WORKING PAPER

Rural Non–Farm Sector Employment in the North–Eastern Region of India: Determinants and Implications for Wellbeing

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April 2024

#164

NCAER

Rural Non-farm Sector Employment in the North-Eastern Region of India: Determinants and Implications for Wellbeing*

NCAER Working Paper

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Abstract

The paper analyses the causal relationship between rural non-farm employment (RNFE) and the wellbeing of the people in India's North-Eastern Region (NER). When India experienced a decline in poverty, specifically during the post-liberalisation period, the reduction of poverty was lower in NER, with a wide variation at the State level in the region than in the rest of the country. However, the structural shift in occupations and livelihoods in NER has been sharper than in other parts of the country. In this context, this paper aims to contribute to an understanding of the issue of occupational diversification in NER. Based on data from three rounds of the National Sample Survey (NSS), Employment & Unemployment Survey (EUS), and two rounds of the Periodic Labour Force Survey (PLFS), that is, the PLFS of 2017-18 and 2019-20. The 2SLS regression analysis highlights the higher inclination of young persons with technical education, people belonging to large families, and females in rural NER towards seeking livelihoods in the non-farm sector.

Keywords: *Non-farm, Poverty, Expenditure, North-east, Education, Employment*

JEL Classifications: *P46, M51, I21, E24*

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1. INTRODUCTION

The 'North-Eastern Region' (NER), consisting of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura, is not just a group of eight States but is also an administrative and planning unit. Exhibiting unique diversity in terms of culture, language, ecology, economy, and political aspects in each of its States, the NER also happens to be geographically isolated from the rest of the country, with a 4000 km-long international political border. Moreover, the region hangs on a 14 mile-long 'chicken neck' piece of land between Nepal and Bangladesh (Verghese, 1997). With a deficiency in both connectivity and infrastructure, NER lags behind other States of the country in many of the aspects of economic development. The neo-liberal impact on the distribution of growth has always been questioned from various perspectives.

In view of India's foreign trade strategies, including its 'Look East Policy' of 1991 and the more recent initiative to pursue extensive economic relations with South-east Asia, the Act East Policy 2014, the perception about NER has shifted from a 'land-locked' to a 'land-linked' region as it functions as a gateway to the East and South-east Asia. However, as highlighted by Bhattacharya and Deka (2021), the infrastructure projects, ranging from the Special Accelerated Road Development Programme for North-East (SARDP-NE) 2005, to the more focused Act East Policy 2014, though serving the country's broader objective of providing national security, have not helped to enhance or transform the livelihood practices of the people of NER.

In the absence of official data on poverty after 2011-12, it is doubtless difficult to assess the poverty levels in India. But the data on poverty that we currently have access to highlights the gap between all-India and the NER. In India, the rural poverty rate was 41.80 per cent in 2004-05, which decreased to 25.70 per cent in 2011-12 (Planning Commission, 2013). However, in the North-east, the rural poverty rate was 35.12 per cent in 2004-05, which decreased to 30.87 per cent in 2011-12. The substantial reduction of national poverty during the period 2004-2005 to 2011-2012 (Pattayat et al., 2022; Chauhan et. al., 2016; Mehrotra et al., 2014) and simultaneous reduction of employment in the farm sector (Himanshu et. al., 2011; Kannan and Raveendran 2019; Mehrotra et al., 2014; Mehrotra and Parida, 2019) have raised the question of a causal relationship between poverty and non-farm employment. During this period, the reduction of poverty was lower in NER, with a wide variation at the State level than the rest of the country (Bhattacharya, 2021). NER also experienced a structural shift in occupations and livelihoods during the same period (Marchang, 2019; Das, 2019).

Various studies, including Kung and Lee, 2001; Nassar and Biltagy, 2017; Lanjouw and Lanjouw, 2001; Ranis and Stewart, 1993; Singh and Pandey, 1990; Ersado, 2006; Datt and Ravallion, 1998; and Hoang et al., 2014, have argued that Rural Non-farm Employment (RNFE) is an extremely important mechanism for achieving rural development and poverty reduction. There are numerous studies that explore this question at the country level, but the existing research arguably fails to capture the systemic causality between the wellbeing of rural households and non-farm employment in NER. In this context, the present work aims to contribute to an understanding of the causality between the growth of RNFE and wellbeing of the rural population of NER.

All activities, excluding the cultivation of field crops, the care of animals, logging, plantations, fishing and hunting, and forestry, among other things, are considered as non-farm activities (Basant and Kumar, 1989; Unni, 1991; Pradhan, 2008). These are characterised as heterogeneous in nature (Lanjouw, 1999; Lanjouw and Shariff, 2004; Rahut and Micevska, 2012), and engaging in multiple sectors such as construction, trade and hotels, service, transport, manufacture, and food processing, among others. RNFE is characterised as not only improving the living condition of the rural population but also contributing to the growth of agricultural

output (Anderson and Leiserson, 1980), reduction in income inequality (Oostendorp et al., 2009), and provision of necessary goods and services to agriculture and the rural population (Unni, 1991). In rural areas, two significant factors incentivising household members to diversify into the non-farm sector can be classified as the 'pull' factors and the 'push' factors (Misra, 2013; Nagler and Naudé, 2017; Jha, 2006). The pull factors include higher payoffs and lower risks in rural non-farm activities (Kaur et al., 2012; Deininger and Olinto, 2001). On the other hand, low or unstable farm income due to land constraints and lack of access to irrigation (Pfeiffer et al., 2009), permanent as well as seasonal reduction of income from agriculture, and reduction in the average size of landholdings (Kaur et al., 2012) are the main push factors to move towards the non-farm sector.

This study aims to: (1) assess the trend and pattern of the rural non-farm sectors in the NER of India; and (2) prospectively analyse the factors that determine rural non-farm employment in NER. Considering the structural transformation in rural NER of India, this paper identifies how the developmental benefits of diversification towards the RNFE have reduced economic deprivation among people. It also addresses the following questions: (1) how do the level of education and economic status of the household determine the involvement of its members in the non-farm sector, and (2) how does participation in the non-farm sector affect household consumption expenditure and the standard of living in NER?

The paper is organised as follows. Following the introduction in Section 1, Section 2 provides a summary of the data sources. Section 3 explains the methodology and econometric tools used for the study. Section 4 presents the results pertaining to rural employment diversification from the farm to the non-farm sector. Section 5 explains the determinants of non-farm rural employment. Finally, the paper's primary findings are summarised in Section 6, which also examines how important these results are for comprehending the elements that affect rural non-agricultural employment.

2. DATA SOURCES AND SAMPLE

The study is based on employment and unemployment data gleaned from the five consecutive rounds of the National Sample Survey (NSS) of India. The NSS rounds as conducted in all the States and Union Territories of India except some districts, which are not reachable throughout the year. The five rounds of data for the study consist of three quinquennial Employment and Unemployment Survey (EUS) round data, that is, the 50th (1993-94), 61st (2004-05), and 68th (2011-12) Rounds, while the remaining two rounds pertain to data from the Periodic Labour Force Surveys (PLFS) of 2017-18 and 2019-20, respectively.

The main difference between the quinquennial NSS and the PLFS survey is that the former is conducted after every five years while the latter is an annual survey. The sample size of the PLFS is smaller as compared to the quinquennial survey. The quinquennial surveys were discontinued after 2011-12 and the PLFS was instead introduced in 2017-18. Although the EUS and PLFS have limited comparability, this study uses data from both the surveys of NSS. The survey methodology, data collection mechanism, and sample design are not same in both EUS and PLFS. However, in both the surveys, there are little differences in the definitions of major concepts related to the labour force, which allows the descriptive analysis to include both the surveys. Since the study is based only on the rural sector of North-east India, only the sample size of the rural sector is discussed. The descriptive analysis is based on weighted observation, or the sampling weights. Table 1 highlights the sample size of the rural NER in five consecutive NSS rounds and in eight NER States, including the entire NER. The EUS and the PLFS surveys provide specific information on principal status activity and subsidiary status activity.

Table 1: Sample Size of Rural North-east India in Different NSS Rounds

State	50th Round (1993-94)	61st Round (2004-05)	68th Round (2011-12)	PLFS-1 (2017-18)	PLFS-2 (2019-20)
Assam	10,764	11,121	8877	8789	8462
Arunachal Pradesh	3273	4654	3461	3500	3769
Manipur	3540	7911	4951	4311	3973
Meghalaya	3371	3533	2781	2745	2774
Mizoram	1520	2746	1944	1716	1657
Nagaland	1543	3211	2402	1981	1926
Sikkim	1395	2818	1790	1318	1344
Tripura	4607	5829	3882	3918	3950
North-east India	30,013	41,823	30,088	28,278	27,855

Source: Different Rounds of NSS unit level data.
Note: The sample shows persons aged 15 years and above.

The surveys provide detailed information on employment and unemployment in principal industry activity[1] and subsidiary status activity.[2] The survey also provides information on employment according to the National Industrial Classification (NIC) of India.[3] In the different NSS rounds, the NIC is different. However, to make it comparable, the NIC code of different year is converted into NIC 2004 by the method of concordance. Based on the broad Usual Principal and Subsidiary Status (UPSS) of employment, the individual worker in rural North-East India is categorised differently as a person engaged in farm activities and one engaged in non-farm activities. Farm activities include only agriculture and allied activities, that is, the primary sector. Usual status workers include principal and subsidiary workers who spent part of their time working in the year when the survey was conducted.

On the other hand, the non-farm sector includes the secondary and tertiary sectors. Since the paper mainly focuses on the non-farm sector, the latter is further grouped into seven major categories: mining and quarrying; manufacturing; electricity, water, etc.; construction; trade, hotel & restaurant; transport, etc.; and other services. Here, mining and quarrying; manufacturing; electricity, water, etc.; and construction fall under the secondary sector while trade; hotel & restaurant, transport, etc.; and other services are included in the tertiary sector. According to child labour norms, only a person of age 15 years or above is considered as an employed person.

3. MODEL SPECIFICATION AND ESTIMATION PROCESS

In order to estimate the determinants of non-farm activity and its impact on household consumption expenditure, we use the Instrumental Variables: Two-Stage Least Squares (2SLS)

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[1] The activity status on which a person spent a relatively long time (major time criterion) during 365 days preceding the date of the survey, was considered as the usual principal activity status of the person.

[2] The activity status in which a person in addition to his/her usual principal status, performs some economic activity for 30 days or more for the reference period of 365 days preceding the date of the survey, was considered as the subsidiary economic status of the person.

[3] The National Industrial Classification (NIC) is a standard industry classification for developing and maintaining comparable data. Such classifications are often used to classify the labour force, statistics on industrial production and distribution, various fields of labour statistics, and other economic data such as national income.

method. The utilisation of this model for the analysis also follows from the fact that the households' decision to pursue non-farm employment was influenced by a number of other factors, including income levels. In the first stage, factors impacting the choice of employment is assessed and in the second stage, the Model IV approach is used to derive the impact of the choice of RNFE on Monthly Per Capita Expenditure (MPCE). The main idea behind use of the Instrumental Variable (IV) is to control the endogeneity problem in non-farm diversification and its causal impact on MPCE. This follows previous studies (Kumar et al., 2020; Kapoor et al., 2021), wherein the causal relation between non-farm diversification and consumption expenditure has been analysed using the Model IV for different parts of the country. This would enable us to consider the causal relationship between RNFE and the welfare of households. However, the households' consumption behaviour and MPCE are legitimately affected by the households' participation in non-farm sector employment, which is again the result of several observed and unobserved factors.

The employment decision is modelled with the dependent variable of the regression model in binary form, that is, if the primary activity of the principal earner of the household is in the rural non-farm sector, it takes the value '1', while in other cases, the value is '0'. The independent variables are a combination of qualitative and quantitative data. A logit regression model is used to estimate the factors determining a household's selection of non-farm sector employment. The logistic regression model is given by the following equation:

$$\text{RNFE (p)j} = \text{Ln}\left[\frac{\alpha}{1-\alpha}\right] = \beta_0 + \sum \beta_{ij} Z_{ij} + \varepsilon_{ij} \tag{1}$$

where, i= 1, 2, ………. k, refers to the ith independent variable. j= 1, 2, …. n, refers to the jth sample unit.

In Equation (1), α denotes the probability that the highest duration of employment of a household is in the non-farm sector, and β denotes the regression coefficients to be estimated. Z refers to the vector of socio-economic and demographic characteristics of the employed member of the household and the household itself, such as age, gender, general education, technical education, household size, and religious affiliation of the household. ε is the stochastic disturbance term of the regression model.

P in the parenthesis indicates the subset of $RNFE_i$ that includes Self-Employed (SE), Casual Labour (CL), Regular Salary Earner (RSE), and Non-Farm All (ALL) depending on the type of dominant non-farm activity that the person engages in. Equation (1) is estimated for each category P, separately.

In the second stage, an expenditure function is used to estimate the impact of non-farm employment on expenditure, as depicted in Equation (2) below:

$$MPCE_j = \alpha + \delta d \text{ (p)} + \gamma X_{ij} + \varepsilon_{i\,j} \tag{2}$$

where $MPCE_i$ denotes the MPCE of the ith person. Since information on MPCE in the data is at the household level, therefore, the value of the average MPCE is repeated for each individual within the same household.

$d(\text{p})_i$ is a dummy variable indicating participation in RNFE that takes the value of 1 in the respective cases, as p varies from "S' to 'ALL', and the value is 0 otherwise. X is the same vector of explanatory variable used in Equation (1). ε is the stochastic disturbance term.

The non-randomness of the household's participation in non-farm employment signals the endogeneity of (p) in Equation (2). The other most likely factors which may determine the choice of non-farm employment in the rural sector include entrepreneurial tendency, family

lineage of occupation, and peer group pressure, among other things. Model IV regression is implemented following the Hausman's test results for endogeneity, which suggest the existence of endogeneity.[4]

There are various studies on peer effects on participation in rural non-farm activities (Lahoti and Swaminathan, 2016; Janvry et al., 2005). In the present study, it has been assumed that peer participation in non-farm employment has a significant influence on the ability to engage in non-farm employment. The peer group consists of individuals having a similar socio-economic status as well as locality. Accordingly, the IV in the present model is chosen as the percentage of households in the same occupational category and village that work outside of agriculture and the non-farm employment of ALL, SE, RSE, and CL are tested with the regression's "p" values. As a pre-requisite to be an instrument, the IV defined for the present model is unlikely to be directly correlated to household expenditure.

Due to the limited comparability of the EUS and PLFS surveys, two separate regression models have been used in the study. The regression model based on the EUS (2011-12) is for a single time period, whereas the PLFS (2017-18 to 2019-20) has been pooled for two time periods in the model. The different sample designs of both the surveys did not allow use of the model by pooling the data from 2011-12 to 2019-20. Therefore, in order to analyse the effect of non-farm sector employment on the economic wellbeing of the people of NER over a period of time, two separate regression models have been used.

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[4] The key characteristics of an ideal instrumental variable are that it should not be correlated with the disturbance term and not directly related to the dependant variable in Equation (2), and that it should, however, be correlated with (p), the variable representing rural non-farm employment. Additionally, it must satisfy the exclusion criterion of an IV, such that there must be at least one variable in Z_i in Equation (1) that is not in X_i in Equation (2).

4. RESULTS AND DISCUSSION

4.1 Trends and Patterns of Rural Non-farm Employment in NER of India

This section highlights the trends and patterns of employment[5] in the farm and non-farm sectors in NER. For a comparative analysis, the employment status of all India is also considered, corresponding to the period of 1993-94, 2004-05, 2011-12, 2017-18, and 2019-20. Employment activities are categorised as farm[6] or non-farm based on the respondent's self-reported major industrial activity and subsidiary activity status. From 1993-94 to 2019-20, the percentage of farm employment has continuously declined from 76.10 per cent to 45.59 per cent in NER and from 78.30 per cent to 61.57 per cent at the all-India level.

Figure 1: Share of Non-farm Sector in NER
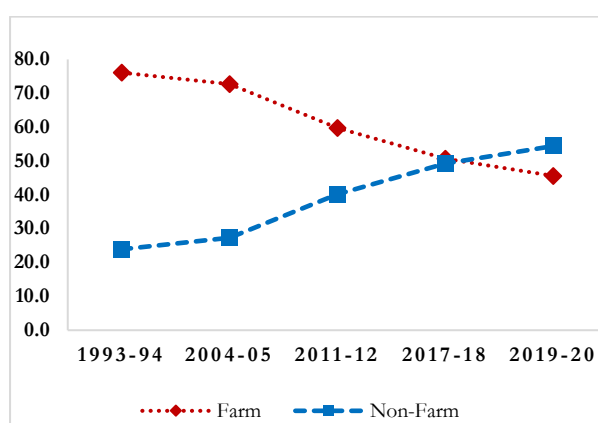
Figure 2: Share of Non-farm Sector in All of India
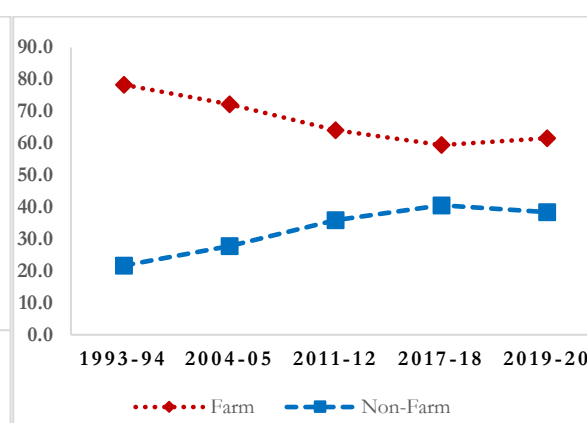
Source for Figures 1 and 2: Authors' estimation from different rounds of NSS unit level data.

As per the Usual Activity Status (UAS),[7] in both NER and at the all-India level, less than 25 per cent of the persons were engaged in the non-farm sector in 1993-94, which includes both the secondary and tertiary sectors (Figures 1 and 2), which increased to 54.41 per cent and 38.4 per cent, respectively in NER and at the all-India level in 2019-20. In NER, the annual growth rate of employment in the non-farm sector increased by 2.93 per cent during the period 1993-94 to 2011-12 and by 3.09 per cent from 1993-94 to 2019-20. During the same period, the annual growth rate at the all-India level was 2.14 per cent, which indicates that the growth of non-farm employment in the North-east is higher than the all-India growth. This supports the narrative that the total NER economy in 2014-15 has been contributed by the industrial sector, with construction as a major contributing area and the manufacturing sector being the crucial and sustainable component, as around 70.8 per cent of the existing manufacturing industrial units are located in the rural areas of NER; 8.5 lakhs of the NER labour force are employed in these units, of which 6.09 lakhs are employed in its rural manufacturing units (Bhattacharjee and Bhattacharya, 2018).

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[5] Employment in the present study means employment in principal and subsidiary status. A worker engaged in principal activity refers toa worker engaged in the significant primary work. On the other hand, any activity other than the main activity is considered as a subsidiary activity.

[6] Farm activity includes cultivation of crops, animal farming, logging, plantations, fishing and & hunting, forestry, etc.

[7] The activity status (Principal Status + Subsidiary Status) of a person is determined on the basis of the activities pursued by the person during the specified reference period. When the activity status is determined on the basis of the reference period of the last 365 days preceding the date of survey, it is known as the usual activity status of the person.

Figure 3 highlights the employment share of the non-farm sector at the State level in NER. Although the increase in non-farm employment in NER is significant compared to that at the all-India level, the State scenarios have featured a combined narrative. In 2019-20, the highest share of RNFE was in Assam, followed by Manipur and Tripura. These three States account for a more than 50 per cent of non-farm employment share in rural areas. There was a sharp increase in the RNFE in the entire NER, as shown in Figure 1. However, the State of Tripura, despite having an overall high percentage share of RNFE employment, is an exception where the increase in the percentage share of RNFE in NER is concerned. Tripura shows a mild decrease in the share of non-farm employment in rural areas, over the period from 1993-94 to 2019-20, which is a counter-trend phenomenon as the RNFE showed a sharp rise in the other States of NER.

**Figure 3: Share (%) of Non-farm Sector in the States of NER**
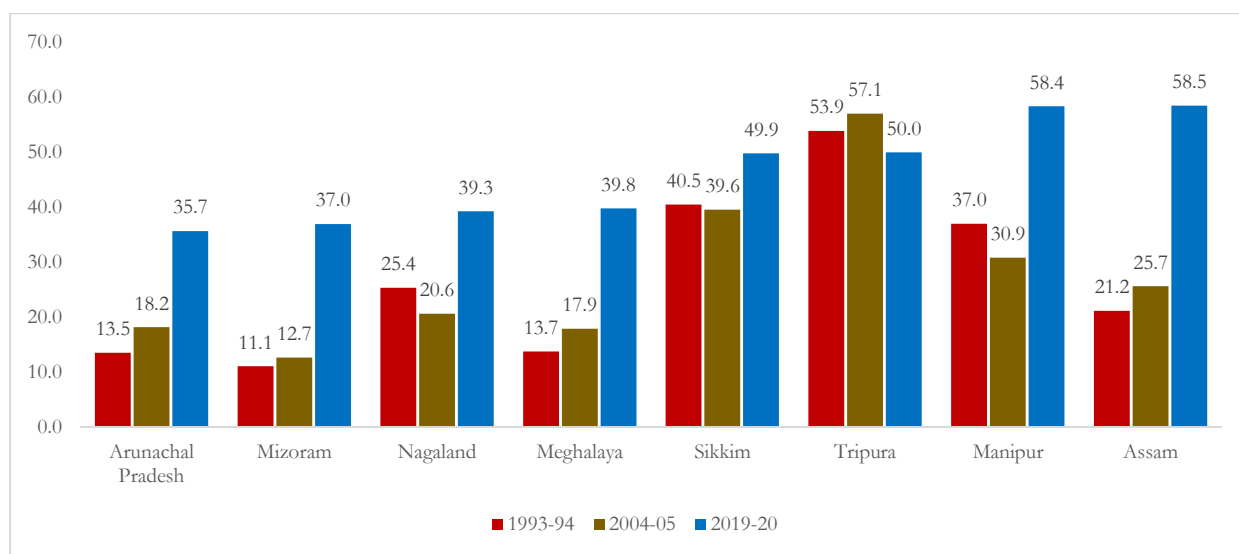
Source: Authors' estimation from different rounds of NSS unit level data.

4.2 Type of Rural Non-farm Employment

For the purpose of examining the different types of jobs within the rural non-farm sector in NER, non-farm employment has been roughly divided into three types: self-employed, regular salary/wage earner, and casual labour. Here, self-employed people are those who run their own businesses independently in a profession or trade on their own account with one or a few partners or with the assistance of family members or both. The regular salary earners are those who work in others' farm or non-farm enterprises and receive salary or wages regularly. Unlike regular salary earners, casual labourers may require renewal of their daily, weekly, or monthly work contracts. A person is casually engaged in others' farming or non-farming businesses in exchange for pay that was determined by the conditions of a daily or recurring work contract. Regular non-farm employment is usually considered as a relatively high and stable source of income. Figure 4 shows that in NER in 1993-94, only 13.67 per cent of the non-farm sector household members were employed as regular wage/salary earners, which increased to 22.66 per cent in 2019-20. The compound annual growth rate was 4.70 per cent during the same period.

Figure 4: Types of Employment in the Non-farm Sector in NER
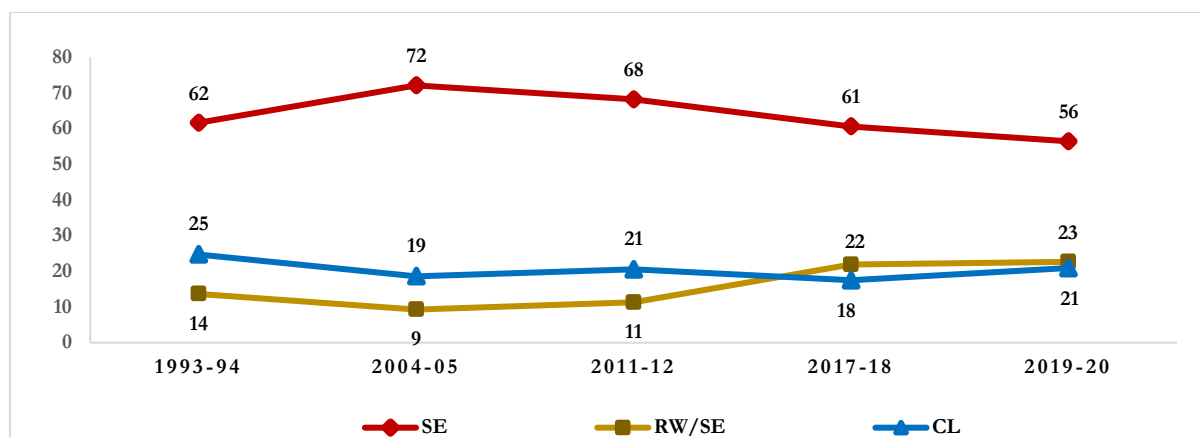
Source: Authors' estimation from different rounds of NSS unit level data.

Furthermore, the annual growth rate of the self-employed in 2011-12 over 1993-94 was 0.92 per cent, which became negative in 2019-20 over 2011-12. Casual labourers suffer more than other workers in the labour market. Most of the casual labourers are unskilled, which deprives them of social security benefits. Over time, the share of casual labour in the total non-farm employment has declined from 24.70 per cent in 1993-94 to 20.91 per cent in 2019-20. During the same period, the growth rate was -1.50 per cent. This points to a marginal decline in the casualisation of labour in the NER States.

4.3 Employment in Different Sub-sectors of Non-farm Employment

Table 2 presents the distribution of non-farm sector employment (Principal and Subsidiary status) by sub-sector during the 1990s and 2000s, and trends in their growth rate. The table shows that the annual growth rate of employment in agriculture and allied sector was also negative in all three decades. However, the rate of decline rate was the highest during 2019-20 over 2011-12 (-3.33 per cent).

Table 2: Trend of Employment Status (Usual Status) in Different Industry Groups

Industry Groups	1993-94	2004-05	2011-12	2017-18	2019-20	CAGR (%) 2011-12 Over 1993-94	CAGR (%) 2019-20 Over 2011-12	CAGR (%) 2019-20 Over 1993-94
Agri, etc.	76.09	72.67	59.79	50.70	45.59	-1.33	-3.33	-1.95
Mining & Quarrying	0.16	0.19	0.22	0.15	0.62	1.71	13.69	5.25
Manufacturing	3.81	3.40	5.09	5.69	6.80	1.63	3.68	2.25
Electricity, Water, etc.	0.28	0.18	0.10	0.21	0.31	-5.35	14.61	0.39
Construction	1.00	3.26	10.87	9.62	12.10	14.20	1.35	10.08
Trade, Hotel, Restaurant, etc.	6.96	8.38	12.13	12.91	15.09	3.14	2.77	3.02
Transport	1.46	2.35	2.92	4.93	5.36	3.92	7.86	5.12
Other Services	10.24	9.58	8.87	15.79	14.14	-0.80	6.01	1.25

Source: Authors' estimation from different rounds of NSS unit level data.
Note: CAGR = Compound Annual Growth Rate.

During 1993-94, the construction sector in non-farm employment provided 1 per cent of employment, which increased to 12.10 per cent in 2019-20. During the period 1993-94 to 2019-20, the CAGR of the construction sector was 10.08 per cent, signifying that this sector achieved the highest growth among all the non-farm sub-sectors. Trade, Hotels & Restaurants (THR), and the transport sector also employ large numbers of the rural population in North-East India. During the same period, the share of employment in transportation and THR almost doubled. In 1993-94, employment in THR was 6.96 per cent, which increased to 15.09 per cent in 2019-20. In the last three decades, people of the North-eastern States of India have been moving out from the farm sector, and most of them have joined the construction, THR, and transportation sectors.

4.4 Economic Status and Non-farm Employment

Figures 5 and 6 show that across the MPCE quintile groups,[8] the dependence on the primary sector has been continuously declining. Although the dependence on agriculture has been continuously reducing in the last three decades, poor households still rely more on agriculture than affluent households. The figures show that in the first two MPCE groups (that is, the lower income quintile groups), the share of farm employment declined from 84 per cent in 1993-94 to 53 per cent in 2019-20. However, in the last two quintiles (that is, the higher income quintile groups) up to 2004-05, the total employment in the farm sector was more than that in the non-farm sector. After 2011-12, both the farm and non-farm sectors intersect each other (Figure 6), the share of the non-farm sector becomes more dominant in providing employment among the higher income quintile groups. This highlights the need to prioritise non-farm employment to improve the incomes and living standards of the rural population. Rural non-farm activities are significant because they produce and provide simple and lower quality goods, which are more

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[8] Expenditure groups are derived from the MPCE variable. Among the quintiles in the group, the first two are the lowest two MPCE quintiles while the last two are the highest two MPCE quintiles.

heavily consumed by poor rural households (Lanjouw and Lanjouw, 1995).

Figure 5: Expenditure Quintile (First Two Quintiles) and Employment in the Non-farm Sector in NER
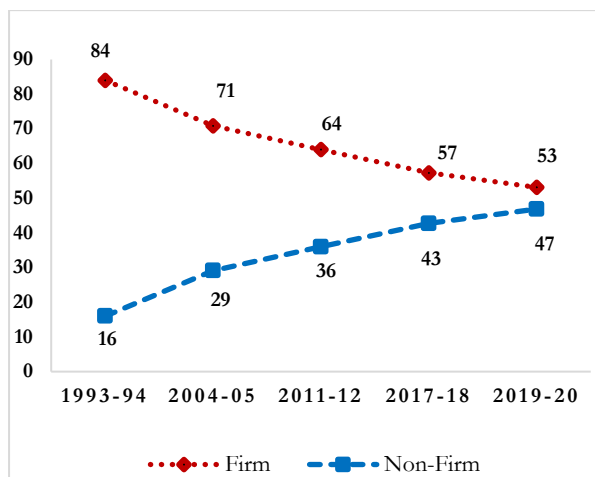
Figure 6: Expenditure Quintile (Last Two Quintiles) and Employment in the Non-farm Sector in NER
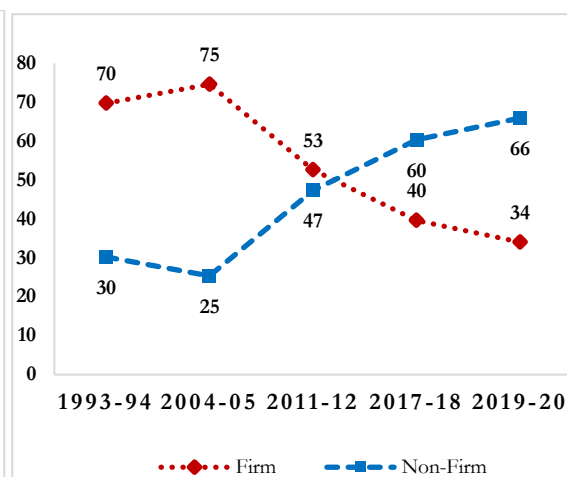
Source for Figures 5 and 6: Authors' estimation from different rounds of NSS unit level data.

Table 3 shows the heterogeneity in the employment participation rate in the industry and service sectors. An increase in employment in the non-farm sector is observed on moving from the lower quintile to the higher quintile groups. In both the quintile groups, the share of employment in the construction, THR, and transportation sectors has increased rapidly. During the period 1993-94 to 2019-20, the compound annual growth rate of employment shares in the first two quintiles for the construction, THR, and transportation sectors were 12.54 per cent, 3.79 per cent, and 4.67 per cent, respectively. In the last two quintiles, the employment share in construction, THR and transportation has also increased but less than the lower expenditure quintile group.

Table 3: Share of Employment Contribution Rate by Sector and Expenditure Quintile Groups

Industry Group	1993-94	2004-05	2011-12	2017-18	2019-20	CAGR (%) 2011-12 Over 1993-94	CAGR (%) 2019-20 Over 2011-12	CAGR (%) 2019-20 Over 1993-94
First Two Quintiles (Low Income Group)								
Agriculture, etc.	84.01	70.89	64.00	57.29	53.12	-1.50	-2.30	-1.75
Mining & Quarrying	0.04	0.27	0.29	0.10	0.52	12.30	7.71	10.86
Manufacturing	3.41	3.12	5.69	5.83	7.19	2.88	2.98	2.91
Electricity, Water, etc.	0.05	0.20	0.12	0.03	0.17	5.32	3.90	4.88
Construction	0.72	4.25	12.37	11.81	15.54	17.11	2.89	12.54
Trade, Hotel, Restaurant, etc.	4.01	8.32	9.16	11.91	10.56	4.70	1.78	3.79
Transport	1.31	2.83	3.08	4.80	4.30	4.86	4.23	4.67
Other Services	6.45	10.12	5.29	8.24	8.61	-1.09	6.28	1.12
Total	100	100	100	100	100	0.00	0.00	0.00
Last two quintiles (Higher Income Group)								
Agriculture, etc.	69.74	74.62	52.66	39.62	34.06	-1.55	-5.30	-2.72
Mining & Quarrying	0.27	0.15	0.22	0.23	1.03	-1.03	21.19	5.34
Manufacturing	4.35	2.87	4.08	5.20	6.56	-0.36	6.11	1.59
Electricity, Water, etc.	0.50	0.18	0.10	0.56	0.57	-8.40	23.92	0.53
Construction	0.91	2.20	9.15	7.53	8.51	13.67	-0.90	8.97
Trade, Hotel, Restaurant, etc.	9.42	8.44	15.82	13.76	20.25	2.92	3.14	2.99
Transport	1.62	1.53	3.42	5.62	5.81	4.26	6.85	5.05
Other Services	13.20	10.01	14.55	27.48	23.20	0.54	6.01	2.19
Total	100	100	100	100	100	0.00	0.00	0.00

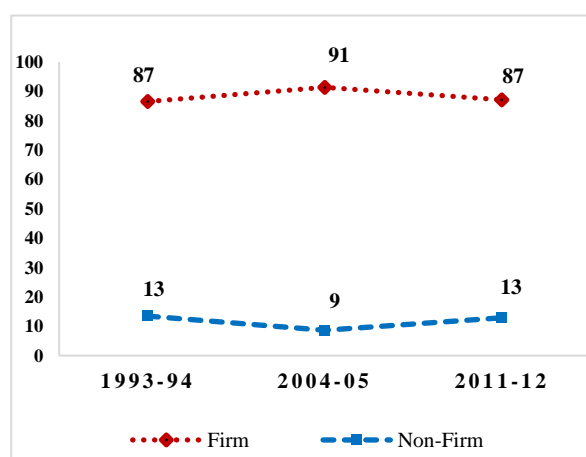Source: Authors' estimation from different rounds of NSS unit level data.

Although an increase in non-farm employment was seen as essential for improving the incomes and living standards of the rural population, the rise of high-productivity sectors in the rural non-farm economy benefits only households with sufficient financial, human, and political capital enabling their members to become entrepreneurs (Haggblade et al., 2010). The poorest and most marginalised sections of the population could not obtain the highest paying and most desirable non-farm jobs (Himanshu et al., 2011). Access to more profitable non-farm income sources is usually open only to relatively wealthy households due to better education (Vatta and Sidhu, 2010). The poor people used to earn significant portions of their total household income through irregular non-farm wage jobs; however, the non-poor people primarily earn non-farm incomes through salaried work (Lanjouw and Shariff, 2004). Considering the pro-poor and inequality-driven character of RNFE (Himanshu et al., 2013), the effective implementation of inclusive policy is critical for fostering structural transformation due to RNFE.

Figures 7, 8, and 9, and Table 4 show the distribution of workers across land size[9] groups in rural NER. Figure 7 shows that marginal and small farmers are less associated with the farm sector. However, semi-medium, medium, and large farmers (Figure 8) are more inclined towards the farm sector. This is most probably because the households with more land would be more likely to employ household members on their farms and less likely to move them outside agriculture. The study of Basant and Kumar (1989) in India also found a negative relationship between participation in non-agricultural work and land size owned by the household. Further, they pointed out that urban industrial and service sectors and agriculture have been unable to absorb the growing labour force quickly, resulting in poverty, unemployment, and under-employment in the rural and urban regions

Figure 7. Marginal and Small Farmer and Employment in the Non-farm Sector
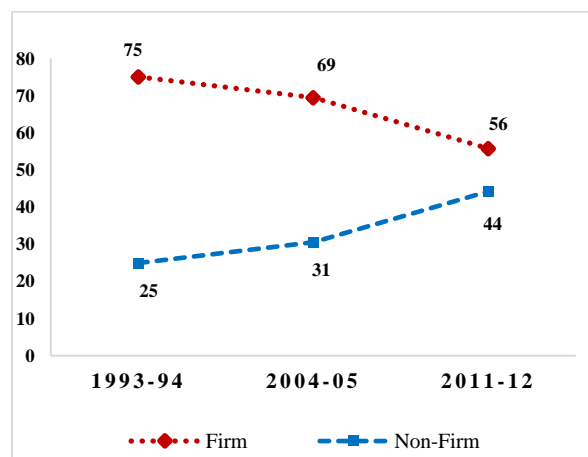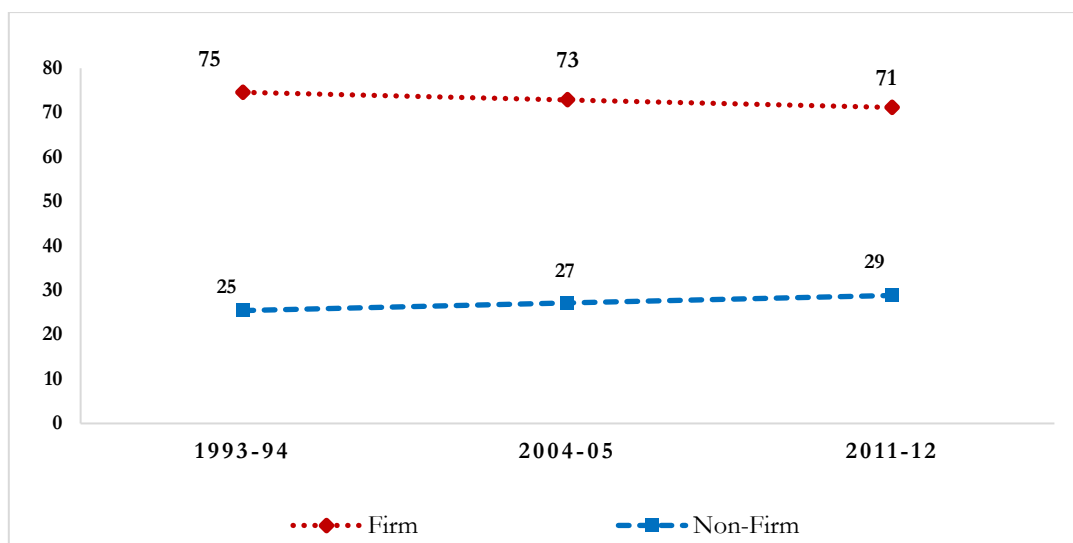

Figure 8. Semi-medium Farmer and Employment in the Non-farm Sector

Source for Figures 7 and 8: Authors' estimation from different rounds of NSS unit level data.

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[9] The land sizes are marginal and small (≤ 2 ha), semi-medium (2-4 ha), and medium and large (> 4 ha).

Figure 9. Medium and Large Farmer and Employment in the Non-farm Sector

Source: Authors' estimation from different rounds of NSS unit level data.

Table 4. Employment Status (Usual Status) in Different Industry Groups across Farm Size[10]

Industry Group	1993-94	2004-05	2011-12	CAGR (%) 2004-05 Over 1993-94	CAGR (%) 2011-12 Over 2004-05	CAGR (%) 2011-12 Over 1993-94
			Marginal and Small Farmers			
Agriculture, etc.	75.06	69.47	55.78	-0.70	-4.15	-1.64
Mining & Quarrying	0.11	0.22	0.22	6.06	10.16	3.84
Manufacturing	3.99	3.96	5.83	-0.06	5.58	2.13
Electricity, Water, etc.	0.31	0.19	0.09	-4.07	-15.54	-6.36
Construction	1.06	3.60	12.35	11.79	42.09	14.64
Trade, Hotel, Restaurant, etc.	7.44	9.35	13.09	2.09	8.40	3.19
Transport	1.55	2.72	3.32	5.26	11.52	4.33
Other Services	10.49	10.49	9.31	0.00	-1.69	-0.66
			Semi-medium Farmers			
Agriculture, etc.	86.53	91.35	87.10	0.49	0.09	0.04
Mining & Quarrying	0.43	0.05	0.00	-17.86	-100.00	-100.00
Manufacturing	2.37	0.72	0.32	-10.31	-24.92	-10.55
Electricity, Water, etc.	0.09	0.02	0.18	-13.81	10.20	3.85
Construction	0.20	0.91	1.43	14.77	32.51	11.57
Trade, Hotel, Restaurant, etc.	2.87	3.55	6.10	1.96	11.39	4.28
Transport	0.76	0.33	0.75	-7.45	-0.29	-0.11

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[10] The information on land size is available only up to the 68th Round (2011-12) of the Employment and Unemployment Survey (EUS). The information on land is not available in the Periodic Labour Force Survey (PLFS), 2017-18 and 2019-20.

Other Services	6.75	3.08	4.12	-6.88	-6.79	-2.70
	Medium & Large Farmer					
Agriculture, etc.	74.58	72.86	71.17	-0.21	-0.67	-0.26
Mining & Quarrying	0.70	0.09	0.47	-17.02	-5.36	-2.12
Manufacturing	3.10	1.58	2.67	-5.93	-2.11	-0.82
Electricity, Water, etc.	0.17	0.45	0.13	9.34	-3.39	-1.33
Construction	1.60	4.36	5.81	9.53	20.20	7.42
Trade, Hotel, Restaurant, etc.	5.43	5.71	8.68	0.47	6.94	2.64
Transport	1.17	1.86	1.08	4.33	-1.14	-0.45
Other Services	13.27	13.09	10.00	-0.12	-3.96	-1.56

Source: Authors' estimation from different rounds of NSS unit level data.

Based on Visaria (1995), it has been observed that due to heavy population pressure on land and the lower elasticity of the demand for foodgrains, the average size of landholdings has steadily decreased, which further increases the number of small and marginal farmers in the rural economy. The landless, marginal, and small farmers thus have to depend on multiple income sources. Consequently, they either migrate to urban areas or look for additional opportunities in the rural areas through non-farm activities (Pradhan, 2008). Under these circumstances, the non-farm sector functions like an additional labour absorber of the farm sector and helps in the overall development strategy of the rural economy.

Table 4 highlights that in NER from 1993-94 to 2011-12, marginal and small farmers primarily moved from agriculture to construction and THR. However, employment in the farm sector in the semi-medium farm household remains stagnant throughout the year. There is little movement of medium and large farmers from agriculture to the non-farm sector. Like the marginal and small farmers, medium and larger farmers also moved from agriculture to construction and THR, but their share in the sector concerned within the latter category is less than the former farm size group.

4.5 Educational Status and Non-farm Employment

Although not all non-agricultural jobs demand a high level of education, the remuneration for many positions in non-farm activities is positively related to the level of education. Poorer and less educated people are engaged in low-paying jobs in the non-farm sector and earn less from the same industry (Rahut and Micevska, 2012). Figures 10, 11, 12, and 13 and Table 5 highlight a direct relationship between the level of education and non-farm employment participation in NER. Illiterate persons are more engaged in the farm sector, but higher educated persons are inclined to move toward the non-farm sector.

The participation rate of illiterate persons (Table 5) within the non-farm sector is higher in other services (10.41 per cent), followed by construction (10.19 per cent), and trade, hotel, etc. (6.60 per cent). Over the past three decades, the CAGR of employment of illiterate persons in the non-farm sector was highest in the construction sector. During 1993-94, non-farm employment in the construction sector was only 0.92 per cent, which increased to more than ten times in 2019-2020 (Table 5). Farm sector employment moved to the non-farm sector, mainly in

construction, trade and hotel, etc., and other services.

Figure 10. Status of Illiterate Persons in the Non-farm Sector
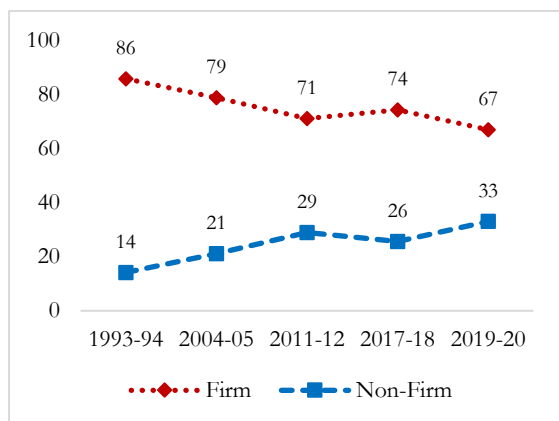
Figure 11. Status of Education up to Senior Secondary Level in the Non-farm Sector
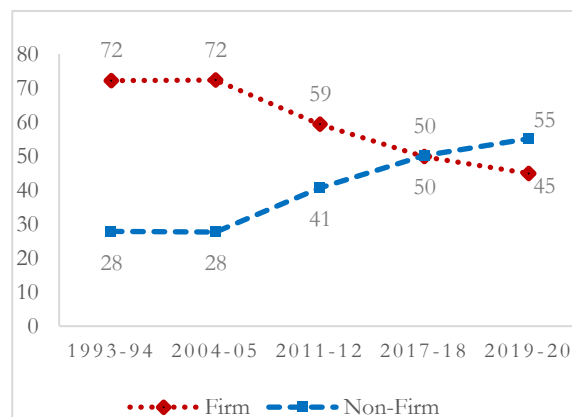
Source for Figures 10 and 11: Authors' estimation from different rounds of NSS unit level data.

Figure 12 Status of Education up to Graduation and Above in Non-farm Sector
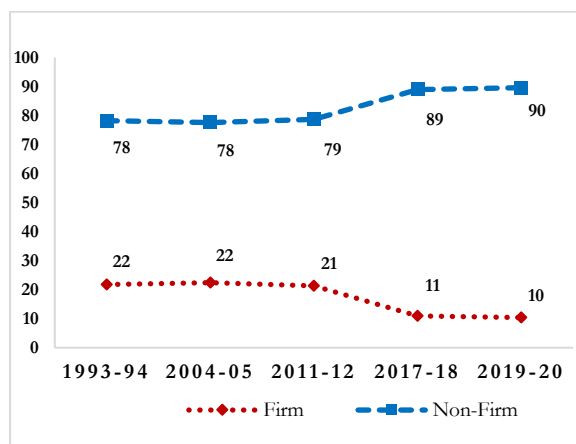
Figure 13 Status of Technical Education in Non-farm Sector
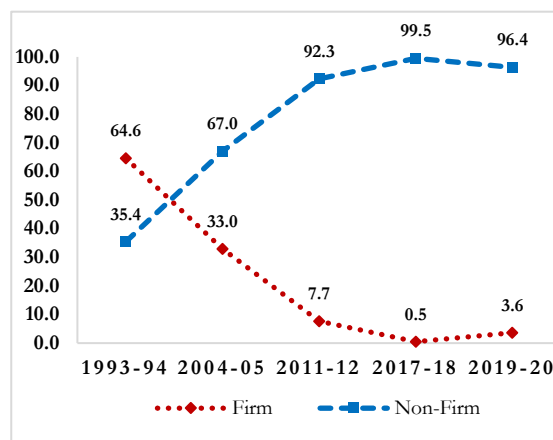
Source for Figures 12 and 13: Authors' estimation from different rounds of NSS unit level data.

Among the educated employees with education up to the senior secondary level, the participation rate within the non-farm sector is higher in THR (16.85 per cent), followed by construction (13.36 per cent) and other services (10.28 per cent) (Table 5). Over the period, the annual growth rate of participation in the same group in the non-farm sector was highest in the construction sector. During 1993-1994 non-farm employment in the construction sector was around 1 per cent, which increased to more than 13 times in 2019-2020. In this segment, over time, farm sector employment majorly moved to the non-farm sector in construction; trade, hotels etc.; and transportation. The completion of secondary education particularly increases non-agricultural activity earnings significantly and is also strongly connected with the possibility that a household will run a home business (Lanjouw, 1999).

Table 5: Employment Status (Usual Status) in Different Industry Groups and Level of Education

Industry Group	1993-94	2004-05	2011-12	2017-18	2019-20	CAGR (%) 2011-12 Over 1993-94	CAGR (%) 2019-20 Over 2011-12	CAGR (%) 2019-20 Over 1993-94
				Illiterate				
Agriculture, etc.	85.81	78.81	71.08	74.33	66.95	-1.04	-0.75	-0.95
Mining & Quarrying	0.05	0.34	0.28	0.01	0.32	10.25	1.40	7.45
Manufacturing	3.06	3.97	4.65	4.23	4.46	2.36	-0.52	1.46
Electricity, Water, etc.	0.10	0.03	0.00	0.00	0.01	-16.29	12.07	-8.43
Construction	0.92	3.30	15.35	7.79	10.19	16.95	-5.00	9.70
Trade, Hotel, Restaurant, etc.	3.63	4.11	4.08	4.96	6.60	0.65	6.19	2.32
Transport	0.91	2.26	1.28	3.65	1.06	1.93	-2.40	0.58
Other Services	5.52	7.17	3.26	5.03	10.41	-2.89	15.63	2.47
				Education up to Higher Secondary				
Agriculture, etc.	72.16	72.33	59.30	49.83	44.89	-1.08	-3.42	-1.81
Mining & Quarrying	0.22	0.15	0.21	0.09	0.71	-0.38	16.44	4.52
Manufacturing	4.23	3.25	5.33	6.29	7.40	1.29	4.19	2.17
Electricity, Water, etc.	0.40	0.21	0.12	0.24	0.36	-6.26	14.26	-0.37
Construction	1.05	3.31	10.30	10.67	13.36	13.51	3.30	10.27
Trade, Hotel, Restaurant, etc.	9.03	9.64	13.80	14.38	16.85	2.38	2.53	2.43
Transport	1.80	2.39	3.32	5.40	6.17	3.47	8.05	4.86
Other Services	11.11	8.73	7.63	13.09	10.28	-2.07	3.79	-0.30
				Graduation and Above				
Agriculture, etc.	21.74	22.41	21.33	11.00	10.38	-0.11	-8.60	-2.80
Mining & Quarrying	0.36	0.01	0.21	1.12	0.21	-2.91	-0.29	-2.11
Manufacturing	4.49	3.07	2.22	1.60	4.76	-3.84	10.03	0.23

Electricity, Water, etc.	0.19	0.85	0.14	0.31	0.38	-1.86	13.52	2.64
Construction	0.75	1.41	4.13	0.90	1.69	9.92	-10.57	3.16
Trade, Hotel, Restaurant, etc.	4.05	9.95	11.44	12.21	12.22	5.94	0.83	4.34
Transport	1.28	1.87	1.62	2.09	4.75	1.29	14.40	5.16
Other Services	67.13	60.42	58.92	70.77	65.60	-0.72	1.35	-0.09
Technical Education								
Agriculture, etc.	64.61	32.98	7.71	0.49	3.62	-11.14	-9.02	-10.49
Mining & Quarrying	1.02	5.35	0.00	13.59	17.24	-100.00	NA	11.49
Manufacturing	2.70	6.08	4.90	0.39	1.64	3.38	-12.81	-1.90
Electricity, Water, etc.	7.38	5.61	2.57	1.40	2.48	-5.69	-0.43	-4.10
Construction	2.05	5.27	2.11	0.15	1.83	0.18	-1.76	-0.42
Trade, Hotel, Restaurant, etc.	1.48	11.52	22.61	10.23	12.46	16.34	-7.18	8.53
Transport	0.68	5.36	2.60	5.40	0.17	7.72	-29.04	-5.27
Other Services	20.09	27.84	57.50	68.36	60.56	6.02	0.65	4.34

Source: Authors' estimation from different rounds of NSS unit level data.

Among persons educated up to the graduate and above level, the employment share was highest in the other services. However, from 1993-1994 to 2019-2020, the CAGR of employment in the same sector was negative. Over the period, the annual growth rate of participation of the same group in the non-farm sector was highest in transportation. During 1993-1994, non-farm employment in the transportation sector was 1.28 per cent, which increased more than four times to 4.75 per cent in 2019-2020. Here, farm sector employment mainly moved to the trade, hotel and restaurant, and transportation sectors. Schooling increases off-farm wages but does not affect physical efficiency in farming (Visaria, 1995). Like a person with higher education, a person with a professional or technical education has a more extraordinary privilege in establishing a non-farm business than a non-technical person. Figure 13 shows that the engagement of the person with a technical degree holder in the non-farm sector increased from 35.4 per cent in 1993-1994 to 96.4 per cent in 2019-2020.

5. DETERMINING FACTORS OF NON-FARM EMPLOYMENT AND ITS INFLUENCE ON HOUSEHOLD EXPENDITURE IN NER

The associations between various non-farm employment types, including RNFE (ALL), RNFE (SE), RNFE (RSE), and RNFE (CL), and various other socio-economic and demographic factors that affect a person's decision to pursue a particular line of work are explained by the 2SLS regression in Tables 6 and 7. The results of the 2SLS analysis are derived after pooling the two rounds of NSS, i.e., the Periodic Labour Force Survey (PLFS) of 2017-18 and 2019-20, and it includes the eight States of NER. In order to better understand the structural shift in employment and wellbeing of the people in NER, a comparison of the model is also considered for the 2011-12 round Employment-Unemployment Survey (EUS). At the time of estimation of the result, the State factors (that is, States) have been kept fixed for 2011-12. However, for the years 2017-18 and 2019-20, both the State factors and the time factor (that is, years) are kept as fixed. The standard errors are clustered at the first stage sample, which is at the village level. The descriptive statistics of the regression models are given in Annexure 1.

Table 6 shows that the 'p' value of the Hausman test is significant in all the four cases of both the time periods. The significant result of the Hausman test indicates the rejection of the null hypothesis that all the independent variables are exogenous. Since the model has an endogenous regressor, the 2SLS-IV regression model has been used. Table 6 shows that except for RNFE (CL), in all the regression models, the instrumental variables are significant at a 1 per cent level, which indicates the peer group impact on the non-farm participation. For the PLFS models, the coefficients of the household size variables are negative and significant for both RNFE (ALL) and RNFE (CL), which suggests that a person of smaller family size has a lower probability of getting employed in the non-farm sector and casual labour as the principal activity. However, in the EUS models, household size is significant and negative for both RNFE (CL) and RNFE (RES), indicating that smaller families are also not inclined towards regular salary employment in the non-farm sector. The coefficients of the variable, age, are positive and significant for both RNFE (ALL) and RNFE (RSE) in the models. However, it is negative for RNFE (CL) in the PLFS model and positive for RNFE (SE) in EUS model.

This highlights that with increasing age, there are more possibilities of joining the non-farm sector, particularly in regular salary-earner jobs. However, with an increase in age, the chances of joining the non-farm sector as casual labour showed a decline during the period 2017-18 to 2019-20. But for non-farm self-employment, increasing age was significant and positive in 2011-12, which was not significant during 2017-18 to 2019-20. Increasing age has a negative relation with non-farm employment, which suggests that among the younger generation, a person has a higher chance of choosing employment in the non-farm sector as a primary activity.

The dummy variable demonstrating the technical education of the person during the first time period of 2011-12 is significant other than in RNFE (CL), which indicates preference for non-farm sector employment with technical education but a significantly negative inclination for non-farm self-employment. On the other hand, during the second time period of 2017-18 to 2019-2020, the technical education of the person is significant other than in RNFE (SE). It indicates a greater inclination towards non-farm employment with technical education but a lesser inclination towards non-farm casual labour. This highlights that over the period 2011-12 to 2019-20, technically educated people's the preference for casual employment in the rural non-farm sector decreased and the preference for self-employment in the non-farm sector became insignificant.

The variable of general education also positively impacts non-farm diversification except casual labour non-farm activity. With increasing level of education, the possibility of a person choosing non-farm activity except that in casual labour and self-employment is higher.

Females showed less likelihood of taking up non-farm employment except in the case of casual labour during 2011-12, and during the second time period of 2017-18 to 2019-20, females preferred to take up non-farm regular salary/wage earning non-farm activity only. These findings highlight the change in the preferences of females from casual labour to non-farm regular salary/wage earning activity in the North-East. From the perspective of religion, it has been observed that households of Christians and those following other religions are less likely to be in non-farm employment than Hindu households.

The variable of proportion of households engaged in RNFE is positive and significant during both the time periods. This shows that peer impact is positive and significant in a person's choice of rural non-farm employment.

Table 6: Instrumental Variable Regression on the Impact of Non-farm Employment on Household Expenditure: First Stage

Variable	*Dependent Variable: Primary Activity of the Household [RNFE (SE/CL/REG/ALL=1, Otherwise=0)]*							
	First Stage Regression Coefficients							
	2011-12 (EUS Round)				*2017-18 and 2019-20 (Pool) (PLFS Round)*			
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
	RNFE (ALL)	RNFE (SE)	RNFE (RSE)	RNFE (CL)	RNFE (ALL)	RNFE (SE)	RNFE (RSE)	RNFE (CL)
Household size	-0.050*** (0.000)	-0.005 (0. .005)	-0.026*** (0. .005)	-0.019*** (0.004)	-0.016** (0.007)	-0.005 (0.006)	-0.001 (0.005)	-0.011** (0.005)
Square of household size	0.003*** (0.000)	0.000 (0. .000)	0 .001*** (0.000)	0.001*** (0.000)	0.001* (0.000)	0.000 (0.000)	0.000 (0.000)	0.001 (0.000)
Age	0.022*** (0.002)	0.009*** (0. .001)	0.015*** (0.001)	-0.002 (0.001)	0.004** (0.001)	-0.001 (0.001)	0.007*** (0.001)	-0.003*** (0.001)
Square of age	-0.000*** (0.000)	-0.000*** (0. .000)	-0.000*** (0 .000)	-0.000 (0.000)	-0.000*** (0.000)	-0.000 (0.000)	-0.000*** (0.000)	0.000 (0.000)
Technical education of the person (Yes=1, No=0)	0.122*** (0.038)	-0.049* (0.028)	0 .206*** (0 .049)	-0.036 (0.017)	0.116** (0.034)	-0.020 (0.033)	0.181*** (0.041)	-0.042*** (0.012)
Gender of the person (Female=1, Male=0)	-0.068*** (0.010)	-0.059 (0. .008)	-0.072*** (0 .006)	0.064*** (0.009)	-0.021** (0.009)	-0.004 (0.008)	0.035*** (0.008)	-0.051*** (0.006)
General education (illiteracy as base)								
Education up to secondary level	0.102*** (0.011)	0.062*** (0.007)	0.083*** (0 .007)	-0.040*** (0.008)	0.138*** (0.012)	0.048*** (0.009)	0.132** (0.007)	-0.041** (0.008)
Education up to graduation and above level	0.352*** (0.016)	-0.040*** (0. .012)	0.528*** (0. .015)	-0.122*** (0.010)	0.399*** (0.017)	-0.028* (0.015)	0.556** (0.016)	-0.122*** (0.010)
Religion (Hindu as base)								
Muslim	0.027** (0.009)	-0.002 (0. .007)	0.010 (0.007)	0.010 (0.007)	-0.007 (0.008)	-0.004 (0.007)	-0.003 (0.006)	-0.004 (0.005)
Christian	0.018** (0.009	-0.009 (0. .006)	0.024*** (0.007)	0.004 (0.005)	-0.026** (0.007)	-0.019*** (0.005)	0.008 (0.005)	-0.007 (0.004)
Others	-0.039*** (0.013)	-0.027*** (0.009)	-0.001 (0.010)	-0.018** (0.006)	-0.030* (0.011)	-0.026*** (0.009)	0.004 (0.009)	-0.006 (0.005)
Proportion of households engaged in RNFE (ALL)	0.009*** (0.000)	-	-	-	0.009*** (0.000)	-	-	-
Proportion of households	-	0.010*** (0.000)	-	-	-	0.010*** (0.000)	-	-

engaged in RNFE (SE)								
Proportion of households engaged in RNFE (RSE)	-	-	0.008*** (0 .000)	-	-	-	0.009*** (0.000)	-
Proportion of households engaged in RNFE (CL)	-	-	-	0.010*** (0.000)	-	-	-	0.010*** (0.000)
Constant	-0.231*** (0.038)	-0.147*** (0.031)	-0.230*** (0 .026)	0.161*** (0.028)	-0.032 (0.042)	0.048 (0.036)	-0.272*** (0.034)	0.207*** (0.030)
Time fixed effects	-	-			Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.27	0.19	0.30	0.27	0.33	0.22	0.28	0.22
Hausman Test (F- value)	27.26	8.82	14.44	11.07	36.98	43.66	21.21	4.12
Hausman Test (P- value)	p = 0.000	p = 0.000	p = 0.000	p = 0.001	p = 0.000	p =0.000	p = 0.000	p = 0.040

Source: Authors' own estimation.

Table 7: Instrumental Variable Regression on the Impact of Non-farm Employment on Household Expenditure: Second Stage

Variables	Dependent Variable: Log (Monthly Per Capita Expenditure)							
	Second Stage Regression Coefficients							
	2011-12 (EUS Round)				2017-18 & 2019-20 (Pool) (PLFS round)			
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
	RNFE (ALL)	RNFE (SE)	RNFE (RSE)	RNFE (CL)	RNFE (ALL)	RNFE (SE)	RNFE (RSE)	RNFE (CL)
Primary Activity								
RNFE (ALL)=1, otherwise=0	0.357*** (0.054)	-	-	-	0.353*** (0.039)	-	-	-
RNFE (SE)=1, otherwise=0	-	0.203*** (0. .051)	-	-	-	0.367*** (0.050)	-	-
RNFE (RSE)=1, otherwise=0	-	-	0.465*** (0 .087)	-	-	-	0.507*** (0.069)	-
RNFE (CL)=1, otherwise=0	-	-	-	-0.012 (0.054)	-	-	-	-0.063 (0.072)
Household size	0.244*** (0.014)	0.224*** (0.013)	0.238*** (0.013)	0.224*** (0.013)	0.239*** (0.012)	0.226*** (0.013)	0.237*** (0.012)	0.507*** (0.013)
Square of household size	-.009*** (.001)	-0.008*** (0.001)	-0.008*** (0.001)	-0.008*** (0.001)	-0.011*** (0.001)	-0.010*** (0.001)	-0.010*** (0.001)	0.227*** (0.001)
Age	-.000 (.002)	0.008*** (0.002)	0.002 (0.002)	0.009*** (0.002)	0.008*** (0.002)	0.010*** (0.002)	0.006*** (0.002)	0.010*** (0.002)
Square of Age	.000** (.000	-0.000* (0.000)	0.000 (0.000)	-0.000*** (0.000)	-0.000 (0.000)	-0.000*** (0.000)	-0.000 (0.000)	-0.000*** (0.000)
Technical education of the person (Yes=1, No=0)	0.169*** (.041)	0.239*** (0.046)	0.127*** (0.046)	0.232*** (0.045)	0.110 (0.055)	0.166*** (0.060)	0.054 (0.056)	0.160*** (0.057)
Gender of the Person (Female=1, Male=0)	0.059*** (.008)	0.042*** (0.008)	0.064*** (0.010)	0.028*** (0.008)	0.016 (0.009)	0.007 (0.009)	-0.019** (0.009)	-0.008 (0.010)
General Education (Illiteracy as Base)								
Education up to secondary level	0.143*** (0.017)	0.175*** (0.017)	0.147*** (0.019)	0.195*** (0.017)	0.104*** (0.016)	0.137*** (0.015)	0.089*** (0.018)	0.166*** (0.015)

Education up to graduation & above	.381*** (0.030)	0.545*** (0.024)	0.256*** (0.054)	0.541*** (0.025)	0.297*** (0.029)	0.472*** (0.024)	0.154*** (0.047)	0.472*** (0.025)
Religion (Hindu as Base)								
Muslim	-0.056*** (0.022)	-0.054*** (0.021)	-0.034 (0.022)	-0.044** (0.021)	-0.027 (0.024)	-0.034 (0.024)	-0.008 (0.025)	-0.018 (0.024)
Christian	.011 (.025)	0.012 (0.026)	-0.003 (0.026)	0.003 (0.028)	0.039 (0.026)	0.022 (0.025)	-0.022 (0.025)	-0.026 (0.026)
Others	.024 (.028)	(0.008)	0.016 (0.028)	0.004 (0.029)	-0.055 (0.041)	-0.063 (0.041)	-0.085** (0.042)	-0.087** (0.042)
Constant	7.400*** (.052)	7.449*** (0.049)	7.456*** (0.051)	7.427*** (0.051)	7.547*** (0.0746)	7.676*** (0.0736)	7.713*** (0.007)	7.737*** (0.078)
Time fixed effects	-	-	-	-	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	16,460	16,460	16,460	16,460	29,943	29,943	29,943	29,943
R-Square	0.41	0.44	0.43	0.45	0.28	0.25	0.27	0.29

Source: Authors' own estimation.

Note: ***, **, * denote significance at 1 per cent, 5 per cent, and 10 per cent, respectively. The figures in parentheses are standard errors.

Table 7 shows the results of the second stage of the IV regression, where MPCE is assumed to be the proxy of household income. The coefficients corresponding to the other non-farm employment [RNFE (ALL), RNFE (SE), RNFE (RSE) and RNFE (CL)] are positive and statistically significant except for RNFE (CL), indicating a positive impact on MPCE. This may be unreasonable, but it denotes that casual labour employment has no sufficient effect on the MPCE. This indicates that employment in the non-farm sector increases the per capita monthly expenditure by 35 per cent more than the corresponding employment in the farm sector. Similarly, the MPCE of the self-employed in the non-farm sector increased by 37 per cent more than that in the farm sector during the period 2017-18 to 2019-20, which is higher than the corresponding figure for the year 2011-12. The proportion of non-farm employment for regular salary/wage earners led to an increase in the MPCE by more than 51 per cent of that of farm employment during the period 2017-18 to 2019-20, which highlights a higher and positive impact of non-farm employment for this period as compared to the time period 2011-12. There is a negative relationship between household size and MPCE, as with an increase in d household size, there is a reduction in non-farm sector employment.

Similarly, during the second time period, age had a positive impact on MPCE, but an increase in age led to a negative impact on the MPCE; this might be because the persons in the higher age group may not want to work further in the non-farm sector and would like to take retirement from work, which was completely reversed during the first time period. Both technical and general education have a positive and significant effect on the MPCE, indicating that with higher education, there was an increase in the income earned from the non-farm sector.

6. CONCLUSION

This paper examined the impact of non-farm employment on the economic wellbeing of the people in rural NER of India. For analysing the economic impact on the household, MPCE has been taken as a proxy of income. The changes in the employment status of the rural population are shown using five rounds of NSS data on employment and unemployment and PLFS over the last three decades (1993-94 to 2019-20).

Consistent with other national-level studies, the results highlight that during the last three decades, there has been a significant shift of the rural household employment trends from the farm to the non-farm sector in NER. At the State level, the results show a mild deviation from the general trend, as in Tripura, the RNFE declined from 57 per cent to 50 per cent during the period 2004-05 to 2019-20. Apart from the general trend of a shift towards rural non-farm sector employment, there has been a decline in the employment of rural people in casual labour and self-employment in the non-farm sector. However, the employment of regular salary/wage earners has been increasing significantly.

In the non-farm sector, both the secondary and tertiary sectors show increased employment participation. Among all the sub-sectors in the secondary sector, the participation rate in the construction sector was high, recording an increase by more than ten times during the last three decades. This may be because during the previous three decades, there has been a significant expansion of construction activities, including the construction of roads, bridges, and buildings, among other things. On the other hand, among the sub-sectors in the tertiary sector, the employment of people in trade, hotel, and transportation increased significantly.

There is a clear tendency towards an increase in per capita expenditure as result of non-farm sector employment. Consistent with earlier studies like Lanjouw and Shariff (2004), which points to higher non-farm income shares in the North-eastern States, the present analysis also shows a higher dependence of poor households in the agricultural sector as compared to the affluent households. The share of employment in the construction and manufacturing sectors is higher in the first two quintile groups (which include relatively poorer members) than in the last two quintile groups (which include relatively richer members). However, the share of employment in the trade, hotel, restaurants, and transportation sectors is higher in the last two quintile groups than in the first two quintile groups.

Moreover, trends in non-farm employment participation in different farm sizes shows that households with smaller farm sizes have a higher tendency of moving towards the non-farm sector, whereas households with large-size farm holdings show a comparatively lower tendency towards non-farm sector employment. This is largely because of the comparative advantage of farming in large farm sizes and their likely better capital base. Members of households with marginal and small farms mainly move from agriculture to construction, trade, hotels and restaurants, manufacturing, and transportation, with the aspiration of improving the wellbeing of the household. On the other hand, medium and larger farm households move only to the construction and the trade, hotel and restaurant sectors. The result also shows a direct relationship between the level of education and non-farm employment participation. Illiterate persons are likely to be engaged in the farm sector, but higher educated persons are inclined towards working in the non-farm sector.

Therefore, while the assertion that there has been an acceleration in the rate of poverty decline due to diversification out of agriculture is open to debate, it is clear that the non-farm sector absorbs a large proportion of the lower strata of the labour force in terms of wealth and capital base.

In order to evaluate the effects of NER rural non-farm diversification on the average MPCE of the sample and the determinants of various non-farm sector jobs, the study used the 2SLS regression. The first stage of the regression, which displays the relationship between non-farm employment and other factors, reveals that age, household size, gender, technical education, general education, and religion significantly impact the non-farm diversification process in North-east India. Young persons with technical education are more inclined toward the non-farm sector. A person from a larger family has a higher probability of selecting all types of employment in the non-farm sector. With an increasing level of education, there are higher chances of a person choosing all the non-farm activities. In NER, females showed a higher chance of joining the non-farm sector mainly in regular salary/wage earning activity, with the preference changing from non-farm casual labour during the period 2011-12 to 2019-20.

The results further show that the different types of non-farm employment, that is, self-employment and regular salary/wage employment, result in an improvement in consumption expenditure, and casual labour employment in the non-farm sector negatively impacts the consumption expenditure. A comparative analysis of the models points to an increasing positive impact of non-farm employment in MPCE over the period 2011-12 to 2019-20. Furthermore, both technical and general education have a positive and significant effect on the MPCE, which indicates that with a higher level of education, the income earned from the non-farm sector increases. On the other hand, household size negatively impacts the MPCE; thus, as household size increases, the MPCE in non-farm sector employment declines. Finally, age has a positive impact on MPCE, but increasing age had a negative impact on the MPCE during the period 2017-18 to 2019-20 as against its corresponding positive and significant impact during 2011-12. This can be viewed as an improvement in living standards for those in the higher age group, which is ratified by the fact that persons in the higher age group do not want to work further in the non-farm sector and want to take retirement from work.

In conclusion, it may be pointed out that the policy implication for the NER regarding employment diversification is to explore the options for encouraging the non-farm sector to help improve the wellbeing of the people. The study suggests that there should be strategic efforts focusing on the general and technical education of the youth in promoting opportunities in the non-farm sector. These efforts are not expected to increase the casualisation in the labour market, and diversification should be aimed at reducing poverty in the country.

Further, NER has often been eulogised as a society where women enjoy a better position as compared to their counterparts in the rest of Indian societies; promoting non-farm activities for women in the region will further gender empowerment in the region, in particular, and the country, in general. As the model used in the study shows, women have a higher tendency towards taking up the non-farm regular salary/wage earning work, which should be leveraged with strategic planning focusing on the specific requirements of the region. Although the study does not cover the supply side of the non-farm employment generation, previous studies (Bhattacharjee and Bhattacharya, 2018) have categorised the handloom and handicraft sector of NER as a dominant rural non-farm activity. This sector can provide sustainable livelihood to women. The development of handlooms and handicrafts can boost the region's traditional subsistence economy, with households and village communities catering primarily to local needs and the local economy.

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Annexure Table 1: Descriptive Statistics of the Independent Variables of the Regression Model

	2011-12				2017-18 & 2019-20			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
Household size	5.2016	2.0263	1	18	5.0223	1.9533	1	18
Square of household size	31.1628	26.3360	1	324	29.0389	24.6938	1	324
Age	38.7115	12.2783	15	85	39.3511	12.3038	15	89
Square of age	1649.3340	1021.8440	225	7225	1699.8910	1037.2960	225	7921
Gender dummy	0.3061	0.4609	0	1	0.2901	0.4538	0	1
Non-farm Employment Activity								
Non-farm All dummy	0.5257	0.4993	0	1	0.5182	0.4996	0	1
Non-farm SE dummy	0.2138	0.4100	0	1	0.2112	0.4082	0	1
Non-farm RSE dummy	0.1771	0.3817	0	1	0.1887	0.3912	0	1
Non-farm CL dummy	0.13483	0.3415	0	1	0.1182	0.3228	0	1
Proportion of households engaged in								
RNFE (ALL) dummy	52.5773	23.0753	0	100	51.8220	24.4941	0	100
RNFE (SE) dummy	21.3822	17.3066	0	100	21.1282	17.8796	0	100
RNFE (RSE) dummy	17.7115	14.5537	0	100	18.8710	15.0886	0	100
RNFE (CL) dummy	13.4835	16.8420	0	87.5	11.8227	15.4698	0	87.5
Religion								
Hindu dummy	0.4052	0.4909	0	1	0.4287	0.4948	0	1
Muslim dummy	0.1001	0.3002	0	1	0.1057	0.3075	0	1
Christian dummy	0.3691	0.4826	0	1	0.3655	0.4816	0	1
Other dummy	0.1253	0.3310	0	1	0.0999	0.2999	0	1
General education								
Illiteracy dummy	0.1386	0.3455	0	1	0.1257	0.3315	0	1
Secondary level dummy	0.7752	0.4174	0	1	0.7868	0.40951	0	1
Graduation & above dummy	0.0854	0.2795	0	1	0.0870	0.2818	0	1
Log MPCE	8.7124	0.4901	6.3117	10.9311	8.8522	0.5214	4.2484	11.39
Technical education dummy	0.0112	0.1056	0	1	0.0100	0.0998	0	1

Source: Authors' estimation from different rounds of NSS unit level data.

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