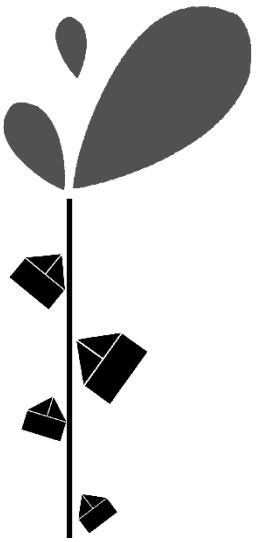
Employment Diversification in Rural India: Nature, Pattern and Determinants



Amandeep Kaur, Akarsh Arora and S. P. Singh

Indian Institute of Technology Roorkee, India

DOI: 10.4422/ager.2019.02

ager

Revista de Estudios sobre Despoblación y Desarrollo Rural

Journal of Depopulation and Rural Development Studies

Páginas: 189-226

Employment Diversification in Rural India: Nature, Pattern and Determinants

Abstract: The present study examines the pattern and nature of occupational shift vis-à-vis non-farm employment in rural India using unit level data of 61st (2004-05) and 68th (2011-12) NSS rounds. The pattern of Rural Non-Farm (RNF) employment is estimated through proportions and employment elasticity to capture the employment for a longer time period during the year (Usual Principal Status (UPS)). The RNF sector provides opportunities either in self-employment or casual employment but very less for regular employment. Furthermore, Multinomial Logit Model has been used to identify the factors that affect the adoption of different RNF occupations at macro as well as at micro level. The regression results reveal that at macro level, electrification, urbanisation along with irrigation impact positively to join RNF as principle occupation whereas at micro level upgradation of education level along with formal vocational training acts as a pull factor whereas the small size of land holdings works as a push factor for moving into RNF sector. The study also highlights the hike in employment in construction sector which is majorly of informal in nature and issue of concern in the present era. Thus, study suggests that in rural areas, policies should be promoted for generating gainful and regular kind of employment in the construction sector along with boosting the manufacturing sector.

Keywords: Employment, Rural non-farm, Usual Principal Status, Multinomial Logit, NSS.

Diversificación de empleo en la India rural: Naturaleza, patrón y determinantes

Resumen: Este estudio examina el patrón y la naturaleza del cambio ocupacional con respecto al empleo no-agrario en el medio rural de India, utilizando datos estadísticos de las series NSS 61a (2004-05) y 68a (2011-12). El patrón de empleo rural no-agrario (RNF) se calcula a través de la elasticidad del empleo durante períodos de un año (a través de un análisis de componentes principales (UPS)). El RNF ofrece oportunidades ya sea como trabajos por cuenta propia o de tipo informal, pero relativamente pocos de forma regular. El Modelo Logit Multinomial se ha utilizado para identificar los factores que afectan a la adopción de diferentes ocupaciones RNF a nivel macro y micro. Los resultados de la regresión muestran que a nivel macro, la electrificación, la urbanización y el regadío tienen un impacto positivo en el RNF como ocupación principal, mientras que a nivel micro la mejora del nivel educativo junto con la formación profesional formal actúan como un factor de atracción clave, mientras que el pequeño tamaño de las propiedades territoriales funciona como factor de empuje para lograr un empleo no-agrario. El estudio también destaca el incremento del empleo en el sector de la construcción, que es principalmente de naturaleza informal y, por tanto, un tema de preocupación actual. Los resultados evidencian que en las áreas rurales se deberían promover políticas para generar empleos remunerados y regulares en el sector de la construcción, junto con el impulso del sector manufacturero.

Palabras clave: Empleo, rural no-agrario, Componentes Principales, Multinomial Logit, NSS.

Received: 15th January 2018
1st revised version: 3rd December 2018
2nd revised version: 25th March 2019
Accepted for publication: 6th April 2019

How to cite this paper: Kaur, A., Arora, A., and Singh, S. P. (2019). Employment Diversification in Rural India: Nature, Pattern and Determinants. *AGER: Revista de Estudios sobre Despoblación y Desarrollo Rural (Journal of Depopulation and Rural Development Studies),* 27, 189-226. DOI: 10.4422/ager.2019.02

Amandeep Kaur. ORCID 0000-0002-2898-2451. E-mail: amandeep8825@gmail.com
Akarsh Arora. ORCID 0000-0001-6936-1902. E-mail: akarsh08061988@gmail.com
S. P. Singh. ORCID 0000-0001-9368-9502. E-mail: singhfhs@iitr.ac.in

Introduction

India's development lies in the development of its rural areas, where about 69 percent of the households and 71 percent of the total population live. Rural areas, which consists of 60 percent of the total males and 61 percent of the total females as an economically active group (15-59 years) and 55 percent of the total males and 25 percent of the total females in the labour force, becomes essential to understand the growth pattern of the country as a whole (Government of India, 2014a). Moreover, it is essential to focus on rural growth pattern and the transformation, which the rural economy is passing through over a period of time (Reddy, Reddy, Nagaraj and Bantilan, 2014). The phenomenon of structural transformation is evident from the present situation of the economic development of the country, which has outpaced the role of industry and services over agriculture and allied activities. The rural areas are also going through the similar situation where the non-farm activities are growing at a faster pace than the farm activities.

Although agriculture occupies a pivotal place in the rural economy in terms of its contribution to employment generation, however, disaggregating rural employment growth in terms of farm and non-farm sectors would demonstrate that non-farm employment growth had been significantly higher than that of the farm sector over a period of time. Even though proportion of employment provided by the RNF sector is an indicator of reduction in unemployment rate (directly) and increase

in rural development (indirectly), still both the aspects are missing in the rural areas if we observe the RNF sector from the perspective of permanent employment, high productivity, lowering inequality and sustainable growth (Jha, 2006; Start, 2001; Binswanger-Mkhize, 2013). Thus, it is essential to understand the nature and pattern of employment in the RNF sector so that policy for employment generation can be designed accordingly.

When a rural economy diversifies, the workers may rise in status either as self-employed workers (at large scale) or as regular employees. At the same time, it is also possible that their status may be lowered to that of casual labours. While in most developed nations workers move to regular jobs or become self-employed; in developing countries like India, they move to the less advantageous position of casual labours (Government of India, 2014a). So, mere shifting from one lower-paid occupation to another lower paid occupation may not improve the employment situation rather may indicate to distress. Moreover, it is also important to know why an individual leaves his/her previous occupation and enters into the non-farm sector or simultaneously works in both the occupations. Such issue of occupational diversification is undoubtedly complex, and its determinants are difficult to identify (Buchenrieder and Mollers, 2006). However, an effort has been made to examine the determinants of rural diversification and opting non-farm occupations.

Against this backdrop the present study raises some questions such as with increase in RNF employment which kind of employment predominates? What are the reasons for adopting a specific employment type? Is these reasons prevail only at macro level or household/Individual characteristics also influence the adoption of a particular employment? To answer all these questions the study has two main objectives: First, to analyse the employment share in RNF sector by comparing the employment pattern and status captured through the NSS round during 2004-05 and 2011-12. Second, to analyse the factors responsible for choosing a particular type of employment among all kinds of employment (Self-employed in farm, Self-employed in non-farm, Casual labour in farm, Casual labour in non-farm, Regular wage earner).

The paper is organised into six sections. Second section explains the data and methodology used for evaluating the employment status along with the description of the variables. The next section examines the share of non-farm employment in total rural employment (activity-wise), followed by the employment status in the fourth section. This section also elaborates the kind of employment provided by the RNF sector, while elucidating the education level, vocational training, type of contract and social security benefits attached to the employment. Further, the study throws light

on the main factors responsible for occupational diversification in the fifth section and ends up with conclusions and policy implications in the last section.

Data and Methodology

Although significance of RNF sector in terms of magnitude of employment opportunities, increase in income, poverty reduction, rural industrialisation and low rate of rural-urban migration has been extensively documented in numerous studies (Haggblade, Hazell and Reardon, 2007; Ranjan, 2009; Himanshu, Lanjouw, Mukhopadhyay and Murgai, 2011; Binswanger-Mkhize, 2013), yet there is a dearth of studies which have highlighted the nature of employment in rural area. Moreover, most of the studies estimate the employment share and status primarily on the basis of Usual Principal and Subsidiary Status (UPSS) and comparatively give less importance to the analysis of permanent nature of employment, popularly known as Usual Principal Status (UPS[1]). Furthermore, UPSS of the population is widely used while discussing employment trends, but it includes the subsidiary status[2] of the workforce, which makes it a more liberal measure of employment. However, the focus here will be on UPS employment, that is, the worker is said to be employed if s/he had pursed gainful economic activity for a relatively longer time period of a year. Therefore, with this study and effort is made to analyse the RNF employment by longer time criterion and social security associated with it.

The present study examines the pattern (analysed through two ways: proportions and employment elasticity[3]) and determinants of RNF sector using 61st and 68th rounds of Employment-Unemployment Survey (EUS) conducted by National

1• This is to note that since the reference period for calculating employment status is one year, so daily commuters, seasonal workers and people involved in the temporary occupation for one or two months will not be the part of UPS employment.

2• Subsidiary employment is measured mainly to capture the various kinds of informal and short-term employment (at least 30 days in a year) opportunities that provide supplementary employment.

3• Employment Elasticity is calculated using rural net domestic product (NDP) data given by National Account Statistics, Center of Statistical Organisation India. For making data comparable for 2004-05 and 2011-12, Consumer Price Index for Agriculture Labour (CPI_AL) is used as deflator.

Sample Survey Organisation (NSSO) during 2004-05 and 2011-12 respectively. 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). There are some reasons for using the dataset of 2004-05 and 2011-12. 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 and Gandhi, 2014). Third, construction employment increased only by 8 million (from 17 million to 25.6 million) from 1999-2000 to 2004-05. But it grew much more sharply after 2004-05 to 50 million by 2011-12. Fourth, some government policies and investment related projects during this period drove the non-farm employment. Thus, rural areas reported growth in non-farm (mainly, construction-related) employment as government investment grew in the rural housing and other rural construction investment (Mehrotra *et al*., 2014).

Although the defining the RNF sector is a debatable issue; this paper does not go into this conflicting argument rather follows the simplest definition of RNF sector that includes industry and services sectors' activities performed within the rural area only. Therefore, the rural masses either going to or coming from the urban area for work, will not be the part of RNF employment.

Two types of factors are responsible for the movement of workers from farm to non-farm sectors: the push factors and the pull factors (Ranjan, 2009; Reddy *et al*., 2014). An individual either is being pushed to join RNFS due to the inadequacy of work in farm sector or he/she is pulled by the better employment opportunities in RNF sector. To understand the factors responsible for this shift, regression analysis has been applied. Some scholars have used logit model for investigating the determinants of RNF occupation (Ranjan, 2008; Khatun and Roy, 2012; Jatav and Sen, 2013). The present study focuses on the determinants of different kinds of non-farm occupations (self-employment, casual employment or regular employment). So, instead of using simple logit model, it applies *Multinomial Logit Model* which takes more than one values for the dependent variable. Since there is no precise ordering of the outcome variable, an unordered multinomial logit model is appropriate (Cameron and Trivedi, 2005).

For rigorous analysis, factors affecting the adoption of RNF employment have been studied separately at micro as well as macro level. The macro level variables taken under consideration are irrigation, urbanisation, migration, wages, electrification, unemployment

rate, credit facilities etc. whereas micro level determinants are land owned, social group, household size, Monthly Per Capita Expenditure (MPCE), general education, technical education, age, and gender etc.

Multinomial Logit Model

Multinomial Logit (MNL) Regression Model is applied when the dependent variable is categorised with more than two alternatives and such alternatives are not in any specific order. Thus, it is an extension of the logit model, which analyses dichotomous (binary) dependents. The simplest MNL model, proposed by Luce in 1959, can be thought of as simultaneously estimating binary logits for all alternatives (here, different occupations). The model contains the structural assumption, i.e., independence from irrelevant alternatives (IIA), that the relative odds of two alternatives are independent of the attributes, or even the presence, of a third alternative. Following Cameron and Trivedi (2005), the description of the model can be given as:

There are J unordered occupations, out of which one is chosen by defining a latent variable which is denoted as V^*_{nj}. V^*_{nj} of an individual n choosing occupation j = 1, ..., J is

$$V^*_{nj} = x'_n \beta_j + \varepsilon_{nj} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

There are J error terms $_{nj}$ for any individual n. The variables x'_n are exogenous variables which describe only the individual and are identical across occupations. However, the parameter β_j differs across occupations. An individual n chooses occupation j if it offers the highest value of V^*_{nj}. Thus the observed choice symbolises as y_n of an individual n is represented as:

$$y_n = \begin{cases} 1 \text{ if } V^*_{n1} \geq V^*_{ni} \text{ for all } i \\ 2 \text{ if } V^*_{n2} \geq V^*_{ni} \text{ for all } i \\ \vdots \\ J \text{ if } V^*_{nj} \geq V^*_{ni} \text{ for all } i \end{cases}$$

Note that this implies that the choice only depends on the *difference* of usefulness offered by an occupation and not on the level (order) of usefulness. The MNL model assumes that the error terms used in equation (1) follow independently

and identically an extreme value distribution. The cumulative distribution function for error term is

$$F(\varepsilon_{nj}) = e^{-e^{-\varepsilon_{nj}}}$$

And also the probability that an individual *n* chooses occupation *j*, i.e., the probability of observed choice given the different occupations for the same group of individuals is represented as

$$P_{nj} = P(y_n = j|x_n) = \frac{e^{x'_n\beta_j}}{\sum_{l=1}^{j} e^{x'_n\beta_l}}$$

The probability in such kinds of choice models is calculated by using odds ratio. An odds ratio is a measure of association between acceptance and non-acceptance of an occupation. It represents that an outcome will occur given a particular occupation, compared to the odds of the outcome occurring in the absence of that occupation. The odds ratio in this model is calculated as given by the equation below. It depicts that the odds ratio (P_{nj}/P_{ni}) depends log-linearly on x_n

$$log\left(\frac{Pnj}{Pni}\right) = x'_n(\beta_j - \beta_i)$$

Where the parameter vectors β_j, $j = 1, ..., J$ are not uniquely defined: any vector q added to all vectors $\beta^*_j = \beta_j + q$ cancels in the choice probabilities P_{nj}

$$P_{nj} = \frac{e^{x'_n(\beta_j+q)}}{\sum_{l=1}^{j} e^{x'_n(\beta_l+q)}} = \frac{e^q e^{x'_n\beta_j}}{e^q \sum_{l=1}^{j} e^{x'_n\beta_l}} = \frac{e^{x'_n\beta_j}}{\sum_{l=1}^{j} e^{x'_n\beta_l}}$$

The β_j's are usually identified by setting the $\beta_j = 0$ for one *reference occupation category I (here, Self-employed in Farm-SEF)*. The description of dependent as well as independent variables used in the model is expressed in Table 1.

Interpretation of the Model

In particular, for MNL models, a positive regression parameter does not mean that an increase in the regressor leads to an increase in the probability of that alternative. Instead, interpretation for the MNL model is relative to the reference or base category group (here Self-employed in Farm (CLF)), which is the alternative normalised to have coefficients equal to zero. The interpretations will vary according

to which alternative (occupation) is normalised to have zero coefficient, and for this interpretation to be really useful, the model should have a naturally accepted base category.

Dependent Variable

To identify the determinants across various occupations in rural areas, the above mentioned model takes into account different types of farm and non-farm occupations as dependent variable and these categories are abbreviated as; Self Employed in Farm (SEF), Self Employed in Non-Farm (SENF), Regular Wage Earner (RWE), Casual Labour in Non-Farm (CLNF), and Casual Labour in Farm (CLF). Here Self Employed in Farm (SEF) has been taken as the reference category.

Construction of Independent Variables

The independent variables used in the study are described as follows:

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

Variables Notation	Description	Categories	Expected relationship
Macro Variables			
Rural Electrification	Percentage of village electrified in a village	Continuous	Positive
Unemployment Rate (15 onwards)	Percentage of unemployed to total labour force	Continuous	Negative
Regional Rural Banks-Number	Number of Branches	Continuous	Positive
Regional Rural Banks-Credit Deposit Ratio	Credit to Deposit Ratio	Continuous	Positive
Urbanisation	Proportion of urban population to total population	Continuous	Negative as well as positive

Variables Notation	Description	Categories	Expected relationship
Macro Variables			
Irrigation	Percentage of gross irrigated area to total cropped area	Continuous	Negative
Net Migration Rate	Difference between the number of immigrants and the number of emigrants in a period of time per 1000 population	Continuous	Negative as well as positive
Wages	Wages in Rs.	Agriculture Wages, Non-agriculture Wages	Negative with Agriculture Wages
Micro Variables			
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.
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
Household Size	Number of family members (including children) in the household	in absolute terms	Positive
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
Age	Age of head of the household (in years)	in absolute terms	Positive
Vocational Training	Vocational training attainment of the head of the household	No training, Formal vocational training, Informal vocational training	Positive
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
BPL	Poor, Non-Poor	0= if Household is Poor (MPCE< poverty line), 1= if Household is Non-Poor (MPCE≥ poverty line)	Negative as well as positive

Note: Dependent Variable; Self Employed in Farm (SEF) =1, Self Employed in Non-Farm (SENF)=2, Regular Wage Earner (RWE)=3, Casual Labour in Non-Farm (CLNF)=4, Casual Labour in Farm (CLF) =5

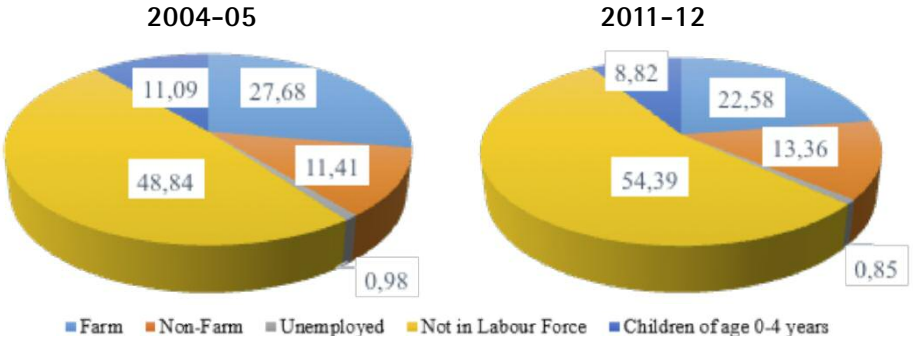
Employment Status in Rural India

Although India has been listed among the fastest growing countries due to the high growth rate even during the recession periods; still it comes under the category of the less urbanised countries with 31.16 % urban population. About 71 % of India's population is still surviving and earning their livelihoods in rural areas (Government of India, 2014b). So, to understand the rural livelihoods, the pattern of rural employment must be known and analysed thoroughly.

Employment Pattern through Proportions

First of all, it is important to evaluate the share of employed persons to form the basis for examining the employment pattern in the rural India. The most astonishing part of the analysis is that the proportion of employed out of total population is declined in rural India by 3.15 % points from 2004-05 to 2011-12; whereas the proportion of the population in labour has reported an increase of 5.55 % points (refer Figure 1). The main reason for the reduction in total employed population or workforce participation rate (WPR) is attributed to declining female labour force participation rate (LFPR) and WPR by 6.8 % points and 6.5 % points respectively. The declining unemployment rate (UR) by 0.2 % points for females provided no change in UR for males, indicates that neither females are part of workforce nor they are willing to work rather they are leaving the labour market. Improvement in family income and more enrolments of women in education are highlighted as the leading cause of their low participation rate (Government of India, 2014c; Rangarajan and Seema, 2014).

Figure 1:
Distribution of Population in Rural India



Source: Authors' calculations from 61st and 68th NSS EUS, GOI (2011-12).

During 2004-05 to 2011-12, rural workforce are leaving farm sector and finding alternatives in the non-farm sector. The study emphasises that 37.2 % of the employed population has opted non-farm occupations as their principal source of employment during 2011-12 (on UPS basis), the share of which was 29.2 % during 2004-05, that is, 8.02 % points increase in the share of RNFE.

The slow and declining growth of employment in agriculture is the result of the declining rate of GDP growth in this sector as compared to the other sectors. Even the employment elasticity of this sector turned to be negative in 2011-12, which indicates that farm sector is not able to absorb the existing workers; thus they move from farm to the non-farm sector in general and industry in particular. The disaggregated analysis shows that during 2004-05 the share of industry and services in providing employment was almost same, i.e., 14.28 % and 14.9 % respectively, but during 2011-12 the share of industry is higher (20.5 %) than that of services (16.6 %). This rise in industrial activities (even within all non-farm activities) is majorly because of construction sector (11.2 %) as it engages the highest proportion of rural population followed by manufacturing activities (8.5 %). However, most of the employment generated in this sector is of low quality, casual and irregular, which does not need much skilled and qualified labour. The manufacturing activities has remained the dominant part of industrial activities in rural areas since past decades but the latest dataset shows the surge of construction activities. Although the share of manufacturing has declined; still the employment provided by these activities is

better than that of construction activities (Wiggins and Hazell, 2008; Rangarajan and Seema, 2014).

In the services sector, the share of rural employment has shown an increment only in transport, storage, and communication and in other services from 0.76 % in 2004-05 to 3.2 % in 2011-12 respectively. Although India as a whole is said to have outpaced some countries with its growth in the services sector (communications, banking and insurance, and business services), primarily by software and BPO services but this was restricted to urban areas only. And rural workforce has not gained much from the labour market deepening in the IT sector (Unni and Naik, 2011).

Employment Pattern through Employment Elasticity

The employment elasticity is defined as the measure of extent to which employment varies with change in economic output (GDP). In simple words, it indicates the ability of an economy to generate employment opportunities for its population as a per cent of its growth or development process. During the last decadal years 2004-11, India saw some of the highest rates of gross domestic product (GDP) but, the problem, however, is that this high growth has not led to more jobs. Lower elasticities, as a result, are indicative of what some economists call 'jobless growth phases'.

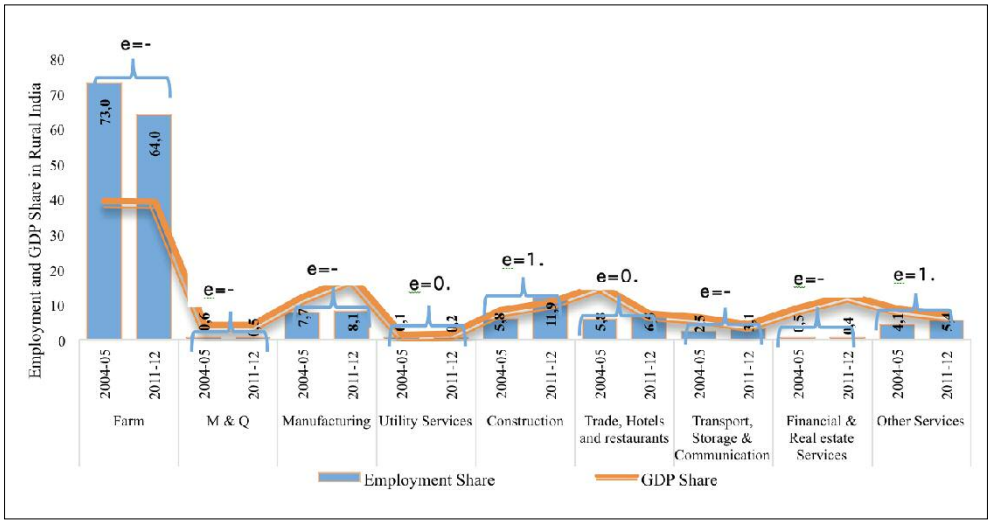
During 2004-05 to 2011-12, the highest employment elasticity has been shown by the Construction (1.12) and utilities sector (1.71; which includes energy, water and waste management). These are the biggest job generators in our country. The farm sector (agriculture, fishing and forestry), manufacturing has negative employment elasticity. During the period, the reduction in the number of workers employed has been reported in farm sector (-0.66). This gross deterioration of employment elasticity in the primary sector means that any effort to improve the productivity or output in the primary sector may result in net job loss (refer Table 2 in Appendix I and Figure 2). Bosworth, Collins and Virmani (2007) also supports the fact that India's output growth depicts very little or no employment creation. The convergence standpoint (specifically for manufacturing) also states that it is not necessary that sectors which can absorb technology can also absorb labour (Rodrik, 2013). This clearly means that the primary sector, mainly agriculture, is burdened with disguised unemployment and underemployment. The employment elasticity for manufacturing sector (-0.07) is too negative during this period. During the period, slow growth in manufacturing is

recorded by the data (Kotwal, Ramaswami and Wadhwa, 2011). The government explains this by quoting that labour intensive technology has been replaced by capital intensive technology and more and more labour force has been accommodated in unorganised sectors or new jobs in the informal sector, with many others went converted into successful small scale entrepreneurs (Misra and Suresh, 2014). Most of the persons displaced found their jobs shifting to the informal sector, mainly in construction industry. Thus, new jobs all created during the period were of informal in nature resulting in worsening of the quality of employment.

Therefore, the primary sector cannot support any new job creation. Even in rural areas, the burden of creating new jobs will fall on rural industry and services. On the other side, the secondary sector witnessed an increase (construction) in employment elasticity, though the increase has been marginal. Precisely for this reason, policy and other economic boosts for the secondary sector (industry) are needed to revive employment generation. Employment elasticity in the tertiary sector shows downward elasticity except community, social and personal services (1.71). It highlights the fact that any rise in tertiary (services) output will not be able to create adequate proportional increase in employment.

The issue of concern is that if employment growth has been so low during a period of high output growth, it has probably become even worse now, when GDP growth has weakened so much. The worry is the construction sector, which may not be able to generate enough employment and able to absorb the new entrants as well as under-employed labour from agriculture. The key, therefore, is to increase investment, which will spur growth in the construction sector and improve employment. Along with, manufacturing sector should also be encouraged to boost the engine of growth.

Figure 2:
Employment and GDP share of Activities in Rural India (2004-05 and 2011-12)



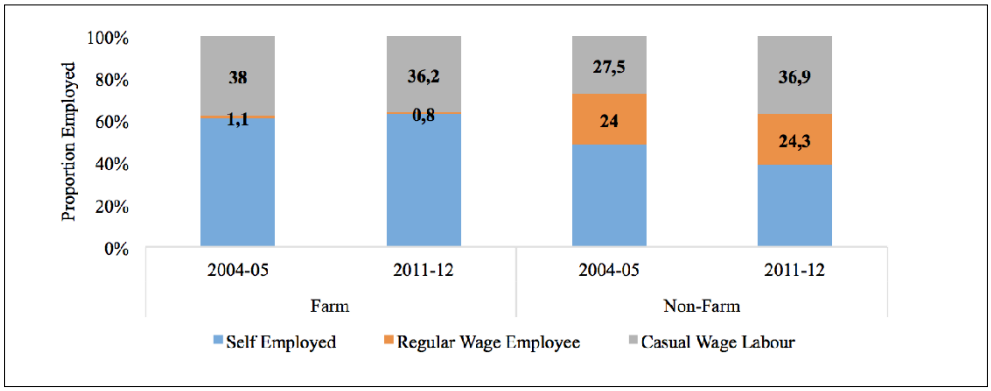
Source: a) National Accounts Statistics, Central Statistical Organisation for Rural GDP
b) NSSO 61st and 68th Rounds EUS data, GOI 2004-05 and 2011-12 for Employment.

Employment Status in rural India

The scale of individual rural non-farm businesses varies enormously, from part-time self-employment in household-based cottage industries to large-scale warehousing facilities operated by large multinational firms. Often highly seasonal rural non-farm activities fluctuate with the availability of agricultural raw materials and in pace with household labour and financial flows between farm and non-farm activities (Wiggins and Hazell, 2008).

There has been a considerable rise in the share of RNF employment in India, but to analyse whether this transforms into the qualitative improvement of employment or not, it is essential to know the employment status (refer Table 3 in appendix I and Figure 3). As regarding employment, regular salaried is considered as the most stable source of income; whereas casual workers are the most insecure and vulnerable. Self-employment is in between these two categories and is neither too risky nor stable (Tarique, 2014).

Figure 3:
Enterprise Type in Rural India (2004-05 and 2011-12)



Source: NSSO 61st and 68th Rounds EUS data, GOI 2004-05 and 2011-12 for Employment

In Rural India, a major transformation has been found for employment status as self-employment registered a sharp decline of 9.6 % during 2004-05 to 2011-12 which occurred mainly due to fall in the share of own account workers (by 5.5 %) followed by unpaid family workers (4.2 %). On the contrary, employers under self-employed enterprises have shown a marginal increase (0.1 %) in their share. Although the share of self-employment declined over a period of last 7 years; the proportion of the population still remains high among all the types of employment. As against fall in self-employment, a sharp rise in casual employment (27.5 % in 2004-05 to 36.9 % in 2011-12) signals the casualisation of rural employment. This rise is not being associated with the increase in MGNREGA (rise by only 2.3 %) rather by increasing employment in other types of work (by 7.1 %). The most secure mode of employment (regular employment) also reported a marginal increase by 0.3 % from 2004-05 to 2011-12.

While the number of people moving into non-farm employment is growing; the type of non-farm employment offered is not appreciable. The activity-wise analysis of employment status (refer Table 4, Appendix I) shows that the most of the jobs provided by the fast-growing sectors of the rural economy are either casual or self-employed in own account enterprises. The provision of secured regular jobs is very less by the flourishing activities. This depicts that type of employment is not an indication of quality employment. Within RNF sector, self-employment is more prevalent and

pervasive in manufacturing (51 %), wholesale and retail trade (82 %), real estate (73 %) and hotels and restaurants (66 %) during 2011-12. Financial and insurance (77 %) and electricity, gas and water supply (60 %) activities provide more of regular employment to the rural people even after fall in the share of employment by 12.7 % and 3.5 % respectively from 2004-05 to 2011-12. The most uncertain or seasonal type of employment (as and when there is demand) is being provided by the two sectors, i.e., construction (89 %) and mining and quarrying (78 %).

Concurrent Subsidiary Employment

The rural people are not only involved in their primary occupation rather they also devote some time in subsidiary work simultaneously to supplement their income. Table 5 (Appendix I) shows that among all the employed, majorly farm workers (73 %) are involved in subsidiary employment along with their existing occupation and rest 27 % non-farm workers are in subsidiary work. Among farm workers, self-employed in the farm (38 % in 2004-05 and 34 % in 2011-12) and casual farm workers (34 % in 2004-05 and 29 % in 2011-12) are going for the alternative job along with their farm sector job. As farm sector does not ensure job security and sufficient earnings, so rural people try to involve themselves in another job to supplement their income and secure their livelihood. Moreover, seasonal behaviour of the farm sector also forces the workers to go for another job too for obtaining job throughout the year. Thus, in the rural area, it is hard to find peasants who do only farming. As a result, they devote a part of their time to farm activities and part of it to non-farm activities (Zahonogo, 2011). However, in non-farm sector, self-employed and casual workers also go for the additional job. The casual non-farm workers are involved in more than one job as their share for subsidiary work has doubled from 9 % in 2004-05 to 18 % in 2011-12.

Determinants of RNF Employment: Multinomial Logit Model

The present study examines the factors which play a significant role in determining the probability of moving to different non-farm occupations at micro as

well as macro level. The relationship between occupational choice and these determinants has been examined for rural India using a multinomial logit model. Various studies have carried out such analysis using similar variables in other developing countries (Mecharla, 2002; Zahonogo, 2011) and also in different states in India (Ranjan, 2009; Khatun and Roy, 2012; Jatav and Sen, 2013). Most of these studies have applied probit or logit models, using a dichotomous dependent variable. But the present study focuses on the more comprehensive aspect, i.e., the probability of joining in different types of employment within the non-farm sector (refer Table 1 in Section 2).

Results and Discussion: Macro Level

Irrigation

The critical importance of agricultural development for creating an environment in which the non-farm sector can prosper, has been supported by various studies in different places such as Uganda, Tanzania, India and South America (Davis and Bezemer, 2003). Agricultural development also generates increased saving surpluses, which can be channelled to rural non-farm activities by farming households or the financial system. However, the growth of agriculture is possible in a way as expected if the irrigation facilities are available. These facilities help in creating agriculture surplus through multiple cropping or make cropping possible even when there is no rain. Thus induces the agriculture growth which (surplus) in turn helps in performing non-farm activities. Therefore, irrigation and non-farm sector are positively related for rural area (Khatun and Roy, 2012). Irrigation availability has also appeared as important factor in boosting RNFS in areas like Gujarat, Uttar Pradesh and Andhra Pradesh (Mecharla, 2002). The regression analysis also depicts the role of irrigation in increasing the probability of non-farm occupation, i.e. casual labour in farm (1.010) whereas self-employed in non-farm (0.996) have less probability to join in comparison to self-employed in farm if irrigation facilities are more (refer Table 8, Appendix II).

Rural Electrification

There are some scholars who do not support the contribution of agricultural growth alone on the development of non-farm employment; for them the development of rural infrastructure also stands out as an important factor for its growth. The two important infrastructural factors emphasised in the studies are road

density or proximity to urban areas (Asher and Novosad, 2015) and rural electrification (Davis and Bezemer, 2003). In the present study road density is not taken as parameter for the infrastructure because of unavailability of comparable dataset at the state level. On the other hand, rural electrification indicator is taken as the percentage of villages electrified to the total villages (inhabited villages).

According to the analysis, in rural India, more coverage under electricity increases the probability of opting CLF (1.019) followed by CLNF (1.015) and SENF (1.009) in comparison to SEF during 2011-12 (refer Table 8, Appendix II). Thus, expansion of areas under rural electrification determines the magnitude of rural non-farm employment and can induce settings up of electricity driven manufacturing units (especially, small scale) in the rural areas (Davis and Bezemer, 2003).

Unemployment Rate

The development of rural non-farm sector in India is not only of paramount importance but also of pressing urgency in view of the ever rising unemployment and a high proportion of rural population in the country's workforce. The high unemployment rate is considered as the push factor for the expansion of RNF employment and positive correlation between unemployment rate and RNF employment also supports the 'residual hypothesis' given by Vaidyanathan (1986). Parthasarthy, Shameem and Sambi (1998) also supported the argument while taking unemployment rate on CDS basis (specifically for rural males), suggesting a distress-induced growth of non-agriculture. The results also support that as unemployment rate rises chances of joining the non-farm sector as CLF (1.003), CLNF (1.003) and SENF (1.003) as compared to SEF (refer Table 8, Appendix II). Thus, in underdeveloped and poorly developed regions, higher unemployment rate has remained one of the important factors for expansion of RNF employment in India.

Availability of Credit Facilities

The availability of credit and rural financial institutions are also counted among the major factors influencing the occupational transformation along with agricultural development and infrastructure development in the rural areas. Lacking access to credit for small and micro enterprises is an important barrier for poor workers. It hampers the rise in the productivity of their activities and the general development of their businesses (Davis and Bezemer, 2003; Khatun and Roy, 2012). In present study both the aspects of credit are considered i.e. availability of credit as well as access to credit. The parameter for availability of credit in rural areas is taken as the number of branches of regional rural banks in the respective area and the access to credit is indicated by the

credit deposit ratio in regional rural banks. Limited access of formal credit in the rural areas reduce the probability of entering in the rural nonfarm sector as self-employed persons comparative to other occupations (refer Table 8, Appendix II).

Urbanisation

The proportion of urban population to the total population also determine the level of RNF employment in India. The degree of urbanisation along with agricultural development are found to be strongly associated with RNF employment in Karnataka (Iyyampillai and Jayakumar, 1995). The results in the former study was elaborated by stating that the 'pull' factors were stronger than the 'push' factors in Karnataka. Furthermore, Jayaraj (1994) in Tamilnadu, and Eapen (1996) in Kerala, also find an important positive influence of urbanisation on rural non-farm growth. Actually, urbanisation expands the market for rural enterprises and encourages non-farm attributes in the secondary and tertiary sector. Interestingly, Eapen (1996) also identified that in 1991 only distress-related factors and urbanisation were important along with other variables. The most significant variable was found to be urbanisation which alone stand out as statistically significant at state level as well as at district level. In line to the literature, Table 8 shows the significant role of urbanisation in probability of opting RNF occupations. The rate of urbanisation positively effects the probability of going for casual labour in farm (1.035) followed by RWE (1.030) and SENF (1.007) in comparison to SEF. It acts as a pull factor for expansion of RNFS.

Migration

Migration (here parameter taken as Net Migration Rate[4]) as a determinant also plays a major role in expansion of RNF employment specifically in case of rural India. When the net migration rate is positive means the inflow of the population towards rural areas and positive sign signals the outflow of the population to the other rural or urban areas. The inflow of the population in rural areas can be in only in the case of higher congestion and high cost of living in the urban areas nearby where they moved earlier but were unable to find appropriate source of living there. After struggling hard, people use to start coming back into their native places and started a new venture and occupation in the rural areas only. Hence migration led to the

4• Net Migration rate is calculated as number of net migrants (number of immigrants minus number of emigrants) per 1000 population.

positive net migration areas in some regions and hence promoted the movement of the workforce towards non-farm activities.

It is also argued that migration in form of remittances have less impact on RNFS rather than represented as movement of persons. If migration expresses in terms of remittances, then it accounts a very small proportion of rural non-farm income. Instead, earnings from self and wage-employment in the RNFE dominate agricultural wage earnings and migration remittances. Despite widespread migration from many poor rural areas, migration income accounts for less than 10 percent of total rural nonfarm income (RNFY) for most rural households, even in labour-exporting zones such as northern Mexico and Burkina Faso (Reardon, 1997; Haggblade *et al.,* 2007). In some areas of rural India, movement of the workforce from rural to urban areas or towards the MGNREGA activities has lesser down the proportion of rural workforce to be employed as agriculture labour hence became the reason to rise in agriculture wages for the rest.

Wages

Bhalla and Hazell (2003) note that the expansion of rural non-farm sector in India has resulted in an increase in productivity in agriculture also. Not only real wages in agriculture have increased, but the wages in non-agricultural occupations are now significantly higher than in agriculture. According to Fisher, Mahajan and Singha (1997) rural non-farm sector jobs, on the average, are superior to those in agriculture. Workers in the RNFS are better paid, less poor and more educated, and there is also less child labour in this sector. Bhalla (1993) showed that overtime rising labour productivity in Indian agriculture did not make the decisive contribution to the observed rise in real wage rates. She contends that workforce diversification has contributed a lot in increasing wage rate rather than growing labour productivity.

Results and Discussion: Micro Level

It is very essential to identify reasons due to which rural masses accept to go for RNF activities as their principal occupation either at household level or at the individual level. There is an extensive literature available witnessing the primary determinants of growth of RNF sector, but very few studies have focused on factors responsible for different types of occupations within the non-farm sector. Some studies have highlighted the household as well as the individual characteristics as the prime movers towards RNF sector, such as, general education (Jayaraj, 1994; Eapen,

1996; Ranjan, 2009; Khatun and Roy, 2012); technical education (Jatav and Sen, 2013; Jayaranjan, 2013) caste or social group (Ranjan 2009; Himanshu *et al.*, 2011); gender (Haggblade *et al.*, 2007); age, household size (Reardon, 1997; Lanjouw and Shariff, 2004; Ranjan, 2009; Khatun and Roy, 2012); and land ownership structure (Unni, 1998; Haggblade *et al.*, 2007). The determinants at the household level (refer Table 9, Appendix II) used in this study during both the time periods are explained as follows:

Land Holdings

The odds ratio of a household to engage in the non-farm sector is positively related to the size of land-holdings (refer Table 9, Appendix II) during 2004-05 as well as 2011-12. Land holdings have a positive and significant association with the self-employment in farm. Marginal landowners have a higher probability to work as casual labour in the farm as compared to casual labour in non-farm[5] as the odds ratio is against but small landowners are likely to go for casual non-farm employment. The odds ratio of being employed as a regular wage earner in RNF sector is higher for small landowners (during 2004-05 as well as 2011-12) and semi medium and medium landowners in 2011-12. Relative to involvement in casual farm employment, households with the large size of landholdings are more likely to be involved in either self-employment in the farm (cultivation) or self-employment in the non-farm sector. This finding is consistent with the notion that larger landholdings provide both opportunities for cultivation as well as for non-farm activities (via a wealth effect), and that agricultural wage labour is a particularly unattractive occupation, even relative to casual non-farm wage employment (Lanjouw and Shariff, 2004; Jatav and Sen, 2013).

Social Group

In countries like India, social group, to which a household belongs to, may also contribute separately to the probability of non-farm participation group (Ranjan, 2009; Himanshu *et al.*, 2011; Khatun and Roy, 2012). The findings reveal that the odds of being employed in any of the non-farm activities are greater for the workers belonging to the SCs as compared to STs as the value of odds is higher for casual labour in farm (3.079) as well as in casual labour non-farm (2.754) during 2011-12 (refer Table 9, Appendix II). The probability of opting regular employment is highest for others (1.228) followed by SCs (1.207) as against self-employed in the farm. The

5• This category was not separately defined in 2004-05 dataset rather it was clubbed with others.

households belonging to lower caste/social group (SCs) have inadequate access to capital which is an essential component in initiating a business (self-employment); that is why they have lower probability in comparison to Non-SC category (Thorat and Sabharwal, 2006). In addition, they are not equipped with high level of skills and education which can make them unable to be absorbed in regular wage market and are more likely to get employment as casual labour in the farm. In our analysis, households belonging to SC group are relatively more likely to be involved in casual and self-employed non-farm occupations than their counterparts belonging to OBC and others groups.

Poor/Non-poor Status

According to the values of the odds ratio, poor people are less likely to work in any of the non-farm employment instead go for farm wage labour (refer Table 9, Appendix II) during 2004-05. The value of odds is higher for casual labour in farm (1.880) and casual labour in non-farm (1.478) during 2011-12. In 2004-05, the probability was even higher (2.475 and 1.585) for casual labour in farm and casual labour in non-farm respectively. The non-poor section is less likely to go for self-employment in non-farm and regular employment as compared to self-employed in farm. Meaning thereby self-employment is highly concentrated by non-poor people. But during 2011-12, they are more likely to join non-farm sector as a regular employee followed by others. Due to lack of pre-requisites for non-farm employment (education, skill, etc.), poor workers are not capable of getting employment in this sector and mostly engage as casual labour in the farm sector (Dary and Kuunibe, 2012). Although most of the studies show that poor people are involved in non-farm jobs to get rid of poverty, but our study, based on the principal status (reference time period 365 days), indicates that the probability of poor workers to be engaged in non-farm occupations as their principal activity is quite low as evidenced by the values of odds ratio. However, they may get jobs in the RNF activities as their subsidiary work (Employment on UPSS). So, they are less likely to participate in the non-farm sector, particularly in those activities that would appear to be able to lift them out of poverty. Also, the poor may not always find it easy to gain access to even casual non-farm employment, the siphoning off the non-poor out of the agriculture labour and into casual non-farm employment puts pressure on agriculture wages (Unni, 1998; Haggblade *et al.*, 2007)

Education of the head of the household

Education has a significant and positive impact on the odds ratio of being employed in non-farm occupations. As the level of education goes up from secondary and higher secondary to diploma/ certificate and then to graduation and above, the odds ratio of being employed in non-farm occupation goes from casual labour to self-employment and then to the regular wage earner, respectively. Those with no education are more likely to be engaged in CLF than in either SEF or RWE. In rural India, lack of education leads to labour being stagnant in agriculture or moving to casual work occupations in the non-farm sector, and not to salaried employment with higher remuneration. It is also clear from Table 6 (Appendix I) that majority of the illiterate workers are working in the construction sector.

Based on odds ratio, those who have completed primary to middle education, are more likely to join non-farm casual or self-employment. But the diploma/certificate holders (odds ratio 26.818) and graduates and above (odds ratio 28.435) are more likely to be employed as RWE as compared to other occupations (refer Table 9, Appendix II). The education sector, which comprises more educated workers (60 % are diploma holders, graduate, postgraduate and above), provides employment only to 2.2 % of the workers. It is not merely the low level of education but also the type of education that constraints skill formation. The shortage of workers with appropriate skills in high-growth activities is thus constraining their growth (Mathur and Mamgain, 2004; Papola, 2009).

The analysis of workers' participation in rural non-farm occupations and their educational attainments confirm the findings of many other research studies that education enables a worker to make better choices over livelihood options available to him. Moreover, with the spread of education more and more of rural workers are joining non-farm vocations as compared to agriculture. Further, the probability of participation in RNF is lower if a worker is illiterate (reference category); he/she is more likely to be in farming as wage labour. Nevertheless, the illiterate and less educated workers settle at low-productivity and low-earning non-farm activities (Dary and Kuunibe, 2012).

Age of the head of the household

Age of the head of the household also depicts the probability of getting involved in specific occupation. The study clearly reveals that the people of younger age are more likely to work as casual labour in non-farm and farm sector (odds ratio 0.965 and 0.981) during 2011-12 followed by self-employment in non-farm (odds

ratio 0.988). Although the youths are more involved in education and are out of the labour market, the majority of them in the rural areas (those who drop out from school early) join as casual workers (Khatun and Roy, 2012). Such people (especially males (15-19)) may not meet the skills and experience requirements of regular wage jobs and have to work as casual workers. Whereas people with higher age has more probability of getting regular employment as compared to any other age group. Those with less skill may initially get a casual job in RNFS, but gradually as their age progress, they may also acquire more experience and skill which increases the probability of their joining as a regular worker (refer Table 9, Appendix II).

Vocational Training of the head of the household

Undergoing some form of vocational training/apprenticeship, either formal or informal, equips the individual with specialist skills to engage in certain non-farm jobs, such as tailoring, repair works (motorbikes, tapes/radio), carpentry, and masonry. Such jobs are often characterised by high entry barriers for many of the rural workers due to the specialist skills required (Dary and Kuunibe, 2012). It is evident that formal training of household heads is essential for the engagement of households in non-farm activities (Jatav and Sen, 2013; Jayaranjan, 2013). Having formal vocational training increases, the chances of being employed as regular wage earner (2.669) followed by SENF (2.135) (refer Table 9, Appendix II). The probability of such people engaging themselves as causal labour is less as compared to self-employed in farm.

Gender of the head of the household

The relationship between gender and the probability of non-farm employment has been examined in some studies. A broad picture that emerges, but that is not necessarily repeated with statistical significance in all the studies, is that the female participation in non-farm activities is low; if participation is there, it is in the low remunerative occupations. Lanjouw and Shariff (2004) document a significantly lower probability of non-farm employment by women from region-level multinomial logit models used for rural India. In accordance with this, the value of odds ratios in our analysis show that females in the rural areas have lower probability of adopting either of the non-farm occupation except regular (1.404) as compared to males during 2011-12 for self-employment in non-farm (0.732), casual employment in non-farm (0.593) and casual employment in farm (0.766). This can also be associated with the low LFPR of females. Their low participation may be because they are either coming out of the labour market due to social and other cultural obligations or involving themselves in the education (Haggblade *et al*., 2007). However, the opportunities for non-farm

employment are also limited and not readily available for them in rural areas. Males are more likely to engage in non-farm jobs, while females participate more in agriculture in the absence of their husbands rather than going for non-farm activities. Moreover, there is another argument that females, children and elderly of the family were forced to join the labour market during the crisis periods who otherwise were not participating and who withdrew themselves with improvement in the situation (Government of India, 2014b).

The broad picture that emerges from these individual-level findings is that non-farm activities appear to be strongly associated with the level of education. As the level of education moves upward, the probability of going to non-farm occupations increases. Therefore, education plays a vital role in getting more secure and regular jobs in rural India. Furthermore, females tend to be particularly highly represented in agricultural labour activities, and underrepresented in the non-farm sector.

Conclusions and Policy Implications

The present study, using the latest dataset of employment and unemployment rounds, gives answer to the raised questions. The RNF sector has been extensively documented in the literature for its contribution to employment generation and poverty reduction, but the majority of employment provided by the sector is casual and informal in nature. Both micro (household/Individual characteristics) as well as the macro level indicators influence the decision of adopting a particular kind of employment. These are education, gender, age, social group, vocational training and size of land holdings, agriculture NDDP, urbanisation, migration, access to credit facilities, irrigation, electrification etc. At micro level, the non-farm activities appear to be strongly associated with the level of education in getting more secure and regular jobs in rural India. Females tend to be particularly highly represented in agricultural labour activities, and underrepresented in the non-farm sector. The casual non-farm activities are also concentrated by the young age workers (15-29) and household head belonging to lower category of social group. At macro level, agriculture NDDP, electrification, urbanisation and agriculture wages play important role as pull factor in expansion of RNF employment. Altogether, our analysis witnesses

that the distress-push factors are also responsible for RNF employment expansion such as unemployment rate and migration.

The study highlights the fact, although the share of RNF sector in total rural employment has increased, the type of employment people is getting is not appreciable. By UPS, the majority of the RNF employment has been provided by the construction sector, followed by wholesale and retail trade and transport and storage. A majority of the workers involved in these activities are illiterate, without any training, working on non-contractual basis without social security, pension, insurance, etc. The pattern of employment status reveals that informal employment, which does not cover the social security, pension, and insurance for the workers, has increased during the period of study. The provision of better infrastructure facilities and credit facilities can play a major role in enhancing the entrepreneurial activities. Furthermore, the worry is the construction sector, which may not be able to generate enough employment and able to absorb the new entrants as well as under-employed labour from agriculture. The key, therefore, is to increase investment, which will spur growth in the construction sector and improve employment. Along with, manufacturing sector should also be encouraged to boost the engine of growth. Thus, more educated along with technical education increases the chances of workers to move towards RNF activities; whereas poor, uneducated and unskilled workers may not be able to get the high profiles jobs (especially regular jobs) in RNF sector.

Provision of public social services (education, skill formation) and infrastructure to rural areas is key to provide better employment opportunities to the rural poor. Better education may help them to absorb themselves into better earning and secure jobs. A majority of the rural population (38.9 %) is involved in non-farm self-employment as compared to any other kind of employment, so more emphasis should be given to the development of small enterprises in non- farm sector, especially for enhancing rural industrialisation. Thus, it can serve as the healthier platform for rural employment. Barriers to entry to employment in the RNFE, such as illiteracy, the absence of vocational training and skill formation need to be addressed. Vocational training improvements should be utilised to assist those within agriculture to shift to other jobs.

The limitation of the study is that it takes into account only UPS employment calculations. For capturing the seasonality of the employment, UPSS (Usual Principal and Subsidiary Status) and CDS (Current Daily Status) estimates can be used. This may also lead to change the factors responsible for the switch over from farm to non-farm.

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Appendix I

Table 2.
Employment and GDP Share of Rural India

Activities	Employment Share		GDP Share		Employment Elasticity
	2004-05	2011-12	2004-05	2011-12	2004-5 to 2011-12
Agriculture, forestry and fishing	72.96	63.97	38.86	38.73	-0.66
Mining and quarrying	0.57	0.51	3.66	3.57	-0.68
Manufacturing	7.73	8.14	11.55	17.13	-0.07
Electricity, gas, water supply & other utility services	0.14	0.21	0.88	1.20	0.46
Construction	5.75	11.91	7.78	10.10	1.12
Trade, repair, hotels and restaurants	5.82	6.47	14.89	6.78	0.04
Transport, storage, communication & services related to broadcasting	2.45	3.07	5.74	3.81	-0.96
Financial services, real estate, ownership of dwelling & professional services	0.46	0.36	8.40	12.01	-0.33
Community, social & personal services	4.12	5.35	8.24	6.67	1.71

Source: a) National Accounts Statistics, Central Statistical Organisation for Rural GDP.
b) NSSO 61st and 68th Rounds EUS data, GOI 2004-05 and 2011-12 for Employment.

Table 3.
Employment Status in Rural India

Sector	Farm		Non-Farm	
	2004-05	2011-12	2004-05	2011-12
Self Employed	60.9	63.0	48.5	38.9
Own Account Worker	31.0	36.7	37.0	31.5
Employer	1.2	1.5	0.7	0.8
Unpaid Family Worker	28.7	24.8	10.8	6.6
Regular Wage Employee	1.1	0.8	24.0	24.3
Casual Wage Labour	38.0	36.2	27.5	36.9
In Public Works	0.0	0.1	0.5	2.8
In Other Types of Work	38.0	36.1	27.0	34.1

Source: Calculated from NSSO 61st and 68th Rounds EUS data, GOI 2004-05 and 2011-12.

Table 4.
Employment Status in Different RNF Activities

Activities	Years	Self Employed	Regular Wage Earners	Casual Labour
Farm	2004-05	60.9	1.1	38
	2011-12	62.9	0.8	36.2
Non-Farm	2004-05	48.5	24	27.5
	2011-12	38.8	24.3	36.9
Mining and Quarrying	2004-05	8.8	16.3	74.9
	2011-12	4.2	18.4	77.5
Manufacturing	2004-05	59.6	19	21.4
	2011-12	51.3	26.1	22.6
Electricity, Gas and Water Supply	2004-05	3.8	90.3	5.9
	2011-12	10.5	77.6	11.9
Construction	2004-05	15.4	2.6	82
	2011-12	8.9	2.3	88.8
Wholesale and Retail Trade	2004-05	83	11.7	5.2
	2011-12	82.2	12.7	5.1
Transport, Storage and Communication	2004-05	71.2	16.1	12.7
	2011-12	42.2	39.2	18.6
Hotels and Restaurants	2004-05	43.6	34.8	21.6
	2011-12	65.9	19.5	14.6
Financial and Insurance Activities	2004-05	33.2	63.4	3.4
	2011-12	37.1	59.9	3.1
Real Estate Activities	2004-05	63.6	29.6	6.8
	2011-12	73.2	21.1	5.6
Other Services	2004-05	30.2	61.4	8.4
	2011-12	30.7	62.8	6.5
Total	2004-05	57.3	7.8	35
	2011-12	54	9.6	36.5

Source: Calculated from NSSO 61st and 68th Rounds EUS data, GOI 2004-05 and 2011-12.

Table 5.
Percentage Distribution of Subsidiary Employment

Employment Type	Subsidiary Activity		No Subsidiary Activity		Total	
	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12
Self Employed in Farm	37.78	34.2	45.47	41.05	43.11	39.54
	(26.97)	(19.08)	(73.03)	(80.92)	(100.00)	(100.00)
Self Employed in Non-Farm	13.84	13.7	14.29	14.63	14.15	14.42
	(30.10)	(20.95)	(69.90)	(79.05)	(100.00)	(100.00)
Regular Wage Earner	4.66	4.87	9.19	10.88	7.79	9.55
	(18.38)	(11.24)	(81.62)	(88.76)	(100.00)	(100.00)
Casual Labour in Farm	34.38	29	23.62	21.01	26.93	22.77
	(39.28)	(28.09)	(60.72)	(71.91)	(100.00)	(100.00)
Casual Labour in Non-Farm	9.35	18.24	7.43	12.44	8.02	13.72
	(35.85)	(29.32)	(64.15)	(70.68)	(100.00)	(100.00)
Total	100	100	100	100	100	100
	(30.77)	(22.06)	(69.23)	(77.94)	(100.00)	(100.00)

Note: Figures in parentheses represent the row percentage.
Source: Calculated from NSSO 61st and 68th Rounds EUS data, GOI 2004-05 and 2011-12.

Table 6.
Activity-wise Percentage Distribution of Workers by General Education

Activity	Years	Illiterate	Literate Without Formal Schooling	Below Primary to Middle	Secondary to Higher Secondary	Diploma	Graduate and Above
Farm	2004-05	50.7	2.7	36.7	8.3	0.2	1.4
	2011-12	41.1	0.5	41.8	14.3	0.3	2.1
Mining and Quarrying	2004-05	55.1	1.5	33.2	7.9	1.4	1
	2011-12	39.6	0.1	41.8	14.8	0.4	3.4
Manufacturing	2004-05	33.9	3.2	47.5	11.4	1.5	2.6
	2011-12	26.8	0.5	49.1	17.9	2.7	3.2
Electricity, Gas and Water Supply	2004-05	5.7	1.6	39.7	32.6	7.6	12.8
	2011-12	17.9	0.1	36.4	23.9	8.2	13.5
Construction	2004-05	41.3	3.1	46.7	7.3	0.7	0.9
	2011-12	36.2	0.5	49.9	11.8	0.6	1
Wholesale and Retail Trade	2004-05	22.3	2.8	47.6	21	1.5	4.8
	2011-12	17.4	0.7	45.1	28.4	1.2	7.2
Transport, Storage and Communications	2004-05	24.6	2.9	47.7	19.6	1.5	3.8
	2011-12	19.1	0.6	49.2	25.6	1.5	4
Hotels and Restaurant	2004-05	31.3	4	51.4	11.4	0.7	1.1
	2011-12	21.8	0.9	53.8	19.5	0.9	3.2
Financial and Insurance	2004-05	1.1	0.6	20.7	36.3	5.5	35.8
	2011-12	1.3	0.1	9.8	37	7.8	44.1
Real Estate Activities	2004-05	5.4	1.6	29.5	28.8	8.2	26.4
	2011-12	10.6	0	34.5	42.7	1	11.2
Other Services	2004-05	19.7	1.9	27.2	24.7	5.9	20.6
	2011-12	13.2	0.5	27	25.3	5	29.1
Total	2004-05	44.4	2.7	38.6	10.6	0.8	2.9
	2011-12	35.1	0.5	42.9	16.4	1	4.3

Source: Calculated from NSSO 61st and 68th Rounds EUS data, GOI 2004-05 and 2011-12.

Table 7.
Activity-wise Percentage Distribution of Workers by Vocational Training

Activity	Year	Formal	Informal	No Training
Farm	2004-05	0.6	10.6	88.8
	2011-12	0.5	10.9	88.6
Mining and Quarrying	2004-05	2.4	9.4	88.2
	2011-12	1.4	9.8	88.8
Manufacturing	2004-05	3.4	26.3	70.3
	2011-12	4.2	29.5	66.3
Electricity, Gas and	2004-05	11.2	0.5	88.4
	2011-12	13.4	15.9	70.8
Construction	2004-05	1.1	9.2	89.7
	2011-12	1	11.7	87.3
Wholesale and Retail Trade	2004-05	3.4	9.8	86.9
	2011-12	2.3	8.2	89.5
Transport, Storage and Communications	2004-05	7.2	14.9	77.9
	2011-12	9.2	21.7	69
Hotels and Restaurant	2004-05	2.4	8.4	89.3
	2011-12	2.3	9.9	87.8
Financial and insurance	2004-05	18.8	4.3	76.9
	2011-12	9.2	6.3	84.5
Real Estate Activities	2004-05	17.7	13.9	68.4
	2011-12	4.1	3	92.9
Other Services	2004-05	9.2	11.7	79
	2011-12	7	11.7	81.3
Total	2004-05	1.8	12.2	86
	2011-12	1.8	12.9	85.3

Source: Calculated from NSSO 61st and 68th Rounds EUS data, GOI 2004-05 and 2011-12.

Appendix II

Table 8.
Determinants of Rural Employment in India (Macro Level)

Variables	Self Employed in Non-Farm		Regular Wage Earner		Casual Labour in Non-Farm		Casual Labour in Farm	
	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12
Electrification	1.001*	1.009***	0.998**	1.006***	1.007***	1.015***	1.011***	1.019***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Unemployment Rate (15 onwards)	1.001***	1.003***	1.001***	1.002***	1.002***	1.003***	1.002***	1.003***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Regional Rural Banks	1.000***	1.000***	1.000	1.000**	1.002	1.001	1.000***	1.000***
(Number of Branches)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Regional Rural Banks	1.004***	0.997***	0.999	0.994***	1.002**	1.003***	1.007***	1.001
(Credit-Deposit Ratio)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Urbanisation	1.009***	1.007***	1.012***	1.030***	1.009***	0.966***	1.023***	1.035***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Irrigation	1.001*	0.996***	0.995***	0.995***	0.997***	1.000	1.002***	1.010***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Net Migration Rate	1.000	0.997***	1.001***	0.992***	0.998***	1.001**	0.998***	0.998**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Literacy Rate	0.981***	1.002	0.990***	1.032***	0.995**	0.999	0.973***	0.990***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Wages	1.693***	22.888***	92.082***	13.656***	42.306***	56.157***	1.141*	1.458***
	(0.05)	(1.12)	(3.28)	(0.69)	(1.48)	(2.95)	(0.05)	(0.12)
Constant	1.079	0.269	0.11	0.032	0.046	0.067	0.3	0.026
	(0.10)	(0.06)	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)	(0.01)

Notes: 1. Dependent Variable; Self Employed in Farm =1, Self Employed in Non-Farm=2, Regular Wage Earner=3, Casual Labour in Non-Farm=4, Others=5.
2. Reference Category: Self Employed in Farm.
3. *** p<0.01, ** p<0.05, * p<0.1

Table 9.
Determinants of Rural Employment in India (Micro level)

Variables	Self Employed in Non-Farm		Regular Wage Earner		Casual Labour in Non-Farm		Casual Labour in Farm	
	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12
Education: Illiterate (reference)								
Literate Without Formal Schooling	1.128	1.041	1.178	1.123	0.604**	0.687	0.457***	0.771
	(0.25)	(0.18)	(0.38)	(0.27)	(0.15)	(0.14)	(0.11)	(0.17)
Below Primary to Middle	1.113	1.386***	1.682***	1.833***	0.815**	0.742***	0.529***	0.577***
	(0.11)	(0.05)	(0.24)	(0.09)	(0.08)	(0.03)	(0.05)	(0.03)
Secondary to Higher Secondary	1.379**	1.668***	4.474***	5.698***	0.459***	0.396***	0.206***	0.256***
	(0.18)	(0.07)	(0.74)	(0.30)	(0.07)	(0.02)	(0.04)	(0.02)
Diploma	2.244	3.237***	30.185***	26.818***	0.627	0.604*	0.54	0.235**
	(1.25)	(0.60)	(15.93)	(4.55)	(0.42)	(0.17)	(0.43)	(0.12)
Graduate and Above	2.795***	2.821***	20.418***	28.435***	0.277**	0.243***	0.242***	0.143***
	(0.68)	(0.20)	(5.16)	(2.01)	(0.13)	(0.04)	(0.11)	(0.03)
Age	1.006	0.988***	0.957**	1.010***	0.974	0.965***	0.983	0.981***
	(0.02)	(0.00)	(0.02)	(0.00)	(0.02)	(0.00)	(0.02)	(0.00)
Vocational Training: No Vocational Training (reference)								
Formal	2.118**	2.135***	1.163	2.669***	3.509***	0.903	0.854	0.270***
	(0.79)	(0.26)	(0.46)	(0.31)	(1.49)	(0.16)	(0.54)	(0.11)
Informal	1.745***	1.702***	0.687**	1.260***	0.995	0.831***	1.011	0.618***
	(0.21)	(0.07)	(0.13)	(0.06)	(0.14)	(0.04)	(0.14)	(0.04)
Gender: Male (reference)	0.349***	0.732***	9.269***	1.404***	0.261***	0.593***	0.250***	0.766***
	(0.07)	(0.04)	(1.33)	(0.08)	(0.06)	(0.04)	(0.05)	(0.05)
Land holdings: Landless (reference)								
Marginal	0.57	0.480*	0.107***	0.214***	0.190***	0.466*	0.190***	0.466*
	(0.30)	(0.17)	(0.05)	(0.08)	(0.09)	(0.19)	(0.09)	(0.19)
Small	0.068***	0.078***	0.026***	0.048***	0.021***	0.038***	0.021***	0.038***
	(0.04)	(0.03)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)
Semi medium	0.082***	0.049***	0.022***	0.029***	0.008***	0.012***	0.008***	0.012***
	(0.05)	(0.02)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
Medium	0.032***	0.024***	0.009***	0.018***	0.002***	0.007***	0.002***	0.007***
	(0.02)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Large	0.030***	0.344**	0.018***	0.309**	0.00	0.373**	0	0.373**
	(0.03)	(0.13)	(0.01)	(0.11)	(0.00)	(0.16)	(0.00)	(0.16)
Social Group : Scheduled Tribe (reference)								
Scheduled Caste	3.112***	1.609***	1.782***	1.207**	3.882***	2.754***	3.943***	3.079***
	(0.44)	(0.08)	(0.31)	(0.07)	(0.53)	(0.15)	(0.53)	(0.21)
Other backward class	2.502***	1.369***	1.295*	0.659***	1.497***	1.218***	1.484***	1.367***
	(0.29)	(0.06)	(0.18)	(0.03)	(0.18)	(0.06)	(0.17)	(0.08)
Others	2.357***	1.119**	1.460**	1.228***	1.287*	0.791***	1.209	0.854**
	(0.30)	(0.05)	(0.22)	(0.08)	(0.18)	(0.04)	(0.17)	(0.06)
BPL	1.197*	0.897**	1.039	0.539***	1.585***	1.428***	2.475***	1.880***
	(0.11)	(0.03)	(0.12)	(0.03)	(0.16)	(0.06)	(0.24)	(0.09)

Notes: 1. Dependent Variable; Self Employed in Farm =1, Self Employed in Non-Farm=2, Regular Wage Earner=3, Casual Labour in Non-Farm=4, Others=5

2. Reference Category: Self Employed in Farm

3. *** p<0.01, ** p<0.05, * p<0.1