household
Loan	String	If the household has any kind of loan or not
Vehicles	String	Type of vehicle the household owns
Total Vehicle	Numeric	Total no. of Vehicles in each household

5. CORRELATION MATRIX

A table representing all the correlation values of variables under study has been created. This table shows the correlation among all the variables with shades of red indicating lower correlation value and shades of green indicating higher correlation value. Here single asterisk (*) means the variables are correlated at 0.05 level of significance. And double asterisk (**) means the variables are correlated at 0.01 level of significance. According to the colour variation green represents the highest correlated variables and red represents the least correlated variables. All the other shades in between represents values between -1(red) to 1(green).

Table 2: Correlation Matrix for different variables considered under study

|	Specific Village	Family Size	No. of male members	No of female members	Below 18 years	Between 18-60 years	Above 60 years	Married members	Unmarried members	Others	Caste	Religion	Employed members	Type of occupation	Unemployed Members	Dependent males	House type	Govt. House	Govt. toilet	Municipality water	BPL/APL	Mode of Cooking	No. of handset	Total no. of govt. schemes	Loans	Vehicle type	Total no. of Vehicles
Specific village	1.00	0.01	-0.21	.251*	-0.01	0.04	-0.14	-0.05	-0.01	0.09	0.06	0.05	-0.05	0.03	0.00	-.285	-0.05	-0.06	-0.14	.455*	-0.09	.301	0.07	-.273	-0.07	-0.11	0.02
Family Size	0.01	1.00	.803*	.620*	.493*	.804*	.382*	.799*	.769*	-0.06	-0.22	.317*	.702*	0.07	.860*	.554*	0.13	0.14	0.01	0.14	-0.03	-0.03	.577*	0.07	-0.03	.249*	.413*
No. of male members	-0.21	.803*	1.00	0.17	.456*	.713*	.342*	.664*	.747*	-0.13	-0.15	0.22	.765*	0.08	.685*	.800*	0.16	0.19	0.07	0.18	0.11	-0.02	.527*	0.20	0.05	0.08	.274*
No. of female members	.251*	.620*	0.17	1.00	.364*	.563*	.282*	.641*	.449*	0.09	-0.10	0.17	.337*	0.04	.721*	-0.07	0.11	-0.01	-0.06	-0.04	-0.06	-0.05	.342*	0.00	0.04	.312*	.374*
Below 18 years	-0.01	.493*	.456*	.364*	1.00	0.09	-0.14	.311*	.712*	-0.21	-.271	.378*	0.18	-0.07	.639*	.529*	0.00	0.17	0.10	0.12	-0.20	-0.14	0.03	-0.10	0.20	-0.01	0.11
Between 18-60 years	0.04	.804*	.713*	.563*	0.09	1.00	.279*	.801*	.565*	-0.04	-0.04	0.10	.760*	0.08	.685*	.363*	0.14	0.05	-0.05	0.04	0.14	-0.04	.646*	0.17	-0.06	.273*	.407*
Above 60 years	-0.14	.382*	.342*	.282*	-0.14	.279*	1.00	.396*	0.11	.305*	0.02	-0.05	.423*	0.21	.300*	0.10	.278*	0.05	0.01	0.07	0.16	0.20	.355*	.280*	0.00	0.13	0.21
Married members	-0.05	.799*	.664*	.641*	.311*	.801*	.396*	1.00	.447*	-.232	-0.13	.245*	.749*	0.00	.700*	.297*	0.07	0.10	0.11	0.16	0.01	0.02	.584*	0.15	0.05	.254*	.439*
Unmarried members	-0.01	.769*	.747*	.449*	.712*	.565*	0.11	.447*	1.00	-.220	-0.17	.245*	.488*	0.06	.809*	.678*	0.17	0.17	-0.03	0.04	-0.06	-0.12	.374*	0.02	0.06	0.14	.242*
Others	0.09	-0.06	-0.13	0.09	-0.21	-0.04	.305*	-.232	-.220	1.00	0.07	-0.15	-0.17	0.17	0.04	-0.06	0.17	0.00	-0.10	0.02	.239*	0.07	-0.07	0.20	0.01	-0.06	-0.11
Caste	0.06	-0.22	-0.15	-0.10	-.271	-0.04	0.02	-0.13	-0.17	0.07	1.00	.869*	-0.04	-0.06	-0.20	-0.17	-0.02	-0.12	-0.12	-.243	.330*	.260*	-0.06	0.20	.222*	-0.01	-0.03
Religion	0.05	.317*	0.22	0.17	.378*	0.10	-0.05	.245*	.245*	-0.15	.869*	1.00	0.07	0.05	.312*	.242*	-0.01	0.10	0.11	.293*	.359*	.316*	0.08	-.223	-.252	0.02	0.04
Employed members	-0.05	.702*	.765*	.337*	0.18	.760*	.423*	.749*	.488*	-0.17	-0.04	0.07	1.00	0.05	.413*	.236	0.04	0.13	0.03	-0.03	0.21	-0.07	.610*	.228	0.00	0.20	.448*
Type of occupation	0.03	0.07	0.08	0.04	-0.07	0.08	0.21	0.00	0.06	0.17	-0.06	0.05	0.05	1.00	0.08	0.06	0.01	0.18	0.16	-0.11	.225*	-0.06	-0.05	0.07	-.231	-.19	-.248
Unemployed members	0.00	.860*	.685*	.721*	.639*	.685*	.300*	.700*	.809*	0.04	-0.20	.312*	.413*	0.08	1.00	.635*	0.12	0.10	0.17	-0.07	-0.02	0.04	.419*	0.06	0.08	0.19	.282*
Dependent males	-.285*	.554*	.800*	-0.07	.529*	.363*	0.10	.297*	.678*	-0.06	-0.17	.242*	.236	0.06	.635*	1.00	0.20	0.18	0.10	.292*	-0.03	0.04	.230*	0.11	0.09	-0.08	-0.01
Housetype	-0.05	0.13	0.16	0.11	0.00	0.14	.278*	0.07	0.17	0.17	-0.02	-0.01	0.04	0.01	0.12	0.20	1.00	0.17	-0.17	-0.10	-0.01	0.13	.241*	0.08	0.06	.266*	0.18
Govt. House	-0.06	0.14	0.19	-0.01	0.17	0.05	0.05	0.10	0.17	0.00	-0.12	0.10	0.13	0.18	0.12	0.18	0.17	1.00	.429*	0.00	0.07	-0.07	0.03	.295*	-0.18	-0.08	-0.04
Govt. Toilet	-0.14	0.01	0.07	-0.06	0.10	-0.05	0.01	0.11	-0.03	-0.10	-0.12	0.11	0.03	0.16	0.10	0.10	-0.17	.429*	1.00	0.12	0.12	-0.11	-0.19	.320*	-0.07	-0.20	-0.15
Municipality water	-.455**	0.14	0.18	-0.04	0.12	0.04	0.07	0.16	0.04	0.02	-.243	.293*	-0.03	-0.11	0.17	.292*	-0.10	0.00	0.12	1.00	-0.07	.275	0.16	-0.01	-0.11	0.13	-0.05
BPL/APL	-0.09	-0.03	0.11	-0.06	-0.20	0.14	0.16	0.01	-0.06	.239*	.330*	.359*	0.21	.225*	-0.02	-0.03	-0.01	0.07	0.12	-0.07	1.00	0.02	.637*	0.14	0.01	-0.10	-0.07
Mode of cooking	-.301**	-0.03	-0.02	-0.05	-0.14	-0.04	0.20	0.02	-0.12	0.07	.260*	.316*	-0.07	-0.06	0.04	0.04	0.13	-0.07	-0.11	.275	0.02	1.00	0.13	0.14	0.08	0.07	0.11
No. of handset	0.07	.577*	.527*	.342*	0.03	.646*	.355*	.584*	.374*	-0.07	-0.06	0.08	.610*	-0.05	.419*	.230*	.241*	0.03	-0.19	0.16	.637*	0.13	1.00	0.00	0.07	.285*	.472*
Total no. of Govt. Schemes	-.273*	0.07	0.20	0.00	-0.10	0.17	.280*	0.15	0.02	0.20	0.20	-.223	.228	0.07	0.06	0.11	0.08	.295*	.320*	-0.01	0.14	0.14	0.00	1.00	0.04	-0.17	-0.05
Loans	-0.07	-0.03	0.05	0.04	0.20	-0.06	0.00	0.05	0.06	0.01	.222*	-.252	0.00	-.231	0.08	0.09	0.06	-0.18	-0.07	-0.11	0.01	0.08	0.07	0.04	1.00	0.03	0.06
Vehicles	-0.11	.249*	0.08	.312*	-0.01	.273*	0.13	.254*	0.14	-0.06	-0.01	0.02	0.20	-.19	0.19	-0.08	.266*	-0.08	-0.20	0.13	-0.10	0.07	.285*	-0.17	0.03	1.00	.575*
Total no. of vehicles	0.02	.413*	.274*	.374*	0.11	.407*	0.21	.439*	.242*	-0.11	-0.03	0.04	.448*	-.248	.282*	-0.01	0.18	-0.04	-0.15	-0.05	-0.07	0.11	.472*	-0.05	0.06	.575*	1.00

6. RESULTS AND DISCUSSION
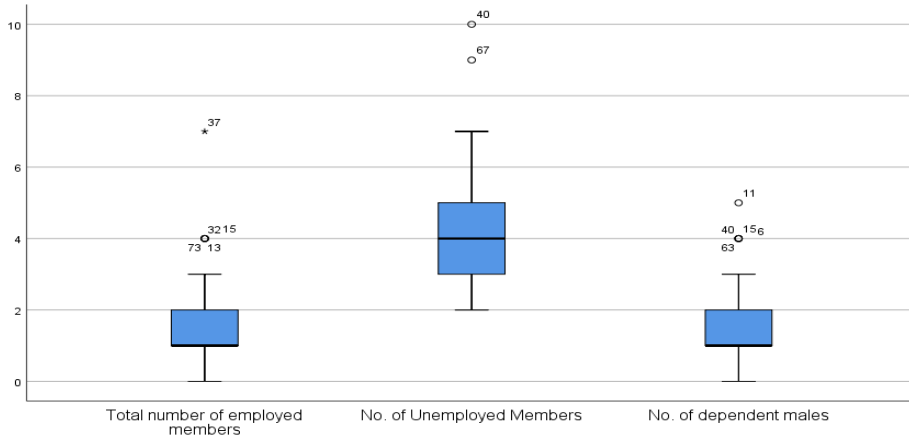
Figure 2: Box and Whisker Plot for Employed, Unemployed and Dependent Male members of Households of all the villages

The above box plot shows the no. of employed, unemployed and dependents male members of the household. Here, the IQR is maximum for unemployed members (3-5) of the household, whereas employed members and dependent male members has an equal value of IQR 1. The maximum range (excluding outliers) is for unemployed members (2-7) and employed members and dependent male members have an equal range of 3. The centre lines going through the width of the boxes indicates symmetry or skewness. The line directs toward the lower hinge in the boxplot of employed and dependent male members which indicates positive skewness whereas its middle position for unemployed members represents symmetric nature. The lowest lower IQR of all the variables are equal (0-1). The highest upper IQR belongs to unemployed members (5-7) and the lowest upper IQR belongs to both employed and dependent male members (2-3).The Outliers are the values which are located outside the

whiskers of the boxplot. The outliers here are situated at 4 and 7, 9 and 10, 4 and 5 for employed, unemployed, dependent male members respectively.

Table 3: Chi-Square Tests for no. of eligible adults available for employment and no. of unemployed members in each family.

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	51.076[a]	4	.000
Likelihood Ratio	34.964	4	.000
Linear-by-Linear Association	30.738	1	.000
N of Valid Cases	80		

Here the chi-square test with 4 df results into 51.076 test statistics. The asymptotic *p*-value associated with this test is less than 5% LoS (Chi-Square (4) = 51.076 , $p<0.05$, .000). Thus we can establish that there is a significant relationship between no. of eligible adults available for employment in each family and no. of unemployed members in each family.

Table 4: Chi-Square Tests for Family Size and No. of Dependent Male

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	47.285[a]	15	.000
Likelihood Ratio	42.796	15	.000
Linear-by-Linear Association	24.247	1	.000
N of Valid Cases	80		

Here the chi-square test with 15 df results into 47.285 test statistics. The asymptotic p-value associated with this test is less than 5% LoS (Chi-Square (15) = 47.285 , $p<0.05$, .000). Thus we can establish that there is a significant relationship between Family Size and no. of dependent males.
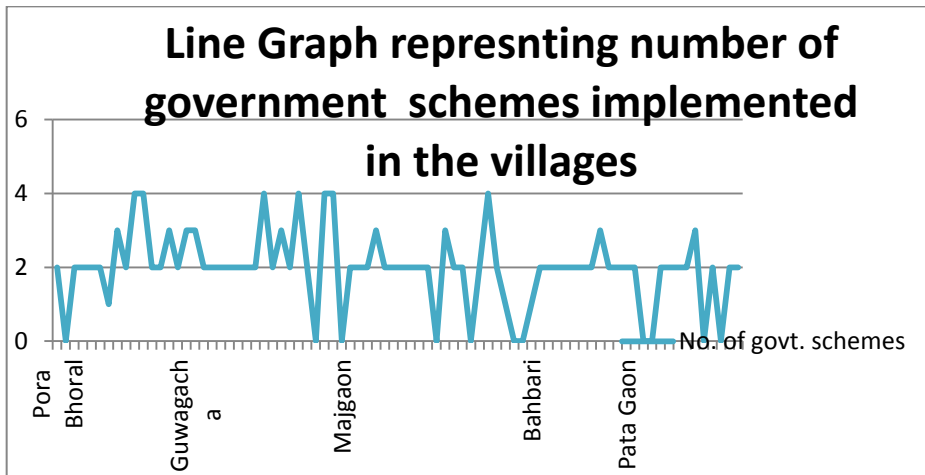

Figure 3: Line graph for No. of Govt. Schemes

Above line graph represents the number of Government Schemes implementing in the villages. It reveals that some of the household still unable to avail single government schemes and some of them availing three or more schemes.

Now we examine the relation between the type of occupation with loans, religion of the head of the household,government house, government toilet,house type, BPL/APL, mode of cooking, total number of government schemes and family size using multinomial logistic regression model. Following section (Table 5 (a -f))depicts the different tables related to this regression model.

Table 5 (a): Model Fitting Information

Model	Model Fitting Criteria			Likelihood Ratio Tests		
	AIC	BIC	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	121.208	125.972	117.208			
Final	136.487	222.24	64.487	52.721	34	0.021

Here we observed that the final model is a significant improvement in fit over a null model χ^2 (34)=52.721,p<0.05)

Table 5 (b): Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	50.259	96	1
Deviance	57.32	96	0.999

Here both Pearson's Chi square[χ^2 (96)=50.259,p=1)} and Deviance Chi square[χ^2 (96)=57.320,p=0.999)] test shows non significant results, which indicates good fit.

Table 5 (c): Pseudo R-Square

Cox and Snell	0.483
Nagelkerke	0.611
McFadden	0.422

The measures Cox and Snell R -square, Nagelkerke R -square and McFadden R -square are called Pseudo R square. Here we may conclude that between 61% and 48% of variation in the type of occupation can be explained by Model 1 based on these measures.

Table 5 (d): Likelihood Ratio Tests

Effect	Model Fitting Criteria			Likelihood Ratio Tests		
	AIC of Reduced Model	BIC of Reduced Model	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	136.487	222.24	64.487[a]	0	0	.
Loans	134.885	215.873	66.885	2.397	2	0.302
Religion of the head of the head of the family	135.591	216.579	67.591	3.103	2	0.212
Govt. House	133.817	214.806	65.817[b]	1.33	2	0.514
Govt. toilet	136.641	217.63	68.641	4.154	2	0.125
House type	139.694	215.919	75.694	11.207	4	0.024
BPL/APL	132.64	208.865	68.64	4.153	4	0.386
Mode of Cooking	141.262	217.487	77.262	12.775	4	0.012
Total no. of govt. schemes	127.065	193.761	71.065	6.578	8	0.583
FamilySize	141.98	213.441	81.98	17.493	6	0.008

The above table shows the likelihood ratio tests of the overall contribution of each independent variables on the model. Here we observe that variable House type (p

=0.024), Mode of cooking (p=0.012) and Family Size (p=0.008) are only significant where as other variables are found to be not significant.

Table 5 (e): Parameter Estimates

Type of occupation[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
Private	Intercept	-55.638	6140.261	0	1	0.993			
	Loans	-0.46	1078.194	0	1	1	0.631	0	.[b]
	Religion of the head of the head of the family	26.851	1172.134	0.001	1	0.982	4.5861E+11	0	.[b]
	Govt. House	-27.68	2793.311	0	1	0.992	9.52E-13	0	.[b]
	Govt. toilet	12.03	829.314	0	1	0.988	167708.453	0	.[b]
	[House type=1]	27.204	1093.037	0.001	1	0.98	6.5226E+11	0	.[b]
	[House type=2]	83.436	2874.448	0.001	1	0.977	1.72E+36	0	.[b]
	[House type=3]	0[c]	.	.	0	.	.	.	.
	[BPL/APL=0]	-6.174	5660.279	0	1	0.999	0.002	0	.[b]
	[BPL/APL=1]	-12.22	3265.643	0	1	0.997	4.93E-06	0	.[b]
	[BPL/APL=2]	0[c]	.	.	0	.	.	.	.
	[Mode of Cooking=0]	44.326	3035.894	0	1	0.988	1.7799E+19	0	.[b]
	[Mode of Cooking=1]	30.704	2641.328	0	1	0.991	2.1606E+13	0	.[b]
	[Mode of Cooking=2]	0[c]	.	.	0	.	.	.	.

		B	Std. Error	Wald	df	Sig.	Exp(B)	Lower	Upper
	[Total no. of govt. schemes=0]	-50.03	4355.603	0	1	0.991	1.87E-22	0	.[b]
	[Total no. of govt. schemes=1]	-28.971	7735.35	0	1	0.997	2.62E-13	0	.[b]
	[Total no. of govt. schemes=2]	40.838	4413.722	0	1	0.993	5.4412E+17	0	.[b]
	[Total no. of govt. schemes=3]	0.545	4485.147	0	1	1	1.725	0	.[b]
	[Total no. of govt. schemes=4]	0[c]	.	.	0	.	.	.	.
	[FamilySize=1]	-13.457	4580.023	0	1	0.998	1.43E-06	0	.[b]
	[FamilySize=2]	15.665	4770.717	0	1	0.997	6359589.48	0	.[b]
	[FamilySize=3]	71.262	5232.027	0	1	0.989	8.8864E+30	0	.[b]
	[FamilySize=4]	0[c]	.	.	0	.	.	.	.
Others	Intercept	-36.417	5550.591	0	1	0.995			
	Loans	-1.748	1078.194	0	1	0.999	0.174	0	.[b]
	Religion of the head of the head of the family	27.296	1172.134	0.001	1	0.981	7.1515E+11	0	.[b]
	Govt. House	-29.253	2793.311	0	1	0.992	1.97E-13	0	.[b]
	Govt. toilet	13.648	829.313	0	1	0.987	845451.332	0	.[b]
	[House type=1]	26.888	1093.037	0.001	1	0.98	4.7563E+11	0	.[b]
	[House type=2]	84.497	2874.448	0.001	1	0.977	4.97E+36	0	.[b]
	[House type=3]	0[c]	.	.	0	.	.	.	.
	[BPL/APL=0]	-24.581	3614.897	0	1	0.995	2.11E-11	0	.[b]
	[BPL/APL=1]	-14.67	3265.643	0	1	0.996	4.26E-07	0	.[b]
	[BPL/APL=2]	0[c]	.	.	0	.	.	.	.

[Mode of Cooking=0]	43.535	3035.894	0	1	0.989	8.0756E+18	0	.ᵇ
[Mode of Cooking=1]	27.723	2641.328	0	1	0.992	1.0959E+12	0	.ᵇ
[Mode of Cooking=2]	0ᶜ	.	.	0	.	.	.	.
[Total no. of govt. schemes=0]	-31.684	0	.	1	.	1.74E-14	1.74E-14	1.74E-14
[Total no. of govt. schemes=1]	-13.562	6392.524	0	1	0.998	1.29E-06	0	.ᵇ
[Total no. of govt. schemes=2]	41.628	4413.722	0	1	0.992	1.1989E+18	0	.ᵇ
[Total no. of govt. schemes=3]	0.633	4485.147	0	1	1	1.883	0	.ᵇ
[Total no. of govt. schemes=4]	0ᶜ	.	.	0	.	.	.	.
[FamilySize=1]	-30.162	3752.714	0	1	0.994	7.96E-14	0	.ᵇ
[FamilySize=2]	-2.486	3983.214	0	1	1	0.083	0	.ᵇ
[FamilySize=3]	52.893	4525.523	0	1	0.991	9.3578E+22	0	.ᵇ
[FamilySize=4]	0ᶜ	.	.	0	.	.	.	.
Reference Category: Government								

The first set of coefficients denotes comparison between Government type of occupation with private occupation. Here we observed no significant predictor variable.

The second set of coefficients denotes comparison between Government type of occupation with others type of occupation. Here also we observe no significant predictor variable.

Table 5 (f): Classification

Observed	Predicted			
	Government	Private	Others	Percent Correct
Government	4	0	0	100.00%
Private	0	13	10	56.50%
Others	1	5	47	88.70%
Overall Percentage	6.30%	22.50%	71.30%	80.00%

Here we observe that Government type of employee were cent percent (100%) correctly predicted by the model. The others type of employee was correctly predicted by the model 88.7% of the time. On the other hand only 56.5% were correctly predicted by the model for private type of employee.

Next we examine the relation between the mode of cooking with loans, religion of the head of the household,government house, government toilet,house type, BPL/APL, total number of government schemes and family size using multinomial logistic regression model. Following section (Table 6 (a -f)) depicts the different tables related to this regression model.

Table 6 (a): Model Fitting Information

Model	Model Fitting Criteria			Likelihood Ratio Tests		
	AIC	BIC	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	106.202	110.966	102.202			
Final	102.795	179.02	38.795	63.407	30	0

Here we observed that the final model is a significant improvement in fit over a null model[χ^2 (30)=63.407,p<0.001).

Table 6 b): Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	24.524	86	1
Deviance	28.855	86	1

Here both Pearson's Chi square[χ^2 (86)=24.524,p=1) and Deviance Chi square[χ^2 (86)=28.855,p=1) test shows non significant results, which indicates good fit.

Table 6 (c): Pseudo R-Square

Cox and Snell	0.547
Nagelkerke	0.724
McFadden	0.563

The measures Cox and Snell R -square, Nagelkerke R -square and McFadden R -square are called Pseudo R square. Here we may conclude that between 72% and 56% of variation in the Mode of Cooking can be explained by Model 1 based on these measures.

Table 6(d): Likelihood Ratio Tests

Effect	Model Fitting Criteria			Likelihood Ratio Tests		
	AIC of Reduced Model	BIC of Reduced Model	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	102.795	179.02	38.795[a]	0	0	.
Loans	100.923	172.384	40.923	2.128	2	0.345
Religion of the head of the head of the family	110.395	181.856	50.395	11.6	2	0.003
Govt. House	102.644	174.105	42.644	3.849	2	0.146
Govt. toilet	102.423	173.883	42.423	3.628	2	0.163
House type	102.152	168.849	46.152	7.357	4	0.118
BPL/APL	101.051	167.748	45.051	6.256	4	0.181
Total no. of govt. schemes	96.843	154.012	48.843	10.048	8	0.262
FamilySize	95.327	157.259	43.327	4.532	6	0.605

The above table shows the likelihood ratio tests of the overall contribution of each independent variables on the model. Here we observe that only variable Religion of the Head of the household (p=0.003) are significant.

Table 6(e): Parameter Estimates

Mode of Cooking[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
Firewood	Intercept	-59.005	7625.212	0	1	0.994			
	Loans	17.394	2122.832	0	1	0.993	35827768	0	.[b]
	Religion of the head of the head of the family	17.778	0	.	1	.	52598838	52598838	52598838
	Govt. House	25.94	2275.469	0	1	0.991	1.84E+11	0	.[b]
	Govt. toilet	26.592	2248.347	0	1	0.991	3.54E+11	0	.[b]
	[House type=1]	1.363	5056.66	0	1	1	3.909	0	.[b]
	[House type=2]	0.597	5056.66	0	1	1	1.817	0	.[b]
	[House type=3]	0[c]	.	.	0	.	.	.	.
	[BPL/APL=0]	-52.821	11513.92	0	1	0.996	1.15E-23	0	.[b]
	[BPL/APL=1]	0.825	2.941	0.079	1	0.779	2.281	0.007	726.81
	[BPL/APL=2]	0[c]	.	.	0	.	.	.	.
	[Total no. of govt. schemes=0]	59.815	12651.59	0	1	0.996	9.49E+25	0	.[b]

	[Total no. of govt. schemes=1]	25.611	12035.92	0	1	0.998	1.33E+11	0	.[b]
	[Total no. of govt. schemes=2]	8.068	5243.334	0	1	0.999	3192.208	0	.[b]
	[Total no. of govt. schemes=3]	-36.654	7583.48	0	1	0.996	1.21E-16	0	.[b]
	[Total no. of govt. schemes=4]	0[c]	.	.	0	.	.	.	.
	[FamilySize=1]	13.321	1301.759	0	1	0.992	610017.9	0	.[b]
	[FamilySize=2]	13.573	1301.756	0	1	0.992	784635.2	0	.[b]
	[FamilySize=3]	15.136	5428.983	0	1	0.998	3746921	0	.[b]
	[FamilySize=4]	0[c]	.	.	0	.	.	.	.
Both	Intercept	-2.33	7051.684	0	1	1			
	Loans	15.981	2122.831	0	1	0.994	8721756	0	.[b]
	Religion of the head of the head of the family	-1.108	2.225	0.248	1	0.618	0.33	0.004	25.833
	Govt. House	26.579	2275.469	0	1	0.991	3.49E+11	0	.[b]
	Govt. toilet	26.429	2248.347	0	1	0.991	3.01E+11	0	.[b]
	[House type=1]	-16.006	4141.515	0	1	0.997	1.12E-07	0	.[b]

	[House type=2]	-18.288	4141.515	0	1	0.996	1.14E-08	0	.[b]
	[House type=3]	0[c]	.	.	0	.	.	.	.
	[BPL/APL=0]	-31.639	7540.465	0	1	0.997	1.82E-14	0	.[b]
	[BPL/APL=1]	1.48	2.26	0.429	1	0.513	4.393	0.052	368.473
	[BPL/APL=2]	0[c]	.	.	0	.	.	.	.
	[Total no. of govt. schemes=0]	38.977	9184.289	0	1	0.997	8.46E+16	0	.[b]
	[Total no. of govt. schemes=1]	25.57	8039.897	0	1	0.997	1.27E+11	0	.[b]
	[Total no. of govt. schemes=2]	7.458	5243.334	0	1	0.999	1732.854	0	.[b]
	[Total no. of govt. schemes=3]	-19.438	6690.427	0	1	0.998	3.62E-09	0	.[b]
	[Total no. of govt. schemes=4]	0[c]	.	.	0	.	.	.	.
	[FamilySize=1]	12.106	1301.76	0	1	0.993	181039.1	0	.[b]
	[FamilySize=2]	14.148	1301.757	0	1	0.991	1394259	0	.[b]
	[FamilySize=3]	14.294	5428.983	0	1	0.998	1614265	0	.[b]
	[FamilySize=4]	0[c]	.	.	0	.	.	.	.
Reference category: LPG.									

In the first set of coefficients LPG mode of Cooking is compared with Firewood mode of Cooking and no significant predictor variable is observed.

The second set of coefficients denotes comparison between mode of Cooking with both (LPG and Firewood) mode of Cooking. Here also we observe no significant predictor variable.

Table 6(f): Classification

Observed	Predicted			
	Firewood	LPG	Both	Percent Correct
Firewood	6	0	6	50.00%
LPG	0	4	3	57.10%
Both	3	2	56	91.80%
Overall Percentage	11.30%	7.50%	81.30%	82.50%

Here we observe that Firewood were 50% correctly predicted by the model. The LPG mode of cooking was correctly predicted by the model 57.1% of the time. On the other hand 91.8% were correctly predicted by the model for both mode of cooking.

7. CONCLUSION

After performing the analysis, it may be concluded that in all the villages people are employed more in private sectors than in government and other sectors. There exists remarkable variation in availing any government schemes among the villages. The disparity in the gap between the number of employed and unemployed members can easily be visualized in the study area.Though we obtain a significant association between number of eligible adults available for employment and number of unemployed members in each family, family size and dependent males, other variables seem to be statistically insignificant. However the absence of statistical significance does not merely conclude the absence of relationship but may be attributed to some other factors. Further the model fitted for studying type of employment and mode of cooking seems to be good though both the model parameters are not significant. Hence this kind of study rightly able to identify the socio- economic condition and demographic status of the aforesaid villages and then highlight the trend followed by these aspects in these areas.

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