



What Determines the Transformation of Rural Workforce? Insights from Dhubri District of Assam, India

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Abstract: The paper explores the socio-economic factors that determine the transformation of the rural workforce in Dhubri district of Assam. In addition, the study investigates the extent of transformation describing the socio-economic conditions and present employment patterns of the respondents. The empirical study was carried out utilising primary data that was collected through a survey schedule following a multi-stage sampling method. The findings suggest that the transition from farm to non-farm sector in Assam is distress-induced, resulting in the casualisation of rural workers. Several socio-economic factors such as per capita land, indebtedness, religion, and age, among others, have affected the transition of rural agricultural workers into non-agricultural activities.

Keywords: Rural Workforce; Transformation; Agricultural employment; Non-agricultural employment; Assam

1. Introduction

A major change in the Indian workforce structure, notably driven by the liberalisation of the economy in 1991, has taken place during the last few decades (Deshpande, 2001; ILO, 2015; Srivastava, 2012; Unni & Lu, 2007). The growth of the non-farm sector played a key role in reshaping the structure of the rural workforce, which resulted in a 28.4-fold rise in overall national income in India (Chand & Singh, 2023). Even, the rapid growth of the non-farm sector was faster than the economy-wide growth. During the mid-2000's, India witnessed acceleration in the

non-farm sector growth primarily led by the increase in non-farm employment (especially transport, services, and construction). Consequently, almost half of the total earnings come from the rural non-agricultural sector in India. The extent of rural non-farm employment (RNFE) in India gained momentum around the end of the 2000s, when six out of ten rural employments were recorded from the non-agricultural sector, compared to four out of ten in the 1980s (Binswanger-Mkhize & D'Souza, 2012; Dubey, 2008; Himanshu et al., 2010). The transition of the workforce from farm to non-farm sector was accelerated in the post-liberalisation period, while agriculture is the backbone of the rural economy in India that contributes almost 46 percent in the total national income (Chand et al., 2017; Ghoshal, 2004). The sectoral transformation has a unique character wherein the share of labour in the farm sector declines faster, while the shares of productivity and output of the farm sector fall slowly. The transition is, however, found to be slower in India in comparison to the other countries. Therefore, the transformation in 72.4 percent of the workforce living in rural areas is inevitable, and accordingly, a huge transition of workers from agricultural to non-agricultural sector was brightly witnessed over the period as the productivity of the latter is much higher than that of the former (Binswanger-Mkhize, 2012; Binswanger-Mkhize & D'Souza, 2012; Das, 2018; Ghoshal, 2004). This is what led to an expanding disparity between the size of the new rural workforce and the growth of agricultural employment in India (Himanshu et al., 2011). On this contrary, the reports of National Sample Survey Organisation (NSSO) suggest a steady increase in the share of rural non-farm workers (RNFW) out of the entire rural workforce from 27.4 per cent in 2004-05 to 32.1 per cent in 2009-10 and later it reached at 40.82 per cent in 2023-24 (NSSO, 2006, 2014a, 2024). During the same period, Assam (the one and only major state in the North-East region) has also witnessed the same pattern of rise in the share of workers engaged in the non-farm sector from 25.8 per cent in 2004-05 to 29.5 per cent in 2009-10 and finally it has increased to 48.57 per cent in 2023-24 (NSSO, 2006, 2014a, 2024). It is worth mentioning that, according to the census survey-2011, over 54.6 percent of the entire rural workforce was involved in agricultural activities in India (Census Report, 2011; Government of India, 2019a). Given the faster expansion of the non-farm sector compared to the farm sector, the transition from the latter to the former has been recognised as a key driver of economic growth in India (Chand, Srivastava, and Singh 2017; Maurya and Vaishampayan 2012; Papola 2012; Aggarwal and Kumar 2012). Considering the aforementioned facts, in this paper, we examine the

socio-economic determinants which resulted in the shifting of rural farm workers into non-farm activities. The present socio-economic conditions and employment patterns of the rural workforce, as well as the extent of transformation, have been assessed based on a primary survey among the non-farm workers in Dhubri district (primarily dependent on agriculture and forest) of Assam.

2. Literature review and theoretical underpinning

Several studies stressed on the improving educational and skill levels among the workers, while analysing the transition in workforce. According to them, the increasing participation in education, achievement of literacy, higher education, skills, and vocational education have improved over the time (Chand & Singh, 2022; Kannan & Raveendran, 2012; Parida, 2015; Rangarajan et al., 2011; Thomas, 2012). The notion is corroborated by various reports from the National Sample Survey Office, which reveal that the proportion of rural workers (Principal Status + Subsidiary Status) in the 15-59 years age group) who received vocational training (both formal and informal) rose to approximately 35.9 percent in 2023-24, compared to 7.4 percent in 2017-18 in India (NSSO, 2019, 2024). Consequently, the increasing skill levels among individuals aged 15 to 59 years over the period led to the creation of respectable jobs in India with better working conditions, steady employment, and higher pay (Singh 2008; Chand and Singh 2022; Parida 2015). Examining the trend and patterns of rural non-farm employment (RNFE) in eastern Indian states (Assam, Bihar, and Odisha), (Kumar et al., 2020) found a significant presence of non-farm diversification among small and large farm households. Noticeably, the participation in non-farm employment in these states is associated with the well-being of the households and per-capita expenditure in particular. The better educated and youth sections were found to be more interested in non-farm jobs.

Scholars (Das, 2018; Fei & Ranis, 1964; Papola & Sahu, 2012) suggest that push factor-like technological up-gradation in the farm sector and pull factor-like comparatively higher wage in the non-farm sector led to the inflow of workers from farm to the non-farm sector. Different studies (Jha, 2005; Lanjouw & Murgai, 2010) have explained the nexus between urbanisation and non-farm employment in India. The expansion of non-farm sector is more closely associated with urban growth. However, the association is stronger in small towns than that of the large cities (Himanshu et al., 2011). On this contrary, a section of scholars has denied the linkage between urbanisation and growth in rural non-farm sector (Kashyap &

Mehta, 2007; Kundu et al., 2003). In the context of North-Eastern region, the rise in rural non-farm employment (RNFE) was positively associated with the growth of total cropped area and infrastructure (Panda, 2012).

There is a counter narrative in regards to the rise in rural non-farm employment (RNFE). Some researchers consider it as distress-driven growth; for example, (Jatav & Sen, 2013) denied the likelihood of agricultural growth-driven rise in RNFE by examining the reports of National Sample Survey (NSS). Instead, they endorsed the hypotheses that acknowledge the growth of RNFE is predominantly driven by agrarian distress. Similarly, a researcher has suggested an inverse connection between farm and non-farm employment growth rates by assessing different indicators (Bhaumik, 2002). On the one side, agriculture lacks the capacity to absorb rural workforce, and on the other side, the incidence of poverty is lower in rural non-farm households as compared to the farm households in India (Dev, 1990; Vaidyanathan, 1986). It is noteworthy to mention that, various push-factors related to the recurring agrarian crises such as flood, water-logging, crop failure due to crop disease and drought, comparatively low profitability, and price collapse etc. have adversely impacted the agriculture dominated livelihood of rural population over the time (Haque & Barua, 2021).

A group of scholars referred to the distress-induced transition as 'Lewis Transition' (Chand & Srivastava, 2014; Parida, 2015; Reddy, 2015), which delineates the movement of agriculture workers from subsistence sector (farm) to the capitalist sector (non-farm sector such as manufacturing) in developing countries (Lewis, 1954). In contrast, others (Basu, 2018; Panda, 2012) were unwilling to assess the structural transformation through the lens of Lewis's dual economy framework (Lewis, 1954), pointing out significant flaws in the model that prevent it from accurately describing the employment characteristics of contemporary India. A study (Thomas & Jayesh, 2016) had raised concerns about the nature and extent of 'Lewis Transition' in India by comparing discrepancies between NSS data and Census survey results, wherein the former suggest that the number of workers involved in agriculture and allied activities declined over the last decade while latter indicates that the size of the agricultural workers increased in absolute numbers. Given the circumstances, numerous studies have examined the factors contributing to the growth of rural non-farm employment at the macro level. It is crucial to recognise that the rise of non-farm sector and its drivers are not homogeneous across the country. It could vary from region to region and state

to state due to the differences in demography and local economies. Several pull-factors such as improving skills and educational attainments or push-factors such as agrarian distress, which drove the transformation in India, were examined based on the reports of Census survey and National Sample Survey (NSS). But the socio-economic drivers at micro level are yet to be examined within the narratives and counter narratives. Therefore, the study based on Dhubri district of Assam seeks the answers to the following research questions: what are the socio-economic determinants of transformation in rural workforce? What is the extent of the transformation in rural workforce?

3. Materials and Methods

The research paper has covered the non-farm households in Dhubri district. In the study, two terms were used: transformed and not-transformed workers. The term 'Transformed' consists of the non-farm workers, who were earlier engaged in agricultural activities and now completely involved in non-agricultural activities. In that case, the base year for assessing the transformation of rural workers from agriculture to non-agricultural activities was 2024. The other term 'Not-transformed' refers to the non-farm workers, who had never worked in the agricultural sector. The population size that includes number of non-farm workers shifted from agriculture is undefined. Therefore, the minimum sample size for the undetermined universe should be 140 as suggested by (Israel, 1992). The research article stands on primary data covering a total of 165 non-farm rural households (7 per cent precision level and 90 per cent confidence level) from Dhubri district. A multi-stage sampling method has been used to collect the data. In first stage, a total of five out of 13 Rural Development Blocks (RDBs) were selected purposively based on their distances from the Dhubri town; two blocks from the farthest away [Jamadarhat block (52 K.M) and Chapar-Salkocha block (67 K.M)], two blocks nearest to the town [Birsing Jarua block (2.9 K.M), Gauripur block (9.7 K.M)] and one block [Agomoni block (33 K.M)] that falls in the mid-way between the town and the farthest way. In second stage, three Gram Panchayats (GPs) from each block were selected purposively following the pattern which was used in identification of RDBs and finally three villages were chosen from each GP. Thus, a total of 33 sample households were covered from each rural development block. The survey was carried out in the aforementioned locations (Figure 1) from October to December, 2024.

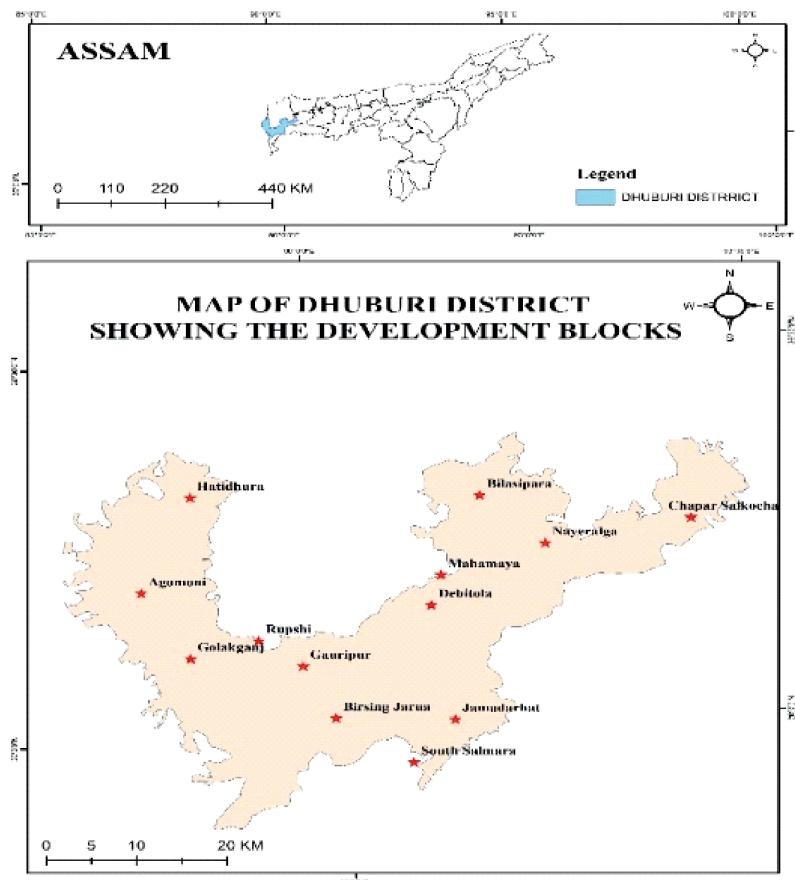


Figure 1: Geographical location of Dhubri district, Assam

The socio-economic factors determining the transformation in rural workforce were examined using a binary logistic regression model. The transformation from farm to non-farm sector of the surveyed respondent (Y) is the dependent variable. It is a binary variable that takes a value of either 0 or 1. It takes 1, if the dependent variable is transformed from farm to non-farm sector, and it takes 0, if the dependent variable is not transformed from farm to non-farm sector.

Explanatory Variables

The explanatory or independent variables are-

- i) Age of the Respondent (AGR)
- ii) Family Size (FS)

- iii) Gender of the Respondent (GR) [Dummy variable (Male=1; Otherwise=0)]
- iv) Religion (RELG) [Dummy variable: [Dummy variable (Hindu=1; Otherwise=0)]
- v) Year of schooling of the Respondent (YRS)
- vi) Age of Head of Household (AGHH)
- vii) Year of schooling of the Household Head (YRSHH)
- viii) Per capita land (PCL) [PCL=Per person land at household level]
- ix) Indebtedness (INDBT) [Dummy variable (Yes=1; Otherwise=0)]
- x) Employment Status of Respondent (ESR) [Dummy variable (Self-Employed=1; Casual/Regular salaried worker=0)]
- xi) Dependency Ratio (DR) [It refers to the number of persons between the ages 0 to 14 and over 65 years, divided by the total population between the ages of 15 to 64.]

Functional specification of the model

As the dependent variable is binary, the logit model is admissible. Thus

$$E(Y_i) = \ln(p_i/1-p_i) = \alpha + \beta_1 AGR + \beta_2 FS + \beta_3 GR + \beta_4 RELG + \beta_5 YRS + \beta_6 AGHH + \beta_7 YRSHH + \beta_8 PCL + \beta_9 INDBT + \beta_{10} ESR + \beta_{11} DR + \varepsilon_i \quad (1)$$

$Y_i=1$, if the respondent transformed from farm to non-farm sector.

$Y_i=0$, if respondent is not transformed from farm to non-farm sector.

β_1 to β_{11} = Vectors of co-efficient

α = Constant; ε_i = Error term

Odds ratio:

$$(p_i/1-p_i) = e^{(\alpha + \beta_1 AGR + \beta_2 FS + \beta_3 GR + \beta_4 RELG + \beta_5 YRS + \beta_6 AGHH + \beta_7 YRSHH + \beta_8 PCL + \beta_9 INDBT + \beta_{10} ESR + \beta_{11} DR + \varepsilon_i)} \quad (2)$$

4. Findings

4.1. Socio-economic condition

Table 1 shows the demographic profile of the respondents in the surveyed area. It is seen that the majority of respondents in the surveyed area were male (i.e., 65.5 percent). Out of the total respondents, 44.8 percent were Muslims and rest 55.2

percent were Hindus. In this study, the ages of respondent are classified into four groups (see in Table 1). The highest number of respondents in the surveyed area is found in the age group 30 to 44 (41.8 percent), followed by the age groups 45 to 59 (26.7 percent), 15 to 29 (24.2 percent), and 60 and above (7.3 percent). But the average age of the respondents is 39 years. In terms of the educational status of the respondents, 67.3 percent are found to be literate and the remaining 32.7 percent are illiterate, followed by primary (25.5 per cent), and upper primary (21.8 per cent). Out of the total literate respondents, only 0.6 percent are found to be literate without formal education. However, the average year of schooling among the respondents is 5 years in the surveyed area. Regarding the family size of the respondent, around 57.6 percent of households have 3 to 4 members in the house, followed by 5 and above (23 percent). The remaining 19.4 percent of households have up to 2 members in the house. But, average family size of the surveyed households is found 4 members, which implies that most of the family small in size.

Table 1: Demographic Profile of the Respondents

<i>Demographic Profile</i>		<i>No of respondents (per cent)</i>
Religion	Muslim	74(44.8)
	Hindu	91(55.2)
	Total	165 (100.00)
Gender	Female	57(34.5)
	Male	108(65.5)
	Total	165 (100.00)
Age Group (Years)	15-29	40(24.2)
	30-44	69(41.8)
	45-59	44(26.7)
	60 & above	12(7.3)
	Total	165 (100.00)
	Mean age	38.7
Education Status	Illiterate	54(32.7)
	Literate without formal education	1(0.6)
	Primary	42(25.5)
	Upper primary	36(21.8)
	Matriculation	17(10.3)
	H.S. & above	15(9.1)
	Total	165 (100.00)

Demographic Profile		No of respondents (per cent)
Family Size	1 to 2 members	32(19.4)
	3 to 4 members	95(57.6)
	5 members and above	38(23.0)
Total		165 (100.00)

Source: Field Survey, 2024; Note: Figure within the bracket indicates percentage.

The findings of the study suggest that the prominent number of rural workers in Dhubri district were involved in agricultural activities prior to joining the non-farm sector. As figure 2 exhibits that around 91.51 per cent of the respondents have reported their previous engagements in agricultural activities and have now fully switched to the non-farm employment. However, the annual reports of the Periodic Labour Force Survey (PLFS) reveal a different picture wherein the rural settings of Assam witnessed a reverse trend. Before pandemic the share of rural farm workers declined to 41.32 per cent in 2019-20 from 50.18 per cent in 2017-18(NSSO, 2019, 2021a). Following the pandemic, rural workers started returning to farm activities, as indicated by the rising share of farm workers from 45.03 per cent in 2020-21 to 48.57 per cent in 2023-24 in Assam (NSSO, 2022, 2024). The sudden rise in agricultural employment indicates the effect of Covid-19 pandemic, which resulted in the closure or slowing of non-farm employment. It may be assumed that the transition in farm workers is a pre-covid phenomenon in Assam.

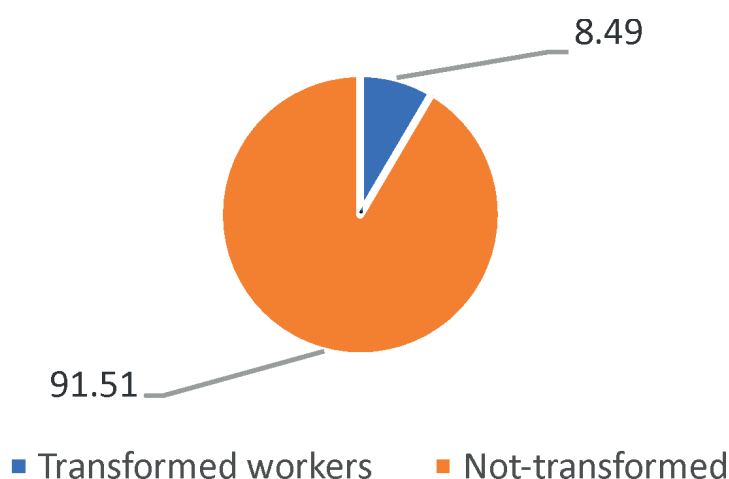


Figure 2: Distribution of transformed and not-transformed rural workforce (per cent)

Source: Field survey, 2024

Land is a crucial component in rural livelihood since non-farm employment options for rural people are quite limited. Furthermore, land owners can mortgage or sell the land to overcome any economic shock (Mahapatra, 2007; Mishra & Nayak, 2020; Rammohan & Pritchard, 2014; Tran et al., 2021; Vu et al., 2021). In India, a huge number of rural households are either landless or have marginal land holding (Government of India, 2019b). Accordingly, the findings of the present study suggest that the prominent number of the surveyed households are found to be landless, followed by the marginal households (Table 2). Among the transformed households, around 57.6 per cent of them do not own any land. A substantial proportion of transformed non-farm workers hail from the marginal households with almost 32.70 per cent proportion and only two transformed households reported landholding sizes of up to 2 hectares (Table 2). The present condition is relatable to the pre-covid period in Assam as according to the 77th round survey of National Sample Survey (NSS), around 84.2 per cent of the non-agricultural households belong to the marginal category (landholding: up to 1 hectare) in rural Assam, followed by 15.5 per cent of landless and 0.3 per cent of small non-farm households (NSSO, 2021b). It may be hypothesised that landlessness is a key driving force behind the transition of the rural workforce to non-agricultural activities.

Table 2: Landholding Status in the surveyed households

Landholding status	Not Transformed	Transformed	Aggregate
Landless	03 (1.80)	95 (57.60)	98 (59.40)
Marginal (below 1 hectare)	09 (5.50)	54 (32.70)	63 (38.20)
Small (1 to 2 hectare)	1 (0.6)	2 (1.2)	3 (1.8)
Semi-medium (2 to 4 hectare)	1 (0.6)	0 (0.0)	1(0.6)
Total	14 (100)	151(100)	165(100)

Source: Field Survey, 2024; *Note:* Figure within the bracket indicates percentage.

4.2. Extent of transformation in rural workforce

It is evident from the present study that casual workers (55.8 percent) dominate the rural workforce in the study area, followed by self-employed workers (35.8 percent), and salaried workers (8.5 percent) (Table 3). What is most striking point is that a large number of previously agricultural workers are engaged as casual workers even after shifting to the non-farm employment. It is undeniable that casual workers

in agriculture have the strongest propensity to join non-farm jobs without any wage restriction (Lanjouw & Shariff, 2004). Several studies suggest that it is lack of education as well as skill, not their caste and religion, that have kept them out of the loop of the appealing non-farm livelihood options (Bairagya, 2021; Lanjouw & Shariff, 2004; Saha & Verick, 2016). Furthermore, the effect of Covid-19 pandemic also may have contributed to the rise of casual workforce in non-agricultural sector. The second largest group of transformed workers have chosen self-employment in non-agricultural sector in Assam when transitioning from agricultural occupations (Table 3).

Table 3: Employment Status of the Respondent

	<i>Not Transformed</i>	<i>Transformed</i>	<i>Aggregate</i>
Self-Employed	3 (21.4)	56 (37.1)	59 (35.8)
Casual worker	9 (64.3)	83 (55.0)	92 (55.8)
Regular salaried worker	2 (14.3)	12 (7.9)	14 (8.5)
Total	14(100)	151(100)	165 (100)
<i>Source: Field Survey, 2024; Note: Figure within the bracket indicates percentage.</i>			

The findings of the study exhibit that there are five popular occupations in rural non-farm employment in Dhubri district. Table 4 shows that manufacturing units, daily wage activities, and running food or tea stalls at road sides are equally prevalent among the rural non-farm workers in the study area. As each of these occupations account for 23.6 per cent of the total and 70.8 percent in aggregate (Table 4). The second prominent occupation in rural non-farm sector is construction work, which constitutes around 20.6 per cent proportion, followed by the transportation related activities with the engagement of almost 8.5 per cent of the non-farm workers in Dhubri district. Noticeably, the largest number of previously agricultural workers (25.2 per cent) have chosen opening food or tea stalls near roadside, while switching to the non-farm activities (Table 4). According to the present study, almost 24.5 per cent of the transformed workers have opted for the daily wage activities in Dhubri district (Table 4), indicating compulsion for engaging in informal sector. The participation of transformed workers in construction works accounts for around 19.9 per cent share out of the total. It is worth noting that Assam witnessed a negative growth of construction workers over the last two years in Assam. The share of rural workers in construction sector fell to 13.30 per cent in 2023-24, down from 28.45 per

cent in 2022-23 (NSSO, 2023b, 2024). Although manufacturing units slowed during the post pandemic period, from 10.53 per cent of workers in 2018-19 to 7.48 in 2019-20, it is gradually regaining its pre-pandemic shape, with a rising share of 9.14 per cent in 2023-24, as suggested by the PLFS reports (NSSO, 2020, 2021a, 2024). This is what has been reflected in the present study, which revealed that around 21.2 per cent of the transformed workers have chosen the jobs in manufacturing units (Table 4). Around 9.3 per cent of the formerly agricultural workers have joined in transportation sector in Dhubri. On this contrary, it was observed that majority of the non-farm workers (49.7 per cent), who had never worked in the farm sector, were employed in manufacturing units, followed by construction works, and daily wage activities (Table 4). In this category, only one self-employed person operating a road-side tea stall was found in the study area. It is reasonable to assume that the transformation among farm workers was driven by the desire to become self-reliant.

Table 4: Occupational Pattern of the respondents

<i>Occupation</i>	<i>Not Transformed</i>	<i>Transformed</i>	<i>Aggregate</i>
Construction worker	4(28.6)	30(19.9)	34(20.6)
Daily wage labourer	2 (14.2)	37 (24.5)	39(23.6)
Manufacturing unit	7(49.7)	32(21.2)	39 (23.6)
Transportation	0 (0)	14 (9.3)	14 (8.5)
Food/Tea stall vendor	1 (7.1)	38 (25.2)	39 (23.6)
Total	14(100)	151(100)	165(100)
<i>Source: Field Survey, 2024; Note: Figure within the bracket indicates percentage.</i>			

In this study, income levels are categorized into four categories. Table 5 exhibits around 50.9 percent of the surveyed respondents had an income less than Rs. 10000 per month, followed by an income level of Rs. 10001 to Rs. 20000 (35.8 percent). Only 12 per cent of the respondents earn more than Rs. 20,000 per month. While segregating the 'not-transformed' and 'transformed' groups, the maximum earning of the former is found to be up to Rs. 20,000 and the amount is Rs. 40,000 for the latter (Table 5). The small proportion of high-income groups justifies the presence of regular salaried non-farm workers. It is interesting to note that the largest number of 'transformed' non-farm workers fall into the lowest income group (up to Rs. 10,000), whereas their 'not-transformed' counterpart group belong to the income group of Rs. 10,001 to Rs. 20,000 per month (Table 5).

Table 5: Monthly Income level of the respondents (Rs.)

Income (Rs.)	Not Transformed	Transformed	Aggregate
0-10,000	6(42.9)	78(51.7)	84(50.9)
10,001-20,000	8(57.1)	51(33.8)	59 (35.8)
20,001-30,000	0(0)	14(9.3)	14(8.5)
30,001-40,000	0(0)	8(5.3)	8 (4.8)
Total	14(100)	151(100)	165(100)
Mean income	Rs. 13,727		
Source: Field Survey, 2024; Parentheses indicate percentage			

The predominance of lower income group among transformed non-farm workers can be explained by the largest number of casual workers engaged as daily wage labourers and construction workers. The dependency of rural farm workforce in casual wage activities is not a new phenomenon in Assam. According to the 70th and 77th rounds of NSS, the share of wage in average monthly earning of farm households in Assam grew by 30.92 percentage points, from 21.36 per cent in 2012-13 to 52.28 per cent in 2018-19. In contrast, the contribution of cultivation to monthly average earning stood at 30.89 per cent in 2018-19, compared to 62.90 per cent in 2012-13 (Figure 3).

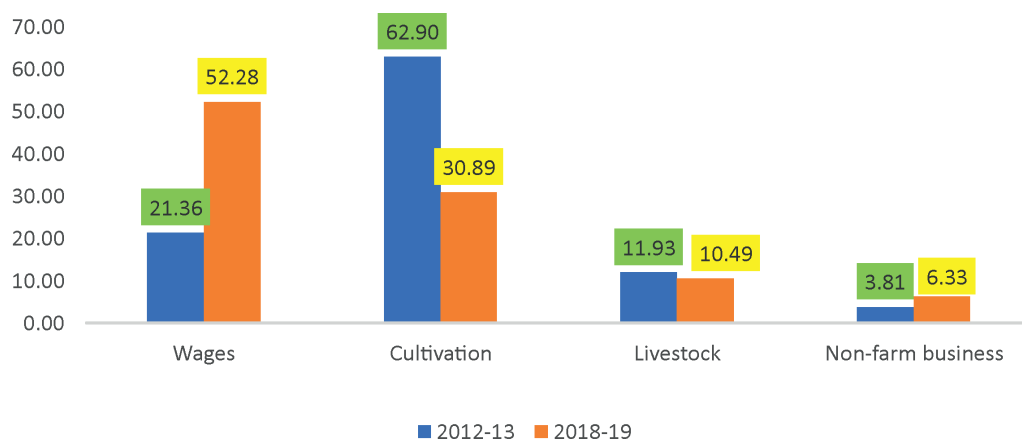


Figure 3: Changing share of income from different sources among farm households in Assam per cent)

Source: Author's calculation from NSSO 70th and 77th rounds survey (NSSO, 2014b, 2021b)

Therefore, it is convincing to accept that the engagement of transformed non-farm workers in causal wage activities existed prior to the transition. The rising share of non-farm business among the farm households (Figure 3), as well as the

sizable share of self-employed workers among the transformed group (Table 3), are incompatible with the domination of the lower income households in the study area. However, research and recent trends from the PLFS corroborate the incompatibility reflected in the current study. Studies (Basole, 2022; Deb, 2022; Neethi, 2014) have observed that self-employment, to a great extent, is often a compulsion rather than a choice in rural regions and it is a survival strategy of rural females in distress. It is worth noting that most of the rural self-employed workers (non-farm) are involved in petty jobs without hiring any labour, particularly sales and service-related activities such as tailoring, hair-cutting, shoe-making, and repair of electric and electronic gadgets, which assures a very low level of earning (Ghuman et al., 2002; IAMR, 2013). The dismal conditions of self-employed workers in non-agricultural employment, particularly the large proportion who have been forced out of the manufacturing industries, establishes an adverse relationship between self-employment and formal employment (Srivastava & Padhi, 2020; Tripathi & Mishra, 2022). Interestingly, some researchers (Bremar 1996; Sainath 1996; Papola 1981; Das 2003) referred to rural self-employed workers in the informal sector as ‘disguised’ casual workers. Surprisingly, the notion highlighted by the researchers in 1980’s and 1990’s persists, as over the last two years the overall growth of self-employed workers in rural Assam has been substantially contributed by the ‘helper in household enterprise¹’ rather than the ‘own account worker²’ or ‘employer³’. The share of the former in Assam rose from 9.3 per cent in 2020-21 to 14.2 per cent in 2023-24 and in contrast, the share of the latter has declined to 48.7 per cent in 2023-24 from 51 per cent in 2020-21 (NSSO, 2022, 2024). While analysing the form of self-employment in Assam, the rising share of ‘helper in household enterprise’ explains the adverse effect of Covid-19 pandemic in rural non-farm sector. Perhaps, the diminishing capacity to afford the hiring of helpers for operating the small household-based units insured the involvements of other family members, women in particular as ‘helper in household enterprise’. Given the dynamics of self-employment in Assam, it is plausible to acknowledge the findings of the present study, which revealed the predominance of the lower income group despite a substantial share of the self-employed individuals among previously agricultural workers in Dhubri district of Assam.

4.3. Determinants of transformation in rural workforce

The logit results (Table 6) showed that six explanatory variables viz., age of respondent, family size, religion, age of household head, per capita land and indebtedness had

significant impact on transformation of worker from farm to non-farm activities. The probability of occupational transition increases when the family size is smaller. This suggests that a reduced number of household members facilitates the decision to change occupations. The positive association with the age of the respondents indicates that their experiences in farming, which were presumably challenging, contributed to their decision to shift occupation. Therefore, the transition was not an overnight phenomenon. Other two variables, such as per capita land and indebtedness, imply a distress-linked transformation of rural workforce in the study area. Per capita land is negatively related with the probability of transitioning into non-farm activities. It indicates that lower the per capita land, higher the transformation of the worker from farm to non-farm sector and vice versa. Land is significantly associated with the income and expenses of farming in India, while successive agriculture census reports show the steady decreasing trend in the average size of operational holdings in Assam, from 1.10 hectare in 2011-12 to 1.09 in 2015-16 (Government of India, 2019b). According to the 77th round survey of NSS, overall expenditure exceeds the income⁴ (excluding non-farm) of medium and large farmers, whose prominent source of income is crop production. For instance, the estimated average monthly income (except non-farm sources) of large farmers was Rs. 21,981 while the expenditure (except non-farm sources) was Rs. 22,864 that indicates of dis-savings of Rs. 883 (NSSO, 2021b). In contrast, marginal farm households, which account for 68.13 per cent of all enumerated farm households in Assam (Government of India, 2019b), rely heavily on income from wages and non-farm sources rather than crop production. It is noteworthy to mention that the share of marginal households has increased by 5 percentage points in Assam, between 2005-06 to 2015-16 (Government of India, 2019b), diminishing the dependency on land. This is how, the declining size of operational holdings resulted in the transition of rural workforce in Assam, and importantly, some empirical evidences based on Assam also revealed that the ownership of the land and size of the landholding among the rural households antithetically impacted the probability of their participations in non-farm employment (Bhuyan & Mitra, 2018; Panda, 2017). Indebtedness is positively associated with the structural transformation of rural workforce. It represents higher the indebtedness, higher the chances of transformation from farm to non-farm sector. Indebtedness, which is prevalent across all landholding sizes, is inevitable for the farm households as it is difficult to meet household expenditures solely depending on the earnings from farm sources.

While analysing the purposes of borrowing money, the 77th round NSS report suggests that around 49.4 of credit was obtained by farmers in Assam to meet the needs such as housing, marriages, education, and other consumption expenditure etc.(NSSO, 2021b). Moreover, it is evident that small, marginal and semi-medium landholdings are most affected groups. Emergency needs and low education among poor and marginal farmers often forced them to rely on informal credit sources, which led to a debt-trap with high interest rates (Pandey, 2016; Reddy et al., 2020; Sajjad, 2012). Thus, the transition of agricultural workers into non-farm activities is induced by indebtedness.

The other socio-economic variables found to be significantly associated with the structural transformation cannot be examined in a single-directional paradigm. Say, age of respondent; the result of the binary logistic regression suggests that higher the age of respondent, higher the transformation of worker from farm to non-farm sector. It may be due to the late entry of youth into the labour market after completing their studies. Since, exclusively the educated youth workforce is being captured by the well-paid non-farm avenues because of the higher productivity and profitability than the farm sector in Assam (Goswami & Bhattacharyya, 2014; Mech et al., 2017). On this contrary, the result of the logistic model implies that higher the age of household head, lower the transformation of workers from farm to non-farm sector and vice versa. Empirical evidences also acknowledged that, if the head of the household is younger, the proclivity to join in non-farm employment increases in Assam (Bhuyan & Mitra, 2018; Mech et al., 2017). Surprisingly, the likelihood of participating in non-farm activities is insignificant but higher among respondents whose heads of families are less educated. The probability to quit agriculture increases, if the respondent belongs to small household in Dhubri district of Assam (Table 6) and the trend is prevalent in national level too as examined by (Jatav & Sen, 2013). Similarly, the likelihood to shift into non-farm activities is significantly higher in Muslim households than that of the Hindu counterparts. The religious dimension may have been fostered by the socio-economic backwardness of Muslim community. This particular trend is not unusual, as a macro-level study acknowledged that Indian Muslim individuals are quite prone to work in the non-farm sector rather than agriculture (Lanjouw & Shariff, 2004). It is interesting to observe that although co-efficient are not significant, female farm workers are less interested in transition from agricultural to non-agricultural occupations in Dhubri district of Assam. Educational attainment is a key driver towards employment in non-farm sector (IHD,

2011, 2014; Kaur et al., 2019; Lanjouw & Shariff, 2004; Misra, 2014; Saha & Verick, 2016). The results of the logistic regression suggest that the educational attainment (year of schooling) of the respondents does not play any significant role in farm to non-farm transformation of the rural workforce. The insignificant association of education with transformation from farm to non-farm employment implies that educational attainment is least important in RNFE in the study area. The finding has a basis. It is worth noting that the popular occupations such as daily wage activities, construction work, driving motor vehicles, job in manufacturing units, working in own enterprise chosen by the transformed workers in the study area do not require any particular education or higher skill. A study based on NSS data has examined the sector wise analysis of educational attainments in RNFE, which clearly reveals that the most labour absorbing occupations such as construction, manufacturing units, and other non-manufacturing sectors are dominated by the lower educated workers (Saha & Verick, 2016). It may be hypothesised that education may have a positive impact on the expansion of RNFE in general. It is insignificant when it comes to the participation of agricultural households.

Table 6: Result of Logit Model

	<i>B</i>	<i>S.E.</i>	<i>Wald</i>	<i>df</i>	<i>Sig.</i>
Constant	9.4	3.413	7.586	1	0.006
Age of Respondent	0.184	0.063	8.563	1	0.003***
Family Size	-1.28	0.471	7.38	1	0.007***
Gender of Respondent	0.515	1.151	0.2	1	0.655
Religion	-2.888	1.245	5.383	1	0.02**
Year of schooling of the respondent	0.077	0.12	0.415	1	0.52
Age of the head of the household	-0.118	0.042	8.074	1	0.004***
Year of schooling of household head	-0.127	0.116	1.201	1	0.273
Per capita land	-0.073	0.038	3.79	1	0.052**
Indebtedness	1.891	1.026	3.396	1	0.065*
Employment Status	0.257	1.207	0.045	1	0.831
Dependency Ratio	0.007	0.011	0.381	1	0.537
No of observations	165				
Prob>chi2	0.000				
Pseudo R square	0.502				
Log likelihood	54.6				

Note:***, ** and * indicates 0.01 level, 0.05 level and 0.10 level of significant respectively

Discussion

This transition predominantly occurs among marginal farmers and landless labourers. Therefore, it may be assumed that the decision to leave agriculture is not driven by the pursuit of better opportunities but by the necessity to fulfil basic needs. It is evident that the rise in marginalisation of land holdings made the landless, small and marginal farmers more dependent upon the earning from the non-farm sources (Singh 2020; Bhalla and Hazell 2003; Das and Srivastava 2021; Jatav and Sen 2013). Empirical evidences based on Assam legitimised that a sizeable proportion of agricultural workers had sought employment under MGNREGS (Mahatma Gandhi National Rural Employment Guarantee Scheme) during the agricultural lean season because of their inability to meet the sufficient needs from the harvest as well as earning from the agricultural activities (Baruah & Radkar, 2017; Bordoloi, 2011). Rising indebtedness among agricultural households in Assam, from 17.5 per cent in 2013 to 31 per cent in 2019 (NSSO, 2014b, 2021b), also corroborates the shifting of marginal agricultural households into non-agricultural occupations. It is worth noting that earning from non-farm business activities climbed by 2.52 percentage points in overall income of agricultural households in Assam over the time (NSSO, 2014b, 2021b). It indicates that the increasing dependency of farm households on non-farm activities in the state. The current study depicts that the formerly agricultural workers, even after shifting to non-farm activities, are far away from the economically viable opportunities in non-farm employment. In fact, the experience of self-employment among the transformed workers is not convincing due to a lack of education and skill, while examining the earning level of the respondents in the study. Higher education and skill always empower individuals, particularly the socially disadvantaged section, to overcome the challenges of self-employment (Tamvada et al., 2022). During the pandemic period, education and skill, as well as vocational training, were found to be extremely crucial for self-employed individuals in non-farm sector. For instance, an empirical study based on Karnataka by (Bairagya, 2021) shows that the fall in earnings among the unskilled self-employed persons in non-farm sector during the pandemic period is significantly higher than that of their skilled or trained counterparts.

Conclusion

The results of the present study suggest that the transformation of rural workforce, especially among marginal landholdings, in Dhubri district of Assam is distress-

driven. Landlessness, dwindling landholding size, and indebtedness among respondents all point to an agrarian-distress led structural shift in the study area. Nonetheless, the transformation appears to be not beneficial for the formerly agricultural workers from poor households. Since, the transformation has resulted in more casualisation of rural workforce in the study area. Although, in broad stroke, the transformation is influenced by the aspiration to become self-reliant, the dominant presence of the lower income groups among transformed non-farm workers suggests the emergence of disguised casual workers. Apart from self-employment, the other popular non-farm activities in Dhubri district include construction sector, daily wage activities, and manufacturing units, which have absorbed a large number of formerly agricultural workers. Therefore, it may be hypothesised that even after the transformation, a large number of transformed workers, with the exception of some regular salaried workers, could not come out of the trap of casualisation due to a lack of education and skill level. The insignificant role of education on facilitating occupational transitions also acknowledges that the emerging non-farm employment opportunities in urban avenues are not accessible to the distressed farm households within the study area. The religious connection with the transformation demonstrates that social backwardness is also a key component in transition from farm to non-farm sector. Therefore, the poor people, to a large extent, are not the real beneficiaries of the expansion of the non-farm economy in Assam. Thus, a huge number of transformed non-agricultural workers are far away from reaping the fruits of the expansion of non-farm sector. It is the need of the hour to include them in the various skill development initiatives and entrepreneurial incentives launched by the Government of India.

Notes

1. Self-employed individuals who worked full or part-time in their household enterprises and without a regular income or compensation for their efforts were regarded as helper in household enterprise(NSSO, 2023).
2. Own-account worker refers to the self-employed individuals who operate their enterprises on their own or with one or more partners without employing any worker(NSSO 2023).
3. Self-employed individual who works on his or her own or with one or more partners and, who, operates the enterprise by hiring workers are called 'employer'(NSSO 2023).
4. Income includes different sources such as wage, leasing out of land, crop cultivation and animal farming. Furthermore, income from crop production and animal farming denote net earnings, which cover both paid out expenses and imputed expenses.

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