Source of Livelihood and Inter-Temporal Mobility: Evidence from Western Odisha Villages

Arup Mitra
Basanta K Pradhan

सत्यमेव परमो धर्मः IEG Working Paper No. 364 2016

Source of Livelihood and Inter-Temporal Mobility: Evidence from Western Odisha Villages

Arup Mitra
Basanta K Pradhan

सत्यमेव परमो धर्मः IEG Working Paper No. 364

2016

ACKNOWLEDGEMENTS

This paper forms part of the project 'Agricultural Contract and Rural Poverty in India', which is a collaborative study between the Chr. Michelsen Institute, Bergen and the Institute of Economic Growth, Delhi, supported by the Research Council of Norway. We benefitted from discussions with Clive Bell and Magnus Hatlebakk. We are very thankful to Rashmi Rastogi for her support in estimations.

Arup Mitra is Professor, Institute of Economic Growth, Delhi.
email: arup@iegindia.org

Basanta K Pradhan is Professor, Institute of Economic Growth, Delhi.
email: basanta@iegindia.org

Source of Livelihood and Inter-Temporal Mobility: Evidence from Western Odisha Villages

ABSTRACT

Occupational structure reveals stagnancy: many of the activities pursued are of residual type, and many individuals are non-workers. Also there is limited information on occupational mobility. However, it is observed that even in a stagnant region with limited opportunities income mobility is occurring, to a limited extent though. Agrarian contract forces households to look for better avenues. With improvement in educational levels individuals are shifting to services and other non-agricultural activities. Livelihood diversification is seen as a risk management strategy of the rural poor. Paucity of earnings compels many to access multiple sources of livelihood at a time. Such a phenomenon, however, implies a greater intensity of work to be pursued to earn the same subsistence level of income.

JEL Classification number: J62, J31, Q12

Key words: occupational choice, upward mobility, income, multiple sources of livelihood

1 ANALYTICAL FRAMEWORK

How low-income households survive in rural areas is a pertinent question, particularly when rural areas—which are characterised by backward agriculture and inadequate cultivable land, irrigation facilities, and other infrastructural support—pose serious challenges to livelihood issues, especially when the possibilities of rural diversification are scanty.

Severe inequality in terms of land distribution restricts income generation in the hands of those situated at the lower echelons, forcing them to work in others' land either as wage labour or as share croppers. Contractual arrangements are not necessarily confined only to land and produce but extend to marketing of the produce and credit taken by the tenant from the land owner. Besides, significant interlocking between land and credit markets exists, and result in complex contractual arrangements (Basu and Bell 2000). Whether these contractual arrangements actually help sharecroppers overcome crisis or perpetuate their meagre earnings has been a matter of serious concern in the development studies literature.

Low-income households have multiple sources of livelihood. Several related questions have drawn a great deal of attention in the recent past.

- Particularly, when agriculture or the rural non-farm sector is not in a vibrant state, how does a household maximise its income or work out strategies that help reduce income risks over the year?
- Which types of household are more likely to access multiple sources of livelihood?
- If one source of livelihood is not adequate to support consumption requirements, do individuals then adopt strategies to access multiple sources of livelihood?
- If so, is there a principal source of income which is then combined with a secondary source, or it is a wide spectrum of secondary activities that tends to vary from time to time?

Therefore, it may be pertinent to delve into the issues of livelihood patterns, seasonal variations, and changes over time, to delineate inter-temporal changes as well.

De Haan (2012) points out that livelihood studies were brought into focus only in the late 1990s and early 2000s. He criticises the old livelihood studies that fall back on early theories and calls for new approaches, instead, that include the study of power relations within and outside households. Also, the quality of life should be considered more important than other quantitative measures of welfare and, secondly, comparative studies should be encouraged.

This prompts us to use household panel data to decipher the patterns of change over time and also to capture cross-sectional variations. Some earlier studies have focused in detail on the occupational aspects of poor households. Bokil (1996), for example, discusses the privatisation of common property resources (like common grazing, forest lands, water

sources, etc.) and how it is often perceived as harmful for the poor and beneficial only for the rich and powerful. In the context of the Marathawada region in Maharashtra, he discusses the problem that arises when the poor encroach upon these resources and try to claim ownership. The government has been forced to regularise these encroachments many times, and the study recognises the need for an institutional framework to be in place to deal with these issues.[1]

Carter and Barrett (2006) develop an asset-based approach to distinguish between chronic poverty and transitory poverty. They stress that it is important to incorporate the asset base of households when calculating the poverty line. If a temporary shock pushes a household below the poverty line, but does not degrade its asset base, then a household with a stronger asset base will be able to recover faster, and with less or no external help, than one with a weaker asset base. When a household loses its asset base, it might fall into the poverty trap. It is important to have a grounding of the asset base of households to separate vulnerable households from those better-off. This can be achieved fairly only when we have estimates of the asset bases of households.

Barrett (2005) uses empirical examples from sub-Saharan Africa to demonstrate rural poverty dynamics, the possible existence of poverty traps, and their implications for development policy. Many poor are seen to be transitorily so, but need safety nets to keep from becoming chronically poor. For this, he stresses the importance of external assistance, which may come in the form of direct transfers or indirectly in the form of policy relaxations. He illustrates two types of prevention methods that help the poor get out of poverty and stay out—safety nets and cargo nets. Safety nets are pre-emptive in nature and cargo nets redemptive. The main pathway out of rural poverty is through the commercialisation of agriculture. It may also be migration to urban areas or switching over to other non-farm activities.

Adato, Carter, and May (2006) explore poverty traps and social exclusion in post-apartheid South Africa. Based on qualitative and quantitative data, they argue that due to the polarisation and exclusion practised within apartheid, South Africa had high levels of income inequality and poverty. This meant that poor households did not have the required access to financial services like loans and insurance which, in turn, rendered them chronically poor and unable to build an asset base and move out of poverty. This exclusion has both economic and social dimensions. Economic exclusion means exclusion from job opportunities and access to assets; and social exclusion means exclusion from decision making, social services and, in an extreme case, exclusion from the rights of citizenship. What the authors observe is that even post-apartheid, the poorest are still excluded from most facilities (economic and social), which makes their recovery more difficult.

[1] NGOs can be set up to make sure that common resources are shared in a fair manner, and such that the poor do not feel left out.

Turning to mobility, it has been conceptualised in the literature in terms of a large number of factors. The country-level Legatum Prosperity Index considers not only GDP per capita but also a host of entrepreneurial opportunities and other factors, including quality of life and wellbeing aspects. At the micro level, families are seen to be passing on their economic advantages or disadvantages to the next generation. Inequality in one generation reduces the pace of upward mobility in the next generation: Krueger (2012) introduced the 'Great Gatsby Curve' based on the data of Corak (2013) and demonstrated less mobility by taking inequality in the horizontal axis and generational earnings elasticity in the vertical axis.

Mobility is usually studied in terms of occupation and income, though the latter indicator is widely used. Mobility can cover a period ranging from one or two years, or a much longer period, involving inter-generational change, as mentioned above (Narayan and Petesch 2012). Fox and Miller (1965) studied inter-generational mobility across countries in terms of occupational shift from manual labour to non-manual labour, or vice versa, in relation to determinants such as GDP per capita, education, urbanisation, political stability, and achievement motivation.

McAllister (1995) talked about three forms of occupational mobility of migrants: intergenerational mobility, career mobility, and migratory mobility. Several studies noted an overwhelmingly large proportion of migrants worked low-status jobs in the early years upon arrival, and that, later, their job status improved significantly, and conformed to a u-shaped curve (Bagahna 1991; Melendez 1994; Nguyen 2005). Though a shift from an occupation that requires more manual work to an occupation that requires less manual work is not necessarily a shift in terms of class, defined on the basis of hierarchy at work, it can be treated as upward mobility (Weber 1968).[2]

Fields (2000)[3] describes five basic approaches to income mobility:

1. time dependence measures the extent of change in one's current position determined by the past position;
2. positional movement gauges changes to an individual's position in the income distribution;
3. share movement captures changes in the share of income;
4. symmetric income movement identifies the magnitude but not the direction of movements and
5. directional income movement weighs fraction of upward and downward movers and the change in the average amount of the gainers and losers.

Baulch and Hoddinott (2007) present studies using household longitudinal data ranging from 18 months to 18 years to examine poverty dynamics and economic mobility. In studying

[2] Social class concept is grounded in the presumption that the social location of individuals is determined primarily by their employment status and job characteristics (Grusky and Kanbur 2006).

[3] As summarized by Narayan and Petesch (2012).

such movements, households which move in and out of poverty over time can be identified and so also their vulnerability changes in relation to changes in their endowments and the returns to those assets.

In the context of rural areas dominated by low-income households, upward mobility cannot be visualised unless one is able to take a long time horizon of at least a decade or so[4]. Those who are already in the relatively high-income strata are less likely to undergo further increase within a short time frame. With increase in educational levels, the probability of getting absorbed in high productivity jobs again rises (Gong and Soest 2002; Gong et al. 2004). But those already with higher levels of education are likely to have migrated and been placed in jobs of desirable status and, thus, for them upward mobility actually can be sluggish within a limited time range.

Following some of these views, we argue that the poorest would rather have a greater expectation and stronger drive to experience greater mobility in a region characterised by strong forces of dynamism and growth. Gaiha (1988) discusses income mobility in rural India; using the panel survey of rural households conducted by the NCAER for 1968-1969 and 1970-1971, he assesses who gains from rapid agricultural growth due to technological advances, and finds that the very poor fared better than the moderately poor, but due to their direct involvement in the growth process, and not to the trickle-down effect of growth.

Keeping in view this background, we examine in this paper individuals' sources of livelihood in different seasons and also over time. Whether one source of livelihood is sufficient across seasons and over time is a pertinent question. In underdeveloped agriculture, inadequacy of income propels individuals to take recourse to various sources of livelihood. However, this situation may change across seasons. In the kharif season, for example, when most of the cultivable land is used up, labour demand can be large enough to keep the wages up and provide a less poverty-intensive level of living. But in a different season, when cultivation is pursued on a limited scale and selectively, taking recourse to multiple sources to earn a livelihood can be an obvious choice. On the other hand, over time, with improvement in irrigation facilities and land distribution, agriculture may become profitable, and dependence on multiple sources to earn a livelihood may not be necessary. However, on the positive side, surplus income from agriculture can be utilised for other allied and/or non-agricultural activities, and this may help individuals in both agriculture and non-agriculture activities experience upward income mobility. This paper on the whole focuses on some of these issues.

The rest of the paper is structured as follows. Section 2 deals with both seasonal variations and long-term changes in livelihood patterns in a descriptive manner. Section 3 brings out the determinants of occupational choice and income function. Section 4 focuses

[4] See Rosenzweig (2003), who suggests that household-level panel surveys that cover time periods of a decade or more have the potential for enabling studies of economic mobility.

on occupational and income mobility across seasons in a given year and also over time. In this section, we attempt to understand the phenomenon of accessing multiple activities, which helps us understand how long-term decisions to change livelihood patterns may differ from short-term compulsions to access multiple sources of livelihood. Finally, the major findings are summarised in Section 5, along with the policy implications.

2 BROAD PATTERNS OF LIVELIHOOD

As Tables 1 to 4 indicate, many of the activities do not help workers earn a wage income, partly because they are self-employed. For example, cattle rearing mostly involves time spent on family livestock, though working as wage labour for rearing others' cattle is also a possibility. Working as non-agricultural labour or labour engaged under the NREGA yields a substantially higher earning than that from agricultural activities.

Table 1 Average Daily Real Wage Rate per person from Primary Occupation in Rabi season in 2013 and 2009

Occupation	Average Daily Real 2013	Wage Rate 2009
Agriculture labour	98	71
Cattle rearing	88	71
Forest product collection and own cultivation	67	75
NREGA	143	n.a
Non-agriculture labour	177	160
Not working	28	23
Services	189	164

Note: Daily wages are deflated by Average CPI of agriculture (with base 2013 = 100) workers in Odisha. Non-agriculture labor includes construction labor and factory labor. Occupation category "Not working" includes non workers, pensioners and students. Services include trade, and transport and services.

Table 2 Average Daily Real Wage Rate per person from secondary occupation in Rabi season in 2013 and 2009

Occupation	Average Daily Real 2013	Wage Rate 2009
Agriculture labor	98	81
Cattle rearing	81	60
Forest product collection and own cultivation	45	67
NREGA	126	132
Non-agriculture labour	137	107
Not working	119	10
Services	196	128

Note: Daily wages are deflated by Average CPI of agriculture (with base 2013 = 100) workers in Odisha. Non-agriculture labor includes construction labor and factory labor. Occupation category "Not working" includes non workers, pensioners and students. Services include trade, and transport and services.

Table 3 Average Daily Real Wage Rate per person from Primary Occupation in kharif season in 2013 and 2009

Occupation	Average Daily 2013	Real Wage Rate 2009
Agriculture Labor	93	95
Cattle Rearing	8	66
Forest product Collection and Own Cultivation	84	88
NREGA	n.a.	n.a.
Non-Agriculture Labor	193	174
Not Working	103	4
Services	152	174

Note: Daily wages are deflated by Average CPI of agriculture (with base 2013 = 100) workers in Odisha. Non-agriculture labor includes construction labor and factory labor. Occupation category "Not working" includes non workers, pensioners and students. Services include trade, and transport and services.

Table 4 Average Daily Real Wage Rate per person from secondary occupation in kharif season in 2013 and 2009

Occupation	Average Daily 2013	Real Wage Rate 2009
Agriculture Labor	87	80
Cattle Rearing	67	87
Forest product Collection and Own Cultivation	85	81
NREGA	137	116
Non-Agriculture Labor	181	162
Not Working	22	10
Services	71	76

Note: Daily wages are deflated by Average CPI of agriculture (with base 2013 =100)) workers in Odisha. Non-agriculture labor includes construction labor and factory labor. Occupation category "Not working" includes non workers, pensioners and students. Services include trade, and transport and services.

The average number of days worked in the primary occupation increased in a number of job categories during the rabi season (Tables 5 to 8). However, in secondary occupations, the number of days declined over time, indicating that the rise in the number of working days in primary occupations tends to enhance their total income which, in turn, reduces the compulsion to work in secondary jobs. This is indicative of upward mobility, in that overall household income may have increased over time despite sluggish growth in the daily wage in some activities. However, the data for the kharif season does not confirm any improvement in the number of days worked in a number of activities.

Table 5 Average Number of Days Worked per person in Primary Occupation in Rabi season in 2013 and 2009

Occupation	Average Number of Days Worked	
	2013	2009
Agriculture Labor	136	118
Cattle Rearing	126	147
Forest product Collection and Own Cultivation	126	112
NREGA	120	n.a
Non-Agriculture Labor	136	129
Not Working	117	114
Services	152	143

Note: Non-agriculture labor includes construction labor and factory labor. Occupation category "Not working" includes non workers, pensioners and students. Services include trade, and transport and services.

Table 6 Average Number of Days Worked per person in Secondary Occupation in Rabi season in 2013 and 2009

Occupation	Average Number of Days Worked	
	2013	2009
Agriculture Labor	35	40
Cattle Rearing	42	88
Forest product Collection and Own Cultivation	31	43
NREGA	33	27
Non-Agriculture Labor	49	50
Not Working	53	42
Services	61	86

Note: Non-agriculture labor includes construction labor and factory labor. Occupation category "Not working" includes non workers, pensioners and students. Services include trade, and transport and services.

The occupational structure lacks dynamism: only some of the non-workers and those in cattle rearing in 2009 seem to have shifted to certain other economic activities in 2013 (Tables 9 and 10). A large chunk moved from cattle rearing to forest product collection. A large majority of non-workers in 2009 who moved to various activities in 2013 worked as non-agricultural labour and service workers.

Table 7 Average Number of Days Worked per person in Primary Occupation in kharif season in 2013 and 2009

Occupation	Average Number of Days Worked	
	2013	2009
Agriculture Labor	107	121
Cattle Rearing	128	144
Forest product Collection and Own Cultivation	101	116
NREGA	n.a	n.a
Non-Agriculture Labor	132	124
Not Working	121	119
Services	137	147

Note: Non-agriculture labor includes construction labor and factory labor. Occupation category "Not working" includes non workers, pensioners and students. Services include trade, and transport and services.

Table 8 Average Number of Days Worked per person in Secondary Occupation in Kharif season in 2013 and 2009

Occupation	Average Number of Days Worked	
	2013	2009
Agriculture Labor	36	38
Cattle Rearing	48	95
Forest product Collection and Own Cultivation	42	61
NREGA	34	10
Non-Agriculture Labor	60	66
Not Working	50	40
Services	58	97

Note: Non-agriculture labor includes construction labor and factory labor. Occupation category "Not working" includes non workers, pensioners and students. Services include trade, and transport and services.

In favour of occupational mobility, however, evidence is rather limited. Particularly in relation to the kharif season, the number of workers who changed their occupations over time is rather scanty, with a few exceptions, i.e., nearly half the workers shifted from cattle rearing to forest product collection. However, in terms of secondary occupations, the shifts are more discernible. Related to the rabi season, again, the occupational mobility in primary jobs is rather limited, except that a greater proportion of non-workers became workers in 2013 compared to 2009. But, in terms of secondary jobs, the work force structure changed evidently over time. From all this, it may be concluded that the areas included in our survey have not undergone any major economic change that may have resulted in variations in the

primary sources of livelihood. Since, generally, secondary occupations are picked up under compulsion (as the primary sources of livelihood are not adequate to suffice for consumption requirements), the lack of stability is not unexpected. These activities are relatively less paid and, hence, a sizeable number keeps exploring possibilities elsewhere. But, as the secondary occupations in the rabi season show, the mobility that occurs is not necessarily from a relatively low-income job to a high-income job—individuals working as factory or construction labour in 2009 moved to working in cattle rearing, forest product collection, and agricultural labour in 2013.

Table 9 Change in Occupation between 2009 and 2013 in Kharif season (absolute numbers)

(a) Primary Occupation

Primary Occupation 2013	Primary Occupation 2009						
	Agriculture	Cattle Rearing	Forest product Collection and own Cultivation	Non-Agriculture Labor	Non-Working	Services	Total
Agriculture Labor	1	0	0	0	2	0	3
Cattle Rearing	0	13	2	0	2	1	18
Forest product Collection and own Cultivation	0	13	24	2	8	0	47
Non-Agriculture Labor	1	0	1	19	12	2	35
Not-Working	0	9	4	0	421	1	435
Services	0	2	1	0	12	20	35
Total	2	37	32	21	457	24	573

(b) Secondary occupation

Primary Occupation 2013	Secondary Occupation 2009						
	Agriculture	Cattle Rearing	Forest product Collection and own Cultivation	Non-Agriculture Labor	Non-Working	Services	Total
Agriculture Labor	48	5	51	2	1	1	108
Cattle Rearing	7	14	39	1	5	1	67
Forest product Collection and own Cultivation	44	14	204	1	5	3	271
NREGA	3	2	1	0	0	0	6
Non-Agriculture Labor	8	2	19	7	1	1	38
Not-Working	19	6	49	1	66	2	143
Services	2	1	12	1	0	11	27

While, in the long run, an occupational shift from low-income jobs to high-income jobs is desirable, the lack of mobility in the short run is an indicator of the availability of steady livelihood opportunities. From this point of view, we have tried to assess the inter-seasonal

occupational distribution of workers in both 2009 and 2013 (Tables 11 and 12). As regards primary occupations, a large majority do not seem to be changing jobs over seasons, except those working in forest product collection. However, in terms of secondary occupations, there is greater disparity across seasons. Depending on the need to get absorbed in secondary occupations, the job search can lead to different outcomes at different points in time. Though, mainly, the supply of jobs determines the possibility of absorption, there is a wide range of activities guided by the push factor, allowing for residual absorption of labour.

Table 10 Change in Occupation between 2009 and 2013 in Rabi season (absolute numbers)

(a) Primary occupation

Primary Occupation 2013	Primary Occupation 2009						
	Agriculture	Cattle Rearing	Forest product Collection and own Cultivation	Non-Agriculture Labor	Not-Working	Services	Total
Agriculture Labor	0	0	0	2	1	0	3
Cattle Rearing	0	14	0	0	2	2	18
Forest product Collection and own Cultivation	0	4	14	1	8	0	27
NREGA	0	0	0	1	0	0	1
Non-Agriculture Labor	2	2	2	71	24	6	107
Not-Working	0	14	1	2	364	3	384
Services	0	1	1	2	13	25	42
Total	2	35	18	79	412	36	582

(b) Secondary Occupation

Secondary Occupation 2013	Secondary Occupation 2009							
	Agriculture	Cattle Rearing	Forest product Collection and own Cultivation	NAREGA	Non-Agriculture Labor	Not-Working	Services	Total
Agriculture Labor	7	2	2	2	4	1	1	19
Cattle Rearing	2	21	37	2	8	4	1	75
Forest product Collection and own Cultivation	3	8	144	9	7	9	2	182
NREGA	2	1	6	11	5	0	2	27
Non-Agriculture Labor	3	2	12	5	36	1	1	60
Not-Working	5	14	43	4	6	73	2	147
Services	1	0	4	0	6	2	13	26
Total	23	48	248	33	72	90	22	536

Table 11 Change in Occupation between seasons – Rabi and kharif in 2013 season (absolute numbers)

(a) Primary occupation

Primary Occupation in Rabi Season	Primary occupation in kharif Season						
	Agriculture	Cattle	Forest product Rearing own Cultivation	Non-Collection and Labor	Not-Agriculture	Services	Total
Agriculture Labor	1	0	0	2	0	0	3
Cattle Rearing	0	10	0	0	0	0	10
Forest product Collection and own Cultivation	0	2	12	0	2	1	17
NREGA	0	0	0	2	0	0	2
Non-Agriculture Labor	2	0	7	36	5	1	51
Not-Working	0	0	5	0	394	3	402
Services	1	0	1	1	0	30	33
Total	4	12	25	41	401	35	518

(b) Secondary occupation

Secondary Occupation in	Secondary occupation in Kariff Season							
	Agriculture Labor	Cattle Rearing	Forest Product Collection and own Cultivation	NAREGA	Non-Agriculture Labor	Not Working	Services	Total
Agriculture Labor	12	0	6	1	1	3	0	23
Cattle Rearing	5	34	43	0	1	4	1	88
Forest product Collection and own Cultivation	38	22	121	3	5	20	2	211
NREGA	10	3	16	2	0	0	1	32
Non-Agriculture Labor	26	3	38	1	13	2	1	84
Not-Working	8	9	41	1	4	187	3	253
Services	2	0	7	0	1	5	20	35
Total	101	71	272	8	25	221	28	726

3 ECONOMETRIC ESTIMATION

In this section, we focus on the following issues: occupational choice function, income function, occupational change function, and change in income function.

3.1 Occupational Choice Function

We begin with the occupational choice function. Many households have agrarian contracts as a given conditionality, which in turn impinges on their decision to choose an occupation and to migrate out. Households with agrarian contracts are forced to pick up activities as

cultivators, and/or at the same time may decide to send out labour to work elsewhere and remit money, so that land mortgaged to the village money lender can easily be released. Those with no land and agrarian contract may be compelled to explore livelihood opportunities from the collection of forest products or working as wage labour in others' farms. On the other hand, individuals with skill but no adequate land for survival may like to work as factory labour or construction labour; if such opportunities are not available in their neighbourhood, they may like to migrate out.

Table 12 Change in Occupation between seasons – Rabi and kharif in 2009 season (absolute numbers)

(a) Primary occupation

Primary Occupation in Rabi Season	Primary occupation in kharif Season						
	Agriculture	Cattle Rearing	Forest product Collection and own Cultivation	Non-Agriculture Labor	Not-Working	Services	Total
Agriculture Labor	2	0	1	0	0	0	3
Cattle Rearing	0	89	6	0	12	0	107
Forest product Collection and own Cultivation	0	1	22	0	2	0	25
Non-Agriculture Labor	4	5	25	38	10	4	86
Not-Working	0	9	13	0	778	0	800
Services	0	0	5	0	3	40	48
Total	6	104	72	38	805	44	1,069

(b) Secondary occupation

Secondary Occupation in Rabi Season	Primary occupation in kharif Season						
	Agriculture	Cattle Rearing	Forest product Collection and own Cultivation	Non-Agriculture Labor	Not-Working	Services	Total
Agriculture Labor	14	3	15	0	0	0	32
Cattle Rearing	2	25	25	2	3	0	57
Forest product Collection and own Cultivation	58	8	234	0	7	1	308
NREGA	11	3	25	2	1	0	42
Non-Agriculture Labor	48	3	49	10	0	0	110
Not-Working	7	2	17	0	91	0	117
Services	2	1	9	0	0	15	27
Total	142	45	374	14	102	16	693

Table 13 Education level of Individuals by occupation type in 2013 in Rabi season

Primary Occupation	Education Level			
	Illiterate	Upto Primary	Above Primary	Total
Agriculture Labor	2	1	2	5
Cattle Rearing	7	9	3	19
Forest Product Collection and Own Cultivation	7	13	10	30
NREGA	0	0	2	2
Non-Agriculture Labor	36	51	50	137
Not working	162	167	143	472
Services	4	14	26	44
Total	218	255	236	709

Table 14 Education level of Individuals by occupation type in 2013 in kharif season

Primary Occupation	Education Level			
	Illiterate	Up to Primary	Above Primary	Total
Agriculture Labor	2	2	2	6
Cattle Rearing	9	7	2	18
Forest Product Collection and Own Cultivation	15	23	15	53
Non-Agriculture Labor	9	12	28	49
Not working	141	204	172	517
Services	5	14	23	42
Total	181	262	242	685

It is pertinent to pose a question in relation to those who do not have land or skill and at the same time cannot afford to migrate, as migration process involves substantial economic and non-economic costs. One possible occupational outcome for them comprises jobs in trade, business, and community, social, and personal services.

Another important determinant of occupation is the household size. In the endogenous fertility literature, parents decide how many children to have, and in occupational choice literature, parents make investments in the future of their children, implying possible interactions between the quantity and quality of children (Mookherjee, Prina, and Ray 2012).

Though there is a negative relationship between fertility and parental wage, it is not found to be universal. For example, in agrarian societies, the possibility of a positive relationship is not ruled out (Clark 2005 and Clark and Hamilton 2006). This prompts us to include household size in the occupational choice function. A large household size with a higher dependency ratio may induce the earners to pick up activities with higher wages.

The educational level of those who join the labour market is expected to be a strong determinant of their occupational choice. Different levels of skill are required for different occupations, which is partly reflected in Tables 13 and 14. A very large percentage of those engaged as non-agricultural labour acquired up to primary or above primary level of education. However, some of the workers with relatively higher level of education are still engaged in cattle rearing and forest product collection.

The occupational choice model is estimated on the basis of a multinomial logit framework. The job categories in occupational choice model include primary as well as secondary occupations. The following job categories are considered: 0 for agriculture labour; 1 for cattle rearing; 2 for forest product collection and own cultivation; 3 for NREGA; 4 for non-agriculture labour; 5 for not working; and 6 for services.

Since all the parameters in a multinomial logit model are not identified, it is not possible to estimate the coefficients in all the categories. In other words, the coefficients in at least one category have to be reduced to 0 before estimating the equations for the other categories. However, these estimates are conditional and, as the results tend to change with the variation in the reference category, cannot be interpreted directly. The marginal effects, therefore, have been calculated: interestingly, the marginal effects are independent of the reference category and, besides, they could be calculated for each of the categories including the base category (Tables 15 and 16 for 2013 and Tables 17 and 18 for 2009).

Gender dummy, age, land holding, education dummies, household size, and agrarian contract turn out to be significant, though not in all the categories of occupations.

Agrarian contract tends to raise the probability of joining job categories 2(forest product collection), 4 (non-agricultural labour), and 6 (services), and to reduce the probability of not working. With an outstanding agrarian contract, it is unlikely that the household head or other members of the household would remain outside the job market. Land holding raises the probability of joining job categories 1 and 2 and reduces the probability of being agricultural labourers who are mostly landless. While agrarian contracts compel workers to look for more lucrative jobs, larger land holding releases some of the household labour to look for jobs outside the family cultivation.

The gender dummy, which takes a value of 1 for males and 0 for females, turns out to be positive and significant for most categories except category 5, indicating that males are less likely to be outside the labour market. Like gender, age is largely a significant variable, with a positive impact on the probability of joining different occupations and a negative effect on

not joining the work force. Education raises the probability of being in services (job category 6) and also being non-agricultural workers (job category 4). That many of the service sector jobs are preferred by the relatively educated ones is indicated here, though the phenomenon of the educated being in residual jobs like forest product collection is not ruled out. Again, an individual with education is unlikely to remain a non-worker. Similarly, individuals from a larger household size are less likely to remain outside the job market, while category 4 shows a positive association with household size (rabi season).

Table 15 Marginal Effects (Occupation Choice 2013): Rabi Season

Variables	Pr (Agriculture Labour)	Pr (Cattle Rearing	Pr (Forest Produce and Collection	Pr (NREGA)	Pr (Non-Agriculture Labour	Pr (Not Working	Pr (Service)
Land Holding	-4.14E-08	0.002**	0.006**	-0.0012	-0.006	0.0003	-0.0008
	(0.00)	(0.000)	(0.003)	(0.001)	(0.005)	(0.007)	(0.002)
Dummy for Gender	0.022***	0.077***	0.136***	0.029***	0.309***	-0.618***	0.045***
	(0.007)	(0.03)	(0.019)	(0.008)	(0.02)	(0.02)	(0.012)
Age	1.33E-08	0.0006***	0.004***	0.0004*	0.004***	-0.011***	0.002***
	(0.00)	(0.00)	(0.000)	(0.0002)	(0.0007)	(0.009)	(0.0004)
Upto Primary Education	-2.89E-07	-0.003	0.015	0.003	0.009	-0.081	0.056**
	(0.00)	(0.003)	(0.02)	(0.006)	(0.03)	(0.05)	(0.029)
Above Primary Education	-6.93E-08	-0.005	0.030	0.007	0.034	-0.224***	0.157***
	(0.00)	(0.003)	(0.02)	(0.008)	(0.035)	(0.061)	(0.051)
Household Size	4.41E-08	0.0005	0.001	0.0003	0.009**	-0.014**	0.002
	(0.00)	(0.00)	(0.003)	(0.0007)	(0.004)	(0.006)	(0.002)
Dummy for Agriculture Contract	2.53E-07	-0.001	0.024	-0.0001	0.069***	-0.107***	0.015
	(0.00)	(0.002)	(0.015)	(0.003)	(0.02)	(0.031)	(0.010)

Note: Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

Table 16 Marginal Effects (Occupation Choice 2013): Kharif Season

Variables	Pr (Agriculture Labour)	Pr (Cattle Rearing	Pr (Forest Produce and Collection	Pr (NREGA)	Pr (Non-Agriculture Labour	Pr (Not Working	Pr (Service)
Land Holding	-0.009***	0.003**	0.018***	-0.001	-0.007**	-0.0006	-0.002
	(0.003)	(0.001)	(0.004)	(0.001)	(0.003)	(0.007)	(0.002)
Dummy for Gender	0.067***	0.081***	0.294***	0.001	0.150***	-0.637***	0.041***
	(0.013)	(0.014)	(0.025)	(0.002)	(0.019)	(0.027)	(0.012)
Age	0.0014***	0.0014***	0.007***	-0.00006	0.001***	-0.0134***	0.002***
	(0.0003)	(0.0003)	(0.0008)	(0.0001)	(0.0004)	(0.001)	(0.0004)
Upto Primary Education	0.005	-0.007	0.052	-0.0022	-0.0224	-0.086	0.060**
	(0.012)	(0.008)	(0.034)	(0.003)	(0.015)	(0.054)	(0.029)
Above Primary Education	0.005	-0.0174*	0.077**	-0.003	0.007	-0.224***	0.1544***
	(0.002)	(0.009)	(0.004)	(0.003)	(0.016)	(0.063)	(0.050)
Household Size	-0.0003	-0.0002	0.006	0.0004	0.001	-0.010	0.0022
	(0.002)	(0.001)	(0.004)	(0.0005)	(0.002)	(0.006)	(0.002)
Dummy for Agriculture Contract	0.007	-0.0002	0.073***	-0.0033	0.022**	-0.131***	0.032***
	(0.008)	(0.0071)	(0.020)	(0.004)	(0.011)	(0.032)	(0.011)

Note: Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

Table 17 Marginal Effects (Occupation Choice 2009): Rabi Season

Variables	Pr (Agriculture Labour)	Pr (Cattle Rearing	Pr (Forest Produce and Collection	Pr (NREGA)	Pr (Non-Agriculture Labour	Pr (Not Working	Pr (Service)
Land Holding	-0.001	0.005***	0.0013	0.0000	-0.005	-0.0002	-0.001
	(0.0008)	(0.002)	(0.002)	(0.000)	(0.003)	(0.005)	(0.001)
Dummy for Gender	0.016**	0.104***	0.129***	0.01**	0.261***	-0.58***	0.055***
	(0.006)	(0.015)	(0.017)	(0.004)	(0.022)	(0.026)	(0.012)
Age	0.0002**	0.003***	0.003***	0.0000	0.003***	-0.011***	0.001***
	(0.0001)	(0.0004)	(0.0004)	(0.000)	(0.0006)	(0.001)	(0.0003)
Upto Primary Education	-0.004	0.007	0.0282	0.0000	0.036*	-0.076**	0.010
	(0.003)	(0.013)	(0.019)	(0.000)	(0.022)	(0.038)	(0.01)
Above Primary Education	0.002	-0.0016	0.046*	0.0000	0.0928**	-0.183***	0.043**
	(0.003)	(0.015)	(0.026)	(0.000)	(0.032)	(0.050)	(0.021)
Household Size	0.0004	0.001	-0.0004	0.0000	0.0008	-0.0014	-0.0004
	(0.0004)	(0.002)	(0.002)	(0.000)	(0.003)	(0.006)	(0.001)
Dummy for Agriculture Contract	0.003	-0.0126	0.029*	0.0000	0.031*	-0.061*	0.008
	(0.003)	(0.010)	(0.016)	(0.000)	(0.018)	(0.03)	(0.007)

Note: Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

Table 18 Marginal Effects (Occupation Choice 2009): Kharif Season

Variables	Pr (Agriculture Labour)	Pr (Cattle Rearing	Pr (Forest Produce and Collection	Pre (Non-Agriculture Labour	Pr (Not Working	Pr Service
Land Holding	-0.007***	0.004**	0.004	-0.000	-0.0002	-0.000
	(0.002)	(0.002)	(0.003)	(0.00)	(0.005)	(0.000)
Dummy for Gender	0.068***	0.126***	0.286***	0.069***	-0.598***	0.0484***
	(0.013)	(0.016)	(0.023)	(0.012)	(0.027)	(0.011)
Age	0.0014***	0.003***	0.006***	0.000**	-0.011***	0.001***
	(0.0003)	(0.0005)	(0.0007)	(0.000)	(0.001)	(0.000)
Upto Primary Education	0.015	-0.003	0.060**	-0.000	-0.085**	0.0125
	(0.013)	(0.13)	(0.027)	(0.000)	(0.039)	(0.01)
Above Primary Education	0.031	-0.007	0.092***	0.000	-0.164***	0.049**
	(0.02)	(0.014)	(0.036)	(0.000)	(0.051)	(0.024)
Household Size	0.0005	0.0004	0.005	0.000	-0.006	-0.000
	(0.002)	(0.002)	(0.004)	(0.000)	(0.006)	(0.000)
Dummy for Agriculture Contract	-0.004	0.003	0.021	0.000	-0.028	0.0086
	(0.01)	(0.012)	(0.325)	(0.000)	(0.031)	(0.006)

Note: Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. No individual was employed under NREGA scheme in kharif Season.

The NREGA, the much talked-about government-run programme, shows a positive and significant relationship only with respect to gender and age, and that too only in the rabi season; in the kharif season, none of the variables turns out to be significant. Though the popular belief is that largely women participate in this scheme, our survey data shows that, in

the relatively slack seasons, men are more likely to show up for NREGA, and that in relatively pre-occupied seasons, this programme remains mostly unutilised. In the rabi season, which falls towards the end of the financial year, the initiatives under this scheme are usually taken up hurriedly, as the funding has to be returned to the government otherwise.

3.2 Income Function

The income of a worker is defined as the wage income earned from primary as well as secondary occupations in a given season. In other words, the number of days is allowed to vary across seasons and over time, unlike in the case of the daily wage rate function. Since the type of occupation is a determinant of income, there is the problem of endogeneity. To overcome it in the income equation, we have, however, estimated the occupational choice function first, from which the probabilities are estimated to be included in the income equation in the place of the occupation dummies.

Asset Index

The index is constructed using factor analysis. The information used in computing the index includes value of assets and livestock possessed by households in 2013. We include wooden plough, cycle, mobile, own plot, and bullocks in constructing the index. Since the income of individuals engaged in own cultivation is not given in such cases, their wages are assumed to be equivalent to average wages of agriculture labour at the same location.

From the results based on 2009 data (rabi), gender and agrarian contract are seen to reduce the wage income earned per worker over a season. Women workers receive lower wages than men (Table 19). In our analysis, agrarian contract includes labour, tenancy, marketing, and credit commitments, and our findings verify that contractual arrangements are associated with negative outcomes. For example, with a credit contract, the compulsion to repay forces individuals to accept jobs without exploring the labour market much. Those with larger land holding are better-off in terms of income. Some of the activities which show a statistically significant effect include NREGA work and non-agricultural labour. The positive effect of the NREGA is understandable, as the number of days of employment, particularly in the agricultural slack seasons (rabi), is likely to increase with the initiation of this scheme. Employment in terms of agricultural labour reduces income. Further, education reduces income, indicating that rural areas do not offer the educated suitable jobs, and that, as a result, they may be forced to explore more to find a desirable job. As they pick up secondary occupations and spend more time on job search, their income tends to decline.

By and large, similar results are brought out from the equations based on 2013 (rabi) data (Table 20). In addition, age also shows a negative impact on income per worker. Unskilled jobs do not require any experience; at the same time, employers prefer younger workers over

older ones for manual and labour-intensive activities. Larger households are likely to have more earners and, hence, a higher level of income. Among activities, cattle rearing, NREGA, non-agriculture labour, and services show a positive impact on income.

By and large, the income equation for the rabi season (2013) with the asset index conforms to these results. Land holding is positive and significant in the rabi season even when the asset index is included (Table 21).

For the kharif season (2009), gender and education show a dampening effect on income, while activities comprising forest product collection raise it in comparison to other jobs; cattle rearing, on the other hand, reduces it. Age shows a positive effect because, in the kharif season, the demand for labour goes up, and the experienced have an edge over newcomers. Household size, however, shows a negative effect on income; since the entire household labour endowment has to be engaged in own farms in the kharif season, income earned explicitly from the labour market may tend to decline.

For the year 2013 (kharif), both non-agricultural labour and services seem to be associated with higher incomes. Land holding augments income and, with the inclusion of the asset index, continues to remain significant.

The fixed effect model based on pooled data also tends to confirm that gender and above-primary-level education reduce income, while land holding improves it (Table 21). Explaining the differences in income per worker, we note that higher education is positive and significant for both rabi and kharif seasons, indicating an increase in income in 2013 relative to 2009 (Table 22). In the equation for the kharif season, the agrarian contract reduces the extent of income increase. Non-agricultural workers registered a faster increase in income in 2013 relative to 2009, compared to other workers; for service workers, the income difference between the two time points was smaller in magnitude.

3.3 Occupational Mobility

Mobility has been considered mainly in terms of workers' occupation change and income increase over 2009 through 2013. To overcome the problem of endogeneity in the income mobility equation, we have estimated the occupational choice function first, from which the probabilities are estimated to be included in the income mobility equation in the place of the occupation dummies. In fact, the income mobility equation is estimated in two alternate ways: taking job dummies directly, and using the estimates of the probabilities from the occupational choice function as instruments. In the equation where we take simply the job dummies, we consider only primary occupations, but the probabilities as calculated from the occupational choice model and included in the income mobility model pertain to both primary as well as secondary occupations.

Table 19 Regression Results- Income Function for the year 2009

Dependent Variable: Real Income of Individuals in 2009

Variables	Rabi Season	Kharif Season
Age	7.897	70.24***
	(23.00)	(19.89)
Dummy for Gender	-10669***	-6258***
	(1841)	(938.0)
Household Size	-36.61	-389.4***
	(164.1)	(101.4)
Land Holding	374.6***	56.15
	(110.3)	(88.05)
Dummy for Agriculture Contract	-1115*	-630.8
	(674.9)	(586.9)
Pr(Agriculture Labor)	-9042	1553
	(62657)	(14643)
Pr(Cattle Rearing)	-27303***	-35570***
	(7623)	(4555)
Pr(Forest Produce and Collection)	24289	54547***
	(30346)	(6743)
Pr(NREGA)	88393***	-
	(21677)	
Pr(Non-Agriculture Labor)	73200***	21843
	(20443)	(15960)
Pr(Services)	21221	26952
	(32267)	(24459)
Upto Primary Education	-1020	-2168***
	(974.7)	(487.7)
Above Primary Education	-3469***	-4017***
	(843.4)	(636.2)
Constant	798.0	4240***
	(1598)	(895.6)
Observations	1386	1384
R-squared	0.194	0.244

Note: Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. Regression results are estimated using OLS method. Heteroscedasticity is controlled through White's standard error.

The binomial logit model, taking 1 for occupational change and 0 for none, has been estimated in terms of certain regressors, which are included keeping in view the studies and the reasoning presented in the preceding sections. Occupational mobility is captured only in terms of change in primary occupations. The regressors are gender dummy (representing 1 for males and 0 for females); two education dummies for three categories (illiterate, up to primary

and above primary (secondary, graduation, technical education)); household size in 2013; agrarian contract in 2013; and land holding in 2013.

Table 20 Regression Results- Income Function for the year 2013

Dependent Variable: Real Income of Individuals in 2013

Variables	Rabi Season		Kharif Season	
	Without Asset Index	With Asset Index	Without Asset Index	With Asset Index
Age	-95.31***	-65.73*	55.65**	77.98***
	(24.17)	(34.22)	(22.18)	(28.32)
Dummy for Gender	-7888***	-7586***	618.3	-1661
	(1679)	(1954)	(962.5)	(1184)
Household Size	215.6*	96.46	67.26	-126.4
	(114.6)	(157.4)	(94.95)	(110.9)
Land Holding	216.6*	301.4**	246.3***	284.1**
	(110.9)	(151.7)	(91.81)	(136.3)
Dummy for Agriculture Contract	271.9	208.1	-203.9	310.1
	(546.6)	(769.7)	(595.0)	(583.7)
Pr(Agriculture Labor)	48153	95926*	6505	-12485
	(34298)	(55912)	(10811)	(15501)
Pr(Cattle Rearing)	4896	11574*	-8778	3886
	(6697)	(6950)	(6691)	(8860)
Pr(Forest Produce and Collection)	4135	-14947	-	-
	(11665)	(15027)		
Pr(NREGA)	135824	76934	-58569	34837
	(83180)	(79477)	(42833)	(79665)
Pr(Non-Agriculture Labor)	30517***	31578**	25749***	41261***
	(11173)	(12491)	(7473)	(9293)
Pr(Services)	37160**	50368**	46540***	33055**
	(17421)	(19479)	(12670)	(14097)
Asset Index	-	439.7	-	305.5
		(410.4)		(397.2)
Upto Primary Education	-703.8	-1210	-26.76	403.9
	(792.7)	(1008)	(626.7)	(763.0)
Above Primary Education	-5162***	-4109***	-2596***	-1714
	(852.7)	(1194)	(855.2)	(1141)
Constant	2337*	2038	618.1	607.5
	(1296)	(1722)	(1053)	(1404)
Observations	1192	483	1200	487
R-squared	0.235	0.270	0.199	0.286

Note: Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. Regression results are estimated using OLS method. Heteroscedasticity is controlled through white standard error.

Table 22 Regression Results for Income gap between 2013 and 2009

Dependent Variable: Total income of an individual in 2013 minus total income of an individual in 2009.

Variables	Rabi Season	Kharif Season
Age	4.147	-5.616
	(30.81)	(36.90)
Dummy for Gender	3714	579.4
	(3416)	(1987)
Household Size	189.9	73.07
	(152.4)	(144.7)
Land Holding	-178.7	-30.29
	(174.9)	(176.8)
Dummy for Agriculture Contract	-1770	-1510**
	(1195)	(714.9)
Pr(Agriculture Labor)	29680	20855
	(91596)	(17962)
Pr(Cattle Rearing)	13621	9244
	(9719)	(7379)
Pr(Forest Produce and Collection)	-32955	-11944
	(30485)	(8517)
Pr(NREGA)	-7864	-
	(23240)	
Pr(Non-Agriculture Labor)	-11044	36525**
	(34011)	(17060)
Pr(Services)	-17513	-54562***
	(25759)	(15123)
Asset Index	-155.8	-55.30
	(785.4)	(340.8)
Up to Primary Education	741.7	1211
	(1073)	(907.3)
Above Primary Education	5601**	5399***
	(2342)	(1275)
Constant	-378.1	-284.7
	(1438)	(1628)
Observations	484	488
R-squared	0.045	0.122

Note: Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1 All explanatory variables belong to the year 2009.

Table 23 presents the results of the logit regression. On occupational mobility, nothing except gender dummy turns out to be significant. As males are the principal income earners in a rural set-up, the drive to explore better job opportunities from time to time is obvious. Also, the unsteady job market compels them to shift fast from one job to another. On the other hand, women's occupation and income, which are treated as supplementary to the

household income, are pursued alongside household activities and, by and large, they remain similar over time. Women's labour supply is confined to a narrow range of activities compared to those of males (Pradhan, Singh, and Mitra 2014).

Table 23 Regression Results: Occupational Mobility

Dependent variable: Binary variable is 1 for change in occupation in 2013 over 2009, and otherwise 0.

Variables	Rabi Season	Kharif Season
Dummy for Gender	0.863***	1.098***
	(0.245)	(0.276)
Household Size	-0.466	-0.124
	(0.447)	(0.054)
Land Holding	.0164	0.040
	(.047)	(0.053)
Dummy for Agriculture Contract	0.081	0.749
	(0.238)	(0.289)
Upto Primary Education	-0.379	-0.068
	(0.302)	(0.334)
Above Primary Education	0.106	-0.435
	(0.294)	(0.356)
Constant	-1.751	-2.088
	(0.364)	(0.433)
Observations	577	569
Log Likelihood	-245.66	-208.05

Note: Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. All explanatory variables belong to the year 2013.

3.4 Income Mobility

Income mobility has been conceptualised in the following manner. The dependent variable 'dumincome' is 1 in the case of increase in real total income in 2013 over 2009. Income includes total income of an individual from all occupations, deflated by the average consumer price index (CPI) of agriculture workers in Odisha. In addition to the age, gender, household size, land holding, and agrarian contract and education categories, the job dummies have been included. Since the job dummies are endogenous, we have replaced them by their probabilities estimated from the occupational choice model. In the two sets of equations, we have different numbers of observations mainly because, in the equation with job dummies, we have used only the primary occupations whereas, in the equations with estimated probabilities, we have used both primary and secondary occupations. (Jobs represent categories 1 to 7, while probabilities are from 0 to 6.) So, the dependent variables in two alternative specifications are change in income of primary occupation holders and change in income of primary and secondary occupation holders, respectively (Tables 24 and 25).

The findings for the rabi season tend to suggest that, with age, the probability to experience upward mobility rises; this indicates the importance of experience. On the other hand, education is a significant determinant of mobility. Those with education (particularly at higher level) are more likely to experience a rise in income compared to the illiterate. The same findings are obtained for the kharif season. In addition, individuals with up to primary education also experienced rise in income.

Table 24 Regression Results: Income Mobility (using estimated probabilities as instruments)

Dependent variable: Binary variable is 1 for rise in income in 2013 over 2009, and otherwise 0.

Variables	Rabi Season	Kharif Season
Age	0.0195*	0.0332***
	(0.0113)	(0.0113)
Dummy for Gender	-0.526	-0.0251
	(0.603)	(0.606)
Household Size	-0.0113	-0.0173
	(0.0359)	(0.0375)
Land Holding	0.0566	0.0441
	(0.0420)	(0.0444)
Dummy for Agriculture Contract	0.119	0.124
	(0.229)	(0.195)
Pr(Agriculture Labor)	-7.570	7.584
	(10.99)	(4.989)
Pr(Cattle Rearing)	3.412	-2.276
	(2.321)	(2.101)
Pr(Forest Produce and Collection)	-8.898	-0.465
	(5.707)	(2.352)
Pr(NREGA)	0.650	-
	(5.265)	
Pr(Non-Agriculture Labor)	8.276**	3.934
	(3.755)	(4.724)
Pr(Services)	-5.125	-8.981**
	(4.639)	(4.251)
Asset Index	-0.104	-0.0838
	(0.0971)	(0.0963)
Upto Primary Education	0.0400	0.524**
	(0.261)	(0.259)
Above Primary Education	0.898***	1.486***
	(0.327)	(0.346)
Constant	-1.447***	-1.692***
	(0.451)	(0.481)
Observations	583	583
Log Liklihood	-363.94	-369.93

Note: Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. All explanatory variables belong to the year 2009.

4 MULTIPLE SOURCES OF LIVELIHOOD

The next issue relates to individuals subscribing to multiple sources of livelihood. It has increasingly been felt that paucity of earnings in regions characterised by static agriculture compels many to access more than one sources of livelihood at a time. Vetter (2013) takes livelihood diversification as a risk management strategy for the rural poor. The importance of the multiple livelihood benefits can be seen from joint activities pursued by households in areas related to livestock, cultivation, forest product collection and trading/marketing of agricultural products. While some activities are conducted as the main activity, some others are done as secondary work, mainly to enhance livelihood resilience. Diversification within a livelihood source and between livelihood sources has been identified as a strategy associated with more resilient livelihood trajectories (Sallu et al. 2010), and the benefits are seen in terms of both cash and non-cash income. The secondary resources on communal land, which are usually called 'hidden capital' (Cousins 1999), are utilised by low-income households to augment the household income. Hence, some rural activities, like agriculture, are not able, per se, to solve the problems of rural poverty, unless these additional sources are exploited. Interventions are required to facilitate opportunities that encourage secondary sources of livelihood and, thus, help households escape poverty.

Ellis (2007) reviews the literature on households using diversification as a survival and income strategy in sub-Saharan Africa. 'Diversification' is defined as households branching out in different activities as a means of survival. It is desirable to have a diverse basket of activities, because it spreads the risks of households and guards them from adverse shocks to one or more source of income. It, therefore, enhances the standard of living. Some reasons that are identified for diversification are seasonality of some professions, risk strategies, coping behaviour, and adaptation to changes, inter-temporal savings, and investments strategies, gender stereotypes, etc. The paper recognises the need for a systematic knowledge of livelihood strategies and of income sources and awareness in general.

Tables 26 to 29 indicate that workers pursuing primary occupations are also engaged in secondary occupations; this is also indicated by the National Sample Survey data. This, of course, implies that individuals put in greater intensity of work from time to time to earn similar magnitudes of income. On the other hand, there are workers who are pursuing more than one secondary occupation in the absence of any principal occupation (Tables 30 to 33). Of course, some of them, particularly the women workers, prefer to have secondary jobs, as they simultaneously participate in the labour market and pursue household activities. At the same time, it also reflects the lack of work opportunity which compels individuals to pick up a number of marginal or subsidiary activities with a view to meeting their consumption requirements.

Table 26 Number of Individuals engaged in Secondary occupation in each category of primary occupation in 2013 in Rabi season (in absolute numbers)

Primary Occupation	Secondary occupation							
	Agriculture Labor	Cattle Rearing	Forest Product Collection and own Cultivation	NREGA	Non-Agriculture Labor	Not Working	Service	Total
Agriculture Labor	0	0	0	0	1	0	0	1
Cattle Rearing	0	0	6	1	1	5	0	13
Forest Product Collection and Own Cultivation	0	2	12	0	1	11	0	26
NREGA	0	0	0	0	0	1	0	1
Non-Agriculture Labor	3	4	22	4	5	18	2	58
Not working	12	38	106	11	15	25	14	221
Services	1	2	4	2	2	5	4	20
Total	16	46	150	18	25	65	20	340

Table 27 Number of Individuals engaged in Secondary occupation in each category of primary occupation in 2009 in Rabi season (in absolute numbers)

Primary Occupation	Secondary occupation							
	Agriculture Labor	Cattle Rearing	Forest Product Collection and own Cultivation	NREGA	Non-Agriculture Labor	Not Working	Service	Total
Agriculture Labor	0	1	0	0	0	0	0	1
Cattle Rearing	2	3	51	5	12	8	5	86
Forest Product Collection and Own Cultivation	0	4	13	2	2	3	2	26
Non-Agriculture Labor	1	3	15	10	6	10	2	47
Not working	19	37	171	16	26	30	12	311
Services	0	1	8	0	2	3	2	16
Total	22	49	258	33	48	54	23	487

We have conceptualised the presence and absence of multiple sources of income in a binomial logit model. For the rabi season, age tends to raise the probability of accessing multiple sources of income and, interestingly, females are more probable than men to access them. Since female wages are lower than those of males, females work more intensely towards developing livelihood diversification strategies. This is in conformity with the general view that lower the income, higher the strife to reduce income risk. Since women

pursue their economic activity along with household activities, they are unlikely to be principal/primary status workers. Hence, to augment the household income, they pick up a wide range of marginal or subsidiary activities (Mitra 2013).

Table 28 Number of Individuals engaged in Secondary occupation in each category of primary occupation in 2013 in kharif season (in absolute numbers)

Primary Occupation	Secondary occupation							
	Agriculture Labor	Cattle Rearing	Forest Product Collection and own Cultivation	NREGA	Non-Agriculture Labor	Not Working	Service	Total
Agriculture Labor	1	0	1	1	1	1	0	5
Cattle Rearing	2	4	11	0	0	0	0	17
Forest Product Collection and Own Cultivation	13	16	9	2	1	8	1	50
Non-Agriculture Labor	7	1	25	0	1	1	0	35
Not working	55	18	119	0	2	22	13	229
Services	0	0	18	0	1	8	2	29
Total	78	39	183	3	6	40	16	365

Table 29 Number of Individuals engaged in Secondary occupation in each category of primary occupation in 2009 in Kharif season (in absolute numbers)

Primary Occupation	Secondary occupation							
	Agriculture Labor	Cattle Rearing	Forest Product Collection and own Cultivation	NREGA	Non-Agriculture Labor	Not Working	Service	Total
Agriculture Labor	1	0	3	0	0	0	0	4
Cattle Rearing	9	1	90	0	2	8	1	111
Forest Product Collection and Own Cultivation	43	20	14	0	4	5	3	89
Non-Agriculture Labor	4	0	18	0	0	0	0	22
Not working	70	25	224	1	6	23	14	363
Services	5	0	22	0	0	2	0	29
Total	132	46	371	1	12	38	18	618

The large household size reduces the probability of having multiple sources of income, though one would expect it otherwise (Table 34). Among the job categories, those engaged as non-agricultural labour are more likely to cultivate multiple sources of livelihood. However,

after dropping the job dummies, the age factor turns out to be insignificant, while the size of agricultural land holding shows a positive and significant effect. It is believable that those with larger holdings are able to diversify their income, as they have the resources to invest in other activities. Similarly, workers engaged as factory and construction labour possibly have surplus resources and information about other sources of livelihood. However, these findings are contrary to the hypothesis that the poor subscribe to multiple sources of livelihood in an attempt to enhance livelihood resilience. Possibly, the poor households in the context in which our samples were collected were endowed with too little resources to pursue other subsidiary sources of livelihood.

Table 30 Individuals earning wages from primary as well as secondary occupation in 2013 in Rabi season

Per Day wages from Primary occupation	Per Day wages from Secondary occupation					
	less than Rs. 100	Rs. 101 to 200	Rs. 201 to 300	Rs. 301 to 400	Rs. 400 above	Total
less than Rs. 100	15	5	1	0	1	22
Rs. 101 to 200	15	4	0	0	0	19
Rs. 201 to 300	3	2	1	1	0	7
Rs. 301 to 400	1	1	0	0	0	2
Above 400	1	1	0	0	0	2
Total	35	13	2	1	1	52

Note: Daily wages are deflated by average CPI of agriculture (with base 2013 = 100) workers in Odisha.

Table 31 Individuals earning wages from primary as well as secondary occupation in 2009 in Rabi season

Per Day wages from Primary occupation	Per Day wages from Secondary occupation			
	less than Rs. 100	Rs. 101 to 200	Rs. 201 to 300	Total
less than Rs. 100	14	6	0	20
Rs.101 to 200	5	13	0	18
Rs.201 to 300	2	0	2	4
Total	21	19	2	42

Note: Daily wages are deflated by average CPI of agriculture (with base 2013 = 100) workers in Odisha.

Table 32 Individuals earning wages from primary as well as secondary occupation in 2013 in kharif season

Per Day wages from Primary occupation	Per Day wages from Secondary occupation			
	less than Rs. 100	Rs. 101 to 200	Rs. 201 to 300	Total
less than Rs.100	30	4	1	35
Rs.101 to 200	28	0	0	28
Rs.201 to 300	11	1	1	13
Rs.301 to 400	1	0	0	1
Above Rs.400	1	0	0	1
Total	71	5	2	78

Note: Daily wages are deflated by average CPI of agriculture (with base 2013 = 100) workers in Odisha.

Table 33 Individuals earning wages from primary as well as secondary occupation in 2009 in kharif season

Per Day wages from Primary occupation	Per Day wages from Secondary occupation			
	less than Rs. 100	Rs. 101 to 200	Rs. 201 to 300	Total
less than Rs.100	54	12	2	68
Rs.101 to 200	17	4	0	21
Rs. 201 to 300	6	0	0	6
Total	77	16	2	95

Note: Daily wages are deflated by average CPI of agriculture (with base 2013 = 100) workers in Odisha.

For the kharif season, again, age turns out to be a significant determinant of accessing multiple sources of income. With experience in the labour market, individuals learn to develop strategies to reduce income risks. In the equation with job dummies, gender is significant, again revealing that females are more likely to diversify sources of income. Some jobs hold the possibility of enhancing the probability of multiple sources of income: cattle rearing, forest product collection, and own cultivation. The first two occupations seem to be in the lower rungs, thus forcing individuals to develop other earning strategies. Though agricultural land holding in the equation without job dummies does not turn out to be significant, the level of total income is significant. This suggests a greater possibility of livelihood diversification for those with greater resources. The policy implication of the findings is that interventions for providing with additional resources and making people aware of cultivating multiple sources of livelihood are prerequisites to help them escape poverty.

Table 34 Multiple Occupations

Dependent Variable: Binary variable is 1 if an individual has multiple sources of income, and otherwise 0.

Variables	Rabi Season		Kharif Season	
	Including jobs Dummy	Including Income of households	Including Jobs Dummy	Including Income of household
Age	0.057***	-0.0002	0.097***	-0.028***
	(0.007)	(0.006)	(0.010)	(0.008)
Dummy for Gender	-2.038***	-1.272***	-1.065***	-0.055
	(0.316)	(0.218)	(0.310)	(0.277)
Household Size	-0.073**	-0.053	-0.004	0.094**
	(0.035)	(0.034)	(0.039)	(0.044)
Land Holding	0.063	0.095***	0.0017	0.032
	(0.039)	(0.038)	(0.045)	(0.052)
Dummy for Agriculture Contract	0.126	0.167	0.086	0.413*
	(0.189)	(0.177)	(0.214)	(0.239)
Dummy for Agriculture Labor	-0.196	-	0.588	-
	(1.282)		(1.07)	
Dummy for Cattle Rearing	1.788***	-	2.266**	-
	(0.662)		(0.968)	
Dummy for Forest Produce and Collection	1.194**	-	1.683***	-
	(0.517)		(0.556)	
Dummy for NREGA	2.019	-	-	-
	(1.458)			
Dummy for Non-Agriculture Labor	1.050***	-	1.787***	-
	(0.328)		(0.442)	
Dummy for Services	0.839*	-	0.778*	-
	(0.439)		(0.461)	
Ln(Income)	-	0.0017	-	0.176**
		(0.051)		(0.083)
Upto Primary Education	-0.047	0.355	-0.212	-0.118
	(0.234)	(0.228)	(0.301)	(0.306)
Above Primary Education	-0.122	0.028	0.236	-0.411
	(0.264)	(0.268)	(0.312)	(0.384)
Constant	-1.364	1.308***	-2.58***	2.323***
	(0.417)	(0.522)	(0.510)	(0.872)
Observations	706	674	683	589
Log Likelihood	-367.35	-405.17	-298.21	-241.35

Note: Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

5 CONCLUSION

A very large percentage of workers seem to be residually absorbed in activities characterised by low productivity. Besides, many respondents are non-workers. Women earn substantially less than men. Agrarian contracts tend to raise workers' probability of joining certain job categories such as forest product collection, non-agricultural labour, and services, while it reduces the probability of not working. With an outstanding agrarian contract, it is unlikely that the household head or other members of the household would remain outside the job market. While agrarian contracts compel workers to look for more lucrative jobs, larger land holdings release some of the household labour to look for jobs outside the family cultivation. Those with larger land holding are better off in terms of income. Among activities, cattle rearing, NREGA work, non-agriculture labour, and services show a positive impact on income. The fixed effect model based on pooled data also tends to confirm that land holding improves income. Explaining the differences in income per worker, we note that higher education is positive and significant for both rabi and kharif seasons, indicating an increase in income in 2013 relative to 2009 for those who were better off in terms of education.

There is limited evidence on occupational mobility, which is indeed an indicator of stagnancy. Agrarian contracts force households to look for better avenues. However, in terms of income, it is observed that even in a stagnant region with limited opportunities, upward mobility is occurring, though to a limited extent. With improvement in educational levels, individuals are shifting to services and other non-agricultural activities and, thus, education turns out to be an important determinant of income mobility. Some of these findings provide important insight into developing appropriate policy initiatives, particularly when there is a dire need to shift workers from the agriculture sector to the non-agriculture sector. Keeping in view the employability of the available unskilled labour force, the requirement for skill development must have a thrust. Since land holding is also seen as an important determinant of income, the land distribution strategy in agriculturally backward regions seems to have relevance.

Livelihood diversification is seen as a risk management strategy of the rural poor. The importance of multiple livelihood benefits can be seen from joint activities pursued by households, particularly in relation to livestock, cultivation, forest product collection, and trading/marketing of agricultural products. Some rural activities, like agriculture, are not able per se to solve the problems of rural poverty, unless additional sources are explored. The paucity of earnings compels many to access more than one sources of livelihood at a time. Individuals pursue jobs of subsidiary status even when they have a main/principal occupation. Such a phenomenon, of course, implies greater intensity of work to earn similar magnitudes of income. On the other hand, there are workers who pursue more than one secondary occupation in the absence of any principal occupation. Of course, many women workers prefer to have secondary jobs as they simultaneously participate in the labour market

and pursue household activities. But, at the same time, this also reflects the lack of work opportunity that compels individuals to pick up a number of marginal or subsidiary activities to meet their consumption requirements. Interventions are required to facilitate opportunities that encourage both primary and secondary sources of livelihood and, thus, help households escape poverty. The need for acquiring systematic knowledge of livelihood strategies and income sources can be met through government initiative.

REFERENCES

Adato, M., Carter, M. R., & May, J. (2006). 'Exploring poverty traps and social exclusion in South Africa using qualitative and quantitative data', *The Journal of Development Studies*, 42(2) 226-247.

Bagahna, I. B.M. (1991). 'The social mobility of Portuguese immigrants in the United States at the turn of the nineteenth century', *International Migration Review,* 25 (2) pp.277-302.

Barrett, C. B. (2005). 'Rural poverty dynamics: development policy implications', *Agricultural Economics*, 32(s1), 45-60.

Basu, Kaushik and Clive Bell (2000). 'Fragmented duopoly: Theory and applications to backward agriculture', in Bardhan P. and Udry C. (eds.) *Readings in Development Economics, Volume 1: Micro Theory.*

Baulch, B. and J. Hoddinott (2000). 'Economic Mobility and Poverty Dynamics in Developing Countries', *Journal of Development Studies,* 36(1) P.1-24.

Bokil, M. S. (1996). 'Privatisation of commons for the poor: Emergence of new agrarian issues', *Economic and Political Weekly,* 2254-2261.

Carter, M. R., & Barrett, C. B. (2006). 'The economics of poverty traps and persistent poverty: An asset-based approach', *The Journal of Development Studies,* 42(2) 178-199.

Clark, G. (2005). 'Human capital, fertility, and the industrial revolution', *Journal of the European Economic Association,* 3(2-3), 505-515.

Clark, Gregory & Hamilton, Gillian, (2006). 'Survival of the Richest: The Malthusian Mechanism in Pre-Industrial England', *The Journal of Economic History,* Cambridge University Press, vol. 66(03), pages 707-736, September.

Corak, M. (2013). 'Income Inequality, Equality of Opportunity, and Intergenerational Mobility', *Journal of Economic Perspectives,* 27 (3) pp.79-102.

Cousins, B. (1999). 'Invisible capital: The contribution of communal rangelands to rural livelihoods in South Africa', *Development Southern Africa*, 16(2) 299-318.

De Haan, L. J. (2012). 'The livelihood approach: a critical exploration', *Erdkunde*, 345-357.

Ellis, F. (1998). 'Household strategies and rural livelihood diversification', *The Journal of Development Studies,* 35(1) 1-38.

Fields, G.S. (2000). 'Income Mobility: Concepts and Measures', in Birdsall N. and C. Graham (eds.) *New Markers, New Opportunities? Economic and Social Mobility in a Changing World,* Washington, D.C.: Brookings Institution and Carnegie Endowment for International Peace.

Fox, T. and Mille, S.M. (1965). 'Occupational Stratification and Mobility: Intra-Country Variations', *Studies in Comparative International Development ,*1pp.1-10.

Gaiha, R. (1988). 'Income mobility in rural India', *Economic Development and Cultural Change,* 36(2) 279-302.

Gong, X. and A. van Soest, (2002). 'Wage Differentials and Mobility in the Urban Labour Market: A Panel Data Analysis for Mexico', *Labour Economics,* 9(4) pp 513-529.

Gong, X., van Soest A. and Villagomez E. (2004). 'Mobility in the Urban Labour Market: A Panel Data Analysis for Mexico', *Economic Development and Cultural Change,* 53 (1) pp.1-36.

Grusky, D. and Kanbur, R. (2006) Conceptual Ferment in Poverty and Inequality Measurement: The View from Economics and Sociology', *Q-Squared Working Paper 21*, Centre for International Studies, University of Toronto.

Krueger, A. B. (2012). 'The Rise and Consequences of Inequality in the United States,' Chairman, Council of Economic Advisers, January 12 (http://www.americanprogress.org/events/2012/01/pdf/krueger.pdf)

McAllister, I. (1995). 'Occupational Mobility among Immigrants: The Impact of Migration on Economic Success in Australia', *International Migration Review,* 29(2), pp. 441-468.

Melendez, E. (1994). 'Puerto Rican Migration and Occupational Selectivity 1982- 1988', *International Migration Review,* 28(1), pp. 49-67.

Mitra, Arup, (2013). *Insights into Inclusive Growth, Employment and Wellbeing in India,* Springer.

Mookherjee, D., Prina, S., & Ray, D. (2012). 'A Theory of Occupational Choice with Endogenous Fertility', *American Economic Journal: Microeconomics,* 4(4) 1-34.

Narayan, D. and Petesch, P. (2012). 'Agency, Opportunity Structure and Poverty Escapes', in Narayan, D. and Petesch, P. (eds.) *Moving out of Poverty: Cross Disciplinary Perspectives on Mobility*, Washington, D.C.: World Bank and New Delhi: Academic Foundation.

Nguyen, L. (2005). 'Pattern and Determinants of Occupational Mobility of Adult Ghanaian In-migrants in the Central Region,' Population Association of America 2005 Annual Meeting Programme (http://paa2005.princeton.edu/abstracts/50333).

Pradhan, B. K., Singh, S. K., & Mitra, A. (2015). 'Female Labour Supply in A Developing Economy: A Tale from A Primary Survey', *Journal of International Development,* 27(1), 99-111.

Rosenzweig, Mark R. (2003). 'Payoffs from Panels in Low-Income Countries: Economic Development and Economic Mobility', *American Economic Review,* American Economic Association, vol. 93(2), pages 112-117, May.

Susanne Vetter (2013). 'Development and sustainable management of rangeland commons – aligning policy with the realities of South Africa's rural landscape', *African Journal of Range & Forage Science,* Volume 30, Issue 1-2 2013

Sallu, SM, Twyman, C and Stringer, LC (2010). 'Resilient or vulnerable livelihoods? Assessing livelihood dynamics and trajectories in rural Botswana', *Ecology and Society,* 15 (4). http://www.ecologyandsociety.org/vol15/iss4/art3/. ISSN 1708-3087

Weber, M. (1968). 'Economy and Society'. In *Conceptual Exposition* (Vol. 1, pp. 956-1005).

RECENT WORKING PAPERS

Title	Name of Author(s)	Paper No.
Demographic Transition, Savings, and Economic Growth in China and India	William Joe Atish Kumar Dash Pradeep Agrawal	E/351/2015
On Reckoning Level Differentials in the Measurement of Progress: An Illustration in the Context of Deliveries Assisted by Skilled Health Personnel	William Joe Udaya Shankar Mishra	E/352/2015
Maternal Mortality in India: A Review of Trends and Patterns	William Joe et. al.	E/353/2015
Mineral Resource Endowments and Investment Destinations: A Panel Data Analysis of Indian States	Basanta K Pradhan Rashmi Rastogi	E/354/2015
Forest Rights Act, 2006 in Protected Areas of Odisha, India: Contextualising the Conflict between Conservation and Livelihood	Tapas Kumar Sarangi	E/355/2015
Finances for Health in India: Are New Sources the Way to Go?	Indrani Gupta Samik Chowdhury	E/356/2015
Strategies for Safe Motherhood in Tamil Nadu: A Note	William Joe et. al.	E/357/2015
Performance of Targeted Public Distribution System in Kerala	T Jayan	E/358/2015
The Dynamics of Government Debt and Economic Growth	Vighneswara Swamy	E/359/2015
Government Debt and Economic Growth: Decomposing the Cause–Effect Relationship	Vighneswara Swamy	E/360/2015
Government Debt and Economic Growth: Estimating Debt Thresholds and Debt Intolerance	Vighneswara Swamy	E/361/2015
Government Debt and its Macroeconomic Determinants: An Empirical Investigation	Vighneswara Swamy	E/362/2015
Migration, Remittances, and Changing Patterns of Livelihood: Evidence from Western Odisha Villages	Arup Mitra Basanta K Pradhan	E/363/2015

Institute of Economic Growth
University Enclave, University of Delhi
Delhi 110007, India
Tel: 27667101/288/424; Fax : 27667410
Website : www.iegindia.org