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Patterns and Determinants of Rural Non-Farm Economy: Evidence from an Indian State

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Abstract

There has been growing evidence of the importance of the rural non-farm economy (RNFE) across the developing world, with rural households engaging in a range of economic activities apart from agriculture, including animal husbandry, casual agricultural and non-agricultural work, non-farm self-employment, and migration. This paper examines the emergence and determinants of rural non-farm employment in the Indian state of Assam. Using unit-level data from the Periodic Labour Force Survey (PLFS) 2022–23, it employs binary and multinomial logistic regression models to analyse the determinants of rural non-farm employment in Assam as well as the determinants of participation in specific types of rural non-farm employment (regular, casual, or self-employed). The findings show that self-employment constitutes nearly half of total rural non-farm employment in Assam, making it the most significant form of livelihood outside agriculture. Non-farm self-employment is dominated by own-account workers engaged in low-return, petty production and informal services. Regression results indicate that younger, better-educated, and historically socially advantaged groups are more likely to transition to non-farm employment, while women and Muslim workers remain disproportionately concentrated in agriculture and non-farm self-employment. The study highlights the need for policies that improve the quality of rural non-farm jobs through skill development, support for labour-intensive sectors, and better access to credit and markets to ensure sustainable rural livelihoods.

Keywords: Rural Transformation; Rural Non-Farm Economy; Rural Non-Farm Self-Employment; Structural Transformation; Assam; India

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Introduction

Across the developing world, the rural non-farm economy (RNFE) supports the livelihoods of approximately 1 billion people (Hazell et al., 2024). Evidence suggests that rural households are no longer dependent on agriculture alone but engage in a range of economic activities, including crop production, animal husbandry, casual agricultural and non-agricultural work, non-farm self-employment, and migration (Chand et al., 2011; Saroj et al., 2022).

Rural transformation, in the past literature, has been defined as processes that include shifts in the movement of people across locations and sectors as well as dynamic interactions between sectors (Wang et al., 2023). In India, where agriculture is no longer the driving force of the economy, the rural economy has undergone changes in its nature as well as in its labour market dynamics with the emergence of RNFE. This raises important concerns regarding the generation of adequate, high-quality employment. A striking feature of India's growth trajectory has been its "jobless" nature, driven largely by the service sector and accompanied by a persistence of self-employment (Ghosh & Abraham, 2019). This increasing reliance on self-employment reflects a tendency among workers to rely on their own resources for generate livelihoods (Dewan, 2024). It thus becomes important to understand the nature of the RNFE in a context where formal employment opportunities remain limited and informal self-employment dominates.

This paper investigates the emergence and determinants of the rural non-farm sector in the Indian state of Assam, which is separated by a 22-kilometre chicken's neck corridor from the rest of the country. Many studies on rural non-farm employment in India have focused on national-level trends in the shift from agriculture to non-farm activities. Similarly, studies of regional stories about the emergence and nature of RNFE help understand India's development narratives. In this context, this paper examines the nature and emergence of RNFE in a relatively less explored region of the country. In particular, it emphasises understanding the determinants of non-farm self-employment, an area that has received limited attention in the existing literature.

The next section provides an overview of the literature on rural transformation and the determinants of RNFE. The section following this highlights the data and methodology used in the paper. Then it explores the nature and structure of Assam's economy, providing a basis for understanding the emergence of the rural non-farm economy. Following this, it investigates the nature and structure of Assam's rural non-farm economy and the characteristics of rural non-farm self-employment. The final section explores the determinants of rural non-farm work in Assam through econometric analysis.

Rural Transformation and the Emergence of Rural Non-Farm Economy (RNFE) in India

Haggblade et al. (2007), in their important volume *Transforming the Rural Non-Farm Economy* and based on studies in the developing world, identified four strands of literature on the emergence of the rural non-farm sector — view from the farm, view away from the farm, livelihood diversification, and regional development. In the Indian context, however, the debate largely centres on whether the expansion of the non-farm sector is dynamic or distress-led.

The agricultural growth linkage literature views agriculture as an important source of surplus resources. Development here is possible by transferring resources from agriculture to industry with simultaneous investment in both sectors (Mellor, 1976). I argue that in a similar context, in the 1960s, India's Green Revolution-led technologies made way for an increase in productivity as well as the income of farmers (Himanshu et al., 2018). It was stipulated that an increase in income of agricultural workers would lead to consumption linkages and generate an increase in demand for goods and services produced by small and labour-intensive rural workers. This was supported by evidence in Punjab and Haryana (Fisher et al., 1997).

The other side of the debate argues that distress leads to the emergence of RNFE. Rural households diversify into a plethora of farm and non-farm activities to "cope" with extreme and risk-prone environments such as floods, droughts, and environmental degradation. Both "push" and "pull" factors govern the way households engage in non-farm activities. Approximately 70 per cent of Indian agricultural households hold less than 1 hectare of land, and only 0.4 per cent of the agricultural households possess land above 10 hectares, according to the National Sample Survey (NSS) 2018-19. This implies a lack of concentration of landowners and the persistence of small-scale cultivators (Lowder et al., 2025; Swaminathan & Baksi, 2017). The insufficiency of farm income and the slow growth of regular employment push the rural population into the unregulated informal and unorganised sector, where they lack labour protection (Singh et al., 2025). Hence, multiple livelihood options are required for sustaining rural households. Thus, a "precariat" class in rural India has emerged, extending beyond daily agricultural labour to include a range of non-agricultural work (Harriss-White, 2017).

In Assam, agriculture has increasingly become a subsidiary occupation while non-farm work occupies centre stage (Das, 2017a; Dey, 2014). Diversification into non-farm activities is high among both landless and large agricultural households, indicating the role of land poverty in pushing households into non-farm work (Bhuyan & Mitra, 2018). Studies also indicate that non-farm workers are more likely to possess higher educational attainments than agricultural workers (Das & Deka, 2024; Mech et al., 2017). Seemingly, Das (2017b) highlighted the role of demography, showing that districts with larger tribal populations witnessed lower non-farm expansion, while tea-growing districts recorded higher shares of non-farm activities.

What Determines RNFE?

Alongside debates on the nature of rural transformation in India, the literature on the drivers of RNFE also examines household-level factors alongside macro indicators such as agricultural linkages. At the household level, social factors like caste and religion significantly shape labour market outcomes in India (Aakanksha et al., 2025). Studies show that households belonging to marginalised castes such as STs and SCs are more likely to enter non-farm activities (Jatav & Sen, 2013), although the nature of RNFE differs across social groups. Higher caste workers, historically endowed with better education and assets, are more likely to access higher-paying regular salaried jobs, while marginalised castes diversify into non-farm work as an alternative source of income (Kumari et al., 2022). Darko et al. (2025), in their study on Rajasthan, found that Muslims, STs, and SCs are more likely to engage in casual non-farm work, while Muslim workers are more likely to be self-employed in non-farm activities.

Age, gender, and education also shape participation in RNFE. Recent studies point towards a "greying of agriculture" (Mohanty & Lenka, 2023), with younger workers moving away from farming due to rising risks and vulnerability in agriculture (Das & Rathore, 2018; Leavy & Hossain, 2014). Women are less likely to engage in non-farm work due to mobility restrictions, unequal domestic burdens, and limited access to non-farm employment opportunities (Goswami & Bhattacharyya, 2014). Education is positively associated with participation in RNFE (Das & Rathore, 2018). While Jatav & Sen (2013) found that larger households are less likely to diversify into RNFE, more recent studies suggest that larger household size may increase participation in RNFE due to distress (Kumari et al., 2022).

The role of the household head has also been emphasised in the literature, with studies showing that household heads are less likely to engage in farm work and more likely to shift towards non-farm activities (Vasco & Tamayo, 2017). Relationship to the household head therefore has important implications for engagement in RNFE, particularly as younger men increasingly move away from agriculture while women remain less likely to participate in non-farm work.

Context of Assam

A brief discussion of Assam's context is important for understanding the role and emergence of RNFE in the state. Assam's economic trajectory has been shaped by its isolation, regional conflict, and distinct patterns of rural non-farm growth. Unlike Punjab and Haryana, where the RNFE emerged through surplus capital diversification following the Green Revolution (Bhalla, 2005), Assam did not significantly benefit from the Green Revolution. Nor did it experience a post-agrarian transition like Tamil Nadu or historically high non-agricultural employment like Kerala (Bordoloi, 2020).

Composition of Gross State Domestic Product (GSDP) and Employment

In 2011–12, agriculture accounted for 19.89 per cent of Assam's GSDP while employing 56.05 per cent of its workforce (Table 1). By 2019–20, its share in GSDP had declined to 16.12 per cent and its share in employment to 36.76 per cent, indicating a clear structural transformation of the state economy. By 2019–20, industry and services together contributed nearly 70 per cent of GSDP, while employment was increasingly concentrated in public administration and other activities, manufacturing, trade, hotels and restaurants, transport and communication, mining and quarrying, and construction.

Table 1: Composition of GSDP and Employment in Assam (in percentage)

	2011-12		2019-20		2022-23	
Type of Industry	**GSDP**	**Employment**	**GSDP**	**Employment**	**GSDP**	**Employment**
Agriculture and Allied Activities	19.89	56.05	16.12	36.79	16.71	48.82
Mining and Quarrying	10.23	0.57	14.27	0.5	15.04	0.09
Primary Sector	30.12	56.62	30.39	37.29	31.75	48.91
Manufacturing	10.76	5.9	16.56	10.73	15.31	4.98
Construction	8.3	6.71	10.12	12.57	1.88	27.7
Electricity, Gas and Water Supply	1.34	0.06	2.31	0.27	9.88	0.22
Industry	20.4	12.67	28.99	23.57	27.06	32.9
Trade, Hotels and Restaurants	14.29	15.02	15.86	19.25	15.71	7.38
Transport, Storage and Communication	5.66	3.61		6.32	6.37	3.62
Banking and Insurance	2.98	0.62	8.18	0.91	2.34	0.36
Real Estate, Ownership of Dwellings and Professional Services		0.01		0.12	4.09	0.11
Public Administration	5.74	1.84	16.58	1.56	4.96	1.39
Other Services	7.53	9.61	16.58	10.98	7.72	5.33
Services	36.2	30.71	40.62	39.14	41.18	18.19
Gross State Domestic Product (GSDP)	**100**	**100**	**100**	**100**	**100**	**100**

Source: Economic Survey of India, various years; NSS Annual Report 2011-12, PLFS Annual Report, various years

The pandemic, however, has slowed the structural transformation of the state's economy. While the share of agriculture in Assam's GSDP has increased slightly from 16.12 per cent in 2019-20 to 16.71 per cent in 2022-23, the share of agriculture in employment in the

same time period has risen remarkably from 36.79 per cent to 48.82 per cent. The increase in the share of employment in agriculture has mainly come at the expense of a decline in the share of employment in services, while the share of employment in the manufacturing sector continued to rise.

Sectoral Composition and Analysis

Predominantly an agrarian economy, agriculture employs nearly 49 per cent of Assam's workforce. However, agricultural growth has historically remained sluggish, declining from 2.5 per cent between 1981 and 1990 to 0.2 per cent between 1991 and 2000, against the national average of 3.4 per cent. Industrial growth too lagged behind the national average, decelerating from 3.9 per cent in the pre-reform period to 2.18 per cent in the post-liberalisation period. The service sector has therefore emerged as the principal driver of Assam's economy, with growth peaking at 8.5 per cent between 2007 and 2012, led by public administration and other services, trade, transport, communication, and hospitality. The 2000s marked a breakthrough decade for Assam's economy, with both GSDP and services recording average growth rates of around 7 per cent and 6 per cent respectively.

However, growth slowed after 2018, further exacerbated by demonetisation, GST implementation, and the COVID-19 lockdown. Agriculture acted as a fallback sector during this period, growing by 7.7 per cent between 2021 and 2023 even as manufacturing and services contracted. Yet the sector continues to be characterised by low productivity, poor irrigation, limited crop diversification, and increasing marginalisation of landholdings, pushing rural households towards non-farm diversification.

The industrial sector, meanwhile, has been driven largely by construction growth through schemes such as Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and Pradhan Mantri Gram Sadak Yojana (PMGSY), while manufacturing remains modest and overwhelmingly unorganised. According to the NSS 2017, the unorganised manufacturing sector employed nearly 69 per cent of manufacturing workers while contributing only 21 per cent of manufacturing value addition (Dutta, 2024). Both construction and unorganised manufacturing remain labour-absorbing but precarious sectors. Although public administration and other services recorded high growth, their employment share has declined, making the rural non-farm economy increasingly important in absorbing the growing rural workforce.

The Rural Non-Farm Sector in Assam

The rural economy of Assam has undergone significant structural transformation over the past three decades, marked by a decline in agriculture's predominance. The share of agricultural employment in rural Assam fell from 79.2 per cent in 1993–94 to 50.82 per cent in 2022–23, while its contribution to rural income declined from 52.24 per cent to 29.48 per cent. In contrast, rural non-farm activities expanded substantially, with their share in both rural employment and income rising sharply over the same period.

Nearly half of Assam's rural workforce is currently engaged in non-farm activities, which account for over 70 per cent of rural income. The share of rural non-farm employment has steadily increased since 1993–94 (Table 1 and Figure 1), particularly in construction, unorganised manufacturing, and wholesale trade, hotels, and restaurants.

Nature of the Rural Non-Farm Sector in Assam: The Size of Rural Non-Farm Self-Employment

Self-employment constitutes nearly half of RNFE in Assam, making it the dominant form of livelihood outside agriculture, as shown in Table 3. Table 2 reveals that it is concentrated in trade and wholesale, transport, food and accommodation services, and other services such as arts and crafts, while regular salaried work is concentrated in education, health, public administration, and modern services. Casual wage employment, on the other hand, is concentrated in construction and mining. PLFS data further suggest that non-farm self-employment alone is often insufficient for household sustenance, with 37.6 per cent of self-employed non-farm workers

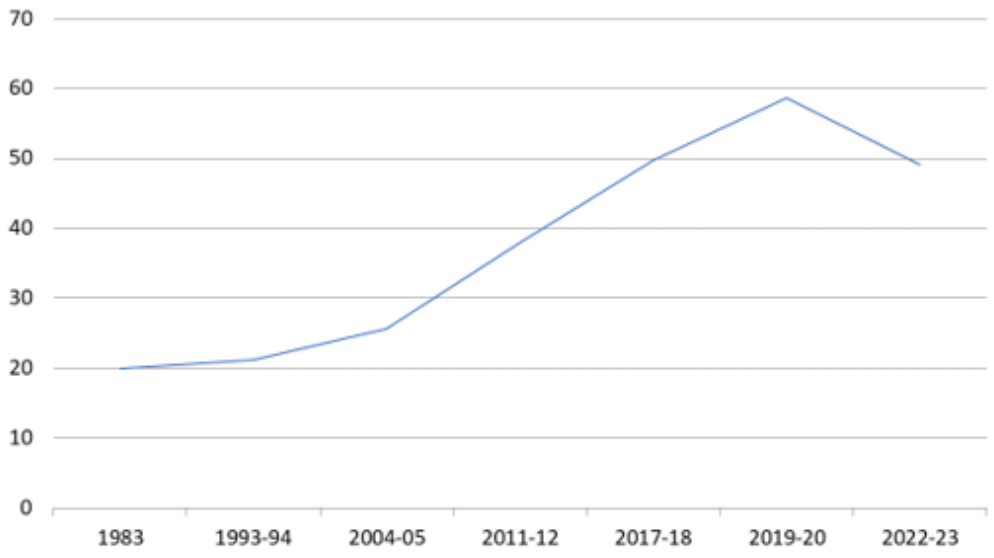
simultaneously engaged in subsidiary activities, predominantly agriculture.

Table 2: Share of Various Sectors in Rural Income and Employment in Assam between 1993-94 and 2022-23

Sectors	Income				Employment			
	1993–94	2004–05	2011–12	2022–23	1993–94	2004–05	2011–12	2022–23
Agriculture And Allied Activities	52.24	34.67	33.25	29.48	79.2	74.3	62.02	50.82
Mining and Quarrying	2.15	7.61	1.94	0.19	0.19	0.3	0.17	0.09
Manufacturing	8.6	10.14	8.67	8.56	3.5	3.1	5.49	4.59
Electricity, Water, Gas, Etc.	1.69	0.55	0.34	0.23	0.3	0.09	0.01	0.14
Construction	4.17	6.78	9.17	5.42	0.7	2.5	6.56	28.45
Trade, Hotels, and Restaurants	14.3	13.71	13.11	23.4	6.9	8.99	12.83	7.16
Transport, Storage, and Communication	3.11	4.98	7.22	8.51	1.3	2.39	3.24	2.54
Finance, Insurance, Real Estate, and Business Services	3.68	3.13	3.32	0.98	0.2	0.19	0.5	0.25
Community, Social, and Personal Services	10.05	18.42	22.98	23.22	7.69	8.1	9.14	5.96
All Non-Farm Activities	**47.76**	**65.33**	**66.75**	**70.52**	**20.8**	**25.7**	**39.8**	**49.18**

Source: Mech's (2018) calculation from NSS Unemployment-Employment rounds (various years) and author's own calculation from PLFS 2022-23

Figure 1: Share of RNFE in Assam from 1983-84 to 2022-23



Source: NSS Employment-Unemployment Surveys and PLFS, various years

Table 3: Share of Employment in Various Types of Rural Non-Farm Activities across Industries as of 2022

Industry	Self-Employed	Regular Salaried	Casual Wage Labour
Mining and Quarrying	37.5	12.5	50
Manufacturing	56.78	26.2	17.24
Electricity, Gas, and Water Supply	0	71.43	28.57
Construction	12.75	2.94	84.31
Industrial Sector	25.81	14.06	53.2
Trade and Wholesale	86.37	12.79	0.84
Transport	81.86	14.41	3.72
Accommodation and Food	67.81	28.81	3.38
Information, Communication, Finance, Insurance, and Real Estate	28	72	0
Other Services	43.04	39.39	17.57
Education and Health	6.44	93.55	0
Public Administration	0	100	0
Service Sector	63.06	33.88	3.06
All Non-farm Work	**49.8**	**28.54**	**21.6**

Source: Author's own calculation, PLFS 2022-23

The dual nature of non-farm self-employment is further evident from Table 4. Around 84 per cent of the self-employed in RNFE are own account workers (OAWs), particularly in transport, trade and wholesale, food and accommodation, manufacturing, and other services. OAWs are considerably more dominant in the service sector than in the industrial sector, indicating the predominance of petty trade, small businesses, household enterprises, and sustenance-driven self-employment in rural Assam.

In terms of real earnings (Figure 2), men in regular salaried jobs earn the highest in rural Assam, as observed from PLFS 2022-23 data. Real earnings from non-farm self-employment are more than four times the real earnings from casual wage work (Figure 3). However, men in non-farm self-employment earn almost four times as much as women in non-farm self-employment.

Beyond gender differences in the real earnings of workers in non-farm self-employment, there is also a distinct variation in the real earnings of OAWs, employers, and helpers. For workers engaged as OAWs, real earnings are around INR 10,000, with significant gender differences. The real earnings of employers are more than 2 times the real earnings of OAWs, reflecting differences in the quality of employment between the two types of non-farm self-employment work in the state.

Data Sources and Methodology

This article employs data from the Periodic Labour Force Survey (PLFS) 2022–23 to analyse the rural labour market in Assam and examine the determinants of rural non-farm self-employment. The PLFS surveyed 1,01,655 households (55,844 in rural areas) and 4,19,512 individuals (2,43,971 in rural areas), providing estimates of key employment and unemployment indicators, including the Labour Force Participation Rate (LFPR), Worker Population Ratio (WPR), and Unemployment Rate (UR). The PLFS dataset provides an important means of tracking the transition from farm-based employment to non-farm jobs in the country.

Table 4: Share of employment in various types of rural non-farm self-employment activities across industries as of 2022-23 (in percentage) in Assam

Industry	OAW	Employer	Unpaid Helper
Mining and Quarrying	37.5	0	**0**
Manufacturing	45.06	6.2	**5.28**
Electricity, Gas, and Water Supply	0	0	**0**
Construction	6.66	5.68	**0.39**
Industrial Sector	**24.13**	**5.87**	**2.62**
Trade and Wholesale	72.43	5.48	**8.43**
Transport	81.86	0	**0**
Accommodation and Food	47.45	13.55	**6.77**
Information, Communication, Finance, Insurance, and Real Estate	28	0	**0**
Other services	38.18	3.03	**1.81**
Education and Health	6.44	0	**0**
Public Administration	0	0	**0**
Service Sector	**54.96**	**3.53**	**4.55**
All Non-Farm Work	**84.05**	**8.47**	**7.47**

Source: Author's own calculation, PLFS 2022-23

The regression analysis presented in the section, Regression results, addresses two objectives:

- To identify the determinants of working in rural non-farm versus farm employment.
- To assess the determinants of participation in specific types of rural non-farm employment (regular, casual, or self-employed).

For the first objective, the dependent variable is the likelihood that an individual aged 14–60 in rural Assam engages in non-farm employment. For the second objective, the dependent variable is the likelihood of engaging in one of the three specified categories of non-farm employment. Farm and non-farm activities are classified in accordance with the National Classification of Occupations (NCO) 2015. The analysis of determinants of participation in rural non-farm employment is based on a total of 4355 observations, estimated from PLFS 2022-2023 and includes individuals engaged in both farm and non-farm activities in rural Assam. The analysis of the types of rural non-farm employment is restricted to individuals already engaged in rural non-farm activities, with 2497 observations estimated from PLFS 2022-2023.

To address the first objective, a binary logistic regression model is estimated as follows:

$$\text{Logit}\,(P_i) = \text{Ln}\left(\frac{P(Yi=1)}{1-P(Yi=1)}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots + \beta_k X_{ki} + \varepsilon_i,$$

Where $P(Y_i=1)$ is the probability that individual *i* participates in non-farm employment, while $(1-P_i)$ is the probability that individual *i* participates in farm employment. $X_1, X_2, \ldots, X_n$ are explanatory variables, including age, gender, education, household size, religion, and caste. β_0 is the intercept, $\beta_1, \beta_2, \ldots, \beta_n$ are the coefficients of the explanatory variables, and ε_i is the error term.

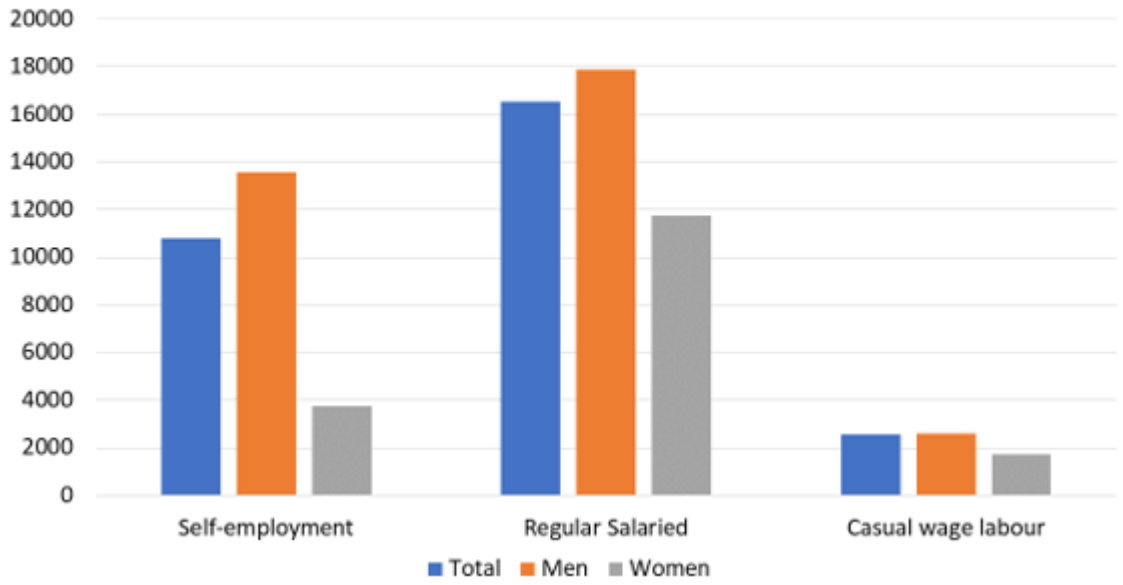
To address the second objective, a multinomial logistic regression model is estimated to examine the likelihood of participation in casual rural non-farm employment or rural non-farm self-employment relative to regular salaried

rural non-farm employment, which serves as the reference category. The model is specified as:

$$\text{Ln}\left(\frac{P(Yi=j)}{1-P(Yi=0)}\right) = \alpha_{j0} + \alpha_{j1}X_{1i} + \alpha_{j2}X_{2i} + \alpha_{j3}X_{3i} + \ldots + \alpha_{jk}X_{ki} + \eta_{ij},\ \ j = 1, 2$$

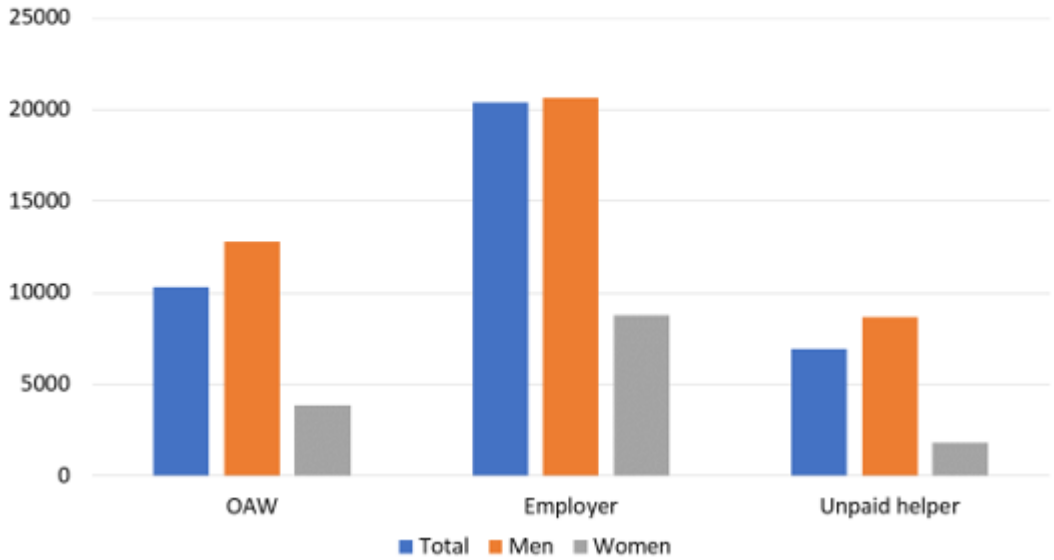
Where $Y_i = 0$ indicates that an individual is engaged in regular salaried rural non-farm employment (reference category), $Y_i = 1$ indicates that the individual is engaged in casual rural non-farm employment, and $Y_i = 2$ indicates that the individual is engaged in rural non-farm self-employment. $P(Y_i = j)$ represents the probability that individual *i* participates in rural non-farm employment type *j*. $X_1, X_2, \ldots, X_n$ are the same explanatory variables as in the binary regression. α_{j0} is the intercept for category *j*, $\alpha_{j1}, \alpha_{j2}, \ldots, \alpha_{jk}$ are the coefficients of the explanatory variables, and η_{ij} is the error term.

Figure 2: Real Earnings of Various Types of Rural Non-Farm Workers in Assam as of 2022-23



Source: Author's Own Calculation, PLFS 2022-23 (in Indian rupees)

Figure 3: Real Earnings in Various Types of Rural Non-Farm Self-Employed Work in Assam as of 2022-23



Source: Author's Own Calculation, PLFS 2022-23 (in Indian rupees)

Variables, Descriptive Statistics, and Regression Analysis

Table 5: Explanatory Variables, Definitions, and Expected Signs (Logit Regression Analysis for Determinants of Rural Non-Farm Activities

Variables	Description	Expected Signs
Age	Age of the worker in years	-
Gender	D_i = 0 if male and D_1 = 1 if female	-
Marital Status	D_i = 0 if married at least once, including currently married, widowed, divorced and separated, and D_i = 1 if never married	+
Years of Formal Education	Years spent in formal education by the worker	+
Relation to the Head of the Household	D_i = 0 if the worker is the household head (HH), D_i = 1 if the worker is the spouse of the HH, D_i = 2 if the worker is the son/daughter of the HH, D_i = 3 if the worker is the son-in-law/daughter-in-law of the HH, D_i = 4 if the worker has any other relation to the HH	- -/+ - -/+
Caste	D_i = 0 if the worker belongs to Scheduled Tribe (ST), D_i = 1 if the worker belongs to Scheduled Caste (SC), D_i = 2 if the worker belongs to Other Backward Class (OBC), and D_i = 3 if the worker belongs to General caste category	+ + +
Religion	D_i = 0 if the worker belongs to Hindu household, D_i = 1 if the worker belongs to Muslim household, D_i = 2 if the worker belongs to Christian household, and D_i = 3 if the worker belongs to Other religious households (Sikhism, Buddhism, and Others)	- - -/+
Household Size	Number of household members	-/+

Table 5 presents a description of the explanatory variables used in our analysis, as discussed in the literature in section "What Determines RNFE?" Tables 6 and 7 provide descriptive statistics for the data, alongside the proportion of Assam's rural working population aged 14 to 60, disaggregated by farm and non-farm employment sectors. It is found that rural non-farm workers are relatively younger (36.91 years) compared to farm workers (40.14 years). A significantly higher proportion of male workers is engaged in non-farm activities (86.2 per cent), whereas women are more concentrated in agriculture (41.4 per cent). Rural non-farm workers also have higher average years of formal education (9.12 years) than farm workers (6.22 years).

In terms of household roles, heads and sons/daughters are more likely to participate in rural non-farm employment, while spouses and daughters-in-law/sons-in-law are more concentrated in agriculture. Caste differences reveal that workers belonging to the Scheduled Tribes (STs) and Other Backward Classes (OBCs) are more concentrated in agriculture, whereas those from the Scheduled Castes (SCs) and

General (non-reserved) categories are relatively more represented in non-farm activities. Among religious groups, Muslim workers show relatively higher participation in non-farm activities, while Christian workers are more concentrated in agriculture. Household size is marginally larger among non-farm workers.

Table 7 presents the descriptive statistics for individuals engaged in different types of rural non-farm employment in Assam: non-farm self-employment, casual wage labour, and regular salaried work. It is observed that casual workers are relatively younger (34.26 years), while self-employed and regular salaried workers are slightly older. Male participation is highest in casual wage labour, whereas regular salaried employment has a relatively higher share of female workers. Individuals in regular salaried jobs also have the highest average years of education (10.76 years), followed by the self-employed in non-farm work, with casual workers having the lowest levels of education.

Table 6: Descriptive Statistics of Variables used in Regression Analysis of Working in Rural Non-Farm vs Farm

Explanatory Variables	Total	Non-agriculture	Agriculture
Age (in years)	**38.28**	**36.91**	**40.14**
Sex			
Male	**74.54**	**86.2**	**58.6**
Female	**25.46**	**13.8**	**41.4**
Marital Status			
Married at least once	**78.68**	**75.51**	**82.99**
Never married	**21.32**	**24.49**	**17.01**
Years of Formal Education (in years)	**7.90**	**9.12**	**6.22**
Relation to Head of Household			
Head	**42.33**	**44.59**	**39.24**
Spouse	**15.01**	**6.43**	**26.73**
Son/Daughter	**33.33**	**41.3**	**22.44**
Son-in-law/Daughter-in-law	**4.35**	**2.22**	**7.27**
Other	**4.95**	**5.44**	**4.29**
Caste			
ST	**21.47**	**17.1**	**27.36**
SC	**8.51**	**9.57**	**7.06**
OBC	**30.08**	**28.39**	**32.39**
General	**39.92**	**44.86**	**33.17**
Religion			
Hindu	**62.72**	**61.34**	**64.62**
Muslim	**32.05**	**34.82**	**28.25**
Christian	**4.84**	**3.52**	**6.64**
Other	**0.37**	**0.3**	**0.47**
Household size	**5.06**	**5.17**	**4.89**

Note: Age and years of formal education are measured in completed years, and household size refers to the number of household members (all reported as means). All other variables are expressed in percentages.

Source: Author's own calculation, PLFS 2022-23

In terms of household roles, heads and sons/daughters constitute a large share across all categories, particularly in casual wage labour. OBC workers are more concentrated in regular salaried employment, while General category workers dominate non-farm self-employment. In terms of religion, Muslim workers have a higher presence in non-farm self-employment, whereas Hindu workers are more represented in regular salaried jobs. Household size remains broadly similar across all employment types.

Table 7: Descriptive Statistics of the Variables Used in the Regression Analysis of Working in a Particular Type of Rural Non-Farm Activity

Variable Name	Self-Employment	Casual Labour	Regular Salaried Employment
Age (in years)	37.74	34.26	37.98
Sex			
Male	85.83	97.82	78.35
Female	14.17	2.18	21.65
Marital Status			
Married at least once	79.79	70.41	71.84
Never married	20.21	29.59	28.16
Years of Formal Education (in years)	8.93	7.35	**10.76**
Relation to the Head of the Household			
Head of the Household	47.86	42.65	40.37
Spouse	6.43	0.91	10.49
Son/Daughter	36.14	53.36	41.43
Son-in-law/Daughter-in-law	2.67	0.36	2.78
Other	6.89	2.72	4.91
Caste			
ST	18.3	19.05	13.81
SC	11.33	7.44	8.1
OBC	23.73	27.94	36.79
General	46.63	45.56	41.3
Religion			
Hindu	58.58	60.43	66.8
Muslim	38.05	36.67	27.89
Christian	3.29	2.35	4.78
Other	0.08	0.54	0.53
Household Size	5.11	5.12	4.89

Note: Age and years of formal education are measured in completed years, and household size refers to the number of household members (all reported as means). All other variables are expressed in percentages.
Source: Author's Own Calculation, PLFS 2022-23

Regression Results

The logit regression results in Table 8 indicate that as workers' age increases, the probability of participating in RNFE decreases, suggesting that younger individuals are more likely to engage in non-farm activities. This aligns with recent studies on rural India where younger people are moving away from agriculture as agriculture has become less remunerative (Das & Rathore, 2018). It is also evident that female workers are less likely to participate in non-farm employment than their male counterparts. Goswami & Bhattacharyya (2014) provide two reasons for the prevalence of farm work among women in rural Assam over non-farm activities. First, the low human capital base of rural women makes it difficult for them to be absorbed in non-farm jobs. Second, the marginalisation of farmers in Assam implies very little potential for mechanisation and insufficient income. As such,

male workers migrate to non-farm jobs while women carry out agricultural activities. It is also seen that educational attainment significantly influences the likelihood of participation in RNFE.

Table 8: Logit Regression Results: Determinants of Rural Non-Farm Activities in Assam	
Explanatory Variables	**Coefficient (Standard Errors)**
Age	**–0.0080 (0.0042) ***
Female	**–0.6321 (0.1539) *****
Never Married	**0.0810 (0.1120)**
Years of Formal Education	**0.1848 (0.0102) *****
Relation to the Head of the Household	
Spouse of the household head	**–0.9207 (0.1861) *****
Son/Daughter of the household head	**–0.0616 (0.1099)**
Son-in-law/Daughter-in-law of the household head	**–1.2163 (0.2402) *****
Other	**–0.0459 (0.1777)**
Caste	
SC	**0.6045 (0.1392) *****
OBC	**0.3764 (0.0949) *****
General	**0.8578 (0.1423) *****
Religion	
Muslim	**–0.2819 (0.1356) ** **
Christian	**–0.3665 (0.1614) ** **
Other	**–0.6429 (0.5358)**
Household size	**–0.0122 (0.0222)**
Constant	**–0.7875 (0.2464) *****
No. of observations	**4355**
Pseudo R^2	**0.4201**
Prob > chi^2	**0**
Log Likelihood	**–1656.49**
Notes: ***, **, and * indicate significance at 1 per cent, 5 per cent, and 10 per cent levels.	
Source: Author's Estimation Based on PLFS 2022–23 Unit-Level Data.	

It is also observed that the spouse and son-in-law/daughter-in-law of the head of the household are significantly less likely to participate in non-farm activities compared to the head of the household. This result reflects intra-household dynamics and role-based expectations. In the traditional patrilocal rural household in Assam headed by a male, the spouse and the daughter-in-law are significantly less likely to engage in rural non-farm work.

Social and religious affiliations also play a significant role in shaping employment patterns. Workers from SC, OBC, and General category households are more likely to be engaged in non-agricultural work. For SC workers, historically low access to agricultural land could imply a move towards RNFE (Roy, 2016), while for OBC and General category workers, this could mean a shift towards better-remunerated non-farm jobs. Both Muslim and Christian household workers are significantly less likely to participate in rural non-farm employment. As minority groups, Muslim and Christian workers lack access to capital and education, have less occupational mobility, and may be pushed towards farm-based activities (Government of India, 2006; see also Ahmed and Nauriyal, 2023).

The multinomial logistic regression analysis in exploring the determinants of the type of rural non-farm work in Table 9 reveals that age has a

significant negative effect on both rural non-farm self-employment and casual rural wage labour, implying that as individuals grow older, they are less likely to engage in these forms of employment relative to regular salaried work. Female workers are significantly less likely to participate in casual rural wage labour. Further, being never married significantly reduces the likelihood of self-employment. Education has a significant negative association with both rural non-farm self-employment and casual rural wage labour, indicating that as years of formal education increase, individuals are more likely to be in regular salaried employment. Among household roles, spouses are significantly less likely to be self-employed in non-farm work, while individuals classified as "other" relations are more likely to be self-employed in non-farm work.

In terms of caste, OBC and General category workers are significantly less likely to be in both non-farm self-employment and casual wage labour, and SC workers are less likely to be in casual work, indicating a greater likelihood of regular salaried employment among these groups. Among religious groups, Muslim workers are significantly more likely to be self-employed in non-farm work, while Christian workers are significantly less likely to be in casual wage labour.

Table 9: Multinomial Logit Regression Results: Determinants of Type of Rural Non-Farm Employment in Assam

Explanatory Variables	Self-Employed Coefficient (Standard Error)	Casual Wage Labour Coefficient (Standard Error)
Age	–0.0235*** (0.0065)	**–0.0757*** (0.0088)**
Female	–0.1932 (0.2123)	**–2.4037*** (0.4460)**
Never Married	–0.5589*** (0.1496)	–0.2881 (0.1818)
Years of Formal Education	–0.1862*** (0.0162)	**–0.4167*** (0.0228)**
Relation to the Head of the Household		
Spouse of the Household Head	–0.6841** (0.2734)	–0.8795 (0.6448)
Son/Daughter of the Household Head	–0.2165 (0.1466)	**0.0738 (0.1912)**
Son-in-law/Daughter-in-law of the Household Head	0.0181 (0.3770)	–0.6063 (0.8521)
Other	0.5379** (0.2456)	**–0.5965 (0.3843)**
Caste		
SC	0.0328 (0.2023)	–0.6389** (0.2710)
OBC	–0.7695*** (0.1509)	**–0.7183*** (0.1935)**
General	–0.5932*** (0.1875)	–0.7580*** (0.2473)
Religion		
Muslim	0.5422*** (0.1639)	**0.2874 (0.2206)**
Christian	–0.2702 (0.2538)	**–0.8201** (0.3790)**
Other	–1.8126 (1.1518)	**0.3452 (0.9543)**
Household Size	0.0311 (0.0324)	–0.0129 (0.0414)
Constant	3.7132*** (0.3900)	**7.0704***(0.5156)**
No. of observations		**2497**
Pseudo R^2		**0.5729**
Prob > chi^2		**0**

Notes: *, **, and * indicate significance at 1 per cent, 5 per cent, and 10 per cent levels.**

Source: Author's Estimation based on PLFS 2022–23 Unit-Level Data.

Marginal Effects

The marginal effects in Table 10 indicate that age significantly reduces the probability of casual rural wage labour while increasing the likelihood of regular salaried employment. Dey (2014), in the context of Barak Valley in Assam, found similar results for government and semi-government jobs, as such jobs require higher education and skill sets that delay their entry into the labour market. As workers' age increases, the probability of engaging in casual wage work may decline, as such work demands greater physical stamina and better health.

Female workers are significantly more likely to be self-employed in non-farm work and in regular salaried work, and significantly less likely to be engaged in casual wage labour. Regular salaried positions, perceived as stable and secure with social protections (Fields, 2011), are often considered suitable for women from "respectable" families (Radhakrishnan, 2009). However, women remain underrepresented in regular salaried jobs (Srivastava & Srivastava, 2010; Singh & Mukherjee, 2022). Further, the low participation of women in casual non-farm work, such as construction (0.15% of women's employment in 2022–23 as per PLFS data), reflects a lack of casualisation in female non-farm labour in Assam. Similarly, it is also found that spouses of the household head are more likely to hold regular salaried jobs.

Marital status and household dynamics further shape rural non-farm employment patterns. Never-married individuals are less likely to engage in rural non-farm self-employment but more likely to hold regular salaried jobs. Singh and Mukherjee (2022), in a study using Young Lives panel data, also found that a majority of unmarried young adults in India are employed in regular salaried jobs. Educational attainment also significantly influences employment type, with more years of formal education decreasing the likelihood of non-farm casual wage labour (by 3.90 percentage points) and increasing the likelihood of regular salaried work (by 4.16 percentage points).

In terms of caste, SC workers are more likely to be self-employed in non-farm work and less likely to be in casual wage labour, while OBC workers are less likely to be self-employed in non-farm activities and more likely to be in regular salaried employment. General category workers are also more likely to be in regular salaried jobs. These findings align with Deshpande's (2011) observation that affirmative action policies in Assam have facilitated non-farm opportunities for marginalised groups, particularly OBCs, enabling access to regular salaried positions.

In terms of religion, Muslim workers are more likely to be self-employed and less likely to be in regular salaried employment, while Christian non-farm workers are less likely to be engaged in casual wage labour. The concentration of Muslim workers in informal non-farm self-employment like small businesses highlights vulnerabilities within marginalised groups and goes with the findings of Darko et al. (2025) in the context of Rajasthan. The concentration of Muslim workers in informal non-farm self-employment may be due to persistent exclusion from formal, regular salaried jobs. Further, it has been found that in the case of Indian Muslims, educational mobility often does not translate into occupational mobility (Fazal et al, 2024). Thus, educated Muslim workers may be more likely to engage in rural non-farm self-employment.

Explanatory Variables	Self-Employed	Casual Wage Labour	Regular Salaried
Age	0.0019 (0.0012)	–0.0081*** (0.0010)	**0.0062*** (0.0011)**
Female	0.1027** (0.0439)	–0.1946*** (0.0195)	**0.0919** (0.0418)**
Never Married	–0.1030*** (0.0289)	0.0135 (0.0211)	**0.0896*** (0.0264)**
Years of Formal Education	–0.0026 (0.0028)	–0.0390*** (0.0022)	**0.0416*** (0.0023)**
Relation to the Head of the Household			
Spouse of the Household Head	–0.0868 (0.0660)	–0.0512 (0.0684)	**0.1380** (0.0578)**
Son/Daughter of the Household Head	–0.0583 (0.0289)	0.0324 (0.0228)	**0.0259 (0.0248)**
Son-in-law/Daughter-in-law of the Household Head	0.0569 (0.0888)	–0.0728 (0.0806)	**0.0159 (0.0679)**
Other	0.1684*** (0.0437)	–0.1081*** (0.0288)	**–0.0603 (0.0369)**
Caste			
SC	0.0755* (0.0375)	–0.0890*** (0.0286)	**0.0135 (0.0294)**
OBC	–0.1030*** (0.0291)	–0.0234 (0.0238)	**0.1264*** (0.0232)**
General	–0.0580 (0.0373)	–0.0453 (0.0304)	**0.1033*** (0.0285)**
Religion			
Muslim	0.0976*** (0.0330)	–0.0148 (0.0263)	**–0.0827***(0.0260)**
Christian	0.0028 (0.0531)	–0.0780** (0.0356)	**0.0752 (0.0499)**
Other	–0.3474*** (0.1123)	0.1922 (0.1556)	**0.1552 (0.1554)**
Household Size	0.0085 (0.0062)	–0.0048 (0.0047)	**–0.0037 (0.0055)**
No. of Observations		**2497**	
Pseudo R^2		**0.5729**	
Prob > chi^2		**0**	

Source: Author's Estimation based on PLFS 2022–23 Unit-Level Data.

Conclusion

Assam's rural labour market reflects the broader structural shifts of the state economy, marked by declining agricultural absorption, stagnant industry, and an erratic yet dominant service sector. While the first decade of the 2000s marked a turning point in Assam's growth trajectory, the COVID--19 pandemic has slowed down the structural transformation of the state. Agriculture has emerged as a fallback sector despite increasing marginalisation of landholdings, low crop diversification, and limited absorptive capacity. At the same time, labour-absorbing sectors such as construction and unorganised manufacturing remain precarious and low-income generating, making RNFE increasingly important.

This paper explored the emergence and determinants of RNFE in Assam, with particular focus on rural non-farm self-employment. Our findings show that rural non-farm self-employment constitutes nearly half of RNFE and is dominated by OAWs engaged in low-return petty production and informal services, particularly in trade, transport, and food-related activities. Although self-employment offers an alternative to casual wage work, it does not generate sufficient or stable income for most workers, compelling many to supplement their livelihoods through subsidiary agricultural activities. There are also pronounced gender and class disparities. Men in self-employment earn almost four times more than women, and employers earn more than twice as much as own-account workers.

Regression results further reveal that younger, educated, and socially advantaged groups are more likely to transition into RNFE, with education especially linked to regular salaried work, while women and Muslim workers remain

disproportionately concentrated in agriculture and informal non-farm self-employment. It is also evident that as age increases, workers in rural Assam are less likely to be employed in agriculture and more likely to engage in non-farm work. However, in non-farm work, age significantly reduces the probability of casual rural wage labour while increasing the likelihood of regular salaried employment.

The analysis in the study relies on the PLFS 2022-23 dataset and does not capture the impact of important variables like access to land ownership and the role of agriculture in driving RNFE. Further, it would be interesting to capture longitudinal trends and determinants of RNFE. Nevertheless, these findings indicate broader implications for understanding the nature of rural transformation and RNFE. Rural non-farm self-employment may not always be dynamic and entrepreneurial in nature; it could also emerge due to a lack of access to formal and regular salaried jobs for certain groups and education levels. Thus, rural non-farm self-employment has emerged as the dominant alternative to casual construction jobs, which are marked by precarity and low wages.

For policymakers, understanding the nature of RNFE and non-farm self-employment is crucial in the context of creating gainful employment. The manufacturing sector plays an important role in creating non-precarious jobs. The social and gendered nature of RNFE also provides interesting insights for policymakers. While women workers are more likely to be absorbed in farm-based work, skill development and credit facilities for women specifically can drive them into non-farm self-employment. Finally, socially disadvantaged and historically marginalised groups should be given priority by policymakers in terms of access to credit, market linkages, and skills. Finally, social protection for informal workers, including casual wage workers and non-farm self-employed workers, should be prioritised given the nature of RNFE in the state.

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Conflict of Interest Statement

I declare that there are no financial or non-financial conflicts of interest related to the conduct or publication of this research. I also confirm that no changes in authorship, order of authorship, or addition of authors have occurred after submission. I further declare that this manuscript was not prepared using AI-generated

text or AI-generated figures. All written content in the manuscript was produced solely by the author.

Ethical Approval Statement

This study was conducted in accordance with the ethical principles of the Declaration of Helsinki and comparable guidelines for research involving human participants. As the analysis is based solely on secondary data from the Periodic Labour Force Survey (PLFS) 2022-23 that has already been collected, anonymised, and is publicly available, no direct interaction with human participants occurred. No institutional ethics committee approval was required for this research, as no identifying information was accessed and the dataset is exempt from ethical review under standard academic guidelines. All procedures adhered to the ethical requirements to ensure confidentiality, anonymity, and responsible data use.

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