

IS RURAL NON-FARM EMPLOYMENT HELPING IN POVERTY REDUCTION AS IT IS BELIEVED TO BE? AN EMPIRICAL ANALYSIS OF INDIAN REGIONS

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Largely agreed that the expansion of Rural Non-Farm (RNF) sector is positively associated with the rural poverty reduction, still the direct relationship between the two cannot be generalised. The present study examines this association across regions of India. The poverty analysis in RNF sector is done across six regions in India using unit level records of 61st (2004-05) and 68th (2011-12) NSS rounds. The identification of poor is based on Tendulkar Expert Group (TEG) estimated state-specific poverty lines and the aggregation of poverty has been carried out by a measure of Headcount Ratio (HCR). Furthermore, the logistic regression is applied to identify the micro as well as macro factors which influence the probability of being poor. The estimates show that industrial sector does not act as the booster for the economy rather it simply plays the role of a savior by providing low productive and low remunerative RNF activities. Central Region comes out to be the poorest region for two reasons as poverty incidence is the highest for a) casual labour; b) among all the activities (specially manufacturing, construction, and transport & storage activities). The study suggests that agriculture sector must be developed along with RNF sector as at macro level agricultural Net District Domestic Product (NDDP), agricultural wages plays an important role in poverty decline. The quality of RNF employment (regular and secure jobs) is equally important along with the quantity in the context of eradication of rural poverty.

Keywords: Rural non-farm employment; Poverty; India; NSSO; Inter-regional analysis

INTRODUCTION

The issue of structural transformation and the upsurge of RNF sector is not a new phenomenon. A number of studies have documented the positive effects of RNF activities on poverty reduction, employment generation, and enhanced market linkages (Haggblade, Hazell, & Reardon 2002; Ranjan 2009; Himanshu, Lanjouw, Mukhopadhyay, & Murgai 2011; Binswanger-Mkhize 2013). However, an extant literature on the RNF sector also reveals the other side of the story, that is, stunted transformation, casual and seasonal employment, low returns, informality, no job security and worst working conditions of the sector (Start 2001; Jha 2006; Binswanger-Mkhize 2013). The incidence of poverty in India has declined over a period (from 2004-05 to 2011-12) in both farm and non-farm sectors, but whether this decline is just because of increase in RNF employment only is a matter of enquiry. The other factors behind this decline can be, increase in agricultural growth and infrastructure development along with migration from rural to urban areas^[1] (Ministry of Finance, GOI 2012-13). Therefore, present study makes an effort to understand the impact of an increase in RNF employment on rural poverty as it has been observed that changing the occupation is merely a shift from one low productive occupation to (Jha 2006; Binswanger-Mkhize 2013).

Numerous studies have analysed the correspondence between poverty and employment. However it was either for major Indian states (Lanjouw & Shariff 2004; Lanjouw 2007), different NSS regions (Kijima & Lanjouw 2005) or different regions within a state (Himanshu, Lanjouw, Mukhopadhyay,

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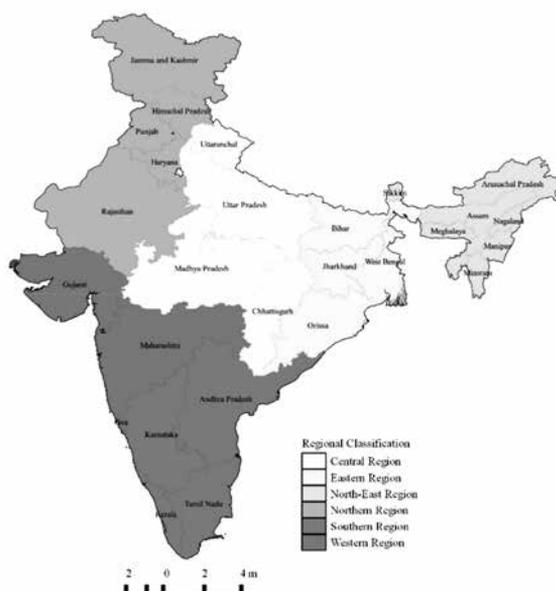
& Murgai 2011) but the studies on regional analysis of poverty are scant. Furthermore, the time period used in these studies is not recent, i.e. census information of 1951, 1991 or 2001, Old NSS rounds i.e. from 1987-88 to 1999-2000 or a state-level panel data set spanning about 40 years and starting in the late 1950s. Therefore, this study is expected to add a new dimension to the analysis of the impact of farm and RNF employment on rural poverty across different regions of India^[2] from the latest NSS data available (2004-05 and 2011-12). Moreover, regional analysis is important for India because a study of the parts is more revealing than a study of the whole. Keeping in view all these issues, the paper aims:

1. to estimate the incidence of poverty in RNF activities (region-wise);
2. to examine the types of employment provided by RNF sectors to the rural poor in different regions; and
3. to identify the factors responsible (macro as well as micro) for increasing the probability of being poor in RNF sector.

DATA, DEFINITION AND METHODOLOGY

The study is based on the unit level data of seventh (61st round, 2004-05) and ninth (68th round, 2011-12) quinquennial NSS^[3] Employment–Unemployment Surveys (EUS). These surveys collect employment-unemployment data as per four different reference periods, namely- usual principal status (UPS), usual subsidiary status (USS), current weekly status (CWS), and current daily status (CDS). However, the focus here is on UPS employment, that is, worker is said to be employed if s/he had pursued gainful economic activity for a relatively longer time period of a year as the study deals with issue of poverty and employment (Ministry of Statistics and Programme Implementation, GOI 2014)^[4].

Figure 1: Regional Classification of India



Source: Regional classification as per Government of India (2012a)

The main reasons for using the data during this period are: First, the structural transformation happened during this time period was at a faster pace as compared to other decades. Second, it was for the first time in the history of India that the absolute number of farm workers declined. In other words, a Lewisian structural shift in employment away from agriculture and towards non-agriculture accelerated significantly after 2004-05 (Shaw 2013; Mehrotra, Parida, Sinha, & Gandhi 2014). Third, only after 61st round (2004-05), we get more precise and robust disaggregated estimates as the NSS sampling design^[5] (Arora & Singh 2017). Fourth, the poverty in the rural India declined at a faster pace (by 2.3 percent points annually) during 2004-05 to 2011-12 as compared to during 1993-94 to 2004-05 (0.75 percent points annually).

For defining the RNF sector, the most commonly used definition has been considered, which states that all activities, excluding agriculture & allied, that are performed within the rural area are collectively termed as RNF sector. Furthermore, the identification of poor is based on Tendulkar Expert Group (TEG) estimated state-specific poverty lines for the year 2004-05 and 2011-12 (Planning Commission, GOI 2009, 2013) and the aggregation of poverty has been carried out by a measure of Headcount Ratio (HCR)^[6].

The poverty analysis in RNF sector is done across different regions in India, and this regional classification (refer Figure 1) is based on the classification given by the Ministry of Labour and Employment in Employment Review 2011 (Ministry of Labour and Employment GOI, 2012). Union Territories (UTs) are excluded from our analysis because UTs primarily consist of urban areas and present study focuses on a rural area only.

Logistic Regression

The paper applies the logit model to examine the factors determining the probability of being poor. Here the relationship is to be established between the categorical dependent variable (BPL= 1, if the household is poor and 0, if the household is non-poor) with one or more continuous as well as categorical independent variables. Several studies have used a logit model to identify the determinants either for the adoption of RNF employment (Khatun & Roy 2012; Jatav & Sen 2013) or determinants of poverty (Anyanwu 2013; Arora & Singh, 2015). Nevertheless, studies finding the factors of poverty in RNF sector at macro as well as at micro level are relatively scant. This study examines the level-specific factors of poverty (macro as well as micro). The results are expressed in terms of odds ratio and value of odds ratio describes the extent of the probability of becoming poor. The odds value more than one indicates that the odds are in favour of happening of the event (more probability of being poor) otherwise, the odds are against the event (more probability of being non-poor).

The mathematical interpretation of the model is as follows:

In the model, the dependent variable is defined as 1 for household's Monthly Per Capita Consumption Expenditure (MPCE) below the poverty line (poor) and 0 if it is equals or above the poverty line (non-poor). The probability of being poor depends on a set of variables (continuous as well as categorical) as listed in appendix table 1 and denoted as x so that:

$$Pr (Y=1) = f(\beta'x)$$

$$Pr (Y=0) = 1 - f(\beta'x)$$

Using the logistic distribution, we have:

$$\Pr (Y=1) = \frac{e^{(\beta'x)}}{1+e^{(\beta'x)}}$$

$$= \lambda (\beta'x)$$

Where, λ represents the logistic cumulative distribution function.

$$\text{Thus, } E[y/x] = 0 [1-f(\beta'x)] + 1 [f(\beta'x)]$$

$$= f(\beta'x)$$

Results of the regression are meant to strengthen and clarify the descriptive analysis as well as focus on the factors that can lead to the sustainability of poverty reduction in rural India.

Table 1: Description of the Independent Variables in the Logistic Regression

Variables Notation	Description	Categories	Expected relationship	Studies related to determinants
Macro Variables				
Agriculture NDDP	Net District Domestic Product (Agriculture)	Continuous	Negative	Virmani, 2007; Sharma and Kumar, 2011; Grewal, Grunfeld, & Sheehan, 2012;
Urbanisation	Proportion of urban population to total population	Continuous	Negative as well as positive	Cali and Menon, 2013
Electrification	Percentage of Village Electrified in a village	Continuous	Negative as well as positive	Banerjee, Barnes, Singh, Mayer, & Samad, 2015; Samanta, 2015
Agriculture Wages	Wages in Rs.	Agriculture Wages, Non-agriculture Wages	Negative with Agriculture Wages	Lanjouw and Murgai, 2008; Himanshu, Lanjouw, Mukhopadhyay, & Murgai, 2011; Venkatesh, 2013
Micro Variables				
Household Type	Employment status of the household	Casual Agricultural Labour (CAL), Self-Employed in Agriculture (SEA), Self-Employed in Non-Agriculture (SENA), Casual Non-agricultural Labour (CLNA), and Others.	Positive relationship with CAL, CNAL, and negative with other three categories.	Sen, 1996; Ellis, 1999; Haggblade et al., 2002; Chadha, 2008; Papola & Sahu, 2012

contd..

Variables Notation	Description	Categories	Expected relationship	Studies related to determinants
Land	The size of land holdings (in hectares) owned by a household.	Landless Household = not own any Land, Marginal Land Owner= <1 hec, Small Land Owner= <2 hec, Semi-Medium Land Owner = 2-4 hec, Medium Land Owner =4-10 hec, Large Land Owner= 10 and above	Positive relationship with landless and marginal farmers and negative with rest of the four categories.	Haggblade et al. 2002; Jha, 2002; Chadha, 2008; Ranjan, 2009
Social Group	Social Group/ caste to which a household belongs	Scheduled Caste(SC), Scheduled Tribe(ST), Other Backward Classes(OBC), Others	Positive relationship with SCs and STs and negative with OBCs and Others	Meenakshi & Ray, 2000; Jha, 2002; Haggblade et al., 2005; Himanshu et al., 2011; Arora & Singh, 2015
Education	Levels of educational attainment of the head of the household.	Not literate, literate without formal schooling, below primary, primary to middle, secondary to higher secondary, diploma/certificate course, graduate and above.	Positive with not literate and Negative with all other categories	Haggblade et al., 2002; Jha, 2002; Ranjan, 2009; Himanshu et al., 2011
Household Size	Number of family members (including children) in the household	in absolute terms	Positive	Lanjouw & Ravallion, 1995; Anyanwu, 2013; Arora & Singh, 2015; Chauhan et. al., 2016;
Formal/ Informal Employment	Nature of employment	Formal employment and Informal employment defined by Sastry (2004) and Government of India (2012b)	Positive with informal employment and negative with formal employment	Ellis, 1999; Sastry, 2004; Bieler, 2009; Government of India, 2012b; Papola and Sahu, 2012
Age	Age of head of the household (in years)	15-29, 30-59 and 60 and above	Positive with age group 15-29 and negative with age group 30-59. In addition, the relationship with 60 and above can be in both ways.	Anyanwu, 2013
Gender	Gender of head of household	0= if the head of the household is male; 1= if the head of the household is female	Positive relationship with Female and negative with Male	Meenakshi & Ray, 2000; Haggblade et al., 2002; Chant, 2006; Ranjan, 2009; Anyanwu, 2013

Note: Dependent variable (BPL) is defined as 1= if the household is poor, 0= if the household is non-poor

INCIDENCE OF POVERTY AND RNF SECTOR

Economic theory has long predicted the stagnation in agriculture and its incapability to absorb the additional labour force (Lanjouw & Shariff 2004; Chadha 2008; Papola & Sahu 2012; Binswanger-Mkhize 2013;). The situation of having unsustainable sources of livelihood has compelled (acted as push factor) the people to find out the persistent source of revenue within or outside the rural areas. Within rural areas, RNF sector has served its best to solve this problem for unemployed rural population, critically when the majority of them are poor (Haggblade et al. 2002; Jha 2002; Chadha 2008; Ranjan 2009). At the same time, there are studies to show the substantial role of RNF sector in poverty alleviation only when it is rooted in growth of agriculture (Dev 1990; Chadha 1994; Papola 1994; Davis 2003; Jatav & Sen 2013; Jayaranjan 2013), higher level of education (Jatav & Sen 2013; Jayaranjan 2013) and infrastructure development (Unni 1998; Davis 2003; Singh 2007; Jayaranjan 2013) etc. However, Vaidyanathan (1986) distinguished between distress-driven non-farm expansion (i.e. push factors) and market driven non-farm expansion (i.e. pull factors). The discussion about push factors indirectly takes into account the compulsions and working condition of the poor employed in the farm sector and how the targeted sector (RNF) is contributing only as a coping strategy for them. The main evidence of this can be linked to the high participation of poor households in RNF activities which are casual, low remunerative and less productive in nature.

1. RNF Employment: A Coping Strategy for Poor

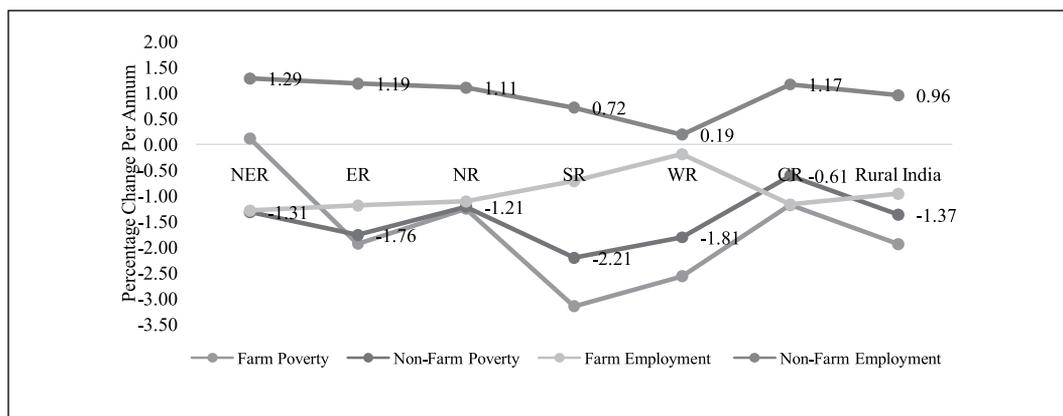
The workers have shifted from farm to non-farm sector (industry and services) within the rural area and getting employment may have led to decline in the proportion of poor indirectly. The indirect effect can be explained through increase in agricultural wages because non-farm employment has increased (particularly casual employment) with few entry barriers for poor especially which exert pressure in agriculture labour market and result in agriculture wage rate hike (Lanjouw 2007). The direct impact of increase in non-farm employment (NFE) and poverty reduction has very limited evidence as less proportion of poor have gained access to NFE especially to high-paying non-farm activities (Lanjouw 2007). Simultaneously in rural areas, along with decline in farm employment; increase in agricultural wages and expansion in irrigated land has resulted in poverty decline.

It also illustrates that for rural India, people are moving out of farm sector and shifting towards industrial and service activities. The movement of the workforce from farm to non-farm has also led changes in poverty incidence in the rural area (39.15 percent in 2004-05 to 26.25 percent in 2011-12). In farm sector, around 1 percent point annual decline in the workforce has gone along with 1.9 percent points annual decline in poverty; whereas in non-farm sector 1 percent point annual increase has led to 1.5 percent points annual decline in rural poverty (refer, Figure 2).

Two inferences can be drawn: a) the decline in farm employment changes the proportion of poor in farm sector which has resulted in poverty decline and b) employment shift towards RNF sector has helped in reducing poverty, but at a slower rate.

It is also observed from the figure that among all the regions, the proportion of poor is comparatively high in CR, followed by ER. Moreover, the comparison between farm and non-farm sectors highlights the higher incidence of poverty in CR (40.9 percent for farm and 43.04 percent for non-farm) during 2011-12. Nevertheless, the decline in poverty proportion per annum in RNFS (0.79 percent points) is very low in CR when compared to all other regions. Although the percentage of poor has fallen in the RNFS from 6-16 percent points in different regions from 2004-05 to 2011-12; still the proportion is very high in CR, followed by ER and NER.

**Figure 2: Incidence of Poverty across Different Regions of Rural India
(Percentage Change Per annum)**

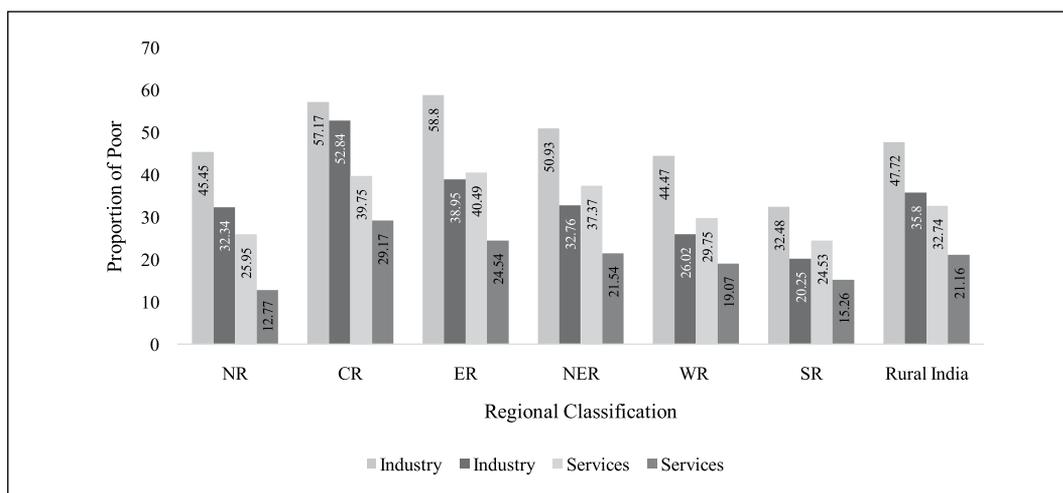


Source: Calculated from NSSO 61st and 68th Rounds EUS data (Government of India, 2004-05, 2011-12)

While focusing on the percentage change per annum, in CR, farm sector reveals the surprising fact of declining proportion of workforce along with declining incidence of poverty. Here the question arises: if agriculture employment has not led to this fall and the RNFS has contributed very less in this fall, then something else might have managed this poverty decline. According to Möllers and Buchenrieder (2011), there can be three ways for getting out of poverty (1) farming (intensification, specialisation), (2) non-farm labour, and (3) migration. However, there is little evidence that an expansion of RNFE has an important direct effect on poverty (Lanjouw, 2007). Thus, possible other reasons for poverty reduction documented in literature are higher agriculture production, rise in rural agricultural wages (first way) and migration from rural to urban area (third way) (Kijima & Lanjouw 2005; Ministry of Finance, GOI 2012-13, Ministry of Rural Development, GOI 2014; Reddy, Reddy, Nagaraj, & Bantilan 2014). The migration patterns help a lot in reducing poverty as net in-migration in Uttar Pradesh, Madhya Pradesh (part of CR) along with Bihar (part of ER) was found to be negative during this period which means out-migration was more than the in-migration (Ministry of Finance, GOI 2012-13). In last section, the study finds the impact of some macro determinants to identify the role of agriculture wages and agriculture NDDP on poverty decline along with RNFE. So without analyzing the role of other factors, it is not justifiable to give the credit to RNFE only. Thus, from the above discussion, it is clear that movement of workforce is occurring from farm to non-farm but it is not an indication of poverty decline.

2. Rural Industrial Employment: A Savior or a Booster?

While talking about the rural poverty, the discussion must focus on the poverty status of households engaged in the farm sector, primarily because about 50 per cent of rural workers are still employed in this sector (Chadha 2008). However, in the present era, with the structural transformation and rapid expansion of RNF activities, employment in industry and services (explicitly called as RNFS) also matters a lot in determining the poverty status of rural households. For rural India, services contribute more in poverty decline (2.1 percent per annum) in comparison to industrial sector (1.0 percent per annum). This is also supported by the fact that rate of growth of GDP of services in India is more than that of industries (Unni & Naik 2011).

Figure 3: Sector-wise Incidence of Poverty across Different Regions of Rural India

Source: Calculated from NSSO 61st and 68th Rounds EUS data (Government of India, 2004-05, 2011-12)

Region-wise analysis shows that industry contributes more within RNFS as compared to services in all the regions during 2011-12, but when it comes to incidence of poverty it brings out more relevant findings. Among all the regions, services contribute 2 percent per annum in poverty decline in CR as compared to 0.2 percent per annum in poverty decline (lowest among all the regions) by the industry.

Due to inadequacy of data available for some activities, activity-wise poverty levels cannot be compared^[7] for all activities. As evident from the past data and literature, the popular and flourishing activity in rural India within non-farm is largely construction and the incidence of poverty is as high (34.72 percent during 2011-12) as its popularity (Bhalla, 2011; Himanshu et al., 2011). The uncertainty associated with the construction activities makes the workers more poverty prone as they work under accident prone conditions with irregular employment and undefined work duration, without social security. For manufacturing too, even if there is decline in poverty, still 22.16 percent households engaging in manufacturing are poor in rural India. Further, services contribute more in poverty reduction as around 19 percent poor households are employed in wholesale trade, hotels and transport and storage etc.

Region-wise activity analysis too highlights the CR as the poorest region as construction sector is the main target sector for the poor households and more than half of poor households were engaged in one or other kind of construction activities followed by 44 percent in ER during 2011-12. In manufacturing too CR accommodates the highest proportion of poor (43.35 percent) followed by NER (34.45 percent) during 2011-12. However, in NER the share of poor has increased by 2.59 percentage points during 2004-05 to 2011-12. Within services activities, transport and storage activities are employing more poor in CR as more than 45 percent of the population engaged in these activities are poor (during 2004-05), and the proportion has come down to only 39.19 percent during 2011-12. According to Lanjouw (2007), trade, transport and commerce activities are growing rapidly in many regions and given low capital and land requirements, poor can access these activities than agricultural activities. In CR, transport, hotels and restaurants engage more than 30 percent poor households followed by 27.36 percent poor households in other services, including education, public administration, and defense activities, etc. during 2011-12 (refer, appendix table 2).

Table 2: Activity-wise Incidence of Poverty across different regions of Rural India

Region	North-Eastern Region		Eastern Region		Northern Region		Southern Region		Western Region		Central Region		Rural India	
	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12
Manufacturing	31.86	34.45	53.68	34.16	17.85	4.79	26.4	6.85	24.85	7.99	47.53	43.35	36.92	22.16
Construction	41.89	19.82	64.96	44.19	31.02	20.75	26.58	11.8	35.49	16.02	61.08	51.81	45.86	34.72
Wholesale and Retail Trade	20.59	14.71	38	29	13.56	5.11	20.12	7	19.7	9.7	39.48	29.98	29.14	19.27
Hotels and Restaurants	24.08	28.02	36.23	31.92	15.82	6.03	23.38	6.42	20.33	10.36	40.78	32.42	28.51	19.25
Transport, Storage and Communication	32.65	20.19	51.33	27.86	18.7	0.3	21.06	10.05	21.1	9.03	46.49	39.19	33.53	19.88
Other Services	28.13	12.8	30.89	24.61	9.84	6.33	20.85	5.18	16.67	6.7	29.64	27.36	23.44	15.45

Notes: a) Estimates of five activities are not shown separately because of inadequate sample (refer, footnote1 on page no 13).

Source: Calculated from NSSO 61st and 68th Rounds EUS data (Government of India, 2004-05, 2011-12).

Since poverty incidence in the CR is the highest among all the activities (except transport and storage in NER) during 2011-12, it is seen as the poorest region among all. Furthermore, discussion highlights the major points as: a) within non-farm sector, concentration of poor is more towards industries than services and the poverty decline is more in the services; and b) more involvement in construction activities and relatively less in manufacturing activities form the weak base of rural non-farm sector (White, 1991; Basu & Kashyup, 1992). Hence, the industrial sector does not act as the booster for the economy rather it simply plays the role of a savior.

Booming Casual Employment: Another way of getting into Poverty

Merely discussing about the proportion of poor does not reveal much about the nature of employment; the picture becomes clearer when the status of employment activities (such as self-employment, casual employment, regular employment, etc.) is taken into account as the status indirectly depicts the quality of employment and the working conditions associated with a particular type of activity (Chadha 1994; Sen 1996; Ellis 1999; Haggblade et al. 2002; Bieler 2009; Papola & Sahu 2012).

However, poverty estimates show that the proportion of poor is high among Casual Agricultural Labour, followed by Casual Non-agricultural Labour (more than 40 percent in both during 2011-12). On the one hand, there are sufficient evidences to show the importance of regular employment to get rid of poverty and to raise the standard of living (Himanshu et al. 2011; Imai, Gaiha, & Thapa 2012); on the other hand, it is also quite evident that casual employment followed by self-employment often results in low productivity along with low returns (Haggblade et al. 2002; Haggblade, Hazell, & Reardon 2005; Jha 2006) and pushing people more into poverty. Casual and self-employment has also been considered as a coping strategy, which helps only to sustain the living rather improve the living (Möllers & Buchenrieder 2011; Jatav & Sen 2013). Moreover, the absorptive capacity of such kind of employment is more as they can hire more workers with low skill and low level of education. This is the way in which poor people could easily join these activities and endure their living. However, to say these help in getting out of poverty simply denies the reality (Ellis 1999; Chadha 2008; Bieler 2009; Papola & Sahu 2012).

The status of employment within farm and non-farm activities may further raise some severe issues regarding impoverishment across employed (refer, figure 4). The analysis reveals that majority of the poor households are employed as Casual Agricultural Labour, and they are highly concentrated in ER (73.99 percent), followed by CR (72.55 percent) and WR (68.43 percent) during 2004-05. However, during 2011-12 the severity shifted to CR with highest proportion of Casual Agricultural Labour (60.55 percent). The major reason for this decline can be associated with rise in agriculture wages. The proportion of poor is also highest among Self-employed in Agriculture (comparatively lesser than Casual Agricultural Labours), and the decline has been observed in all the regions, except WR.

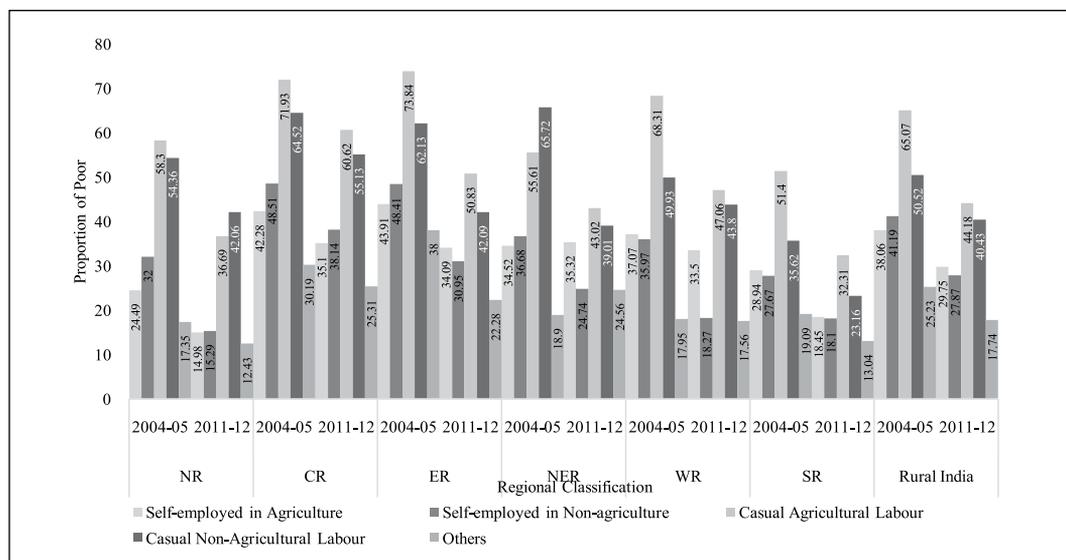
Within the non-farm sector, serious issue of concern is the highest proportion of poor among Casual Non-agricultural Labour for which CR ranks first, followed by ER and WR. The CR can be considered as the poorest region because the proportion of poor Casual Labour engaged in manufacturing, construction, and transport & storage activities were as high as 51.08 percent, 58.19 percent, and 37.45 percent respectively during 2011-12.

[Figure 4]

The aforementioned explanation reveals that predominantly agriculture areas have majority of the

poor engaged as casual agriculture labour followed by casual non-agriculture labour. The highest share of poor involved as agriculture labour along with the trend of declining poverty forces us to deny the fact of sole role of rural non-farm sector in poverty reduction. There might be rising agricultural wages which have led to the poverty reduction in rural areas. Moreover, various state sponsored anti-poverty programmes have limited impact on rural poverty because these programmes encourage self-employment (especially small scale) in non-farm which is of low productivity levels and resulting in lower returns (Chadha 2008). Thus, rising lower productive activities (such as construction) and casual employment in RNF sector do not highlight their major role in poverty decline rather signal towards the contribution of other factors which have helped directly or indirectly along with RNF sector in this decline.

Figure 4: Status-wise Incidence of Poverty across different regions of Rural India



Source: Calculated from NSSO 61st and 68th Rounds EUS data (Government of India, 2004-05, 2011-12)

DETERMINANTS OF RURAL POVERTY: A LOGISTIC REGRESSION ANALYSIS

To analyse the possible determinants of rural poverty, a logistic regression has been used. The probability of being poor depends upon many factors which include micro as well as macro factors. This study considers agriculture NDDP (proxy for agriculture growth), urbanization, electrification and agriculture wages as macro level variables and, land ownership, social group, education, type and location as micro level variables to determine the level of poverty (refer, appendix table 1). These variables are described in appendix table 1, and the estimates of the logistic models are shown in appendix table 3 and table 4. The values of F-statistics indicate that all the four models are fit to study the determinants of poverty. The impact of each variable on poverty odds has been explained separately as follows:

1. Macro Determinants of Poverty

Agriculture Growth: It reduces poverty because of two reasons :1) high proportion of poor still

depends upon agriculture for employment; and 2) poorest section with low assets and no skill find difficult to absorb themselves in RNFS and ultimately have to engage in agriculture to cope up with poverty (Sharma and Kumar 2011; Virmani 2007). In line with the literature, the logistic regression results show the positive impact of agriculture growth on poverty reduction as odds are against the probability of being poor. The values of odds ratio for rural India (0.986 in 2004-05 and 0.969 in 2011-12) significantly depict that probability of being poor falls as agriculture NDDP increases for all the regions (refer, appendix table 3). For NER (0.923), agriculture NDDP contributes more in declining the chances of being poor as compared to other regions followed by NR (0.969) and CR (0.974) during 2011-12.

Table 3: Region-wise Macro Determinants of Poverty in Rural India (2004-05 and 2011-12)

Macro Indicators	NER	ER	NR	WR	SR	CR
2004-05						
Agriculture NDDP	0.977***	0.982**	0.984**	0.953***	0.971***	0.977***
Urbanisation	0.967***	0.969***	0.963***	0.989***	0.967***	0.967***
Electrification	0.988***	0.985***	0.987**	0.988**	1.010**	0.998*
Agriculture Wages	0.695***	0.684***	0.874***	0.500***	0.730***	0.960***
2011-12						
Agriculture NDDP	0.923***	0.988***	0.969**	0.993**	1.006**	0.974***
Urbanisation	0.977***	0.972***	0.980***	0.998	0.988***	0.963***
Electrification	0.978***	1.004	0.978***	2.493***	0.978***	1.002*
Agriculture Wages	0.788**	0.795***	0.720***	1.074	0.891**	0.603***

Notes: a) ***, **, * represents level of significance at 1, 5 and 10 respectively.

Source: Calculated from NSSO 61st and 68th Rounds EUS data (Government of India, 2004-05, 2011-12)

Urbanisation: The regression estimates show that with increase in rate of urbanisation, the probability of being poor in rural areas is declined for all the regions; only the extent of impact varies across regions (refer, appendix table 3). Cali and Menon (2013) support the positive impact of urbanization through two rounds. First is explained through the process of migration (direct effect) and thereafter second channel is described through the spillover effects of urbanization (indirect effect).

Electricity: There are very limited empirical studies that has examined the causal relationship between the massively accomplished rural electrification endeavors and poverty reduction in the rural India (Samanta 2015). In the present study, the regression results show that as the village electrification increases, the probability of being poor declines during 2004-05 except SR, whereas during 2011-12, except WR (2.493) and CR (1.002), electrification contributes towards poverty reduction. WR and CR are the regions that constitute states with high proportions of poverty (refer, appendix table 3). In these states like Uttar Pradesh and West Bengal, even after the electricity connection to the grid, the electrification impact is unclear on livelihood of poor section, because of poor availability and quality of the service provision. Many poor households are not capable of purchasing electrical appliances to efficiently use the electricity.

Table 4: Region-wise Micro Determinants of Poverty (2004-05 and 2011-12)

Micro Variables	NER		ER		NR		SR		WR		CR	
	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12
Education of Household Head: Not Literate (reference)												
Literate Without Formal Schooling	0.862	0.675**	0.649***	1.117	0.718**	0.975	0.754*	0.340***	0.896	1.822	0.92	0.919
Below Primary to Middle	0.470***	0.487***	0.357***	0.608***	0.636***	0.598***	0.679***	0.575***	0.573***	0.690***	0.682***	0.738***
Secondary to Higher Secondary	0.217***	0.239***	0.138***	0.390***	0.349***	0.323***	0.348***	0.403***	0.313***	0.482***	0.424***	0.453***
Diploma	-	0.161***	0.058**	0.299***	0.229**	0.251***	0.286***	0.274***	0.188***	0.175***	0.157***	0.183***
Graduate and Above	0.099***	0.135***	0.081***	0.279***	0.239***	0.190***	0.196***	0.160***	0.172***	0.217***	0.234***	0.222***
Household Type: Self-employed in Agriculture (reference)												
Self-employed in non-agriculture	0.486***	0.554***	0.992	0.941	1.099	0.668***	0.726***	1.262***	0.94	0.777***	1.074**	1.098***
Others/Regular wage salary	0.324***	0.290***	0.421***	0.470***	0.615***	0.443***	0.572***	1.029	0.623***	0.559***	0.605***	0.645***
Casual Labour in agriculture	1.190**	2.042***	2.438***	2.001***	2.755***	1.171	2.220***	2.506***	2.564	2.231***	2.183***	2.079***
Other Labour/Casual labour in non-agriculture	1.322***	1.703***	2.050***	1.767***	2.192***	1.632***	1.108	1.685***	1.419***	1.735***	2.114***	1.686***
Others	-	0.700***	-	0.779***	-	1.174	-	1.451***	-	0.704	-	1.103
Social Group: SCs (reference)												
STs	0.599***	0.652***	1.346***	1.803***	1.093	2.033***	1.296	1.598***	1.512***	2.948***	1.209	2.136***
OBCs	0.433***	0.942	0.663***	0.836***	0.501***	0.636***	0.777***	0.689***	0.633***	0.915	0.752***	0.831***

contd..

Micro Variables	NER		ER		NR		SR		WR		CR	
	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12
Others	0.567***	1.350***	0.869***	0.548***	0.368***	0.659***	0.622**	0.467***	0.409***	0.545***	0.512***	0.363***
Land Owned: Landless (reference)												
Marginal	0.211***	0.657***	0.511***	0.689	0.575	3.258	0.243***	2.175	1.316	0.925	2.310**	0.572**
Small	0.042***	0.444***	0.224***	0.278***	0.313***	2.227	0.084***	2.51	1.057	0.892	1.024	0.352***
Semi-medium	0.026***	0.565**	0.100***	0.139***	0.286***	1.397	0.021***	2.261	0.869	0.643	0.543*	0.231***
Medium	0.009***	0.434***	0.074***	0.101***	0.221***	0.846	0.023***	1.339	0.392***	0.267	0.240***	0.123***
Large	-	1.014	-	0.584**	0.091***	1.652	0.001***	1.757	0.110***	0.52	0.134***	0.357***
Household size	1.496***	1.354***	1.246***	1.312***	1.174***	1.206***	1.463***	1.270***	1.214***	1.228***	1.216***	1.189***
Nature of Employment: Informal (reference)	0.593*	0.851	0.739	0.406***	0.544**	0.967	0.447***	0.848	0.486***	0.676*	0.523***	0.868
Age of Household Head: 15-29 (reference)												
30-59	0.878**	0.768***	0.731***	0.831***	1.007	0.706***	0.896**	0.729***	0.775***	0.857***	0.974	0.852***
60 and above	0.724***	0.623***	0.591***	0.702***	1.062	0.507***	0.977	0.752***	0.689***	0.646***	0.780***	0.690***
Gender: Male (reference)	0.885**	0.828***	0.973	0.885***	0.817***	0.778***	0.969	0.961	0.835***	0.879***	0.857***	0.850***
Constant	1.527	0.267***	-	0.381***	0.633	0.042***	0.681	0.036***	0.51	0.103***	0.211	0.845

Notes: a) ***, **, * represents level of significance at 1, 5 and 10 respectively.

Source: Calculated from NSSO 61st and 68th Rounds EUS data (Government of India, 2004-05, 2011-12)

Agriculture Wages: In support to this, Lanjouw and Murgai (2008) confirm the role of rising agriculture wages in poverty reduction. However, expansion of RNFE can be associated with increase in agriculture wages. Himanshu et al. (2011) also examine the indirect effect of RNFS on poverty reduction through rising agriculture wages (specifically in case of Uttar Pradesh). The regression results show that the agriculture wages turn out to have statistically significant impact on the poverty reduction as odds ratios in context of agriculture wages are against the poverty but it varies across regions (refer, appendix table 3). The odds ratio is observed lowest in WR (0.500) followed by NER (0.693) and SR (0.730) in 2004-05. But during 2011-12, the odds ratio is estimated to be lowest in CR (0.603), followed by NR (0.720) and NER (0.788). However, the role of wages is significant as compared to other factors in poverty reduction for all the regions (except WR in 2011-12).

2. Micro Determinants of Poverty

Land Owned: In rural areas, landless, marginal, and small landholding households constitute the largest block of rural poor, and the likelihood of sinking more into the poverty fades away with the increase in the size of land holdings (Haggblade et al. 2002; Chadha 2008; Ranjan 2009). The regression estimates reveal that probability of being poor is very less for large land owners (>10 hec), followed by medium (6-10 hec) and semi-medium (4-6 hec) land owners, but the likelihood of being poor for marginal and small farmers is higher as compared to other land owners in reference to landless, holding other factors constant.

Social Group : The social group (theoretically, caste) of a household plays an important role in determining the level of poverty across them (Lanjouw & Shariff 2004; Ranjan 2009; Arora & Singh 2015;). Moreover, discrimination, weaker asset base, and restrictions on geographic and occupational mobility all conspire to limit the access by key disadvantaged social groups, and move them to even less remunerative rural non-farm activities with having less probability of getting out of the poverty (Meenakshi & Ray 2000; Lanjouw & Lanjouw 2001; Haggblade et al. 2002; Haggblade et al. 2005; Himanshu et al. 2011). The regression estimates also show that odds of being poor are more for STs, whereas OBCs and 'others' are less likely to be poor in comparison to SCs in all the regions except NER. As poor are less capable of being employed in high productive non-farm activities, their probability of being poor is more.

Education: Being more literate, people are more aware of the job market opportunities than their illiterate counterparts (Ranjan 2009; Möllers & Buchenrieder 2011; Jatav & Sen 2013). Moreover, education also enhances the labour productivity and makes the rural poor capable of availing better opportunities. The regression estimates show that heads of households with no education, have a higher probability of being poor than those with at least primary education. Moreover, the likelihood of being poor decreases as the level of education of the head of household increases from primary to secondary and then graduation and above, holding other factors constant.

Household Type: Looking at the household type on basis of employment status of the household, the households working as casual labour in agriculture and non-agriculture are more likely to be poor as compared to self-employed in agriculture and non-agriculture and regular salaried workers. The regression estimates are in tune with the fact that Casual Agricultural Labour is the most crushing burden of the rural poverty (Sen 1996; Haggblade et al. 2002; Chadha 2008). However, this relationship holds true for all the regions except the CR where self-employed in non-agriculture also came out to be positively related with poverty and same is the case with SR for year 2011-12.

The reason for this can be well associated with the absorption of more workforce in either Casual Non-agricultural Labour or low productive Self Employed Non-Agricultural activities, which acts only as a coping strategy for the poor households (Ellis 1999; Bieler 2009; Papola & Sahu 2012).

Household Size: A number of studies have highlighted the positive association between the household size and poverty (Lanjouw & Ravallion 1994; Anyanwu 2013; Arora & Singh 2015; Chauhan, Mohanty, Subramanian, Parida, & Padhi 2016). Lanjouw and Ravallion (1994) and Anyanwu (2013) explain that with an increase in the household size, the burden of consumption expenditure increases and without increment in additional income source, the burden of distribution of same income among more members raises the probability of getting into the poverty. In line with the literature, the regression estimates of the present study also reveal a positive and significant association between household size and odds of being poor in all the regions. This relationship is found to be stronger in NER and SR as compared to other regions, however it has weakened in these regions in 2011-12 and it became stronger in all other regions (increase in odd ratios) except CR.

Nature of Employment: The nature of employment (stated as formal or informal) plays a major role in defining poverty status of a household. The formal employment ensures regular, secure and higher income to the households, whereas informality does not guarantee the security of the job and offers seasonal and casual kind of employment which may further help to just sustain the day to day livings (Sastry 2004). Poverty seems to be negatively related to formal employment in all the regions; however this variable came out to be statistically insignificant during 2011-12 in four out of six regions.

Age: It is also assumed that age of the household head is not linearly related to the poverty. According to regression estimates, workers of age group 15-29 are having more likelihood of being poor than other working age-group. Majority of the workers of this age group in India participate in the labour market. Being a head of the household, they cannot afford to remain unemployed for long and, hence, pick up activities characterized by low labour productivity (Mitra & Verick 2013). So, chances of being poor of 15-29 age group increases as compared to age group of 30-59. However, with expertise and better jobs, earnings of the latter group increase and drive them out of poverty. Moreover, the sample consists of only employed elderly (60 and above), so due to the absence of old dependency (which is the main reason of poverty among the elderly) may also reduce the chances of being poor (Möllers & Buchenrieder 2011).

Gender: The regression estimates also highlight that the female headed households are comparatively more poor in reference to male headed households in RNFS particularly during 2011-12, keeping other factors constant. Even being the head of the household, social and cultural obligations and child rearing responsibilities also hinder their growth and participation in the labour market (Haggblade et al., 2002; Ranjan, 2009). Therefore, they get fewer chances to expose themselves and take the advantages of growth opportunities and consequently are more likely to be poor. It is also argued that due to a lower level of education and lack of ownership of assets (such as land), poverty is more prevalent among the female headed households (Meenakshi & Ray 2000) and moreover, they are also tagged as '*Poorest among the poor*' (Chant 2006).

Other Factors: The argument related to a positive relationship between RNFE and poverty reduction has been given by a number of scholars through an increase in the income and employment worldwide. Based on some evidence, simply assuming it as the only factor behind this decline will not be judicious. The evidence have also been given where poverty has risen along with the expansion of RNFE, but generalisation may not be viable. It is also possible that both poverty

and the RNFS were driven by third forces, such as migration patterns or technological change in agriculture or remittances from urban areas (Haggblade et al. 2005; Kanchi 2010; Sharma & Saha 2015). Population growth, leading to declining per capita land holdings and environmental degradation, could be a powerful force in rising poverty if offsetting factors, such as, an expanding RNFS or increasing agricultural productivity were not present. Road connectivity in rural areas can also be a strongly associated with poverty reduction as found in Arora and Singh (2017) but due to data inadequacy and compatibility among different states, this variable was not used for analysis. So, to simply generalise the positive relationship is not possible (Haggblade, Hazell, & Reardon, 2010). Thus, this remains an issue of concern whether rural poor are actually benefitting from the growth of RNFS or other factors along with RNFE help during the process.

CONCLUSIONS AND POLICY IMPLICATIONS

The RNFS is a significant sector in reducing the pressure on farm sector and providing additional employment opportunities in the rural areas. Its role in reducing poverty has been documented extensively, but whether merely increase in RNFE is the only source of poverty decline, is a debatable issue. The present study has tried to resolve this issue to a greater extent through inter-regional analysis of rural India. The association between increase in RNFE and poverty reduction has been established through estimation of the sector-specific and activity-specific incidence of poverty. This indirect relationship has also been highlighted through the annual percentage change in the proportion of poor and RNFE for different regions. Surely, this relationship put forward the fact that poverty decline has occurred along with an increase in RNFE, but it does not necessarily mean that RNFE has led to this fall. Thus, especially during 2004-05 to 2011-12, the movement of workforce occurred from farm to non-farm is not an indication of poverty decline. Some other factors like agriculture NDDP, urbanization, electrification of villages and have helped in reducing incidence of poverty.

Another serious concern is the highest proportion of poor among Casual Non-agricultural Labour for which CR stands out to be the poorest, followed by ER and WR. The CR can be considered as the poorest region because the proportions of poor Casual Non-agricultural Labour engaged in manufacturing, construction, and transport & storage activities were 63.47 percent, 65.84 percent, and 71.20 percent, respectively during 2004-05, which declined to merely 51.08 percent, 58.19 percent and 37.45 percent respectively during 2011-12.

The regression estimates the macro and micro level determinants of the probability of being poor. At macro level, agriculture NDDP, urbanization, agriculture wages and rural electrification turn out to be the significant factors in determining the probability of being poor; whereas at micro level, education, landownership, and casual employment are found to be the significant factors in explaining the probability of being poor. Further, casual employment (both farm and non-farm) increases the likelihood of being poor. Moreover, household being employed in CR, followed by ER and WR are having more probability of being poor than being employed in other regions.

The broad picture, which emerges from these findings, is that, non-farm activities appear to be strongly associated with declining incidence of poverty but in-depth analysis shows that the poor face significant pressure to explore opportunities in the RNFS. The lack of their human (such as, education and skill), financial and physical (such as land ownership) assets often confines them to low productive, low remunerative and low-growth labour market segments, of which there are few pathways out of poverty, simply a means of bare survival. Hence, on the basis of the regression

results, promoting education, and making policies associating with more security and regularity to the casual employment should be encouraged. The self-employment can be made a more profitable venture for the rural poor through skilling them and providing easy and affordable access to institutional credit, technology and market. It should also be noted that RNFE is not a substitute for farm employment; it is rather a supplementary option. The negative and significant impact of agriculture NDDP shows that agricultural development is still important in poverty reduction and should be pursued as a necessary precondition. Keeping in view the importance of farm, and non-farm linkages, both the sectors should be upheld. The most important for rural poverty reduction is to improve the quality of RNFE rather just focusing on the quantity.

References / Notes

1. As for the first time, increase in urban population was reported higher than increase in rural population during 2001-2011 (Ministry of Finance, GOI 2012-13).
2. The regional classification is done according to employment review published by Directorate of Labour and Employment, 2012. This classification is not based on the traditional classification of India rather it is based on the geographical location of organized establishments (i.e. primarily based on employment) in the country (refer, figure 2).
3. There is one more round (66th round) conducted during 2009-10 (between 2004-05 and 2011-12), but the present study does not take into account this round as 2009-10 was a drought year and may have affected the results of the survey while depicting a less than positive picture of the economy (Shaw, 2013).
4. The details about the other kinds of employment status can be studied from EUS reports of NSSO (Ministry of Statistics Programme Implementation, GOI 2004-05, and 2011-12).
5. Defining rural and urban parts of the districts as strata for selection of sample villages and urban blocks, respectively.
6. HCR is defined as proportion of poor below the poverty line with reference to overall population.
7. The sample proportion is less than 1 percent in Mining and Quarrying, Hotels and Restaurants and Real estate and Renting Activities during 2004-05 as well as 2011-12 whereas this proportion is less than even 0.5 percent for Electricity, Gas and Water supply and Financial and Insurance Services during both the periods.