

## Labour migration and livelihood analysis in rainfed rice based farming systems of coastal Odisha

Parshuram Samal\* and Sushil Pandey

Central Rice Research Institute, Cuttack

### ABSTRACT

*Data collected from 193 farmers of coastal Odisha were analysed to find out the extent of migration, sources of employment and income. It is revealed from the analysis that out of the total male labour employment, 62 per cent were employed in non-farm and 32 per cent in on-farm work. Females were much less employed than male workers. There is widespread unemployment prevalent in coastal Odisha, as only 55 per cent of the days in a year, the male workers got employment. It was found that maximum number of people had migrated to places out of state followed by out of district and out of village. Remittances accounted for 25 per cent of total family income of all farmers followed by other non-farm activities and income from rice. The remittance was highest from the workers those who had migrated to out of state followed by out of district, out of village and out of country. Four sources of income like remittances, salaried job, other non-farm activities and rice were found to contribute more than 95 per cent of the income inequalities.*

**Key words:** Odisha, rainfed rice, labour migration, livelihood analysis

During the pre and early independence era, agriculture was the main source of livelihood for majority of the rural families in India. With passage of time, an increase in non-farm employment has become essential for improving the income and standard of living of rural population (Chadha, 1993 and Kumar *et al.*, 2003). This has been well documented from other village level studies elsewhere using panel and cross sectional data (Hayami and Kikuchi, 2000; Barrett *et al.*, 2001). People have often devised their own adjustment mechanism in response to the emerging situations. A diversification of the pattern of economic activities pursued by the rural families has played key role in this process. Migration is a safety net against income shortfall due to crop failure or low productivity created by natural calamities.

The increase in non-farm employment of the rural work force has been due to both developmental and distress factors (Verma and Verma, 1995). Temporary migration by family members is increasingly becoming a routine livelihood strategy of the rural population in eastern India (Paris *et al.*, 2007). In rainfed areas, the distress factors play dominant role in search of non-farm activities in other places in comparison to

irrigated areas. One push factor is the unfavourable rice growing environments that affect rice and non-rice crop production leading to unattractive returns. The distress factors like poverty, unemployment and frequent occurrence of natural calamities pushed the rural youths to migrate in search of various non-farm activities to supplement their farm income. However, a wide regional variation in the nature and composition of such labour force exists (Rao, 1995, Elumalai and Sharma, 2003). It is important to conduct micro studies to identify the pattern of employment and income, so that appropriate policy support may be provided as per regional needs (Vaidynathan, 1986 and Visaria, 1995).

Rice cultivation is the main crop production activity in rural Odisha as it covers 53 per cent of total gross cropped area. The rural population accounts for 85 per cent of total population of the state and the productivity of rice in the state (1.7 t/ha) is below the national average (2.2 t/ha). The state faces frequent natural calamities making the agricultural production too risky and unstable over years (Reserve Bank of India, 1984 and Samal, 2004). Coastal Odisha accounts for 48 per cent of total population and 26 per cent of total geographical area of Odisha. This region accounts

for 38 per cent of total rice area and about 40 per cent of the total vegetables and fruits area of the state. The present study is an attempt to analyse the nature and extent of occupational diversification, migration of rural workforce and the sources of other non-farm income and employment in rainfed villages of coastal Odisha. The specific objectives of the paper are to analyse the pattern of employment and income diversification among the farmers of coastal Odisha, to study the migration pattern among different categories of farm, and to identify the sources contributing to inequality in income among farming community.

## MATERIALS AND METHODS

Two rainfed districts Balasore and Kendrapara were selected in the first stage by eliminating the irrigated districts using the criteria of 40 per cent area under irrigation. In the second stage, the irrigated blocks were first eliminated from each district using the same criteria and two blocks from the remaining blocks in each district were selected using the random sampling technique. In the third stage, two villages from each block were selected using the random sampling technique. The farmers were then classified in each selected village into 4 groups according to the land owned by them such as marginal (up to 1 ha), small (1-2 ha), medium (2-4 ha), and large (> 4 ha). In the last stage, 25 farmers from each village were selected using the technique of stratified random sampling with probability proportion to size. Data collection was completed from each village with the help of schedules and questionnaires. The sample consists of 98 marginal, 53 small, 28 medium and 14 large farmers making a total of 193.

The employment of each farmer in various on-farm, off-farm (working as agricultural labours in others' farm) and non-farm (other than farm works) activities were collected. The incomes from crops were computed after deducting paid-out costs from the gross income of that crop. The cropping year for which data were compiled was 2000-2001. The non-farm income of each family member was computed after deducting pocket expenses from total non-farm income of each family member. The persons who have migrated and not residing with the family, the amount of remittances per year to the household for such persons were considered. The income and employment thus computed were analysed.

The Ginni coefficient was computed using the formula discussed by Nagar and Das (1983). Decomposition of the Ginni coefficient to find out contributions by different income sources is useful to identify the relative contribution of each income source to the overall inequality (Pyatt *et al.*, 1980). The pseudo-Ginni coefficient is based on the formula for a Ginni coefficient but, using the ranks of total income of the farmers in the computation. The decomposition of income of the farmers of coastal Odisha into different components was done with the help of pseudo-Ginni coefficients.

## RESULTS AND DISCUSSION

The average family size in coastal villages was eight and the size increased with increase in farm size. On an average, the family size varied from seven with marginal farmers to nine with large farmers (Table 1). The average numbers of male, female and children available are 3.0, 2.3 and 2.5, respectively, in the study area. The male and female workers in each farm size category increased with increase in farm size. The average owned farm area owned by marginal, small, medium and large farmers was 0.45 ha, 1.36 ha, 2.63 ha and 6.29 ha respectively, with an overall average of 1.44 ha.

**Table 1. Average family and farm size of different categories of farmers in coastal Orissa.**

Farm Category	Male	Female	Children	Total	Average farm size (ha)
Marginal	2.51	2.00	2.37	6.88	0.45
Small	3.32	2.57	2.53	8.42	1.36
Medium	3.46	2.71	2.79	8.96	2.63
Large	3.71	2.86	2.57	9.14	6.29
All	2.96	2.32	2.49	7.77	1.44

There has been almost equal proportion of migration on short and long term basis. Out of the four broad places of migration, the number of migrants out of state was highest for both short and long term migration followed by out of district. Further, the number of migrants of marginal and small farmers was highest to out of state than other places. The average number of male labour migrants per family for marginal and small farmers was 15.9 and 19.3 per cent, respectively,

**Table 2. Average number of male labour migration per family on short term and long term basis in coastal Odisha by farm type.**

Place of migration	Marginal		Small		Medium		Large		All	
	M	F	M	F	M	F	M	F	M	F
<b>Short term</b>										
Out of Village	0.01	0.02	0.00	0.29	0.03					
Out of District	0.01	0.21	0.07	0.14	0.08					
Out of State	0.19	0.19	0.07	0.07	0.17					
Out of Country	0.00	0.00	0.00	0.00	0.00					
All	0.21	0.42	0.14	0.50	0.28					
% male member migration	8.37	12.65	4.05	13.48	9.46					
<b>Long term</b>										
Out of Village	0.00	0.06	0.14	0.07	0.04					
Out of District	0.03	0.06	0.11	0.07	0.05					
Out of State	0.15	0.09	0.29	0.36	0.17					
Out of Country	0.00	0.02	0.00	0.00	0.01					
All	0.18	0.23	0.54	0.50	0.27					
% male member migration	7.17	6.93	15.61	13.48	9.12					
<b>Both Short and Long term</b>										
Out of Village	0.01	0.08	0.14	0.36	0.07					
Out of District	0.04	0.26	0.18	0.21	0.13					
Out of State	0.35	0.28	0.36	0.43	0.34					
Out of Country	0.00	0.02	0.00	0.00	0.01					
All	0.40	0.64	0.68	1.00	0.55					
% male member migration	15.94	19.28	19.65	26.95	18.58					

Figures in parentheses indicate per cent male labour migration.

out of the total male labour available with an overall average of 18.6 per cent for all families. The male migrant to out of state from the families of marginal and small farmers was 88 and 44 per cent, respectively.

**Table 3. Years of schooling of different categories of farmers in coastal Odisha.**

Type of farmer	Adults (18 & above)		Children (<18)		All	
	Male	Female	Male	Female	Male	Female
Marginal	6.2	3.5	5.2	3.5	5.4	3.3
Small	8.0	4.0	6.3	4.1	6.6	4.0
Medium	8.9	5.5	7.4	5.3	7.7	5.2
Large	10.8	7.0	7.4	5.6	8.2	5.9
All	7.6	4.3	6.0	4.1	6.4	4.1

Nevertheless, the per cent of male labour migrants per family was highest for farmers with larger holding than the smaller farmers. This is due to better education level of male members of larger group of farmers than smaller farmers.

It was observed that the average years of schooling of male and female persons were 6.4 and 4.1 years, respectively. The year of schooling of adult members of family was 7.6 for males and 4.3 for females. Further, it was observed that the number of years of schooling increased with increase in farm size for both adult and children. The educational level has a bearing on non-farm income. The correlation between number of years in school of adult male members and non-farm income were found out to be 0.35 and significant.

In coastal Odisha, rice is the single important crop during both the seasons. Wet season was entirely covered by rice (99.7 per cent) as no other crop can be grown in the season due to excess water conditions in the fields. Besides rice (8.9 per cent), some farmers

**Table 4. Employment pattern (in man days) of different categories of farmers in broad activities in coastal Odisha.**

Activity	Marginal		Small		Medium		Large		All	
	M	F	M	F	M	F	M	F	M	F
Non-farm	264 (60)	4	325 (62)	20	369 (67)	58	388 (66)	0	305 (62)	16
On-farm	128 (29)	34	171 (33)	32	183 (33)	33	204 (34)	8	154 (32)	31
Off-farm	47 (11)	0	26 (5)	0	0	0	0	0	31 (6)	0
Total	439 (100)	38	522 (100)	52	552 (100)	91	592 (100)	8	490 (100)	47
Potential*	753	-	996	-	1039	-	1114	-	888	-

M: Adult male; F: Adult female;

Figures in parentheses indicate percent of total male labour employment.

\* Potential labour employment of male workers per family was worked out @ 300 man-days per person per year.

had grown pulses, oilseeds and vegetables to a very limited extent, wherever limited irrigation was available in dry season. In general, the fallow land was more (90.1 per cent) in dry season.

Females were much less employed than the male workers. The females were mostly engaged in household works. Females are less employed due to two reasons. First, the availability of salaried employment, which they prefer is much less. Second, due to social customs and traditions, they prefer household works. These restrictions prevent females to migrate to other places for non-farm works. On the average, female workers were engaged for one month in a year in on-farm work and 16 days in non-farm work in their own place. Male labourers were employed in non-farm works for 62 per cent of the days. On-farm works absorbed only 32 per cent of total employment in a year and the rest 6 per cent labour days were in off-farm works. It was observed that the per cent engagement in non-farm and on-farm works increased with increase in farm size up to medium category and decreased thereafter (Table 5). The off-farm engagements which constituted mainly agricultural works were carried out exclusively by marginal and small farmers and accounted for 6 per cent of total employment. It was also observed that the average level of employment was 55 per cent of the man days available with them, thus indicating underemployment.

farm incomes were different from salaried job, remittances, fishing in the sea and other NFA. These four group of income sources accounted for 71 per cent of the total income. The income earned from other NFA accounted maximum to the total family income followed by remittances. Due to distress factors like poverty, unemployment and frequent occurrence of natural calamities, migrations have occurred to urban areas of other states and districts. The migrant workers remitted around one fourths of total income of the farm families. These findings corroborate the study of Paris *et al*, 2007 in eastern Indian states of Uttar Pradesh, Bihar and West Bengal. Thus, the hypothesis that significant amount of total family income of farmers comes from migrant workers in rainfed area was correct. Rice, which was traditionally the main source of income of the farmers, has taken the third position. Salaried jobs near the village area contributed about 11 per cent and fishing in the sea 6 per cent to the total income of the farm families. On the average, agricultural labours accounted for 5 per cent of the total income. Livestock and income from other crops accounted for 2 per cent each of the total income.

When different groups of farms were considered, similar trend was observed with respect to income from various sources except agricultural labour and livestock. The earnings from agricultural labour

**Table 5. Income share from different farm and non-farm activities in coastal Odisha**

Farm type	Farm activities				Non-farm activities			Other Non-farm activities	Total income (Rs.)
	Rice	Other crops	Live-stock	Agricultural Labour	Salaried Job	Remittances	Fishing		
Marginal	19.38	2.13	0.77	9.49	7.74	19.19	6.41	34.90	29039
Small	19.53	0.80	0.82	3.47	17.43	28.68	4.75	24.52	42984
Medium	24.77	2.24	2.93	0	11.08	30.29	4.89	23.78	52582
Large	24.08	2.82	4.33	0	7.08	25.67	7.73	28.28	66543
Average	21.06	1.83	1.65	4.64	11.25	25.03	5.77	28.77	39004

The livelihood systems of the people of coastal Odisha included income from rice cultivation, other crops including perennials, livestock, agricultural labour, salaried job, remittances, fishing in the sea, and other non-farm activities (NFA) like construction, transportation, small scale industries, repairing and shop keeping etc. On the average, the income of the farmers per family per year was Rs 39,004 (Table 5). Non-

contributed 9 per cent of total income of marginal farmers and 3 per cent of total income of small farmers. Rice contributed about one-fourth of total income of larger farmers, while it contributed about one-fifth of total income of smaller farmers. On the average, the total income of larger farmers was more than two times than that of marginal farmers. In general, it was observed that the earnings from non-farm income was

about 3 times more than on-farm income within the farmers with small holdings and two times more within the farmers with large holdings.

The average remittances of the male members of marginal, small, medium and large farmers was Rs 5571, Rs 12328, Rs 15929 and Rs 17086 respectively with an overall average Rs 9765 per year (Table 6). On the whole, the average remittance was highest (53 per cent) from the workers those who had migrated to out of state followed by out of district (32 per cent). The members of marginal farmers had remitted maximum (78 per cent of total) from out of the state, while members of other group of farmers had remitted maximum from out of district places.

**Table 6. Remittances of migrant workers disaggregated by places of origin and farm type**

Places of origin	Marginal	Small	Medium	Large	All (average)
Out of Village	17.94	7.88	11.72	10.04	12.32
Out of District	3.89	44.43	48.71	48.76	32.03
Out of State	78.18	39.99	39.57	41.20	52.98
Out of Country	0.00	7.70	0.00	0.00	2.68
All Sources	100.00	100.00	100.00	100.00	100.00
	5571	12328	15929	17086	9765

Figures in parentheses indicate actual remittances per year in rupees.

The Ginni coefficient of income taking all the farmers into consideration was computed to be 0.36. The lower the coefficient, the better is the distribution of income within the population. The coefficient was further decomposed to find out the sources of inequality in income. Out of the eight sources studied (Table 7), it was found that four sources of income were the main causes of income inequalities. They are income from rice, remittances, salaried job and other non-farm activities. These four sources accounted for 95 per cent

**Table 7. Percent contribution to income inequality from major sources**

Sources	Marginal	Small	Medium	Large	All
Rice	9	2	8	22	12
Remittances	39	36	59	32	41
Salaried job	15	37	17	11	20
Other NFA*	33	24	9	20	22
Total	96	99	93	85	95

\*Other NFA include construction, transportation, shop keeping, Small Scale Industries and repairing etc.

of total income inequality. Among these four sources, remittances contributed maximum to inequality in income followed by other non-farm activities. Salaried job contributed one fifth to total income inequality in both the years. Rice contributed 12 per cent to the income inequality during the period under survey. When different farm categories were considered, it was noticed that other non-farm activities, remittances and salaried job contributed maximum to the inequality in income of marginal and small farmers. Remittances, rice income and income from other non-farm activities contributed maximum to the inequality in income of large farmers, whereas remittances alone accounted for more than 50 per cent of inequality in income of medium farmers. Remittances alone contributed more than one-third of the income inequalities of marginal and small farmers.

The analysis revealed that out of the total male labour employment, 62 per cent were employed in non-farm and 32 per cent in on-farm works. Females are much less employed than male workers. Due to distress factors, maximum people migrated to places outside the state followed by district and village. There is widespread unemployment prevalent in coastal Odisha as only 55 per cent of the days in a year, the male workers got employment. Migrant workers contributed more than one-third of total non-farm income which accounted for 71 per cent of total income of farmers. On the average, the remittance was highest from the workers, who had migrated to places out of state followed by district, village and country. In general, it was observed that the earnings from non-farm income was about 3 times more than on-farm income of small farmers and 2 times more within the large farmers. Four sources of income like remittances, salaried job, other non-farm activities and rice were found to contribute more than 95 per cent of the income inequalities. The three non-farm sources mentioned above contributed more than 90 per cent of income inequalities for marginal and small farmers.

## REFERENCES

- Barret CB, Reardon T and Webb P 2001. Non-farm income diversification and household strategies in rural Africa : Concepts, dynamics, and policy implications. *Food Policy*, 26 : 315-331.
- Chadha GK 1993. Non-farm employment for the rural households: Evidence and prognosis. *Indian Journal of Labour Economics*, 38(3) : 296-327.

- Elumalai K and Sharma RK 2003. Non-farm employment for rural households in India. *Agricultural Economics Research Review*, 16 (Conference Issue): 1-19.
- Hazell PBR and Haggblade S 1991. Rural-Urban growth linkages in India. *Indian Journal of Agricultural Economics*, 46(4):515-529.
- Hayami Y and Kikuchi M 2000. *A Rice Village Saga: Three decades of green revolution in the Philippines*. Barne and Noble, New York and International Rice Research Institute, Philippines.
- Kumar Alok 1993. Rural non-farm employment: A static and dynamic study of inter-state variations. *The Indian Journal of Labour Economics*, 36(3): 440-453.
- Nagar AL and Das RK 1983. Measurement of economic inequality in *Basic Statistics*, 2<sup>nd</sup> Edition, Oxford University Press, New Delhi, pp. 362-393.
- Paris TR, Singh A, Singh RK, Saha NK, Lakra V, Luis JS, and Hossain M 2007. Labour outmigration, livelihood, and gender roles: Synthesis of empirical findings in eastern India in *Science, technology and trade for peace and prosperity*, Aggarwal P.K., Ladha J.K., Singh R.K., Devkumar C., Hardy B. (eds). Proceedings of the 26<sup>th</sup> International Rice Research Conference, 9-12 October, 2006, New Delhi, India, IRRI, Philippines, ICAR & NAAS, New Delhi, pp. 609-20.
- Pyatt G, Chen C and Fei J 1980. The distribution of income by factor components. *Quarterly Journal of Economics*, 95:451-473.
- Rao Gangadhar G 1995. Rural farm and non-farm employment and pattern of rural non-farm employment by Geo-agro base: A study of West Godavari district. *Indian Journal of Agricultural Economics*, 50(1): 86-92.
- Reserve Bank of India 1984. Report of the committee on Agricultural Productivity in Eastern India. Vol. 2, Part III, pp. 139-40, Reserve Bank of India, Bombay.
- Samal, P 2004. Rice Production in Orissa: Achievements and Challenges in R. K. Panda (ed.), *Reviving Orissa Economy-Opportunity and Areas of Action*, A.P.H. Publishing Corporation, New Delhi-2, pp.5-15.
- Verma BN and Verma N 1995. Distress diversification from farm to Non-farm rural employment Sector in the eastern region. *India Journal of Agricultural Economics*, 50(3): 422-429.
- Visaria Pravin 1995. Rural non-farm employment in India: Trends and issues for research. *India Journal of Agricultural Economics*, 50 (3): 398-409.