

INCOME INEQUALITY IN RURAL INDIA: EVIDENCE FROM VILLAGE-LEVEL STUDY

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Abstract: The study measures inequality in income distribution among the rural households between two types of villages varying under agronomic features. Following multi-stage sampling technique 250 sample households of varying operational holdings are studied from Satyabadi Block of Puri District, Odisha. Gini coefficient is used to measure income inequality among the households across the selected villages. Lerman and Yitzhaki decomposition model is used to find the source-wise contribution to total inequality in the sampled villages. The findings reveal inequality in income distribution among the households in both types of villages – the better off villages showing higher inequality than poorer ones. Among the sources agriculture is found predominantly contributing to inequality while wages and livestock activities are found inequality reducing. The study suggests for promoting livestock and small-scale manufacturing activities to reduce income inequality. Since the study area is calamity prone and the small holders are found more affected by such calamities social safety net needs to be provided to these people as it has the potential in reducing income inequality.

Keywords: homogeneity, natural calamities, gini coefficient, non-farm sector, transformation.

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INTRODUCTION

The Indian rural economy accounting as the major contributing sector to the country's national income and employment has been showing rapid transformation in the structure of employment and source of income during the last few decades. Using different rounds of NSSO unit level data the

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study of Parida 2015 reveals that between 2004-05 and 2011-12 about 37 million workers left agriculture and during this period the employment in the non-farm sector increased by 5 million per annum between 2005 - 2010 and 13.5 million per annum between 2010-2012. During 2010-12 quite a sizeable percentage of workers leaving agriculture were absorbed in labour intensive manufacturing activities. Observing the changing structure of rural production and employment in recent years, Reddy *et al*, 2014 have claimed that in the development process of the Indian economy the non-farm sector is no longer a residual sector but an emerging driver of rural development and transformation contributing 65 percent to the rural NDP in 2010. Working on the NSS data for the four decades from 1970-71 to 2011-12 Chand *et al* (2017) have reported that growth of rural non-farm sector has been more profound in the post-reform period as compared to pre-reform period. Their findings reveal that between 2005-2012 the mean annual growth rate of the rural non-farm economic activities in terms of output has been found to be 9.21 percent as compared to its pre-reform (1971-94) growth rate of 5.70 percent and growth rate in the farm sector activities of 4.27 percent during 2005-12. However, their study has brought out discrepancy between growth in output and employment in the non-farm sector – the former is faster than the latter. Disaggregating the secondary data for deriving the growth of non-farm employment at different state levels the study of Rajeev Meenakshi and M. Bhattacharjee (2018) have reported that the rise in non-farm sector has not been uniform across the country and agriculturally advanced states exhibit a higher share of employment in non-farm sector than agriculturally laggard states.

However, notwithstanding the mismatches observed between output and employment growth in the non-farm sector, notable changes are found in the sources of income of the rural households over the past few decades. The study of Chand *et al* 2017 has estimated that nearly two-third of rural income is now generated in non-agricultural activities in the country. Estimating the income of rural households earned from different sources between 1993-94 and 2004-05 the study of Himanshu *et al* 2013 has reported that farm households earn 46 percent of their income from non-farm activities and while rural households earn 48 percent of their income from non-farm activities. Compared to the earlier estimation of Lanjouw and Sharif (2004) – 35 percent for the year 1993-94, the estimation of Himanshu *et al* 2013 is

seen much higher indicating impressive increase in diversification of rural economic activities towards non-farm sector as income source over time.

Acknowledging that there has been impressive sectoral shifts in the rural economy over time the Indian rural society is confronted with new issues beyond what were there in the traditional agricultural societies. More particularly, increasing structural changes in terms of output/ income growth have shown distributional outcomes in rural societies. The rise of non-farm sector's share in the Indian rural NDP has altered the traditional income distribution among the rural households. In this context there are dearth of studies in evaluating the impact of higher share of non-farm income on rural income distribution. More so, in the available studies we find wide differences in the findings among the researchers on whether increase in non-farm income sources of the rural economy is inequality raising or reducing. Analyzing the macro level data for 1993 and 2005 Azam and Shariff (2011) have revealed that between these two selected years income inequality has increased in rural India from 0.46 to 0.50. Using Gini coefficient for source-wise decomposition analysis they have identified that it is the income from agriculture which is found contributing mostly to the income inequality during the selected years. The study of Ranganathan *et al* (2016) has shown that rural non-farm diversification has increased rural income inequality in the country – the Gini coefficients increased from 0.536 in 2004-05 to 0.557 in 2011-12. However their findings reveal that in contributing to income inequality agriculture in 2011-12 was less inequality increasing that it was in 2004-05. Studying on Palanpur village in rural Uttar Pradesh, Chris Elbers and Peter Lanjouw (2019) find that the increasing proportion of non-agricultural works in the village are found associated with containing the growth of income inequality along with reducing poverty. However in their study they have argued for the increasing access of poor people to non-farm jobs for reducing rural income inequality and vice versa.

Amidst the disagreement among the researchers on the increase / decrease in the growth of rural income inequality in the context of diversification of Indian rural economy, the study of Chancel and Piketty (2017) over a long period from 1922 to 2014 presents some serious notes. Their study depicts rapid increase in income inequality in India after 1980s. In furthering elaboration, the study tells that the country's top One percent population receives 22 percent of total national income while the share of bottom 50

percent is limited to only 13 percent. Income inequality has widened in the country after the economic reforms of the 1990s. Dev 2018 opines that in terms of income inequality India occupies the second highest country in the world next to South Africa. No doubt with the objective of achieving inclusive growth and mitigate poverty and adverse impact of growing income inequality the Government of India in the post-reform period has undertaken massive transfer of resources into rural areas under multiple development schemes. Such government schemes include both monetary and non-monetary transfers such as direct benefit transfer (cash transfer) to farmers under Prime Minister Kishan Samman Nidhi Yojana, food security under food grains distribution to poor through PDS and free food to the poor and ultra-poor under Pradhanmantri Garib Kalyan Yojana, employment generation through MGNREG Scheme and a host of others. However, in the context of the working of these and other development schemes it is often remarked that the benefits from these schemes have not trickled down sufficiently and as such have failed to achieve income equity in rural areas (Bhattacharya *et al* 1991, Kurien 1992). More so, agriculture continuing to be the predominant source of income in the Indian countryside has all along been contributing significantly to inequality in the rural income distribution (Dantwala 1987, Paul 1989, Birthal and Singh 1995). Since the villages constitute the primary units of rural economy in India but lack homogeneity in demographic, agronomic and other characteristics, the present study with the help of Gini coefficients attempts to make a comparative measure of the extent of income inequality present among the rural households between two types of villages varying in terms of agronomic features. Following the decomposition model of Lerman and Yitzhaki (1985) the study tries to ascertain the association of different income sources influencing the income inequality among the sample households taken under the study.

DATA AND METHODOLOGY

The study is based on field level data collected from Satyabadi Block of Puri district in the coastal region of Odisha. Broadly the block exhibits two types of agronomic features viz: some villages having fertile soil developed out of deltaic alluvium from Mahanadi Delta with irrigation facility available from canal as well as lift points and others a littoral tract developed out of coastal alluvium of marine origin mixed with sand and thus lacks power in

preserving water (Government of Odisha, 2016). The latter type of villages situated at the tail end of canal do not access irrigation water round the year. No lift points operate in these villages. Accordingly, the former type of villages having better soil and availability of irrigation practise multiple cropping with higher cropping intensity and higher crop yield. In contrast the latter type of villages with poor soil and lacking in irrigation largely cultivate paddy during khariff season with low crop yield. In the rest of the year the land mostly remains fallow excepting a few pockets where some vegetables are grown due to availability of water from small field tanks. Taking into account the two varying agronomic situations prevailing in the villages of the C.D Block, two villages from each area is selected with the help of Agricultural Extension Officials for study purpose. The first one is hereafter called as Agriculturally Advantaged Villages (AAV) the other is Agriculturally Disadvantaged Villages (ADV). In the second stage of sampling, the total number of households in the two types of villages are classified into three categories viz; Category-I (the marginal farmers-cum agricultural labourers below one hectare of operational holding), Category-II (the small farmers between 1-2 hectares of holding) and Category-III (farmers above 2.01 hectare of holding). Since the block is dominated by small holders (up to 2 hectares of holding accounting 96 percent farmers) and semi-medium, medium and large holders are very few in number, constituting hardly 4 percent of the total farming community, these three categories are clubbed under Category-III for the study purpose. From each category twenty percent of the households are sampled for investigation. Direct personal interview method is followed to elicit various information from the selected households. A total of 131 households (65 from Category-I, 49 from Category-II and 17 from Category-III from Agriculturally Advantaged Villages and 119 households (58 –Category-II, 46- Category-II and 15- Category-III) from Agriculturally Disadvantaged Villages are taken for questionnaire. The study period pertains to 2021-2022.

ANALYTICAL TOOLS USED

Gini Indices of Concentration (GIC) are worked out to indicate the extent of income inequality among the farm households between the two types of villages.

$$G = \frac{1}{n(n-1)} \sum_{i=1}^n \sum_{j=1}^n [X_i - X_j]^2 \text{ where,}$$

Where, X denotes the income of persons and n- number of persons.

Lerman and Yitzhaki decomposition model is used to calculate the source wise contribution to total inequality in the sampled villages. The model measures the contribution of a source to total inequality as the product of its share in total income, source Gini and the correlation between the source and total income. The decomposition of Gini Index inequality measure is given by:

$$G = \sum_{K=1}^K [\text{Cov}(Y_k, F) / \text{Cov}(Y_k, F_k)] [2 \text{Cov}(Y_k, F_k) / \bar{Y}_k] [\bar{Y}_k / \bar{Y}]$$

On substitution it can be written as:

$$G = \sum_{K=1}^K R_k G_k S_k$$

Where R_k is the Gini correlation between income sources, K and total income, $R_k = \text{Cov}(Y_k, F) / \text{Cov}(Y_k, F_k)$. The relative Gini index of sources 'k' is given by $G_k = 2 \text{Cov}(Y_k, F_k) / \bar{Y}_k$ and

S_k represents sources' contribution to total income, $S_k = \bar{Y}_k / \bar{Y}$.

RESULTS AND DISCUSSION

Sources of Income

The share of different sources of income to total income for different categories of rural households in the two types of selected villages is presented in Table-1. At the village level significant differences are noticed in the sources of income earned by the selected households. Agriculture remains as the major source of income for the households irrespective of categories in both types of villages. However with respect to other sources significant differences are noticed. While for the households of Agriculturally Advantaged Villages (AAV), trade and services happens to be the second important source of income followed by wages and livestock, for the Agriculturally Disadvantaged Villages (ADV) wage income accounts for the second major source of income followed by trade and services and livestock

activities. Between the household categories, we also find significant variation in the sources of income. Within Agriculturally Advantaged Villages, for the category-I households, other than agriculture, wage income happens to be the second most important source of income followed by livestock and trade and services. However for category II and III households, trade and services is found to be the second important source of income followed livestock and wage income. In case of Agriculturally Disadvantaged Villages a similar trend as noticed across households in Agriculturally Advantaged Villages is observed. For category-I households wage income accounts for the second major source of income followed by livestock and trade and services. But for the households of category-II and category-III income from trade and services is found to be the second important source of income followed by livestock and wage income. Thus, the foregoing data analysis reveals visible differences in the income sources of the sample households both at across the villages and within the villages. Between village types while the households of AAV have better earning sources (higher share from trade and services) than that with the households of ADV, between different categories of households, it is the categories-II and III which exhibit better earning sources (higher share from agriculture and trade and services) than that with category-I and this is irrespective of village types.

Distribution of Income

The distribution of income among different categories of rural households in the selected villages is presented in Table-2. Data reveal that the category-I households constituting the largest section of the rural households in both types of villages (49.62 percent in AAV and 48.74 percent in ADV) their share in the total income is estimated to be the lowest - 19.62 percent in case of Agriculturally Advantaged Villages and 21.49 percent in the case of Agriculturally Disadvantaged Villages. In contrast category -III households constituting the smallest category of the rural households bag the largest share of total income in both types of villages (50.83 percent in case of AAV and 48.39 percent in case of ADV). Category-II households thus lie between the two categories both in terms of number as well as income shared. These households comprising 37.40 and 38.65 percent of the households share 29.55 and 30.12 percent of the total income in AAV and ADV respectively. All these indicate that both in AAV and ADV the income

distribution among the rural households is found skewed in favour category II and III households. The Gini indices of concentration (GIC) works out to 0.32 for Agriculturally Advantaged Villages and 0.30 for Agriculturally Disadvantaged Villages indicating prevalence of income inequality among the households in both types of villages. Between the village types income inequality is found higher in AAV than that in ADV. The higher income inequality in case of Agriculturally Advantaged Villages may be because of higher proportional contribution of agriculture to total inequality in these villages as compared to the other ones.

Decomposition of Inequality

The decomposition of inequality according to sources of income is presented in Tables-3 and 4 for the selected village types - Table-3 presenting for the Agriculturally Advantaged Villages and Table-4 for the Agriculturally Disadvantaged Villages. The contribution of each source to total inequality is calculated as the product of the source's Gini Index, its share in total income and correlation with the total income. The proportional contribution of a source to total inequality is the ratio of its absolute contribution to total Gini Index (column 6) in both tables. It is seen that the contribution of agriculture to the total inequality is the highest in both types of villages (0.69 in case of AAV and 0.73 in the case of ADV). There is also high degree of correlation between agriculture and total income ($r = 0.74$ for the AAV and 0.71 for the ADV (Column 4).

Trade and Services happen to be the second largest source contributing moderately to income inequality in both types of villages. Its contribution to inequality works out at 28 percent in the case of AAV and 23 percent in the case of ADV (column 6). Income from livestock contributes marginally to income inequality among the households in both village types. It works out to 0.09 in case of AAV and 0.13 in case of ADV. Wage income is found to have negative contribution to income inequality among the households. It works out to -0.06 in case of AAV and -0.10 for the ADV.

To find out whether a source is raising or reducing income inequality, the ratio of the proportional contribution of the source to total income has been worked out. Observation shows that (column 7 in tables 3 and 4) agriculture and trade and services in both types of villages are adding to income inequality (values from these two sources are found greater than

Table 1: Percentage Share of Each Source to Total Income among different categories of Rural Households in Agriculturally Advantaged and Agriculturally Disadvantaged Villages during 2021-2022

<i>Size Categories/ Village Types</i>	<i>Agriculture</i>	<i>Livestock</i>	<i>Wages</i>	<i>Trade & Services</i>	<i>Total</i>
Well-Off Villages					
Category-I (65)	41.06	14.89	28.63	14.68	100
Category II (49)	49.55	18.14	10.33	21.98	100
Category III (17)	54.42	16.30	4.02	25.26	100
Pooled (131)	45.97	16.29	18.59	19.15	100
Poor Villages					
Category I (58)	40.46	10.22	41.57	7.75	100
Category II (46)	47.19	14.83	18.46	19.52	100
Category III (15)	49.08	15.25	5.92	29.75	100
Pooled (119)	44.14	12.63	28.14	15.09	100

Source: author's Calculation

Table 2: Distribution of Income according to Source among different categories of Rural Households in Agriculturally Advantaged and Disadvantaged Villages during 2021-22 (percent)

<i>Size Categories/ Village Types</i>	<i>No. of Holdings (percent)</i>	<i>Agriculture</i>	<i>Livestock</i>	<i>Wages</i>	<i>Trade & Services</i>	<i>Pooled</i>
Well -off Villages						
Category I	49.62	10.34	29.09	57.53	21.25	19.62
Category II	37.40	31.49	36.42	31.26	30.54	29.55
Category III	12.98	58.17	34.49	11.21	48.21	50.83
Total	100	100	100	100	100	100
Poor Villages						
Category I	48.74	17.66	30.48	47.29	10.18	21.49
Category II	38.65	28.45	34.12	33.05	28.24	30.12
Category III	12.61	53.89	35.20	19.66	61.58	48.39
Total	100	100	100	100	100	100

GIC of Income Distribution for Agriculturally Advantaged Villages: 0.32

GIC of Income Distribution for Agriculturally Disadvantaged Villages: 0.30

Table 3: Decomposition of Total Income according to Sources in Agriculturally Advantaged Villages

<i>Income Source</i>	<i>Income Share</i>	<i>Gini of Source</i>	<i>Correlation with rank of total income</i>	<i>Contribution to total inequality</i>	<i>Proportion contribution to total inequality</i>	<i>Relative income inequality</i>	<i>Marginal income inequality</i>
1	2	3	4	5	6	7	8
	S_k	G_k	R_k	$R_k G_k S_k$	$R_k G_k S_k / G$	Col. 6 / Col.2	Col. 6 -Col. 2
Agriculture	0.49	0.61	0.74	0.22	0.69	1.41	0.20
Livestock	0.18	0.42	0.45	0.03	0.09	0.50	-0.09
Wages	0.07	0.73	-0.53	-0.02	-0.06	-0.86	-0.13
Trade & Services	0.26	0.91	0.38	0.09	0.28	1.08	0.02
Total Income	1.00	0.32	1.00	0.32	1.00	1.00	0.00

Source: Author's calculation

Table 4: Decomposition of Total Income according to Sources in Agriculturally Disadvantaged Villages

<i>Income Source</i>	<i>Income Share</i>	<i>Gini of Source</i>	<i>Correlation with rank of total income</i>	<i>Contribution to total inequality</i>	<i>Proportion contribution to total inequality</i>	<i>Relative income inequality</i>	<i>Marginal income inequality</i>
1	2	3	4	5	6	7	8
	S_k	G_k	R_k	$R_k G_k S_k$	$R_k G_k S_k / G$	Col. 6 / Col.2	Col. 6 -Col. 2
Agriculture	0.53	0.60	0.71	0.22	0.73	1.37	0.20
Livestock	0.16	0.48	0.57	0.04	0.13	0.81	-0.03
Wages	0.09	0.67	-0.51	-0.03	-0.10	-1.11	-0.19
Trade & Services	0.22	0.86	0.38	0.07	0.23	1.04	0.01
Total Income	1.00	0.30	1.00	0.30	1.00	1.00	0.00

Source: Author's calculation

one (1.41 and 1.08 in case of former and 1.37 and 1.04 in case of latter type of villages respectively). On the other hand income obtained from livestock and wage labour is found reducing inequality in both the types of villages (values less than one for the former source and negative for the latter source respectively).

The marginal effect of an income source on inequality is also worked out for the two village types (column 8 in tables 3 and 4). Observation shows that agriculture has a positive and the largest marginal effect on income inequality (0.20) in both the types of villages. Next to agriculture, income from trade and services is found to have positive marginal effect on income inequality in both village types. It works out to 0.02 in case of AAV and 0.01 in case of ADV. The marginal effect of livestock on income is found negative. It comes to -0.09 in case of AAV and -0.03 in case of ADV. This indicates that an increase in livestock as a source of income would reduce income inequality. The negative marginal effect of wage income in both types of villages also suggests that a rise in this source of income would reduce income inequality.

CONCLUSION AND POLICY IMPLICATIONS

The study with the help of Gini coefficients finds inequality in income distribution among the households in both Agriculturally Advantaged and Agriculturally Disadvantaged Villages. Between these two types of villages the income inequality is relatively higher in Agriculturally Advantaged Villages than in Agriculturally Disadvantaged Villages. In both types of villages income distribution is found discriminatory against Category-I households (below one hectare of holding). These households' share in income is much less compared to their number. Among the sources leading to income inequality, agriculture followed by trade and services are found inequality increasing while incomes from wages and livestock are found inequality reducing. Particularly wage income is negatively related to income inequality. In view of the findings it is suggested that there is need for higher thrust in developing allied/subsidiary activities such as cattle rearing, poultry farming, small-scale manufacturing catering to local needs etc; through institutional credit support so as to reduce income inequality amongst the households in study villages. In Agriculturally Advantaged Villages along with these measures, land ceiling measures need to be regularly monitored so as to check reverse tenancy/ land leasing by small holders so as to contain growing concentration of land in a few hands. Since Puri is a coastal district and is prone to frequent natural calamities like flood and cyclone, and the small holders are more affected by such natural calamities there is need for providing them with social safety nets in the form of food assistance,

unemployment benefits etc as these government sponsored programmes have the potential to reduce income inequality.

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