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Dynamics of Income in Jharkhand: Evidences from Village Studies

M. S. Meena¹, K. M. Singh², R. K. P. Singh³, Abhay Kumar⁴, and Anjani Kumar⁵,

1. Introduction

A number of studies have been undertaken to pinpoint the contribution of different sources of income inequality in developing world (Kun and Lee, 2001; Leibbrandt *et al.*, 2000; Adams and Alderman, 1992). Incomes are not usually measured in developing-country surveys, and rarely in India. By measuring income and its sources, we know not merely level of a household's standards of living but also how it achieved that level and, thus we obtain a better understanding of why it is poor, average, or affluent. Measuring income along with households' expenditures and possessions also reveals aspects of income volatility and provides an additional measure of inequality. However, obtaining precise estimates of household incomes is complicated because few households have regular sources of income. Where incomes are irregular, such as in agriculture or business, considerable efforts is required to obtain estimates of revenue and expenditure before net income can be calculated. Indian Human Development (IHD) reports (2004-05) shows a large regional variation in both rural and urban incomes. In 2004, typical Indian households earned ₹ 27, 856 which was lower in Jharkhand (₹ 24, 000). Per capita income on national basis was ₹ 5,999 which are higher than Jharkhand (₹ 4,833). The lowest incomes are in Orissa (₹ 16, 500). The states wise differences are especially pronounced for rural areas and somewhat narrow for urban incomes. While financial resources themselves are insufficient to ensure health, educational attainment, or gender equality within households, a lack of financial resources is frequently an important constraint.

In Jharkhand, Census (2011) illustrates the dynamics among demographic features. State constitutes 2.70% (3.29 Crores) populace with 2.5% geographical area of country. The density is 414 per sq km which is higher than national average (382 per sq km). The total population growth in this decade was 22.34% which was 23.19% in previous decade. The proportions of rural and urban population are 75.95% and 24.05%, respectively. The literacy was higher in urban area (83.30%) than rural (62.40%). Sex ratio is higher (960) in rural than urban (908). Literacy rate in Jharkhand has seen upward trend (67.63%). Of that, male literacy stands at 78.45% while female literacy is 56.21%. Sex ratio in Jharkhand is 947 stands below the national average (940). Instead of these facts, there are various dimensions of human development such as access to education, health care, and well being of vulnerable populations. In Indian context, numerous studies have recently conducted on methodological issues for estimating income inequality and poverty and on actual measurement of these variables. But most of these studies are either based on secondary data available from National Sample Survey (NSS) and/or conducted for depicting the picture at national level. Literature based on in-depth village studies is limited particularly for Jharkhand state. Such studies can provide important insights that cannot be derived from secondary data due to lack of relevant information. These empirical studies help the policy makers to identify nature and character of income inequality within a

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society and devise policies to improve the income distribution. Hence, present study evaluates per capita income, income composition, income diversity, income inequality and its determinants in Jharkhand state.

2. Data and Methodology

The study is undertaken in four sample villages of the two sample districts in Jharkhand state, namely, Ranchi and Dumka to track the changes in rural poverty in eastern states of India. The data pertains to these two representative districts, one representing socio-economically developed district (Ranchi) and other representing the socio-economically backward district (Dumka). While Ranchi district has edge over other districts of Jharkhand with respect to education level, per capita income, health and hygiene, and infrastructure facilities. Dumka district has been inferior to majority of districts of Jharkhand with respect to education level, per capita income, health and hygiene, and infrastructure facilities. The study is based on primary as well as secondary data. Secondary data were obtained from published documents of various national organizations. Primary data collected from four villages of Jharkhand i.e., two villages each from Ranchi and Dumka districts of Jharkhand state. A sample of 40 households from each village, making a total household sample of 160 was selected for detailed investigation in project entitled “*Tracking Change in Rural Poverty in Households and Village Economies in South Asia*”. Besides simple statistical tools, Lorenz curve are plotted. Gini Ratio is computed to measure income inequality among villages of Jharkhand. Diversification index is computed to have an idea about diversity of income sources. Linear regression model is adopted to identify the determinants of income.

3. Trends in per capita income (NSDP/person):

Trend in per capita income in Jharkhand shows the estimates of Triennium Ending (TE) 1993-94 as ₹ 16, 024 which is higher from national average (₹ 15, 653). TE for 2004-05 depicts a decreasing trend (₹ 15, 617) while escalating trend was found in national level (₹ 23, 235). During TE 2009-10, income of Jharkhand and national level increased drastically (Table-1). The compound annual growth rate of Jharkhand during 1993 to 2004-05 was negative (-0.3) while the national growth was observed as 3.9%. The growth of Jharkhand was encouraging (2.7%) from 2004-05 to 2009-10 while the national growth was much higher (6.7%). For the whole period (1993-94 to 2009-10) growth of Jharkhand state was positive (1.5%) while growth of country was much elevated (4.8%).

Table-1: Trends in per capita income in Jharkhand (₹ /Person).

Year	Jharkhand	India
TE 1993-94	16024	15653
TE 2004-05	15617	23235
TE 2009-10	20106	32247
<i>Compound Annual Growth Rate (% per annum)</i>		
1993-94 to 2004-05	-0.3	3.9
2004-05 to 2009-10	2.7	6.7
1993-94 to 2009-10	1.5	4.8

4. Average per capita income in selected villages.

Per capita income reflects the purchasing power and living standard of the people. For inclusive growth, it is indispensable for the states to put in efforts to raise the income attributable to each person. Jharkhand state is growing at a frenetic pace in terms of their per capita income. Assocham Eco Pulse (2008) conducted a study on '*States performance in per capita income*' highlighted that Jharkhand state registered 16.6% growth with per capita income of ₹14,990. Table-2 & Table-3 recite per capita income annually and monthly, respectively. In-depth study in villages of Jharkhand have registered highest (₹ 16,814) annual per capita income among small households of Dubaliya village followed by medium (₹ 11,194) and large category (₹ 18,569). While in Dumariya and Hesapiri village, labour household had highest income, i.e. ₹ 15,470 and ₹ 12,788, respectively. Overall per capita income/annum in sample village was higher in Dubaliya village (₹ 14,871) followed by Dumariya (₹ 9,885), Hesapiri (9,066) and Durgapur (₹ 6,378) (Fig-1). Table-3 also shows identical trend. Average per capita income/month was highest in Dubaliya village (₹ 1,222) followed by Dumariya (₹ 812), Hesapiri (₹ 745) and Durgapur (₹ 524).

Table-2: Average per capita income in selected villages in Jharkhand (₹/Person/Annum).

Village	Labour	Small	Medium	Large	All
Dubaliya	12701	16814	11194	18569	14871
Hesapiri	12788	7364	7306	9346	9066
Dumariya	15470	7636	7222	9760	9885
Durgapur	6279	4031	6905	8367	6378

Fig.1 Per capita income (in₹)/annum in villages of Jharkhand, India.

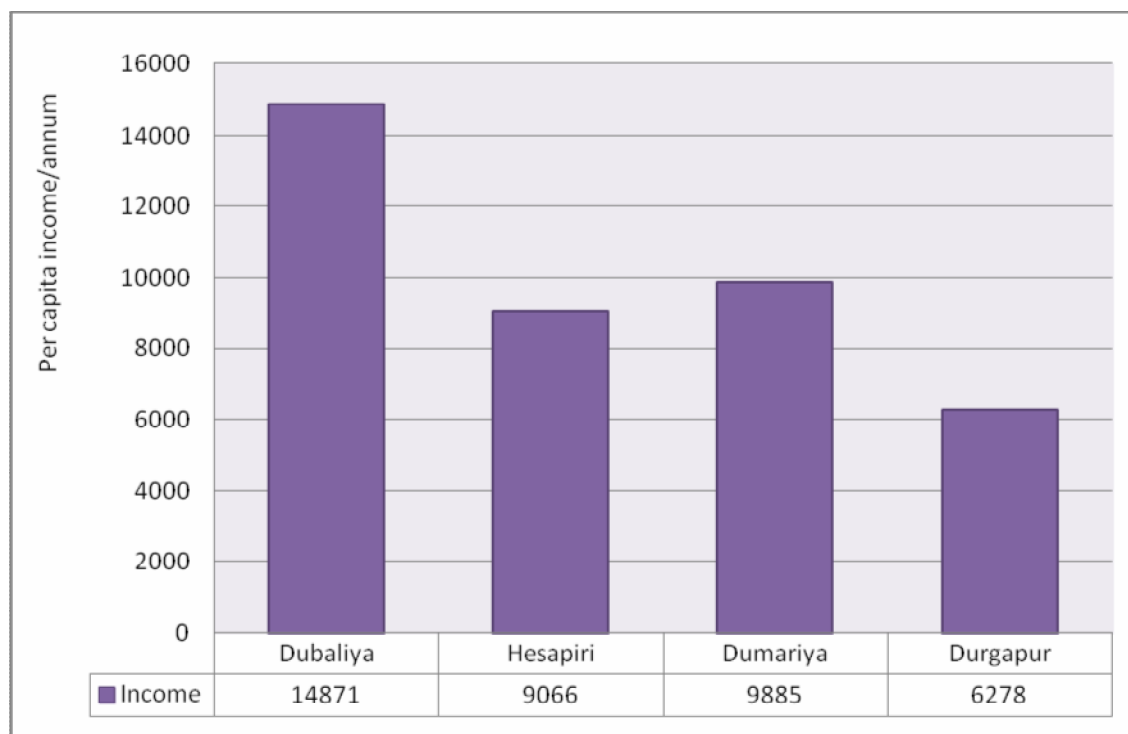


Table-3: Average per capita income (₹/person/month) in selected villages in Jharkhand.

Village	Labour	Small	Medium	Large	All
Dubaliya	1044	1382	920	1526	1222
Hesapiri	1051	605	600	768	745
Dumariya	1272	628	594	802	812
Durgapur	516	331	568	688	524

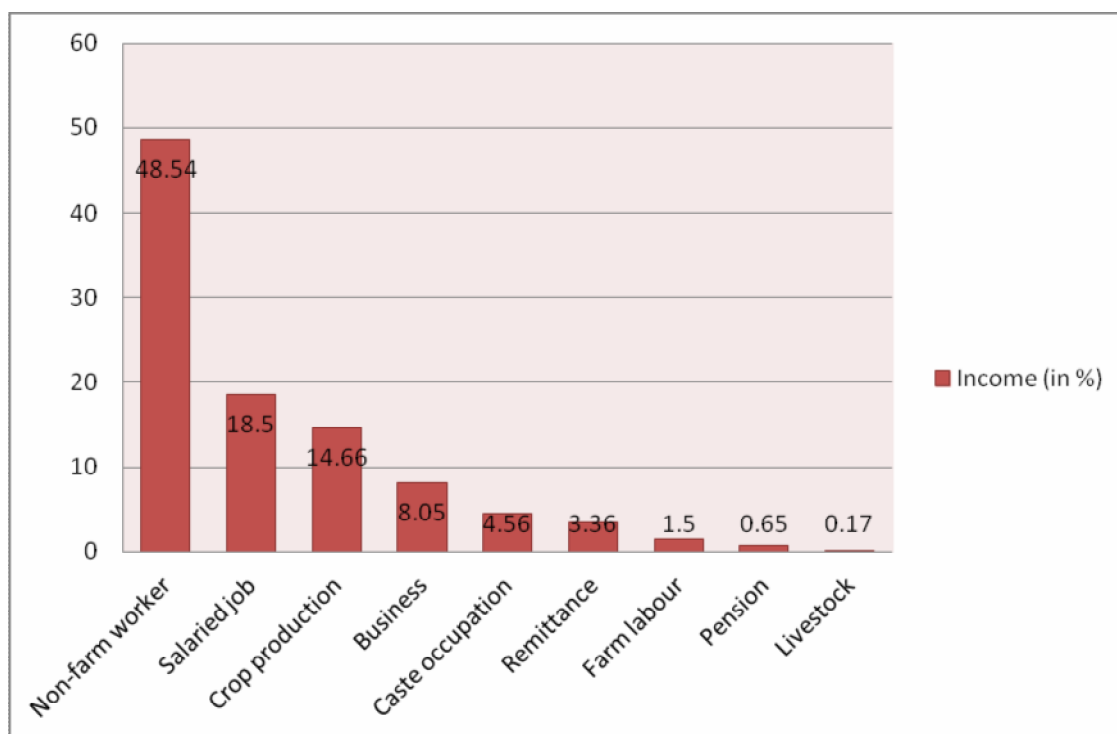
5. Composition of income

Source of income in sample households consisted of crop, livestock, farm labour, non-farm worker, salaried job, caste occupation, business, remittance and pension (Table-4). Income from the crop production was highest in Dumariya (31.36%) village followed by Hesapiri and Durgapur village. In Dubaliya village, crop production showed negative income (-2.04%) showed loss from cultivation of agricultural crops. The income from livestock is only 4.51% in Hesapiri while it is nearly 4% in Dubaliya and Durgapur each. Farm labour contributed very less income in Durgapur village while negligible in other three sample village. Non-farm activity is the prominent source of income of all the villages i.e. Hesapiri (63.67%), Durgapur (47.92%), Dubaliya (45.54%) and Dumariya (37.19%). After non-farm activity, salaried job is generating much income for villagers. In Dubaliya, its contribution is 38.27% followed by Dumariya (24.09%) and Durgapur (9.71%). Caste occupation (*Jajmani system*) is still prevalent in Jharkhand. Nearly one-tenth income of Dumariya village is accumulating from *Jajmani system* followed by Durgapur (6.91%). Business activity is only widespread in Durgapur village (16.31%). Remittances as a source of income contributed 8.87% in Dubaliya village whereas 4.59% in Durgapur village. A lesser amount of income is contributed through the pension source. In-depth investigation reveals that households obtained 48.54% average income from non-farm activity followed by salaries job (18.50%), crop production (14.66%), and business (8.05%). Less than 5% are obtained through caste occupation, remittances, farm laobur, pension and livestock (Fig-2).

Table-4: Composition of income (in %) in Jharkhand.

Village	Crop	Livestock	Farm labour	Non-Farm Worker	Salaried job	Caste occupation	Business	Remittance	Pension
Dubaliya	-2.04	3.99	0.00	45.54	38.27	0.00	3.48	8.87	1.89
Hesapiri	23.48	4.51	0.46	63.37	1.94	0.16	5.98	0.00	0.08
Dumariya	31.36	-11.65	0.78	37.19	24.09	11.20	6.46	0.00	0.57
Durgapur	5.84	3.86	4.80	47.92	9.71	6.91	16.31	4.59	0.07

Fig.2 Overall average income* from various sources in villages of Jharkhand, India.



*Note: The negative contribution/income was deducted from positive income and divided by no. of villages for overall average.

6. Diversity in income

Diversification of income is a long practiced strategy by many livelihoods in order to reduce risk of external shocks since different sources of income are likely to be affected differently by external shocks. Income diversification is key for risk management and will help vulnerable households to meet and smoothen the consumption, social and labour needs. Income diversification opportunities can be within and outside agricultural production and include both on and off-farm strategies. Table-5 depicts the picture of the income diversity in Jharkhand state. In the sampled villages, the maximum number of income sources was observed to be 9. The maximum income diversity sources were found to be 3.5 in Durgapur and Dumariya village. However, it is less in labour category while prominent in all other categories of households (small, medium and large) irrespective of sampled villages. Table-6 and Fig-3 elaborates the diversification indices of incomes in the Jharkhand state. Across the village, Dumariya had higher diversification index (0.50) followed by Durgapur (0.43), Hesapiri (0.40) and Dubaliya (0.28). Dumariya village shows higher diversification index indicates higher diversity in caste system at village compared to other villages. The higher diversity indices were observed among the large (0.40-0.60) and small household category (0.30-0.59) in all villages of Jharkhand state. The indices were least among the labour category as they had limited land (leased in) and options for diversification.

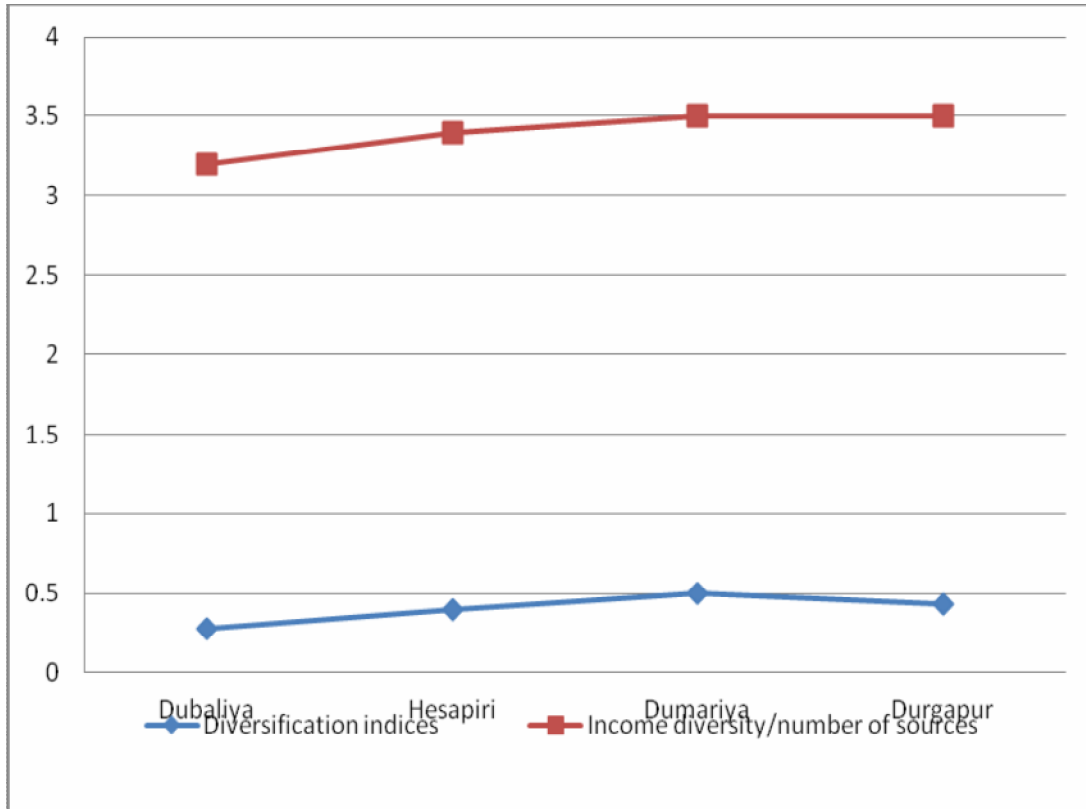
Table-5: Diversity in income in Jharkhand (Number of sources) Max: 9.

Village	Labour	Small	Medium	Large	All
Dubaliya	2.3	3.5	2.9	3.9	3.2
Hesapiri	2.7	3.6	3.6	3.5	3.4
Dumariya	2.9	3.8	3.8	3.5	3.5
Durgapur	3.3	3.8	3.4	3.4	3.5

Table 6: Diversification indices of income sources in Jharkhand

Village	Labour	Small	Medium	Large	All
Dubaliya	0.09	0.30	0.31	0.40	0.28
Hesapiri	0.18	0.41	0.51	0.48	0.40
Dumariya	0.30	0.59	0.51	0.60	0.50
Durgapur	0.39	0.52	0.28	0.52	0.43

Fig. 3 Diversification indices and income diversity in villages of Jharkhand, India.



7. Determinants of income

The variables of respondents i.e., age, education, size of households, non-farming income, and adoption of high yielding varieties found significant impact on households' income (Table-7). However, other variables i.e. own land, value of farm asset, members' earning, total land use and migration of respondents did not illustrate any relationship with the income of respondents.

Age of respondents: Age had significantly correlation with the income level. The respondents who had higher age earned higher incomes from various sources. Older respondents had rich working experience with diverse income generating enterprises.

Education: Education is an instrument for change. Education brings the changes the thinking process, knowledge level, skills and attitude of people. Education had a positive and significant impact on income of households. Higher levels of education quality increased a country's rate of technological progress (Jamison, Jamison & Hanushek, 2006). Moreover, higher levels of education quality increased growth rates of national income. Asadullah and Rahman (2005) demonstrate that basic literacy and numeracy in farmers leads to an increased ability to process agricultural information and take advantage of available technologies.

Size of households: Size of households has negative impact on income of households. Study confirms that the less number of households have more income with those had more family members.

Non-farm incomes: Non-farm income includes the income from off the farm. It includes non-farm wages, salaries, pensions, and interest income earned by farm families. Non-farm income had the significant impact on the income of households.

Adoption of High Yielding Varieties (HYVs): Dissemination of HYVs has been gradually penetrating Jharkhand state. However, present technological intervention of various research institutes, State Agricultural Universities (SAUs), Krishi Vigyan Kendra (KVK) had significant and positive impact on livelihoods of the households.

Table-7: Coefficients and corresponding standard error of variables for determining income in sample villages in Jharkhand.

Variables	't' value	Standard Error	Pr > t
(X1) Age (in years)	1.21	0.28354	0.2327
(X2) Education (in years)	2.93	0.11241	0.0053***
(X3) Household size (in number)	-2.06	0.31736	0.0453**
(X4) Land (in acre)	-0.63	0.09196	0.5329
(X5) Farm asset value (in ₹)	1.49	0.04704	0.1443
(X6) Earning member (in number)	1.35	0.24846	0.1838
(X7) Livestock (in numbers)	0.94	0.14162	0.3514
(X8) Share of non-farm income (in %)	-4.22	0.17347	0.0001***
(X9) Migration (yes-1; no=0)	0.68	0.21754	0.4973
(X10) High yielding varieties (in %)	2.07	0.11426	0.0448**
** Significant at 5% of probability, *** Significant at 1% of probability.			

The estimated coefficient of determination (R^2) for the variability in the data found to be 0.5418 which explains 54% variations due to variables under the study.

8. Income inequality

There are regional variations in income inequality in India, but the variation lies almost wholly within the variation observed among developing economies. The principal fact to be explained is not the inequality variations within India, but the enormous gap in inequality between developed countries and developing countries. Regional variations within India in income levels are more substantial. The higher income states have three to four times the income per capita as the lower income states. Nevertheless, these state differences in income levels account for only 9% of the national income inequality (Vanneman and Dubey, 2010). Most income inequality in India is within states. As per ASSOCHAM India Report (2012), between 2004-05 and 2009-10 the inequality (Gini Coefficient) in rural India has marginally increased from 0.264 to 0.274. This must have been the direct result of the fact that the growth in the lower Monthly Per Capita Expenditure (MPCE) class average consumption has been much lower than that experienced in the higher MPCE classes. There has been an increase of 0 percent points in the share of consumption expenditure of the bottom 20% population and an increase of 7.7% points in the share of consumption expenditure of the top 20% population during 2005-2010. These values indicate that there is more inequality in consumption expenditure in villages in 2010 when compared with that of 2005. It shows that along with economic growth, economic inequalities too have increased. This broadly implies that poor are getting poorer and the rich getting richer. The calculated Gini Coefficient for Bihar including Jharkhand state indicates that income inequalities have increased by 4.9% points.

The village study in Jharkhand (Table-8 & Figure-4, 5, 6, & 7) shows that among the labour category, Gini Ratio ranges from 0.24 to 0.55. The income inequality is highest (0.55) in Dumariya village while the more equality in was found in Dubaliya village (0.24). Among the small category, there is less variation (0.20 to 0.34) than labour class. In medium class the trend is almost alike (0.20 to 0.37). The larger farmers have more inequality with higher Gini Ratio (0.22 to 0.50). Overall the highest inequality was found in Dumariya village (0.43) followed Hesapiri (0.38), Dubaliya (0.36) and Durgapur (0.34). When considering the category of farmers, the highest inequality was found among labour class (0.55) followed by large (0.50), medium (0.37) and small (0.34) category.

Table-8: Income inequality (Gini Ratio) in selected villages in Jharkhand.

Village	Labour	Small	Medium	Large	All
Dubaliya	0.24	0.34	0.20	0.50	0.36
Hesapiri	0.48	0.29	0.35	0.26	0.38
Dumariya	0.55	0.25	0.37	0.22	0.43
Durgapur	0.30	0.20	0.31	0.36	0.34

Figure-4: Lorenz curve of per capita income per month: Dubaliya

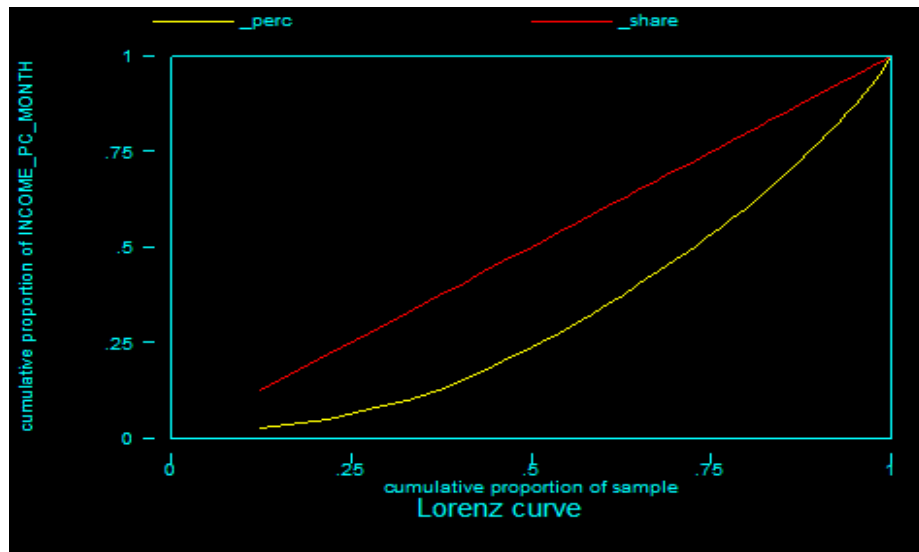


Figure-5: Lorenz curve of per capita income per month: Hesapiri

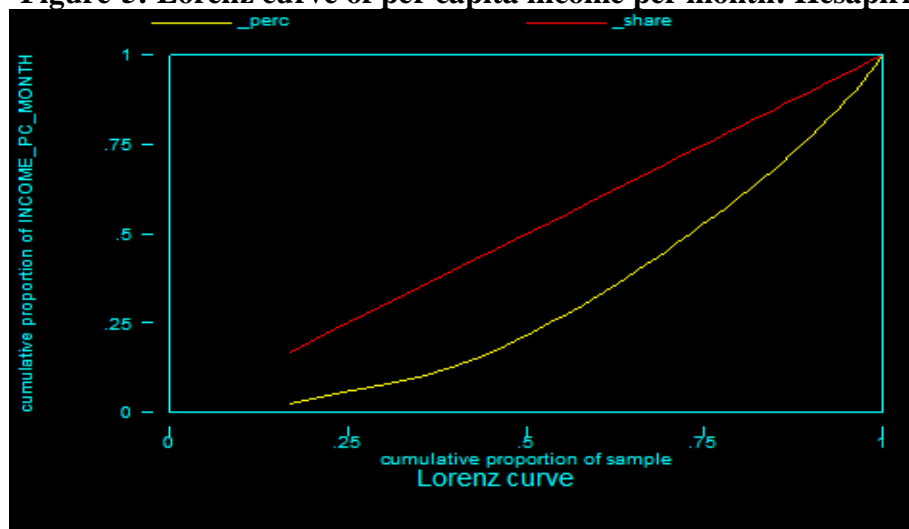


Figure-6: Lorenz curve of per capita income per month: Dumariya

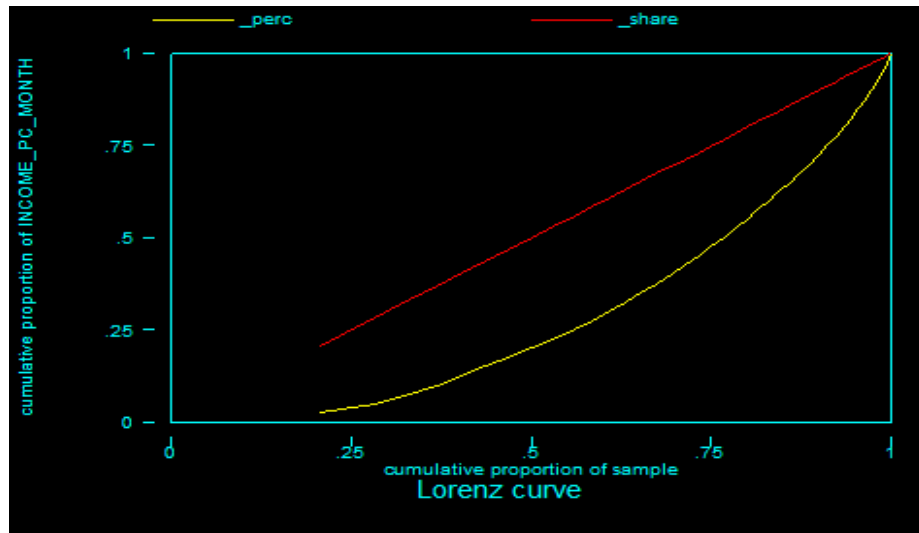
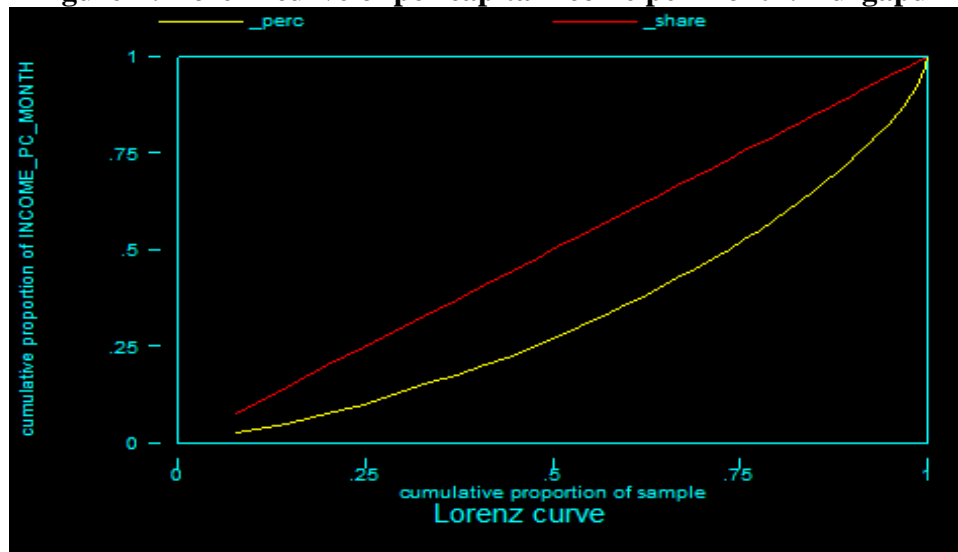


Figure-7: Lorenz curve of per capita income per month: Durgapur



9. Sources of income inequality

Distribution of total income may change because of changes in individual components of income and/or changes in income share of components. If additional income is derived from a relatively equally distributed sources, income distribution will improve. Conversely. If the faster growing sources of income are more unequally distributed, the inequality in the distribution of income

will worsen. The economic position of a household depends on the per capita income rather than on income from an individual component. Income inequality in India has increased between 1993 to 2005. Agriculture income and total income inequality has declined significantly. A marginal increase in agriculture and salaried income leads to increase in inequality: however a marginal increase in labour income leads to reduction in income inequality (Azam and Shariff, 2011).

Thakur *et al.*, (2000) conducted study in Bihar and reveals that income from rice cultivation (Gini, 0.37) and other agricultural activities (0.29) are less unequally distributed than the income from non-agricultural activities (Gini, 0.46). The most unequally distributed sources of income are services (Gini, 0.54) and trade and business (Gini, 0.45). However, household access to these sources of income depends on the endowment of physical and human capital and on the state of infrastructure development of the area. Obviously the high income households with educated members and favorable access to finance and credit are in better position to take advantage of the employment opportunities in the services and trade sector compared with low-income households get a larger share of income from this sources. The concentration of income from non-agricultural labour (processing, transport and construction activities), although positive, is less that of income from crop production activities. Since, the major source of households incomes come from non-agricultural activities and income from these sources are more unequally distributed. More than two-third of concentration of household incomes are on account of non-farm activities. In less developed villages, contribution of Rice cultivation (6% of total households' income) was marginal because it was a low-profit economic activity. While in technologically developed villages, it contributes to an augmenting of its share to 16%. The most favorable effect is on account of labour-based occupations-construction and processing activities and transport operations. The relatively less unequal distribution of incomes in the developed villages was mostly on account of non-agricultural activities.

It has been observed that per capita income, income and level of education are the significant sources of income inequality. An increase in per capita income is likely to increase income inequality but increase in level of education level increase income equality in villages under study in Jharkhand (*appendix-I*)

10. Conclusions and policy implications

The study evaluates the dynamics of income from Jharkhand state. Per capita income reflects the purchasing power and living standard of the people. The per capita income/annum in sample villages ranged from ₹ 6, 378 to ₹ 14,871 which shows a difference of more than doubles (₹ 8, 493). There are various sources of income however; non-farm activity was prominent source of income among all villages (37.19% to 63.67%). More interestingly, *Jajmani system* is still prevalent in the state and accumulating a considerable income. This shows that income diversification is a long practiced strategy by many livelihoods in order to reduce risk of external shocks. State has great diversity of income. Livestock system is an integral part of livelihoods of rural poor however its contribution is negligible. Livestock sector could be revived through the technological intervention from research institutes, development departments and policy planners. Study shows that age, education, size of households, non-farming income, and adoption of high yielding varieties are the main determining factors who had a significant impact on households' income. Gini ratio shows that highest inequality was found in Dumariya village (0.43). The ranges of Gini ratio were 0.33-0.43. The highest inequality was observed among

labour class (0.55) followed by large (0.50), medium (0.37) and small (0.34) category. Income inequality is higher across villages and households and education and income level emerged as important sources of inequality.

The findings have important policy implications. At government point of view, there is dire need for generating more non-farm labour opportunities through public works. These opportunities could lead to the better infrastructure facilities and rural livelihoods in rural India. Providing labour opportunities outside the agricultural activities can serve manifold and can reduce the income inequalities among the rural poor. It can play an important role in poverty reduction intervention and will provide safety mesh for income shocks. It will assist in reducing unemployment and under-employment in rural area. Education is an instrument for change. It brings the changes in the thinking process, knowledge, skills and attitude of people. Hence it could be an instrument for reducing inequality among the rural poor.

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Liner Regression Results/Jharkhand**The REG Procedure****Model: Linear_Regression_Model****Dependent Variable: Ginni Ratio**

Number of Observations Read	16
Number of Observations Used	16

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr>F
Model	4	0.12129	0.03032	6.76	0.0053
Error	11	0.04933	0.00448		
Corrected Total	15	0.17062			

Root MSE	0.06697	R-Square	0.7109
Dependent Mean	0.32556	Adj R-Sq	0.6057
Coeff Var	20.57067		

Parameters Estimates					
Variable	DF	Parameter Estimate	Standard Error	t-Value	Pr> t
Intercept	1	0.06877	0.17805	0.39	0.7067
Per_ Capita_Income	1	0.00030704	0.00006175	4.97	0.0004
Diversity_income	1	0.05583	0.04278	1.31	0.2185
Agriculture	1	1.923656E-7	1.693075E-7	1.14	0.2800
Education	1	-0.14469	0.04649	-3.11	0.0099