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## STUDY ON LIVELIHOOD DYNAMICS OF RURAL HOUSEHOLD OF MUNGELI DISTRICT OF CHHATTISGARH STATE INDIA

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### ABSTRACT

The study was carried out to study the livelihood dynamics of rural household of Mungeli district of Chhattisgarh state. Two blocks namely Lormi and Mungeli were taken into consideration for the study. A total sample size of 89 farmers was made from 07 villages. The study finds that the largest participation of rural household was in the livelihood activities like agriculture (crop production) with 95.50 per cent and non-farm (construction) with 26.96 per cent. Agriculture and non-farm were identified as the main two sources of income for rural households. The participation in both the livelihood activities estimated 84.96 per cent and 12.39 per cent respectively. Crop production and horticulture (vegetable production) were the main contributors to the farm income of rural households their contribution being 62.67 per cent and 24.29 per cent. Personal-Social services and whole sale-retail trade-small stall were the main contributors to the non-farm income of rural households their contribution being 16.99 per cent and 3.62 per cent. The degree of diversification was found to be greater with 0.56 per cent among the landless and those belonging to lower farm-size groups. Shortage of irrigation water leads to certain problems including lower yields, decrease cultivated area. Therefore, the government should form efficient and strong policies for the better management of available water resources, ensuring equal availability to every farmer.

**Keywords:** Livelihood, Livelihood Activities, Diversification of income sources.

### INTRODUCTION

Food, shelter water and clothing are the basic necessities in life for a livelihood. So all works involved in finding food, cloth water and shelter required for human survival at individual and households level are referred to as livelihood.

Agriculture is the mainstay of our economy and a way of life for millions of farm families. Land is a primary source of livelihood and a critical factor that shapes the livelihood strategies and resultant outcomes.

In livelihood people secure themselves to secure and to live out. To meet their needs through workers, energy, intelligence, technology and social relation, people organize to transfer the environment. Livelihood is also shaped by the broader economic and political system within which they operate.

India being a diverse country offers regional imbalance on various socio-economic dimensions. From developed state to impoverished states, one measure issue that the rural poor are facing is securing sustainable livelihood. Historically India's rural economy is based on agriculture and other related activities, but with decreasing land holding and increasing population, the dependency on primary livelihood is on risk. In this situation, village's youth migrate to urban area in search of employment.

The prime urban area, over loaded with shipment of unskilled youth can only offer low wages labour

opportunities. Therefore, it is altogether imperative to find alternative livelihood models and strategies for achieving inclusive growth. The process of livelihood generation in typically poor villages of India has got a unique social dynamics by having a social amittosis of power structure, institutionalization of unique leadership instilled deep into the power fabrics and the economics reconfiguration followed by land reform and implementation of Panchayati Raj at a unique pace and level as well (Debnath, and Dasgupta, 2006).

In Chhattisgarh, agriculture is the main source of livelihood and more than 80 % population depends on agriculture for their living. Main crops are paddy, maize, pulses, and oil seeds more than 70 per cent of the total workers excluding marginal workers are engaged in farming and farm labour and however, agriculture is rain-fed as only 21% of the net shown area is irrigated. Though 67% of the total cropped area is rice, agriculture is the main source of income for the rural household in Chhattisgarh and income from wage labour, forest produce and livestock.

The major livelihood activities in Mungeli district of Chhattisgarh are crop production, agricultural wages, and non-farm activities. Non-timber forest product and making utensils both are supplementary source of income to the existing livelihood option for the some farmers. It is also an assured source of income during lean period of agricultural activities. In Mungeli district 35.52 per cent people are involved in farming, 51.02 per cent people in agricultural wages, 1.02 per cent people involved in family

business and 12.42 per cent people are involved in other activities for their livelihood (Source: Census 2011), 80 per cent settlement depends on farming in Chhattisgarh state. Over 70 per cent of the total prole excluding marginal workers is active in farming or as farm labours.

Looking to the livelihood dynamics of rural household in the state of Chhattisgarh. The survey has been operated with the following specific objectives.

**Objectives**

1. To identify rural household participation in various livelihood activities.
2. To study the distribution of household income across different income resources.
3. To estimate determinants of households participation in various income- generating activities.
4. To suggest policy measure for raising income of the farmers.

**MATERIAL AND METHOD**

The study was conducted in Mungeli district of Chhattisgarh state. Out of 03 blocks 02 blocks namely Lormi and Mungeli were selected for the study. Four villages from Lormi, namely Paraswara, Akhrar, Ghanaghat, Uraikchar, and three villages from Mungeli namely Jamkhor, Dewari, and Baihakapawere were selected for the study. The respondents were categorized into marginal (up to 1 ha), small (1.01-2.00 ha), medium (2.01-4.00 ha), large farmers (above 4.01 ha) and landless (0.00 ha) based on their holding size and 5 per cent farmers from each of the 5 categories for the 7 selected villages were sampled to collect the required information. In all, sample size of 89 farmers was made for the study.

**Analytical tools**

The following analytical procedure were adopted to analyse the data

To analyze the data related to household participation in various livelihood activities and distribution of income across different income resources tabular analysis were used. To know the extent of income diversification herfindahl's diversification index (i) was used. The value of the index ranges between 0 and 1; a large value shows higher level of income diversification.

**Herfindahl's diversification index (DI).**

$$DI = 1 - \sum_{i=1}^k S_i^2 \quad \dots(i)$$

$S_i$  is the proportion of income from the  $i^{th}$  income sources in the total household income.

The impact of an income sources was examined by Gini decomposition procedure developed by Lerman and Yitzhaki (1985) The Gini coefficient in income was calculated by following Formula;

$$G = 2 cov[y, F(y)] / \bar{y} \quad \dots(ii)$$

Where  $y$  and  $F(y)$  are the total and average income of the individual, respectively and  $F(y)$  is the cumulative distribution of income. Gini coefficient measures the inequality among values of a frequency distribution (for example, level of income). A Gini coefficient of zero express perfect equality, where all values are the same. A gini coefficient of 1 express maximum inequality among values. However, a value greater than one may occur if some persons represent negative contribution to the total. Gini decomposition analysis was carried out using Lerman and Yitzhaki (1985)

$$G = 2 \sum_{k=1}^k cov(y_k, F) / \bar{y} \quad \dots(iii)$$

Where,  $k$  is the number of income sources of the  $i^{th}$  household and  $cov(y_k, F)$  gives the covariance of an income source with cumulative distribution of the total household income.

The inequality estimate for a source was obtained by following formula

$$G = \sum_{k=1}^k cov(y_k, F) / cov(y_k, F_k) \quad \dots(iv)$$

$$[2 cov(y_k, F_k) / \bar{y}_k] [\bar{y}_k / \bar{y}]$$

$$G = \sum_{k=1}^k R_k G_k S_k \quad \dots(v)$$

$R_k = cov(y_k, F) / cov(y_k, F_k)$  = is the correlation between total income and source income,

$$G_k = 2 cov(y_k, F_k) / \bar{y}_k$$

is the Gini coefficient of income source.

$$S_k = \bar{y}_k / \bar{y}$$

gives the share of an income source in the total income.

**Probit analysis**

The determinants of household's participation in a particular income-generating source were identified using probit analysis computing through R Studio software (version- 1.1463.exe).

**RESULTS AND DISCUSSION**

The result obtained from the study as well as discussion has been summarized under the following heads.

**Rural household participation in various livelihood activities**

The Table 01 reveals rural household participation in various livelihood activities among all the households' categories in order to obtain an understanding of their livelihood pattern. In case of landless households 72.72 per cent was participated in agricultural activities. Within the agricultural activities most households 81.81 per cent were participated in agricultural wages followed by crop production i.e. 63.63 per cent and forestry 23.80 per cent. After agriculture non-farm activities were second important livelihood activities for landless household in which 81.81 per cent households were participated. Non-farm was further categorized into personal and social services in which 45.45 per cent household involved in it followed by construction with 18.18 per cent and manufacturing with 9.09 per cent participation. Study found 27.27 per cent household actively dependent on transfer income.

In marginal farm households agriculture perceived as the most important livelihood activities as 100 per cent further these agriculture activities were categories into crop production in which 100 per cent households were participated followed by agricultural wages i.e. 86.20 per cent, horticulture 13.79 per cent, forestry 6.89 per cent and livestock 3.44 per cent. Agriculture was followed by non-farm activities with 72.41 per cent and transfer activities with 17.24 per cent. Under non-farm activities household's participation were more in construction activities being 44.82 per cent followed by personal and social service 17.24 per cent, whole-sale-retail-small stall 6.89 per cent and manufacturing 3.44 per cent.

In small farm households the main livelihood activities and source of income were agriculture 100 per cent. Under agriculture sector, participation in crop production found 100 per cent followed by agricultural wages 53.84 per cent, horticulture 23.07 per cent and forestry 11.53 per cent. Other important livelihood activities and source of income were non-farm activities i.e. 65.38 per cent. In non-farm activities, whole sale- retail/-small stall was main livelihood activity in which households participation was 23.07 per cent followed by construction 19.23 per cent, manufacturing and personal and social service 11.53 per cent third least important livelihood activities were transfer activity in which peoples participation was least with 7.69 per cent.

In medium farm households agriculture was ranked the most important livelihood activities as observed 100 per cent participation in it followed by non-farm activities and transfer activities with 76.92 per cent and 15.38 per cent respectively. Survey in study area revealed that crop production was prime livelihood activities and source of income for medium households with 100 per cent participation followed by agricultural wages 38.46 per cent, horticulture 15.38 per cent, and forestry 7.69 per cent. In non-farm activities proportion of participation

in construction was 30.76 per cent followed by whole-sale-retail-small stall 23.07 per cent manufacturing 15.38 per cent and personal and social services 7.69 per cent. Participation of medium households in other activities was found null.

In large farm household's agriculture were most important activities being 100 per cent participation in agriculture. In agriculture participation of people was higher for crop production i.e. 100 per cent followed by horticulture with 40.00 per cent, forestry 10.00 per cent and livestock contribute 10.00 per cent. After agriculture again as usual non-farm activities were another important livelihood activity in which participation of households were higher for personal and social service with 50.00 per cent, followed by whole sale- retail trade-small stall 20.00 per cent, manufacturing 10.00 per cent. Participation of large household in transfer activity was 50.00 per cent and in other activity was 20.00 per cent and this category was having other source of income as observed 20 per cent large farm looks for towards it.

Overall participation of households in agriculture was 96.62 per cent followed by non-farm with 73.03 per cent, transfer payment with 19.10 per cent and other with 2.24 per cent.

#### **Distribution of total household income across different income sources**

The Table 02 reveals that agriculture; non-farm income and transfer payment was the major source of income among rural households. For landless households non-farm income was major source of income with 56.19 per cent share from the total household's income. Further non-farm income was categorized into personal and social service with the share of 38.95 per cent followed by manufacturing 7.26 per cent, whole sale-retail trade-small stall with 6.05 per cent and construction with 3.90 per cent. Share of agriculture income was 33.70 per cent from the total household's income. Within agriculture income the share of crop production was highest with 18.56 per cent followed by forestry 8.51 per cent and agriculture wages 6.62 per cent. Transfer payment with 10.11 per cent share from the total household income.

In case of marginal farm households agriculture was the major source of income with the share of 63.89 per cent from the total household income. Agriculture was further categorized into crop production with 46.11 per cent share followed by horticulture 8.82 per cent, agriculture wages 7.84 per cent, livestock 0.80 per cent and forestry with 0.28 per cent. Non-farm income with 33.51 per cent share from the total household's income. Within non-farm income share of personal and social service was 15.18 per cent followed by construction 10.68 per cent, manufacturing 5.30 per cent and whole sale-retail trade-small stall with 2.35 per cent. Share of transfer income

**Table 01:** Rural household participation in various livelihood activities

(Household/activities)

S. No.		household type					
		Landless n= 11	Marginal n=29	Small n=26	Medium n=13	Large n=10	Overall n=89
1	<b>Agriculture</b>	08 (72.72)	29 (100)	26 (100)	13 (100)	10 (100)	86 (96.62)
	Crop production	07 (63.63)	29 (100)	26 (100)	13 (100)	10 (100)	85 (95.50)
	Agriculture wages	09 (81.81)	25 (86.20)	14 (53.84)	05 (38.46)	-	53 (59.55)
	Horticulture	-	04 (13.79)	06 (23.07)	02 (15.38)	04 (40.00)	16 (17.97)
	Forestry	05 (45.45)	02 (6.89)	03 (11.53)	01 (7.69)	01 (10.00)	12 (13.48)
	Livestock	-	01 (3.44)	-	-	01 (10.00)	02 (2.24)
2	<b>Non-farm</b>	09 (81.81)	21 (72.41)	17 (65.38)	10 (76.92)	08 (80.00)	65 (73.03)
	Construction	02 (18.18)	13 (44.82)	05 (19.23)	04 (30.76)	-	24 (26.96)
	Manufacturing	01 (9.09)	01 (3.44)	03 (11.53)	02 (15.38)	01 (10.00)	08 (8.98)
	Whole sale, Retail, Small stall	01 (9.09)	02 (6.89)	06 (23.07)	03 (23.07)	02 (20.00)	14 (15.73)
	Personal and Social services (PS service)	05 (45.45)	05 (17.24)	03 (11.53)	01 (7.69)	05 (50.00)	19 (21.34)
3	<b>Transfer payment</b>	03 (27.27)	05 (17.24)	02 (7.69)	02 (15.38)	05 (50.00)	17 (19.10)
4	<b>Other</b>	-	-	-	-	02 (20.00)	02 (2.24)

**Note:** Figure in parentheses represents the percentage of household's participation in various livelihood activities.

from the total household income was 2.60 per cent.

For small farm households again as usual agriculture was the major source of income with the share of 96.79 per cent from the total household income. Under agriculture share of crop production was 76.37 per cent followed by horticulture 16.26 per cent, agriculture wages with 3.37 per cent and forestry with 0.77 per cent. Agriculture was followed by non-farm income with the share of 2.96 per cent in which the share of personal and social services was 16.14 per cent followed by whole sale-retail trade-small stall 7.03 per cent, construction 3.22 per cent and manufacturing with 3.15 per cent. Transfer payment contributed 0.26 per cent share from the total household income which was very least.

For medium farm household share of agriculture was highest with 89.63 per cent in which the share of crop production was 60.48 per cent followed by horticulture 28.59 per cent, agriculture wages with 0.48 per cent and forestry with 0.05 per cent. Agriculture was followed by non-farm income with the share of 10.23 per cent further non-farm income categorized into personal and social

service with 5.19 per cent followed by whole sale-retail trade- small stall with 2.51 per cent, construction with 1.37 per cent and manufacturing with lowest share of 1.14 per cent. Least source of income was transfer payment with 0.14 per cent share from the total household's income.

In case of large farm households Agriculture was the major source of income with the share of 74.55 per cent in which the share of crop production was 60.26 per cent followed by horticulture 13.60 per cent, livestock with 0.52 per cent and forestry with 0.16 per cent. Non-farm income was second source of income with the share of 24.81 per cent in which the share of personal and social services was higher with 21.05 per cent followed by whole sale-retail trade-small stall with the share of 2.82 per cent, manufacturing with 0.93 per cent. Share of Transfer payment and other was 0.59 per cent and 0.62 per cent.

Overall agriculture was the source of highest income with 84.96 per cent followed by non-farm income with 12.39 per cent, transfer payment with 1.33 per cent and other with 1.32 per cent.

**Table 02:** Distribution of total household income across different income sources

(₹/annum)

Source of income		Household type					
		Landless	Marginal	Small	Medium	Large	Overall
A	<b>Agriculture</b>	30357.93 (33.70)	54844.60 (63.89)	121769.60 (96.79)	397792.87 (89.63)	358421.44 (74.55)	192635.8 (84.96)
	Crop production	16722.42 (18.56)	39596.32 (46.11)	96094.24 (76.37)	268469.60 (60.48)	289710.21 (60.26)	142118.59 (62.67)
	Agricultural wages	5963.36 (6.62)	6731.64 (7.84)	4244.41 (3.37)	2153.90 (0.48)	-	4773.32 (2.10)
	Horticulture	-	7579.30 (8.82)	20461.58 (16.26)	126923.21 (28.59)	65400.24 (13.60)	55091.08 (24.29)
	Forestry	7672.15 (8.51)	248.13 (0.28)	969.37 (0.77)	246.16 (0.05)	810.65 (0.16)	1989.29 (0.87)
	Livestock	-	689.21 (0.80)	-	-	2500.34 (0.52)	1594.77 (0.70)
B	<b>Non-farm</b>	50609.09 (56.19)	28776.18 (33.51)	3718.11 (2.96)	45399.37 (10.23)	119301.2 (24.81)	28080.79 (12.39)
	Construction	3518.54 (3.90)	9172.40 (10.68)	4061.62 (3.22)	6092.32 (1.37)	-	5711.22 (2.51)
	Manufacturing	6545.63 (7.26)	4551.25 (5.30)	3963.72 (3.15)	5076.54 (1.14)	4500.41 (0.93)	4927.51 (2.17)
	Whole sale, Retail trade, Small stall	5454.82 (6.05)	2017.91 (2.35)	8846.97 (7.03)	11153.62 (2.51)	13600.62 (2.82)	8214.78 (3.62)
	Personal and Social service (PS Service)	35090.10 (38.95)	13034.62 (15.18)	20307.80 (16.14)	23076.89 (5.19)	101200.18 (21.05)	38541.92 (16.99)
C	<b>Transfer</b>	9109.21 (10.11)	2234.43 (2.60)	323.32 (0.26)	646.41 (0.14)	2820.53 (0.59)	3026.78 (1.33)
D	<b>Other</b>	-	-	-	-	3000.26 (0.62)	3000.26 (1.32)
E	<b>Total</b>	90075.09 (100.00)	85855.21 (100.00)	125811 (100.00)	443838.7 (100.0)	480722.9 (100.0)	226743.6 (100.0)

Source: Survey (2017-18)

Note: Figure within parentheses represents the percentage of total income.

**Table 03:** No. of income source across various farm categories of rural households

(In per cent)

No. of income source	Farm size					
	Landless	Marginal	Small	Medium	Large	Overall
One source	2 (18.18)	1 (3.44)	3 (11.53)	1 (7.69)	2 (20.00)	9 (10.12)
Two sources	-	4 (13.80)	11 (42.30)	6 (46.15)	4 (40.00)	25 (28.08)
Three sources	5 (45.45)	17 (58.62)	7 (26.93)	5 (38.46)	3 (30.00)	37 (41.58)
More than three sources	4 (36.36)	7 (24.13)	5 (19.23)	1 (7.69)	1 (10.00)	18 (20.22)
Total	11 (100.00)	29 (100.00)	26 (100.00)	13 (100.00)	10 (100.00)	89 (100.00)

Source: Survey (2017-18)

Note: Figures in parentheses represents percentage to total.

**Table 04:** Gini Decomposition of inequality by income source

Income source	Share in total income (Sk)	Gini coefficient for source (Gk)	Gini Correlation with rank of total income (Rk)	Contribution of source income to total inequality (RKGKSK)	Proportional contribution of source to total inequality (RKGKSK/G)	Gini income elasticity (RK-GK/G)
Farm	0.37	0.47	0.90	0.16	0.36	0.96
Non-farm	0.74	0.55	0.86	0.35	0.80	1.07
Transfer	0.06	0.54	0.40	0.01	0.02	0.47
Rental	0.08	0.1	0.02	0.00	0.00	0.00
Gini for total income		0.44		0.44	1.00	

**Source:** Survey (2017-18)

**Table 05:** Probit estimate for determinants of household's participation in various income generating activities

Variables	Farm income	Non-farm income
Constants	3.33 (0.01)*	-0.08 (0.96)
Family size (No.)	-0.00 (0.99)	0.09 (0.75)
Land holding (ha)	-0.09 (0.04)*	-0.14 (0.19)
Working population Ratio	0.41. (0.05)	0.79 (0.02)*
Age of household head (year)	-0.02 (0.31)	-0.08, (0.06)
Education of household head (year of schooling)	-0.09 (0.13)	0.11 (0.27)
Distance (km)	-0.15 (0.003)**	-0.12 (0.19)

**Note:** \*,\*\*,and \*\*\*, indicate significance at 10 per cent 5per cent and 1 per cent level of significance respectively.

**Source:** Survey (2017-18)

### Number of income sources across various farm-categories of rural households

Number of income sources across various farm-categories depicted on Table 03 which revealed the large size farm having dependency of 20 per cent for income generation on one source followed by landless with 18.18 per cent, marginal farm was found by 3.44 per cent holding depends on one source of income. Most of the households from medium, small, and large farm were generating their income from two sources being 46.15 per cent, 42.30 per cent and 40.00 per cent respectively. Amongst the marginal and landless farm households 58.62 per cent and 45.45 per cent of the households, respectively had maximum access to their sources, other category ranged small 26.93 per cent to medium 38.46 per cent.

### Impact of rural household income diversification

The Gini coefficients were estimated to measure the extent of income inequality and the results are presented in Table 04. The Gini coefficient for overall income was 0.44 signifying the prevalence of high-income inequality in rural Mungeli. Farm income and rental income were more unequally distributed than other sources; their Gini coefficient being 0.47 and 0.1 respectively. Though non-farm sector enables the poor to enhance their incomes, the barriers for entry into productive activities lead to unequal distribution of gains. The Gini income elasticity value of more than one implies that an income source is inequality increasing, the value less than one indicates that the source is inequality reducing and the Gini income elasticity is one when the source does not affect the income distribution among the households. The gini decomposition analysis shows that non-farm income contributed to the increase in inequality among the rural households as gini income elasticity estimated 1.07. However, farm income and transfer income contributed to the source is inequality reducing as observed income elasticity less than one. The transfer income showed an inequality reducing effect, it is also showed a lower correlation with the total income as compared to the farm and non-farm income. Farm income showed a slightly inequality reducing effect where the correlation with the total income was observed 0.90 which is at par with non-farm correlation.

### Determinant of household's participation in different economic activities

The probit estimates shown in Table 05 have revealed that working population ratio determined the participation of a household in non-farm activities. The households with higher worker population ratio were found to be more active in non-farm income generating activities.

### Issues involved in increasing income of the farmers

Table 06 represents the issues or challenges of households in their income generating activities. During the survey it was found that, non-existing irrigation system was the main obstacle in reducing income of 93.25 per cent rural

**Table 06:** Issues involved in increasing income of the farmers

S. No.	Issues	Overall n= 89	Rank
1	Non-availability of irrigation	83 (93.25)	I
2	Non-availability of credit	67 (75.28)	II
3	Low wage rate	34 (38.20)	III
4	Lack of job opportunities	28 (31.46)	IV
5	Insect attack on crop	19 (21.34)	V
6	Price fluctuation	14 (15.73)	VI
7	Small farm size	12 (13.48)	VII
8	Lack of technical knowledge	08 (8.98)	VIII
9	Grazing by wild animal	06 (6.74)	IX
10	Low literacy	04 (4.49)	X

**Source:** Survey (2017-18)

**Note:** figure in parentheses indicate percentage to respective total households.

households. The second major obstacle was found to be the shortage of finance, which lowered the crop production of 75.28 per cent of rural households. 38.20 per cent of the households said that the low labour wages was also a major obstacle in reducing their financial status, this was followed by lack of job at the village level 31.46 per cent, insect and plant disease 21.34 per cent, risk of price 15.73 per cent, low land holding 13.48 per cent, lack of technical knowledge 8.98 per cent, animal problem 6.74 per cent and low literacy 4.49 per cent.

Over all non-existing irrigation system was the main issues among rural households which might be due to the reasons for not getting the water of the canals easily to the fields or due to weak monsoon or even a delay monsoon-timing because large majority of the farmers are dependent on the rains. As a result, production of food-grain fluctuates year after years. Irrigation is the most important agricultural input in a tropical monsoon country like India where rainfall is uncertain, unreliable and erratic India cannot achieve sustained progress in agriculture unless and until more than half of the cropped area is brought under assured irrigation. Non-existing irrigation system was followed by shortage of finance which may be due to the lack of resources to either buy or lease more land or invest in farm infrastructure- irrigation, power, farm machinery etc.

## CONCLUSION

The largest participation of rural household was in the livelihood activities like agriculture (crop production) with 95.50 per cent and non-farm (construction) with 26.96 per cent.

Agriculture and non-farm were identified as the main two sources of income for rural households. The participation in both the livelihood activities estimated 84.96 per cent and 12.39 per cent respectively.

Farm income of rural households was mainly derived from five sub sector namely crop production, agricultural wages, horticulture, forestry and livestock. Crop production and horticulture (vegetable production) were the main contributors to the farm income of rural households their contribution being 62.67 per cent and 24.29 per cent. Within the farm sectors people receiving income from forestry 0.87 per cent and livestock 0.70 per cent were found very less. Very few rural households were interested in livestock activities of livelihood.

Non-farm incomes of rural households were mainly derived from four sub-sectors namely construction, manufacturing, wholesale-retail trade-small stall and personal and social services. Personal-Social services and whole sale-retail trade-small stall were the main contributors to the non-farm income of rural households their contribution being 16.99 per cent and 3.62 per cent. Out of these four sub-sectors, Whole sale-Retail trade-small stall and personal-social services showed an increase in their contribution to total non-farm income of households whereas the contribution of manufacturing, construction showed a decline. Construction and manufacturing remained the paramount contributor with to the non-farm income of landless and marginal household while for small and landless farming household Wholesale-Retail trade-small stall and personal-social services contributed maximum share to the non-farm income for landless and large farm households.

The degree of diversification was found to be greater with 0.56 per cent among the landless and those belonging to lower farm-size groups. The degree of diversification was less for medium farm households with 0.18 per cent and they were found to engage in the relatively more productive activities due to their better asset position, access to infrastructure, higher education and higher skill levels. The Gini coefficient for overall income was 0.44. Farm income and rental income were more unequally distributed than other sources; their Gini coefficient being 0.47 and 0.1 respectively. However, the Gini coefficient for non-farm income and transfer income was 0.55 and 0.54 each, indicating that the distribution of income from these two sources was almost equal to other sources.

Working population ratio was most effective determinants

of non-farm activities whereas land holding was most significant determinants of farm income. Relatively poor rural households having low land holding, low level of human resources, limited assets, diversify in order to protect their already meager income, while the richer households apportion most of the benefits of diversifying to more remunerative income sources. Non-existing irrigation system has negative implication upon the socio-economic conditions of rural households in the study area. Shortage of irrigation water leads to certain problems including lower yields, decrease cultivated area. Negative social impacts include water theft crime, poverty, and frustration. Shortage of finance is another main issue in raising income of the farmers.

### Policy implication

Promotion of livestock activity in agricultural sector in the rural economy would help in providing livelihood to the unskilled labour force in rural areas thus the odds of inequality of income distribution could be overcome to some extents.

It is equally important to improve access of the poor households to non-farm employment by encouraging education and skills amongst them. There is a need to promote this sector by encouraging farm and non-farm linkages and creating necessary infrastructural facilities for them. Such effort will not only help in generating additional employment opportunities but will also help in reducing the income gaps between the rich and the poor. Rural households should be encouraged to engage more in subsidiary activities like poultry, aquaculture, goat rearing and mushroom cultivation. Self help groups of women can play a major role in financing such activities. The government should form efficient and strong policies for the better management of available water resources, ensuring equal availability to every farmer. Awareness must be created among farming community about the precise use of irrigation water by adopting land leveling techniques and avoiding water crimes. Awareness should be reached among the farmers about irrigation management work such as ground water irrigation, water harvesting technique, such as rain catchment system and sand dams.

Farmers should be aware of agricultural finance and agricultural insurance made by the government. Government should make strict and suitable policy for agricultural insurance (e.g. financial incentives, premium subsidies and overall role of government to promote agriculture insurance). Co-operative societies should bring agricultural inputs to the farmers at the right time. Lower levels of female education call for focusing the efforts to promote education amongst the rural females as this helps in improving access to employment and hence in the diversification of income sources. Rural non-farm sector seems to be an important component of rural

economy.

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