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Dynamics of Poverty and Food Insecurity in Orissa: Macro Analysis and Case Studies

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Abstract

Based on meso data, study analyses the causes of poverty and food insecurity. It seeks to identify who is food insecure and where they are, why they risk food insecurity and what options exist to reduce their vulnerability. Using the sustainable livelihoods framework and collecting qualitative and quantitative data from two selected districts of Balangir and Dhenkanal under Village Level Studies Project, the paper looks at five livelihood groups, notably marginal and small scale farming households, labouring rural households, mining worker households, rural artisan households and scheduled tribal households. Even though Orissa is virtually self-sufficient in food grains, there is a significant prevalence of food insecurity in the state and around 9 percent of the population are classified as extremely food insecure consuming less than 1,800 kcal per day. The situation varies significantly within the state: 15 percent of the population in the southern region are extremely food insecure compared to 3 percent of the population living in the coastal areas. The study finds that food insecurity and vulnerability are mainly caused by a limited physical as well human asset base, slow economic growth, limited or no access to welfare provisions and public services, lack of land reform and difficulties in accessing credit institutions. Based on the findings of the analysis, the paper identifies key interventions to address the immediate food needs of the most vulnerable and to stimulate rural development, in particular promoting agriculturally linked livelihoods. Proposed interventions include increased investment in agricultural research, improved watershed development, developing financial services and promoting small scale industries as well as micro enterprises and strengthening anti-poverty programmes within the state. The two district sampled, where more or less half population are under poverty. Livelihood options are limited and skewed towards large farmers in the study villages. Differential land holding, occupational diversification, migratory pattern and agricultural productivity hold key factors of poverty across farmer category and size holding.

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Introduction

More than one third of the world's poor live in India. According to the international poverty indicator of US\$1/day, the total number is 350 million, although the official statistics (1999-00) place the number at 260 million or 26% of the total population. Around 22 % population in India live Below Poverty. The extreme poverty and hunger in India castling in villages where Bharat lives. (72% of total population lives in 5, 50,000 lakh odd villages) .Orissa among all Indian states tops the incidence of poverty. Orissa emerges in the forefront of all states signifying all indices. Poverty is a condition created by unjust society, denying people access to and control over the resources that they need to live a fulfilled life. Orissa also lives in villages. Almost 85% percent of people live in rural area of the state. Around 42 % people in Orissa and 47% people of rural Orissa live below poverty. Although state endowed with rich natural resources in the form of vast mineral deposits, forest, fertile land, plentiful surface and ground water resources, long coast line, and picturesque tourist potential. But, such resources have not been exploited adequately for income generation activities. As a result, Orissa ranks very low in terms of per capita income, and it has become one of the poorest of the country. Large proportion of people in the state has very poor living conditions. As per an estimate, among the fifteen major states of India, the position of Orissa with regard to living conditions or standard of living is fourteenth (Behera and Mitra,1996). So, it becomes necessary to examine the dimensions of poverty and food insecure population for devising a stupendous task to break vicious cycle of poverty in Orissa.

Data and Methodology

Study on Rural poverty is a part of Village Level Study (VLS) and BMGF funded project Tracking changes in rural poverty in household and village economies in eastern India. Meso level quantitative secondary data has been collected from national sample survey organisation and different published, unpublished sources to understand the macro perspectives dimensions and extent of poverty in the state. Two districts in Orissa were identified for the purpose of the study. From KBK region Balangir district and central table region Dhenkanal district taken, where primary investigation provides a flavour of the extent of livelihood pattern across different farm size holders and occupational class categories. Data collected with the structured schedule from 1200 households using memory recall methods.

Poverty Estimates Approach

The poverty estimates, in India are based on two approaches: head count ratio and poverty line concept based on minimum calorie intake of 2400 Kcal per capita per day (Food Insecurity Atlas of Rural India, 2001). The head count ratio though quantifies income poverty but neither takes into account the underlying calorie intake norm nor ecological/natural resources factors. The two different approaches thus cause divergence in the overall estimates of poverty levels. However, both have their own merits. For example, poverty line is closely connected to food insecurity and depth of hunger, while head count ratio is interpreted more in terms of livelihood opportunity. The poverty estimates, based on these two approaches, have been providing valuable insights about the overall dynamics of poverty over the years, among the communities, occupations and across the various regions.

Trends and Extent of Poverty – Orissa v/s Other States

Among the 14 major states, Orissa has the highest proportion of population living below the poverty line. Table 1 indicates that, in the year 2004-05, the percentage of people living below the poverty line in the state was 39.90, whereas, it was 32.50 per cent in case of Bihar. On the other hand, the all India average was found to be 21.80 per cent. The lowest poverty ratio was seen in Punjab (5.2 per cent) followed by Haryana (9.90 per cent) and Kerala (11.10 Per cent). Further, the estimates of the Expert Group of Planning Commission, 1993 show that, the poverty ratio was 48.6 per cent, which was second highest in the country. Bihar occupied the first position with 54.6 per cent population living below the poverty line. The poverty ratios of different States for rural and urban areas in the years 1973-74, 1977-78, 1983, 1987-88 and 1999-00 also indicate that Orissa was always at a higher stage of poverty ratio compared to the national average as well as most of the other states.

The incidence of poverty in Orissa vis-à-vis other major States, as estimated by the Planning Commission from 1973-74 to 2004-05 on the basis of NSS consumer expenditure data, has been compared in Table 2. The number and percentage of BPL population for the 61st NSS round (2004-05), based on mixed recall period (MRP) and uniform recall period (URP). Keeping the slow pace of reduction of poverty in the 1990s in view, the State Government has taken a number of steps to accelerate poverty reduction and targeted poverty reduction of 7 percentage points during the 10th Plan. In fact, Orissa reduced the incidence of poverty by

7.25 percentage points from 47.15% in 1999-2000 (55th NSS round), as revealed from the estimates of the 61st NSS data of 2004-05 based on MRP methodology.

Table 1: Incidence of Poverty in Orissa vis-à-vis Other States: 1973-74 – 2004-05

| Sl. No. | State | People Below Poverty Line (%): 1973-74: 2004-05 | | | | | | |
|------------------|----------------|---|--------------|--------------|--------------|--------------|--------------|--------------|
| | | 1973-74 | 1977-78 | 1983 | 1987-88 | 1993-94 | 1999-00 | 2004-05* |
| 1 | Andhra Pradesh | 48.86 | 39.31 | 28.91 | 25.86 | 22.19 | 15.77 | 11.10 |
| 2 | Bihar | 61.91 | 61.55 | 62.22 | 52.13 | 54.96 | 42.60 | 32.50 |
| 3 | Gujarat | 48.15 | 41.23 | 32.79 | 31.54 | 24.21 | 14.07 | 12.50 |
| 4 | Haryana | 35.36 | 29.55 | 21.37 | 16.54 | 25.05 | 8.74 | 9.90 |
| 5 | Karnataka | 54.47 | 48.78 | 38.24 | 37.53 | 33.16 | 20.04 | 17.40 |
| 6 | Kerala | 59.79 | 52.22 | 40.42 | 31.79 | 25.43 | 12.72 | 11.40 |
| 7 | Madhya Pradesh | 61.78 | 61.78 | 49.78 | 43.07 | 42.52 | 37.43 | 32.40 |
| 8 | Maharashtra | 53.24 | 55.88 | 43.44 | 40.41 | 36.86 | 25.02 | 25.20 |
| 9 | Orissa | 66.18 | 70.07 | 65.29 | 55.58 | 48.56 | 47.15 | 39.90 |
| 10 | Punjab | 28.15 | 19.27 | 16.18 | 13.20 | 11.77 | 6.16 | 5.20 |
| 11 | Rajasthan | 46.14 | 37.42 | 34.46 | 35.15 | 27.41 | 15.28 | 17.50 |
| 12 | Tamil Nadu | 54.94 | 54.79 | 51.66 | 43.39 | 35.03 | 21.12 | 17.80 |
| 13 | Uttar Pradesh | 57.07 | 49.05 | 47.07 | 41.45 | 40.85 | 31.15 | 25.50 |
| 14 | West Bengal | 63.43 | 60.52 | 54.85 | 44.72 | 35.66 | 27.02 | 20.60 |
| All India | | 54.88 | 51.32 | 44.48 | 38.36 | 35.97 | 26.10 | 21.80 |

*Based on MRP Consumption Source: Govt of Orissa (2010), Economic survey 2009-10. Directorate of Economics and Statistics, Bhubaneswar.

Table 2: People Below Poverty (%) in Orissa and India: 1973-74 to 2004-05

| Year | Orissa (%) | | | India (%) | | |
|---------|------------|-------|--------------|-----------|-------|--------------|
| | Rural | Urban | Total | Rural | Urban | Total |
| 1973-74 | 67.28 | 55.62 | 66.18 | 56.44 | 49.01 | 54.88 |
| 1977-78 | 72.38 | 50.92 | 70.07 | 53.07 | 45.24 | 51.32 |
| 1983 | 67.53 | 49.15 | 65.29 | 45.65 | 40.79 | 44.48 |
| 1987-88 | 57.64 | 41.53 | 55.58 | 39.09 | 38.20 | 38.36 |
| 1993-94 | 49.72 | 41.64 | 48.56 | 37.27 | 32.36 | 35.97 |

| | | | | | | |
|----------|-------|-------|--------------|-------|-------|--------------|
| 1999-00 | 48.01 | 42.83 | 47.15 | 27.09 | 23.62 | 26.10 |
| 2004-05* | 39.80 | 40.30 | 39.90 | 21.80 | 21.70 | 21.80 |

* Based on MRP Consumption.

Source: Economic survey 2009-10. Directorate of Economics and Statistics, Bhubaneswar.

Depth and Severity of Poverty

Table 3 reveals that head count ratio (HCR), poverty gap (PG) and squared poverty gap (SPG) of Orissa for rural and urban areas in different years. The HCR, PG and SPG reflect the extent, depth and severity of poverty respectively. The extent of poverty reached the peak, i.e., 70.29 per cent in 1968-69 in rural Orissa, whereas, in urban Orissa, it was highest i.e., 69.12 per cent in 1960-61. In the eighties and early part of nineties, the extent of poverty was found to be much less compared to the previous years in both rural and urban Orissa. The decline in the extent of poverty in 1993-94 over the year 1957-58 was found to be about 25 percentage points in the above two areas. The depth and severity indices of poverty broadly followed the pattern of movement as revealed by the extent of poverty.

Table 3: Extent, depth and severity of Poverty in Orissa

| NSS Round | Year | Rural | | | Urban | | |
|-----------|---------|-------|--------|--------|-------|--------|--------|
| | | HCR | PG | SPG | HCR | PG | SPG |
| 13 | 1957-58 | 65.06 | 23.180 | 11.129 | 64.07 | 23.338 | 10.619 |
| 16 | 1960-61 | 61.72 | 20.129 | 8.287 | 69.12 | 25.752 | 12.081 |
| 20 | 1965-66 | 59.90 | 18.280 | 7.806 | 64.84 | 23.051 | 10.676 |
| 23 | 1968-69 | 70.29 | 24.308 | 11.070 | 61.90 | 20.050 | 8.426 |
| 25 | 1970-71 | 64.77 | 22.173 | 10.162 | 54.43 | 17.162 | 7.121 |
| 38 | 1983 | 56.76 | 16.962 | 7.126 | 54.94 | 16.701 | 6.710 |
| 43 | 1987-88 | 47.86 | 11.699 | 3.840 | 47.53 | 13.371 | 5.014 |
| 45 | 1989-90 | 39.48 | 8.454 | 2.403 | 41.09 | 11.599 | 4.385 |
| 50 | 1993-94 | 40.28 | 8.724 | 2.790 | 40.76 | 11.256 | 4.148 |

Note: 1. HCR- Head Count ratio. 2. PG- Poverty Gap 3. SPG- Squared Poverty Gap

Source: National Sample Survey organisation Data of different rounds

Poverty by Social Groups

The incidence of poverty by social groups shows that there was higher concentration of poverty among the scheduled caste (SC) and scheduled tribe (ST) population in rural areas, which can be seen from Table 4. The percentage of poor was as high as 62 to 79 per cent among the SC/ ST group in rural for the entire population in 1983. The incidence of poverty among the ST population was near about two times more than that of the other caste

population in the same year. The same situation was found even after a decade in 1993-94. The percentage of ST poor to total number of poor was 35.98 while the share of ST population to total population was 25 per cent in rural areas in 1993-94. Though the percentage of population living below the poverty line declined in 1993-94 over the year 1983 among all social groups, but the incidence of poverty among the SC population decreased considerably in 1993-94 over the year 1983. The poverty ratio of SC population reached near to that of all groups in 1993-94. During 2004-05, situation is also no more different. Over sixty four percent ST and over thirty eight percent SC persons are poor. About two-thirds (65%) of the total poor in rural Orissa belong to either ST or SC groups. However poverty ration over 1993-94 declined considerably in all the social groups.

Table 4. Incidence of poverty by social groups, rural orissa:2004-05, 1993-94and 1983

| 2004-05* | | | | 1993-94 | | | 1983 | | |
|--------------|-------------------|-----------------------------|-------------------|-------------------|-----------------------------|-------------------|-------------------|-----------------------------|-------------------|
| Social group | Poverty ratio (%) | Contribution to poverty (%) | Population Share% | Poverty ratio (%) | Contribution to poverty (%) | Population Share% | Poverty ratio (%) | Contribution to poverty (%) | Population Share% |
| ST | 64.3 | 44.88 | 22.8 | 71.31 | 35.98 | 25.1 | 79.1 | 33.1 | 23.1 |
| SC | 38.6 | 20.59 | 18.4 | 49.79 | 18.51 | 18.5 | 62.6 | 18.9 | 16.6 |
| OBC | 24.5 | 27.2 | 39.6 | - | - | - | - | - | - |
| Other | 15.6 | 7.33 | 19.1 | 40.23 | 45.51 | 56.3 | 43.8 | 48.0 | 60.3 |
| All Groups | 35.53 | 100 | 100 | 49.81 | 100 | 100 | 55.1 | 100 | 100 |

*Tentative analysis of pooled NSS data using MRP Method

Source: as reported by Panda (2000) and Govt. of Orissa report, 2010

Poverty by Regions

As discussed above that percentage of population below the poverty line stood at 39.90 per cent in 2004-05 as against 21.8 per cent at the all-India level. (Economic Survey, 2008-09, GoO, p. 8/1) There is, however, greater concentration of poverty in Southern Orissa which is home to a large “proportion of ST and SC population”. The districts like Gajapati, Kandhamal, Kalahandi Malkanagiri, Nawarangpur and Raygada have 50.78 per cent, 51.96 per cent, 28.65 per cent, 57.43 per cent 55.03 per cent and 55.76 per cent of tribal population respectively. Some of these districts like Kalahandi, Kandhmal and Malkanagiri and Boudh have also a sizeable proportion of SC population which constitute 17.67 per cent, 16.89 per cent, 21.35 per cent and 21.88 per cent of their total population respectively. Predictably

these areas have a larger presence of extremely poor families who are landless and illiterate and live below the subsistence level. It may be revealing to note that incidence of poverty has been estimated at 83.61 per cent, 88.88 per cent, 78.42 per cent and 78 per cent in the southern districts of Koraput, Malkanagiri, Kandhamal and Nuapada. (Economic Survey, 2007-08, GoO) Poverty among the STs in the southern region has been estimated at 82.8 per cent. (Food Security Atlas of Rural Orissa, 2008, p.15) Implementation of anti-poverty programmes has not substantially reduced the number of families below the poverty line income. A study of the impact of poverty alleviation programmes in the Baliguda block of Malkanagiri district could find that only two per cent of the beneficiary house-holds could go above the poverty line. (Panda 2000) And it is doubtful if the people in the region with low education and no training will be found suitable for employment when industries are located in these regions.

Region wise estimates of poverty for rural Orissa for 1993-94 and 2004-05 periods summarised in Table 5. It may be observed from the table that poverty ratio in coastal region drastically reduces from 45.33% to 18.57%, while in other region of southern and northern negligible 2-3% reduction was observed over decade and at the same time population share improved 14.5% and 9.19% in southern and northern region respectively.

Table 5. Incidence of poverty by NSS Regions, Rural Orissa: 2004-05 and 1993-94

| Region/ Poverty | Poverty Ratio (%) | Contribution to Poverty (%) | Population Share (%) | Poverty Ratio (%) | Contribution to Poverty (%) | Population Share (%) |
|--------------------|----------------------|--------------------------------|-------------------------|----------------------|--------------------------------|-------------------------|
| | 2004-05* | | | 1993-94 | | |
| Coastal | 18.57 | 24.01 | 45.8 | 45.33 | 43.03 | 47.63 |
| Southern | 62.5 | 33.6 | 19.8 | 68.84 | 25.26 | 19.1 |
| Northern | 43.69 | 42.39 | 34.3 | 45.87 | 31.71 | 33.2 |
| Total | 35.53 | 100 | 100 | 49.81 | 100 | 100 |

*Tentative Analysis of pooled NSS data using MRP Method
Source: Govt. of Orissa report, 2010

Rural Poverty by Income Groups

Survey conducted by Panchayat Raj Department, Govt. of Orissa reveals that out of 52. 23 lakh of rural families in the state in 1992, 78.70 per cent of families were living below the

poverty line. Out of 78.70 per cent of rural poor families, the shares of destitutes (in the income range Rs.0-4000), very very poor (in the income range Rs.4001-6000), very poor (in the income range Rs.6001-8500), and poor (in the income range Rs.8501-11000) families were 25.89, 30.01, 15.55 and 7.24 per cent, respectively. This shows that the shares of destitutes and very very poor families were much more than that of very poor and poor families, and the destitutes and very very poor families constituted 71.03 per cent of the total number of rural poor families in the state. In other words, the intensity of rural poverty was much higher in the state. The district-wise analysis shows that Jharsuguda district had the lowest percentage of rural poor families, i.e., 53.67 percent, who were living below the poverty line, whereas, the highest percentage of rural poor families (93.03) were in Phulbani district.

As per the survey conducted in 1997, out of 67.87 lakh rural families, 66.37 per cent rural families were living below the poverty line, which indicates the decline of 12.33 percentage points over 1992 survey. Nuapada district had the highest percentage of rural poor families (85.70 per cent) in the state. On the other hand, Jharsuguda district had retained its earlier position in terms of lowest percentage of rural poor families (49.02 per cent) (Table 8.7). Information with regard to percentage of rural poor families by income groups is not available as per 1997 survey.

Rural Poverty by Occupations

Out of the total rural poor families in Orissa, 78.70 per cent of rural poor families were agricultural labourers, marginal farmers and small farmers. The rest 12.64 per cent of rural poor families were non-agricultural labourers, rural artisans and others. It can be seen from Table 6 that the percentage shares of rural poor families of the categories of small farmers, marginal farmers, agricultural labourers, non-agricultural labourers, rural artisans and others to total rural families were 12.64, 34.19, 21.91, 6.91, 2.05 and 0.91 respectively. Districts like Rayagada, Koraput, Phulbani and Ganjam had a little higher percentage of rural poor families of the category of non-agricultural labourers. Higher percentages of rural poor families working as rural artisans were found in the districts like Phulbani, Cuttack and Jajpur. District-wise analysis shows that, in almost all the districts, there were higher concentration of small farmers, marginal farmers and agricultural labourers, who were living below the poverty line. The 1997 survey data reveals almost similar picture. Agricultural labourers, marginal farmers and small farmers constituted 85.61 per cent of the total rural poor of

Orissa. This is 1.75 percentage points less than the 1992 survey. Even than percentage share of agricultural labourers, marginal farmers and small farmers out of the total rural families are found to be higher. The percentage shares of BPL families of the categories of agricultural labourers, marginal farmers, small farmers and rural artisans to total rural families in the state were found to be 24.91 per cent, 20.90 per cent, 11.02 per cent and 3.24 per cent respectively. Reference district Balangir and Dhenkanal occupational structure is no more different. But over the reference period 1992 and 1997 condition of the class occupants improved across district from 91.90 to 61.06 in Balangir and from 84.17 to 62.23 in Dhenkanal district.

Table 6: Rural families below poverty line of Rs 11000 the basis of occupations in Orissa

in percent

| Farm groups | Orissa State | | Balangir District | | Dhenkanal District | |
|--------------------|--------------|--------------|-------------------|--------------|--------------------|--------------|
| | 1992 | 1997 | 1992 | 1997 | 1992 | 1997 |
| Small Farmer | 12.64 | 11.02 | 20.84 | 11.05 | 9.41 | 6.61 |
| Marginal Farmer | 34.19 | 20.90 | 38.53 | 17.93 | 41.00 | 24.67 |
| Agriculture labour | 21.91 | 24.91 | 23.38 | 21.26 | 24.82 | 26.92 |
| Non. Agr. labour | 6.91 | - | 5.44 | - | 6.35 | - |
| Rural Artisan | 2.05 | 3.24 | 1.37 | 1.09 | 2.12 | 0.73 |
| Others | 0.99 | - | 2.34 | - | 0.45 | - |
| TOTAL | 78.70 | 66.37 | 91.90 | 61.06 | 84.17 | 62.23 |

Source: Panchayat Raj department, Govt. Of Orissa, 1992, 1997

Conclusion

Analysis on poverty indicates that the living condition of the people of Orissa is miserable compared to other states. Even within the state, caste and region wise differences in the living conditions are observed. About eighty per cent of the rural families were leading a painful life in the state. As a result, the living condition of the people in terms of the development indicators like literacy rate, infant mortality rate, per capita income, per capita food grain production, etc. was much below the national average. Moreover, centrally funded welfare

activities directly address poverty, food insecurity and mal nutrition also observed to be not. The study realise that poverty and food insecurity are mainly caused by a limited physical as well human asset base, slow economic growth, limited or no access to welfare provisions and public services, lack of land reform and difficulties in accessing credit institutions. Agro-linked livelihood intervention needed with increased investment in agricultural research, improved watershed development, developing financial services and promoting small scale industries as well as micro enterprises.

References

Anonymous (2010) Regional disparity and inclusive growth and displacement in Orissa Mianstream Vol XLVIII, No. 6, Jan.,30,2010

Behera, M and A K Mitra (1996); 'The Standard of Living in India: An Attempt towards Inter- Regional Study', Indian Journal of Regional Science, Vol 38, No 2. Chennai, India.p.15

Economic Survey 2009-10. Directorate of Economics and Statistics, Planning and Coordination Department, Government of Orissa

EPW Research Foundation (1993). 'Poverty Levels in India: Norms, Estimates and Trends', Economic and Political Weekly, Vol 28, No 34, August-21.

Food Insecurity Atlas of Urban India (2002), World food Programme, the Food Aid Organisation of the United Nations and MS Swaminathan Research Foundation, Chennai, India.

Food Security Atlas of Rural India (2008), World Food Programme, the Food Aid Organisation fo the United Nations and MS Swaminathan Research Foundation,Chennai
Government of Orissa, (2008) Economic Survey, 2007-08. Directorate of Economics and Statistics, Planning and Coordination Department, Government of Orissa.

Government of Orissa, (2009), Economic Survey, 2008-09. Directorate of Economics and Statistics, Planning and Coordination Department, Government of Orissa.

Kar, G C and R K Meher (2001). An Evaluation of Anti-poverty Programmes in Nawarangpur District of Orissa (Mimeo), Nabakrushna Choudhury Centre for Development Studies, Bhubaneswar.

Misra, S N and M Behera (2000). An Evaluation of Anti-poverty Programmes in Mayurbhanj District of Orissa (Mimeo), Nabakrushna Choudhury Centre for Development Studies, Bhubaneswar.

Orissa Agricultural Statistics-2008-2009, Directorate of Agriculture and Food Production, Govt of Orissa

Panda, M (2000). 'Changing Poverty Scenario in Orissa', Paper presented in the Seminar on 'Social Development Research in Orissa', Nabakrushna Choudhury Centre for Development Studies, Bhubaneswar, March.

Panda, P.C. (2000), Political Economy of Rural Poverty, Ph.D Thesis, Utkal University (Unpublished), Bhubaneswar, Odissa, India

Shankar, K (1997). 'Revamped Public Distribution System – Who Benefits and How Much?' Economic and Political Weekly, Vol.XXXII, No.13.

Sinha, M K; P Nanda, A Kumar and NR Sahu 2013. Socio-economic and Resource Profile Analysis of Sogar Study village. *Res. Bulletin 61*, Directorate of Water Management, Bhubaneswar, pp.33

Sinha, M. K., Nanda, P. and Kumar, A. 2011. Rural Livelihood Pattern of Agricultural Households: Preliminary Evidence from Orissa. *Agril. Econ. Res. Rev.*, 24 (conf), 547-547.

Sinha, M. K., P Nanda, A Kumar, GP Behra 2013. Socio-economic and Resource Profile Analysis of Chandrasekharpur Study village. *Res. Bulletin 62*, DWM, Bhubaneswar, pp.29.

Sinha, M. K., P Nanda, A Kumar, J Gaudo 2013. Socio-economic and Resource Profile Analysis of Ainlatunga Study village. *Res. Bulletin 59*, DWM, Bhubaneswar, pp.37.

Sinha, M. K., P Nanda, A Kumar, SN Biswal 2013. Socio-economic and Resource Profile Analysis of Bilaikani Study village. *Res. Bulletin 60*, DWM, Bhubaneswar, pp.35

Sinha, M.K. and NN Thombare, 2014. Incidence and impacts of clinical mastitis in dairy cattle farms: Case of Maharashtra Farmer, *Indian Journal of Dairy Sciences* 67 (1), 70-73.

Sinha, M.K. and JP Dhaka, 2014. Predicting risk of credit default using discriminant approach: A Study of Tribal Dairy Farmers from Jharkhand. *Agricultural Economics Research Review* 27 (1), Jan-June Issue 2014.

Sinha, M.K., JP Dhaka and B Mondal, 2014. Analysing social attributes of loan default among small Indian dairy farms: A discriminant approach. *Scientific Research and Essays* 9 (2), 2354-2358.

UN World Food Programme (2008), Food Security Atlas of Rural Orissa, Institute of Human Development, New Delhi.