RURAL NON-FARM ECONOMY IN SAT INDIA: NATURE, EXTENT AND DETERMINANTS[1]

Patan Elias Khan, Uttam Deb and Cynthia Bantilan[2]

Abstract

Increased importance of rural non-farm economy (RNFE) to the livelihoods of rural population has been reported in recent studies. The RNFE includes all income generating activities (either as a paid work or as self-employment) that are not agricultural but provide income to the rural households. The RNFE is of great importance to the rural economy for its productive and employment effects as well as for creating demands for agricultural commodities. This paper has documented the occupational patterns among rural households in semi-arid tropics (SAT) of India. It has identified various types of rural non-farm (RNF) activities and quantified the contribution of various RNF activities to employment and household income. We have studied participation behaviours of household members in non-farm employment and factors affecting the RNF activities. The study is based on household level panel data collected by ICRISAT under the Village Dynamics Studies in south Asia (VDSA) project. A total of 864 panel households covering 18 villages across six states in India (Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh Maharashtra and Telangana) are studied for four years (2009-10 to 2012-13). The study villages and sample households come from different rainfall zones representing varied infrastructural and socio-economic conditions. Descriptive analyses are carried out for understanding the occupational pattern and contribution of RNF activities to employment and income. The Tobit model was used to know the contribution of

[1] Paper presented at the 8th Conference of the Asian Society of Agricultural Economists (ASAE) held on 15-17 October 2014 at the BRAC Centre for Development Management (BRAC-CDM), Savar, Dhaka, Bangladesh.

[2] Authors are, respectively, Scientific Officer, Principal Scientist and Director, Research Program on Markets, Institutions and Policies, International Crops Research Institute for Semi-Arid Tropics (ICRISAT), Patancheru 502324, Telangana, India. Email: p.eliaskhan@cgiar.org

various factors such as land ownership and tenancy, age of household head, number of household workers, dependency ratio, average education of working family members, asset ownership, etc. which are affecting the intensity of participation in RNF activities. The study has revealed significant contribution of RNF activities as a source of primary and secondary occupations, and increased importance for employment and household income. However, the extent and contribution of RNF activities varied across villages and states.

Key words: Rural non-farm economy, Tobit model, Panel data, SAT India

1. INTRODUCTION

Increased importance of rural non-farm economy (RNFE) to the livelihoods of rural population has been reported in recent studies (Davis 2003). The RNFE includes all income generating activities (either as a paid work or as self-employment) that are not agricultural but provide income to the rural households. The RNFE is of great importance to the rural economy for its productive and employment effects as well as for creating demands for agricultural commodities. It is argued that RNFE is important not only with respect to poverty alleviation, economic growth and rural development, but also for enhancing sustainable use of natural resources and food security in rural areas (Bhalla 2002; Chadha 2002; Davis 2003; Ellis 1998).

During the independence and afterwards (1950s and 1960s), rural economy of India was predominantly agriculture and allied activities. Non-agricultural activities started to grow over the years and got significance over time. In the early 1980s, agriculture used to contribute about two-thirds of the rural Net Domestic Product (NDP) while non-farm activities contributed about one-third. There has been a structural change in the rural economy over the last three decades. Agriculture sector has lost its dominance. In recent years (2009-10), non-agriculture sector contributes about two-third of the rural NDP while agriculture contributes about one-third of the rural NDP (Papola, 2013). The National Sample Survey (NSS) estimates showed that in 1978-79, in terms of their usual status, nearly 20 per cent of male workers and around 12 per cent of female workers in rural India were employed in non-agricultural activities (Vaidyanathan 1986). According to the 1981 Census, nearly one-fifth of the rural work force was reported to be employed in non-agricultural pursuits. In recent years (2009-10), non-agriculture sector employed about one third of the total rural labor force. Hence, it is important to understand the rural non-farm sector particularly types of activities prevailing in the non-farm sector, employment situation and its contribution to the livelihood of rural population.

Different empirical studies often reveal that the RNFE comprises a set of heterogeneous activities, ranging from employment in high productive sectors to low productive activities earning just enough to sustain subsistence (Reardon, 1997). This heterogeneity is driven by different incentives and capacity to undertake non-farm activities among rural households. Many poor households are excluded from non-farm activities due to the lack of assets required to overcome entrance barriers. Others are trapped in low-remunerative activities that do not allow them to grow out of poverty. Therefore it is important to study the recent situation of non-farm economy at the household level and understand the factors which influences and facilitates participation in non-farm activities in general and in business, salaried job and non-agricultural labor in particular.

The present study deals with the nature, extent and determinants of rural non-farm economy in the semi-arid tropics (SAT) regions of India. Specific objectives of the study are as follows:

- To document occupational patterns and employment situation among rural households in SAT India.
- To identify various types of rural non-farm (RNF) activities.
- To understand the participation behaviour of household members in rural non-farm employment and factors affecting participation in the rural non-farm activities.
- To quantify the contribution of various RNF activities to employment and household income.

This paper consists of six major sections. After this introductory section, section 2 discusses about the data sources and sample households. Section 3 deals with the Composition of the rural non-farm economy which includes Structural Changes in Rural Economy, Rural Population and Labor Force, Economically Active Population, Occupational Distribution of Labor Force and Occupational Mobility. Section 4 was Employment in rural non-farm activities which cover Employment and

Labor Productivity and Determinants of Participation in Rural Non-farm Activities. Contribution of RNF to the rural income was mentioned in Section 5. Conclusions and implications for policy are put forward in the last section.

2. DATA SOURCES AND SAMPLE HOUSEHOLDS

Some Basic Characteristics of the sample villages was reported in Table 1. This study is based on household level panel data collected by ICRISAT under the Village Dynamics Studies in south Asia (VDSA) project. A total of 864 panel households covering 18 villages across six states in India (Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh Maharashtra and Telangana) are studied for four years (2009-10 to 2012-13). These 18 study villages and sample households come from different rainfall zones representing varied infrastructural and socio-economic conditions.

Table 1: Some Basic Characteristics of the sample villages

S. No.	Village	District	State	Nearest town name and distance (Km)	Total households in whole village in 2010 (Number)	Distance from nearest national highway (Km)
1	Aurepalle	Mahbubnagar	Telangana	Amangal; 10	984	50
2	Dokur	Mahbubnagar	Telangana	Devarkadra; 7	545	13
3	JC Agraharam	Prakasam	Andhra Pradesh	Cumbum; 18	382	115
4	Pamidipadu	Prakasam	Andhra Pradesh	Ongole; 28	1214	14
5	Kanzara	Akola	Maharashtra	Murtizapur; 9	319	7
6	Kinkhed	Akola	Maharashtra	Murtizapur; 12	189	10
7	Kalman	Solapur	Maharashtra	Vairag; 15	660	35
8	Shirapur	Solapur	Maharashtra	Solapur; 30	546	3
9	Papda	Raisen	Madhya Pradesh	Gairatganj; 13	164	13
10	Rampura Kalan	Raisen	Madhya Pradesh	Gairatganj; 10	359	10
11	Kapanimbargi	Bijapur	Karnataka	Indi; 18	320	1
12	Markabbinahalli	Bijapur	Karnataka	Basavana Bagewadi; 25	392	40
13	Belladamadugu	Tumkur	Karnataka	Madhugiri; 9	276	34
14	Tharati	Tumkur	Karnataka	Koratagere; 6	401	16
15	Karamdichingariya	Junagadh	Gujarat	Mangrol; 14	240	14
16	Makhiyala	Junagadh	Gujarat	Junagadh; 12	789	6
17	Babrol	Panchmahal	Gujarat	Santrampur; 9	750	45
18	Chatha	Panchmahal	Gujarat	Godhra; 27	289	27

Source: VDSA Project.

Distribution of the sample households according to the farm size category was reported in Table 2. In 2009, data were collected from 864 households. In subsequent years, the original households along with the split households were studied. We had a real life situation of re-joining of some split households and migration of a few households. Thus, total sample size varied between 867 in 2011 and 862 in 2012. Based on their land ownership status, sample households can be divided in five

farm size groups: Marginal (Up to 1 ha), Small (1.01 to 2.0 ha), Semi-medium (2.01 to 4.0 ha), Medium (4.01 to 10.0 ha) and Large (10.01 ha and above). These definitions are used by the Government of India (Agriculture Census 2010-11). Among the sample households, majority of the households were of marginal farm size (45 percent of total sample) followed by small farm size (25 percent) and semi-medium farm size (17 percent). Only two percent of the households were of large farm size category while 10 percent were medium farm size category.

Table 2: Distribution of the sample households according to farm size group: 2009-2012

Farm Size Group	2009	2010	2011	2012
Marginal (Up to 1 Ha)	399	392	393	385
Small (1.01 to 2.0 Ha)	212	222	213	218
Semi-medium (2.01 to 4.0 Ha)	149	151	157	152
Medium (4.01 to 10.0 Ha)	86	83	84	87
Large (10.01 Ha and Above)	18	18	20	20
All	864	866	867	862

Source: Authors' calculation, based on VDSA Panel Data.

Distribution of the sample households according to main occupation of the households (defined by the highest source of income) in SAT villages, 2009-2012 was presented in Table 3. In rural India, families are now engaged in multiple occupations. Therefore, it is important to understand the sample households in terms of their occupation. In a family, different members are engaged in different types of activities. Sometimes the same person is engaged in multiple occupations. Therefore, to define the main occupation of the household, we have used their main source of income. We have classified the sample households under two major categories, namely, Farm and Non-farm households. In 2009, out of the 864 households, 530 were farm households and 334 were non-farm households. In percentage terms, 61 percent of the households were farm households and 39 percent of the households were non-farm households. Within the short span of four years, farming as the major occupation has declined by four percent (from 530 households in 2009 to 494 households in 2012) while it has increased by four percent for non-farm (from 334 households in

2009 to 368 households in 2012) as the major source of income for the households. Farm households were again sub-grouped into crop farming households, livestock farming households and farm labor households. In the initial year (2009), majority of the farming households (33 percent of all households) were crop farming households followed by livestock farming (11 percent) and farm labor (18 percent) households. Non-farm households were sub-grouped into business, salaried job, caste occupation, non-farm labor, temporary migrant workers and other RNF households. The Other RNF households rely mostly on income earned as interests and rental income. In 2009, majority of the non-farm households (12.5 percent of all households) were from non-farm labor, followed by salaried job (9 percent), business (5.5) and others (5) etc.

Table 3: Distribution of the sample households according to main occupation of the households (defined by the highest source of income) in SAT villages, 2009-2012

Occupation of the Household	**2009**	**2010**	**2011**	**2012**
Farm	530	546	506	494
Crop	283	314	235	267
Livestock	94	94	141	118
Farm Labor	153	138	130	109
Non-farm	334	320	361	368
Business	48	39	45	42
Salaried Job	78	69	96	99
Caste Occupation	14	43	47	39
Non-farm Labor (Other non-farm sources)	108	84	65	74
Migrant Workers (Remittances)	40	21	23	22
Others	46	64	85	92
Total	864	866	867	862

Source: Authors' calculation, based on VDSA Panel Data.

Basic characteristics of the sample households are presented in Table 4. Household size was about 5 members which had slightly reduced over the study period. Also percentage of children, child-women ratio slightly decreased over the study period. The female-male ratio in children has decreased from 0.97 in 2009 to 0.91 in 2012, whereas the female-male ratio in adults decreased from 0.93 in 2009 to 0.92 in 2012. The reproductive women percentage was almost the same over the study period with a little deviation. The dependency ratio has been decreased from 0.45 in 2009 to 0.40 in 2012, which implies that either working group is increasing or the children and old people are decreasing.

Average age of the household head was about 48 years in 2009 which has slightly increased in the subsequent years. On an average, the household head had five years of education. Sample households had ownership of 0.4 ha of land on a per capita basis. The per capita income level of the sample households has increased by 61 percent within only four years. It has increased from USD 525 in 2009 to USD 847 in 2012. Both farm and non-farm income was increased. However, increase was higher for non-farm income (77 percent) than the farm income (51 percent). Ownership of non-land assets on a per capita basis was almost doubled (from USD 1296 in 2009 to USD 2344 in 2012).

Table 4: Basic Characteristics of the Sample households

Indicators	Periods			
	2009	**2010**	**2011**	**2012**
Household Size	5.11	5.01	4.98	4.96
Children (%)	25.90	25.34	24.51	23.54
Number of Households	864	866	867	862
Female-male Ratio (Child)	0.97	0.97	0.94	0.91
Female-male Ratio (Adult)	0.93	0.91	0.91	0.92
Reproductive Women	0.54	0.55	0.54	0.55
Child-woman Ratio	0.73	0.76	0.68	0.65
Dependency Ratio (%)	0.45	0.44	0.43	0.40
Average Age of Head	47.97	48.52	49.02	49.75
Average Head Years of Education	4.92	4.90	4.93	4.96
Average Per Capita Own Total Area (Hectares)	0.39	0.41	0.42	0.45
Average Per Capita Farm Income (USD Current Price)	312	463	475	470
Average Per Capita Non-Farm Income (USD Current Price)	213	312	378	377
Average Per Capita Total Income (USD Current Price)	525	775	853	847
Average Per Capita Value of Non-land Assets (USD)	1296	1638	1895	2344

Source: Authors' calculation, based on VDSA Panel Data.

3. COMPOSITION OF THE RURAL NON-FARM ECONOMY

3.1 Structural Changes in Rural Economy

Recent studies on Indian economy have shown that the production structure of rural India has changed substantially over the years. Agriculture is no longer the dominant sector of the economy (Reddy 2014). The share of agriculture has declined from about two-thirds (64.36%) of the rural national domestic product (NDP) in 1980-81 to about a little over one-third by 2009-10 (Table 5).

It is now the non-agricultural activities which together account for almost two-thirds (65%) of the rural NDP. The drivers of change have been construction, trade, hotels, transport, storage and manufacturing. The share of construction has increased from about 4 percent in 1980-81 to 15 percent in 2009-10. During the same period, share of trade, hotels, etc., have increased from about 7 percent to 18 percent. On the other hand, share of transport and storage has increased from about 1 percent to 7 percent. The share of manufacturing, which had the highest share in non-agriculture output in 1980-81, has been reduced to lowest share of about 12 percent in 2009-10. What is noteworthy is that though these changes have been in evidence since early 1980s, the acceleration of the shifts in the rural production structure has been more in evidence since 2004-05. Overall, the faster growth of non-agricultural sector resulted in growing productivity differences between agriculture and non-agriculture (Binswanger-Mkhize 2013). The productivity gap between agriculture and non-agriculture increased from 1:2.7 in 1993-94 to 1:5.6 in 2009-10 (Papola, 2013).

Table 5: Changing Structure of Rural Net Domestic Product (NDP)

	1980-81	**1993-94**	**2004-05**	**2009-10**
I. Agriculture	64.36	56.99	38.34	35.00
II. Non-Agriculture	35.64	43.01	61.66	65.00
Manufacturing	9.16	8.15	11.13	11.85
Construction	4.05	4.61	7.91	15.00*
Trade / Hotels, etc.	6.68	7.77	14.98	18.00*
Transport / Storage	1.32	3.41	5.81	7.00*

Note: Figures rounded to nearest integer. **Source**: Papola (2013) *Projected

An analysis of trends in output and employment in rural India by Nagaraj et al. (2014) revealed that non-agriculture sector emerged as a dominant sector in the rural Net Domestic Product (NDP). In

the early eighties, agriculture used to contribute about two-third of the NDP which has reduced to about one-third in the recent years (Table 6). Importance of non-agriculture sector has also increased in terms of employment. Non-farm sector now employs about one-third of the rural work force in India against only one-fifth in the eighties. However, in terms of employment, agriculture is still the major employer. In the recent years, agriculture sector employs about two-third of the rural work force in India compared to the four-fifth of the labor force in the early eighties.

Table 6: Trends in output and employment in rural India (%)

Year	**Structure of Rural NDP**		**Trends in Employment in Rural India based on Usual Status**	
	Agriculture	Non-Agriculture	Agriculture	Non-Agriculture
1980-81	64	36	81	19
2009-10	35	65	68	32

Source: NSSO Employment and Unemployment Surveys as reported in Nagaraj et al. (2014).

Household level longitudinal panel data based analysis from six villages in Maharashtra and Telangana indicated that agriculture was the primary occupation for about 88 percent of the sample households in the mid-1970s, which has been reduced to about 70 percent in 2012. On the other hand, non-farm occupations are the primary occupation for about one third of the labor force against only 12 percent in the mid-1970s. Counting both primary and secondary occupations, non-agriculture provides employment to 45 percent of the workforce in 2012. On the other hand, agriculture was the source of primary and secondary occupation for 115 percent of the workforce. This implies that many of the rural folks are now engaged in multiple occupations (Deb, Bantilan and Khan 2014).

3.2 Rural Population and Labor Force

Rural labor force depends to a large extent on the demographic characteristics of the rural population. Distribution of people in different age group has significant impact in the economy. Composition of the household members with different age groups impart differential impact on the livelihood strategy of the household (Hossain and Bayes, 2009). Household with more children and old age people implies more dependent and leads to more burden of the family. On the other hand, households with more working age people reduce the burden and they can enjoy a good living standard. It is because the former has more dependents (bread eaters), and the later has more earners (bread-winners).

The age pyramid of the sample households are reported in Table 7. Household members are grouped into three categories: Children (up to 14 years), Working Age (15-59 years) and Old Age (60 years and above). About two-third of the total population was in the working age category. About one-fourth of the total population was children while one-tenth was old age. More or less the distribution was same for both male and female population. In terms of distribution of population among different age categories, there was a rising trend of working age population over the four years of the study.

Table 7: Distribution of the population in sample households by age group (%): 2009-2012

Category	Age Group (Years)	Total Population			
		2009	2010	2011	2012
Children	0-4	7.22	6.62	6.60	6.57
	5-9	8.65	8.74	8.32	8.19
	10-14	10.03	9.98	9.71	9.12
Working Age	15-19	10.69	10.38	9.59	9.73
	20-24	9.62	9.34	10.29	9.85
	25-29	8.38	8.95	8.16	8.96
	30-34	7.52	7.24	7.86	7.46
	35-39	7.13	6.99	6.60	6.99
	40-44	5.89	6.27	7.28	7.09
	45-49	6.04	6.34	5.54	5.66
	50-54	4.91	4.63	5.56	5.40
	55-59	3.92	3.99	3.64	4.40
Old Age and Retired	60-64	3.24	3.32	3.80	3.27
	65-69	2.97	2.84	2.64	3.16
	70+	3.80	4.38	4.40	4.14
All Group		100.00	100.00	100.00	100.00

Source: Authors' calculation, based on VDSA Panel Data.

One important aspect of the labor force is to know the growth in total labor force and for male and female workers. As mentioned earlier, we have included people aged between 15 and 59 years as part of the labor force. Contrary to our expectation, there was a decline in the labor force among the sample households (Table 8). During 2009 to 2012, absolute labor force among the sample farms declined annually at the rate of 0.26 percent. It had declined for both male and female population. For female, annual decrease in labor force was 0.31 percent while it was 0.22 percent for male. This surprising situation deserves scrutiny at a much broader level may be at the state and district level using large data bases.

Table 8: Growth in Labor Force among the sample households

Sex	Labor Force (Working age population per household)				Average annual growth in labor force (%) during 2009 to 2012
	2009	2010	2011	2012	
Male	1.57	1.53	1.53	1.56	-0.22
Female	1.70	1.68	1.68	1.69	-0.31
Total	3.28	3.21	3.21	3.25	-0.26

Source: Authors' calculation, based on VDSA Panel Data.

3.3 Economically Active Population

We wanted to know the distribution of the rural population and their involvement in various activities. To do so, we had collected information from all household members about their involvement in various economic and domestic activities. Following Hossain and Bayes (2009), we have defined economic activities as those that generate income for the households or saves household expenditure for the acquisition of the goods and services from the market. This includes employment in agricultural and non-agricultural labor market, and also unpaid work for the household in crop cultivation, homestead gardening, livestock and poultry raising, fishing, cottage industry, transport operation, construction, business, and personal services. There are many other activities done mostly by women that are quasi-economic in nature which are not valued in national income accounting. Examples are food processing and preparation of meals for the family members; child care, helping old and sick members of the household; and tutoring of children. If the household had hired workers for doing these jobs, it would involve some expenditure. We have termed these activities as **domestic activities**.

Results of this exercise are reported in Table 9. We have observed that percentage of population engaged as student has been substantial. About one fourth of the total population and one tenth of the adult population was student. One eighth of all the household members and one seventh of adult

members were engaged in domestic activities. Percent of unemployed population was only 0.25 percent of adult population. Inactive population was one tenth of the adult population.

Table 9: Economically active population (%)

	All Members				Adult Member (15 years and above)			
	2009	**2010**	**2011**	**2012**	**2009**	**2010**	**2011**	**2012**
Labor force	51.26	55.57	52.26	51.72	68.74	74.09	69.13	67.70
Unemployed	0.00	0.30	0.35	0.35	0.00	0.40	0.46	0.46
Domestic	15.78	7.95	11.56	12.68	20.90	10.44	15.16	16.53
Student	24.90	25.16	24.61	24.21	10.33	11.06	10.95	11.52
Inactive	8.06	11.02	11.22	11.04	0.03	4.01	4.31	3.78
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Authors' calculation, based on VDSA Panel Data.

3.4 Occupational Distribution of Labor Force

Occupation distribution of the employed population was presented in Table 10. Employed population were engaged in various types of farm and non-farm occupations. Some of them were engaged in one activity as their main or primary occupation while part of their time was involved in another activity as secondary occupation. We have counted occupational distribution into various occupations considering their primary occupation as well as their involvement in the economic activities as primary plus secondary occupation. It was revealed that many had multiple occupations. In 2009, about three fourth of the total employed persons were engaged in agriculture as primary occupation while the rest (one-fourth) were engaged in non-farm activities. Within a short span of only three years percent of employed population in non-farm activities as primary occupation has increased by seven percent. In other words, non-farm activities as primary occupation were increasing annually at the rate of 2.3 percent. Major shift was from farm to non-farm labor and engagement in business. In case of employment in agriculture, share of farm labor as primary occupation has reduced and participation in livestock related occupations has increased.

In case of primary and secondary occupations, the percent of people engaged in farm activities is almost the same over the study period whereas in non-farm activities, it was increased from 30 percent in 2009 to 43 percent in 2012. Non-farm labor was increased from 5 percent in 2009 to 16 percent in 2012.

We have collected detailed employment data along with income earned from that activity on a monthly basis throughout the four years. This unique data provided us a rare opportunity to categorize major occupation of the households on the basis of their top most sources of income. On the basis of actual income earned by the households, two-fifth of the households was agricultural households in the initial year (2009). Within a short span of only three years it was decreased by four percentage points. In other words, rural farm households had declined annually at the rate of 1.3 percent. On the other hand, similar increase in non-farm occupations was observed. One important observation was that there was fluctuation or movement among various occupations.

Analysis of occupational pattern for workers along with their education level revealed that highly educated (graduate and above) labor force were engaged in salaried job (45 percent) followed by farming (33 percent) (Table 11). About half of the employed population having education level up to intermediate (12 years) were engaged in farming. If we include farm labors, then two-third of the labor force having education up to intermediate level was engaged in agriculture related activities.

Table 10: Occupational distribution of employed population, 2009 to 2012

Occupation	Primary Occupation (%)				Primary and Secondary Occupations (%)			
	2009	**2010**	**2011**	**2012**	**2009**	**2010**	**2011**	**2012**
Agriculture	76.50	72.54	70.02	68.87	121.81	121.05	122.28	122.41
Farming	44.92	45.21	44.04	44.39	62.71	63.82	63.66	65.82
Livestock	3.65	7.85	4.79	4.52	14.08	20.55	20.86	20.64
Farm labor	27.93	19.47	21.20	19.96	45.02	36.69	37.76	35.94
Non-agriculture	23.50	27.46	29.98	31.13	30.42	39.23	41.39	43.48
Business	4.38	3.49	4.19	4.88	6.80	5.39	5.94	6.74
Caste occupation	0.26	2.42	2.49	2.34	1.23	4.68	4.73	4.44
Salaried job	13.39	8.04	9.28	10.11	15.59	8.40	9.52	10.39
Non-farm labor	4.27	9.80	9.73	9.60	5.33	14.74	15.31	15.91
Others	1.20	3.72	4.29	4.22	1.46	6.03	5.89	5.99
All	100.00	100.00	100.00	100.00	152.22	160.28	163.67	165.89

Source: Authors' calculation, based on VDSA Panel Data.

Table 11: Major Occupational Pattern for Workers with different levels of Education: 2009-2012

Education Level	Occupational Pattern (Per Cent of Worker in Braces)				
	First	Second	Third	Fourth	Fifth
No Formal Schooling	Farming (47)	Farm Labor (29)	Non-Farm labor (9)	Livestock (8)	Caste Occupation (2)
Primary Attended	Farming (51)	Farm Labor (21)	Non-Farm labor (9)	Livestock (7)	Business (4)
Secondary Attended	Farming (46)	Farm Labor (20)	Non-Farm labor (10)	Salaried job (5)	Livestock (5)
SSC or Intermediate Passed	Farming (43)	Salaried job (18)	Farm Labor (11)	Non-Farm labor (10)	Business (8)
Graduate and Above	Salaried job (45)	Farming (33)	Business (6)	Non-Farm labor (5)	Farm Labor (3)

Source: Authors' calculation, based on VDSA Panel Data.

3.5 Occupational Mobility

To study the dynamics of rural labor force about their occupation it is worthwhile to consider the occupational mobility matrix. The matrix illustrates the movements of rural households across occupations, and thus represents the dynamics of rural livelihoods. Table 12 provides information about occupational mobility of employed workforce in 2012 compared to 2009. It was revealed that highest mobility was observed for business. Only 46 percent of the people engaged in business in 2009 were in business in 2012 indicating a situation that people wanted to be engaged in economically rewarding activities. In the absence of employment opportunities of their choice and commensurate return they tried with petty business and gave up. Caste occupation was fully rigid. All people engaged in caste occupations were retained in the caste occupations. Most of the people engaged in farming (86 percent) remained in farming. It would have been interesting to see movement within agriculture, for example, crop farming to livestock framing and engagement in horticultural and high value crops. We didn't have such information at the household member level. Therefore, we were unable to analyse such situation. However, we have observed such mobility among the working population in our sample households. There was movement between farm and non-farm labor. Only half of the farm labor remained as farm labor. One fifth of the farm labor moved to self-employed farming indicating spread of peasant farming in the dryland agriculture through expansion of tenancy markets. One sixth of the farm labor has moved to non-farm sector as labor. In case of non-farm activities like salaried job, only half of the people engaged in 2009 were retained in salaried jobs. Probably this indicates a situation where short-term low paid monthly contractual jobs were available in unorganized non-farm activities in rural areas.

Table 12: Individual Occupational mobility matrix: 2009 Vs 2012

Occupation in 2009 (%)	Occupation in 2012 (%)							
	Number	Farming	Farm Labor	Business	Salaried Job	Caste Occupation	Non-farm Labor	Other non-farm work
Farming	947 (100)	86	5	2	2	1	2	1
Farm Labor	475 (100)	18	56	2	5	2	16	2
Business	78 (100)	12	4	46	4	22	5	8
Salaried Job	201 (100)	9	3	7	49	2	15	15
Caste Occupation	7 (100)	0	0	0	0	100	0	0
Non-farm Labor	71 (100)	14	7	4	8	4	56	6
Other non-farm work	22 (100)	9	0	23	14	0	9	45

Source: Authors' calculation, based on VDSA Panel Data.

4. EMPLOYMENT IN RURAL NON-FARM ACTIVITIES

4.1 Employment and Labor Productivity

The distribution of labor force participation in different economic activities in general and by gender is presented in Tables 13 and 14. Average number of working members per household during the four years of study was more or less unchanged. There were no major fluctuations across years. About 3.8 persons per household comprising 2.0 male workers and 1.8 female members were in the working age population. In 2009, two out of three male persons of the working age population took part in economic activities which has reduced to three out of five persons in 2012. In 2009, one out of two working age female used to be engaged in economic activities which have reduced to two out of five females in 2012. Participation in domestic activities also declined for both male and female population. If this was the case, then where have they really gone? Are they spending their time without anything? We can solve the mystery if we look towards their

involvement as student. There is enormous increase in participation in full time study for working age male and female. People are entering in the labor force at a higher age. Households irrespective of their economic status and castes put high importance towards education of their children. Thanks to the various government programs which are supporting the aspirations of rural households. Average daily working hours for economic activities of male were 6.67 hours. On the other hand, average daily working hours for female workers were 4.74 hours. Male workers who were engaged in domestic activities worked for about 1.92 hours per day. Female workers were engaged in domestic activities for about 4.74 hours per day. There was not much fluctuation across years.

Table 13: Labor force participation in economic activities

Indicators	**All**			
	2009	**2010**	**2011**	**2012**
Working age members per household (No.)	3.79	3.74	3.75	3.77
Members participating in economic activity (No.)	2.20	1.93	1.97	1.89
Labor force participation rate (% of workers)	57.99	51.58	52.43	49.97
Participation in domestic work (% of workers)	52.52	46.73	47.36	45.02
Duration of work (hours/day)	9.65	8.91	8.70	8.98
Economic activities	5.94	5.76	5.86	6.05
Domestic activities	3.71	3.15	2.84	2.93

Source: Authors' calculation, based on VDSA Panel Data.

Table 14: Labor force participation in economic activities by gender

Indicators	Male				Female			
	2009	2010	2011	2012	2009	2010	2011	2012
Working age members per household (No.)	1.97	1.95	1.96	1.96	1.82	1.79	1.79	1.81
Members participating in economic activity (No.)	1.28	1.16	1.18	1.15	0.91	0.77	0.78	0.74
Labor force participation rate (% of workers)	65.21	59.22	60.39	58.57	50.19	43.21	43.72	40.65
Participation in domestic work (% of workers)	55.33	50.35	51.15	49.65	49.49	42.76	43.21	40.01
Duration of work (hours/day)	8.84	8.32	8.42	8.77	10.43	9.53	8.89	9.07
Economic activities	6.64	6.49	6.66	6.88	4.90	4.67	4.66	4.74
Domestic activities	2.21	1.83	1.76	1.89	5.53	4.86	4.23	4.33

Source: Authors' calculation, based on VDSA Panel Data.

The labor force participation in economic activities by education level of labor force is presented in Table 15. Based on the education level of the worker, labor force has been classified into five categories: (1) no formal education, (2) primary attended, (3) secondary attended, (4) SSC or intermediate passed, and (5) graduate and above. The average working members per household for the study period ranged between 0.24 (for graduate and above) to 1.15 (for no formal education). Average members participating in the economic activities per household ranged between 0.12 (for graduate and above) to 0.65 (for no formal education). About one half of the labor force was engaged in the economic activities for all the education levels and 85 to 93 percent for domestic activities. An average daily working hour in economic activities varies from 7 hours for no formal education and primary attended levels and about 7.5 hours to other levels of education. On the other hand, average daily working hour in domestic activities varies from 1.20 hours for graduate and above level to 5.30 hours per day for primary attended level.

Table 15: Labor force participation in economic activities by Education level

Indicators	No Formal Schooling	Primary Attended	Secondary Attended	SSC or Intermediate Passed	Graduate and Above
Working age members per household (No.)	1.15	0.61	0.64	0.93	0.24
Members participating in economic activity (No.)	0.65	0.35	0.37	0.49	0.12
Labor force participation rate (% of workers)	57.01	57.12	57.31	52.44	48.24
Participation in domestic work (% of workers)	93.32	92.19	91.45	85.79	85.19
Duration of work (hours/day)	9.94	12.42	12.21	10.74	8.67
Economic activities	7.05	7.12	7.55	7.67	7.46
Domestic activities	2.89	5.30	4.66	3.07	1.20

Source: Authors' calculation, based on VDSA Panel Data.

The labor force participation in economic activities by land ownership was present in Table 16. There is a decreasing trend in the working members per household and members participating in the economic activity as land ownership increases from marginal to large. The labor force participation rate varies from two third for marginal to one fifth for large group. Whereas the participation rate in domestic activities is around 90 percent for all the land ownership groups. The average daily working hours in economic activities was 7.09 hours and the average daily working hours in domestic activities females was 3.71 hours for all the groups of land ownership during the study period.

Table 16: Labor force participation in economic activities by Land ownership

Indicators	Marginal (Up to 1 Ha)	Small (1.01 to 2.0 Ha)	Semi-medium (2.01 to 4.0 Ha)	Medium (4.01 to 10.0 Ha)	Large (10.01 Ha and Above)
Working age members per household (No.)	1.49	0.88	0.66	0.42	0.12
Members participating in economic activity (No.)	1.02	0.49	0.32	0.12	0.03
Labor force participation rate (% of workers)	68.62	55.32	48.28	28.18	21.75
Participation in domestic work (% of workers)	91.29	89.67	90.79	88.70	85.45
Duration of work (hours/day)	10.76	11.46	11.58	14.97	15.47
Economic activities	7.51	7.40	6.99	6.59	6.97
Domestic activities	3.26	3.61	3.66	3.91	4.14

Source: Authors' calculation, based on VDSA Panel Data.

Sex wise distributions of different wage activities are present in the Table 17. Overall, males are spending more hours per day than the females with a few deviations. Of all the activities, transport accounts for highest hours per day for males and non-farm labor in case of females. Caste occupation accounted for lowest hours per day for both males and females. The number of hours per day is in the increasing trend for farm labor from 2009 to 2012 and irregular for the non-farm activities.

Table 17: Sex wise engagement in different wage activities (hours/day)

Wage Activity	2009		2010		2011		2012	
	Female	Male	Female	Male	Female	Male	Female	Male
Farm Labor	7.14	7.39	7.32	7.40	7.30	7.27	7.47	7.56
Non-farm labor	8.81	8.29	8.10	8.36	7.94	8.32	8.63	8.50
Business	5.64	7.78	5.86	8.05	5.85	7.57	5.69	8.02
Salaried Job	6.03	7.69	6.56	8.11	6.77	8.15	6.75	7.98
Transport		9.25		8.69	3.48	8.98	8.00	9.14
Caste Occupation	3.99	5.68	4.02	6.07	3.62	5.78	3.64	6.37
Others	5.69	7.73	5.33	7.48	5.59	6.95	5.45	7.64

Source: Authors' calculation, based on VDSA Panel Data.

As mentioned by Walker and Ryan (1990) in India's semi-arid tropics region, the non-agricultural self-employment was a means to reduce household income variability. In this study, monthly data was collected from the employment module every year with 12 rounds and number of hours engaged by each member in various activities every month. The results are present in the Table 18. The number of days per year engaged by female in farm labor ranged from 109 in 2009 to 120 in 2012 and for males, it is from 97 in 2011 to 106 in 2009. The number of days per year is highest for the salaried job in case of males and females. Non-farm labor accounted lowest days in 2009 and 2010 for males and females, farm labor and transport in 2011 and 2012 for males and females respectively.

Table 18: Sex wise Duration of Employment in 2009 to 2012 (days/year)

Activity	2009		2010		2011		2012	
	Female	Male	Female	Male	Female	Male	Female	Male
Farm Labor	109	106	119	106	114	97	120	99
Non-farm labor	61	78	62	105	64	111	66	141
Business	188	216	208	193	197	196	209	230
Salaried Job	272	245	248	257	258	270	273	260
Transport		233		192	23	200	5	211
Caste Occupation	190	196	165	159	201	202	162	199
Others	92	135	96	123	80	97	84	109

Source: Authors' calculation, based on VDSA Panel Data.

It is to be noted that the labor productivity is one of the factor which responsible for expansion of non-farm sector in rural area. It already stated by many literatures that if labor productivity is lower than agricultural wage rate then the push factors are try to expand the rural non-farm sectors. The trends of labor productivity by sex wise in various wage activities are present in the Table 19. The activities with high labor Productivity are salaried job, transport and business and low for caste occupation, others and farm labor for both male and female. The labor productivity of female for farm labor ranged from USD 1.32 in 2009 to 2.33 in 2011 per day and for males, it is ranged from USD 2.08 in 2009 to 3.67 in 2011. The labor productivity of males for salaried job is increasing from 5.07 USD per day in 2009 to 5.55 USD per day in 2012. There is a significant difference between the labor productivities of males and females in all the activities and in all the years.

Table 19: Sex wise Labor Productivity in 2009 to 2012 (USD/day)

(Current USD)

Activity	2009		2010		2011		2012	
	Female	Male	Female	Male	Female	Male	Female	Male
Farm Labor	1.32	2.08	2.03	2.91	2.33	3.67	2.07	3.27
Non-farm labor	1.80	2.79	2.05	3.63	2.23	4.26	2.74	4.01
Business	1.69	3.71	2.48	5.66	3.02	6.42	2.73	4.85
Salaried Job	4.19	5.07	4.22	5.28	3.99	5.19	3.98	5.55
Transport		5.64		7.00	2.33	5.71	1.82	4.90
Caste Occupation	1.35	2.06	1.63	2.73	1.68	3.37	1.99	3.55
Others	1.29	3.16	1.67	4.80	1.60	4.50	1.55	4.99

Source: Authors' calculation, based on VDSA Panel Data.

4.2 Determinants of Participation in Rural Non-farm Activities

To know the factors which contribute towards participation in nonfarm activities, we have carried out Probit regression analysis. In the Probit regression, dependent variable was participation in nonfarm activities. If the worker has participated in RNF activities then we have provided a value of 1 and 0 otherwise. Explanatory variables were related to individual member characteristic, household characteristics and village level characteristics. The results of Probit regression is represent in Table 20. Estimated coefficients revealed that age and education level of the worker is positively associated with participation in RNF activities. If the worker is male adult then he is likely to participate in RNF than a female worker with similar kind of background and characteristics. If the member himself is the head of the family then there is higher probability to join in rural non-farm activity. Among the household characteristics age of head was positively associated with participation in RNF activities. Per capita land ownership had a negative association with the participation in RNF activities. It is probably because who can earn their living and engage themselves in agricultural activities they preferred to be engaged in agriculture rather than moving out of agriculture. On the other hand, square of land ownership had a positive

association for participation in RNF activities. It indicates a real world situation where households having financial resources for expansion of their agricultural enterprise but unable to expand their farming business due to lack of availability of land had opted for participation in RNF activities to fully utilize their economic potential. Factors which were negatively associated with the participation in RNF activities include household size and dependency ratio. Higher the household size and dependency ratio lower the likelihood to participate in RNF activities.

Table 20: Determinants of individual participation overall Non-farm activities in the study villages: A Probit model estimates

Variables	Coefficients	SE
Constant	-2.641162***	0.105423
Age of the member	0.145128***	0.004640
Age Square of the member	-0.001741***	0.000055
Marital Status (Married=1)	-0.053007	0.037974
Years of Education	0.019452***	0.003449
Gender Dummy (Male=1)	0.78396***	0.031619
Member Dummy (Head=1)	-0.082002**	0.039832
Household Size	-0.079339***	0.005790
Dependency Ratio	-0.375512***	0.030820
Age of the Household Head	0.007565***	0.001306
Years of education of the Household Head	-0.021684***	0.003341
Per-capita land ownership (ha)	-0.812562***	0.045648
Per-capita land ownership (ha) square	0.078263***	0.007638
Credit obtained by the household	0.000023***	0.000005
Non-land asset of the household	0.000002	0.000002
Dummy for large farms (Large farm size=1)	0.34191***	0.104888
Infrastructure Dummy (Village with developed infrastructure=1)	-0.161682***	0.030605
2010 Year Dummy (Base year is 2009)	-0.125587***	0.033670
2011 Year Dummy (Base year is 2009)	-0.069744**	0.033837
2012 Year Dummy (Base year is 2009)	-0.23435***	0.034734
Number of Observations	14703	
LR chi2(19)	3903.61	
Prob > chi2	0	
Log likelihood	-7223.15	
Pseudo R2	0.2127	

Note: *, ** and *** represent the coefficients are significant at 10%, 5% and 1% level of significance, respectively.
Source: Authors' calculation, based on VDSA Panel Data.

To know the extent of participation in nonfarm activities we have conducted a panel Tobit regression. Results are provided in Table 21. We have used share of nonfarm income to total income as the dependent variable. We have tried to understand the factors which contribute towards extent of participation in RNF activities in general and in particularly in business, services and non-agricultural labor. Extent of participation in nonfarm activities is positively associated with workers average years of education, age of household head, years of education of household head, non-land assets of the household and village infrastructure. These factors facilitate participation in nonfarm activities. On the other hand, amount of land ownership and extent of tenancy in the village have significant negative impact.

Extent of participation in business was positively linked with years of education of household head, number of workers in the family, average years of education of workers, ownership of non-land assets and better infrastructure of the village.

Variables positively associated with the extent of participation in salaried job are years of education of household head, number of workers in the family, average years of education of workers. On the other hand, variables negatively associated with extent of participation in salaried job include amount of land owned by the household and dependency ratio. Extent of participation in salaried was less in 2010 than in the base year.

Number of workers in the family is positively associated with participation in non-agricultural labor activity. Factors negatively associated with extent of participation in non-agricultural labor activity include land ownership of the household. More the amount owned by the household less is the likelihood to work as nonfarm labor. Non-land asset owned by the household is also negatively associated with extent of participation as nonfarm labor.

Table 21: Factors affecting participation in rural non-farm activities: Estimating through a panel Tobit Model

Factors	Business	Salaried job	Non-agricultural labor	All non-farm activities
Constant	-116.5935***	-79.85894***	9.2815*	23.8632***
Land ownership (ha)	-4.5209***	-5.31908***	-5.9348***	-3.5702***
Area under tenancy (ha)	-2.3450	-1.71583	0.1044	-3.5656***
Age of the Household Head	0.2295	0.09867	-0.4273***	0.2794***
Years of education of the Household Head	1.2810***	0.84114**	-1.5273***	0.6612***
Household workers	4.1140***	4.07972***	3.5816***	-0.7917*
Dependency ratio	-6.6534*	-18.51036***	-7.1937***	-8.3384***
Years of education of the worker	3.3050***	5.52064***	-0.3211	1.7548***
Non-land asset of the household (Current USD)	0.0005***	-0.00003	-0.0002*	0.0003***
Credit Dummy (Received credit=1)	-0.2021	3.33586	10.1657***	-1.0064
Infrastructure Dummy (Village with developed infrastructure=1)	14.0448***	-4.46900	0.7080	4.5524***
2010 Year Dummy (Base year is 2009)	-7.3536*	-8.61746**	-1.4103	-0.4245
2011 Year Dummy (Base year is 2009)	0.1495	-0.87751	3.4284	4.9228***
2012 Year Dummy (Base year is 2009)	-6.8204	-0.92842	4.2704*	4.1761**
Number of Observations	3458	3458	3458	3458
LR chi2(13)	152.72	298.69	404.34	374.35
Prob > chi2	0	0	0	0
Log likelihood	-3735.6	-5308.86	-8251.81	-15643.5
Pseudo R2	0.02	0.0274	0.0239	0.0118

Note: (1) The dependent variable is measured as the share (percent) of the non-farm activity to total household income; (2) *, ** and *** represent the coefficients are significant 10%, 5% and 1% level of significance, respectively.

Source: Authors' calculation, based on VDSA Panel Data.

5. CONTRIBUTION OF RNF TO THE RURAL INCOME

Net income has been calculated by adding both cash and kind income and deducting the consumption expenditure from the gross income. We have measured the income in current USD so as to compare with the international level. The trends of household income for the study period are presented in Table 22. Even though non-farm income has been increased over the study period, farm income still occupies the major share of income. In farm income, income from crop is the major component followed by livestock and agricultural farm labor. Salaried job, income from other non-farm sources, business and remittances form the major share of non-farm income. The farm income has gradually increased from USD 295 in 2009 to USD 425 in 2012. During the same period, non-farm income increased from USD 193 to USD 332.

Table 22: Trends in Per Capita Household Income (USD) by income sources, 2009 to 2012

Sources of Income	Annual Income (current USD)			
	2009	**2010**	**2011**	**2012**
Farm	295	427	434	425
Crop	181	275	235	257
Livestock	67	87	129	107
Farm Labor	47	65	71	61
Non-farm	193	283	341	332
Business	24	30	45	36
Salaried Job	51	61	78	84
Caste Occupation	4	22	25	24
Non-farm Labor (Other non-farm sources)	52	53	46	44
Migrant Workers (Remittances)	26	37	31	31
Others	35	81	116	113
Total	488	711	775	757

Source: Authors' calculation, based on VDSA Panel Data.

The trends in per capita household income in current USD from farm and non-farm households by income sources from 2009 to 2012 are presented in Table 23. The farm income of farm households is ranged from USD 450 in 2009 to 717 in 2011 and for non-farm households; it is ranged from USD 93 in 2009 to 165 in 2010. The non-farm income of farm households is ranged from USD 93 in 2009 to 190 in 2011 and non-farm households; it is from USD 404 in 2009 to 652 in 2012. As the households are involved in multi occupations, income is generating from both farm and non-farm sources for their livelihoods with major share of income from their respective sources.

Table 23: Trends in Per Capita Household Income (USD) from Farm and Non-farm Households by income sources, 2009 to 2012

Annual Income (current USD)

Sources of Income	Farm Households				Non-farm Households			
	2009	**2010**	**2011**	**2012**	**2009**	**2010**	**2011**	**2012**
Farm	450	637	717	702	93	165	137	159
Crop	282	429	420	456	35	74	43	73
Livestock	99	123	199	161	27	39	43	38
Farm Labor	68	85	98	85	31	51	51	49
Non-farm	93	152	190	172	404	586	642	652
Business	11	11	20	15	48	63	80	63
Salaried Job	17	15	22	18	120	160	177	194
Caste Occupation	1	11	7	11	9	52	57	49
Non-farm Labor (Other non-farm sources)	26	33	34	26	102	97	74	73
Migrant Workers (Remittances)	16	22	28	29	51	42	46	54
Others	22	61	80	73	74	171	207	218
Total	543	789	906	874	497	751	779	812

Source: Authors' calculation, based on VDSA Panel Data.

To know the contribution of various factors to the nonfarm income earned by the household we have conducted a panel data model generalised least square (GLS). Table 24 presents the results of the GLS regression analysis. Age of the household head, square of education of the household head, square of per capita land ownership, ownership of non-land assets, amount of loan obtained, infrastructural facilities were positively associated with nonfarm income. Nonfarm income was higher in 2010, 2011 and 2012 than in the base year. Square of Age of the Household Head, Education of the Household Head, Dependency Ratio and Dummy for large farms was negative and significant.

Table 24: Determinants of Non-farm Income of the Rural Households: Estimating through a panel GLS model

Variables	**Coefficients**
Constant	-306.18*
Age of the Household Head (Years)	13.41**
Age of the Household Head (Years) Square	-0.12**
Education of the Household Head (Years)	-17.48**
Education of the Household Head (Years) Square	2.96***
Dependency Ratio	-102.52***
Per capita land ownership (Ha)	43.51
Per capita land ownership (Ha) Square	10.18***
Ownership of Non-land Assets (USD)	0.001***
Amount of loan obtained (USD) by the household	0.02***
Dummy for large farms (Large farm size=1)	-471.96***
Infrastructure Dummy (Village with developed infrastructure=1)	97.49***
2010 Year Dummy (Year 2009 is base year)	80.93***
2011 Year Dummy (Year 2009 is base year)	129.01***
2012 Year Dummy (Year 2009 is base year)	102.8***
Number of Observations	3459
R2: within	0.0914
between	0.3202
overall	0.2525
Prob > chi2	0

Note: *, ** and *** represent the coefficients are significant at 10%, 5% and 1% level of significance, respectively.

Source: Authors' calculation based on VDSA data base

6. CONCLUSIONS AND POLICY IMPLICATIONS

Household level panel data based analysis of rural nonfarm economy in India revealed that nonfarm sector provided more than 50 percent of the household income and more than 40 percent of the rural labor force. Participation of rural labor force in nonfarm activities are positively linked with age and education level of the worker, better infrastructure of the village. Male members of the household take part in nonfarm activities than their female counterpart. On the other hand, amount of land ownership, household size and dependency ratio are negatively associated with participation in RNF activities. Extent of participation in nonfarm activities is positively associated with workers average years of education, age of household head, years of education of household head, non-land assets of the household and village infrastructure. These factors facilitate participation in nonfarm activities. On the other hand, amount of land ownership and extent of tenancy in the village have significant negative impact. Results of our study indicate that RNF activities can be facilitated through supporting education in the villages, building better infrastructure and road network in the village.

REFERENCES

Bhalla, Sheila. 2002. “Rural Non-Farm Employment and the Unorganised Sector in India”, The Indian Journal of Labour Economics, Vol 45, No 4, pp 695-717.

Binswanger-Mkhize, Hans P. 2013. The Stunted Structural Transformation of the Indian Economy: Agriculture, Manufacturing and the Rural Non-Farm Sector. Economic and Political Weekly, XLVIII, 5–13.

Chadha, G.K. 2002. "Rural Non-Farm Employment in India: What does Recent Experience Teach Us?", The Indian Journal of Labour Economics, Vol. 45, No. 4.

Davis, J. R. 2003. The rural non-farm economy, livelihoods and their diversification: Issues and Options. Natural Resources Institute Report No : 2753.

Deb U, Bantilan MCS and Khan PE. 2014. Changing Pattern of Rural Labor Markets in Semi-Arid Tropics: Evidences from Village Dynamics Studies. Paper presented at the National Symposium on "Dynamics of Rural Labor Markets: Implications for Agricultural Growth and Rural Transformation" held on 15-16 September 2014 at the National Academy of Agricultural Sciences (NAAS), New Delhi.

Ellis, F. 1998. "Household Strategies and Rural Livelihood Diversification", The Journal of Development Studies, Vol.35, No. 1.

Hossain, M. 2004. "Rural Non-Farm Economy: Evidence from Household Surveys." Economic and Political Weekly, September 4: 4053-4058.

Hossain, M. 2004. Rural Non-Farm Economy in Bangladesh: A View from Household Surveys. Centre for Policy Dialogue Occasional Paper Series No. 40, July 2004.

Hossain, M., and A Bayes. 2009. Rural economy and livelihoods insights from Bangladesh. A H Development Publishing House, Dhaka.

Jadav, M. and Sen, S. 2013. Drivers of Non-Farm Employment in Rural India. Economic and Political Weekly. XLVIII, 14–21.

Malek, M. A., and Usami, K. 2009. "Determinants of Non-farm Income Diversification in Developed Villages of Bangladesh". American Journal of Economics and Business Administration, 1 (2): 141-149.

Matshe, I., Young, T. 2004. "Off-farm labor allocation decisions in small-scale rural households in Zimbabwe". Agricultural Economics, 30(3): 175-186.

Mehta, G. S. 2002. Non-farm economy and rural development.

Nagaraj N, Deb U, Singha Roy N, Bhattarai M, Padmaja R and Bantilan MCS. 2014. Dynamics of Rural Labor Markets in India: Implications for Agriculture. Poster paper. India: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru 502324, Telangana.

Papola TS. 2013. Employment Growth during Post-Reform Period. The Indian Journal of Labor Economics, Vol. 56, No. 1:1-14, January-February.

Reardon, T. 1997. "Using evidence of household income diversification to inform study of the rural non-farm labor market in Africa." *World Development*, 25 (5): 735-748.

Reddy DN. 2014. Emerging Trends in Rural Employment Structure and Rural Labor Markets in India. Paper presented at the National Symposium on "Dynamics of Rural Labor Markets: Implications for Agricultural Growth and Rural Transformation" held on 15-16 September 2014 at the National Academy of Agricultural Sciences (NAAS), New Delhi.

Vaidyanathan, A. 1986. "Labour use in Rural India: A Study of Spatial and Temporal Variations", Economic and Political Weekly, Vol. 21, No. 52.

Walker, T., and J. Ryan. 1990. Villages and household economies in India's semi-arid tropics. Baltimore: Johns Hopkins University Press.