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Keywords: Structural transformation; non-farm diversification; off-farm choice; wage labor; entrepreneurship; external conditions

JEL Code: J24; O12; O18; Q12; Q13; R53

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The process of structural transformation in India presents some unique features not seen in the developed countries, viz., seasonal migration from rural to rural areas within the country for employment within the agricultural sector, and the phenomenon of *in situ* occupational diversification into off-farm activities by farm households in the country. This paper analyzes the determinants of such off-farm livelihood diversification by farm households. The paper argues this process is driven by various household and farm level push factors as well as structural pull factors that are beyond the farmer's control. To test this hypothesis, the paper estimates a multinomial probit model that distinguishes five categories of off-farm activities, viz., wage labor (farm sector), wage labor (non-farm sector), non-farm entrepreneurship, both wage labor (farm) and non-farm entrepreneurship, and both wage labor (non-farm) and non-farm entrepreneurship. Results show that apart from farm and household conditions, structural features such as the village neighborhood, infrastructure, agro-climatic conditions, urbanization, and size of the state economy impact household decision on non-farm diversification.

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1 Introduction

A defining feature of structural transformation is the decline in share of agriculture in total GDP, and rise in the share of non-farm sector. Expansion of the agricultural sector and rise in agricultural productivity relaxes the wage-good constraint which helps in growth of the non-farm sector (Johnston and Mellor, 1961; Hymer and Resnick, 1969; Johnston, 1970; Schultz, 1978; Matsuyama, 1992; Chavas, 2001; McMillan and Rodrik, 2011; Alston and Pardey, 2014; De Janvry and Sadoulet, 2015). Economic growth has typically involved labor moving out of the farm sector and migrating towards the urban centers where modern industries were located. History suggests that the process of structural transformation in the advanced economies have always been accompanied by rural to urban migration in search of employment in the non-farm sector (Lewis, 1954; Chenery and Taylor, 1968; Harris and Todaro, 1970).

Though similar in pattern, structural churning in India presents some unique features not seen in the developed countries. Similarity has been mostly with regard to the rise in the share of non-farm sector in India's GDP. But, corresponding non-farm employment growth has been rather slow (Papola, 2006; Aggarwal and Kumar, 2015). In fact, around 51% of households in India are still dependent (directly and indirectly) on agriculture for their livelihood during 2017-18 (GoI, 2019a,c)[1], even though the sector accounts for only about 15% of GDP in that year (GoI, 2019b). In the context of rural-urban migration, as in the developed countries, people do migrate searching for non-farm employment opportunities in India. According to Census 2011, around 45 million Indians migrated for better employment opportunities (Dalal, 2019).

Structural transformation in India shows two distinguishing features not seen in developed countries. First, is the phenomenon of seasonal migration from rural to rural areas within the country for employment within the agricultural sector (Haberfeld et al., 1999; Deshingkar and Start, 2003). Such kind of migration is usually for a short term, cyclical and circular

[1]This may be a result of premature deindustrialization ailing most of the developing countries (Dasgupta and Singh, 2007; Rodrik, 2016; Haraguchi et al., 2017).

in nature, wherein people from rural India migrate with changing agricultural season, and often return back to their home. This makes rural households still dependent on agriculture though outside of their own village, district or even state. Second, in recent times, there has been increase in *in situ* occupational diversification of farm households in the country; i.e., even while continuing to pursue agricultural operations on ones own farm, several farm households undertake off-farm and non-farm employment (wages and entrepreneurial) activities. In fact, non-farm livelihood has emerged as an important feature of the rural economy itself. Chand et al. (2017) note that during 2011-12, rural areas contributed around 51.3% of net value added in the manufacturing sector. Similarly, Jacoby and Dasgupta (2018) find shift in employment towards the non-farm sector in rural India. These atypical aspects of structural transformation make India a special case to study.

Literature on structural change in India has largely focused on three aspects: One, the macro perspective of change in the sectoral shares of income and employment and the reasons behind the observed patterns (Lanjouw and Shariff, 2004; Kijima and Lanjouw, 2005; Rada and Von Arnim, 2012; Chand and Srivastava, 2014; Chand et al., 2015, 2017; Jacoby and Dasgupta, 2018). Two, the nature, pattern and drivers of rural to urban migration (Coffey et al. 2015; Chandrasekhar and Sahoo 2018). Three, seasonal rural to rural migration within agriculture (Bhattacharya 2000). In general, these studies provide a macro perspective on structural transformation. The literature on migration identifies several macro- and micro-level "push" and "pull" factors that drive people to migrate.

However, a corresponding micro-level understanding of the changes in the livelihood patterns of farm households that structural change is expected to bring about is only partially studied in the literature. Livelihood choices of farm households can be thought to have two dimensions: one, diversification within the farm, which refers to the instances of farmers cultivating more than one crop even as they may engage in some animal husbandry activity(ies) alongside. There exists a rich literature on within farm diversification decisions of farm households for India (Joshi et al., 2007; Birthal et al., 2006; Das, 2018). As with the literature on migration, by and large, these studies also identify push and pull factors, and

have brought out the importance of several household and farm level characteristics as being important drivers of on-farm diversification.

The second dimension to the livelihood choices of farm households is diversifying into non-farm activities. Rise in non-farm employment observed at the macro level due to structural transformation should be reflected with rural farm households undertaking non-farm employment. As mentioned above, India is in fact witnessing such *in situ* occupational diversification by farm households. However, this aspect has largely been overlooked in the literature.

This paper is a response to this end. It seeks to understand the factors affecting farm households choice of non-farm activities. As with migration and on-farm diversification, various push and pull factors could affect farmers choice of diversifying into non-farm activities. Drawing upon the literature on agricultural diversification, the push factors could largely be at the farm and household levels. Farmers, however, do not operate in isolation. They are subject to various location specific structural factors and policy environment affecting not just agriculture but the overall functioning of the economy. These structural and policy factors are by and large beyond farmers control and they could be the pull factors that propel their decision to engage in non-farm activities.

This paper uses the latest available nationally representative farm household-level data (National Sample Survey Office, Situation Assessment Survey, 70^{th} round) and combining it with Census and other data sets that provide information on structural and policy variables to study the non-farm occupational choices of farm households in India. The NSSO data provides information on various household and farm level characteristics. It also provides information on five types of off the farm activities that the households may pursue, viz., (i) wage labor in the farm sector, (ii) wage labor in the non-farm sector, (iii) non-farm entrepreneurship, (iv) both wage labor in the farm sector and non-farm entrepreneurship, and (v) both wage labor in the non-farm sector and non-farm entrepreneurship. The Census and other data sets provide information on various variables at the village, district and state-levels, from which structural factors are constructed for use in this study. A multinomial

probit model that relates the households choice of activities to various household, farm, village, district and state-level factors is estimated.

The results show that apart from farm and household level conditions, there is a larger structural context which has a significant bearing on non-farm diversification decision by farm households. Structural factors at the village neighborhood, infrastructure, agro-climatic conditions, urbanization, and state level factors influence non-farm diversification. These results are likely to have important policy implications for employment generation in rural areas, increasing farmers income and also reducing volatility in their incomes. The policy implications from this study can also help in reducing rural to urban migration and promoting environmentally sustainable urbanization.

The rest of the paper is structured as follows: section 2 discusses the factors affecting non-farm diversification. Section 3 discusses the data and summary statistics. Methodology is discussed in section 4. Section 5 presents the results. The conclusion and policy implications from the paper are discussed in section 6.

2 Structural factors and non-farm diversification

Factors affecting farm household decisions regarding non-farm occupational choices have been broadly categorized into push and pull factors in the literature (Barrett et al., 2001; Haggblade et al., 2010; Skoufias et al., 2017; Nakajima et al., 2018). Push factors comprises of farm and household characteristics that drive farm households to undertake non-farm employment. Studies so far have primarily highlighted the influence of push factors on non-farm diversification. Important push factors cited in the literature are farm and household level conditions, such as farm size, irrigation, household size, age, social group, education level of the household, number of dependent members in the household, gender of the household head, and gender composition of the household (Ellis, 2000; Reardon et al., 2000; Barrett et al., 2001; Corral and Reardon, 2001; Lanjouw and Shariff, 2004; Rigg, 2006; Birthal et al., 2006; Fernandez-Cornejo et al., 2007; Xiaoping et al., 2007; Lanjouw and Murgai, 2009; Hag-

gblade et al., 2010; Birthal et al., 2015).

However, determinants of non-farm diversification are not limited to farm and household characteristics alone. There is a larger structural context which influences household's non-farm activity choice (Winters et al., 2001; Kijima and Lanjouw, 2005). Therefore, the external structural conditions should be taken into account for any analysis of non-farm diversification decision process. Some recent studies have analyzed few such external conditions. For example, while studying the impact of rainfall on occupational diversification in India, Skoufias et al. (2017) take into account district level infrastructure variables such as irrigation, roads, banks, post offices, and schools. Similarly, to understand livelihood strategies in rural China and Ethiopia, Zhang et al. (2019) and Woldeyohanes et al. (2017) consider village distances to county center, markets and regional dummies to account for external conditions. However, these studies are limited in its focus on few aspects of the structural environment. Factors such as village non-farm labor market, social composition, infrastructure (public transport, electricity), agro-ecological factors (soil conditions, ground water recharge), structural features (extent of urbanization and proximity to urban centres), could also impact non-farm occupation choice. The objective of this paper is to empirically analyze the broader external dimension under which a farm household takes non-farm livelihood decisions.

In the Indian context, labor markets are not well integrated in India. At the village level, prevailing labor market conditions could affect household non-farm diversification decision. Local labor market network helps in seeking non-farm employment (Harris and Todaro, 1970). Hence, this study takes into account the village level non-farm labor market condition in assessing household non-farm diversification decisions. Features at the district level could as well play an important role in influencing non-farm diversification. Social composition, physical infrastructure such as roads, transport, proximity to towns, power availability, etc. affects rural development (Fan et al., 2008; Asher and Novosad, 2016; Aggarwal, 2018). Provision of such public infrastructure increases the non-farm opportunities. Access to power helps in generating non-farm employment (Dinkelman, 2011; Wolfram et al., 2012). Both

commercial and domestic power availability could raise non-farm employment. Commercial power may have a direct impact on non-farm diversification. Domestic power availability may have indirect effect on non-farm work through substitution effect of household labor time with non-farm activities.

Agro-climatic conditions could also have a bearing on non-farm diversification. Rainfall significantly affects rural livelihood in India (Skoufias et al., 2017). However, the broad local agro-climatic condition such soil type, ground water availability, etc. also influences agricultural outcome (Palmer-Jones and Sen, 2003; Krishna Kumar et al., 2004), and hence could influence non-farm choice (Kochar, 1999). Impact of broad agro-ecological feature covering rainfall deviation, favorable farming soil conditions and soil moisture availability are discussed in this study.

Growing urbanization influences household production behaviour (Rao et al., 2007; Christiaensen et al., 2013; Chatterjee et al., 2015; Vandercasteelen et al., 2018). As urban centers grow, accompanying rural-urban linkages helps in structural transformation and increases non-farm employment. Though urbanization may be necessary condition for ensuring non-farm occupational shift, it may however result in urban congestion and lower quality of life (Zhao, 1999). Studies have shown that different degrees of urbanization could have variable effects on rural non-farm diversification (Lange et al., 2013; Christiaensen et al., 2013). Also, states with higher *per capita* income should be expected to have larger proportion of population engaged in non-farm activities. This study includes such state *per capita* GDP in understanding non-farm employment.

3 Data: Source, measurement, and description

This study is based on agricultural household data on National Sample Survey (NSS) 70^{th} round Situation Assessment Survey (Schedule 33)[2]. The NSS 70^{th} round defines an 'agricul-

[2]Though a similar survey was conducted in its 59^{th} round NSS survey (2002-2003), a change in the definition of agricultural household renders the 59^{th} and 70^{th} round incomparable. See Chapter 5, Instruction Manual, 70^{th} round NSSO (2014).

tural household' as one receiving value of produce equal to or greater than Rs.3000/- from agricultural activities (cultivation of crops, animal husbandry, poultry, fishing, etc.) during the last 365 days. And, at least one member of the household should be self-employed in agriculture either in principal status or in subsidiary status. The survey is canvassed in two visits. The first Visit 1 is for *kharif* season from July-December 2012, and the second one is Visit 2 canvassed for the *rabi* season January-June 2013. It surveyed 34,907 agricultural households in both the two visits for the period July 2012 to June 2013.

NSS provides information on various farm and household level characteristics. However, to bring in information on structural variables, the NSS data is combined with Census 2011 and other statistical sources (discussed later in this section). Since, villages cannot be matched between NSS and Census and other sources, the study is limited to only those districts for which full set of information is available for all the structural variables. Hence, for this reason the study is limited to analysis 28,917 farm households, covering 20 major states[3] for which data on structural variables are available. This covers around 85 per cent of the districts in India.

Non-farm (or off-farm) work is defined as working in any remunerative work other than on one's own farm. Each household is limited by total labor time endowment, which is allocated between on-farm and off-farm activities. It could mean working as wage labor in other farms, or as wage earners in non-farm work, or having non-farm enterprises or businesses. As such, analysis at a household level helps in understanding the optimal household behavior regarding non-farm labor choice by farm households. Barrett et al. (2001) approached the issue of analyzing non-farm diversification by categorizing household into different sectors based on the share of income from different sources. However, Jiao et al. (2017) argue that income share may not reflect the true resource allocation into each activity and is also volatile in nature. Hence, in this study, agricultural households are categorized into six

[3]These states are Assam, Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Telangana, Uttarakhand, Uttar Pradesh, and West Bengal.

possible off-farm activity decisions[4]: (i) households which report having no off-farm activity at all, (ii) households with only wage labor working in farm sector (agricultural and allied sector), (iii) households with only wage labor working in non-farm sector, (iv) households exclusively engaged in non-farm businesses / entrepreneurship, (v) households engaged in both wage labor (farm sector) and having non-farm businesses / entrepreneurship, and (vi) households engaged in both wage labor (non-farm sector) and having non-farm businesses / entrepreneurship.

Choice of off-farm activity depends upon the agricultural season. Household's resources (off-farm labor time) available for off-farm employment also changes during the two seasons. The transition matrix for number (and percentages) of household in each category of off-farm diversification between *kharif* (Visit 1) and *rabi* (Visit 2) is shown in Table 1. We see that a somewhat higher proportion of households choose not to have any off-farm diversification during Visit 1 (54%) than during Visit 2 (49%). 31% of households do not engage in any form of off-farm activities in either season. Among the five categories of off-farm activities, the highest percentages of households are engaged in wage earning from agricultural sector in both the seasons. During Visit 1, 30% of households earn wages by working in the farm sector outside of their own farm, while in Visit 2, this increases to 32%. Around 6% of households are wage earners working in the non-agricultural sector during Visit 1, which increases to 8% during Visit 2 in this category. 5% and 4% of households are exclusively into non-farm businesses or entrepreneurship during Visit 1 and Visit 2, respectively. About 5% of households engage in both wage earning by working in the farm sector and have their own non-farm businesses in both the seasons. Only 1% of households have both wage earnings from the non-farm sector and non-farm businesses.

District variation in wage labor (farm sector) is depicted in Appendix Figure 1. A high proportion of such households are mostly in the western and eastern districts of Gujarat, Rajasthan, Uttar Pradesh, Odisha, West Bengal, Jharkhand, Chhattisgarh, and in few dis-

[4]The NSS SAS 70^{th} round designates off-farm industrial classification of household members according to the National Industrial Classification (NIC-2008) at two-digit level and household off-farm businesses at NIC-2008 five-digit level.

Table 1: Transition matrix of non-farm activities between *kharif* (Visit 1) and *rabi* (Visit 2)

		Rabi (Visit 2)						
		0	1	2	3	4	5	Total
Kharif (Visit 1)	0	8973	5292	1337	39	25	2	15668
		(31)	(18)	(5)	(0)	(0)	(0)	(54)
	1	4302	3526	802	12	4	5	8651
		(15)	(12)	(3)	(0)	(0)	(0)	(30)
	2	966	524	178	4	4	2	1678
		(3)	(2)	(1)	(0)	(0)	(0)	(6)
	3	0	0	0	595	702	133	1430
		(0)	(0)	(0)	(2)	(2)	(0)	(5)
	4	0	0	0	532	694	104	1330
		(0)	(0)	(0)	(2)	(2)	(0)	(5)
	5	0	0	0	61	78	21	160
		(0)	(0)	(0)	(0)	(0)	(0)	(1)
	Total	14241	9342	2317	1243	1507	267	28917
		(49)	(32)	(8)	(4)	(5)	(1)	(100)

Source: Authors' calculation based on NSS 70^{th} round.
Note: Percentages of households in each category is given in parenthesis.
0: No non-farm, **1**: Wage (farm), **2**: Wage (non-farm), **3**: Business, **4**: Wage (farm) & Business, **5**: Wage (non-farm) & Business

tricts of Andhra Pradesh, Maharashtra, and Karnataka, during both the seasons. Households with only wage earnings from non-agricultural sector are concentrated in states like Punjab, Rajasthan and Haryana during Visit 1 (Appendix Figure 2). However, during Visit 2 share of such households increases in the eastern parts of India as well.

Districts with share of households with only entrepreneurship / non-farm businesses as non-farm activity are mostly spread across districts in Maharashtra and Andhra Pradesh in both the seasons (Appendix Figure 3). Households with both wage income from agricultural and allied sectors and entrepreneurship are also mostly in the states of Maharashtra and Andhra Pradesh (Appendix Figure 4). However, very few districts show share of households with both wage income from anon-agricultural sector and entrepreneurship more than 25% during both the seasons and are not specific to any particular region (Appendix Figure 5).

Variable notations, their explanations, and summary statistics are provided in Appendix Table 1. Farm size, irrigation, household size, social group, education, age, etc., are some of the important farm and household level factors affecting off-farm livelihood diversification. There is not much difference in the farm and household level variations during the two seasons. The average farm size is around 1.58 hectares, with maximum farm size at about 66 hectares. On an average 44% of farm household's land is under irrigation. 92% of households are headed by males, with 36% of households having illiterate household head. 28% of households belong to SC/ST group. The average household age is around 32 years. On an average, 47% of household members are dependents in the household. The average male female ratio is 52%. The average proportion of household members with graduation and above is 5%.

Using NSS data, for each household (except the household concerned), the proportion of households in that village engaged in any form of off-farm activity is calculated. As seen earlier, on an average, 46% of households in a village are engaged in off-farm work in Visit 1, and 51% of households are engaged in off-farm work during Visit 2. All the district level data on social composition, infrastructure, and urban centers have been compiled from GoI

(2011). District rainfall deviation, ground water availability, and soil types have been taken from GoI (2013), GoI (2017) and ICRISAT (2018), respectively. State GDP is derived from RBI (2013). District level variables are measured in terms of proportion / average. This is because village codes are not the same for NSS, Census and other sources. Proportion of SC and ST households in a district denote the social composition of the district. SC and ST households are usually endowed with very little resources. The opportunity cost from off-farm activity is low for such households. On an average 19% of district's population are SC and 12% are ST population.

Access to infrastructure is accounted for by proportion of villages with public transport, towns within 5 kms, financial services, and self-help groups. On an average, 98% of villages in districts have access to public transport, while 25% of villages have towns within 5 kms. 69% of districts have villages with self-help groups (SHGs), and 32% of villages in districts have access to financial services. Non-farm activity in a district can also be gauged by the number of village non-farm products produced in a district. The maximum number of non-farm village products in a village is 3 and minimum is 0.

The capacity to pursue off-farm activity is also dependent on the availability of power for commercial purpose in rural areas. However, most of the rural off-farm enterprises (using power) in rural India are mostly household enterprises. Hence, we control for average power availability for both commercial and domestic purposes in a district (for each seasons). These are weighted by population in each village. On an average, power is available for commercial use in a district for 8.5 hours/day during summer and for 9.2 hours/day during winter. On other hand, power is available for domestic purpose for around 12 hours/day during summer and for 13 hours/day during winter. Average village manufactured products (including handicrafts) in a district is less than 1. On an average, 57% of villages have *pucca* houses.

Urbanization leads to an increase in the demand for off-farm goods which may be produced in the rural areas. Also, in a Lewisian dual-sector framework, the urban centers provide off-farm employment opportunities for the rural population (Lewis, 1954). Urban centers

could have a positive impact on off-farm diversification through higher a demand for off-farm products or / and through increase in off-farm employment opportunity. However, as discussed above, urban centers could also demand variety of farm products. This may result in farm households to be engaged in farm diversification rather than be engaged in off-farm activity. To analyze the effect of urban centers of different sizes, this study considers urban centers in a district categorized into six different classes. The urban centers are classified by population sizes. Class 1 and 2 cities are large urban centers with a population between 1,00,000 and above, and 50,000 to 99,999, respectively. Class 3, 4, 5, and 6 are relatively smaller urban centers. On an average, each district has one Class 1 and / or Class 2 cities, and 11 Class 3, 4, 5 and 6 cities combined.

To control for the agro-climatic conditions of a district, this accounts for rainfall deviation, soil moisture, and soil type condition of the district. The soil type condition is a categorical variable based on Das (2018), indicating the suitability of district soil type for favorable on-farm diversification. The general economic condition of the state is represented by *per capita* state gross domestic product (GDP). On an average, the *per capita* state GDP is around Rs 87,092/- during 2012-13.

4 Methodology

For a household i, in village v, district d, state s, and visit t, the observed non-farm activity is denoted as y_{ivdst}. As mentioned earlier, NSS data allows us to distinguish five different non-farm activities. Accordingly, y_{ivdst} is defined as y_{ivdst} $\bar{0}$, if no off-farm diversification by a farm household, 1 if off-farm diversification as wage labor only (farm sector), 2 if off-farm diversification as wage labor only (non-farm sector), 3 if non-farm businesses / entrepreneurship, 4 if both wage labor (farm sector) and non-farm entrepreneurship / businesses, and 5 if both wage labor (non-farm sector) and non-farm entrepreneurship / businesses.

To determine various farm, household and structural factors affecting farm households choice of off-farm activity, a multinomial probit (MNP) model is considered as follows:

$$y^*_{ivdst} = \gamma_0 + \gamma_1 FARMCH_{ivdst} + \gamma_2 HHLDCH_{ivdst} + \gamma_3 VILLCH_{vdst} + \gamma_4 DISTCH_{ds} + \gamma_5 STATE_s + \epsilon_{ivdst} \quad (1)$$

$FARMCH_{ivdst}$ denote the farm characteristics. $HHLDCH_{ivdst}$ denote the household socio-economic and demographic characteristics. $VILLCH_{vdst}$ and $DISTCH_{ds}$, are the village and district characteristics, respectively. $STATE_s$ denote the state level factor. And, ϵ_{ivdst} is a random error term, such that:

$$E(\epsilon_{ivdst}) \sim N(0, \Omega)$$

$$\text{where, } \Omega = I_N \otimes \Sigma$$

$$\text{and, } \Sigma = E(\epsilon_{ivdst}\ \epsilon'_{ivdst}) = \begin{pmatrix} \sigma_{01} & \cdots & \sigma_{0N} \\ \vdots & \ddots & \vdots \\ \sigma_{5N} & \cdots & \sigma_{5N} \end{pmatrix} \quad (2)$$

Suppose, the available off-farm activity options for the farm household is $y^*_{ivdst} = 1, 2, ..., 5$, then the actual observed choice y_{ivdst} is then obtained as $y_{ivdst} = argmax y^*_{ivdst}$, shown below:

$$y_{ivdst} = \begin{cases} 0 \text{ if } \max\{y^*_{i1}, \cdots, y^*_{i5}\} = y^*_{i0} & \text{No non-farm activity} \\ 1 \text{ if } \max\{y^*_{i1}, \cdots, y^*_{i5}\} = y^*_{i1} & \text{Wage labor (farm)} \\ 2 \text{ if } \max\{y^*_{i1}, \cdots, y^*_{i5}\} = y^*_{i2} & \text{Wage labor (non-farm)} \\ 3 \text{ if } \max\{y^*_{i1}, \cdots, y^*_{i5}\} = y^*_{i3} & \text{Non-farm business} \\ 4 \text{ if } \max\{y^*_{i1}, \cdots, y^*_{i5}\} = y^*_{i4} & \text{Wage labor (farm)+Non-farm business} \\ 5 \text{ if } \max\{y^*_{i0}, \cdots, y^*_{i5}\} = y^*_{i5} & \text{Wage labor (non-farm)+Non-farm business} \end{cases} \quad (3)$$

The above MNP model is estimated as a pool cross-section over the two visits, with visit dummy assigned for the agricultural season.

5 Results and discussion

For model specification, the analysis is first followed in a hierarchical order, from the local farm and household level factors, to the village, district and state level factors. Table 2

shows the four hierarchical models A, B, C, and D, consisting of explanatory variables from the farm and household level, to village, district and state policy variables. Models A and B consist of information based on NSS data. In addition to these, information from Census and other sources are added to generate models C and D.

Table 2: Hierarchical model specification

Models	A		$B = A + Village$	$C = B + District$	$D = C + State$
Levels	Farm	Household	Village	District	State
Variables	Farm size Irrigation share	Soc. Group Household size Age Education Gender Dependents	Prop. in non-farm activity	Social demography Financial infrastructure (financial services) Power infrastructure (commercial & domestic) Agro-clim. (rain, mai, soil) Ground water recharge *Pucca* houses Urban agglomerations (city classifications)	PC GSDP
Source	NSS	NSS	NSS	NSS + Census + other sources	NSS + Census + other sources

We compare the explanatory power of models A, B, C and D based on Likelihood Ratio (LR) tests. The LR are stated in Table 3. When we compare model B over model A, we find that model A is nested in model B, and hence B is a better specification than A (p-value = 0.000). Similarly, model C is a better specification than model B, and model D is a better specification over model C. This indicates that external factors at the village, district and state levels, influences off-farm activity choice. Therefore, in the following analysis, model D specification is considered with all the information on farm, household, village, district, and state variables. The estimated coefficients for the model (D) are presented in Table 4.

Table 3: Likelihood ratio tests for models

Models	LR-chi2	p-value
Model A nested in Model B	23439.9	0.000
Model B nested in Model C	21193.9	0.000
Model C nested in Model D	1581.4	0.000

Source: Authors' calculation based on data as discussed.

5.1 Farm and household

Farm size has a negative and significant impact on the probability of household having any form of off-farm diversification. However, the squared term of land size have a positive and significant effect on all except only entrepreneurship alone. Irrigation share has no impact on off-farm diversification choice. A male headed household raises the probability of wage earning from farm sector only. Similarly, having an illiterate household head raises the probability of working as wage labor (both farm and non-farm sector). A higher number of household members increase the probability of household wage earnings by working in the non-farm sector. SC/ST households have higher probability of working as wage laborer in the farm sector, however, it decreases the probability of having non-farm businesses. A higher average age of the household reduces the probability of wage labor in the farm sector and non-farm businesses. More the standard deviation in household age, more would be wage labor in the non-farm sector and non-farm businesses. Higher the proportion of dependents in the household (household members with age < 15 and > 60), lower would be the probability of wage labor in farm sector and non-farm businesses. Similarly, a higher male female ratio has a negative effect on the probability of wage labor in farm sector and non-farm businesses. Having a higher number of graduates in the household raises the probability of non-farm wage labor and businesses.

5.2 Structural factors

(a) Village

A higher proportion of households in the village engaged in off-farm work increases the probability of all forms of off-farm diversification during both the two seasons. This indicates that there might be strong neighborhood network effect of off-farm work on household off-farm diversification decision. Cooper and John (1988) note that village neighborhoods being homogeneous clusters, household usually take complementary decisions. Having a higher proportion of households in the village engaged in off-farm work might reduce the cost of job search, and hence motivate a farm household to diversify into off-farm activities.

(b) Socioeconomic and infrastructure

A higher proportion of SC population in a district does not seem to have significant effect on farm household's off-farm job choice. However, a higher proportion of ST population in a district have a positive and significant impact on uptake of wage labor in the non-farm sector, and also farm labor and non-farm businesses. ST population are generally resource poor with unfavorable socio-economic conditions. Such households are asset poor, especially farm land. Farm wages are usually lower in districts with higher ST population. This may indicate that farm households could employ farm labor at a cheaper rate and themselves could substitute their labor time with non-farm activities.

A higher proportion of villages in the district with towns at a distance of less than 5 kms and access to public transport decreases the probability non-farm businesses and wage labor. However, both its interaction has an insignificant impact on off-farm diversification. However, having more villages with proximity to towns and village manufactured products, raises non-farm businesses and farm wage labor. Self-help groups (SHG) have a positive and significant impact on farm wage labor, but has a negative effect on non-farm wage labor and non-farm businesses. A higher proportion of villages in a district with access to financial services, lead to higher probability of non-farm businesses, and both farm and non-farm wage labor.

Average domestic power availability has an inverted U-shaped relationship with the probability of non-farm businesses, and both farm and non-farm wage labor with non-farm businesses. This implies that at a lower level, domestic power availability has a positive impact, however, at a higher level (squared term) domestic power availability might offset any gain from domestic power use in non-farm diversification. Similarly, commercial power availability has an inverted U-shaped relationship with probability of non-farm labor, and non-farm businesses with both farm and non-farm labor. Except for wages earner in the off-farm sector, proportion of permanent rural houses in a district has a negative significant impact on off-farm diversification. Though having of higher proportion of *pucca* houses in a district negatively

affects farm wage labor and non-farm businesses, it however has no significant impact on non-farm wage labor among farm households.

(c) Agro-climatic conditions

A favorable soil condition leads to higher probability for off-farm businesses, and both farm and off-farm wage labor. This implies that favorable soil types require less household labor time for on-farm diversification which can be substituted with non-farm household diversification for higher earnings. Deviation in rainfall leads to a rise in the probability of non-farm diversification. Higher ground water recharge reduces off-farm diversification as on-farm diversification may become more attractive. Soil moisture availability has a positive association with the probability of household engaging with non-farm businesses, and with both farm and non-farm wage labor.

(d) Urban agglomeration

In this study, we have considered three different categories of urban centers. We find that urban centres of class 2 have a U-shaped relationship with category 3, 4 and 5 forms of off-farm diversification. Urban centres of class 3, 4, 5, 6 have an inverted U-shaped relationship with non-farm businesses only. This implies that different urban class sizes might have different effects on off-farm diversification choice. Similar findings have been mentioned by Christiaensen et al. (2013) with regard to different impact of urbanization sizes on non-farm diversification.

(e) Size of state economy

A higher *per capita* state GDP seems to have an inverted U-shaped relationship with wage labor only (both farm and non-farm sector). However, with regard to non-farm entrepreneurship, and along with wage labor (both farm and non-farm sector), there is a U-shaped relationship. This may imply that the size of the economy has an impact on raising off-farm activities for those households engaged in wage labor only. However, at a higher level (squared term), it instead helps in raising non-farm entrepreneurship along with wage labor.

Table 4: Multinomial probit model estimation results of non-farm diversification choice

	Base= 0, no non-farm activity				
	y_i				
	1	2	3	4	5
	Wage (farm)	Wage (non-farm)	Business	Wage (farm) & Business	Wage (non-farm) & Business
FARM & HOUSEHOLD					
Total land	-0.189***	-0.144***	-0.0795*	-0.251***	-0.211***
	(-11.20)	(-6.96)	(-2.56)	(-8.12)	(-4.79)
Square total land	0.00364***	0.00331***	0.00160	0.00561***	0.00502***
	(6.71)	(5.19)	(1.36)	(7.86)	(6.04)
Proportion of land under irrigation	-0.00163	0.0233	-0.0420	0.0502	-0.178
	(-0.03)	(0.38)	(-0.43)	(0.48)	(-1.27)
Dummy head male	0.450***	0.113	0.348	0.138	0.214
	(5.49)	(0.78)	(1.61)	(0.60)	(0.85)
Dummy head illiterate	0.409***	0.158**	0.0670	0.309**	0.116
	(8.66)	(2.63)	(0.64)	(2.75)	(0.91)
Household size	0.00679	0.0492***	-0.0293	-0.0768**	0.000660
	(0.66)	(3.98)	(-1.13)	(-2.68)	(0.02)
Dummy SC/ST household	0.196***	0.0826	-0.233*	0.0408	-0.153
	(3.80)	(1.26)	(-2.00)	(0.31)	(-0.97)
Avg household age	-0.00950***	-0.00495	0.00291	-0.0101*	0.000717
	(-3.72)	(-1.52)	(0.64)	(-2.14)	(0.11)
SD household age	0.00419	0.00822	0.00985	0.0115	0.0255**
	(0.98)	(1.45)	(1.42)	(1.60)	(2.77)
Proportion of dependents	-0.174	0.142	-0.0551	-0.464*	-0.102
	(-1.71)	(1.17)	(-0.25)	(-2.10)	(-0.35)
Male female ratio	-0.113	0.207	-0.337	-0.719*	0.439
	(-0.91)	(1.27)	(-1.06)	(-2.04)	(1.08)
Graduates	-0.306*	0.921***	0.267	-0.413	0.818*
	(-2.08)	(5.80)	(0.77)	(-1.11)	(2.20)
VILLAGE					
Village proportion of non-farm workers	2.446***	1.926***	5.755***	6.535***	5.270***
	(35.50)	(21.97)	(19.22)	(17.65)	(11.22)

Source: Authors' calculation based on data as discussed.
Robust Z statistics in parentheses.
$*p < 0.1$, $**p < 0.05$, $***p < 0.001$
0: no off-farm diversification by a farm household (base), 1: wage earner only (farm sector), 2: wage earner only (non-farm sector), 3: non-farm businesses / entrepreneurship only, 4: both wage earner (farm sector) & businesses / entrepreneurship, 5: both wage earner (non-farm sector) & businesses / entrepreneurship as the form of non-farm diversification.

Table 4 (*contd.*): Multinomial probit model estimation results of non-farm diversification choice

	Base= 0, no non-farm activity				
	y_i				
	1	2	3	4	5
	Wage (farm)	Wage (non-farm)	Business	Wage (farm) & Business	Wage (non-farm) & Business
DISTRICT					
(i) Social composition, infrastructure					
Proportion of SC	-0.562	0.0179	0.892	-0.00784	-0.498
	(-1.69)	(0.04)	(0.73)	(-0.01)	(-0.33)
Proportion of ST	0.0915	-0.378	2.896***	1.253*	3.449***
	(0.54)	(-1.65)	(5.69)	(2.48)	(5.71)
Proportion with towns within 5kms	0.0897	0.780	-5.627*	-6.583**	-6.059
	(0.13)	(0.85)	(-2.51)	(-3.06)	(-1.93)
Proportion with public transport	0.169	0.551	-6.415***	-7.309***	-7.228***
	(0.55)	(1.22)	(-4.55)	(-6.04)	(-3.70)
Public transport * towns within 5 kms	0.111	-1.128	-1.511	-0.172	0.452
	(0.16)	(-1.21)	(-0.63)	(-0.07)	(0.14)
Avg village manf items	-0.133	0.331**	-4.083***	-3.982***	-1.942***
	(-1.32)	(2.85)	(-13.55)	(-13.39)	(-3.38)
Avg village manf items* towns within 5 kms	0.488*	-0.166	7.802***	8.257***	2.089
	(2.16)	(-0.73)	(10.75)	(10.65)	(0.97)
Proportion of SHG	0.258**	-0.564***	-3.885***	-2.656***	-2.727***
	(2.61)	(-5.05)	(-10.10)	(-6.07)	(-4.01)
Proportion of finservices	0.0581	-0.228	3.980***	2.466***	3.069***
	(0.50)	(-1.70)	(13.56)	(7.93)	(7.42)
Avg power available for dom. use	0.0134	-0.0393	1.519***	1.327***	1.407***
	(0.87)	(-1.74)	(14.80)	(11.65)	(8.13)
Sq avg power available for dom. use	-0.00000284	0.00128	-0.0481***	-0.0401***	-0.0428***
	(-0.00)	(1.58)	(-14.45)	(-10.99)	(-7.71)
Avg power available for com. use	-0.0165	0.0915***	0.853***	1.074***	0.783***
	(-1.01)	(3.90)	(10.17)	(9.64)	(6.20)
Sq avg power available for com. use	0.000725	-0.00311***	-0.0204***	-0.0296***	-0.0209***
	(1.16)	(-3.62)	(-7.52)	(-8.35)	(-5.42)
Pucca rural houses	-0.00392**	-0.00149	-0.0183***	-0.0284***	-0.00627
	(-2.63)	(-0.83)	(-4.29)	(-6.14)	(-1.20)
(ii) Agro-climatic					
Dummy favorable on-farm diversification	0.0676	-0.340***	1.526***	1.454***	1.394***
	(1.26)	(-4.67)	(10.40)	(9.80)	(6.44)
Rainfall deviation	0.0000429	-0.000314	0.000472***	0.000363***	0.000234**
	(0.67)	(-1.69)	(6.92)	(4.63)	(2.77)
Share of groundwater recharge	0.0643	0.160	-1.015***	-0.509	-0.788*
	(0.57)	(1.05)	(-3.91)	(-1.90)	(-2.39)
Moisture availability index	-0.251***	-0.244**	0.624***	0.567**	0.731**
	(-4.24)	(-2.81)	(3.37)	(3.03)	(2.67)

Table 4 (*contd.*): Multinomial probit model estimation results of non-farm diversification choice

	Base= 0, no non-farm activity				
	y_i				
	1	2	3	4	5
	Wage (farm)	Wage (non-farm)	Business	Wage (farm) & Business	Wage (non-farm) & Business
(iii) Urban agglomeration					
Class 1 cities	0.0489	-0.0357	-0.0286	-0.155	-0.157
	(0.80)	(-0.41)	(-0.20)	(-1.08)	(-0.70)
Square of class 1 cities	-0.000369	0.0191	-0.0835**	-0.0203	-0.0363
	(-0.03)	(1.21)	(-3.13)	(-0.76)	(-0.98)
Class 2 cities	-0.0615	0.159*	-0.839***	-0.718***	-0.794***
	(-1.20)	(2.17)	(-7.91)	(-7.20)	(-5.66)
Square of class 2 cities	0.00755	-0.0281	0.127***	0.0877***	0.119***
	(0.71)	(-1.83)	(6.92)	(4.97)	(5.39)
Class 3, 4, 5, 6 cities	0.00288	-0.0115	0.0603*	0.0384*	0.0765
	(0.46)	(-1.28)	(2.06)	(2.28)	(1.80)
Square of class 3, 4, 5, 6 cities	-0.0000232	0.000130	-0.00123*	-0.0000245	-0.00110
	(-0.36)	(1.47)	(-1.96)	(-0.12)	(-1.28)
Ratio of class 1 and 2 cities to total cities	0.474*	-0.535	4.538***	5.380***	3.398***
	(2.21)	(-1.76)	(8.57)	(10.91)	(3.46)
STATE					
Per capita state GDP	0.0000263***	0.0000268***	-0.000467***	-0.000451***	-0.000428***
	(6.07)	(4.63)	(-18.89)	(-18.09)	(-10.63)
Square per capita state GDP	-1.28e-10***	-1.14e-10***	2.09e-09***	2.05e-09***	1.91e-09***
	(-6.09)	(-4.24)	(18.96)	(18.28)	(10.51)
Dummy Visit 2	-0.108	-0.224	-0.640***	-0.128	0.0826
	(-1.14)	(-1.88)	(-3.68)	(-0.70)	(0.31)
Constant	-2.819***	-3.907***	5.710***	6.078***	3.695
	(-6.63)	(-6.21)	(3.31)	(3.55)	(1.16)
N	57834	57834	57834	57834	57834
Log pseudolikelihood	-1347160.9				
AIC	2694732				
BIC	2696570				

6 Conclusion & policy implications

The path of economic growth and development in the advanced economies has been through the process of structural transformation. This involves a rise in the share of non-farm sector in the national income and migration from rural to urban areas. Though in the case of India, structural change in the economy has led to a decline in the share of agricultural sector, still employment in the farm sector remains very high. Rural to urban migration has been typically of seasonal nature in India, with rural households still dependent on agriculture. However, non-farm income share in rural household has been rising in India. This may be attributed to the fact that farm households in India are adopting non-farm livelihood diversification. Literature so far provides a macro account of this phenomenon. However, a micro perspective to this macro story is not clearly available in the literature. This paper contributes to the understanding of structural change in rural India by analyzing the factors which determine farm household's decision of non-farm diversification.

Using a nationwide farm household data and applying a multinomial probit estimation, this study finds that apart from farm and household conditions, the local external structural feature of the economy also affects household non-farm diversification decision. Our analyses show that neighborhood non-farm labor participation has a role in non-farm diversification. This shows that farm households benefit by adopting a "complementary strategy" (Cooper and John, 1988), and hence engage in non-farm pursuits. This has policy implication for encouraging for increasing rural non-farm diversification at the village level.

The findings show that proximity to towns and access to public transport may not affect non-farm diversification. Das (2018) finds that proximity to towns and public transport raises the probability of on-farm diversification. This indicates that at the margin, with easy access to towns and public transport, on-farm diversification is more profitable for farm households than off-farm diversification. Studying Sub-Saharan countries, Davis et al. (2017) find that irrespective of distance or integration with urban centers, farm households prefer to be engaged in farming activities. Farm households which are within the nearby periphery

of towns find it profitable to diversify on-farm and sell their products in the urban centers. This has policy relevance for understanding the trade-off for farm households between farm and non-farm diversification.

Access to financial services increases the probability of entrepreneurial activities along with wage employment. This indicates that access to financial services allows farm households to undertake non-farm activities and also generate rural employment. However, accesses to rural financial services are skewed in India. Most of the villages with access to financial services are concentrated in the western and southern regions of India (Appendix Figure 6). There is scarce presence of financial services in the eastern and northern states. This has implications for provisioning of financial services in the lagging districts for improved off-farm rural employment.

Rural power availability is crucial for generating non-farm employment Wolfram et al. (2012). Our results show that both commercial and domestic power availability has a positive effect on non-farm diversification decision. Domestic power availability help in substituting labor time doing household chores with non-farm activities (Dinkelman, 2011). On the other hand, commercial power availability directly helps in raising non-farm activities. This has policy implications for India. Domestic power is mostly prevalent in the western and southern states of India (Appendix Figure 7 & 8), with few districts in eastern districts. Almost all the districts in western India enjoy domestic power availability of more than 10 hours per day. Similarly, rural commercial power availability is mostly seen in the western, northern and southern regions. Hence, for better non-farm opportunities in the eastern and central regions, it is important to improve upon rural domestic and commercial power availability in such districts.

This study finds that agro-climatic conditions have a bearing on non-farm diversification decision. A soil type which favors on-farm diversification increases the probability of wage and entrepreneurial forms of non-farm diversification. It points to the fact that, a favorable soil condition for farming activities releases household labor time for non-farm activities.

Similarly, soil moisture content also favors household off-farm employment. Thus, policy makers should take into account the agro-climatic condition of a region while making policy decisions. Urbanization increases migration and raises non-farm employment. However, our results show that different urban class sizes might have varied impacts on off-farm diversification choice. *Per capita* state GDP have a positive influence on wage earning decision (both farm and non-farm), whereas, it helps in non-farm entrepreneurial activities only at a higher level.

The paper highlights the structural features that may matter for farm household's off-farm livelihood decisions. It may be well argued that household process of livelihood diversification is a dynamic process. However, this study presents a static view of off-farm employment diversification. Availability of panel structural variables would provide a spatio-temporal impact of structural features on household off-farm diversification decisions. Another limitation in this study is that local village level labor market conditions are measured in an indirect manner. It would have been better if some direct measures were available. Since, such information is not available, the network effects different sectors might have on off-farm diversification decision can not be estimated.

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Appendices

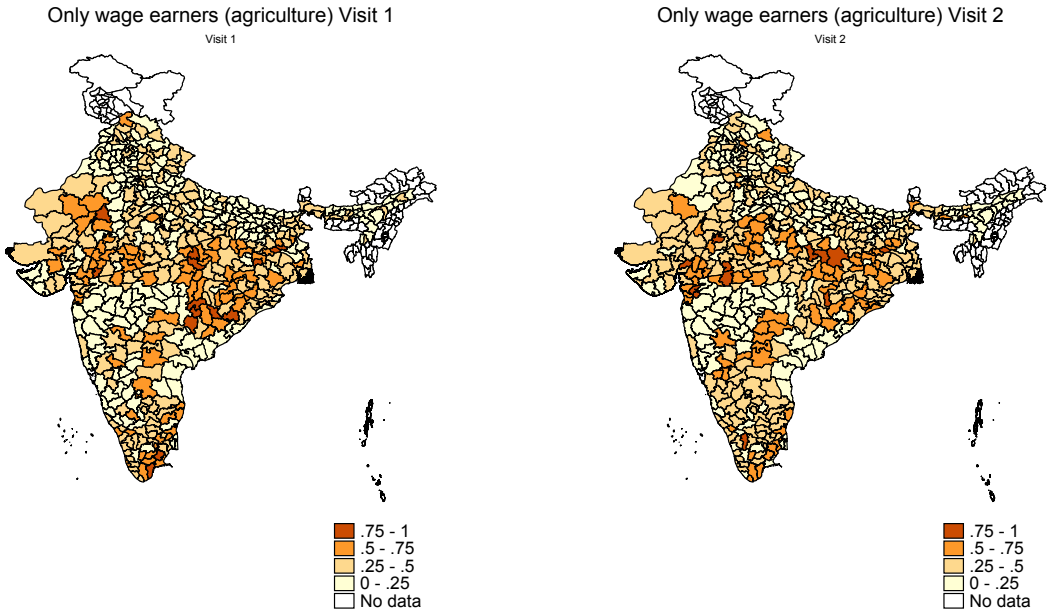

Figure 1: Only wage earners (agriculture) during *kharif* and *rabi* seasons in India
Source: Authors' calculation based on NSS 70^{th} round.

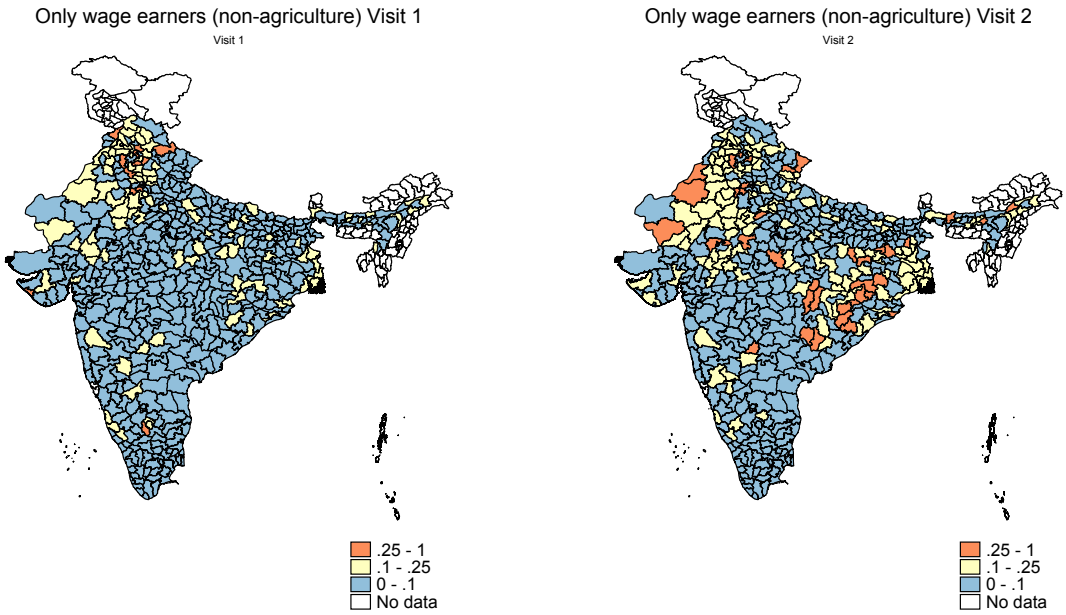

Figure 2: Only wage earners (non-agriculture) during *kharif* and *rabi* seasons in India
Source: Authors' calculation based on NSS 70^{th} round.

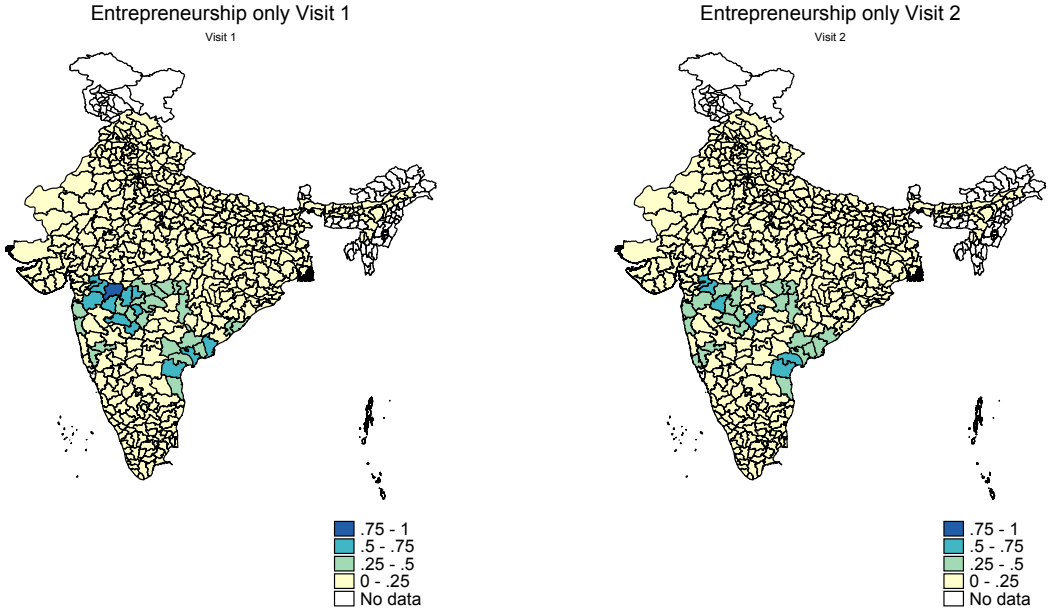

Figure 3: Entrepreneurship only during *kharif* and *rabi* seasons in India
Source: Authors' calculation based on NSS 70^{th} round.

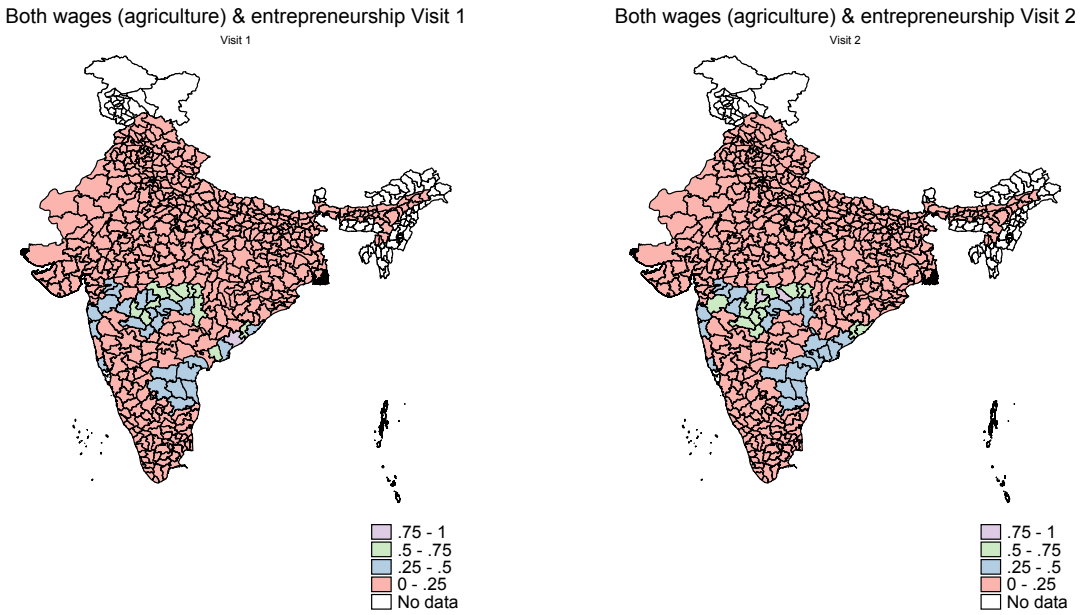

Figure 4: Both wages (agriculture) & entrepreneurship during *kharif* and *rabi* seasons in India
Source: Authors' calculation based on NSS 70^{th} round.

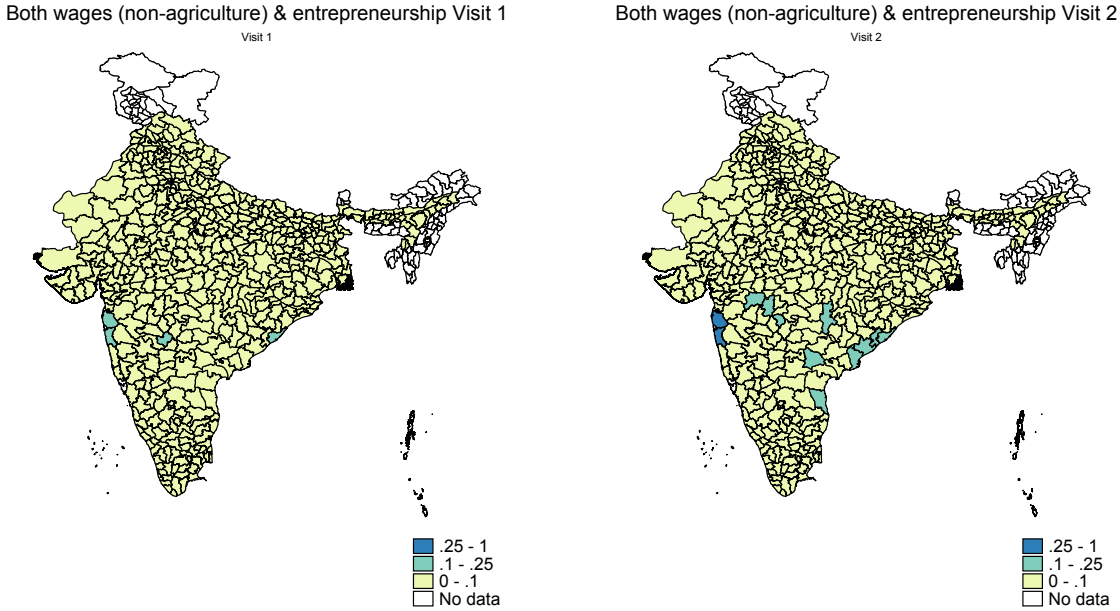

Figure 5: Both wages (non-agriculture) & entrepreneurship during *kharif* and *rabi* seasons in India
Source: Authors' calculation based on NSS 70^{th} round.

Table 1: Variable notations, definitions & summary statistics

Variable	Description	Mean	Std. Dev.	Min	Max
FARM & HOUSEHOLD					
Source: NSS 70^{th} round					
Visit 1					
Total land (hectares)	Total land possessed	1.58	1.97	0	65.9
Proportion of land under irrigation	Share of irrigated land	0.44	0.49	0	1
Dummy head male	Dummy=1 if head is male, 0 otherwise	0.93	0.25	0	1
Dummy head illiterate	Dummy=1 if head is illiterate, 0 otherwise	0.36	0.48	0	1
Household size	Household size	5.41	2.77	1	41
Dummy SC/ST household	Dummy=1 if household ST/SC	0.28	0.45	0	1
Avg household age	Average age of the household members	31.76	11.89	9	95
Proportion of dependents	Proportion of dependents in the household	0.47	0.25	0	1
Male female ratio	Ratio of male to female members in the household	0.52	0.16	0	1
Graduates	Proportion of household members graduate & above	0.05	0.15	0	1
Visit 2					
Total land (hectares)	Total land possessed	1.58	1.97	0	65.9
Proportion of land under irrigation	Share of irrigated land	0.44	0.49	0	1
Dummy head male	Dummy=1 if head is male, 0 otherwise	0.92	0.27	0	1
Dummy head illiterate	Dummy=1 if head is illiterate, 0 otherwise	0.36	0.48	0	1
Household size	Household size	5.41	2.77	1	41
Dummy SC/ST household	Dummy=1 if household ST/SC	0.28	0.45	0	1
Avg household age	Average age of the household members	31.76	11.89	9	95
Proportion of dependents	Proportion of dependents in the household	0.47	0.25	0	1
Male female ratio	Ratio of male to female members in the household	0.52	0.16	0	1
Graduates	Proportion of household members graduate & above	0.05	0.15	0	1
VILLAGE					
Source: NSS 70^{th} round					
Village proportion of non-farm workers	Proportion of households engaged in non-farm activities in village (Visit 1)	0.46	0.34	0	0.9
Village proportion of non-farm workers	Proportion of households engaged in non-farm activities in village (Visit 2)	0.5	0.34	0	0.9

Table 1: Variable notations, definitions & summary statistics (*contd.*)

Variable	Description	Mean	Std. Dev.	Min	Max
DISTRICT					
Source: Census, RBI, GoI					
(i) Social composition, infrastructure, agro-climate					
Proportion of SC	Proportion of SC population	0.19	0.09	0	0.6
Proportion of ST	Proportion of ST population	0.12	0.18	0	1
Proportion with public transport	Proportion of villages connected by public transport	0.25	0.28	0	1
Proportion with towns within 5kms	Proportion of villages with town ¡ 5 kms	0.98	0.11	0	1
Avg village manf items	Avg no. of manufacture & handicrafts produced	0.2	0.32	0	3
Proportion with SHG	Proportion of villages with self help groups	0.69	0.26	0	1
Proportion of finservices	Proportion of villages with access to financial services	0.32	0.27	0	1
Avg power available for com. use (hrs./day)	Weighted daily avg commercial power use (Summer)	8.47	6.78	0	24
Avg power available for dom. use (hrs./day)	Weighted daily avg domestic power use (Summer)	11.88	5.72	0.2	24
Avg power available for com. use (hrs./day)	Weighted daily avg commercial power use (Winter)	9.21	7.1	0	24
Avg power available for dom. use (hrs./day)	Weighted daily avg domestic power use (Winter)	12.97	5.92	0.16	24
Pucca rural houses	Percentage of pucca rural houses	57.59	21.2	6.4	97.6
(ii) Agro-climatic					
District rainfall deviation	Rainfall deviation from normal (Visit 1)	-19.4	43.9	-144.2	213.5
District rainfall deviation	Rainfall deviation from normal (Visit 2)	89.7	565.2	-96.3	7993.4
Moisture availability index	Moisture available in the soil type of the district	0.7	0.4	0.1	2.6
Dummy soil type	Dummy=1 if district soil type is favorable for on-farm diversification, 0 otherwise (Visit 1)	0.7	0.5	0	1
Dummy soil type	Dummy=1 if district soil type is favorable for on-farm diversification, 0 otherwise (Visit 2)	0.2	0.4	0	1
Share of groundwater recharge	Replenishable share of groundwater recharge (Summer)	0.8	0.2	0.1	1
Share of groundwater recharge	Replenishable share of groundwater recharge (Winter)	0.4	0.3	0	1
(iii) Urban agglomeration					
Class 1 cities	Number of urban centres with population 100000 or above	1.1	1	0	6
Class 2 cities	Number of urban centres with population 50000-99999	1	1.2	0	7
Class 3, 4, 5, 6 cities	Number of urban centres with population 20000-49999, 10000-19999, 5000-9999, below 500	11.3	13.1	0	96
Ratio of class 1 and 2 cities to total cities	Ratio of class 1 & 2 urban centres	0.2	0.2	0	1
STATE					
Source: RBI					
Per capita state GDP	Per capita State GDP	87092.4	42089	32824.6	172685.6

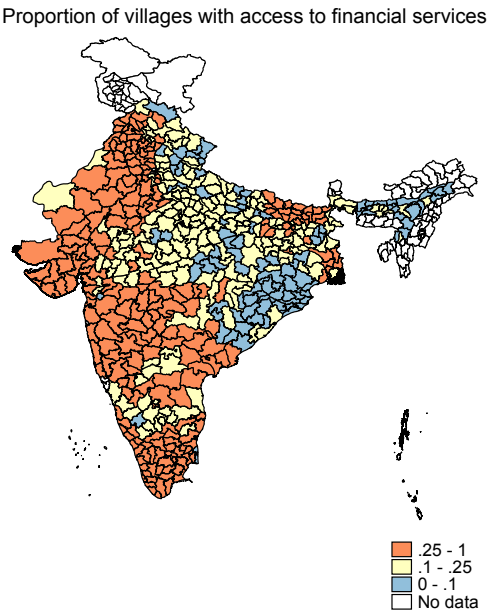

Figure 6: Proportion of villages with access to financial services
Source: Authors' calculation based on Census 2011.

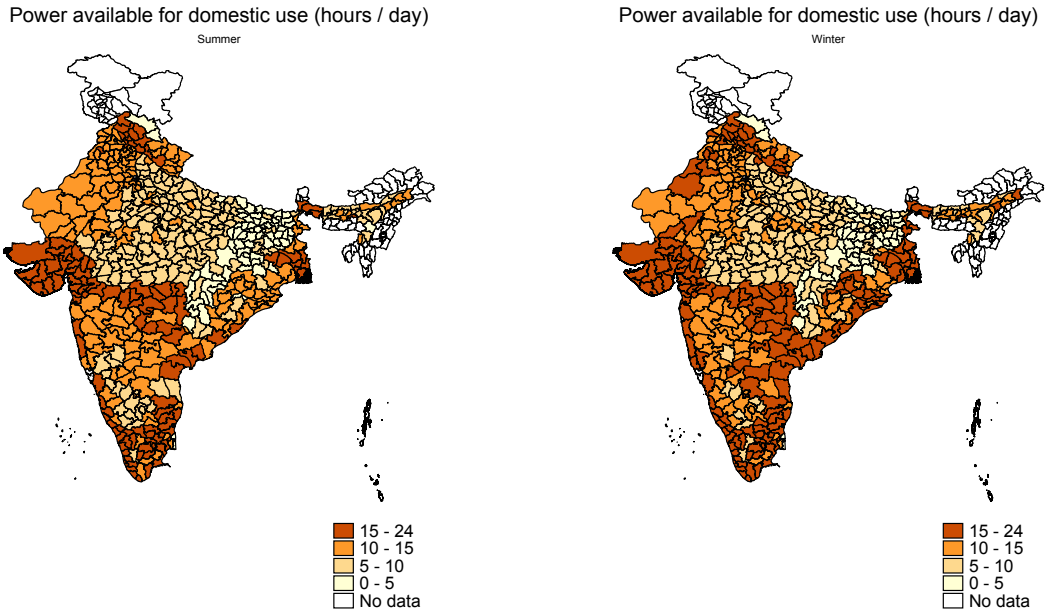

Figure 7: Power available in villages for domestic use (hours/day)
Source: Authors' calculation based on Census 2011.

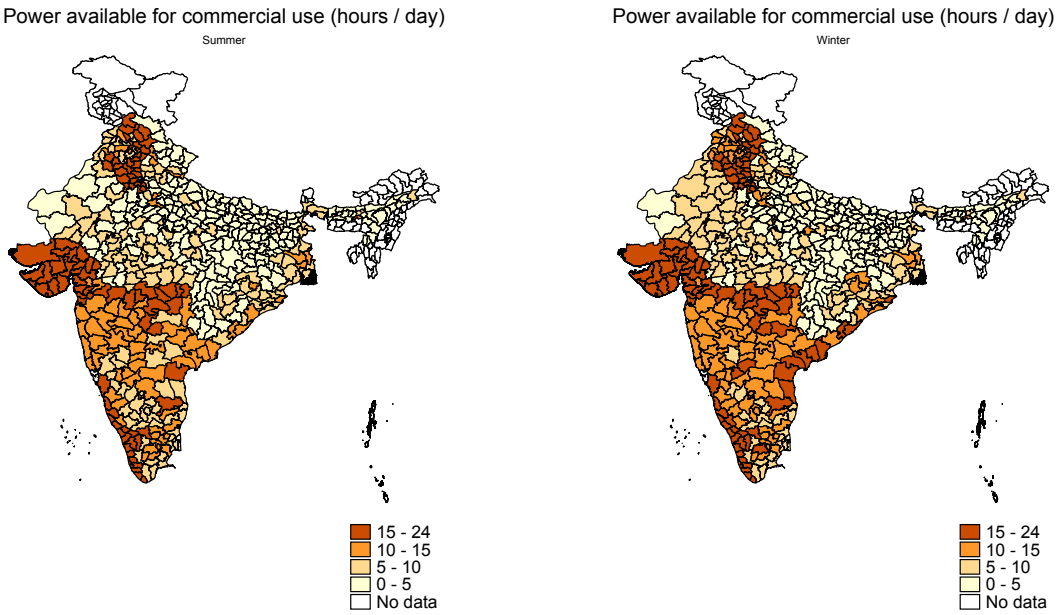

Figure 8: Power available in villages for commercial purpose (hours/day)
Source: Authors' calculation based on Census 2011.