Production and Exchange Relations in Rain-fed Agriculture: The Case of Rice in Odisha

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Abstract: *This paper examines the production and exchange relations in rice production systems in rain-fed agriculture. The two objectives were i) to capture the essential features of 'traditional' rain-fed agriculture persisting into the 21st century, ii) to examine the rice sector as a system – involving distribution as well as production. Two districts: Koraput and Nuapara (part of undivided Kalahandi) were chosen for the field-survey. A complete census of two purposively chosen villages, one from each of the selected districts, was undertaken to understand the production relations of dry-land agriculture.*

The working paper presents the findings of this survey in relation to agrarian structure and relations in paddy production, post-harvest processing and marketing. It locates the changes in rain-fed rice cultivation in the context of i) changing livelihoods, ii) the introduction of green revolution techniques into new areas and iii) state interventions for rural development.

I. Introduction

Rain-fed agriculture is typically perceived as low in productivity and is intrinsically linked to poverty and nutrition insecurity in India. Practised on nearly two thirds of the total cropped area of the country, it supports 40 per cent of India's population and contributes 44 per cent to India's food basket. Nearly 55 per cent of rice, 91 per cent of coarse grains, 90 per cent of pulses, 85 per cent of oilseeds and 65 per cent of cotton are grown under rain-fed conditions (Yadav 2009 cited in Angles et al, 2011). The close linkages between rain-fed

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agriculture and poverty have also been thoroughly investigated (Garikipati et al, 2008).

Rice is an important crop in India. Rice, however, is produced under diverse conditions (Yadav and Subba Rao, 2001). The regional specificities of rice production systems require a nuanced and differentiated approach to understanding paddy production (Barah and Pandey, 2005). The diversity of rice production includes the following crucial dimensions:

(a) there is diversity in ecological conditions, production relations and exchange relations - associated with rice. Yadav and Subba Rao (2001) report, for 17 of India's 27 states, *105 crop rotations* that include rice;

(b) rice is cultivated both as a subsistence crop as well as a 'cash crop'- sometimes even as an 'export crop';

(c) rice is produced with or without irrigation; with little or high levels of mechanisation;[1]

(d) farmers of all size classes cultivate rice using both family and wage labour along with significant use of female and (seasonally) migrant labour in many cases.

This paper presents research on the production, exchange relations and distribution of paddy in two relatively less developed districts of Odisha. We set out to examine three aspects in particular: i) changes in rain-fed rice cultivation in the context of changing livelihoods, ii) the belated introduction of green revolution techniques into new 'laggard' areas and iii) state interventions for rural development. To this end the paper is organised as follows. In the next section, we explain the significance of paddy in the rural agrarian economy of Odisha. Then, we present findings from a primary survey in two villages. Following the discussion on livelihood scenarios, agrarian relations and production conditions, we turn to discuss the post-harvesting processing and marketing system. The final section concludes.

[1] Approximately 55% of India's rice crop is irrigated, the fraction of rice area that is irrigated varies by state from <50% in Madhya Pradesh, Maharashtra, and Bihar, to >90% in Punjab, Tamil Nadu, Andhra Pradesh, and Haryana. Rainfed rice occupied 13 Mha, plus 5.45 Mha of upland rice and 1.35 Mha of deepwater rice (>1 m depth of flood water – in 1999-2000).

II. Rice in Odisha Agriculture: A Brief Outline

Odisha is not only among the poorest states of India: until recently, its record in poverty reduction has been consistently less impressive than many other less developed states of the country. In this relatively under-developed state, agrarian livelihoods are the key to the survival of the poor. However, poverty in Odisha is also highly concentrated – both spatially and socially (de Haan and Dubey, 2005; Shah et al, 2005; Mishra,2009; Panda, 2008). It is the interior districts of South Odisha, and, to a lesser extent North Odisha, where the incidence of poverty is higher and rates of poverty reduction considerably lower than elsewhere in the state. Among social groups, it is the scheduled castes and scheduled tribes who account for bulk of the poor population. And it is in the South and North Odisha NSS regions that these marginalised social groups also have a relatively higher demographic share. Even among the SCs and STs, those living in South Odisha live in far greater poverty than those living in the coastal region. Thus spatial and social vulnerabilities reinforce each other.[2]

In terms of agricultural productivity, Odisha is also much behind the national average and also the neighbouring states of Andhra Pradesh and West Bengal. In fact, apart from the areas irrigated by the Hirakud dam (mostly in undivided Sambalpur) and parts of coastal Odisha district, the green revolution simply bypassed the state. Even in these isolated pockets of agrarian prosperity, until lately productivity levels were much lower than the national average. Recent decades have seen some dynamism in the interior districts, which is partly captured by Tables 1 and 2. A recent study, however, suggests that agricultural productivity in Odisha continues to be heavily dependent on traditional inputs like human labour, bullock labour and the sheer gross cropped area: no significant technological progress has developed during the past 37 years (Reddy, 2013). Whatever dynamism is witnessed in Odishan agriculture, it is disproportionately concentrated in the fertile coastal region.

Rice is the staple food in Odisha and it accounts for 32% of Odisha's total cropped area. There has been an increase in the area under rice between 1980-81 and 2009-10, primarily because paddy continues to be both a subsistence and a commercial crop. The resource use pattern in agriculture is markedly different

[2] This phenomenon has much deeper socio-historical roots and cannot be explored here. For Odisha as a whole, the incidence of poverty among the ST and the SC is higher than that among the others. Between 1993-94 and 2004-05, poverty ratio in fact, has increased among the STs and SCs in the northern and southern districts (de Haan and Dubey, 2005; Mishra, 2010).

from the regions of advanced agriculture in India. For example, as per NSS 59th round data:

(i) 65 per cent of Odisha's farmers used organic manure for Khariff crops (contrasted with Tamil Nadu (TN): 62 per cent; Andhra Pradesh (AP): 69 per cent; while the All-India level is at 56 per cent);
(ii) only 19 per cent used improved seeds (TN: 68 per cent; AP: 68 per cent; All-India: 46 per cent);
(iii) 41 per cent of farmers used pesticides (TN: 65 per cent; AP: 71 per cent; India:46 per cent);
(iv) 76 per cent of farmers used fertilizers however (TN: 72 per cent; AP : 81 per cent ; All-India: 76 per cent).

The conditions of agricultural production in Odisha, in terms of energy use, are also different from the relatively advanced states. The same data set (NSS 59th round) shows that (i) 88 per cent of farmers use animal power for ploughing (TN: 30.4 ; All India: 52.0); (ii) 92.7 per cent use animal power for harvesting (TN: 13.1; AP: 61.4; India: 37.6); (iii) 86 per cent use animal power for transport (TN:34.8 ; AP: 39.8; India: 46.2); (iv) only 7.1 per cent of farmers use diesel/petrol/kerosene as power supplies for harvesting (TN: 78.7 ; AP: 60; India:58.6).

Table 1: Paddy Production and Diversification in Districts of Odisha

Name of the Districts	% of Gross Cropped Area under Paddy (Total) 2007-2010 (triennial averages)	Index of Crop Diversification 2007-2010 (triennial averages)	Index of Crop Diversification 1980-81	Change in % of GCA under Paddy (during 2009-10 and 1980-81)
Balasore	48.36	0.48	0.67	5.26
Bolangir	33.12	0.49	0.63	17.51
Cuttack	31.98	0.61	0.62	-10.06
Dhenkanal	25.29	0.52	0.55	-8.12
Ganjam	24.43	0.66	0.67	-1.55
Kalahandi	27.56	0.69	0.66	42.28
Keonjhar	32.08	0.55	0.60	0.03
Koraput	26.40	0.59	0.58	20.26
Mayurbhanj	43.80	0.71	0.68	0.45
Phulbani	25.85	0.49	0.51	19.16
Puri	34.04	0.73	0.72	-11.22
Sambalpur	38.45	0.67	0.65	1.04
Sundergarh	38.30	0.67	0.67	7.92
Odisha	32.42	0.64	0.63	4.16

Note: The old 13 districts have been used in this study.
Source: Source: Orissa Agricultural Statistics, various years.

Further, inter-district variations in levels of agricultural development in Odisha are pronounced. Intensive farming practices are mostly concentrated in the coastal districts of Cuttack, Puri, Balasore and Ganjam together with Sambalpur in inland Odisha. In poor regions of Southern and Northern Odisha, agriculture is rain-fed, of low productivity and subsistence-oriented.

The data for 2007-10 presented in Table 1 show that while paddy accounted for 33 per cent of GCA in Odisha; for the Kalahandi region (where one of the districts under study, Nuapada is situated) the share of paddy was only 27.56, while for undivided Koraput (where the other study village is sited) it was 26.40 per cent.

Table 2: Yield Gap in Paddy Production in Districts of Odisha

Name of the Districts	Yield of Paddy (Kg per Ha) 2007-2010 Year (triennial averages)	% Gap between Odisha average for the same year (2007-2010) and district average	% Gap between All India average for the same year (2007-2010) and district average
Balasore	1686.40	3.53	-28.68
Bolangir	1794.95	9.36	-20.89
Cuttack	1674.93	2.87	-29.56
Dhenkanal	1404.45	-15.84	-54.51
Ganjam	1960.62	17.02	-10.68
Kalahandi	1421.25	-14.47	-52.68
Keonjhar	1478.24	-10.06	-46.80
Koraput	1493.94	-8.90	-45.25
Mayurbhanj	1544.99	-5.30	-40.45
Phulbani	1505.95	-8.03	-44.09
Puri	1550.65	-4.92	-39.94
Sambalpur	1940.65	16.17	-11.82
Sundergarh	1168.54	-39.23	-85.70
Odisha	1626.94	0.00	-33.38
All India	2170		0.00

Source: Orissa Agricultural Statistics, various years.

Data presented in Table 2 shows that Odisha's paddy yields are nearly a third lower than the All-India average. Within Odisha there is a great deal of variation in paddy yield - from 1941 kg/ha in Sambalpur to 1169 in Sundergarh. Both Kalahandi (1421) and Koraput (1494) have average yields lower than the All-Odisha mean.

Table 3: Growth Rates of Area, Production and Yield of Paddy in Districts of Odisha

Name of the Districts	Compound Annual Growth Rate of Paddy: 1980-81 to 1990-91			CAGR of Paddy: 1990-91 to 2000-01			CAGR of Paddy: 2000-01 to latest 2009-10			CAGR of Paddy: 1980-81 to latest year 2009-10		
	A	P	Y	A	P	Y	A	P	Y	A	P	Y
Balasore	1.00	-1.44	-2.42	-0.32	5.89	6.23	-0.13	1.49	1.61	0.18	1.81	1.62
Bolangir	1.00	4.87	3.84	-0.20	-8.62	-8.43	1.14	14.91	13.62	0.58	2.64	2.05
Cuttack	-0.18	0.34	0.52	-0.60	-1.37	-0.78	-0.44	6.93	7.39	-0.38	1.59	1.97
Dhenkanal	0.30	0.82	0.51	-0.10	-7.89	-7.80	-1.28	11.03	12.47	-0.30	0.61	0.92
Ganjam	-0.01	2.11	2.12	-0.09	-2.11	-2.02	-0.08	5.63	5.72	-0.06	1.56	1.62
Kalahandi	1.95	3.26	1.29	1.74	2.46	0.70	0.29	4.99	4.68	1.27	3.25	1.96
Keonjhar	1.13	3.19	2.03	-0.79	-0.35	0.44	-0.38	3.74	4.13	0.00	1.97	1.96
Koraput	1.23	4.85	3.58	1.44	0.44	-0.98	-0.67	1.76	2.44	0.66	2.19	1.52
Mayurbhanj	-0.07	0.15	0.22	0.39	1.56	1.17	-0.30	2.06	2.36	0.02	1.13	1.12
Phulbani	2.19	5.30	3.05	0.42	-6.14	-6.54	-0.71	11.74	12.54	0.63	2.83	2.19
Puri	-1.12	0.96	2.10	-0.12	1.20	1.32	-0.08	3.31	3.39	-0.42	1.63	2.07
Sambalpur	0.47	4.41	3.93	-0.43	-6.32	-5.92	0.08	8.29	8.20	0.04	1.58	1.54
Sundergarh	1.87	3.36	1.46	-0.17	-6.04	-5.88	-0.94	2.55	3.52	0.27	-0.22	-0.49
Odisha	0.55	2.30	1.73	0.08	-1.48	-1.55	-0.19	5.39	5.60	0.15	1.77	1.62

Source: Orissa Agricultural Statistics, various years.

The growth pattern for paddy in Odisha, as presented in Table 3, shows that after a modest growth in yield during the 1980s, yield growth was negative during the 1990s - a pattern that has been observed in many other states as well. But the period 2000-10 saw a remarkable recovery.

In terms of growth of paddy yield, both the districts studied have shown lower rates of growth than that of the state. In the 1980s, that of Koraput was much more remarkable than that of Kalahandi, of which Nuapada was a part. In the 1990s however, Koraput had a sharper deceleration in yield growth. During 2000-1 to 2009-10, both the districts, particularly Kalahandi, have shown a notable growth in yield, which is largely because of an increase in the area under irrigation.

Since these two districts - Kalahandi and Koraput - have been split into 2 and 4 new districts respectively, the yield gap and growth rates of area, production and yield of paddy for these new districts are shown for 2000-2010 in Table 4.

The yield in Nuapada is 15 per cent lower than that of the All-Odisha average, while that of Koraput is only marginally lower than the state average.[3]

Table 4: Yield Gap and Growth Rates of Area, Production and Yield of Paddy in Nuapada and Koraput Districts

Name of the Districts	Yield of Paddy (Kg per Ha) 2007-2010 Year (triennial averages)	% Gap in Yield between Odisha average (2007-2010) and district	% Gap between All India average (2007-2010) and district	Compound Annual Growth Rate of Paddy: 1990-2000 to 2009-2010		
				Area	Production	Yield
Koraput	1633	0.37	-32.89	-1.34	-1.69	-0.35
Malkanagiri	1315	-23.73	-65.04	-0.17	-0.57	-0.40
Nawarangpur	1373	-18.52	-58.08	0.32	-1.11	-1.42
Rayagada	1743	6.65	-24.51	0.75	2.73	1.97
Koraput (undivided)	**1494**	**-8.90**	**-45.25**	**-0.19**	**-0.49**	**-0.30**
Kalahandi	1390	-17.08	-56.17	2.40	5.09	2.63
Nuapara	1492	-9.02	-45.42	0.06	1.62	1.55
Kalahandi (undivided)	**1421**	**-14.47**	**-52.68**	**1.73**	**4.23**	**2.46**
Odisha	1626.94	0.00	-33.38	0.59	-3.31	-3.88
All India	2170		0.00	-0.84	-0.07	0.77

Source: Orissa Agricultural Statistics, various years

Not only is rice an important crop in terms of agricultural production and share in the gross cropped area, it is also important for consumption. Average rice consumption per capita per day – at 95 per cent of total cereal consumption and 62 per cent of total food-grain consumption - is much higher in rural Odisha than the all India average (Table 5). The corresponding All-India averages are 57 per cent for cereals and 35 per cent for food-grains. Within Odisha, the predominance of rice in the food basket is much more pronounced in the North and South Odisha NSS regions, than in the coastal region.

[3] The reasons need further investigation, but expansion of area under irrigation because of Upper Kolab and other projects, could be among the reasons for this better yield.

Table 5: Rice Consumption in Odisha

Rural	Average Per capita Daily Consumption of Rice (in Kg)	Average Per Capita Daily Consumption of Cereals (in Kg)	Average Per Capita Daily Consumption of Food grains (in Kg)	% of Rice in Total Cereal Consumption	% of Rice in Total Food grain Consumption
Coastal Odisha	.4319	.4663	.7441	92.62	58.04
North Odisha	.4775	.4923	.7051	96.99	67.72
South Odisha	.4100	.4341	.6678	96.45	61.39
Odisha	.4377	.4629	.7070	94.56	61.90
All India	.2155	.3794	.6171	56.80	34.92

Note: Total food-grains include cereal, pulse, milk, sugar, edible oil, vegetable and fruits
Source: NSS Consumer Expenditure Schedule, 2009-10

Further, the consumption of rice and its share in total food-grain consumption are higher among the poor than among the non-poor population, higher among the agricultural labourers than cultivators. Among the poor, among agricultural labourers and cultivators, the share of rice in total food-grain consumption is higher in the North and South Odisha regions than that in the coastal region. So the consumption of rice, though relatively high for all population groups in rural Odisha, has marked associations with spatial and socio-economic correlates of the population. The culture of rice is associated with poverty and backwardness.

In this setting the conditions of production and distribution are investigated in subsequent sections.

Table 6: Rice Consumption among Socio-Economic Groups: The Regional Dimension

NSS Region (Rural)	Category	Average Per capita Daily Consumption of Rice	Average Per Capita Daily Consumption of Cereals	Average Per Capita Daily Consumption of Food grains	% of Rice in Total Cereal Consumption	% of Rice in Total Food grain Consumption
Coastal Odisha	Poor *	0.406	0.422	0.629	96.39	64.65
	Non-Poor *	0.417	0.468	0.784	89.07	53.13
	self-employed in non-agriculture	0.413	0.457	0.740	90.34	55.77
	Agricultural Labour	0.465	0.478	0.742	97.20	62.66
	Other labour	0.432	0.476	0.754	90.81	57.31
	self-employed in agriculture	0.431	0.464	0.731	92.93	58.99
	Other	0.396	0.460	0.797	86.06	49.66
North Odisha	Poor	0.446	0.453	0.615	98.41	72.53
	Non-Poor	0.480	0.512	0.782	93.73	61.40
	self-employed in non-agriculture	0.481	0.497	0.709	96.76	67.79
	Agricultural Labour	0.462	0.469	0.654	98.68	70.70
	Other labour	0.493	0.504	0.730	97.82	67.52
	self-employed in agriculture	0.492	0.508	0.721	96.91	68.29
	Other	0.438	0.472	0.743	92.63	58.90
South Odisha	Poor	0.369	0.392	0.568	94.16	65.06
	Non-Poor	0.440	0.470	0.771	93.74	57.10
	self-employed in non-agriculture	0.395	0.423	0.678	93.45	58.31
	Agricultural Labour	0.403	0.426	0.617	94.71	65.34
	Other labour	0.404	0.430	0.668	94.04	60.46
	self-employed in agriculture	0.427	0.447	0.681	95.44	62.63
	Other	0.394	0.433	0.772	91.02	51.12
Odisha	Poor	0.401	0.417	0.598	96.09	67.10
	Non-Poor	0.441	0.481	0.780	91.68	56.54
	self-employed in non-agriculture	0.426	0.458	0.716	93.01	59.48
	Agricultural Labour	0.443	0.458	0.675	96.72	65.66
	Other labour	0.431	0.457	0.700	94.31	61.56
	self-employed in agriculture	0.449	0.472	0.711	95.13	63.14
	Other	0.409	0.457	0.773	89.50	52.90

Note: * Poverty line has been taken from Planning Commission, Government of India, 2009-10.
Source: NSS Consumer Expenditure Schedule, 2009-10

III. Production Conditions in Rainfed Paddy Cultivation: Insights from a Village Survey

Study Area and Survey Design

To explore the production and exchange relations in rain-fed paddy production systems which do not use the bio-chemical inputs of the green revolution, a detailed primary survey was undertaken in 2012 in two of the new districts of Odisha: Nuapada and Koraput. These two districts had lower levels of both productivity and irrigation. Two study villages were selected purposively according to the following criteria:

(a) rain-fed paddy cultivation;

(b) no use of electricity in agriculture;

(c) no/ little use of chemical fertilizers and pesticides.

The objectives were threefold. First, to capture the essential features of 'traditional' rain-fed agriculture persisting into the 21st century, second, to measure material parameters (energy, water and the production of waste GHGs) for rice, and third, to examine the rice sector as a *system* – involving distribution as well as production. This research has not been done before.

Primary data was collected from households on the basis of two different schedules. First, all the households in the selected villages were interviewed on the basis of a detailed questionnaire, through which information about all aspects of farming, allied agricultural activities and livelihoods sources were collected. Second, twenty-four randomly selected farmers cultivating rice were asked detailed questions about paddy cultivation in one representative paddy plot cultivated by the household. Information generated from this exercise from 48 plots in a comparative framework has been used for the LCA-VCA model to calculate greenhouse gases[4], while information from the general household questionnaire has been used in this paper to investigate the conditions of production and exchange in the study villages[5]. This has been supplemented by focus group discussions and in-depth interviews with traders, wholesalers, grocery shop owners, officials with regulated market cooperative societies, commission agents, rice mill owners, researchers, hauler-owners, officers managing the PDS, labourers, transport workers and owners to gather information about post-harvest processing, marketing and distribution of paddy.

[4] For the material parameters for rain-fed rice to a life cycle assessment of energy, water and greenhouse gases see Gathorne-Hardy, 2013.

[5] That is why there are some discrepancies between in the figures generated through the analysis of plot-level data and data generated through household-level information.

The two districts: Koraput and Nuapara (part of undivided Kalahandi) are part of KBK-region- which has a special policy identity. Two phases of the Biju KBK Yojana have been implemented by the state government with assistance from the Planning Commission and the Central Government. In the 1980s, Kalahandi, Balangir and Koraput (KBK) region came to be recognized as synonymous with mass poverty, starvation and hunger deaths (Currie, 2000; Lokadrusti, 1993). Although these districts continue to have very high incidence of poverty, interventions by the state and NGOs have brought-in many new programmes to strengthen food security and to improve agricultural productivity. So far as the agrarian economy of the region is concerned, two recent changes are noteworthy but are out of the scope of our field research: first, new irrigation projects have generated irrigation for traditional rain-fed regions, leading to mono-cropping and double crop paddy in selected pockets. Second, cotton is being promoted by both government and private agencies, and is being aggressively developed as an alternative to traditional rice-based production systems under low water availability.

Socio-Economic Features of the Two Villages

The two case studies are in relatively small villages with large shares of Scheduled Caste (SC) and Scheduled Tribal (ST) people. The Nuapada village is comprised mostly of STs, while the Koraput village has a mix of SCs and STs. [6] Literacy rates were 52 and 71 per cent in Koraput and Nuapada villages respectively. Around 9 per cent of the villagers have studied beyond class 10. In both villages, agriculture is the major occupation (Table 8) but in the Koraput village agricultural labour emerges as the second most important occupation, while in Nuapada, it is less important. While a miniscule percentage of households report salaried employment or business, a relatively high (15-18) per cent of households report 'pension' as their main ‘occupation’.[7]

[6] In the rest of the discussion when we refer to Nuapada or Koraput we are discussing these two study villages. While the primary data presented here is expected to be a good representative of the rain-fed rice production system in the region, in other aspects they may not represent the district.

[7] The Government of Odisha has launched a scheme to provide pensions (at Rs300 per month) to persons above 60 years of age, widows and persons with disabilities if their annual family income is less than Rs 24,000 (for details see http://wcdodisha.gov.in/node/64).

Table 7: Basic Demographic and Socio-Economic Features

	Koraput	Nuapada	Total
No Of Households	67	80	147
Population	233	369	602
Average Family Size	4.79	4.82	4.81
Literacy Rate (%)	52	71	64
% of People Who Have studied beyond 10th	7	10	9
% Of SC	24	0	11
% of ST	76	90	84
% of OBC	0	10	5

Source: Field Survey, 2012

Sources of Livelihoods

Since the concept of 'occupation' does not capture the diversity of livelihoods in the villages, a separate and revealing question was asked about diversity of livelihoods, with the possibility of opting for multiple answers. The average number of livelihoods per households works out to be 3.48 in Koraput and 3.26 in Nuapada. In Koraput, the most frequently cited sources of livelihoods were: forest related activities (that include collection of non-timber forest products (NTFPs) for self-provisioning as well as for sale); casual wage labour in agriculture; casual wage labour in non-agriculture (within the village or in nearby towns through commuting) and cultivation. In Nuapada, the most important livelihoods are: cultivation; casual farm labour; forest-related activities and seasonal migration. In overall terms the most significant sources of livelihoods are: forest-related activities; casual wage labour in agriculture and cultivation (Table 9).

Table 8: Distribution of Households by Principal Occupation

Sl. No.	Principal Occupations of HH heads	Koraput	Nuapada	Total
1	Cultivation	40 (60)	60 (75)	100 (68)
2	Agricultural Labour	11 (16)	1 (1)	12 (8)
4	Animal husbandry	0 (0)	2 (2)	2 (1)
5	Casual non-farm work	1 (1)	1 (1)	2 (1)
6	Trade and business	1 (1)	0 (0)	1 (1)
7	Regular salaried employee	1 (1)	3 (4)	4 (3)
8	Pension	12 (18)	12 (15)	24 (16)
9	Others	1 (1)	1 (1)	2 (1)
10	Total	67 (100)	80 (100)	147 (100)

Source: Field Survey, 2012

Table 9: Major Sources of Livelihoods

Sl No	Occupations/ Livelihoods	Koraput		Nuapada		Total	
		No	%	No	%	No	%
1	Own Farm Activities (Cropping)	41	17.60	72	27.59	113	22.87
2	Livestock (for sale or for self consumption)	3	1.29	11	4.21	14	2.83
3	Forest (firewood/ leaves for sale or for self consumption)	61	26.18	63	24.14	124	25.10
4	Casual Labour (Farm) in the village	55	23.61	66	25.29	121	24.49
5	Migration for Casual labour in farm	3	1.29	1	0.38	4	0.81
6	Casual Labour non-farm in village or nearby	50	21.46	5	1.92	55	11.13
7	Migration for labour non-farm	3	1.29	17	6.51	20	4.05
8	Salaried Employment	1	0.43	4	1.53	5	1.01
9	Petty Business/Trade/ Manufacturing	0	0.00	4	1.53	4	0.81
10	Major Business/Trade/Manufacturing	1	0.43	0	0.00	1	0.20
11	Collection/Foraging	0	0.00	1	0.38	1	0.20
12	Charity/Alms	0	0.00	1	0.38	1	0.20
13	Public Transfers/Pensions	12	5.15	14	5.36	26	5.26
14	Private Transfers/Remittances	0	0.00	2	0.77	2	0.40
15	Other (specify)	3	1.29	0	0.00	3	0.61
		233	100	261	100	494	100

Note: Multiple Answers Allowed
Source: Field Survey, 2012

Since a number of different livelihoods are combined by rural households, the predominant livelihood combinations have also been examined (Table 10). With some simplifications, 33 different livelihood combinations were identified for

the 147 households under study. The following are the most important combinations in the Koraput village: (crop cultivation+ casual farm labour+ forest); (crop cultivation+ casual non-farm labour+ forest); (casual labour in farm+ casual labour in non-farm+ forest) and (crop farming+casual labour in farm+ casual labour in non-farm). Similarly, for the Nuapada village, the most important livelihoods combinations are (crop cultivation+ casual non-farm labour+ forest); (cultivation+ casual farm labour + seasonal migration to non-farm).

Even this highly simplified mapping of livelihoods brings out their diversity in the study areas.

The key aspects of the livelihoods strategies that emerge from the analysis are: (i) the significance of forest-resources as a supplementary source of livelihoods to agriculture; (ii) the participation of cultivator households in the wage labour market; (iii) the significance of non-farm wage labour, both within and outside the villages.

The important difference between these two villages, so far as the source of non-farm work is concerned, is that in the Koraput village while most of those working as wage labour in the non-farm economy commute to work by auto-rickshaws, in Nuapada by contrast, seasonal migration has a durable presence.

Paddy production is embedded in these varied and diverse occupational conditions.

Table 10: Major Livelihoods Combinations

Sl No	Livelihoods Combinations	Koraput		Nuapada		Total	
		No	%	No	%	No	%
1	1,4,3 (Crop Cultivation, Casual Labour in Farming, Forest)	23	34.33	34	42.50	57	38.78
2	1,3,6 (Crop Cultivation, Forest, Casual Labour non-farm)	9	13.43	1	1.25	10	6.80
3	4,3,6 (Casual Labour Farming, Forest, Casual Labour in Non-farm)	8	11.94	1	1.25	9	6.12
4	1,3,7 (Crop Farming, Forest, Seasonal Migration-Nonfarm)	1	1.49	7	8.75	8	5.44
5	1,4,6 (Crop Farming, Casual Labour Farm, Casual Labour Non-farm)	6	8.96	1	1.25	7	4.76
6	1,4,7 (Crop Farming, Casual Labour Farm, Seasonal Migration-non-farm)	1	1.49	6	7.50	7	4.76
7	3,4,6 (Forest, Casual Labour Farm, Casual Labour Non-farm)	5	7.46	0	0.00	5	3.40
8	1,2,3 (Crop Farming, Livestock, Forest)	0	0.00	4	5.00	4	2.72
9	1,4 (Crop Farming, Casual Labour Farm)	0	0.00	4	5.00	4	2.72
10	1,4,16 (Crop Farming, Casual Labour Farm, Public Transfer, Pension)	0	0.00	3	3.75	3	2.04
11	16 (Public Transfer, Pension)	3	4.48	0	0.00	3	2.04
12	16,3,4 (Public Transfer, Pension, Forest, Casual Farm Labour)	2	2.99	1	1.25	3	2.04
13	9 (Salaried Appointment)	1	1.49	2	2.50	3	2.04
14	1,2,4 (Crop Farming, Livestock, Casual Farm Labour)	0	0.00	2	2.50	2	1.36
15	3,4 (Forest, Casual Farm Labour)	1	1.49	1	1.25	2	1.36
16	4,3,16 (Casual Farm Labour, Forest, Public Transfer)	1	1.49	1	1.25	2	1.36
17	9,1 (Salaried Appointment, Crop Farming)	0	0.00	2	2.50	2	1.36

18-33	Others	38	56.72	36	45.00	74	50.34
Total		67	100.00	80		147	100.00

Note: 1-Own Farm Activities (Cropping); 2-Livestock (for sale or for self consumption); 3-Forest (firewood/ leaves for sale or for self consumption); 4-Casual Labour (Farm) in the village; 5-Migration for Casual labour in farm; 6-Casual Labour non-farm in village or nearby; 7-Migration for labour non-farm; 8-Long Term Agriculture Labour (Permanent Labour); 9-Salaried Employment; 10-Personal (Jajmani) Services; 11-Petty Business/Trade/ Manufacturing; 12-Major Business /Trade / Manufacturing; 13-Collection/Foraging; 14-Charity/Alms; 15-Interest Income, Property, Land Rentals, Etc; 16-Public Transfers/ Pensions; 17-Private Transfers/Remittances; 18-Other (specify)

Source: Field Survey, 2012

Access to Land

Both the villages under study are tribal-dominated villages, and there were no 'traditional' upper caste landlords there. Such villages are typically characterised by a low degree of inequality in the distribution of land. The average size of owned holdings in Koraput village was 1.50 acres and in Nuapara it was 1.95 acres. Most of the households own tiny plots. In fact, nearly 78 per cent of households own less than 4 acres of land. The incidence of landlessness is not very high, as one might expect in a predominantly tribal area, but if the marginal farmers owning less than an acre of land are considered near-landless, the incidence goes up to 45 per cent in Koraput while it is 6.5 per cent in Nuapada. In both villages, small farmers owning 2-4 acres of land have a significant presence, but in Koraput village, one household alone owns 25 acres of land.

The question of land quality proves extremely important, as productivity differentials between valley low-lands and hilly uplands are very high. The relatively large land-owning households typically have greater shares of the fertile low-land and, to that extent, the picture presented in Tables 11 and 12 under-estimates inequality in land ownership.

Table 11: Distribution of Households by Ownership Holdings

Class	Koraput		Nuapada		Total	
	Number	Area owned (in acres)	Number	Area Owned (in acres)	Number	Area Owned (in acres)
Landless (0 acre)	3 (4.48)	0.00 (0.00)	3 (3.75)	0.00 (0.00)	6 (4.08)	0.0 (0.0)
Marginal (0.001-1)	27 (40.30)	3.94 (3.92)	2 (2.50)	0.80 (0.49)	29 (19.73)	4.74 (1.79)
Small (1.001-2)	18 (26.87)	22.83 (22.74)	38 (47.50)	48.16 (29.40)	56 (38.10)	70.98 (26.87)
Semi-medium (2.001-4)	16 (23.88)	38.58 (38.43)	28 (35.00)	68.37 (41.74)	44 (29.93)	106.95 (40.48)
Medium and Large (4.001 & above)	3 (4.48)	35.05 (34.91)	9 (11.25)	46.46 (28.37)	12 (8.16)	81.51 (30.85)
Total	67 (100)	100.39 (100)	80 (100)	163.78 (100)	147 (100)	264.17 (100)

Note: Figures in brackets refers to percentages to column totals.
Source: Field Survey, 2012

Table 12: Distribution of Households by Operational Holdings

Class	Koraput		Nuapada		Total	
	Number	Area Operated (in acres)	Number	Area Operated (in acres)	Number	Area Operated (in acres)
Not Operating any land	21 (31.34)	0.00 (0.00)	5 (6.25)	0.00 (0.00)	26 (17.69)	0.00 (0.00)
Marginal (0.001/1)	18 (26.87)	12.52 (12.66)	24 (30.00)	24.00 (15.29)	42 (28.57)	36.52 (14.27)
Small (1.001/2)	18 (26.87)	31.40 (31.74)	28 (35.00)	48.53 (30.92)	46 (31.29)	79.93 (31.24)
Semi-medium (2.001/4)	8 (11.94)	24.00 (24.26)	17 (21.25)	50.42 (32.12)	25 (17.01)	74.42 (29.09)
Medium and Large (4.001 & above)	2 (2.99)	31.00 (31.34)	6 (7.50)	34.00 (21.66)	8 (5.44)	65.00 (25.40)
Total	67 (100)	98.92 (100)	80 (100)	156.95 (100)	147 (100)	255.87 (100)

Note: Figures in brackets refers to percentages to column totals.
Source: Field Survey, 2012.

In terms of the distribution of operational holdings, it is found that most farmers operate tiny holdings. The three lower size-classes, operating between 0.001 and 4 acres of land, account for 64 per cent of holdings in Koraput and 85 per cent of holdings in Nuapada. If the non-cultivating households are excluded, their share goes up even further. Thus, cultivation is mostly carried out on tiny and smallholdings and the overall character of agriculture is that of subsistence production rather than of production for markets.

In the study villages land-leasing was insignificant. In total, 4 households (in Nuapada) are leasing-in: two part-tenants (owning 1 acre each and leasing-in 2.92 and 2 acres respectively (total 4.92 acres)) and two pure tenants (owning no land but with 6 and 5 acres respectively leased-in (total 11 acres)). This finding is consistent with other research showing a higher incidence of tenancy in the irrigated rice-cultivating belt (Mishra, 2008).

Cropping Pattern

The cropping pattern in the two study villages is dominated by paddy: its share in GCA is 60 per cent in Koraput and 89 per cent in Nuapada. While Ragi is the most important second crop in Koraput, Arhar occupies the same position in Nuapada. Most cultivators reported themselves to be single-crop farmers. However, many farmers, particularly in Koraput, also use simultaneous sowing and sequential harvesting methods of mixed cropping in uplands. Ragi, Alsi (an oilseed) and Suan (a small millet) are among the traditional food crops of the region and these crops, because of the sequential nature of their harvesting, provide food security during the lean periods. The complexities of the crop cycle are captured by the data on crop combinations (Table 14). A large number of farmers in Nuapada reported to be cultivating paddy alone, while in Koraput paddy is cultivated as part of a number of different crop combinations. So, it is useful to analyse paddy as part of a crop system rather than as an isolated crop – with implications for household food security.

Table 13: Cropping Pattern

Crop	Koraput		Nuapada		Total	
	Area	% of GCA	Area	% of GCA	Area	% of GCA
Paddy	55	59.88	145	88.46	200	78.21
Ragi	18	20.03	0	0.00	18	7.18
Arhar	0	0.33	11	6.78	11	4.47
Alsi	7	7.97	0	0.00	7	2.86
Moong	6	6.55	0	0.00	6	2.35
Biri	0	0.00	6	3.42	6	2.19
Groundnut	4	4.15	0	0.00	4	1.49
Urad-Arhar-Suan*	0	0.00	2	1.34	2	0.86
Suan*	1	1.09	0	0.00	1	0.39
Total	92	100.00	164	100.00	256	100.00

Note: Area in acres; *Suan (small-millets);
Source: Field Survey, 2012

Table 14: Major Crop Combinations

Crop combinations	No of Households/ Holdings		
	Koraput	Nuapada	Total
Paddy	17	46	63
Paddy, Arhar	0	15	15
Paddy, Ragi	12	0	12
Paddy, Moong	0	6	6
Paddy, Ragi, Biri	4	0	4
Paddy, Arhar, Groundnut	0	3	3
Paddy, Arhar, Moong	0	3	3
Paddy, Ragi, Alsi	3	0	3
Paddy, Ragi, Alsi, Biri	2	0	2
Paddy, Alsi, Ragi	1	0	1
Paddy, Ragi, Alsi, Biri,Arhar	1	0	1
Paddy, Ragi, Alsi, Biri, Arhar	1	0	1
Paddy, Ragi, Suan, Alsi	1	0	1
Total	42	73	115

Source: Field Survey, 2012

Input-Use in Paddy Cultivation

The importance of subsistence paddy production in the region is revealed in the analysis of costs and returns from the cultivation of different crops. Costs of three key inputs (viz. seeds, chemical fertilizer and organic manure) are presented in Table 15, along with the percentage of farmers using purchased inputs. A substantial majority use homegrown seed, for paddy as well as for other crops. Most farmers use organic manure. In per acre terms large farms use more organic manure than other size classes; at the same time very small farms are also using organic manure extensively. Even in the case of groundnut, which is cultivated by households for commercial purposes, inputs are rarely purchased (Table 16). The use of HYV seeds, chemical fertilisers and mechanization in Odisha is much lower than the All-India averages; however, what is important here is the near complete absence of green revolution technology in the study villages. Partly this is because of limited suitability of the technology to the ecological conditions (particularly in the upland Koraput village), partly it is due to the lop-sided policy priorities with respect to agriculture in which rainfed agriculture is greatly neglected (Raina, 2006).

Table 15: Size Class-wise Input-Use (per acre) & percentage of households using purchased inputs

Crop	Size Class	Input (Seed)		Input (Fertilizer)		Input (Manure)	
		Amount per acre (kg)	Percentage of households using purchased seed	Amount per acre (kg)	Percentage of households using (purchased) chemical fertilizer	Amount per acre (kg)	Percentage of households using purchased manure
For All Crops	Marginal	25	6	64	2	573	--
	Small	46	12	--	--	377	--
	Semi-medium	37	18	--	--	547	--
	Medium & Large	37	0	40	17	577	--
	Total	31	8	61	2	548	--

Source: Field Survey, 2012

Table 16: Input-Use (per acre) & percentage of households using purchased inputs: Crop wise

Crop	Size Class	Input (Seed)		Input (Fertilizer)		Input (Manure)	
		Amount per acre (kg)	Percentage of households using purchased inputs	Amount per acre (kg)	Percentage of households using purchased inputs	Amount per acre (kg)	Percentage of households using purchased inputs
Paddy (111)	Total	41	7	61	4	498	--
Ragi (25)	Total	35	--	--	--	509	--
Arhar (21)	Total	4	19	--	--	760	--
Alsi (9)	Total	7	--	--	--	407	--
Green gram (9)	Total	1.1	22	--	--	375	--
Black gram (7)	Total	2	--	--	--	1133	--
Ground nut(3	Total	53	33	--	--	275	--

Source: Field Survey, 2012

Labour-Use Pattern

Wage labour is used even by the smallest of farm-size categories (Table 17). In terms of total labour-use, per acre labour varies between 60-70 labour days. The smaller size of holdings use labour more intensively than larger holdings. The use of wage labour, which is around 36-42 percent among small and marginal farmers, increases to 68 per cent among medium sized farmers.

The continuing significance of family labour - specifically that of female labour - is also brought out from Table 16. So far as wage labour is concerned, the access to non-farm work in nearby towns and also through the NREGA, has meant that wage rates in agriculture have risen. As many small and marginal farmers hire-out their labour for wages and also hire-in wage labour, they have collectively agreed to a dual wage-rate system. A lower wage rate is charged when a fellow villager is employed for farm-related activities (with the implicit understanding that the employer would also work at a similar wage rate, if needed) and a higher wage rate is charged for non-farm work within the village or farm work outside the village.

Table 17: Pattern of Labour-Use

	Farm-Size	Gender	Labour-Use (Labour days)		
			Wage Labour per acre	Family Labour per acre	Total Labour-use per acre
Paddy	Marginal	Male	16	32	40
		Female	22	33	39
		Total	29	61	79
	Small	Male	9	18	23
		Female	13	17	19
		Total	18	31	42
	Semi-Medium	Male	6	16	22
		Female	14	14	19
		Total	17	26	41
	Medium & Large	Male	9	11	15
		Female	11	10	13
		Total	19	20	28
	Total	Male	11	24	31
		Female	17	25	29
		Total	23	45	60
All Crops Combined	Marginal	Male	12	26	33
		Female	15	29	29
		Total	21	50	62
	Small	Male	9	18	23
		Female	13	16	19
		Total	18	30	42
	Semi-Medium	Male	6	15	20
		Female	14	13	17
		Total	16	23	37
	Medium & Large	Male	9	11	14
		Female	11	10	10
		Total	20	18	25
	Total	Male	10	23	29
		Female	14	25	25
		Total	19	42	54

Source: Field Survey, 2012

Output Per Acre

Output per acre shows a consistent inverse relationship to farm-size in the case of paddy (and also for ragi) - the main crop in the villages (Table: 18). Although output is used mainly for subsistence, 24 out of the 111 paddy cultivating households sold some paddy – and the proportion of households selling paddy increases with farm size. Most of those with a market surplus, however, have

sold it to other local households or in nearby villages - again demonstrating the low level of commercialization of the product market.

Table 18: Output per acre and Output Marketed

Crop	Size Classes	No. of Households Cultivating	Output per acre (kg per acre)	No. of households involved in sale	Share of output marketed	Sold to whom (Distribution of Households)		
						Weekly market	private households within the village	private household out of village
Paddy	Marginal	40 (36)	632	3	23.85	0	1	2
	Small	40 (36)	564	11	14.73	2	8	1
	Semi-medium	22 (20)	511	7	16.71	1	3	3
	Medium & Large	9 (8)	456	3	5.17	0	1	2
	Total	111 (59)	569	24	15.25	3	13	8
Ragi	Total	25 (13)	387	1	25.00	1	--	--
Arhar	Total	21 (11)	94	2	51.31	--	--	2
Alsi	Total	9 (4.8)	183	1	20.00	--	--	1
Green gram	Total	9 (4.8)	98	4	43.03	1	--	3
Black gram	Total	7 (3.7)	127	1	50.00	--	--	1
Ground nut	Total	3 (1.6)	866	2	37.50	1	--	1

Source: Field Survey, 2012

The Gross Value of Output: Paddy and other Crops

In terms of the gross value of output, paddy and ragi are at similar levels while other crops such as alsi and groundnut generate higher farm returns (Table 19). For paddy, it is marginal farmers who reap the highest gross value of output per acre, followed by small farmers – due to the low use of marketed inputs and their dependence on family labour However, given the facts that there is only one cropping season, that most of the farmers own tiny pieces of land, and most of the family members work in the fields, the actual earnings from agriculture are abysmally low.

Table19: Gross Value of Output per acre for different crops per acre

Crop	Size-class	Gross Value of Output per acre (INR)
Paddy	Marginal	6962
	Small	5518
	Semi-medium	5058
	Medium & Large	4562
	Total	5869
Ragi	Marginal	6500
	Small	5802
	Semi-medium	4586
	Medium & Large	3000
	Total	5349
Arhar	Marginal	--
	Small	4817
	Semi-medium	5671
	Medium & Large	7722
	Total	5517
Alsi	Marginal	--
	Small	7700
	Semi-medium	6666
	Medium & Large	5666
	Total	6904
Green gram	Marginal	--
	Small	3714
	Medium & Large	3147
	Total	3399
Black gram	Marginal	--
	Small	5542
	Semi-medium	3900
	Medium & Large	3227
	Total	4507

Ground nut	Marginal	--
	Small	23750
	Semi-medium	22500
	Total	23333
All Crops	Marginal	6920
	Small	5962
	Semi-medium	5454
	Medium & Large	4569
	Total	5904

Source: Field Survey, 2012

Credit Market

The credit market has undergone substantial changes in the past few decades. This region is known for the dominance of moneylenders (Mishra, 2008). However, the 2012 survey shows a substantial reduction in the influence of moneylenders. There are significant differences in the two study villages (Table 20). The credit market appears to be virtually absent in the Koraput village [8], and the bigger farmers have taken loans from the banks and cooperative societies. In the Nuapada village, however, SHGs have a significant presence. Overall SHGs are the most important source of credit. And contrary to expectations, formal credit dominates the credit market. Other research shows a decline in producers' dependence on moneylenders as a result of easy credit provided by SHGs. The under-reporting of loans from private moneylenders and employers (in case of seasonal migration contracts) is also a distinct possibility. However, an important development is that food loans were almost non-existent, while earlier studies have revealed them to be a predominant feature of the region. The two significant factors that have contributed to this change are: (i) the presence of SHGs and (ii) the provision of cheap food-grains through the PDS.

[8] This, however, could be a village-specific result. On the basis of our interviews and group discussions in other villages, we report that in other villages, traders, shopkeepers and moneylenders continue to advance loans to needy families. But the significance of such high interest informal loans has declined over the years.

Table 20: Sources of Credit

Size class	No. of Loans	Sources of Credit				Average amount of loan (in Rs)
		Commercial Bank	Cooperative Bank	Others (SHGs)	Private Money Lenders	
	Koraput					
Landless	0	0	0	0	0	--
Marginal	0	0				--
Small	2	0	1	0	1	3500
Semi-medium	0	0	0	0	0	--
Medium & Large	2	1	1	0	0	200000
Total	4	1	2	0	1	101750
	Nuapada					
Landless	4	1	1	2	0	9000
Marginal	11	1	1	9	0	11182
Small	21	4	2	15	0	9571
Semi-medium	12	1	1	9	1	8833
Medium & Large	5	2	0	3	0	11400
Total	53	9	5	38	1	9868
	Total					
Landless	4	1	1	2	0	9000
Marginal	11	1	1	9	0	11182
Small	23	4	3	15	1	9043
Semi-medium	12	1	1	9	1	8833
Medium & Large	7	3	0	3	0	65285
Total	57	10	7	38	2	21824

Source: Field Survey, 2012

In sum: the production conditions in the study villages point to the dominance of small-scale production for subsistence, but with some market involvement in input and outputs. The diversity of livelihoods sources points to the (increasing) importance of labour markets - both farm and non-farm - in the livelihoods strategies of rural people. In this context, paddy cultivation is undertaken as a subsistence rather than a commercial activity.

IV. Post-Harvesting Processing and Marketing

As with other aspects of production, small-scale activity provides the key to understanding the post-harvesting processing and marketing in the study region. Paddy is transported from fields to houses/ threshing places (*Khala*) by head-

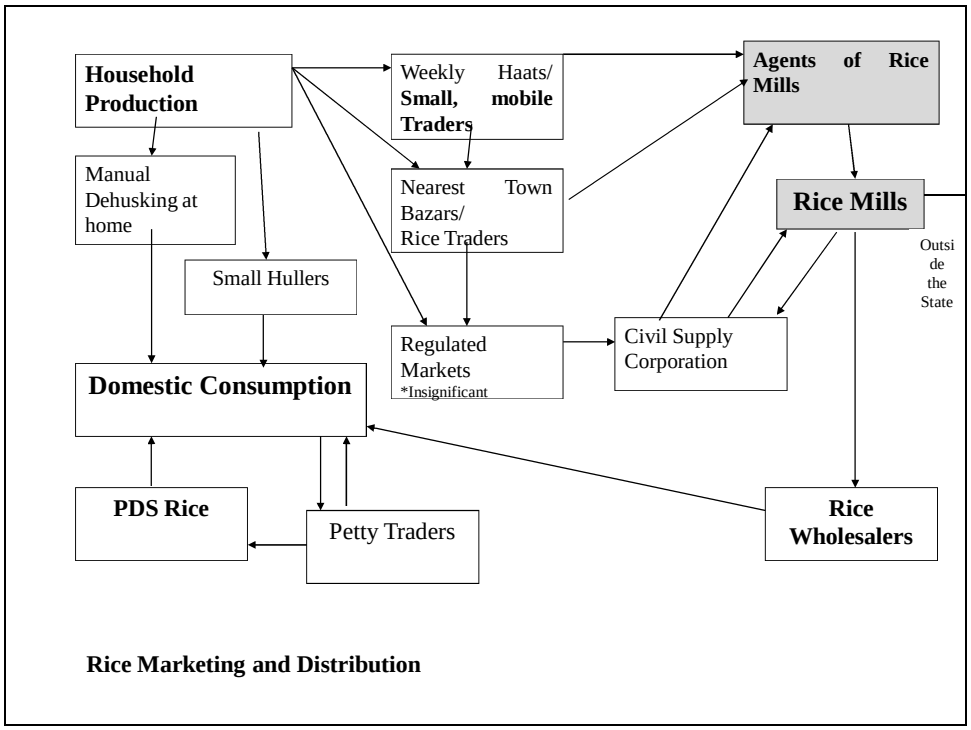
loads, cycles, and (in rare cases) tractors. Bullock carts have almost disappeared - mainly because of the high costs of keeping animals[9].

Some paddy de-husking is still done manually, using primitive tools - mostly by women. The dominant mode of processing however is through electric hulling mills. The huller-millers keep the husk and no charges are taken for de-husking. Many of the owners of hullers used to be small paddy-converting traders in the past - buying paddy from small farmers, and selling the rice to shop keepers. This practice has completely disappeared. It is no longer profitable, given the universal PDS that is in operation in the districts.

A significant proportion of the paddy (and other products) is still for self-provisioning. Most of it never leaves the boundaries of the village. But paddy is sold in weekly markets *haats* or in nearby towns. The mode of transport to towns is usually in buses, shared jeeps and auto-rickshaws. Depending on the distance, paddy is brought to the *haats* on head-loads, cycles, shared jeeps, shared trucks, auto-rickshaws and buses. Paddy is then transported from *haats* to the regulated markets or rice mills in trucks.

[9] In our study village in Koraput, villagers had an old system of cattle rearing- families belonging to a particular caste were responsible for cattle rearing. They would collect cattle from the entire village and take the herd for grazing in exchange for a contribution in kind from all the households. The system has become dysfunctional, as the families do not find it remunerative enough to engage in cattle rearing; they have started depending on labour market for survival. A dispute with the neighbouring village related to the use of the common grazing land has also affected the livestock economy. The large farmers have started hiring tractors for land preparation and transport.

Figure 1: Post Harvest Processing and Marketing of Paddy



In Koraput, there are several government agencies involved in the process of marketing of paddy - the Regulated Marketing Cooperative Society (RCMS, the apex body at district level and the nodal agency), the Odisha State Civil Supplies Corporation (OSCSC), the Primary Agricultural Cooperative Societies (PACS), and the Tribal Development Corporation (TDCC). But procurement is mostly from villages with abundant low / valley-lands, more particularly from the area irrigated by the Upper Kolab Dam Project. Although RCMS authorities claimed that only genuine farmers bring their paddy to the markets, and are paid through the banks, it was clear to us that there is active collusion between rice millers, RCMS and other official agencies and relatively big farmers engaged in the procurement operations. This, however, has more to do with surpluses in irrigated rice zones rather than with rain-fed rice.

Paddy cultivation practices were found to be remarkably different in irrigated / low-land and rain-fed areas of the district. *Dongar dhan*, the paddy varieties cultivated in uplands are not purchased by the procurement agencies. Hence even within the same region, and sometimes in adjoining villages, different paddy cultivation and procurement practices are noticed. Faced with such a

differentiation in the paddy market, villagers have opted for one of two strategies available to them: either they have switched to hybrid varieties (depending upon availability of low-land), have started purchasing seeds and fertilisers from the market, and are selling their output to the procurement agencies directly or through middle men; or they have continued with subsistence production, gradually shifting towards the labour markets for survival.

Rice traders claim that the 'Rs2 a kilo rice' scheme has competed successfully with the open market - and reduced their profits. They procure rice from small farmers, from retail traders who pick up bags of rice from weekly *haats* and also from rice mills. Some of the wholesalers procure rice at longer distances from neighbouring Andhra Pradesh and also from the neighbouring district of Nawarangpur in Odisha.

The earlier practice of purchasing rice directly from farmers through interlinked credit transactions has been replaced by a system where enterprising villagers have started operating as middle men, purchasing small quantities of paddy from the villagers at low prices at weekly *haat*s and selling them to wholesale dealers and rice millers. Credit advances against a standing crop, which usually carries a high interest burden, seem to have disappeared altogether. Commission agents were less visible - but they are active in the irrigated belt.

V. Summary and Conclusions

Both villages studied are located in relatively less-developed districts of Odisha and are representative of rain-fed agriculture. The livelihoods scenario emerging from the field research broadly supports the contention that in large parts of rural India, peasant households are no longer able to survive simply by depending upon agriculture (Lerche et al, 2013). Livelihoods diversification, often under duress, seems to be the only option to survive the livelihoods crisis facing households. That is why such a high percentage of rural households - especially those of ‘independent’ producers - have, at least partly, started to depend on wage labour markets for survival.

Labour market dependence (whether local or distant; farm or non-farm) signals the gradual integration of relatively isolated local economies into the circuits of capital. But this is happening without much commercialisation of agriculture, at

least in our study villages. Crop cultivation in general and paddy farming in particular remains a subsistence activity for a large proportion of households. We therefore find the coexistence of a vibrant labour market in non-agriculture and stagnation and subsistence in rain-fed paddy production.

State intervention through the universal PDS has no doubt had a limited but positive impact on food security in the region, but a procurement policy biased to low-land paddy has left farmers cultivating traditional varieties in uplands with no option but to continue farming as a subsistence activity.

This has led to two radically different trajectories. While some pursue a strategy of avoiding the 'green revolution', others with access to low-lands and irrigation have already started to commercialise production.

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