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Minimum Wages and Lighthouse Effect in the Presence of Wage and Non-wage Sectors in India: An Exploratory Analysis of the Non-Farm Sector

Mohit Sharma* **and Brinda Viswanathan****

The Indian labour market is characterised by large informality and self-employment. While most of the literature in developing nations on minimum wages has focused on the impact of minimum wages on wages and the employment of the 'wage earners', this leaves out a large proportion of the self-employed workforce (non-wage earners). Using the novel data on minimum wages and with the availability of earnings data for self-employed workers in the recent Periodic Labour Force Survey (PLFS) rounds 2017-18, 2018-19, and 2019-20, this study attempts to explore the role of minimum wages on the earnings of all categories of workers, including self-employed in the non-farm sector. We find that for unskilled and semi-skilled workers who have studied up to secondary education, higher levels of minimum wages reduce the earnings gap between regular, own-account, and casual workers. This might indicate the "lighthouse effect", where both casual and own-account workers (primarily engaged in informal activities) use minimum wages as a numeraire to carry out earnings negotiations. It has also been found that a higher level of minimum wage reduces the earnings disparity between males and females.

***JEL classification**: J21, J23, J30, J31, J46, J50*

Keywords: Minimum wage, Informality, Self-employment, Lighthouse effect, India

1. Introduction

The statutory enactment of minimum wages helps to protect workers against low wages. It can further help in reducing wage inequality and poverty (David, Manning, and Smith 2016; Mansoor and O'Neill, 2021; Stigler, 1946). However, the most direct impact of minimum wages is expected to be on the wages of the workers. Almost all studies that estimate wage effects have found a positive relationship between minimum wages and the wages of the worker (Card and Krueger (1994); Dickens et al. (1999); Dube (2019); Lemos (2009); Dube et al.(2010); Dinkelman and Ranchhod (2012); Bhorat et al. (2013); Giuliano (2013); Dolton et al. (2015); Gudibande and Jacob (2017); Cengiz et al. (2017); and Menon and Rodgers (2017); Soundarajan. V (2019); Gopalan (2020); Mansoor and O'Neill (2021).

The positive impact of minimum wages is particularly visible on the wages of the workers belonging to the formal sector (Fajnzylber 2001; Gindling and Terrell 1995; Maloney and

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Nunez Mendes 2004). However, the higher level of minimum wages has also been found to raise wages in the informal sector, which is indicative of the "lighthouse effect" (Betcherman, 2015). According to the "lighthouse effect", in the presence of legislated minimum wages, usually workers and employers undertake wage bargaining with minimum wages as their benchmark. Maloney and Mendez (2004); Menon and Rodgers (2017); Baanante (2004), and Lemos (2009) discuss the "lighthouse effect". Faznzlyber (2001) argued that there is considerable evidence that minimum wage is used as a *numeraire* not only by the protected formal sector but also in the informal sector. This is indicative of the "lighthouse effect" for informal sector workers.

This paper aims to make two contributions to the existing literature using the novel minimum wage data compiled using state-wise minimum wage notifications for respective scheduled employments and job categories and earnings data of all workers provided by the Periodic Labour Force Survey (PLFS) for the year 2017-18, 2018-19, and 2019-20. First, it aims to analyse the association between minimum wages and earnings of different categories of workers, including self-employed workers. Second, to explore whether the "lighthouse effect" exists among the unskilled and low-skilled casual and own-account workers.

In developing countries, like India, the labour market is characterised by large informality and self-employment. 91 per cent of the workers in India are informally employed (ILO, 2021). Moreover, according to PLFS, 2019-20, 53.6 per cent of the Indian workforce (farm and non-farm together), and 37.3 per cent in the non-farm sector are self-employed. India is also one of the first developing countries to have minimum wage regulations with the aim of protecting workers from receiving excessively low wages. In India, the Minimum Wages Act was enacted in 1948 and, for the past 70 years, has been shaping the minimum wage policy of the country. The Minimum Wages Act, 1948 allows the Government of India to revise and fix minimum wages for employees working in scheduled employment (ILO, 2018). Both the central government and state governments fix minimum wages for scheduled employment under their authority. The state-wise minimum wages are announced according to skill level for each of the scheduled employment. This evolving process has contributed to building a complex web of minimum wage rates in India (Satapathy et al., 2021). At present, the minimum wage system in India has nearly 429 scheduled employments, with 45 in the Central sphere and the rest in various states, and 1,915 scheduled job categories for unskilled workers (GoI, 2018).

To do away with these complexities, the Government of India came up with the new Wage Code Bill (2019). This bill was enacted in many states in 2021. The Wage Code Bill is complemented by wage rules; both discuss several aspects of the reform related to the system of minimum wage in India. One of the key reform measures that the Wage Code Bill discusses is the universalisation of payment of wages by allowing a legal extension of minimum wages to all wage-earners in India. The universalisation of payment of Minimum Wages is expected to protect the most vulnerable group of wage-earners belonging to the informal sector. While the Wage Code Bill is applicable to wage-earners, it leaves out 53 per cent of the workforce, who are self-employed; many of them belong to vulnerable sections of the informal sector.

In the past decade or so, several studies have examined the impact of minimum wages on wages and employment in India. However, most of the earlier studies in India are primarily concerned with wage-earners and leave aside self-employed workers. Few studies have analysed the employment effects of minimum wages on the self-employed, but could not study the wage effects of minimum wages on the earnings of the self-employed. This is largely due to the non-availability of earnings for the self-employed until recently.[1]

Evidence from other countries shows that minimum wages impact the entire earnings distribution, including those of self-employed workers (Fajnzylber, P., 2001). However, even internationally, the evidence is limited to a few studies.

The structure of the paper is as follows. Section 2 covers the literature review. Section 3 provides a discussion on PLFS data and how minimum wage data have been compiled. Section 4 briefly discusses the labour market trends in India. Section 5 discusses the estimation strategy and presents the main findings from the regressions. Section 6 concludes with a discussion of the potential takeaways.

2. Literature Review

2.1 Wage and Employment Effects of Minimum Wages

The curiosity to understand the costs and benefits of minimum wage legislation, in conjunction with the rise of innovative econometric applications, has impelled the rise of voluminous and rich literature since the early 1990s. In his seminal analysis, Stigler (1946) explored the economics of minimum wage legislation. According to him, the impact of minimum wages on aggregate employment is dependent on the market structure. In a perfectly competitive labour market, wages are usually set by market forces rather than individual employers. In this case, the imposition of a minimum wage above the market-clearing wage for low-skilled workers can result in a reduction in employment. However, this might not hold true in the real world, where there is overwhelming evidence of monopsonistic labour markets where employers set wages at the low end of the labour market (Ashenfelter, Farber and Ransom 2010; Manning 2011 and Soundarajan 2019). Therefore, in the case of a monopsonistic market, enacting minimum wages can result in an increase in employment as long as it is below the threshold wage. If minimum wages are set above this threshold wage, then that can result in a decline in employment.

Owing to this theoretical framework under which different outcomes of employment are possible, the literature on the impact of minimum wages on employment reaches different conclusions. Some studies have found a positive or null impact of minimum wages on wages and employment (in Card and Krueger (1994), Dickens et al. (1999), Dube (2019), Lemos (2009), Dube et al.(2010), Dinkelman and Ranchhod (2012), Bhorat et al. (2013), Giuliano (2013), Dolton et al. (2015), Gudibande and Jacob (2017), Cengiz et al. (2017), and Menon and Rodgers (2017), Soundarajan. V (2019), Gopalan (2020), Mansoor and O'Neill (2021), while several others have found a negative impact of minimum wages on employment including

[1] Periodic Labour Force Survey (PLFS) data, since 2017-18, started collecting information on earnings of all kind of workers including self-employed.

Neumark and Wascher (1992), Bell (1997), Burkhauser et al. (2000), Strobl and Walsh (2003), Machin and Wilson (2004), Lemos (2004), Gindling and Terrell (2009), and Neumark et al. (2014). The divergent findings in the literature can be attributed to the structure of labour markets (degree of monopsony power), the bargaining power of the trade unions, and the ability of the industrial sector to pass through the increasing costs to the consumers (Dube, 2019). However, the threshold of the minimum wage that can result in a decline in employment is more of an empirical question. In the Indian context, Soundarajan (2019), Gudibande and Jacob (2020), and Mansoor and O'Neill (2021) used a quasi-experimental approach to analyse the impact of minimum wages on wages and employment.

2.2 Distributional Effects of Minimum Wages

According to Stigler (1946), the popular objective of minimum wage legislation is fighting poverty. According to him, minimum wages can have a positive impact on family income at the lower tail of the wage distribution, thereby reducing inequality in wages. One of the earlier empirical studies on the impact of minimum wages on wage inequality was conducted to explore the rising wage inequality in the United States of America during the 1980s. Lee (1999) concluded that from 1979 to 1988, the rising wage inequality can entirely be attributed to the fall in federal minimum wages during that period. David et. al. (2016), in their seminal work, carried out the analysis of three decades of data, since 1980, and concluded that minimum wage reduces inequality in the lower tail of the wage distribution. The evidence from developing countries is limited, but many interesting studies have been conducted. Similar to Lee (1999), Bosch and Manacorda (2010) find evidence that the growth in wage inequality in Mexico, for the bottom end of the wage distribution, can be explained by the decline in the minimum wage between the late 1980s and early 2000s. Lemos (2007) and Sotomayor (2021) found that the enactment of minimum wage legislation reduced poverty and inequality in Brazil. Similarly, in an interesting study for Indonesia, Yamada (2016) concluded that an increase in minimum wages not only resulted in enhancement of employment but also an increase in earnings at the lower tail of the distribution. Mansoor and O'Neill (2021) carried out an analysis to explore the impact of minimum wage compliance on employment and household welfare in India. According to them, the increase in minimum wages positively impacts both employment and household consumption in high compliance regimes. However, they have not found similar evidence in a low compliance regime. Further, Besler and Rani (2011) argue that perfect enforcement of minimum wages would significantly reduce inequality, poverty, and the gender pay gap.

2.3 Effects of Minimum Wage in the Presence of Informal and Self-Employed Sector

If minimum wages induce the migration of workers from the formal wage-earning sector, the corresponding increase in the supply of labour in the informal wage-earning or self-employed sector could, in principle, lower earnings. There are, however, several countering effects that could lead to the opposite result (an increase in informal sector earnings). Fajnzylber (2001) found that minimum wages impact the entire wage distribution, and the changes in wage distribution seem to impact all kinds of workers, including self-employed

workers. Fajnzylber (2001) found that self-employed benefitted from an increase in the minimum wage, with an earnings elasticity of self-employed workers (1.32) which is significantly larger than that of formal and informal salaried workers (1.08 and 1.03, respectively). Alaniz, Gindling, and Terrell (2011) estimated the impact of minimum wages on the transition of workers from the covered sector to the uncovered sector, including self-employment. An increase in wages in the formal private sector can result in disemployment, and these disemployed workers can find themselves working as self-employed workers. Further, according to Alaniz, Gindling, and Terrell (2011) due to higher legal minimum wages, many workers who lost their jobs in the private sector were forced to enter into unpaid family work. Moreover, the increase in minimum wages can result in higher prices, which in turn can impact the self-employed workers (Bird and Manning, 2008).

3. Data Source

This study makes use of the Periodic Labour Force Survey (PLFS) 2017-18, 2018-19, and 2019-20 datasets. PLFS collects yearly information on key employment and unemployment indicators that can help us to estimate the Labour Force Participation Rate (LFPR), Unemployment Rate, proportional distribution of different categories of workers, and average earnings, among many others. It also collects information about individual worker-specific details such as gender, socioeconomic group, general education level, marital status, religion, household size, and age.

The information is collected both using Current Weekly Status (CWS) and Usual Primary and Secondary Status (UPSS). Under CWS and UPSS, the activity status of the worker is determined using the seven-day reference period and one year preceding the date of the survey, respectively. The information on earnings is available only for CWS, as a result. We have used CWS criteria to categorise workers into employer, regular, casual and own-account workers.

The dataset on minimum wages is compiled using state-wise notifications issued by the Labour departments of respective State governments. The minimum wages are notified for all categories of workers, regardless of their gender, age, or whether working in rural/urban locations. Moreover, they are notified for the respective scheduled employment. The number of scheduled employment differs from state to state. For instance, Odisha notified minimum wages for 89 scheduled employment, whereas Bihar notified minimum wages for 69 scheduled employment.

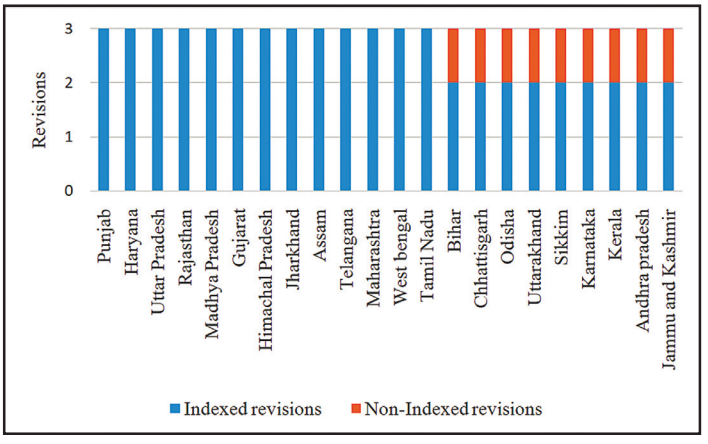
For the purpose of analysis, we mapped minimum wages to PLFS data, effective before January of the same year when the PLFS survey took place. For instance, workers belonging to PLFS 2017-18 were mapped using minimum wage data prior to January 2017 for the majority of states.[2] This has been done to account for adjustment lags for the internalisation of minimum wage in the system (Soundarajan 2019, Menon 2017).

It is mandated in the 'Minimum Wage Act, 1948' to revise the minimum wage not exceeding

[2] For some states this could not be done due to unavailability of data. The details are provided in appendix A

five years. Figure 1 shows the indexed and non-indexed minimum wage revisions. 15 states and 3 Union Territories (UTs) have undertaken a minimum of 3 indexed revisions between 2016 and 2019, with a few making 2 indexed and 1 non-indexed revision. Two states, Manipur and Mizoram, have not made any revision to the minimum wage during this period. In Puducherry, only one indexed revision was made. 13 states and two Union Territories have made a single non-indexed revision. Nine states are shown in the picture; the other four are Arunachal Pradesh, Meghalaya, Nagaland and Tripura. The two UTs that have made non-indexed revisions are Lakshadweep and Andaman and Nicobar.

Figure 1: Minimum wage revisions between 2016 and 2019 for selected states



Source : Author's Estimate

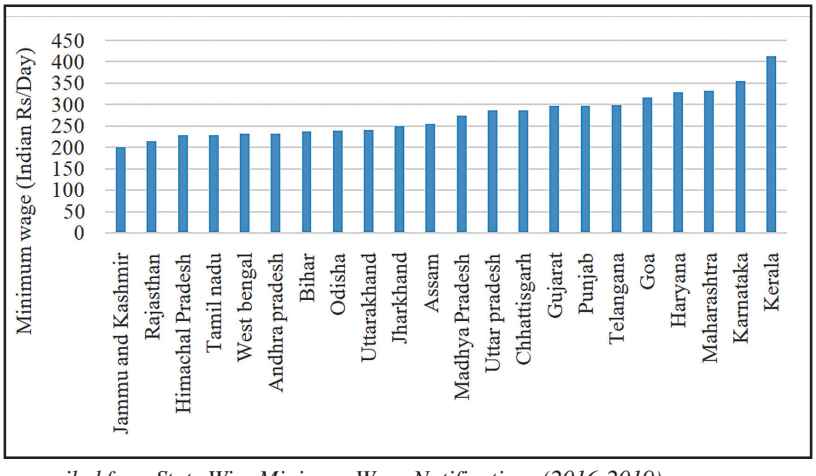
The format for announcing the minimum wage also differs from state to state.[3] Some states use only skill level as the basis for announcing minimum wages. In these states, different minimum wages are announced for each skill level (unskilled, semi-skilled, skilled and high-skilled), but minimum wages remain the same across scheduled employments. On the other hand, some states use skill level as well as scheduled employment as the basis to announce minimum wages. In these states, different minimum wages are announced for each scheduled employment and the skill level within each scheduled employment. In this study, we have mapped skill level-wise minimum wages present in the minimum wage to the PLFS worker data using the National Classification of Occupation (NCO, 2015) categorisation of occupations into different skill levels. For a few categories of workers, NCO coding is not available in PLFS data. NCO report also does not classify 'legislators' in any skill category. In those cases, we have used education level as the criteria for classifying workers according to skill level. In states where different minimum wages are announced for separate scheduled employment, we have mapped scheduled employment using National Industrial Classification (NIC) coding available in PLFS. In case multiple minimum wages are announced within a given NIC, then we have taken the minimum of minimum wages. If there is a zone-wise difference for the same skill, in that case also we have taken the minimum of minimum wages within a skill level.

[3] The details are covered in Table A1 of the Appendix

19 states and 5 UTs announce minimum wages on the basis of only skill level. The rest of the states and UTs announce minimum wages using both scheduled employment and skill level as the criteria. Barring Himachal Pradesh, Delhi, West Bengal, Maharashtra, Arunachal Pradesh and Tripura, all states in North, North East, Central and West India announce minimum wages on the basis of only skill level. On the other hand, barring Goa and a few UTs, all South Indian states/UTs namely Tamil Nadu, Kerala, Karnataka, Telangana, Puducherry and Andhra Pradesh announce minimum wages using both scheduled employment and skill level as the criteria (Table A1). Tamil Nadu is the only state which uses only scheduled employment as the criteria and doesn't announce minimum wages on the basis of skill levels.[4]

Figure 2 shows the state-wise level of minimum wages for unskilled workers. There is a difference of more than Rs. 200 between the state with the highest minimum wage (Kerala) and the state with the lowest minimum wage (J&K). This implies that across states, a lot of heterogeneity in minimum wages exists.

Figure 2: State-wise Minimum Wage for unskilled workers in nominal terms (averages over 2017-18, 2018-19, and 2019-20)



Source: Data compiled from State Wise Minimum Wage Notifications (2016-2019)

4. Labour Market in India

Employment in India is characterised by two major categories: those that are self-employed (non-wage earners) (the majority of which are own-account workers), and those that are defined as wage earners. The latter refers to those with an employment relationship linked through the payment of wages. Under this category, the PLFS has subdivided workers into regular/salaried and casual wage employment. According to PLFS 2019-20, 53.6 per cent of the workers are self-employed, 24.4 per cent are regular and salaried employees, and 21.8 per cent are casual workers in India (Table 1).

[4] For our study, if skill levels are not given we assume same minimum wage across all skill levels.

Casual workers are usually engaged in informal jobs, are under-employed with irregular working cycles and are compensated on a daily basis (ILO, 2018). Regular or salaried workers, on the other hand, have continuous employment and their wage compensation is made periodically (weekly or monthly) (Estupinan et al., 2020).

The other half of the workforce comprises self-employed individuals. In 2019-20, 53.6 per cent and 37.3 per cent of the Indian workforce in the 'farm and non-farm together' and 'non-farm sector' are self-employed, respectively (Table 1). Self-employment is composed of employers, unpaid family workers, and own-account workers. The latter constitutes the biggest group of the self-employed: 70 per cent are own-account workers, 26 per cent are unpaid family members, and 4 per cent (approx.) are employers in 2019-20 (Table 1). Further, most of the own-account workers are also home-based workers and home workers, and their income fluctuates the same as casual workers (ILO, 2018).

Table 1: Year-wise percentage distribution of individuals belonging to the age group 15 to 65 according to Current Weekly Status (CWS), farm and non-farm together and Non-farm only

	Farm and Non-farm (%)			Non-Farm (%)		
	17-18	18-19	19-20	17-18	18-19	19-20
Regular worker	11.24	11.84	11.96	13.6	14.19	14.85
Casual worker	11.18	10.77	10.59	7.79	7.79	7.08
Own account worker	17.16	17.26	18.35	9.64	9.94	10.95
Employer	0.85	0.97	0.93	0.69	0.8	0.7
Unpaid family worker	5.57	5.29	6.84	1.38	1.34	1.43
Unemployed	4.47	4.46	4.76	5.54	5.46	6.03
Not in labour force	49.54	49.42	46.58	61.36	60.47	58.97
Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

Source: Author's estimate using PLFS 2017-18, 2018-19, and 2019-20

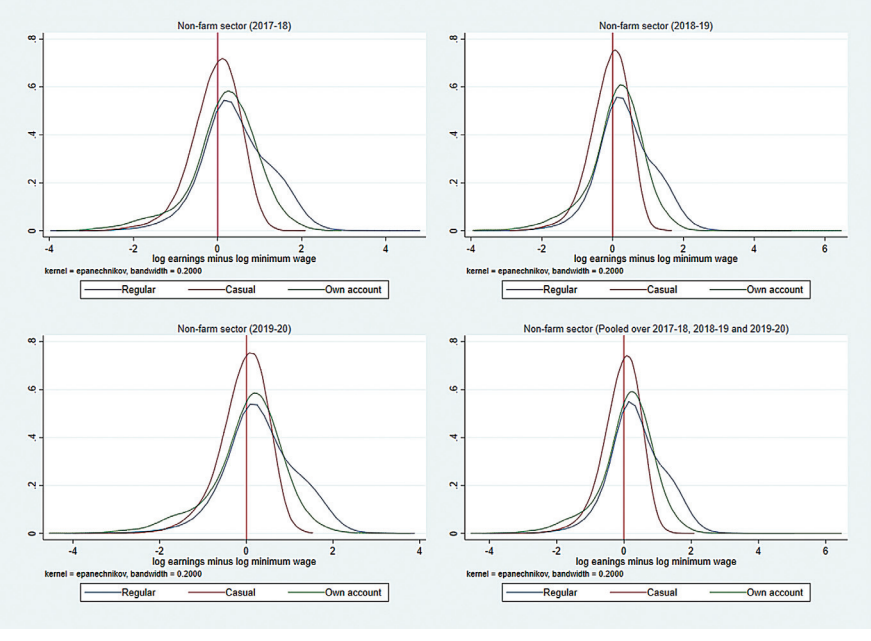
5. Empirical Strategy

5.1 Kernel Density Plots

Kernel density plots (KDPs) are utilised to draw inferences about the level of compliance as well as to explore whether minimum wages have any impact on the earnings of the workers. This is one of the two popular techniques (the other being regression) to analyse the relationship between minimum wages and wages (Wolfson, 2019). KDPs are the non-parametric probability density function (PDF) of wage distributions. However, in such studies, the PDF is commonly estimated at the difference between the logarithm of earnings and the logarithm of minimum wage (horizontal axis) rather than at the earnings or log earnings. The peak of KDP indicates the level of earnings difference where most of the individuals are clustered together.

Figure 3 shows KDPs for the casual, regular, and own-account workers for the entire non-farm sector for the years 2017-18, 2018-19, and 2019-20. The horizontal axis represents the difference between the log of earnings and the log of minimum wages. If the height of KDP is noticeably taller at zero, indicating no difference between MW and earnings, than at any other point on the horizontal axis and is drastically reduced on either side, then this provides evidence that most of the workers are receiving earnings more or less equivalent to minimum wages. We can notice that density values are relatively lower to the left for regular workers, in comparison to own-account workers, which in turn are lower to the left than casual workers. This shows better compliance for regular workers in comparison to own-account and casual workers. Moreover, a spike at the point where log earnings minus log minimum wage is zero implies that minimum wages may be impacting the earnings of the workers. This spike at '0' is visible for all categories of workers, including own-account workers. This gives preliminary evidence of the positive impact of minimum wages on the earnings of wage earners (casual and regular workers) and non-wage earners (own-account workers).

Figure 3: KDPs non-farm sector all workers



Source: Author's estimate using PLFS 2017-18, 2018-19, and 2019-20

5.2 Linear Regression Model

As part of this study we want to explore the following; first, how much is the variation in average earning gap between the reference category of regular workers compared to casual workers or, own-account workers or employers, and second, whether some of the earning gap between different categories of workers can be explained by the presence of minimum wage. In order to answer these questions, we have used the two regression specifications. The first question can be answered using the following specification:

$$y_{ijst} = \beta_0 + \beta_1 C_{ijst} + \beta_2 Ow_{ijst} + \beta_3 Em_{ijst} + \beta_4 LnMW_{jst} + \beta_5 \boldsymbol{X}_{ijst} + \beta_6 \gamma_{st} + \partial_t + \partial_s + \partial_t \times \partial_s + \partial_t \times \partial_Q + \mu_{ijst} \quad eq\ (1)$$

Where y_{ijst} is the outcome variable, log of earnings, for worker *i* in state *s* and at time *t*. C_{ijst} denotes *casual worker i*, OW_{ijst} denote *own-account worker i*, EM_{ijst} denote *employer i* in industry *j*, at time *t* in state *s,* respectively. We have used regular workers as the base category that helps us to estimate the earnings gap between regular workers and all other categories of workers. $LnMWj_{st}$ is the log of the statutory nominal minimum wage across the industry, state and time. *Xijst* is the set of household and individual characteristics such as workers' education, social group, age, religion, the proportion of dependents and marital status. It also includes an indicator which identifies whether a worker belongs to a rural or urban region. γst represents net per capita real domestic product, and the unemployment rate to account for labour demand conditions (Menon and Rodgers, 2017; Soundarajan, 2019). δ_t and δ_s are the time and state fixed effects, respectively, that are common for all individuals in each year. δ_t x δ_s shows the interaction between state and time. This will help to control for any unexpected shock at the state level that might influence the earnings of the workers and is also correlated with the state-level changes in the minimum wage (Card 1992, Card and Krueger 1995, Menon 2017). δ_t x δ_Q gives the interaction between time and quarter, which helps us to control for any significant quarterly shock to the labour market, such as the COVID lockdown that coincides with the period of April to June 2020. u_{ijst} is the error term that includes unobservable individual-specific characteristics. It is pertinent to note that worker *i* is different every year, and it is not a panel at the individual level.

To answer the second question, whether some of the earning gap between different categories of workers can be explained by the presence of minimum wage? We have used the following regression specification:

$$y_{ijst} = \beta_0 + \beta_1 C_{ijst} + \beta_2 Ow_{ijst} + \beta_3 Em_{ijst} + \beta_4 LnMW_{jst} + \beta_3 (C_{ijst} \times LnMW_{jst}) + \beta_3 (Ow_{ijst} \times LnMW_{jst})) + \beta_3 (Em_{ijst} \times LnMW_{jst} + \beta_4 (LnMW_{jst} \times G_{ijst}) + \beta_5 (LnMW_{jst} \times S_{ijst}) + \beta_6 \boldsymbol{X}_{ijst} + \beta_7 \gamma_{st} + \partial_t + \partial_s + \partial_t \times \partial_s + \partial_t \times \partial_Q + \mu_{ijst} \quad eq\ (2)$$

The only difference between eq (2) and *eq* (1) is the presence of five interaction terms *(C_{ijst} x $LnMW_{jst}$), (Ow_{ijst} x $LnWN_{jst}$), (Em_{ijst} x $LnMW_{jst}$), ($LnMW_{jst}$ x G_{ijst})* and *($LnMW_{jst}$ x S_{ijst})* in eq (2). The first three interaction terms depict the interaction between the worker type and the log of minimum wages. The fourth is between the worker type and gender, and the fifth one is between the worker type and sector (urban/rural). Everything else is the same between *eq* (2) and *eq* (1). These first three interaction terms will help us analyse how the difference in earnings between separate categories of a categorical variable is changing with increasing minimum wages. In all models, standard errors are clustered at the district level to account for the correlation between workers' unobservable characteristics at the district level. All models are estimated using OLS.

5.2.1 Results of Linear Regression Model

We have estimated the regression specifications explained in the previous section for all the workers employed in the non-farm sector with positive earnings and in the age group of 15 to 65 years. As earnings data is not available for unpaid family workers, they are not considered for the analysis. Table 2 reports the summary statistics for the outcome and key control variables for all workers (female and male) across all worker categories who have reported earnings.[5] Table 3 reports the summary statistics for the outcome and key control variables for only males.

The outcome variable is the log of monthly earnings. From Tables 2 and 3, it is observed that employers as a category have the highest average weekly earnings, followed by regular workers, then own-account workers and the lowest for casual workers. Around 32 per cent of the casual workers belong to the SC category. Whereas 18 per cent, 16 per cent and 8 per cent of the regular, own-account and employers belong to the SC category. 82 per cent of the casual workers have education at or below middle class. Whereas 35 per cent, 60 per cent and 33 per cent of the regular, own-account and employers have education at or below middle class. 36 per cent of regular workers and employers, compared with two per cent of casual and 12 per cent of own-account workers, have education at or above diploma level. The average number of children is higher for casual, own-account and employer workers than regular workers. A similar result holds for the male sample (Tables 2 and 3).

Table 2: Summary statistics of all covariates (All workers-Non Farm, Age:15 to 65 years) (averages over 2017-18, 2018-19 and 2019-20)

	Regular workers		Casual workers		Own Account Worker		Employer	
	mean	sd	mean	sd	mean	sd	mean	sd
Weekly earnings (Rupees)	3748.1	3868.6	1703.2	785.8	2596.8	7844.5	6244.6	5036.0
Log weekly earnings (Rupees)	7.79	1.33	7.31	0.63	7.32	1.76	8.41	1.30
MPCE (Rupees)	3232.4	2707.2	1646.6	918.7	2357.4	1772.6	4358.91	3365.7
Gender (Male)	0.77	0.42	0.88	0.33	0.84	0.37	0.95	0.22
Age (in years)	36.29	11.01	36.20	11.51	39.90	11.34	42.36	10.36
Household size	4.48	2.01	4.75	1.99	4.78	2.03	4.71	2.03
Social group:								
Scheduled tribe	0.06	0.24	0.11	0.32	0.04	0.20	0.02	0.14
Scheduled caste	0.18	0.38	0.32	0.47	0.16	0.37	0.08	0.27

[5] Summary statistics in all the tables are reported by combing all the three years of PLFS data. We have dropped bottom 2 percent sample from our regression to account for outliers. 75 percent of bottom 2 percent sample reported zero earnings. Cutoff at 2 percent reported earning Rs 750 (9.4 USD) per month. Including these workers does not significantly alter the results and the main conclusion of the study still holds.

	Regular workers		Casual workers		Own Account Worker		Employer	
	mean	**sd**	**mean**	**sd**	**mean**	**sd**	**mean**	**sd**
OBC	0.39	0.49	0.42	0.49	0.46	0.50	0.41	0.49
Forward caste	0.37	0.48	0.15	0.36	0.33	0.47	0.49	0.50
Education								
Illiterate	0.07	0.26	0.29	0.46	0.14	0.35	0.04	0.19
Primary	0.11	0.31	0.27	0.45	0.20	0.40	0.11	0.31
Middle	0.18	0.38	0.26	0.44	0.25	0.43	0.18	0.39
Secondary & higher	0.27	0.45	0.16	0.36	0.27	0.44	0.30	0.46
Diploma	0.01	0.09	0.00	0.04	0.00	0.05	0.01	0.08
Tech diploma	0.03	0.17	0.01	0.07	0.01	0.11	0.05	0.22
Graduate and above	0.25	0.43	0.01	0.11	0.11	0.32	0.25	0.43
Tech diploma (graduate & above)	0.02	0.15	0.00	0.01	0.00	0.07	0.01	0.12
Tech degree (graduate & above)	0.05	0.22	0.00	0.03	0.01	0.10	0.05	0.21
Vocational education:								
No vocational training	0.78	0.42	0.86	0.34	0.78	0.41	0.77	0.42
Non-formal vocational	0.15	0.36	0.13	0.34	0.19	0.39	0.16	0.37
Formal vocational	0.07	0.26	0.01	0.08	0.03	0.18	0.06	0.25
Marital status:								
Never married	0.24	0.42	0.19	0.39	0.11	0.32	0.08	0.27
Currently married	0.72	0.45	0.77	0.42	0.84	0.36	0.89	0.31
Widowed	0.04	0.19	0.03	0.18	0.04	0.19	0.02	0.14
Divorced/separated	0.01	0.09	0.01	0.08	0.01	0.08	0.01	0.08
Religion:								
Hindu	0.83	0.37	0.80	0.40	0.77	0.42	0.79	0.41
Islam	0.10	0.30	0.15	0.35	0.18	0.39	0.13	0.34
Christian	0.03	0.18	0.02	0.16	0.02	0.14	0.03	0.18
Sikh/Jain/Buddhism	0.03	0.17	0.02	0.15	0.03	0.16	0.05	0.21
Others	0.00	0.07	0.01	0.08	0.00	0.07	0.00	0.06
No. of Children (<15 years)	0.94	1.12	1.28	1.30	1.20	1.24	1.07	1.14
No. of elders (>60 years)	0.16	0.44	0.11	0.36	0.15	0.42	0.22	0.50
N	125757		48969		85621		6012	

Source: Author's estimate using PLFS 2017-18, 2018-19, and 2019-20

Table 3: Summary statistics of all covariates (Male-Non Farm, Age: 15 to 65 years) (averages over 2017-18, 2018-19 and 2019-20)

	Regular workers		Casual workers		Own Account Worker		Employer	
	mean	sd	mean	sd	mean	sd	mean	sd
Weekly earnings (Rupees)	3943.9	3663.6	1790.7	770.9	2880.6	8501.1	6319.4	5063.8
Log weekly earnings (Rupees)	7.88	1.30	7.38	0.58	7.51	1.67	8.42	1.31
MPCE (Rupees)	3161.6	2565.0	1622.7	909.0	2336.4	1714.0	4260.5	3059.8
Age (in years)	36.10	11.09	35.73	11.47	40.30	11.28	42.50	10.41
Household size	4.55	2.05	4.82	2.00	4.86	2.06	4.74	2.04
Social group:								
Scheduled tribe	0.06	0.23	0.11	0.31	0.04	0.19	0.02	0.14
Scheduled caste	0.17	0.37	0.32	0.47	0.16	0.37	0.08	0.27
OBC	0.40	0.49	0.41	0.49	0.47	0.50	0.41	0.49
Forward caste	0.38	0.48	0.16	0.36	0.34	0.47	0.49	0.50
Education:								
Illiterate	0.05	0.22	0.26	0.44	0.12	0.33	0.04	0.19
Primary	0.11	0.31	0.28	0.45	0.19	0.40	0.11	0.32
Middle	0.19	0.39	0.27	0.45	0.25	0.43	0.19	0.39
Secondary and higher	0.30	0.46	0.17	0.37	0.28	0.45	0.31	0.46
Diploma	0.01	0.10	0.00	0.04	0.00	0.05	0.01	0.08
Tech diploma	0.03	0.18	0.01	0.08	0.01	0.11	0.05	0.22
Graduate and above	0.24	0.43	0.01	0.11	0.12	0.32	0.24	0.43
Tech diploma (graduate & above)	0.02	0.14	0.00	0.01	0.00	0.07	0.01	0.12
Tech degree (graduate & above)	0.05	0.21	0.00	0.03	0.01	0.10	0.04	0.20
Vocational education:								
No vocational training	0.77	0.42	0.86	0.35	0.79	0.40	0.77	0.42
Non-formal vocational	0.16	0.37	0.14	0.34	0.18	0.38	0.17	0.37
Formal vocational	0.07	0.25	0.01	0.08	0.03	0.16	0.06	0.24

	Regular workers		Casual workers		Own Account Worker		Employer	
	mean	**sd**	**mean**	**sd**	**mean**	**sd**	**mean**	**sd**
Marital status:								
Never married	0.25	0.43	0.21	0.40	0.11	0.32	0.08	0.27
Currently married	0.74	0.44	0.78	0.42	0.87	0.34	0.90	0.30
Widowed	0.01	0.10	0.01	0.12	0.01	0.12	0.01	0.12
Divorced/separated	0.00	0.06	0.00	0.07	0.01	0.07	0.00	0.06
Religion:								
Hindu	0.83	0.37	0.79	0.41	0.77	0.42	0.78	0.41
Islam	0.11	0.31	0.16	0.36	0.18	0.39	0.14	0.34
Christian	0.03	0.16	0.02	0.15	0.02	0.13	0.03	0.17
Sikh/Jain/Buddhism	0.03	0.17	0.02	0.15	0.03	0.16	0.05	0.21
Others	0.00	0.07	0.01	0.08	0.00	0.06	0.00	0.06
No of Children (<15 years)	0.97	1.14	1.31	1.31	1.22	1.26	1.08	1.14
No. of elders (>60 years)	0.16	0.42	0.11	0.36	0.15	0.42	0.22	0.50
N	96549		42987		71415		5707	

Source: Author's estimate using PLFS 2017-18, 2018-19, and 2019-20

Table 4 reports the regression results for equation 1, with models (1) and (3) for all workers and models (2) and (4) for male workers. Models (1) and (2) do not include the minimum wage as one of the explanatory variables, and models (3) and (4) do include the minimum wage.[6] Minimum wage is statistically significant and positively associated with the earnings of workers [models (3) and (4)], Table 4. 'Worker-type' is included in the regression to understand the earnings differences between separate categories of workers. Worker-type categorises workers into four categories: (i) Regular worker, (ii) Casual worker, (iii) Own Account Worker and (iv) Employer. Regular workers have been used as the reference category in the regression model. According to model (1), casual workers on average earn 22 percent lesser and own-account workers earn 16 percent lesser than regular workers. Employers earn, on average, 37 per cent higher than regular workers. In model (2), which considers only the male sample, we find that the gap between earnings of regular workers and own-account workers is 8.8 per cent. This implies that the larger earnings gap between

[6] 2,66,359 is the total sample of workers. In regression the sample got reduced to 2,60,230. Total sample lost is 6,129. Out of 6,129 workers, 2,247 worker sample lost due to non-inclusion of bottom 2 percent of workers. 3,882 sample lost due to non-inclusion of Lakshadweep, Daman and Diu and Dadra and Nagar Haveli as Gross Domestic Product (GDP) data is not available for these Union Territories (UTs). The inclusion of this sample does not significantly change the conclusions of the study

regular and own-account workers in model (1) is mainly contributed by females. In all four models, casual and own-account workers earn significantly less than regular workers.

Table 4: Determinants of Wages for Workers in the Non-Farm Sector (Age group 15 to 65 years) (Outcome: Log of monthly wages)

	(1)	(2)	(3)	(4)
	All workers	**Male**	**All workers-MW**	**Male-MW**
Casual worker (Ref: Regular worker)	-0.222***	-0.236***	-0.189***	-0.203***
	(0.011)	(0.011)	(0.012)	(0.012)
Own account worker (Ref: Regular worker)	-0.164***	-0.088***	-0.179***	-0.105***
	(0.011)	(0.010)	(0.011)	(0.010)
Employer (Ref: Regular worker)	0.376***	0.405***	0.356***	0.384***
	(0.018)	(0.019)	(0.019)	(0.020)
Ln Min Wage			0.793***	0.794***
			(0.053)	(0.051)
Age	0.041***	0.038***	0.040***	0.038***
	(0.001)	(0.001)	(0.001)	(0.001)
Age square	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Urban	0.183***	0.171***	0.183***	0.169***
	(0.010)	(0.009)	(0.009)	(0.009)
Male	0.658***		0.657***	
	(0.019)		(0.020)	
Primary (Ref: Illiterate)	0.102***	0.094***	0.091***	0.085***
	(0.009)	(0.009)	(0.009)	(0.009)
Middle (Ref: Illiterate)	0.172***	0.153***	0.154***	0.139***
	(0.008)	(0.009)	(0.008)	(0.009)
Secondary and higher (Ref: Illiterate)	0.319***	0.287***	0.289***	0.263***
	(0.009)	(0.010)	(0.009)	(0.009)
Diploma (Ref: Illiterate)	0.628***	0.562***	0.586***	0.526***
	(0.032)	(0.032)	(0.031)	(0.031)

(GDP) data is not available for these Union Territories (UTs). The inclusion of this sample does not significantly change the conclusions of the study

	(1)	(2)	(3)	(4)
	All workers	**Male**	**All workers-MW**	**Male-MW**
Tech diploma (Ref: Illiterate)	0.573***	0.493***	0.527***	0.455***
	(0.022)	(0.022)	(0.021)	(0.022)
Graduate and above (Ref: Illiterate)	0.765***	0.675***	0.695***	0.610***
	(0.017)	(0.015)	(0.017)	(0.015)
Tech diploma(graduate & above) (Ref: Illiterate)	1.116***	1.000***	1.024***	0.910***
	(0.035)	(0.040)	(0.033)	(0.038)
Tech degree(graduate & above) (Ref: Illiterate)	1.149***	1.026***	1.059***	0.940***
	(0.026)	(0.027)	(0.026)	(0.026)
Non-formal voc (Ref: No voc training)	0.014	0.023*	0.014	0.022*
	(0.013)	(0.013)	(0.013)	(0.013)
Formal voc (Ref: No voc training)	0.030*	0.038**	0.025	0.032**
	(0.016)	(0.015)	(0.016)	(0.016)
Islam (Ref: Hinduism)	-0.026**	-0.017	-0.028***	-0.018
	(0.010)	(0.011)	(0.010)	(0.011)
Christian (Ref: Hinduism)	0.023	-0.012	0.025	-0.009
	(0.017)	(0.016)	(0.017)	(0.016)
Sikh/Jain/Buddhism (Ref: Hinduism)	0.043	0.050**	0.038	0.047*
	(0.027)	(0.024)	(0.027)	(0.025)
Other (Ref: Hinduism)	-0.002	-0.004	0.012	0.010
	(0.027)	(0.025)	(0.027)	(0.025)
ST (Ref: Forward caste)	-0.091***	-0.105***	-0.086***	-0.099***
	(0.015)	(0.014)	(0.015)	(0.014)
SC (Ref: Forward caste)	-0.119***	-0.110***	-0.112***	-0.104***
	(0.010)	(0.009)	(0.010)	(0.009)
OBC (Ref: Forward caste)	-0.107***	-0.094***	-0.102***	-0.089***
	(0.009)	(0.009)	(0.009)	(0.009)
Currently married (Ref: Not married)	0.118***	0.151***	0.121***	0.153***
	(0.008)	(0.008)	(0.008)	(0.008)

	(1)	(2)	(3)	(4)
	All workers	**Male**	**All workers-MW**	**Male-MW**
Widowed (Ref: Not married)	0.092***	-0.015	0.102***	-0.007
	(0.019)	(0.027)	(0.019)	(0.027)
Separated (Ref: Not married)	0.061**	-0.075	0.064**	-0.074
	(0.030)	(0.048)	(0.031)	(0.048)
No of Children (<15 years)	-0.007***	-0.005**	-0.006***	-0.005**
	(0.002)	(0.002)	(0.002)	(0.002)
No. of elders (>60 years)	0.016***	0.010**	0.015***	0.009*
	(0.005)	(0.005)	(0.005)	(0.005)
Unemployment rate	-0.442***	-0.537***	-0.444***	-0.541***
	(0.125)	(0.156)	(0.126)	(0.158)
Per capita GDP	0.885	1.023	0.895***	0.795***
	(1.756)	(1.179)	(1.683)	(1.183)
Covid quarter (April to June 2020)	-0.065***	-0.107***	-0.066***	-0.107***
	(0.023)	(0.022)	(0.023)	(0.022)
Constant	-2.405	-3.275	-51.26***	-49.90***
	(19.81)	(13.30)	(19.02)	(13.41)
State dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
State & year interaction	Yes	Yes	Yes	Yes
Year and quarter interaction	Yes	Yes	Yes	Yes
Observations	260230	211983	260230	211983
R^2	0.422	0.406	0.452	0.412

Standard errors in parcentage
Robust standard errors are clustered at the district level
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

5.2.2 Results of Interaction between Minimum Wages and Worker Type

In equation (1), worker type is included as fixed effects using intercept dummy variables. Equation (2) also allows for differences in slope coefficients for minimum wage across worker type as an interaction of worker type with minimum wages to understand the association between a higher level of minimum wages and the different kinds of worker earnings. This will also help to understand the impact of higher minimum wages on the earnings gap among different categories of workers. If the "lighthouse effect" hypothesis is

true, then one would expect workers to use minimum wages as the benchmark to conduct 'earnings-bargaining'. The minimum wage can be used as a *numeraire* by workers at higher levels of minimum wages. At a very low level of minimum wages, the majority of workers earn above minimum wages; hence minimum wages are not expected to serve as a *numeraire* for workers. According to our calculations, 93.6 per cent of workers are earning above minimum wages when the nominal minimum wage is less than 175. Whereas 50 per cent of the workers earn above minimum wage, 22 per cent at minimum wage and 28 per cent below minimum wage when the nominal minimum wage is less than 400. This implies that workers earning closer to the minimum wage rise at a higher level of minimum wages.

Following Soundarajan (2019), we dropped skilled workers and workers with higher education to make the sample homogeneous to understand the role of minimum wages on worker type. The sample now consists of unskilled and semi-skilled workers who have completed education up to secondary school. To further explore the segmentation of the labour market between unskilled plus semi-skilled and skilled plus high-skilled workers, we estimated two different models: one for those workers who have completed education up to secondary school and the other for those who have education above the higher secondary level (including graduates and masters). Chow test was carried out to see whether a significant difference exists between the interaction term coefficients of the two models. We have used the *contrast* command in STATA to carry out the test. The Chow test rejects the null hypothesis with F (8, 36303) = 20.98 and Prob > F = 0.000, implying a significant difference in the values of the true interaction coefficients between the two models. While estimating the regression model only for skilled workers, we find that the interaction coefficient for casual and own-account workers becomes insignificant (Table 5). The result of the Chow test, in addition to the insignificant interaction coefficient for casual and own-account workers in skilled/higher skilled worker regression, as well as the fact that 99.3 per cent and 78.8 per cent of casual and own-account workers, respectively, are unskilled and semi-skilled in our sample, leads us to believe that making the sample homogeneous will qualitatively help us in understanding the minimum wage effects on the earnings of different categories of workers. Moreover, we conducted this analysis for males. It has been observed that weaker compliance exists among firms that hire female workers, which can potentially bias our estimates (Menon and Rodgers, 2017).

The coefficient on worker type and its associated interaction are given in Table 5.

Table 5: Impact of minimum wages on earnings gap between regular workers, casual workers, and own-account workers (Age group 15 to 65 years, Outcome: Log of monthly wages)

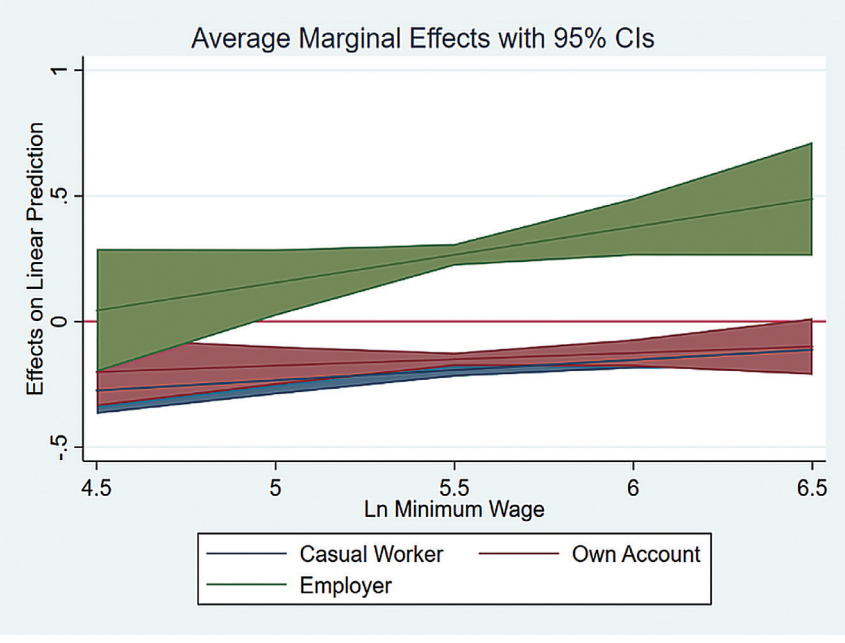
	Male (education till secondary)	**Male (education above secondary)**
Casual worker (ref: regular worker)	-0.815***	-.248
	(0.104)	(.213)
Own account worker (ref: regular worker)	-0.358***	.038
	(0.097)	(.126)

	Male (education till secondary)	**Male (education above secondary)**
Employer (ref: regular worker)	-0.439**	.152
	(0.223)	(.248)
Casual worker × Ln Min Wage	0.108***	-.030
	(0.018)	(.037)
Own account worker × Ln Min Wage	0.056***	-.051***
	(0.017)	(.022)
employer × Ln Min Wage	0.154***	.009
	(0.038)	(.043)
State dummies	Yes	Yes
Year dummies	Yes	Yes
State & year interaction	Yes	Yes
Year and quarter interaction	Yes	Yes
Observations	137897	74086
R^2	0.263	0.392

Note: The following control variables are incorporated in the regressions: respondent education, gender, age, Scheduled Caste/Scheduled Tribe, number of adults in the household, number of children in the household, state level unemployment rate and per capita real state gross domestic product. Standard errors are clustered at the district level in parentheses. Asterisks are based on standard *p*-values: *** p<0.01, ** p<0.05, * p<0.1. Sampling weights have been included.

We have used marginal effects to disentangle the effect of increasing minimum wages on the earnings of separate categories of workers. Marginal effects allow for a change in one independent variable, while keeping all other variables constant, to estimate the predicted value of the dependent variable at different values of the independent variable (Stolz and Williams, 2020). While estimating the marginal effect's values of all other independent variables in a regression model are kept constant. We have used the STATA post-estimation command *margins* to get predicted values of earnings for different worker types at different levels of minimum wages. Figure 4 shows the predicted average marginal effects for casual workers, own account workers and employers, with regular workers as the base category, for increasing values of minimum wages. The line y=0 represents the regular workers. Any deviation from y = 0 would represent the predicted earnings difference between regular workers and any other category of worker. The confidence plots are also given in the figure. If, for increasing values of minimum wages, the predicted values of marginal effects for a particular category of worker are positive, then that implies a positive earnings difference for that worker in comparison to regular workers. However, if, for increasing values of minimum wages, the predicted values of marginal effects are negative, then that implies a negative earnings difference for that worker in comparison to regular workers.

Figure 4: Predicted average marginal effects of earnings at different levels of minimum wage for Unskilled and Semi-skilled male workers (Education till middle school)



Source: Author's estimate based on regression estimates using PLFS 2017-18, 2018-19, and 2019-20

We find that, with a homogeneous sample, the earnings gap between regular workers and own-account as well as casual workers is predicted to reduce with an increasing level of minimum wages (Figure 4). This might be indicative of the "lighthouse effect" at a higher level of minimum wages, where earnings of own-account and casual workers, who mostly belong to informal sectors, may rise with increasing levels of minimum wage. According to the "lighthouse effect", in the presence of legislated minimum wages, workers and employers usually undertake wage bargaining with minimum wages as their benchmark (Maloney and Mendez 2004, Menon and Rodgers 2017, Baanante 2004, and Lemos 2009). The evidence of the "lighthouse effect" is visible for own-account workers too. This might be the result of the similar nature of jobs performed by low-skilled own-account workers and casual workers. According to the instructor manual of PLFS;

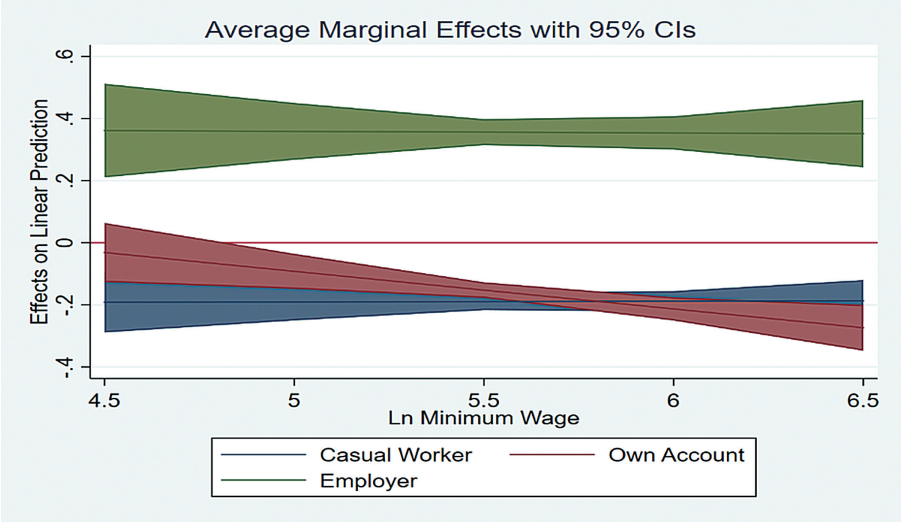
"*Carpenters, masons, plumbers, etc., who move from place to place in search of work and carry out the work on a contract basis (not on a wage basis) whenever work is available, will be considered as 'own-account workers'. But if such persons are working on a wage basis under a contractor, they will be considered as employees*"

At a higher level of minimum wages, own-account workers might be bargaining by looking at the wages of casual and regular workers, who in turn use minimum wages as a benchmark wage.

When we estimate the model for all workers, we find the interaction coefficient for casual workers to be insignificant (Table 6). For own-account workers, the interaction coefficient

becomes negative, depicting a larger earnings gap between own-account workers and regular workers at higher levels of minimum wages; this might be due to the high skill-earning premium for regular workers at higher levels of minimum wages (Figure 5).

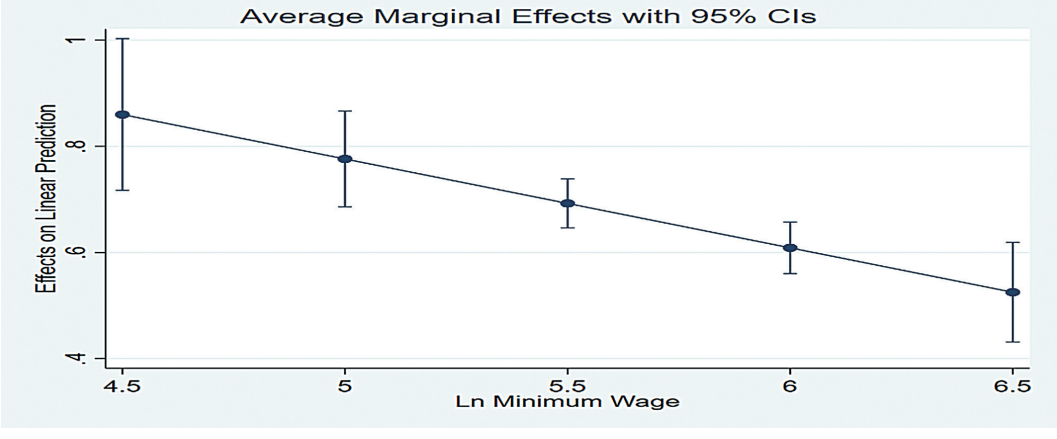
Figure 5: Predicted average marginal effects of earnings at different levels of minimum wage for different worker types



Source: Author's estimate based on regression estimates using PLFS 2017-18, 2018-19, and 2019-20

We have also allowed the interaction of gender with minimum wages. In model (1) of Table 6, the coefficient of *male* is positive, indicating a positive earnings difference in comparison to females. Here, we have used the margins command to interpret the interaction term of male × Ln Min Wage. Figure 6 shows that the gap in earnings between males and females is predicted to reduce with higher values of minimum wages.

Figure 6: Predicted average marginal effects of earnings gap between male and female at different levels of minimum wage



Source: Author's estimate based on regression estimates using PLFS 2017-18, 2018-19, and 2019-20

Table 6: Determinants of Wages for Workers in Non-Farm Sector (Age group 15 to 65 years) (Outcome: Log of monthly wages)

	(1)	(2)
	All Workers	**Male**
Ln Min Wage	0.884***	0.736***
	(0.073)	(0.056)
Casual worker (ref: regular worker)	-0.202	-0.234
	(0.229)	(0.221)
Own account worker (ref: regular worker)	0.514**	0.347*
	(0.234)	(0.185)
Employer (ref: regular worker)	0.384	0.356
	(0.361)	(0.377)
Casual worker × Ln Min Wage	0.002	0.005
	(0.040)	(0.038)
Own account worker × Ln Min Wage	-0.121***	-0.079**
	(0.041)	(0.033)
employer × Ln Min Wage	-0.005	0.004
	(0.063)	(0.066)
male	1.613***	
	(0.327)	
male × Ln Min Wage	-0.167***	
	(0.056)	
Urban	0.945**	0.975**
	(0.234)	(0.223)
Urban × Ln Min Wage	-0.198	-0.201
	(0.041)	(0.039)
Age	0.040***	0.038***
	(0.001)	(0.001)
Age square	-0.000***	-0.000***
	(0.000)	(0.000)
Primary (ref: Illiterate)	0.088***	0.085***
	(0.009)	(0.009)

	(1)	(2)
	All Workers	**Male**
Middle (ref: Illiterate)	0.152***	0.139***
	(0.008)	(0.009)
Secondary and higher (ref: Illiterate)	0.289***	0.264***
	(0.009)	(0.009)
Diploma (ref: Illiterate)	0.578***	0.521***
	(0.030)	(0.031)
Tech diploma (ref: Illiterate)	0.524***	0.456***
	(0.021)	(0.021)
Graduate and above (ref: Illiterate)	0.689***	0.609***
	(0.017)	(0.015)
Tech diploma(graduate & above) (ref:Illiterate)	1.012***	0.903***
	(0.033)	(0.037)
Tech degree(graduate & above) (ref:Illiterate)	1.050***	0.933***
	(0.026)	(0.026)
Non-formal voc	0.013	0.022*
	(0.013)	(0.013)
Formal voc	0.023	0.031**
	(0.015)	(0.016)
Islam (Ref: Hinduism)	-0.028***	-0.019*
	(0.010)	(0.011)
Christian (Ref: Hinduism)	0.026	-0.007
	(0.018)	(0.016)
Sikh/Jain/Buddhism (Ref: Hinduism)	0.041	0.048*
	(0.027)	(0.025)
other (Ref: Hinduism)	0.011	0.008
	(0.027)	(0.025)
ST (ref: Forward caste)	-0.085***	-0.099***
	(0.014)	(0.014)
SC (ref: Forward caste)	-0.110***	-0.103***
	(0.010)	(0.009)

	(1)	(2)
	All Workers	**Male**
OBC (ref: Forward caste)	-0.100***	-0.087***
	(0.009)	(0.008)
Currently married (ref: Unmarried)	0.121***	0.153***
	(0.008)	(0.008)
Widowed (ref: Unmarried)	0.106***	-0.008
	(0.019)	(0.027)
Separated (ref: Unmarried)	0.068**	-0.073
	(0.031)	(0.048)
No of Children (<15 years)	-0.006***	-0.005**
	(0.002)	(0.002)
No. of elders (>60 years)	0.015***	0.009*
	(0.005)	(0.005)
Unemployment rate	-0.448***	-0.542***
	(0.125)	(0.156)
Real GDP	4.614***	4.617***
	(1.555)	(1.070)
Covid quarter (April to June 2020)	-0.066***	-0.107***
	(0.023)	(0.022)
Constant	-49.10***	-47.58***
	(17.60)	(12.13)
State dummies	Yes	Yes
Year dummies	Yes	Yes
State & year interaction	Yes	Yes
Year and quarter interaction	Yes	Yes
Observations	260230	211983
R^2	0.454	0.414

Note: Standard errors are clustered at the district level and are given in parentheses.

6. Conclusion

Minimum wage policy aims to protect unskilled workers against low wages. However, in developing countries, like India, labour markets are characterised by high informality and self-employment. In the minimum wage literature, studies have attempted to study the wage

effects of minimum wages. However, most of these studies have considered only wage earners, leaving aside a large proportion of non-wage earners. This study attempted to include self-employed workers and explore the impact of minimum wages on the earnings of all kinds of workers, including self-employed workers, using the novel minimum wage data and earnings data from the three recent PLFS rounds from 2017-2020. It has been found that for unskilled and semi-skilled workers who have studied up to secondary education, higher levels of minimum wages reduce the earnings gap between regular, own-account, and casual workers. This might be indicative of the "lighthouse effect", where both casual and own-account workers (mostly engaged in informal activities) use minimum wages as a *numeraire* to carry out earnings negotiations. Given the recent enactment of the Wage Code Bill (2019) that includes elements of coverage, compliance, and adequacy to enhance the effectiveness of minimum wage policy, these results show that a higher level of the minimum wage is positively associated with the earnings of not only casual workers, who are mostly employed in the informal sector, but also of unskilled and semi-skilled own-account workers.

This study does not delve deeper into the question of what the *adequate* level of minimum wages is that can influence the earnings of informal and non-wage earners. Rather, it just concludes that a higher level of minimum wages positively influences the earnings of both own-account and casual workers. This is a preliminary study on the relationship between minimum wages and earnings, and future analysis will be extended to use the causal framework of difference-in-differences and related methods to empirically investigate the impact of minimum wages on earnings. Further, it has not considered the differential level of compliance rates existing in different industries. The research in the following areas is warranted in the future.

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Contract Farming as a Tool for Crop Diversification and Employment Generation: A Case Study of Rural Haryana

Rakesh Sihmar*

There are many studies which show that contract farming increases employment opportunities in rural areas. Crop diversification and the introduction of new techniques by contract farming are the main reasons for employment generation in the agricultural sector. Contract farming helps farmers to diversify from traditional crops to commercial and vegetable crops, which are more labour-intensive. When land diversifies from cereal and foodgrain crops to vegetable crops, it generates new employment opportunities for agricultural labour, particularly for women (Singh, 2003). A traditional cropping pattern provides a few days of employment during cropping, while a fruits-vegetable cropping pattern provides more employment days during a cropping year. In this situation, contract farming introduces a new cropping pattern that increases the working days in a cropping season, particularly for women. Therefore, the main motive of this study is to analyse the impact of contract farming on crop diversification and employment generation in rural areas.

Keywords: Contract Farming; Labour; Employment Generation; Crop Diversification; Haryana; Rural

1. Introduction

Contract farming is a new agricultural marketing arrangement which generates new employment opportunities in rural areas, particularly for women, throughout the entire year. There are two main reasons for employment generation by contract farming. First, it diversifies farmers from traditional crops to vegetable crops, and second, it demands better quality products, which generate more employment in grading and processing of farm produce. Contract farming plays a dual role in the agriculture sector; first, it helps the farmers during crop cultivation by providing new inputs for crops such as seed, fertiliser, and technology know-how, etc.; second, it provides assured marketing of the final product to the farmers. Therefore, contract farming mainly generates two types of employment; the first is associated with farm activities, and the second is employment associated with marketing activities. In traditional farming, the male labour force has dominance in agriculture, but with the immersion of contract farming, labour conditions have changed in agriculture, and it creates new employment opportunities for women. The employment generated in farming activities is higher in the case of contract crops because the crop under contract is highly labour-intensive (Goldsmith, 1985; Singh, 2005).

Generally, contract farming crops are labour-intensive, high-value crops such as fruits and vegetables, which require more labour for harvesting, grading and packaging at the farm level, and in processing, transportation, packaging and marketing at the post-farm stage

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(Singh, 2003). Vegetable crops are more labour intensive and can provide 4-5 times more employment opportunities in rural areas, as compared to wheat and paddy crops (Johl, 2002). Contract farming increases employment and diversifies the employment structure in rural areas. The main problems of agricultural labour are low agricultural wages, fewer employment opportunities, especially during lean seasons, and a lack of non-farm employment opportunities in rural areas. In this context, contract farming plays a major role in sorting out all these problems in rural areas. It is observed that contracting helps the farmer to improve their situation by providing them with reliable incomes and generating employment for the rural poor (Glover & Kusterer, 1990; Key & Rusten, 1999; Goldsmith, 1985; Glover, 1984).

There are many studies which show that contract farming has increased employment in rural areas (Glover & Kusterer, 1990; Singh, 2001; Swain, 2008). In the current study, it is seen that contract farming has a positive impact on employment in both aspects: family labour as well as hired labour. There are three main aspects which generate new employment opportunities in rural areas; one, it diversifies farmers from traditional crops to commercial and vegetable crops, and these crops require more labour. Second, contract farming introduces new techniques of farming that require more employment. Third, it introduces processing and marketing activities in rural areas, which include grading and packaging of agricultural produce and generating women's employment in rural areas.

2. Data Source and Methodology

The primary data used in this study were collected through a field survey of two districts, Karnal and Kurukshetra in Haryana. Karnal and Kurukshetra were selected for the sample survey because both districts have similar geographical and climatic conditions. There are three categories of farmers in this study, viz small (1 - 4 ha), medium (>4 - 10 ha) and large (> 10 ha). It consists of a quantitative household survey of 250 farmers (including 90 Contract and 160 Non-Contract). A sample of 90 contract farmers was taken for the primary survey: 50 farmers from Karnal district and 40 farmers from Kurukshetra district. The data from both districts show that the majority of farmers are large (73 per cent), followed by medium (15.5 per cent) and small only 11 per cent. To analyse the impact of contract farming on crop diversification and employment, the Herfindahl-Hirschman Index and simple statistical tools are used. The Student's t-test is used to find significant variations in the mean values of employment generated under contract and non-contract farms.

Table 1 – Sample Size for Primary Survey

Categories of farmers	Karnal (1)		Kurukshetra (2)		Aggregate(1+2)	
	Contract	Non Contract	Contract	Non-Contract	Contract	Non-Contract
Small	6 (12)	18(19.3)	4(10)	11(16.4)	10(11.1)	29(18.1)
Medium	7(14)	20(21.5)	7(17.5)	17(25.4)	14(15.5)	37(23.1)
Large	37(74)	55(59.1)	29(72.5)	39(58.2)	66(73.4)	94(58.8)
All	50(100)	93(100)	40(100)	67(100)	90(100)	160(100)

Source: Author; Note: Values in parentheses are percentages.

3. Impact of Contract Farming on Crop Diversification

It has been argued that contract farming helps farmers to diversify from traditional crops to vegetable and fruit crops. This means that contract farming leads to crop diversification from traditional crops to vegetable crops and fruit crops. It introduces a new cropping pattern in rural areas by providing new technological know-how. Therefore, the first objective of the study is to analyse the impact of contract farming on crop diversification. There are many studies which have concluded that contract farming has a positive impact on overall employment as well as women's employment (Singh, 2003; Kumar & Kumar, 2008). The impact of contract farming on crop diversification has been examined in three aspects. First, by analysing the proportion share of area under different crops and second, by the share of the value of output/product (VOP) of the total value of output/product during the whole cropping year. Third, diversification is measured by the Herfindahl-Hirschman Index (HHI). To examine the impact of contract farming on crop diversification, a cropping year has been classified into four different crop-wise sub-categories. The gross cropped area and share of the value of output/product (VOP)have been divided into different crop-wise sub-categories.

- Share of area and share of VOP of foodgrain
- Share of area and share of VOP of oilseeds
- Share of area and share of VOP of vegetables
- Share of area and share of VOP of other crops

4. Results and Discussion

4.1 Share of Area under Different Crops

Table 2 shows the cropping pattern between contract farmers and non-contract farmers. This cropping pattern explains crop diversification. It finds that the contract farmers are less concentrated in foodgrain crops and non-contract farmers are more concentrated in foodgrain crops. The study shows that the share of area under food grains for contract farmers is 66.2 per cent, whereas it is 69.6 per cent in the case of non-contract farmers. The share of area under oilseeds is 7.4 per cent for both contract and non-contract farmers. A major difference is seen in the share of area under vegetable crops among various vegetables. The share of area under vegetables is 22.5 per cent for contract farmers whereas it is 17.8 per cent for non-contract farmers. The share of area under vegetables is higher, and the share of area under foodgrain crops is low for contract farmers. It indicates that the contract farmers are more diversified towards vegetable crops and less diversified toward foodgrain crops. On the other hand, the share of area under foodgrains is higher, and the share of area under vegetables is lower; this indicates that the non-contract farmers are more concentrated on foodgrain crops and less concentrated on vegetable crops.

Small farmers, both contract and non-contract, are more diversified towards non-foodgrain crops, indicating that these farmers diversify more towards high-value crops such as vegetables. It also shows that the contract farmers are more diversified towards vegetable crops. The share of area under vegetables for small farmers, including contract as well as non-contract, is 24.1 and 18.4 per cent, respectively.

Overall findings indicate that the share of area under vegetables and commercial crops is higher for contract farmers as compared to non-contract farmers; whereas the share of area under foodgrain is high for non-contract farmers. Similarly, many studies indicate that small and medium farmers grow high-value crops (Singh & Singla, 2011; Brithal *et al.,* 2013), concluding that small and marginal farmers allocate large proportions of their cultivated land to high-value crops such as fruits and vegetables. Small farmers allocate a larger proportion of their land to horticultural crops (Singh & Singla, 2011). The findings reflect that contract farming has diversified farmers from traditional crops to commercial and vegetable crops.

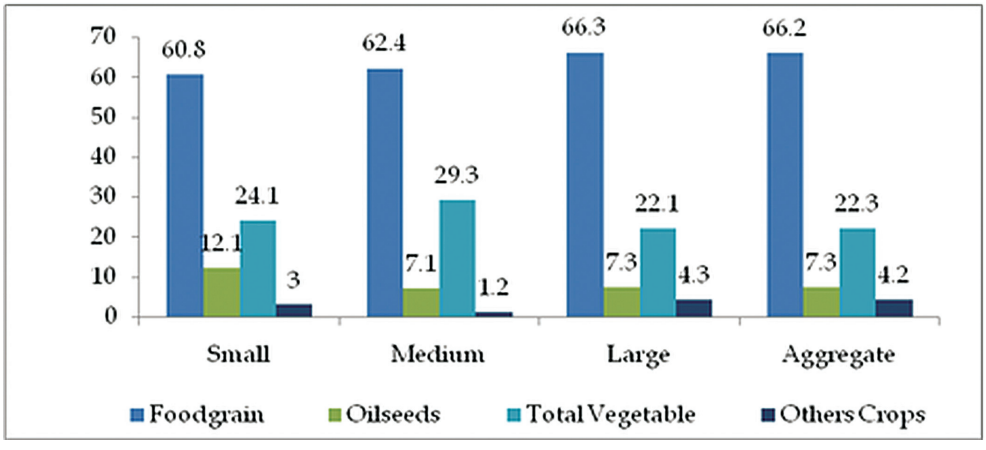
This study gives a clear indication that the area under vegetables is higher for contract farmers as compared to non-contract farmers, whereas the share of the area under foodgrains is higher for non-contract farmers. It shows that contract farming is the main reason for diversification from traditional crops to vegetables because the area under vegetables is higher for contract farmers. High-value perishable crops (fruits and vegetables) are riskier as they have uncertain yields and higher costs due to the higher use of high-cost inputs. Moreover, their quality and profitability are dependent upon timely market access and price (Singh & Singla, 2011). In this aspect, contract farming provides a timely assured market and better prices, which reduces all types of risks. Therefore, the contract farmers are more diversified toward vegetable crops.

Table 2 – Area under Different Crops for Contract Farmers and Non-Contract Farmers (%)

Contract farmers							
Categories of Farmers	**Foodgrain**	**Oilseeds**	**Potato Vegetables**	**Other Vegetables**	**Total Crops**	**Other**	**Total**
	1	**2**	**3**	**4**	**5 (3+4)**	**6**	**(1+2+5+6)**
Small	60.8	12.1	22.4	1.7	24.1	3	100
Medium	62.4	7.1	27.3	2	29.3	1.2	100
Large	66.3	7.3	20.1	2	22.1	4.3	100
Aggregate	66.2	7.3	20.4	1.9	22.3	4.2	100
Non-Contract farmers							
Small	75.2	0.1	7.2	11.2	18.4	6.3	100
Medium	75.3	3.4	16	3.3	19.3	2	100
Large	68.5	8.2	15.5	2.3	17.7	5.5	100
Aggregate	69.6	7.4	15.2	2.6	17.8	5.2	100
Percentage Difference							
Small	-14.4	12	15.2	-9.5	5.7	-3.3	-
Medium	-12.9	3.7	11.3	-1.3	10	-0.8	-
Large	-2.2	-0.9	4.6	-0.3	4.3	1.2	-
Aggregate	-3.4	-0.1	5.2	-0.7	4.5	-1	-

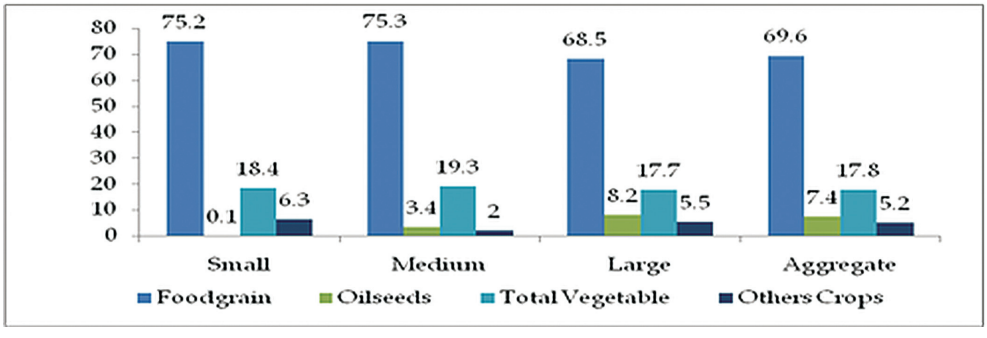
Source*: Primary survey.*

Figure2a – Share of Area under Different Crops for Contract Farmers (%)



Source*: Primary survey.*

Figure 2b – Share of Area under Different Crops for Non-Contract Farmers (%)



Source*: Primary survey.*

4.2 Share of Value of Output under Different Sub-Category of Crops

Crop diversification can be analysed by the share of the value of output under different sub-categories of crops too. The results of the share of the value of output for total food grain, oilseeds, vegetables, and other sub-categories of crops are presented in Table 3. The results show that the share of the value of the output of foodgrain is comparatively lower for contract farmers as compared to non-contract farmers. The share of the value of output for vegetables, however, was found to be high for contract farmers as compared to non-contract farmers. The share of the value of output for foodgrain is 53.3 per cent for contract farmers, whereas it is 61 per cent in the case of non-contract farmers. This shows that the share of the value of output under foodgrain is low for contract farmers as compared to non-contract farmers.

From the analysis, we get a clear picture that the share of the value of the output of vegetables is high in the case of contract farmers and that the share of the output value of foodgrain is higher under non-contract farmers. The share of the value of output shows that the contract farmers are more diversified towards vegetables as compared to the non-contract farmers. This can be bolstered by the argument that the contract farming arrangement provides the

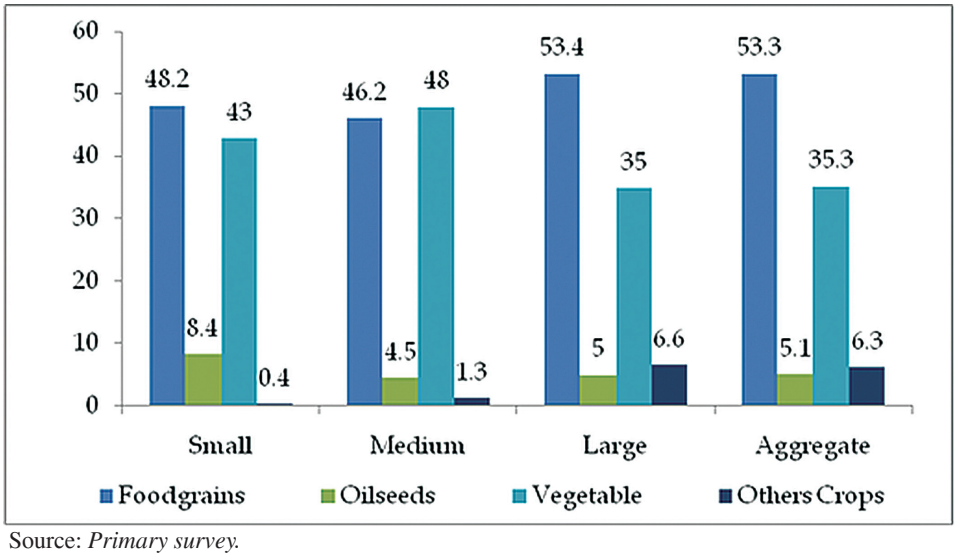
farmers with new market accessibility and a better price. This makes the contract farming of crops more profitable compared to other crops and further leads to more diversification towards crops which are under the contract.

Table 3 – Share of Value of Output of Different Crops (%)

Categories of Farmers	Foodgrain	Oilseeds	Potato Vegetables	Other Vegetables	Total Crops	Other	Total
	1	2	3	4	5 (3+4)	6	(1+2+5+6)
Contract Farmers							
Small	48.2	8.4	42.4	0.6	43	0.4	100
Medium	46.2	4.5	47.6	0.4	48	1.3	100
Large	53.4	5	33.4	1.6	35	6.6	100
Aggregate	53.3	5.1	34.1	1.2	35.3	6.3	100
Non-Contract Farmers							
Small	78	0	10.2	6.8	17	5	100
Medium	68	2.7	24.6	3	27.6	1.7	100
Large	59.8	5.6	23.3	2.6	25.9	8.7	100
Aggregate	61	5.5	23	2.8	25.8	7.7	100
Difference							
Small	-29.8	8.4	32.2	-6.2	26	-4.6	—
Medium	-21.8	1.8	23.0	-2.6	20.4	-0.4	-
Large	-6.4	-0.6	10.1	-1.0	9.1	-2.1	-
Aggregate	-7.7	-0.4	11.1	-1.6	9.5	-1.4	-

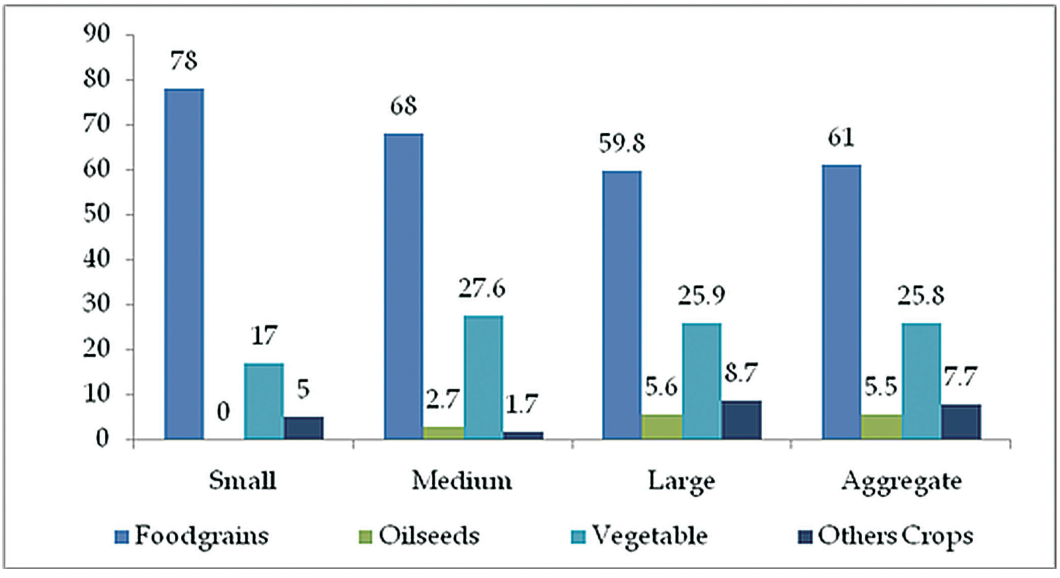
Source*: Primary Survey*

Figure 3a – Share of Value of Output for Different Crops for Contract Farmers (%)



Source: *Primary survey.*

Figure 3b – Share of Value of Output of Different Crops for Non-Contract Farmers (%)



Source*: Primary survey.*

Although crop diversification has been shown by the share of area under crop-wise sub-categories, if we want an analysis of the magnitude of crop diversification, it can be analysed through the Herfindahl Index. Therefore, crop diversification has been examined by measuring the area under individual crops as well as the Herfindahl Index. Potato is the contracted crop in the sample area; therefore, the share of the area and the share of the value of the output of potato have been analysed separately between contract and non-contract farmers. The crop diversification shown by the share of area under different crops and the Herfindahl Index is presented in Table 4. The analysis shows that paddy and wheat remain the dominant crops among both contract and non-contract farmers. In the case of contract farmers, the percentage share of area under paddy and wheat is found to be comparatively low, whereas the percentage share under potato remains high. Around 60 per cent of the gross cropped area is under wheat and paddy for contract farmers, whereas it is 68 per cent for non-contract farmers.

Table 4 – Cropping Pattern and Crop Diversification between Contract Farmers and Non-Contract Farmers

Share of Area Under Different Crops and HHI			
Crop	**CFs**	**NCFs**	**Aggregate**
Paddy	38.0	40.0	39.1
Wheat	22.5	27.6	25.0
Maize	5.0	0.7	2.9
Total pulses	2.0	0.6	1.4

Share of Area Under Different Crops and HHI			
Crop	**CFs**	**NCFs**	**Aggregate**
Total oilseeds	7.6	7.2	7.4
Sugarcane	3.0	3.5	3.2
Potato	18.0	16.6	17.0
Onion	0.2	0.4	0.3
Tomato	0.3	0.2	0.3
Lady finger	0.2	0.1	0.1
Brinjal	0.0	0.1	0.0
Cauliflower and cabbage	0.0	0.2	0.1
Carrot	0.2	0.0	0.1
Bottle gourd	1.1	0.5	0.8
Water melon	0.1	0.0	0.04
Muskmelon	0.8	0.4	0.6
Cucumber	0.1	0.4	0.3
Fodder crops	1.0	1.0	1.0
Chilly	0.1	0.1	0.1
Others	0.1	0.6	0.3
Gross Cropped Area (GCA)	100.00	100.00	100.00
HHI	**0.240**	**0.260**	**0.248**

Source*: Primary survey.*

The share of area under paddy is found to be almost the same for both contract farmers and non-contract farmers. The area under potato is 18 and 16.6 per cent for contract farmers and non-contract farmers, respectively. The total area under pulses is 2 per cent for contract farmers, whereas it is 0.7 per cent for non-contract farmers. The total area under oilseeds is almost the same for contract farmers and non-contract farmers, which is 7.6 per cent for contract farmers and 7.2 per cent for non-contract farmers. The finding shows that the area cultivated by contract farmers is more diversified, whereas the area cultivated by non-contract farmers is comparatively more concentrated. This is shown by the Herfindahl-Hirschman Index (HHI) too. A higher value of HHI explains higher concentration, whereas a lower value of HHI shows higher diversification. Table 4 shows that the HHI is 0.240 and 0.260 for contract farmers and non-contract farmers, respectively; this implies that the farmers under contract farming are more diversified as compared to non-contract farmers. The higher value of HHI for non-contract farmers explains a more concentrated scenario for their area under crops. The aggregate HHI is 0.248; this implies that the contract farmers are more diversified and non-contract farmers are more concentrated.

4.3 Determinants of Crop Diversification

Both demand-side and supply-side factors affect crop diversification. Demand-side factors are those factors that directly influence crop diversification, such as urbanisation, income growth, industrialisation, and enhanced living standards. The higher the economic growth and consequent increase in incomes, the higher the demand for high-value commodities (Dorjee *et al.*, 2002). All these factors diversify the demand for agricultural products, helping farmers to diversify from traditional crops to commercial crops.

Supply-side factors are those factors that help farmers to facilitate better and cheaper marketing channels for their produce. Among the supply-side factors, diversification is largely influenced by infrastructural availability such as markets and roads, technology, relative profitability and risk in different commodities, and resource endowments such as water and labour (Joshi *et al.*, 2004).

Thus, crop diversification may be influenced by several factors, namely road connectivity, age and educational level of farmers, family size, economic conditions, the value of product per acre, net operated area, and contract farming. To examine the factors that are influencing the diversification in favour of non-food crops, several explanatory variables have been explored, and a simple linear regression model has been employed. The infrastructure development variables such as road connectivity and market distance have been included in the model.

The factors that determine crop diversification are as follows:

$$Y = \beta 0 + + \beta_1 X^1 + \beta_2 X^2 + \beta_3 X^3 + \beta_4 X^4 + \mu,$$

Where the dependent variable, Y = share of area under non-foodgrain crops, X^1 = net operated area (acres), X^2 = dummy road connectivity (if farm is connected =1, otherwise 0), X^3= value of product of non-foodgrain crops (Rs.), X^4 = total fixed capital (Rs.), and μ = error term.

To arrive at the results, the simple Ordinary Least Squares (OLS) method is used, and the results are presented in Table 5, which shows that the coefficient of the net operated area shows a negative relationship with diversification to non-foodgrain crops. It indicates that large farmers are less diversified towards non-food grain crops as compared to small and medium farmers. The coefficient of the total fixed capital also turned out to be negative; that may have happened because large farmers have more fixed capital than small/medium farmers. This also shows that the net operated area and total fixed capital are negatively related to the diversification of non-foodgrain crops. Similar findings are exhibited in other studies, which have concluded that the share of area under non-foodgrain crops is higher for small farmers (Singh *et al.,* 2002; Birthal *et al.,* 2008; Shroff & Kajale, 2008).

The regression results show that road connectivity has a positive relationship with a significant coefficient value. This indicates that better road connectivity spurs farmers towards non-foodgrain crops. That is, road connectivity has a positive impact on crop diversification. A better road network allows farmers easy and quick disposal of their perishable goods, lower

marketing costs, and therefore, reduced risk of post-harvest losses in case of perishable goods. These results are consistent with the earlier studies (Joshi, 2003; Singh & Sahoo, 2007).

The value of the output of non-foodgrain crops is also an important determinant for diversification in their favour. The regression coefficient is significant and positive. Higher profit from these crops would induce farmers to diversify in their favour. Fruits and vegetables are highly profitable in comparison to cereals and other traditional crops. These results are consistent with the findings of (Joshi, 2003).

Table 5 – Determinants of Crop Diversification

Dependent Variable: Share of Area under Non-foodgrain Crops		
Adj R-squared	0.49	
No of observations	217	
	Coefficients	T-Value
Net operated area	-0.372***	-10.68
Value of Output	0.0001***	8.6
Total fixed capital	-0.00004	-0.51
Dummy road connectivity	3.716***	2.5
Constant	20.46	14.98

Sources: Based on Primary Survey; *Note:****, ** and * indicate levels of significance at 1, 5, and 10 % levels, respectively.

4.4 Contract farming and its Impact on Employment

To examine the impact of contract farming on employment, three aspects have been analysed. First, total human labour days during a cropping year; second, per acre of the gross cropped area; and third, per acre labour days in potato crop. Labour days in potato crops are analysed separately because the potato crop is contracted in the study. It is found that contract farming has increased employment opportunities during cultivation and marketing time by grading the produce of the farmers. The average level of employment per cropping year of the contract and non-contract farmers, given in Table 6, reveals that Contract farmers employed more hired human labour than non-contract farmers. The family human labour employment days were also high for contract farmers. The overall average human labour employment generated is higher for contract farmers than non-contract farmers, among all the categories of farmers. This is due to more labour-intensive crops under contract farming. The finding shows that total yearly employment is more under contract farming among all farm sizes. In small farm size, total family male labour days are 330 for contract farmers, whereas it is 241 days for non-contract farmers, which is 36 per cent significantly more. Total family female labour days are 36.9 per cent significantly more in the case of small contract farmers as compared to small non-contract farmers. The study finds that the overall labour, viz. total family male labour days, total family female labour days, total hired male days and total hired female

days, are significantly higher in small contract farmers as compared to small non-contract farmers. The hired male labour days are 100 per cent significantly higher for small contract farmers as compared to small non-contract farmers. Total human labour is 526 days for small contract farmers whereas it is 326 for small non-contract farmers; this is 62 per cent significantly higher.

In the case of the medium farmers, all the labour days are statistically significantly higher for contract farmers as compared to non-contract farmers. The total family male labour days for contract farmers are 424 labour days, whereas it is 351 labour days for non-contract farmers. It is 20.8 per cent more for contract farmers. Total family female labour is 61.2 per cent, statistically significant, more for Contract Farmers as compared to non-contract farmers. Total human days (male and female) are 846 labour days and 563 labour days for contract farmers and non-contract farmers, respectively, which is 50.3 per cent statistically higher for medium contract farmers (Table 6). In the case of large farmers, all the labour days are statistically significantly higher for contract farmers. Total family male days are 563 and 417 for contract farmers and non-contract farmers, respectively, which is 30.7 per cent statistically significantly higher.

Table 6 – Status of Yearly employment for Contract Farmers and Non-Contract Farmers
(*Total Human Days in a Cropping Year)*

Contract Farmers				
	Small	**Medium**	**Large**	**Average**
Family Male	330	424	561	477
Family Female	65	79	94	86
Family Human	395	503	655	563
Hired Male	28	71	374	288
Hired Female	105	273	1310	1005
Hired Human	131	343	1685	1293
Total Human	526	846	2340	1856
Non-Contract Farmers				
	Small	**Medium**	**Large**	**Average**
Family Male	241	351	429	365
Family Female	46	49	51	52
Family Human	287	400	480	417
Hired Male	14	57	152	119
Hired Female	25	106	404	314
Hired Human	39	163	556	433
Total Human	326	563	1036	850

Change Over Non-Contract Farmers (%)				
	Small	**Medium**	**Large**	**Average**
Family Male	36.9 ***	20.8 *	30.8 *	30.7 **
Family Female	41.3 ***	61.2 ***	84.3 ***	65.5 ***
Family Human	37.6 ***	25.8 **	36.5 ***	35 ***
Hired Male	100 ***	24.6 *	146.1 ***	142 ***
Hired Female	320 ***	157.5 ***	224.3 ***	220.1 ***
Hired Human	241 ***	110.4 ***	202.1 ***	198.7 ***
Total Human	62 ***	50.3 ***	125.9 ***	118.4 ***

Source*: Primary survey;* Note*: ***, ** and * indicate level of significance at 1, 5 and 10 % levels, respectively*

Total family female labour is 36.5 per cent statistically significantly higher for contract farmers. Total family human labour days are 655 for contract farmers, whereas it is 480 labour days for non-contract farmers, which is 36.5 per cent significantly higher. Total hired male days are 374 and 152 for contract farmers and non-contract farmers, respectively, which is 146 per cent statistically significantly higher. The total human labour days (family and hired) are 2340 and 1036 for contract farmers and non-contract farmers, respectively, which is 136 per cent significantly high (Table 6).

4.5 Employment per Acre of Gross Cropped Area

Employment generated per acre of net operated area for contract farmers and non-Contract farmers, presented in Table 7, indicates that contract farmers employed more hired human labour than non-contract farmers. The family human labour employed for contract farmers is also higher for the contract than non-contract farmers, in all farm sizes except for large. Thus, family labour employed per acre is 4.5 per cent more for contract small farm size. Total hired male and female labour days are statistically significantly higher for small contract farmers. The total human labour days (family and hired) per acre were 113 and 92 for contract farms and non-contract farms, respectively, which is 23 per cent significantly more.

In the case of medium farm size, total family male labour, family female labour days, total hired male labour days and total hired female labour are statistically significant, more in the case of contract farms as compared to non-contract farms. The family human labour days (male and female) per acre are 64 and 49, which is 30 per cent higher. The total hired human labour is 44 for males and 20 for females, which is 120 per cent higher under contract farming. The total human labour (family and hired) is 108 and 69 labour days, which is significantly higher by 56 per cent under contract farming.

However, the overall labour days are statistically significantly higher under contract farming for all farm sizes. But in the case of large contract farmers, the total family male labour days are low. The main reason is the large size of land holdings of large contract farmers. The total family human days are 15 and 19 labour days per acre for contract farmers and non-

contract farmers, respectively, which is 21.1 per cent lower for contract farmers. The total hired male labour days and total hired female labour days are higher under contract farming. The total human labour days are (family and hired) 50 and 41 for contract farmers and non-contract farmers, respectively, 24.4 per cent higher under contract farming of large farmers. The total human labour days of contract farmers are 26.1 per cent more as compared to non-contract farmers.

Table 7 – Total Employment for Contract and non-contract farmers (per acre)

Contract Farmers				
Labour Days	**Small**	**Medium**	**Large**	**Average**
Family Male	71	54	12	18
Family Female	14	10	3	4
Total Family	85	64	15	22
Hired Male	6	9	8	8
Hired Female	23	35	28	28
Total Hired	28	44	36	36
Total	113	108	51	58
Non-Contract Farmers				
Labor Days	**Small**	**Medium**	**Large**	**Average**
Family Male	68	43	17	21
Family Female	13	6	2	3
Total Family	81	49	19	24
Hired Male	4	7	6	6
Hired Female	7	13	16	15
Total Hired	11	20	22	22
Total Human	92	69	41	46
Change Over Non-Contract Farmers (%)				
Family Male	4.5	25.6***	-29.2	-14.2
Family Female	7.7	66.8***	50.0	33.3
Total Family	4.9	30.0***	-21.1	-8.3
Hired Male	50.2***	28.6*	50.0	33.3
Hired Female	228.0***	169.1***	75.1***	86.3***
Total Hired	154.7***	120.1***	63.7***	63.8***
Total	23.0*	56.0***	24.4***	26.1*

Source: *Primary survey; Note: ***, ** and * indicate significance at 1, 5, and 10 % levels, respectively.*

4.6 Employment in Potato Farming

In India, the concept of contract farming is not only restricted to farming, but it is a concept for marketing as well. Therefore, it generates new employment opportunities in farming as well as marketing. In the case of farming, it creates new employment opportunities by providing new techniques of farming and new cropping patterns, which necessitate more employment. From the marketing viewpoint, it generates new employment opportunities related to grading, processing and packaging of agricultural produce.

The marketing aspect has an extremely positive impact on employment generation, particularly for women. In the present study, it is found that contract farming in potatoes plays an important role in generating new employment in rural areas. The overall dominance of female labour is observed for the potato crop, in both cultivation and marketing. Marketing aspects such as grading and packaging also generate new employment opportunities for women labour in rural areas. In the case of contract farmers, all the marketing cost such as grading, packaging and transportation is paid by the contracting firm. Thus, in this section, the impact of grading and packaging on female labour days is analysed separately.

Table 8 shows the average labour days per acre for potatoes among contract and non-contract farmers. The study shows that both male and female days are higher for contract farmers as compared to non-contract farmers of all farm sizes. The total family labour days are 30, 17 and 9 for small, medium and large farmers, respectively, whereas it is 27, 14 and 8 for small, medium and large farmers practising non-contract farming. The total human labour days are 65, 54 and 52 for small, medium and large contract farmers, whereas it is 58, 43 and 39 for small, medium and large non-contract farmers.

The family labour days for small contract farmers are 11 per cent higher than those of small non-contract farmers, whereas hired labour is 12.9 per cent higher for small contract farmers. The total labour of small contract farmers is 12.2 per cent higher than that of small non-contract farmers. In the case of medium and large farmers, both family and hired labour days are higher for contract farmers as compared to non-contract farmers. Overall, small contract is 11.1 per cent higher, medium 25.6 per cent higher and large 33.3 per cent higher labour in potato cultivation.

Table 8 –Average Labour Days Under Contract and Non-Contract Farmers for Potato Cultivation (per acre)

Contract Farmers				
Labour Days	**Small**	**Medium**	**Large**	**Average**
Family Male	19	12	8	9
Family Female	11	5	1	3
Total Family	30	17	9	12
Hired Male	4	5	6	5
Hired Female	31	32	37	36

Total Hired	35	37	43	41
Total	65	54	52	53
Non-Contract Farmers				
Labour Days	**Small**	**Medium**	**Large**	**Average**
Family Male	17	11	7	8
Family Female	10	3	1	2
Total Family	27	14	8	10
Hired Male	3	3	3	3
Hired Female	28	26	28	27
Total Hired	31	29	31	30
Total	58	43	39	40
Higher Labour Days of Contract Farmers over Non-Contract Farmer (%)				
Labour Days	**Small**	**Medium**	**Large**	**Average**
Family Male	11.8	9.1	14.3	12.5
Family Female	10.0	66.7	0.0	50.0
Total Family	11.1	21.4	12.5	20.0
Hired Male	33.3	66.7	100.0	66.7
Hired Female	10.7	23.1	32.1	29.6
Total Hired	12.9	27.6	38.7	33.3
Total	12.1	25.6	33.3	30.0

Source*: Primary survey.*

4.7 Female Employment from the Marketing Aspect of Potato Cultivation

Contract farming generates more female labour employment in rural areas. In marketing, grading the potato is one of the highest employment-generating tasks. It generates 25 to 30 female labour days per acre of potato. In the case of contract farmers, the grading cost is paid by the contracting firm. Table 9 shows the female labour days of contract farmers and non-contract farmers in the grading of potatoes. The female labour days of a small contract farmer are 28 days, whereas they are 3 for non-contract farmers; this is 833 per cent higher than that of non-contract farmers. There are 26 female labour days for medium and large contract farmers each, whereas there are 6 and 4 female labour days for medium and large non-contract farmers, respectively. Average female employment under contract farming is 26 labour days, while it is 4 female labour days in the case of non-contract farming, which is 550 per cent higher. It is interesting to note that all the marketing labour cost is paid by the contracting firm to the farmers under the contract farming while it is borne by oneself in the case of non-contract farmers.

Table 9 – Female Labour Days in Marketing of Potato per acre

	Contract@	Non-Contract	Change Over Non-CF(%)
Small	28	3	833***
Medium	26	6	333***
Large	26	4	550***
Average	26	4	550***

Source: *Primary survey;* Note: *@ Female days paid by the company; ***, ** and * indicate the level of significance at 1, 5 and 10 % levels, respectively.*

5. Conclusion

Contract farming creates new employment opportunities in rural areas. It creates new employment opportunities by shifting the area from traditional crops to vegetable and fruit crops, which are more labour-intensive. It generates more employment for both male workers as well as female workers. Even some studies have found that contract farming generates more employment opportunities for female workers through the new concept of processing agricultural produce at the farm level. It generates twice to four times more labour employment because it diversifies traditional cropping patterns to vegetable and commercial cropping patterns, which require more labour in the agriculture sector. Therefore, switching from cereal crops to horticulture crops generates more employment for hired labour, small farmers, and landless labourers.

Contract farming generates new employment opportunities in the agriculture sector. On the one hand, it diversifies farmers from traditional crops to vegetable crops, which are labour-intensive. On the other hand, it generates new employment opportunities through marketing aspects, particularly for women. Grading the agricultural produce is a new concept which generates new employment opportunities for female labour in rural areas. Even the employment generated through grading is paid by the contracted firms. The results show that female labour is double that of contract farmers as compared to non-contract farmers in potato, which shows that contract farming plays an important role in generating new employment opportunities in the rural area.

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Is Remittance Addressing the Material Deprivation of the Rural Migrants from West Bengal, India?

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This study investigates the remittance-sending and saving behaviours of rural migrants in West Bengal, India, with a specific focus on their potential to alleviate material deprivation through asset accumulation. Drawing on primary data collected from 550 migrant and 350 non-migrant households across 127 villages in eight districts, the research employs descriptive statistics and a Standard of Living Index (SLI) to examine patterns of remittance utilisation and asset formation. The findings reveal limited variation in remittance behaviour across socio-economic groups. Of the 588 migrants surveyed, 529 regularly remit funds; however, only 75 per cent of recipient households are able to save, indicating persistent financial vulnerability. A longitudinal analysis of asset ownership shows that migrant households experienced more rapid asset accumulation compared to non-migrant households, including increased ownership of high-end assets such as two- and four-wheelers. Nonetheless, households classified within the lower SLI category have not experienced significant improvements in their material conditions. These results underscore the uneven benefits of migration and highlight the need for targeted policy interventions to support the most deprived.

Keywords: *Remittance, asset creation, standard of living, material deprivation, West Bengal, cumulative frequency function*

Introduction

Labour migration is a long-standing socio-economic phenomenon. In recent decades, advancements in transportation and communication infrastructure have facilitated unprecedented mobility, contributing to increasingly complex patterns of migration. Among the primary drivers of such mobility is regional economic disparity, which not only influences the characteristics of migration but also has far-reaching implications for both the origin and destination areas. Empirical research consistently demonstrates that rural populations in India, particularly those who are landless, economically marginalised, or face limited livelihood opportunities, are more likely to engage in labour migration (Reja & Das, 2016; Chandrasekhar & Sahoo, 2018).

Migration is frequently viewed as a strategy for improving household well-being by alleviating poverty and addressing socio-economic inequalities. Individuals often perceive migration as

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a means to enhance their own living conditions and those of their families (Szabo et al., 2018; Glinskaya et al., 2007; Davin, 1999). Chronic deprivation, stemming from a persistent lack of basic livelihood resources across generations, has led many poor households to adopt migration as a coping mechanism (Kothari, 2002). Evidence from the India Human Development Survey (IHDS) suggests that nearly 73 per cent of rural households pursue diverse livelihood strategies, including agriculture, non-agricultural labour, and migration (Kumar, 2020).

While classical macroeconomic theories of migration—such as those proposed by Lewis (1954), Lee (1966), and Todaro (1969)—tend to conceptualise migration as a one-time movement with limited ties to the place of origin, contemporary microeconomic theories offer a more nuanced understanding. These frameworks highlight the sustained interaction between migrants and their families, portraying migration as a strategy for status enhancement and long-term well-being (Murrugarra et al., 2011; Hull, 2010). The act of remitting, therefore, is not merely a financial transaction; it reflects the migrant's continued social, emotional, and economic engagement with their community of origin.

The notion of relative deprivation has emerged as a critical lens through which to assess the motivations and consequences of migration. Stark and Taylor (1991) argue that migration is often driven not only by absolute poverty but by the perception of being worse off than others within one's reference group. Their work, along with that of Stark and Yitzhaki (1988), underscores the role of social inequality in incentivising migration. However, many of these studies address deprivation in relative terms without fully examining material deprivation as a concrete, measurable condition.

Remittance-sending behaviour is a key indicator of a migrant's intention to maintain ties with the origin and to invest in its socio-economic development. Literature suggests that poorer individuals, particularly those with limited skills and education, are more likely to engage in temporary migration due to the high cost of living in urban centres (Kesari, 2020). For these migrants, remittances serve as a critical resource for basic consumption and, where possible, asset accumulation. In this context, saving behaviour becomes an important aspect of migration, as savings underpin long-term investments in housing, education, and income-generating assets (Szabo et al., 2018; Sundari, 2005; Kothari, 2002).

Despite the growing body of literature on remittances and development, a key research gap remains: to what extent are rural migrant households able to alleviate material deprivation through migration and subsequent asset creation? Previous studies often treat migrant populations as homogeneous groups and fail to capture intra-group disparities in outcomes. Furthermore, India suffers from a lack of reliable migration data, particularly at the sub-state level, necessitating field-based investigations to uncover the nuances of migrant experiences.

This study addresses these gaps by examining the remittance-sending and saving behaviour of rural migrants from West Bengal, with a particular emphasis on asset creation and its role in mitigating material deprivation. The research seeks to determine whether the benefits of migration are equitably distributed among migrant households or if significant disparities persist, especially among those at the lowest rungs of the socio-economic hierarchy.

Research Question and Objectives

The research gap generates the ultimate question of whether all rural migrants are able to address their material deprivation through migration.

In that context, the present study tries to understand remittance-sending and saving behaviour, as savings are one of the most important prerequisites for improving financial base and asset creation, which in turn allows the rural migrants to improve their living conditions. The specific objectives of this research paper are:

- To understand remittance sending and saving behaviour
- To explore whether asset creation done through remittance is addressing the material deprivation of all.

Data and Methodology

Increasingly, migration is becoming complex, with differential duration, intermittent return, skill inequality and differential market dynamics at origin and destination. The secondary data, in most cases, are unable to capture the majority of the dynamics because of their complex nature, which poses difficulty in defining migration. The current study is based on a primary survey. Data for the present study have been collected under the project titled 'Demographic and socio-cultural consequences of male out-migration from rural West Bengal.' The survey covered some of the districts where migration from rural areas is prominent. For the present purpose, both internal and international migration are considered. There is a lack of any official data source to know the international out-migration, yet one can assume that the districts with high internal migration will also produce large-scale international migration, as migration happens to continue as an inertia (Messy et al.1994).

Currently, West Bengal has 23 districts, of which eight districts, namely Paschim Medinipur, Jhargram, Birbhum, Murshidabad, Maldah, Dakshin Dinajpur, Cooch Bihar and Darjeeling are covered. These districts are well dispersed and represent the entire state as well as the geographical locations. In the absence of interstate out-migration data from secondary sources, we relied upon the administrative information from the state to select the districts. Information from the local administrative bodies has been used to identify the villages with large-scale migration too. A total of 550 migrant households and 350 non-migrant households were covered from 127 villages of the state. Whenever there was response saturation, the team reached the new village. The survey was done during 2019-2020 (till March, before the COVID-19 pandemic). The respondents in the survey were the adult members in the households who are usual residents and mentally and physically fit to respond.

The questionnaire was designed and pretested before execution. When some of the information was categorical, the information on household size, age, duration of migration, remittance received and savings was collected as continuous variables. The data are analysed by adopting multiple methods, namely, bivariate descriptive statistics, central tendencies, the standard of living index (SLI), and Multiple Classification Analysis (MCA). For the preparation of SLI, standard weightage for each indicator as adopted by the National Family Health

Survey (IIPS, 2000) is considered (Appendix I). Weights are allocated to the durable goods and services available in a household, and the index is calculated by summing up those weights. There were ten in-depth discussions with the village heads on migration and livelihood issues. Cumulative Distribution Function is used to understand change in asset possession over the five years for both migrant and non-migrant households.

Migrants and their Remittance Sending Behaviour

Understanding the remittance-sending behaviour of migrants is essential for contextualising the socio-economic dynamics of migration and its potential to mitigate material deprivation in rural areas. In the present study, a total of 588 migrants were identified across 550 migrant households, indicating that many households reported more than one migrant member. This section presents the socio-demographic characteristics of the migrants and analyses their remittance-sending patterns (Table 1).

In a country like India, where regional economic disparities are pronounced, internal migration may be even more important than international worker migration, certainly in terms of the number of people involved, possibly even regarding remittance volumes (Deshingkar, 2006). Remittances, in this context, are defined as funds transferred by migrants to their families through formal or informal channels. These remittances represent an essential component of household income and are a reflection of the enduring link between migrants and their communities of origin. The descriptive statistics (Table 1) are presented by considering the characteristics of the migrants. The socio-economic characteristics examined in this study include household size, age, gender, marital status, educational attainment, employment type, nature of migration (intra-state, inter-state, or international), duration of migration, remittance amount sent in the preceding 365 days, and the regularity of remittance-sending behaviour. While the analysis of remittance channels lies beyond the scope of this study, the focus here is on the frequency and volume of remittance transfers.

Consistent with the tenets of the new economics of labour migration, which posits that larger households may engage in migration as a risk diversification strategy, the findings show that more than half of the migrants come from medium-sized households (4 to 5 members), and over one-quarter belong to large households (6 or more members). The demographic profile reveals a predominance of young adult males, reflecting broader national trends in rural-to-urban migration. Nearly half of the migrants have completed secondary education, and approximately 38 per cent have attained higher secondary education, with a smaller fraction possessing tertiary qualifications.

Occupationally, the majority (62 per cent) of migrants are engaged as casual labourers, indicative of the informal nature of employment that characterises much of rural-origin migration. About one-third are regular wage employees, while a small proportion are self-employed or not currently engaged in economic activity. The vast majority of migrants—approximately 75 per cent—undertake inter-state migration, with 17 per cent migrating within the state and nearly 8 per cent engaging in international migration. Furthermore, around 67 per cent of migrants have been mobile for less than a decade, suggesting a relatively recent surge in migration.

An overwhelming 87 per cent of migrants reported sending remittances regularly to their families. The remaining 13 per cent, largely those who had established new family units at their destinations or whose parents and siblings remained at the origin, did not remit regularly. In such cases, financial transfers were event-driven and often sent for specific purposes such as ceremonies or emergencies, as has been seen in many other developing countries (Schrieder and Knerr, 2000; Das et al., 2021). This aligns with previous findings that altruistic motivations to remit diminish when return migration becomes unlikely (Delpierre & Verheyden, 2014). In this sample, 10 per cent do not send any remittances as they have formed separate familial units at their destination.

This evidence underscores the fact that remittance-sending is deeply embedded in the migrant's socio-economic category and is significantly shaped by factors such as familial responsibility, employment stability, and the duration and type of migration. These insights set the stage for further exploration of how remittances are utilised and whether they translate into long-term improvements in asset ownership and standard of living for migrant households.

Table 1: Socio-economic profile of the migrants

Socio-economic Background		**Count**	**Per cent**
Household size	2 to 3 members	103	17.4
	4 to 5 members	326	55.7
	6 and more members	159	26.9
Age-Group	Less than 20 yrs	21	3.5
	20 to 35 yrs	359	61.1
	36 to 50 yrs	194	33.0
	More than 50 yrs	14	2.4
Sex	Male	539	91.7
	Female	49	8.3
Marital Status	Never married	148	25.2
	Currently married	437	74.4
	Widowed/divorced	3	0.2
Educational Background	Not literate	24	3.9
	Secondary	286	48.9
	Higher secondary	222	37.8
	Graduation and above	56	9.3
Economic Activity	Regular Wage employee	195	33.1
	Casual Labour	367	62.4
	Self-employed	16	2.8

Socio-economic Background		Count	Per cent
	Not working	10	1.7
Type of Migration	Intra-state	100	17.0
	Inter-state	442	75.2
	International	46	7.8
Duration of Migration Duration	Less than 4 yrs	133	22.6
	4 to 6 yrs	168	28.5
	7 to 9 yrs	101	17.2
	10 yrs and more	186	31.7
Amount of remittances sent in 365 days	Less than 20000	12	2.3
	20000 to 35000	94	17.8
	35001 to 50000	94	17.8
	More than 50000	329	62.1
	No amount sent	59	10.0
Remittance sent systematically	Yes	459	86.8
	No	70	13.2
	No amount sent	59	10.0

Remittance sent and saved

Remittance utilisation patterns reflect the socio-economic priorities and constraints of migrant households at the place of origin (Ansary & Das, 2019; Reja & Das, 2016; Glinskaya, 2007). In this context, understanding how remittances are both sent and saved offers key insights into their effectiveness in alleviating material deprivation. The literature suggests that remittances in low-income households primarily serve two functions: sustaining day-to-day consumption and financing specific expenditures. The latter category often includes housing repairs, education, and asset creation, which are contingent upon the household's ability to save from remitted income.

Correlates of remittance sending behaviour

To assess the factors influencing remittance flows and savings behaviour, this study employs Multiple Classification Analysis (MCA), treating the annual remittance amount and the amount saved as outcome variables. Socio-demographic characteristics serve as the explanatory variables. Among the 588 migrants surveyed, 529 reported sending remittances, while the remaining are treated as zero remitters for analytical completeness.

The unadjusted and adjusted means generated through MCA help disentangle the direct and mediated effects of various predictors on remittance and savings behaviour. The correlation ratio (ETA) and partial regression coefficient (BETA) reveal the gross and net influence of

each factor.

Table 2: Predicted mean for amount of remittance sent in 365 days

Independent Variable		Unadjusted	ETA	Adjusted	BETA
Household size	2 to 3 members	76189	0.018	75601	0.030
	4 to 5 members	78841		78296	
	6 and more members	79522		81075	
Age-group	Less than 30 yrs	78677	0.111	75456	0.081
	30 to 50 yrs	77665		79344	
	More than 50 yrs	98538		107155	
Sex	Male	76214	0.131	76732	0.102*
	Female	105548		99599	
Marital Status	Never married	90380	0.110	93974	0.140*
	Currently married	75137		74028	
	Widowed/divorced	51000		55869	
Educational Level	Upto Secondary	74157	0.076	78788	0.004
	Higher secondary & above	83396		78320	
Occupation at the destination	Regular Wage employee	93182	0.188	88119	0.150**
	Casual Labour	71374		74015	
	Self-employed	80067		84951	
	Not working	21250		8455	
Migration Type	Inter-state	74427	0.234	75528	0.172***
	International	127317		114346	
Duration of Migration	Less than 6 yrs	75176	0.055	71640	0.102*
	6 to 9 yrs	78634		81020	
	10 yrs and more	82941		85674	

*p<0.001= *** p<0.01= ** p<0.05= **

The result of multiple classification analysis (Table 2) shows the gross and net effect of the predictor variables on the amount of remittances sent by the migrants in 365 days. The unadjusted value shows the gross effect, and when the other variables are controlled, it estimates the net or adjusted result. The R^2 is 0.509, which indicates a moderately strong relation between the predictor and the outcome variables.

Sex, marital status, occupation at destination, migration type and duration of migration significantly impact the amount of remittance sent by the migrants. Female migrants, although fewer in number, tend to remit higher amounts than their male counterparts. The desperation

of addressing the material deprivation at the origin often remains much higher among female migrants than among male migrants, which drives them to send more remittances than male migrants (Das and Singh, 2019; UN Women, 2020). This trend is particularly evident in Darjeeling, where women employed in international destinations exhibit stronger financial commitments towards addressing the material deprivation of their families at origin. Unmarried migrants also remit higher amounts, likely due to fewer personal financial obligations. Occupation and migration type further mediate remittance levels: regular wage earners and international migrants remit significantly more than casual labourers or inter-state migrants. Duration of migration positively correlates with remittance volume, suggesting that financial stability over time enhances the capacity to remit. Migrants working as regular wage employees send the highest amount of remittances, as all of them are working in the organised sector with relatively higher job stability and regular salary that allows them to remit regularly.

Factors impacting savings behaviour

The relationship between remittance size and savings is intuitive yet important: households receiving higher remittances are more likely to save. Moreover, systematic remittance-sending behaviour—defined as regular and planned transfers—is positively associated with savings, although the correlation is weaker after adjusting for other variables.

These findings illustrate that while remittance flows offer a critical support system for rural households, their capacity to foster long-term economic resilience through savings and asset creation is not uniform. Factors such as occupation type, duration of migration, and initial household deprivation levels continue to mediate outcomes, pointing to the importance of tailored policy interventions that address structural inequalities in the migration-remittance-savings nexus.

Savings from remittances follow a somewhat different pattern. Among the 529 remitting migrants, only 400 households (75 per cent) were able to save, while the remaining 25 per cent reported zero savings, primarily due to high consumption demands (Table 3). The amount saved from remittances provides several interesting correlates, among which economic and migration-related variables are the most prominent. The variables, namely economic activity, migration type, duration of migration, amount of remittances sent in the last 365 days, and remittances sent systematically, are significant at the 95 and 99 per cent level of confidence.

Marital status, education, occupation, migration duration and the amount of remittances sent in 365 days are significant determinants of savings. Unmarried and better-educated migrants are more likely to save, possibly due to fewer household responsibilities and enhanced financial literacy. A longer duration of stay enables a higher amount of remittances and hence, a higher amount of savings. Self-employed migrants save the most, likely motivated by aspirations of establishing income-generating ventures upon return. Conversely, casual labourers report the least savings, reflecting their unstable incomes and higher vulnerability. It is often observed that the extremely poor reap poor benefits from migration, as they are unable to reach the destination where a higher wage rate prevails. As expected, those places are often far away. From Nepal, the poorer people come to India, where the wage is not as high as that in the Middle Eastern countries, but the cost of migration is affordable for them (Lokshin et al., 2010). A similar observation was reported in Tanzania (Beegle et al., 2011).

Table 3: Predicted mean for amount saved from remittance in 365 days

Independent Variable		Unadjusted	ETA	Adjusted	BETA
Household size	2 to 3 members	25232	0.052	25811	0.058
	4 to 5 members	30747		29627	
	6 and more members	31113		33097	
Age-group	Less than 30 yrs	29438	0.036	28114	0.048
	30 to 50 yrs	30570		31349	
	More than 50 yrs	21538		22524	
Sex	Male	29324	0.049	29832	0.007
	Female	36795		30839	
Marital Status	Never married	38416	0.113	39970	0.134*
	Currently married	27402		26894	
	Widowed/divorced	27500		36321	
Educational Level	Upto Secondary	25177	0.123	27832	0.054*
	Higher secondary & above	35255		32258	
Occupation at the destination	Regular Wage employee	36676	0.188	33321	0.166***
	Casual Labour	25337		26741	
	Self-employed	58571		64360	
	Not working	0		11851	
Migration Type	Inter-state	28101	0.147	28995	0.075
	International	50000		40077	
Duration of Migration	Less than 6 yrs	24757	0.110	24353	0.121**
	6 to 9 yrs	35347		36286	
	10 yrs and more	32019		31768	
Amount of remittance sent in 365 days	Upto ₹ 50000	14481	0.293	16768	0.250***
	More than ₹ 50000	39249		37866	
	Remittance not sent	0		0	
Remittance sent systematically	Yes	31737	0.113	30445	0.033
	No	18224		26491	

*$p<0.001$***, $p<0.01$**, $p<0.05$* $R^2=0.395$*

A large number of studies have observed that migrants, both internal and international, contribute substantially to poverty reduction and thus address relative deprivation. Beegle et al. (2011) observed that, at the baseline, migrants and non-migrants did not have much wealth differentials but observed a reduction of poverty by 8 percentage points among the migrants after four years. In Nepal, it is observed that migrants from poorer households

receive less remittance, which is used for usual consumption, but those who send high-value remittances invest in asset creation and real estate (Lokshin et al., 2010). These findings illustrate that while remittance flows offer a critical support system for rural households, their capacity to foster long-term economic resilience through savings and asset creation is not uniform. Factors such as occupation type, duration of migration, and initial household deprivation levels continue to mediate outcomes, pointing to the importance of tailored policy interventions that address structural inequalities in the migration-remittance-savings nexus.

Addressing the material deprivation

A critical lens through which the impact of migration and remittances must be assessed is the degree to which they alleviate material deprivation among rural households. In the case of West Bengal, data from the 2011 Census (GoI, 2011) indicates that approximately 11.8 per cent of households reside in dilapidated dwellings, the highest proportion among all Indian states. Furthermore, the Socio-Economic and Caste Census (SECC) of the same year reports that 59 per cent of rural households live in kuchha (temporary) structures, highlighting the acute inadequacy of housing infrastructure in the region. Field evidence from the present study corroborates these findings. One of the earliest and most frequent uses of remittances by migrant households is for housing improvement. Whether through renovation, reconstruction, or the construction of new dwellings, households receiving remittances tend to prioritise upgrading their living conditions. This trend holds true for both migrant and non-migrant households, contributing to similar rates of improvement in basic housing assets across the board. Consequently, housing improvements alone are not a sufficient indicator of migration's impact on deprivation alleviation(Table 4).

Table 4 - Asset creation differential between migrant and non-migrant households (before and after 5 years)

	Migrants Household			Non-Migrants Household		
	5 years before	5 years after	Growth	5 years before	5 years after	Growth
House	450	502	11.56	288	321	11.46
Television	265	377	42.26	186	247	32.80
Computer	13	35	169.23	20	37	85.00
Refrigerator	32	88	175.00	50	94	88.00
Two-Wheeler	41	173	321.95	82	134	63.41
Four-wheeler	1	11	1000.00	7	15	114.29

To provide a more comprehensive assessment, this study compares changes in the ownership of various household assets over a five-year period among migrant and non-migrant households. These assets include televisions, computers, refrigerators, two-wheelers, and four-wheelers. The results indicate that migrant households experienced substantially higher growth in asset acquisition than their non-migrant counterparts, particularly in the ownership

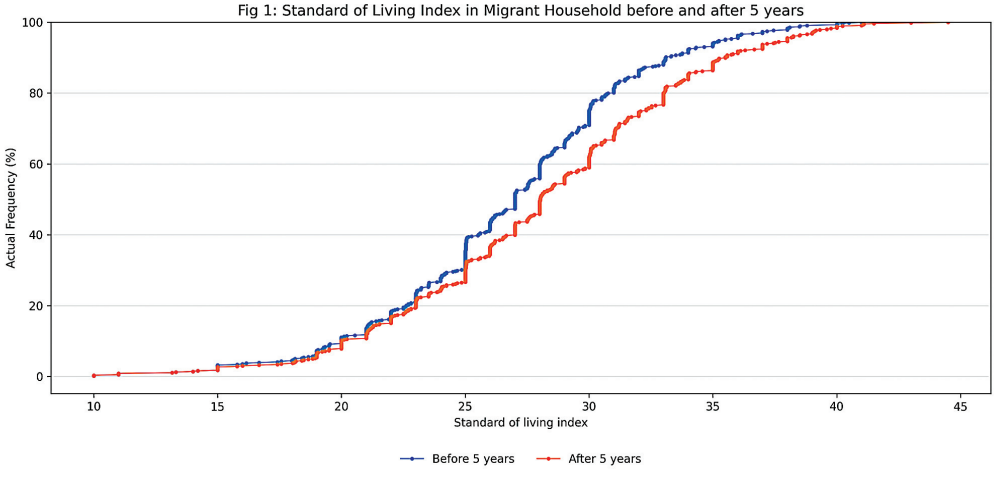
of high-end and income-generating assets.

For example, the number of migrant households owning two-wheelers and four-wheelers increased by 322 per cent and 1000 per cent, respectively, compared to 63 per cent and 114 per cent among non-migrant households. These figures suggest that remittances are not only used for consumption but are also channelled into productive investments. Borrowing for asset creation in developing countries is not easy for poor families, as the banks require huge collateral against the loan, and remittances fill that void (Massey et al., 1993). Vehicles often serve dual functions: enhancing mobility and providing income-generating opportunities, such as employment in transport services or rental operations. Two-wheelers are making their life smoother, as access to facilities in nearby towns and horizon of movement for opportunities are enlarged. These demonstrations initiate a spiral of growth and inertia for migrants who feel relatively deprived, and migration becomes pervasive (Massey et al., 1993).

The purchase of such assets significantly contributes to improving the overall standard of living. However, the benefits of migration are not evenly distributed. While middle- and higher-income migrant households show marked improvements in asset ownership and material well-being, those in the lowest SLI categories report limited gains. The standard of living index (SLI) is constructed for both migrant and non-migrant households by considering their asset position five years before the survey and at the time of the survey. Interviews with village leaders and key informants reveal that the poorest migrants often lack the skills, resources, or continuity of migration necessary to derive sustained benefits from remittance income.

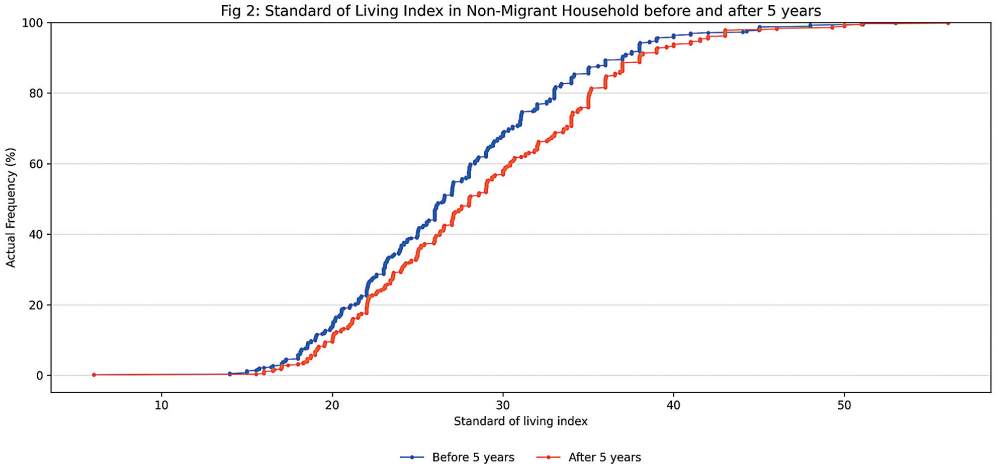
Cumulative Distribution Function (CDF) analysis was conducted to assess changes in the distribution of living standards among both migrant and non-migrant households. Among migrants, the CDF showed a slight rightward shift, suggesting modest improvement in living standards, particularly among middle-income groups. However, the lower tail of the distribution—the poorest households—experienced minimal change.

Cumulative Frequency Function for Migrant Households



In-depth interviews with ten village heads highlight a similar pattern where they generalise that extreme poor are very low-skilled, indebted households and thus neither are they earning better at the destination nor being able to save sufficiently in the short duration of migration. They also observed that discontinuation or intermittent migration is also high among the poor, as they do not see sufficient improvement in their living.

Cumulative Frequency Function for Non-Migrant Households



In contrast, the CDF for non-migrant households exhibited a broader but flatter rightward shift, indicating that while some non-migrant households improved, many remained stagnant. Overall, the comparative analysis reveals that migration can accelerate material improvement for some, but the most socio-economically deprived remain at a disadvantage, irrespective of their migration status.

These findings underscore the need for differentiated policy approaches. While migration can serve as a pathway to upward mobility, targeted interventions are essential to support the most vulnerable migrant households. Capacity-building, access to skills training, and affordable financial services could enhance the ability of poorer households to maximise the benefits of migration and break free from entrenched cycles of deprivation.

Conclusion

The findings of this study reinforce the notion that labour migration, particularly from rural areas of West Bengal, continues to function as an essential livelihood strategy for economically vulnerable households. Most migrants are young, male, and come from low-income, low-skilled backgrounds. Migration is often prompted by the need to diversify income sources in the face of persistent underdevelopment at the place of origin. While many migrants remit money to their families, not all are in a position to save, and those in the poorest segments of the population appear least able to translate remittances into meaningful long-term improvements.

The study reveals that remittances contribute to asset accumulation, particularly in the form of household durables and transportation assets, which in turn enhance the quality of life and economic mobility of recipient households. Migrant households demonstrated faster rates of asset growth compared to their non-migrant counterparts, especially in the acquisition of two- and four-wheelers, which often serve dual functions as both consumption and income-generating goods.

Nevertheless, the benefits of migration are not uniformly experienced. Households at the bottom of the socio-economic ladder, despite engaging in migration, often lack the skills, resources, or sustained opportunities required to derive significant returns. The poorest migrants frequently engage in intermittent or short-duration migration, with little capacity to save or invest in productive assets. Consequently, material deprivation remains entrenched for many, even in the presence of remittance flows.

Moreover, the analysis indicates that structural barriers such as irregular employment, limited financial literacy, and inadequate access to formal credit continue to constrain the transformative potential of remittances for the most vulnerable. These findings point to the importance of supporting migration with enabling policies that foster financial inclusion, skills enhancement, and investment in local livelihood infrastructure.

In conclusion, while migration has demonstrable benefits in improving the standard of living for many rural households in West Bengal, it is not a panacea to address poverty or material deprivation. A comprehensive development approach—integrating migration with local economic development, targeted support for the poorest, and institutional mechanisms to channel remittances into sustainable investments is required. Only through such integrated strategies can migration be an effective vehicle for inclusive and equitable rural development.

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Appendix I: NFHS Standard of Living components and weights

	Household characteristic	Scores			
1	House type	- pucca =4	- semi pucca=2	- kachha=0	
2	Separate room for cooking	- yes=1	- no=0		
3	Ownership of house	- yes=1	- no=0		
4	Toilet facility	- own flush toilet=4	public or - sharedflush toilet or own pit toilet=2	- shared or public pit toilet=1	- no facility=0
5	Source of lighting	- electricity =2	-kerosene, gas, oil=1	- other sources of lighting=0	
6	Main fuel for cooking	- electricity, liquid petroleum gas or biogas=2	- coal, charcoal or kerosene=1	- other fuel=0	
7	Source of drinking water	- pipe, hand pump, well in residence/ yard/plot=2	- public tap, hand pump or well=1	- other water source=0	
8	Car or tractor	- yes=4	- no=0		
9	Moped or scooter	- yes=3	- no=0		
10	Telephone	- yes=3	- no=0		
11	Refrigerator	- yes=3	- no=0		
12	Colour TV	- yes=3	- no=0		
13	Black and white TV	- yes=2	- no=0		
14	Bicycle	- yes=2	- no=0		
15	Electric fan	- yes=2	- no=0		
16	Radio	- yes=2	- no=0		
17	Sewing machine	- yes=2	- no=0		
18	Mattress	- yes=1	- no=0		
19	Pressure cooker	- yes=1	- no=0		
20	Chair	- yes=1	- no=0		
21	Cot or bed	- yes=1	- no=0		
22	Table	- yes=1	- no=0		
23	Clock or watch	- yes=1	- no=0		
24	Ownership of livestock	- yes=2	- no=0		
25	Water pump	- yes=2	- no=0		
26	Bullock cart	- yes=2	- no=0		
27	Thresher	- yes=2	- no=0		

Source*: IIPS, 2000*

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A Study of Employment Patterns, Prospects, and Functional Aspects of Home Delivery Work in India

Asiya Nasreen*

Home Delivery work is an emerging blue-collar employment owing to the continuous growth of e-commerce in the service sector. The literature pertaining to the work life of home delivery workers is quite scarce, and the same has been the concern of this paper. It explored the employment patterns, prospects in delivery work and analysed its functional role. Primary data was collected from 200 delivery boys working in Delhi, with full-time employment for most of them. The food and non-food segments are two sub-categories of home delivery. Third-party agencies play an important role in recruitment and provide flexible employment contracts. Those workers who work in the food segment are at greater disadvantage in terms of security of their tenure and other benefits. Incentives, bonuses and social security are partially provided. Low education and unpleasant working conditions become dysfunctional for home delivery workers, whereas the flourishing e-commerce market becomes functional for e-commerce companies.

Keywords: *Home delivery; E-commerce; Employment pattern; Employment prospects; Contract.*

Introduction

The service sector has brought new work opportunities in both urban and semi-urban areas. Pareekh (2010) argued that the urban poor mainly work in the service sector. Electronic commerce, or e-commerce, is a subset of the service-sector economy and has been growing rapidly, whereby plenty of employment opportunities are being created in India. The Hindu Business Line, 2021, stated that: "In India, the e-commerce market is projected to expand to USD 200 billion from USD 46.2 billion in 2020. Concurrently, retail sales driven by e-commerce companies are estimated to increase by 31 %, which is around USD 32.70 billion.

Steered by the rising usage of smartphones and low data rates, goods and services which were earlier procured physically have shifted to online purchases and home deliveries using online platforms. This aside, transactions for online shopping have gained impetus through inter-bank connectivity, provision of digital payments through platforms like Mobikwik, Google Pay, Rupay, Paytm and many others. All these factors taken together facilitate customers to select the product of their choice, place an order, make online payments and get it delivered at the doorstep.

The outcome of the stimulating e-commerce industry is the creation of demand for technical and non-technical professionals, skilled and unskilled blue-collar workers in different segments, including e-tail. Across all occupational groups in the e-commerce industry, only the last-mile

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workers responsible for doorstep delivery of products have face-to-face contact with the customers. These workers are called 'Home delivery workers' or 'delivery workers'. The Confederation of Indian Industry, in 2016, predicted that the e-tail sector would create one million jobs by 2021 in the logistics and warehousing sector, which includes the delivery workers, but the number has exceeded far more than this at present. Companies like Swiggy, Zomato, etc are pressurised to hire them, particularly during festive seasons, New Year occasions or any other important event during which the sales scenario gets accelerated to meet the needs of customers (The Economic Times, January 20, 2022). Independent reports and blogs do provide an estimated number of delivery workers, but officially, there is no statistical data available to indicate the extent of workers employed through digitally intermediated platforms.

Though companies engaged in large-scale hiring offer reasonable salaries, on the greyer side, high attrition and an insufficient workforce force the hiring agencies or start-up companies to look towards small towns and villages, attract students and less qualified youngsters. Economic activities are influenced by structural factors like availability of jobs in the market, educational level, skills possessed, experience and resources for investments, etc. Job accessibility also depends on the availability of jobs and the needs of the candidate. Structurally and functionally, e-commerce business supports the unemployed youth through the created demand for home delivery workers, which in turn gets strengthened by getting more and more business. Together, companies and their employees maintain the system as a 'whole' and contribute to its stability (Rawat, 2015), yet underneath are some latent functions that cause 'Dysfunction' or 'non-function' due to negative consequences in society. With this backdrop, the present paper describes the functional value of employment generated in the e-tail sector for its blue-collar employees or delivery workers.

Literature Review

E-commerce industry, Employment opportunities and working conditions

Home delivery of goods plays an important role in the e-commerce business by creating demand for delivery boys in India (De Vera, 2006; India Brand Equity Foundation, 2018). The logistics industry will further flourish with the emergence of organised retail and Quick Service Restaurants (QSRs), and the requirement for home delivery personnel will arise (The Economic Times, 2015). A technology-based food delivery application; 'Swiggy' one of the pervasive companies directly hire individuals to work as delivery executives currently employs 1.2+ lakh individuals so that the company's "*exceptional consumer focus…*on…*lightning fast deliveries, live order tracking and no restrictions on order amount, all while having the pleasure of enjoying your favourite meal wherever you'd like it"*…can be put to reality (https://careers.swiggy.com/discover-our-world/, 2019). Delhi, Mumbai, Kolkata, Hyderabad, and Ahmedabad would be major cities where the major employment opportunities in the logistics sector are found.

Though the demand for home delivery personnel will rise, the employment pattern of temporary and contractual workers in the e-commerce industry would also be felt (Jasper Infotech Pvt Ltd, 2016). Woetzel et al. (2017) stated that e-commerce companies such as Amazon and

Flipkart are creating new types of jobs rarely covered under the formal economy in India. They hire delivery personnel through temporary hiring firms during the festive seasons to meet the large volume of delivery targets (Times of India 2018, Ernst & Young LLP, 2017, Livemint, 2016). The delivery work in the e-commerce business comes under the 'exchange' category and includes various processes through which goods produced are transferred between the seller or E-commerce company and the buyer or customer. The exchange of commodities led to the creation of a new occupational group in the labour market, transformed social relations between capital and labour, patterns of employment and systems of training (Fevre, 2014). The fundamental function of digital platforms is matching the tasks that need to be completed so that the exchange can take place between the worker and the consumer. This matching function in terms of actual work can be divided into two categories: exchange of assets and facilitating production. The former is based on advanced skills, and the latter can be taken up by workers who have rudimentary skills (Farrell and Greig, 2016).

Prassl (2018) explains the perils and promises of gig work, which include the idea of autonomy and freedom in the daily lives of the workers and emphasises the importance of a regulatory framework that could benefit the workers. Characteristics such as *'removing protections and assurances…and through…creation of riskier and more precarious forms of low-paid work'*, which are similar to the characteristics of the nature of informal work, are mentioned by Mehrotra (2019).

Rewards and Benefits:

The compensation sought through digital platform-based work is similar to compensation sought through piece work in the early history of merchant capitalism, which is described by Stanford (2017) as a "*good historical example of the long-standing application of several flexible and subcontracted work strategies that have again become common in modern digital businesses"*. Although there are instances of some platforms providing wages and social security benefits like health and accident insurance to the 'delivery partners' or micro-entrepreneurs working with them, it is not a standard practice. The information is contextualised in relation to success stories of the start-up based on three metrics described longitudinally from 2014 to 2017. These are: *the number of restaurant partners, the number of orders completed, and the number of Delivery partners.* The description eulogises the autonomy and freedom of their partners and emphasises 'incentives', 'rewards' and 'earn more' to the delivery partners.

The recall of secondary source data brings out that the exponential growth of e-commerce has opened up employment opportunities, especially in last-mile delivery; however, empirically, there is a paucity of information about the working conditions of home delivery workers and prospects of delivery work.

Research Questions and Objectives

With this backdrop, the present paper considers the following objectives

1. To know the socio-economic profile of home delivery workers.

2. To examine the process of joining delivery work and the nature of employment.
3. To explore the working conditions of the delivery segment.
4. To know the prospects in delivery work.

Research Methodology

The primary data were collected from 200 home delivery workers working in different e-commerce companies in the National Capital Territory (NCT), Delhi. The respondents were males who were contacted through snowball sampling, and a semi-structured interview schedule was applied to them to achieve the objectives. The information was triangulated with four Focus Group Discussions (FGD). The responses received were coded and analysed in Excel software and through SPSS 22.

Results

The variables included in the study were demographic profile, process of joining delivery work, its nature, mode of employment and contract, social security benefits, incentives and bonus, reimbursement and travel expenses, leave entitlement and prospects of a delivery job. Each of the variables is presented in the subsequent sections.

A. Demographic Profile

As depicted in Table 1, the majority of the respondents (91 per cent) were less than 40 years of age, which is the most productive age group in society. The median age was about 27 years. Nearly three-fifths (59%) of them were married. Educationally, all were literate; most of them completed secondary school education, and some were Graduates and above, including technical degrees. Through delivery work, they were able to earn rupees 10,000/ to 25,000/ per month.

Table 1: Respondents Profile

S. No.	Particulars	Frequency (In percentage)
1	**Age (in Years)**	**N=200**
	18-30	63
	31-40	28
	41-50	7
	51 and above	2
	Total	100
2	**Marital Status**	
	Married	59
	Unmarried	41
	Total (N=200)	100

S. No.	Particulars	Frequency (In percentage)
3	**Educational Qualification**	
	Primary	7
	Secondary	45.5
	Intermediate	34
	Graduate and above	13.5
	Total	100
4	**Monthly income (in INR)**	
	Upto 10000	2
	10001-15000	54.5
	15001-20000	37
	20001-25000	5.5
	25001 and above	1
	Total	100
5	**Native State**	
	Delhi	40.5
	Other States	59.5

Nearly three-fifths of respondents (59.5%) belonged to states other than Delhi and have migrated for livelihood. Since 2000, as the e-commerce market in Delhi started rising, the availability of home delivery jobs pulled many people from different parts of the northern states to migrate for better prospects to cities and aptly coincides with the observation of Ray (2015) that youths educated up to elementary to secondary schools go for various semi-skilled jobs to urban centres.

B. Process of joining delivery work

People gain information about employment opportunities through different sources. Nearly three-fifths of respondents joined delivery work through a reference from a friend or relatives or known person, as it helps in fetching financial incentives from the company. This was corroborated by FGD, and the participants stated that '*referrals*' are the main source to get a job in the e-tail sector and confirm the World Bank study that blue-collar workers are mostly recruited through personal recommendations in the developing countries and are important recruitment channels in the logistics sector (McKinnon,2017).

Secondly, nearly a quarter of respondents received job-related information from online or social media platforms like WhatsApp groups or company sites, and also offline from newspapers. The rest of the respondents (17.5 per cent) contacted the company directly for

the job. All of them faced an interview, and documents were verified before formal joining.

Respondents deliver a range of products that can be categorised into delivery of food items or non-food items and are found working in almost equal proportion in these sub-categories of home delivery.

C. Nature of home delivery employment

The nature of employment generally means temporary or permanent employment offered by an employer, which leads to the creation of the structural relationship between the employer and employee. The nature of employment and type of contracts that exist in the e-commerce delivery system are depicted in Table 2. The majority of the respondents (94 per cent) were working full-time, and they work for a minimum of 10 hours a day, which extends up to 12 to 14 hours in certain cases. In the part-time engagement, respondents were working for fewer hours but not less than 4 hours and provided flexibility and an opportunity to earn at ease. Further, with age advancement, they preferred to work full-time.

Table 2: Nature of employment of delivery boys (In Percentage)

Particulars	**Nature of employment**		
	Full-time work	Part-time work	Total(N=200)
Mode	**94**	**6**	**100**
	Type of employment		
	Direct	Vendor	Total(N=200)
Full time	**57**	**43**	**100**
Part time	**83**	**17**	**100**
Total	**59**	**41**	**100**
Types of products in home delivery			
Food items	**83**	**17**	**100**
Non-food items	**36**	**64**	**100**
Total	**59**	**41**	**100**
Types of contract			
Types of contract	Food items(n=99)	Non-food items(n=101)	Total
Signed written Contract	**36**	**91**	**64**
App-based contract	**64**	**6**	**34.5**
Oral or Verbal Contract	**0**	**3**	**1.5**
Total	**100**	**100**	**100**

The mode and type of employment for home delivery workers indicated that nearly three-fifths (59 per cent) were hired directly by the company and included both those who were

working as full-time workers as well as part-time. Companies had been hiring directly and through outsourcing or vendors. The home delivery workers have been involved in the delivery of food and non-food items for various platforms like Amazon, Swiggy, Zomato, Delhivery, etc. However, the maximum inclination was towards delivery of food items, and these accounted for a total of 83 per cent. The liking for the food sector is high, probably due to the following identified reasons:

a) E-commerce is flourishing more in the case of food items, and respondents have a direct relationship with their employer through the mobile app, and all working conditions, including remuneration, are monitored and controlled through the App only.

b) Food is a consumable and basic item that customers order more frequently and at regular intervals than the non-food items.

The third and most important aspect of employment is the type of contract that the company offers to the workers. Service contracts are the arrangements between an employee and the employer that define their work agreement, indicating the conditions of work and remuneration. A signed and written contract was the dominant form of employment contract, which stood out at 64 per cent for workers employed in delivery of food and non-food items, followed by app-based contracts (34.5 per cent). Once offered an appointment after selection, respondents were asked to download the App on their mobile and after filling in all the details, the information was submitted to the company, and it became a source of connection between the contracting parties. The distinguishing aspects of the App-based contract are:

a) After completion of the formalities through the App, delivery boys have to pay a security fee of approximately INR 1500 at the nearest boarding centre of the company, then receive a delivery kit which includes a delivery bag, raincoat and T-Shirt along with log-in ID and password to operate the App. Except for the use of the delivery kit, the rest of the things that respondents do in the field were through the app only.

b) The App-based contract considers the respondents as ‘delivery partners’, ‘Riders’, ‘Delivery Associates’, etc. and not as employees.

The new emerging forms of contracts confirm that various forms of engagement models vis-a-vis temporary and contractual employment are being experimented with during peak season by E-commerce players, which permeates even for professional services (Ernst and Young LLP, 2017, The Hindu Business Line, 2021). Though Apps are flexible and easy to handle, but equally easier it is for the companies to evade social security and other welfare measures that are provided by structured employment contracts. As such, home delivery work is quite precarious.

D. Social security benefits

Social security is the protection provided to employees to manage the exigencies of leaving a job or becoming unemployed, which is generally mandated by the government. ILO describes social security as a human right and a fundamental means for the creation of social cohesion,

which guarantees income security and health protection to the workers as well as their family members. For the employer, social security helps to maintain a stable workforce that can adapt to changes. Results (Table 3) revealed that almost half of the respondents were receiving social security provisions. Those who were not receiving were working in the food delivery sector.

Table 3: Social Security benefits for respondents

Social Security benefits	**Food item Delivery (n=99)**	**Non-food item Delivery (n=101)**	**Total (N=200)**
	(Frequency in Percentage)		
Yes	**47**	**51**	**49**
No	**53**	**49**	**51**
Total	**100**	**100**	**100**
Types of benefits received by respondents			
Types	Food item(n=47)	Non-food item(n=51)	Total(n=98)
Provident Fund	**70**	**100**	**86**
ESIC facilities	**70**	**100**	**86**
Insurances	**49**	**16**	**32**

Information about the types of benefits received revealed that three types of social security are provided: Provident Fund (PF), Employees State Insurance (ESIC) and life insurance. The non-food delivery sector is relatively generous, as almost all its full-time or part-time delivery boys were covered with PF and ESIC. The respondents working in the delivery of food items were provided insurance coverage, which included life and medical insurance against the odds and injuries that may happen during commuting. During the interaction, it was found that respondents were contributing an amount of INR 800 to 1500 per month towards the PF and INR 300 to INR 500 towards ESIC, depending on the wages received by them. Life insurance or accidental insurance to the tune of INR 2 - 5 lakhs was provided depending on the company's policy.

Perhaps, the idea of considering the employees as 'delivery partners', 'delivery associates', in app-based contract relieves the responsibility of entitlement to social security, as it is not provided to the partners and is the covert reason that pushes these workers to work beyond stipulated 8-9 hours at workplaces so that they can earn extra amount.

E. Incentives and bonus

Besides salary, other forms of financial benefits provided to employees act as motivators for job performance. Towards this regard, the majority of respondents were receiving a bonus, which is over and above the monthly remuneration and differs from company to company

depending on the kind of employment arrangement they had with their employer. For instance, respondents working in the non-food sector were receiving INR 5-10 extra on each item delivered by them to the customer. Similarly, respondents working in a leading food delivery company were receiving a per-day incentive of INR 200 on completion of 17 orders and INR 400 on completing 24 orders. For a part-timer, INR 100 was the per-day incentive if earnings were more than INR 480 between Monday to Friday that was increased from INR 480 to INR 600 during weekends. In addition to this, respondents get INR 350 per week as a login incentive for completing 6 days' shifts in a week, working beyond 11 PM and during bad weather conditions.

Some respondents were receiving an attendance bonus, which was the number of days attended during the month over which the company calculates the bonus. A leading E-commerce company was providing INR 1000 as an attendance bonus to the workers. Similarly, there was a provision for a bonus for carrying extra weight in kg for delivering more packets than the target fixed for the day. In case of the food delivery sector, a reputed company was giving INR 10 extra to the delivery boys or riders for receiving a 'five-star' rating from the customer.

In addition to the above, they were getting a 'starting bonus' and 'referral bonus'. The starting bonus was received when they joined and completed a certain minimum number of orders within a specified time. Similarly, the workers get a referral bonus if they refer a person known to them to become delivery partners in food delivery Apps. Moreover, they received a host of rewards like being acknowledged as an employee of the month by the company, followed by a party in the hub or distribution centre, provided shopping coupons, lottery cards, etc. Authors (Armstrong, 2012; Dessler and Varkkey, 2011) mention that the financial and non-financial incentives are paid to the workers if they achieve or go beyond predetermined targets. In this case, getting incentives is reasonably complicated, as the home delivery workers have to achieve their pre-decided targets anyhow, work during odd timings and score good ratings from customers.

F. Benefits provided

Reimbursement of travel expenses: During the interview and FGD, it was shared that the majority of the respondents were receiving monthly mobile charges and fuel charges for every extra kilometre they cover in a day. In some companies, for motivation purposes, the fuel charges in two instalments in a month were provided, which were not included with salary.

Leave entitlements: Leaves are provided to employees to meet unforeseen contingencies. Casual leaves, earned leaves and medical leaves are generally provided. More than three-fourths of the respondents in the non-food category of home delivery were not availing them because during weekends, public holidays or festivals, leaves are not permitted due to a rise in sales or for the sake of incentives being accrued to them on each delivery. Some companies have the provision of providing longer annual leave for two weeks on completing one year of service.

G. Prospects in delivery work

An attempt was made to explore various prospects in delivery work relating to promotions or elevation in the career ladder. Nearly two-fifths of respondents (41.0 per cent) shared that there were prospects of promotion or elevation in their respective companies. Based on years of experience, evaluation of work and qualifications, delivery workers could become a supervisor, shift manager, hub manager, team leader, etc. For promotion or elevation purposes, companies follow a due process of holding interviews, considering customer feedback, leadership qualities, and their interpersonal relations with other workers in the hub and in the field. However, many respondents working in App-based delivery platforms shared that since the company considers them as 'Delivery Partner' and not staff or employees, they do not have any promotion opportunities.

H. Stability and security of the delivery job

More than half of the respondents mentioned that there was no job security in delivery work. Different reasons were mentioned, like many times the appointment gets terminated for silly reasons or minor complaints received against them. These included: the non-permanency of the job being completely demand-based, as whenever the demand for home delivery rises during festive seasons or mega sales, companies hire additional delivery boys for a fixed term only. Further, the respondents who were in food delivery shared more job insecurity, as they were engaged through an app-based system; the only medium of interaction with their company could be closed at any point. Closing of their login ID led to termination of their partnership and income. There are many aspirants in the market to work as delivery boys, so the company also did not care much about them.

Secondly, nearly one-third of respondents (32 per cent) shared that they would continue the delivery job as long as they were physically fit, as the work required continuous and strenuous travel. Thirdly, more than a quarter of respondents (29.5 per cent) shared that the changing policy of the e-commerce companies has brought more worries to them. At the beginning of delivery work, they were hired directly, later contracted by third-party vendors and expected to follow their terms and conditions of work. Some of the respondents shared that e-commerce companies were gradually decreasing their delivery charges over the years, leading to an overall decrease in their per-day income. In the beginning, delivery boys who were working in food delivery Apps were getting around INR 40 per delivery, which was reduced to INR 30 in a year. Similarly, in the case of non-food delivery, they were getting INR 18 per packet delivery a year ago, which was reduced to INR 14. Their incentives were also changed from 10 packets to 14 packets per day. Moreover, with newer e-commerce companies entering the business, competition has penetrated here as well, which is reflected in the redistribution of the number of delivery orders among new players.

Lastly, more than one-fifth of the respondents (21.5 per cent) shared that their retention depends upon the feedback given by the customer and, if it is aversive, their appointment gets terminated. Thus, even home delivery work is becoming a challenge in terms of instability and confirms that it is a non-standard form of work (ILO) offering exploitation and insecurity for the delivery workers.

Discussion

Technology has touched almost every aspect of human life and transformed the way of living, including the experience of buying things. E-commerce in current time has become the champion of buying and selling products of all types and for almost all classes, penetrating urban and semi-urban areas across India. There are two ways to understand the functionality of delivery work: one for the e-commerce sector and the other for the home delivery workers. The growth estimates put forth by Economic Times, 2022; The Hindu Business Line, 2021; CII, 2016, indicate that the e-commerce market will grow far and wide. The outcome of economic growth is the creation of demand for almost all types of professionals handling E-Commerce operations. One such demand is for workers involved in door-to-door delivery of goods to customers, which has provided both full- and part-time employment options to many young persons, DEF Covid-19 Ground Report Series. 2021, Bharadkar, et. al, 2020 and the same has been confirmed by the present study. Respondents further informed that entry into delivery work is easy through reference, by which more and more needy youngsters can enter the employment domain.

Multiple models of engagement exist in delivery work, which include app-based digital contracting, freelancing, etc., that offer flexibility to the delivery workers to work conveniently as per the time suitable to them. The App-based contract is widely used in the food delivery sector, wherein the delivery boys share a direct relationship with their employer on the digital platform. They are regarded as a 'Delivery Partner' and offered prideful job titles like 'Delivery Executives'. Provident fund, ESIC and medical insurance are not provided uniformly, and those who are hired for a short duration are not covered under any social security measures, simply confirms Mehrotra, 2019. Compensation is mostly paid on the basis of piece rate; incentives and bonuses are also contingent on achieving the targets. Further, benefits like provisions of leave are not an entitlement but are granted on a roster basis regardless of the need of a person. The rewards are non-commensurate with the stress and strain borne by them for 12 to 14 hours by biking on the road 24X7 round the year doing the same type of work.

Apparently, it seems and sounds like a fit case of employment generation, but there are several itchy facts about the mode by which the employee is hired, having implications on the working conditions, Prassl, 2018. The change in the nomenclature has created the scope of not considering them as 'Employee' and reinforces that it is only an exchange and transference of goods from the company to the consumer in lieu of the payment received Fevre, 2014. Thus, strategic models of employment contracts are a subtle way to escape the responsibility of providing social security by the e-commerce employer. The findings strongly corroborate that the employment patterns are non-standardised, as the idea of decent work is not being fulfilled (ILO).

For the home delivery workers, this work has long and strenuous working hours, repetitive work, thin progress prospects on account of low levels of education, skills and precarious employment contracts. Monetary incentives, bonuses, or sometimes tips received from the customers are perceived as prospects and growth avenues in the job hierarchy. In labour

legislation, they are not included, and the new labour codes are yet to be implemented. All this makes home delivery workers informal labour within the formal sector, which is manifested in their day-to-day precarity Farrell and Greig, 2016. The rudimentary skills and compulsion of economic needs force them to pursue disguised employment, making the delivery work dysfunctional for them but functional for the e-commerce companies.

In order to address the work-related challenges and to improve the conditions of home delivery workers, it is recommended that with changing technology, they should also gain technical skills, build the soft skills like interpersonal communication, teamwork so as to interact in pleasant manner with customers on a regular basis for remaining employable in the labour market and to be abreast with the nuances of delivery work. The scattered workforce of home delivery workers can be organised as a self-help group or create a collective to work together for negotiating better relations between them and their employer. Efforts can also be directed towards sensitising the E-commerce delivery companies or hiring agencies to provide minimum wages, mandated working conditions and social security benefits for fulfilling and satisfying work.

Conclusion

Many youths and unemployed persons in India, irrespective of their socio-economic backgrounds, are being provided employment opportunities by e-commerce industries within the service sector. Innovative, cost-cutting patterns of employment are created that go beyond the traditional employer-employee relationship, making its workforce informal. Superficially, it provides income avenues but is not sustainable in the sense that the requirement of livelihood drives the person to pursue low-paid jobs, but as the agility of youth fades, stability is missed in the employment contracts.

The need for encompassing employment remains unmet. More than being functional for the workers, it is dysfunctional for them but functional for the e-commerce companies.

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