Dynamics of Rural Poverty in Odisha

Sahoo, Priyabrata

University of Hyderabad

10 November 2015

Dynamics of Rural Poverty in Odisha

Priyabrata Sahoo

ABSTRACT

The post-reform era in Odisha's economy has seen a major structural break in the year 2004-05. The economy achieved a high growth in NSDP especially in the farm sector since 2004-05 and a high reduction in Rural Poverty. Hence the major proposition which the article raises is whether the farm growth resulted in a reduction in poverty. The 1st period (1993-94 to 2004-05) has seen a distress in the farm sector and slow reduction in poverty while the 2nd period (2004-05 to 2011-12) witnesses growth in the farm sector and a higher decline in poverty. In the 1st period, there is a distress driven labor mobility from farm to nonfarm sector while the 2nd-period witness mobility of labor within farm sector. The growth in the farm sector in the 2nd period resulted in declined in poverty among all the economic groups in rural Odisha. The growth effect of the poverty decomposition is higher than the distribution impact. The state has witnessed huge disparities in Poverty among the regions. Except for rising in farm growth, factors which cause the reduction in poverty are an increase in public spending and rise in farm productivity since 2004-05.

Key Words: Rural Poverty, Farm Growth, Economic Groups, Decomposition, Odisha.

Journal Classification –

Introduction –

The state Odisha is situated in the eastern region of the Country and is having high natural resource base. It has a huge coastal belt, high forest cover and huge minerals reserves along with good climatic and fertile land. Amidst the plenty the state has been considered as one of the backward regions among the states and is having the 2nd highest incidence of poverty among the states of India after Bihar (Planning Commission). As per the latest 2011-12 National Sample Survey Organisation (NSSO) survey, around 33 percent of Odisha's population is poor in comparisons to 22 percent in the case of All India. To census 2011, 23% of the state's population belongs to Scheduled Tribe and 16% belongs to the Scheduled Caste constituting 40% of the total population of the state. Poverty in Odisha remains confined to Southern and Northern regions where the SC-ST population percentage is higher. The state has seen a slow urbanization process, and according to the latest 2011 census still 83% of the state's population lived in the rural areas. The main occupation of the rural population is agriculture. More than 60% of the state's rural population depends on the Agriculture sector for their livelihood. The Industrial sector of the state is mainly dominated by the mining activities. The minings are situated in the rural hinterland of the states where the tribal are living. Though post-reform has seen a huge flow of FDI to mining sectors and resulted in the higher growth rate of this sector, regarding employment generation the mining sectors lags behind (Das, 2016). Hence it's the agriculture sector which remains the backbone of the state. Odisha's per capita income for the fiscal year 2014 was rupees 24,928 which was about 62 per cent of the all-India average of rupees 39,904. This shows the state still lags behind the national average.

Some of the recent literature observed that the growth and relative economic position of Odisha have improved. Samantaray A et al. (2014) took both the income and non-income indicator (literacy rate, infant mortality rate & maternal mortality rate) to show the improved economic position of Odisha. Panda (2015) in his paper has shown Odisha has seen a high reduction in poverty after 2004-05. Das A (2014) also shows the inclusive nature of growth in Odisha in the recent decades by using the district level income & MPCE data. The 1990's decade has seen a slowdown in the agriculture growth (Patnaik Itishree 2011, Swain Mamata, Pradhan R.P) and a rising in mining growth (Das 2016, Mishra 2010). The reason for slow growth in agriculture is because of the shift in the focus of the Government of Odisha from Agriculture towards mining

due to the huge demand of Iron ore by China and the demand for coal for the power sector (Das Amarendra 2015). The attitude shift of the state from pro-poor to pro-business focusing on the cut down of subsidies to agriculture, Public expenditure also resulted in the slow growth of this sector. Whereas the period after 2004-05 has seen a higher agriculture growth and a reduction in the growth of the mining sector. While the 1st period (1993-94 to 2004-05) has seen a slower reduction in poverty, the 2nd period (2004-05 to 2011-12) has seen a higher decline which is highest among the states. Hence it seems there is a link between the agriculture growth and poverty reduction in the state. If it is true it is important to have a look into which are the occupation groups in rural Odisha seen a reduction in poverty. Is the household type engaged in farm sector as self-employed in agriculture and agricultural labor who has seen poverty reduction or the poverty reduction is among all the occupation groups both in farm and nonfarm sector? Does the structure of the Odisha economy especially structure of the labor market resulted in poverty reduction in the state? Is there a rise in income among the economic groups.

According to Gulati (2016), 90% of the total poor in Odisha are from rural area, and hence eradication of rural poverty through farm productivity plays an important role. The main focus of the paper is whether the reduction is poverty in rural Odisha is driven by the growth of the farm sector. In this paper, an attempt has been made to explain the variations in poverty in Odisha for the rural sectors and among the economic groups (Household-Type) and factors involved in the reduction. Whether the poverty has been declined among all the regions of Odisha. Does the growth effect of poverty reduction is higher than the inequality effect? The rest of the paper is organized as follows. The section-2 describes Growth and Poverty in Odisha. The section-3 deals with poverty among the economic group in rural Odisha. The section-4 deals with the population mobility and change in income among the households in rural Odisha. The section-5 provides the decomposition of poverty into growth & distribution effect. The section-6 explains the regional disparities in Odisha. The section-7 gives the necessary explanation of reduction in poverty and section-8 presents concluding remarks.

Growth and Poverty in Odisha –

The post-reform period has seen a higher growth rate at the national level as well in most of the states of India. Some of the states having very low per capita income in comparison to the national average have grown at a double-digit level. The post-reform period in Odisha has seen a

higher growth rate. The sectoral NSDP data has been collected from EPW Research Foundation from 1970-71 to 2012-13. The five-year moving average has been calculated to make the data series smooth. The splicing method has been used to make the data series into a common base. [1]I have used the dummy variable method and fit a semi-log method of estimation of regression. The CAGR has been estimated from the coefficient to reach the growth figures. The regression equation is - $\ln Y_t = a1 + a_2 D_1 + a_3 D_1 t + U_t$.

Where $\ln Y_t$ is the log of income, t is the time trend, and u_t is the random disturbance term. The D1 is the dummy variable which took value zero for 1st period and 1 for the 2nd period.

The decadal growth rate has been calculated. The post-reform period has seen a growth of 5.11 % which is twice that of the pre-reform 2.72%. The sub-sectors also saw a high growth rate in the post-reform. While the post-reform can be again classified into two decades. The 2000's decade has seen a high growth in NSDP especially has seen a high agriculture and primary sector growth. The agriculture sector has seen a growth of 4% from a negative growth in the previous decade. Odisha's economy has been undergoing a structural change with the service sector becoming more prominent accounting for more than half (56%) of the NSDP followed by the industrial sector (24%). The agriculture sector has a mere 20% share of the total NSDP of Odisha in the year 2011-12. Though the share of NSDP for the agriculture sector has declined over the year still 60% of the total population depends on this sector for their livelihood. The mining and Industrial sector's contribution to total employment is meager (Mohanty A 2015).

Table -1: Sectoral Growth of Odisha in Post-Reform Period

ODISHA-SECTORS	1972-73 to 1991-92	1992-93 to 2011-12	1992-93 to 2001-02	2002-03 to 2011-12
AGRICULTURE&AH	1.76	1.83	-0.17	3.97
PRIMARY	**1.30**	**1.89**	**0.31**	**3.48**
MINING & QUARRYING	5.07	10.06	12.32	4.02
TOTAL NSDP	**2.72**	**5.11**	**3.25**	**6.76**

Source – Calculated from NSDP series at 2004-05 base from EPW Research Foundation series

The factors causing a spurt in agriculture has to be explored. The mining sector of Odisha has seen the highest growth of 12 % in the 1990's decade while in the 2000's decade the growth has

---

[1] The NSDP data are of the different base. To have a comparable data series, I have converted the back series into 2004-05 base series by the method of splicing.

declined at a faster rate. The huge flow of the FDI to the Steel Industry and the increasing demand for steel by China & Japan resulted in the growth of mining sector in Odisha as explained by Das (2014). The fall in mining growth in the 2000's decade is due to the stringent law by the Supreme Court and by the Comptroller Auditor General (CAG) regarding the corruption in action and violation of environmental protection act. The economy has also seen a higher growth rate due to higher growth in Primary and tertiary sector in the 2000's decade. Does the high growth in NSDP in the post-reform resulted in poverty reduction in the state. Datt & Ravallion (1998, 2002) taking the panel data analysis among Indian state shoes a negative relation between rural poverty and farm productivity. The panel analysis can't be done for a particular state. So an analysis of Poverty among the socio-economic groups has been looked into to have an idea of the inclusiveness of poverty in Odisha.

Poverty Head Count Ratio (HCR) has been estimated by using the Tendulkar Methodology. The poverty line figures have been collected from the Planning commission, Government of India (GOI) and the poverty HCR from the NSSO unit level data. For calculating the poverty among the socio-economic group the NSSO unit level data on "Consumer Expenditure Survey" for the 1993-94 (55th), 2004-05 (61st), and the 2011-12 (68th) round has been used.

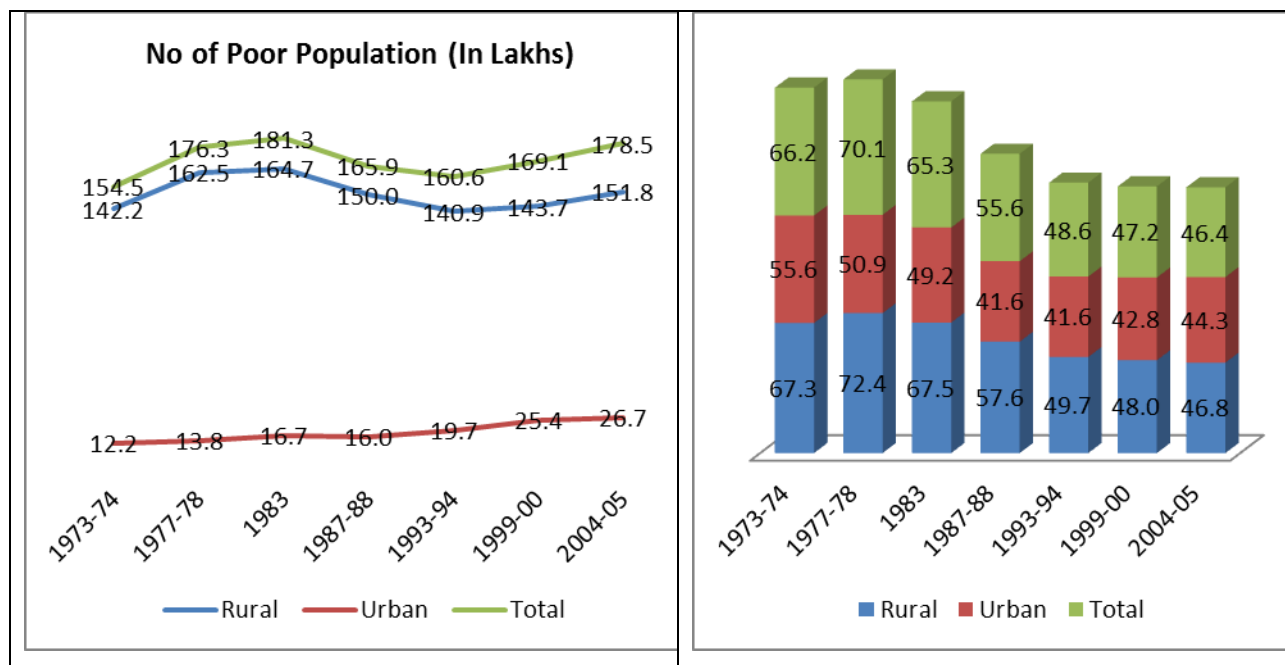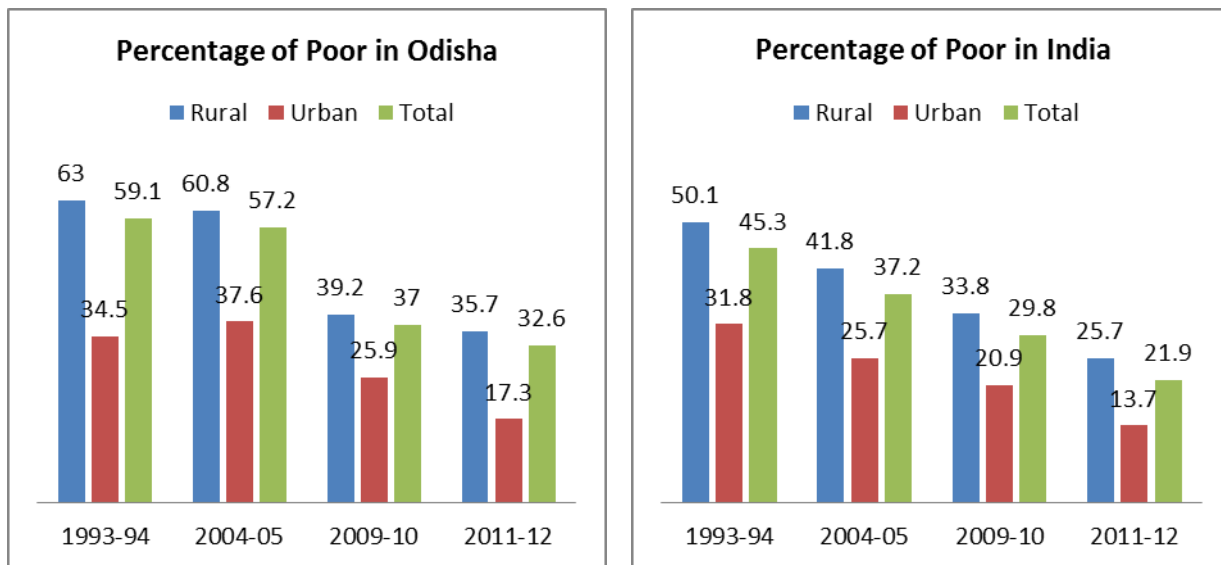Fig.1: Number of Poor (In Lakhs) and Percentage of Population below poverty in Odisha

Fig.2: Percentage of Population below poverty in Odisha and India to Tendulkar Methodology

Percentage of Poor in Odisha

■ Rural ■ Urban ■ Total

	1993-94	2004-05	2009-10	2011-12
Rural	63	60.8	39.2	35.7
Urban	34.5	37.6	25.9	17.3
Total	59.1	57.2	37	32.6

Percentage of Poor in India

■ Rural ■ Urban ■ Total

	1993-94	2004-05	2009-10	2011-12
Rural	50.1	41.8	33.8	25.7
Urban	31.8	25.7	20.9	13.7
Total	45.3	37.2	29.8	21.9

Source – Planning Commission

Figure.1 gives a picture of Number of poor and the percentage of poor in Odisha starting from the 1973-74 (27th) quinquennial rounds. The data point stops at 2004-05 as it was taken into consideration the Lakadwala Methodology. Figure.2 is based on the Tendulkar methodology which starts with 1993-94. The year 1999-00 has been omitted from the analysis due to the problem in estimation. [2]

From the figure's it can be shown that the poverty is higher in the Odisha than the all India level in both the sectors in all the NSSO rounds. Poverty and the number of poor started declined in Odisha mainly in the period of 1983-93 and 2004-05 to 2011-12. Comparing the 50th and 61st round where the poverty in India has been declined by 9 % and the decline for Odisha is very slow 2% point. The period between 2004-05 to 2009-10 has seen a much decline in the poverty in Odisha which is one of the fastest among the states. The decline in poverty is 20% point in Odisha which is much higher than the national average of 7% point. Even the decline from 2009-10 to 2011-12 is higher at the Odisha than the all-India. Both the Rural sector and the combined shows the same trends over time, as the higher percentage of the poor population are residing in the villages both in Odisha and India. While the gap between the rural and urban

---

[2] The NSS CES survey 1999-00 has a problem in the estimation of reference period and hence can't be compared with other rounds.

poverty in India is very low, in the case of Odisha it is higher. The recent period has seen a higher decline in poverty in Odisha. Still, around 32% of the population in Odisha are poor which is 10 percent point higher than the national level. Odisha is a state where 83% of the people reside in rural areas, and 90% of the total poor in Odisha are from Rural Odisha (Gulati 2016). Hence it becomes important to know the among which economic group in rural areas of Odisha poverty lies. Does the poverty reduction in Odisha is inclusive?

Poverty Among Economic Group (Household-Type) in Rural Odisha –

Though various studies have been done on poverty at the national and state level also, very few study have been done on poverty at the sectoral level. A sectoral analysis of poverty in the rural area shows a change in poverty among farm and nonfarm sector in rural areas. The sectoral analysis too gives us a picture of the relationship between poverty and growth of that sector. The further disaggregation of poverty into economic groups gives us a clear picture of the nature of poverty, whether the poverty reduction is inclusive or not? At the national level, there are few literature Sundaram& Tendulkar (2003), Thorat&Dubey (2012) dealing with the poverty among the socio-economic groups. As this is important to know which economic group poverty lies and which are the household type seeing a higher decline in poverty, this section focusses on the poverty among household type in rural Odisha. NSSO makes disaggregation of the surveyed households according to economic groups, what the NSS reports describe as "household types." These are classified on the basis of the reported major source of income or livelihood during the last year for the household as a whole. Five household types are distinguished for the rural households by ownership or lack of physical or human capital, [3] Namely - i) Self-employed in agriculture, ii) Self-employed in non-agriculture, iii) Rural agricultural labor, iv) Other rural labor, v) other. Table.2 presents the Poverty Head Count Ratio (HCR) & percentage of poor among the sectors in rural Odisha and India.

Table-2: The poverty HCR and share of House Hold to total Poor in Rural Odisha & India

		Poverty HCR			Percentage Share of Poor		
	Sector	1993-94	2004-05	2011-12	1993-94	2004-05	2011-12
	Farm	65.11	68.21	41.34	81.18	71.84	67.09
Rural Odisha	Non Farm	52.70	48.65	29.31	18.81	28.15	32.90

---

[3] For Detailed discussion on Household type look into Sundaram & Tendulkar (2003)

	Total	62.35	61.27	36.42	100.00	100.00	100.00
	Farm	54.69	45.34	27.90	79.25	72.84	65.41
	Non Farm	41.70	34.96	22.13	20.75	27.15	34.58
Rural India	Total	51.37	41.96	25.59	100.00	100.00	100.00

Source – Authors own calculation from NSSO CES unit level data using NIC classification

While the poverty HCR among the farm sector in the 1st period rises slowly from 65% to 68%, the non-farm sector has seen a decline from 53% to 49% in rural Odisha. While at the national level the HCR fall for both the sector. Hence the overall decline in poverty in the 1st period is because of the declines in poverty in the nonfarm sector only. The farm sector contribution to the total poor in rural area decline from 81% to 72% in the 1st period, though the percentage of poor increases among the farm sector. This is because of the fall in the percentage of population among the farm sector i.e. movement of people from farm to non-farm sector which will be explained in the next section. The rural nonfarm sector has seen a fall in HCR though the contribution to the total rural poor has increased from 19% to 28%, which is because of the rise in the percentage of the population in the rural nonfarm sector. The 2nd period has seen a decline in the percentage of poor in farm and nonfarm sector in rural Odisha. The decline in HCR both for farm and the nonfarm sector is faster in the case of rural Odisha than the national level in the 2nd period. The reasons are the 2nd period has seen a high growth in the farm sector in Odisha in comparison to the national level. It shows the importance of the farm sector in a reduction in poverty in Odisha. The more disaggregated figures are needed to have an idea of the inclusive nature of poverty. Whether the poverty has declined for particular groups or the decline is throughout the groups can be looked into. The inclusiveness can be looked by looking the poverty among the economic groups. Table.3 gives us a picture of the percentage of the poor population and their share of total rural poor, located in households classified according to economic groups.

Table -3: The HCR and share of House Hold to total Poor in Rural Odisha

Rural	Poverty HCR			Percentage Share of Poor		
Sector	1993-94	2004-05	2011-12	1993-94	2004-05	2011-12
Self Employed in Agriculture	55.27	59.07	32.10	34.33	32.24	34.38
Self Employed in NonAgriculture	56.62	47.24	25.18	13.55	14.74	13.47
Agriculture Labour	79.72	79.05	59.63	42.75	36.40	31.23
Other Labour	65.85	71.50	45.44	4.83	12.20	16.32

Others	33.75	28.84	14.64	4.52	4.41	4.57
Total	62.34	60.90	35.69	100.00	100.00	100.00

Source- Calculated from Unit level data of NSSO, CES Survey

It is the agricultural labor households which record the highest headcount ratio of nearly 80 % in the year 1993-94, which declines to 60 % in 2011-12. This group also contributes the highest percentage of poor in rural Odisha though it has declined from 43% to 31%. These households possess little if any, physical or human capital assets and depend on for their livelihood on irregular, fluctuating and uncertain casual labor employment, related mainly to seasonal agricultural activities which are dependent on the vagaries of weather. Agricultural labor households forming 19 per cent of the total rural population (Table 6) but accounting for an overwhelming 31 percent of the rural poor, clearly represent the most vulnerable segment of the rural economy in the year 2011-12. It is the non-agricultural rural labor whose population as well the share to total poor has been increasing more than triple over the period. There is a diversification from agricultural labor to other labor of non-farm sector in Odisha. It has seen a rise in the percentage of poor among the other labor which shows a distress driven mobility between these two groups. The 1st half the decline in poverty has been contributed by the nonfarm self-employed and the other. While for the self-employed in agriculture and other labor of nonfarm sector the HCR increases and for the agricultural labor it remains same. But regarding share of the total rural poor the share of agriculture labor has declined throughout and other labor has seen a rise. This might be the result of the diversification of population from farm to nonfarm sector. The HCR has declined for all the groups in the 2nd period. Rural agricultural labor and casual labor constitute the most vulnerable and economically disadvantaged segments, with the highest HCRs across household types, in the rural areas. The former i.e. agricultural labor households, also account for the numerically dominant share of the poor rural population. The lowest HCR is recorded other households in rural Odisha i.e., the regular wage and salaried households in the rural population. The analysis can be combined with the growth story of the agriculture sector in Odisha. The 1st period has seen a growth of the rural nonfarm sector as seen in the high growth of mining and registered manufacturing and the declines in poverty are among the nonfarm economic groups. The poverty HCR has risen among the farm economic groups due to a negative farm growth in this period. The 2nd period has seen a poverty reduction among all the economic groups which can be explained due to a high growth of farm sector and poverty

reduction among all the groups due to the linkage of the farm with nonfarm sectors. Hence its the growth of the farm sector which resulted in the reduction in poverty at a higher rate. As we know, the sectoral growth has an impact on the population mobility and income among the groups. Hence it is important to have a look into the labor mobility between sector in rural areas and the change in income there in which has been explained in the next section. Table 4 & 5 presents the population mobility and the real income among the economic groups over time.

Structure of Odisha Economy –

As we know with structural change in an economy both the output and employment has shifted from low productivity traditional sector to high productivity modern sector. The economy moves from agriculture to industry to service sector. The post-reform period saw a high growth in Odisha. Is there any major structural changes in Odisha. Whether the change in the composition of growth in Odisha have an impact on the labor mobility. Is there any major change in income among the major household-type? The NSSO unit level data on Consumer Expenditure Survey (CES) has been used to calculate the change in population share between the sector and among the economic groups. The adjustment has been made to convert all the Monthly Per Capita Expenditure (MPCE) data into 2004-05 real series.[4] The mean income for the rural economic groups and for the different sectors has been calculated from the real MPCE series. Table.4 presents the labor mobility and change in real income among the household type in rural Odisha.

Table-4: The share of Population and the Real MPCE among the HHType in Rural Odisha & India

	Population Share			Real MPCE		
	1993-94	2004-05	2011-12	1993-94	2004-05	2011-12
	77.73	64.54	59.11	392.24	377.52	489.74
	22.26	35.45	40.88	461.53	494.8	579.11
Rural Odisha	100.00	100.00	100.00	407.71	422.05	531.28
	74.43	67.41	60.00	483.5	538.73	661.29
	25.56	32.58	40.00	568.56	651.59	758.36
Rural India	100.00	100.00	100.00	505.23	579.18	707.23

Source – Same as a table.2

Table-5: The share of Population and the Real MPCE among the HHType in Rural Odisha

[4] The poverty ratio of (2004-05 PL with the respective year) has been multiplied to get the real MPCE series.

Rural	Population Share			Real MPCE		
Sector	1993-94	2004-05	2011-12	1993-94	2004-05	2011-12
Self Employed in Agriculture	38.72	33.24	38.23	428.75	416.49	528.12
Self Employed in NonAgriculture	14.92	19.00	19.10	425.40	483.49	570.16
Agriculture Labour	33.42	28.04	18.69	337.56	331.95	413.48
Other Labour	4.57	10.39	12.82	386.52	365.57	458.18
Others	8.34	9.31	11.14	570.98	651.13	757.20
Total	100.00	100.00	100.00	407.71	422.05	531.28

Source - Author's calculation from unit level data of NSSO, CES Survey

 In the year 1993-94 around 78% of the population are engaged in the farm activities in the rural Odisha and the rest 22 % of the rural population engaged in the nonfarm activities. The percentage of the population in farm activities has declined, and the nonfarm activities have increased over time. The diversification over the period is higher in the case of Odisha in comparison to the national level. Around 60 % of the population depends on the farm activities both in rural Odisha and India. Turning to rural household types, a population located in self-employed (agricultural as well as non-agricultural) households accounted for nearly 54 percent of the total rural population which increases to 58 % over the year. However, the share of the population located in rural (agricultural as well as non-agricultural) manual labor households was 38 percent which declines to 31%. Residual (non-manual, non-self-employed) households were 9% of the total rural population which rises to 11%. Within each of the two major groups of the self-employed and rural labor households, agricultural ones dominated over the non-agricultural. The 1st period from 1993-94 to 2004-05 has seen a reduction in the percentage of the population engaged in self-employment agriculture and agricultural labor and a rise in self-employed non-agriculture and nonfarm casual labor. This is because of the negative growth rate of the agriculture sector, people have been shifting to the rural nonfarm sector. The labor mobility from farm to the nonfarm sector in the 1st period is due to distress in the farm sector. Though there is a movement from farm to the non-farm sector in rural areas the HCR has declined only for the nonfarm self-employed but for the other casual labor, it remains same in the 1st period though there is a non-farm sector growth in that period. The rural nonfarm growth of mining and manufacturing are highly capital intensive and does not result in the generation of employment as proposed by Mohanty 2016. But the 2nd period from 2004-05 to 2009-10 has seen an increase in self-employed agriculture, while the self-employed non-agriculture population remains same

as 2004-05. The share of agricultural labor has declined while the casual labor and others have increased slowly in this period. The period has seen a mobility of population within farm sector. The decline in the share of agricultural labor moves towards the self-employed agriculture. The 2nd period has seen a revival of the agricultural growth. This period has seen stagnancy in the nonfarm sector regarding the labor mobility. The mobility took place among the farm sector from agricultural labor to the self-employed agriculture. In the 1st period (1993-94 to 2004-05) the decline in HCR is higher for the self-employed non-agriculture followed by others. The poverty has increased for the other labor showing the casual rural non-farm worker have not benefited much from the diversification from farm to non-farm where the self-employed rural nonfarm does benefit. The HCR has increased among self-employed agriculture. Whereas in the 2nd period (2004-05 to 2009-10) has seen a reduction of poverty among all the economic groups. The decline in poverty is higher among the other, followed by self-employed in farm and nonfarm sector and the agriculture labor.

Though the 1st period has seen a fall in farm income in rural Odisha, the 2nd period has seen a rise in income both for the farm and nonfarm sector. At the national level both the period has seen a rise in income of both farm and nonfarm sector. The decline in farm income in the 1st period is because of the negative growth of the agriculture sector in Odisha. The rise in income for the rural nonfarm sector is higher in the 2nd period in comparison to the 1st period. The real MPCE for rural Odisha increases by 0.32 % annually in the 1st period while in the 2nd period the annual increase is very high of 4.31 %. Especially the rise in income is higher among the self-employed in agriculture which increases by 4.47 % followed by agricultural labor MPCE by 4.09% annually. While the income from the other labor rises annually by 4.22 % the self-employed agriculture MPCE rises annually by 3% point. Among the household type the MPCE higher for the others followed by self-employed in non-agriculture & self-employed in agriculture. The agriculture labor is having the lowest MPCE among the economic groups. The others and self-employed in agriculture have above average MPCE of rural Odisha. Hence the 2nd period has seen a rise in income among all the household type in rural Odisha with a decline in HCR over all the groups. The growth of farm sector in the 2nd period has an impact on the income and poverty of farm and nonfarm sector through the farm-nonfarm linkage.

Decomposition of Poverty –

In the previous section, we have been dealing with the poverty among the socio-economic groups. The decline in poverty is attributable to the change in Monthly per capita expenditure and the distribution. The methodology of decomposition of change in poverty starts with the seminal work of Jain & Tendulkar (1990), Datt & Ravallion (1991) and recently by Kakwani (2000). Whereas the first two author distinguishes a change in poverty into growth in MPCE, distributional change & the residuals, Kakwani proposed an exact decomposition where there are no residuals. Later on Son (2003), Mishra (2015) has included the population effect in the poverty decomposition literature. The change in poverty can be written as follows.

$$\Delta P = P(z_t, \mu_t, L_t) - P(z_{t0}, \mu_{t0}, L_{t0}) = \Delta P_\mu + \Delta P_L \quad \text{.....................(1)}$$

$$\Delta P_\mu = [(P(\mu_t, L_0) - P(\mu_0, L_0)) + (P(\mu_t, L_t) - P(\mu_0, L_t))]/2 \quad \text{............(2)}$$

$$\Delta P_L = [(P(\mu_t, L_t) - P(\mu_t, L_0)) + (P(\mu_0, L_t) - P(\mu_0, L_0))]/2 \quad \text{............(3)}$$

The 1st equation presents the change in poverty is equal to change in mean income and change in distribution. The change in mean income keeping inequality constant has shown in equation-2 and change in inequality keeping mean income constant has been shown in the equation -3. The average has been taken and the residual if any has been canceled and what we got the exact decomposition as proposed by Kakwani (2001). [5]

Table-6: Decomposition of change in Poverty into Growth & Distribution in Rural Odisha

ODISHA	1993-94 to 2004-05			2004-05 to 2011-12			1993-94 to 2011-12		
Rural HH Type	change	growth	distribution	change	growth	distribution	change	growth	distribution
farm	3.1	3.14	-0.03	-26.87	-26.61	-0.25	-23.77	-25.24	1.47
Non farm	-4.05	-5.58	1.52	-19.34	-14.32	-5.01	-23.39	-22.16	-1.23
SE AGR	3.79	2.72	1.06	-26.97	-24.95	-2.02	-23.17	-24.56	1.38
SE NA	-9.38	-14.24	4.85	-22.1	-15.12	-6.98	-31.44	-32.31	0.875
AGR LAB	-0.67	1.13	-1.8	-19.41	-21.09	1.67	-20.09	-22.42	2.33
OTH LAB	5.64	6.58	-0.93	-26.39	-24.17	-2.22	-20.41	-16.66	-3.74
OTHERS	-4.91	-10.59	5.67	-14.19	-10.97	-3.22	-19.11	-20.14	1.02
All	-1.43	-3.87	2.43	-25.26	-22.31	-2.95	-26.64	-28.76	2.11

---

[5] The decomposition of poverty into growth – inequality has been made using the command developed by the POVCAL network of the World Bank by using the STATA software.

Table 6 presents the decomposition of change in poverty into growth in MPCE & the distributional effect in rural Odisha among the economic groups. While the growth in MPCE have a positive impact on poverty reduction while the distributional change has both positive and negative impact depending upon fall & rise in inequality. While the rise in income will result in poverty reduction, the rise in inequality will offset the poverty reduction. For the rural Odisha as a whole, the growth in MPCE in the 1st period has been offset by a rise in inequality resulting in a smaller reduction in poverty. The effect of growth in MPCE on poverty is higher among the self-employment non-agriculture and other in the 1st period and among the self-employed agriculture and agriculture labor and other labor in the 2nd period. The rise in inequality is higher for self-employed non-agriculture and more on other in the 1st period and agricultural labor & self-employed in agriculture in the 2nd period. The inequality is higher in the groups where the growth is higher. In the 1st period, inequality is higher among nonfarm groups as there is a growth of the nonfarm sector in the 1st period and in the 2nd period the inequality is higher in the farm group as the growth of farm sector is higher in the 2nd period. In the 2nd period, the growth effect has risen faster in comparison to the 1st period among all the groups. The inequality has declined for all the socio-economic groups in the 2nd period. While in the 1st period the rise in rural inequality is due to rise in inequality of the non-farm sector, in the 2nd period the fall in inequality is due to fall in inequality among the nonfarm sector. The slow growth in MPCE with the rise in inequality resulted in a slow poverty reduction in the 1st period. The rise in growth and reduction in inequality in the 2nd period forces the poverty figures down. The high growth in the farm sector in the 2nd period has resulted in a high reduction in poverty in Rural Odisha.

Poverty at the Sub-Region of Odisha: -

Odisha state has diversified geographical regions regarding climatic condition, demographical characteristics and occupational distributions. Odisha is having three NSS regions as coastal, Northern and Southern. The coastal region consists of 9 districts, northern region nine districts, and the southern region has 12 districts. The coastal regions are well irrigated and having good climatic and soil condition. The northern regions are dominated by mining activities, and extraction of mineral has taken place in these regions. The southern regions are hilly and tribal regions. The coastal region of Odisha has higher primary sector production, and the northern

regions have high industrial production. Hence Poverty varies among the regions and among socio-economic groups. The coastal regions are having the lowest percentage of poor followed by northern and southern. The districts of Coastal region have seen a high reduction in poverty followed by northern and southern.

Table.7: – Poverty at the regions of Odisha

Region	2004-05			2009-10			2011-12		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Coastal	41.75	35.38	40.75	25.16	18.08	23.95	21.60	6.90	19.00
Southern	73.44	44.61	71.00	52.35	37.08	50.80	48.00	35.60	46.61
Northern	70.73	36.29	64.98	41.66	29.26	39.78	39.97	19.13	36.74
Total	60.91	37.52	57.71	39.15	25.91	37.26	35.70	17.20	33.00

Source – Calculated by the Author from Unit level NSSO CES data

The southern region of Odisha is having the highest percentage of poor followed by northern and coastal. The rural poverty in the coastal region is half that of the southern and one-third of the northern regions. The urban poverty in the coastal region is one fifth of the southern and one-third of the northern region for the year 2011-12. The annual percentage decline in rural poverty between 2004-05 to 2011-12 remain 6.89 and 6.21 percentage point respectively among coastal & northern regions, while it is less for the southern region 4.95 % point. While for the urban Odisha the coastal region has seen twice decline in poverty in comparison to the northern and four-time decline in comparison to the southern. The annual percentage decline in poverty in urban Odisha of coastal, northern and southern are 11.50, 6.76 and 2.89 percentage point. While the rural Odisha has seen a higher decline in poverty between 2004-05 to 2009-10 the urban Odisha has seen the highest decline between the year 2009-10 to 2011-12.

Odisha is one among the states having huge mineral reserves, and around 40% of the total populations are Scheduled Caste and Scheduled Tribe. Odisha Industrial activities are mainly confined to the mining in the rural hinterland which has seen a high growth rate in the 1990's decade. These are the regions which are having a high percentage of the tribal population. Out of total population of Odisha around 40% belongs to the scheduled caste and scheduled tribe and hence it became important to know the incidence of poverty among these regions/districts of Odisha. Odisha is having seven mining districts and fifteen districts which are having more than

40 % of the SC-ST population which are above the state average. NSSO unit level data for the 61st, 66th & 68th round has been used for this purpose. The districts have been recoded into SC-ST & NonSC-ST districts, mining & non-mining districts.

Table-8: Poverty among SC-ST and Mining – Non-Mining Regions of Odisha

Regions	2004-05			2009-10			2011-12		
	Population	HCR	% Share of poor	Population	HCR	% Share of poor	Population	HCR	% Share of poor
SC-ST DIST	42.25	75.34	52.27	41.86	57.37	61.35	41.60	53.61	62.50
OTHER DIST	57.74	50.34	47.72	58.13	26.02	38.64	58.39	22.91	37.49
MINING DIST	26.56	58.67	25.58	26.75	48.38	33.05	26.62	41.42	30.90
NON MIN DIST	73.43	61.71	74.41	73.24	35.77	66.94	73.37	33.61	69.09

Source – Calculated by the Author from Unit level NSSO CES data

Though the poverty has declined both among SC-ST and not SC-ST districts the decline is faster in the later showing an increase in the percentage of share of poor among the from 52 % to 63% among the SC-ST districts. Similarly, though the poverty HCR has declined both in mining and non-mining districts the decline is faster among the non-mining regions showing an increase in the percentage share of poor among the mining district. This figure shows that poverty mostly lies among the SC-ST and mining regions of Odisha. The rise in the mining sector has not benefited the masses. It might be because the Industries in Odisha highly become capital intensive with a high capital-labor ratio as proposed by Mohanty (2014). The employment generation of the mining industry has declined over the year, Das (2014). Hence poverty in Odisha became a social phenomenon. The mining does not have a significant impact on the poverty reduction in Odisha. Instead, it's the growth of agriculture which resulted in the poverty reduction in Rural Odisha. If the proposition " farm growth reduces poverty in rural Odisha" & "there exist a linkage between farm & nonfarm sectors in Odisha" holds true the poverty must decline among all the economics groups in Odisha in the periods where there is a growth in the farm sector, which is true for the rural Odisha.

Mechanism of Poverty Reduction –

This section proposes factors which might cause the reduction in rural poverty in Odisha. The whole set of literature available on the mechanism of poverty reduction can be classified into three heads as farm growth, non-farm growth, and public spending. The paper by Ahluwalia M S(1978), Datt & Ravallion (1998), Eswaran et all (2009), Janvery & Sadoulet (2009) emphasizes the role of the farm sector, especially the farm productivity on rural poverty. Fan- Hazell & Thorat (2000), Hong & Ahmed (2009) looks into public spending and its impact on rural poverty. Whereas Foster & Rosenzweig (2004), Lanjouw & Murgai (2009), Ravallion & Datt (2002) emphasizes the role of non-farm sector growth on rural poverty.

The farm sector has a direct impact on the poverty reduction via a rise in productivity and agricultural wage whereas non-farm sector has an indirect impact on rural poverty through labor allocation from farm to the non-farm sector and its impact on agricultural wage and poverty. Public spending, especially on the welfare program, resulted in a reduction in poverty. The analysis is looking into which are the factors causing the reduction in poverty in Odisha in the recent decade.

The area of food grain production more or less remains same in Odisha after the post-reform, but the production has risen since 2002-03. This is due to the rise in yield in this period (Swain 2007, Pradhan 2008). The revenue expenditure and especially the developmental expenditure have seen rising trends since 2005-06 causing a rise in the standard of living and reduction in poverty in Odisha (Sen 2011). Among the developmental expenditure both the social and economic service has seen a faster rise. The spending on agriculture & allied activities & irrigation & flood control has also reflected rising trends after 2006-07 showing a rise in farm productivity and production. The rise in rural developmental expenditure & introduction of various social security measures resulted in reduction in rural poverty in Odisha

The rise in agriculture productivity in Odisha has not resulted in a rise in agricultural wages. Though the real wage of casual labor has seen rising trends after the post-reform period of 1991, it remains same throughout the 2000's decade. The real wage does not affect by the rise in agricultural productivity or rise in farm to nonfarm diversification. Hence the reduction in poverty in Odisha in the 2nd period is mainly a growth driven.

Conclusion –

The poverty decline in Odisha in the 1990's decade is basically as a result of growth in the non-farm sector and the 2000's decade poverty decline is due to the farm sector growth. The poverty decline varies among the economic groups. The population located in agricultural & Other labor households record above-average headcount ratio. The poverty reduction in rural Odisha is mainly growth driven. It's the growth of farm sector which results in poverty reduction among both the farm and nonfarm economic groups. While the labor mobility from farm to the nonfarm sector in the 1st period is distress driven and the slow poverty reduction is due to the negative growth of the farm sector. The reduction of poverty in the 2nd period for all the groups is the result of the growth of farm sector, and the mobility of labor is within the farm sector. Hence it's the growth of farm sector which is resulting in the rise in income for the entire economic group having a linkage with the rural nonfarm sector and fall in poverty HCR among all the economic groups. The 1st period's slow reduction in poverty is a result of slow growth in MPCE with a rise in inequality whereas the 2nd period has seen a rise in growth in MPCE with low inequality resulting in a higher reduction in poverty. There exist huge disparities among the districts of Odisha. It's the mining and SC-ST districts which are more deprived. The growth of farm productivity along with the rise in public spending on infrastructure, agriculture, rural development, social security measures resulted in a reduction in rural poverty in Odisha.

Reference –

Dandekar&Rath (1971): *"Poverty in India-I", Dimensions and Trends*, EPW, Jan, PP.25-47.

Datt, G., and M. Ravallion (1992), *Growth and Redistribution Components of Changes in Poverty Measures: A Decomposition with Applications to Brazil and India in the 1980s*. Journal of Development Economics 38 (2), 275–295.

Deaton &Dreze (2009): *Food and Nutrition in India: Facts and Interpretations*, *EPW*, Feb 14, VOL-XLIV, No -7.

Deaton Angus (2000): "*Poverty and Inequality in India: A Re-Examination in the 1990's*", Center for Development Economics, Delhi School of Economics.

Dev & Ravi (2007): Poverty and Inequality: All India and States, 1983-2005, EPW, Feb 2007.

Haan&Dubey (2005): *Poverty disparities or the development of Underdevelopment in Odisha,* EPW, May 28.

Himanshu (2010):   *Towards New Poverty Lines for India*, *EPW,* January 2, 2010, Vol.XLV, NO.1

Jain, L.R., and Tendulkar, S.D. (1990), *'The Role of Growth and Redistribution in the Observed Change in Headcount Ratio Measure of Poverty: A Decomposition Exercise for India*', *Indian Economic Review*, XXV, 165-205.

Kakwani, N. (1997), 'On Measuring Growth and Inequality Components of Poverty with Applications to Thailand', *Discussion Paper, School of Economics, The University of New South Wales*, Australia.

Nayak P.B & et.al (2016): The Economy of Odisha, A Profile, Oxford University Press

Panda Manoj (2006):   *Economic Development in Odisha: Growth without inclusion*, IGIDR, WP.

Patnaik U (2007): *Neoliberalism and Rural Poverty in India*, *EPW, July 28,* pp. 3132-3150

Radhakrishnan. Al (2004): *Chronic Poverty and Malnutrition in 1990's,* EPW, Vol.39, No.28

Report on the expert group on the estimation of poverty (1993 & 2009), Perspective Planning Division, Planning Commission, Government of India.

SaggarMridul (1994): "*Scheduled Castes and Scheduled Tribes in Eastern India*," EPW, March.

Samantaraya A et.al (2014): Has Odisha became less Poor in the last Decade, EPW, Nov.

Sundaram& Tendulkar (2003):   *Poverty among socio-Economic Groups in India in 1990's*, *EPW*, Dec 13, Vol. 38, No-5.

Thorat&Dubey (2012): *Has Growth been Socially Inclusive during 1993-94 – 2009-10*, *EPW*, Mar 10, Vol.XLVII, No-10.