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Research Article

Exploring the Education-Income Nexus: A Comparative Study of Regular, Casual, and Self-Employed Workers Using PLFS Data

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ABSTRACT

An analysis of education and income patterns across different employment types in India reveals that the average incomes of educated self-employed people are lower than those of illiterate casual workers. Nevertheless, the percentage of people engaged in self-employment significantly increased. Earnings were significantly harmed by the COVID-19 pandemic; many workers are still unable to reach their pre-pandemic pay levels, showing substantial labor market misery. In terms of incomes and the workforce's educational makeup, certain K-shaped recovery patterns are beginning to emerge, despite signs of a V-shaped recovery in more general economic measures.

Keywords: Education. Earning. Regular worker. Casual worker. Self-employed.

1. Introduction

India has rapidly emerged as one of the fastest-growing major economies globally and is predicted to rank among the top three global economic powers in the decade that follows. This growth is driven by its strong democratic system and international alliances. Since the economic reforms of the early 1990s, India's economic performance has steadily improved. By 2015, India surpassed China as the world's fastest-growing major economy. The nation's sizeable, youthful population creates a robust labor pool and a dynamic consumer market, both of which support ongoing economic growth.

According to research, people who possess a greater education typically earn higher salaries (Jones 2001). This raises questions about the optimal point at which to continue or discontinue academic pursuits. Another significant challenge is determining the profitability of investing in further education. Due to growing evidence that human capital is a major factor in raising individual earning potential, substantial research has been conducted since the late 1950s. Our focus on assessing the returns on investment originates from the fact that education is frequently seen as an investment (Machlup, 1982; Shaffer, 1961). According to economists, differences in educational pursuits across various levels and methodologies can be explained by the returns on education. This metric also guides the distribution of public expenditures for education (Psacharopoulos 1985). It motivates people to make educational investments for their own personal growth as a gauge of educational productivity.

With high unemployment rates among educated individuals, there is a belief that there is excess education in the economy, contributing to an underproductive labor force. It can be difficult to get white-collar jobs or employment in the organized sector, which educated people frequently desire. The educated population experiences greater unemployment rates as a result of this trend. The illiterate, on the other hand, have lower unemployment rates because they have fewer work preferences and are hence more likely to accept a wider variety of available positions (Nepram et al., 2021). In May 2023, the unemployment rate for people in India who are 15 years of age or older was 7.7% (Somayya, 2023). One might anticipate that persons with advanced degrees would have an easier time finding job, especially given the growing need for skilled workers brought on by technical improvements and pressures from global competition. However, as Pauw et al. (2008) point out, the number of unemployed people with advanced degrees has been increasing since 1995, which goes

against these assumptions. Since it seems counterintuitive for a skills-constrained economy to witness rising unemployment among skilled labor participants, policymakers are focusing more on solving the "graduate unemployment problem." This prompts an investigation into the returns on educational investment and calls into question the effectiveness of educational funding in India. The primary objective of this paper is to investigate the returns on educational investment for three distinct groups in the Indian labor market: self-employed people, regular wage workers, and casual wage workers. This study assesses the contribution of education to income generation in India by examining the effects of educational credentials on incomes across several worker groups. It also looks at patterns in educational attainment and the returns on education over time, as well as changes in the percentage of adults who complete primary and higher education.

2. Literature review

According to recent studies, the Indian labor market has had difficulty creating a sufficient number of high-quality jobs for educated people in the non-farm sector (Mehrotra and Parida 2019; Rawal and Bansal 2019). Given that labor is on the concurrent list, it is expected that the state and union governments would work to create an atmosphere that encourages the creation of jobs. At the state and federal levels, government plays a crucial role in alleviating hardship, which frequently has beneficial knock-on effects.

India is frequently seen as a thriving economy on the international scene, despite the fact that it is realistic to presume that employment issues exist in economically deprived states. Thus, it's critical to look into the scope and nature of employment concerns in this setting. India has also been selected for this research due to the fact that many studies have looked at the connection between education and work (see, for instance, Agrawal 2011; Card 1999; Chen et al. 2022; Duraisamy 2002). However, particularly in recent years, there aren't many studies in India that use unit-level data. It is imperative to conduct a thorough analysis of the different facets of this distress in order to create and implement appropriate solutions. A local-to-global viewpoint can help us better grasp global hardship by offering insightful information about local distress.

In light of this research gap, the aim of this article is to emphasize the challenges faced by highly educated individuals and investigate the relationship between education and income across a variety of occupational kinds. Analysing these objectives could contribute to the development of a more successful and educational employment policy for India.

3. Data source

This analysis uses unit-level data from the National Sample Survey Office's (NSSO) Periodic Labour Force Survey (PLFS), which was conducted across seven years, from 2017–18 to 2023–24. The quinquennial Employment and Unemployment Surveys (EUS) were replaced by the PLFS to remove data reporting delays and offer timely employment estimates to support policymaking. Earnings from different occupations are analysed using the PLFS records, which provide the non-rentier income of workers in three main categories: self-employment, regular wage/salaried, and casual workers (Kar and Mohanan 2022). These groups' earnings information is collected over a variety of reference periods. Specifically, self-employed individuals record their earnings for the last 30 days, regular wage and salaried workers report their earnings for the previous calendar month, and casual wage workers report their daily earnings for the preceding seven days. Additionally, the employment status is recorded using the current weekly status (CWS), which incorporates a seven-day reference period. Because of this disparity, the authors have looked at how wealth and educational attainment have changed among the three categories, which has eventually made it possible to draw broad conclusions.

Methodology

This chapter concentrates on the main goal of the study, which is to look at the connection between earnings and education in India. Based on the current weekly state, it starts with a review of employment and unemployment data. In order to evaluate employment and unemployment trends in India, we have examined important indicators such as the Worker Population Ratio (WPR), the Labor Force Participation Rate (LFPR), and the unemployment rates (UR) based on the most recent weekly data. An individual's activity status as assessed by their participation in economic activities over the seven days preceding the survey is known as their current weekly status (CWS). The distribution of workers by kind of occupation and educational attainment is next analysed. Lastly, this study calculates the association between education and earnings for various worker types, such as self-employed people, casual labourers, and regular employees.

4.2 Employment and unemployment indicators in current weekly status

We have examined general labor market data broken down by work type in order to obtain a comprehensive grasp of the changing trends and difficulties in India's employment environment.

4.2.1 Labour Force Participation Rate (LFPR)

LFPR is calculated as the proportion of individuals in the labor force relative to the total population and it serve as positive indicators of economic empowerment, meaning that higher values reflect greater empowerment. The formulas used for estimation are provided below:

$$\text{LFPR}= \frac{\text{no.of employed persons} + \text{no.of unemployed persons}}{\text{total population}} * 100$$

Worker Population Ratio (WPR)

WPR is a measure of the proportion of the population that is employed, and it is a positive predictor of economic empowerment; larger numbers indicate greater empowerment. The following lists the estimating formulas:

$$\text{WPR}= \frac{\text{no.of employed persons}}{\text{total population}} * 100$$

Unemployment Rate (UR)

The percentage of jobless people in the labor force is known as UR. The unemployment rate (UR), on the other hand, is a negative measure; a lower number denotes greater economic empowerment. The following lists the estimating formulas:

$$\text{UR}= \frac{\text{no.of unemployed persons}}{\text{total population no.of employed persons} + \text{no.of unemployed persons}} * 100$$

4. Results

In general, both rural males and females have a higher LFPR than their urban counterparts for those aged 15 and older. The LFPR for males living in rural areas has been steadily increasing, going from 76.4 in 2017–18 to 80.2 in 2022–23 and 2023–24. Urban males, on the other hand, had a lower LFPR, starting at 74.5 in 2017–18 and slightly increasing to 75.6 by 2023–24. The LFPR for rural females, on the other hand, has increased dramatically, rising from 24.6 in 2017–18 to 47.6 in 2023–24. Conversely, urban females experienced a more gradual rise, rising from 20.4 to 28 by 2023–2024. The type of job prospects found in rural areas are primarily to blame for this development. In rural India, where farming and related activities require a significant amount of effort, agriculture continues to be the main source of revenue. As a result, agricultural labor is common in these regions for both men and women, which results in high participation rates. Furthermore, people frequently work in a variety of sectors without official contracts in rural areas, where informal employment is prevalent. Both men and women tend to participate at higher rates as a result of this flexibility. In addition, rural cultural practices encourage the concept of family work sharing, which forces all household members to participate in economic activity. For both rural men and women, this engagement raises the LFPR.

These statistics highlight the growing disparity between rural and urban locations over time and the increasing labor force involvement of rural women in comparison to their urban counterparts. There are a number of reasons for this growing gap. People may be encouraged to prioritize their education over rapidly entering the profession because career chances in metropolitan regions tend to need higher education and specialized skills. The LFPR in metropolitan areas is lowered as a result of many young individuals in these locations delaying their entry into the labor. The development of formal job sectors has also been aided by the economic growth seen in larger cities, creating a more competitive labor market that might not offer possibilities to everyone, thereby lowering LFPR. On the other hand, because rural areas continue to rely heavily on agriculture and unorganized enterprises, participation rates there are consistently high. The growing disparity emphasizes the necessity of policies that support equitable employment opportunities and deal with the unique problems that India's rural and urban residents face.

Table 5.1: LFPR based on CWS for individuals aged 15 and above

	Rural		**Urban**	
Years/Gender	Male	Female	Male	Female
2017-18	76.4	24.6	74.5	20.4
2018-19	76.4	26.4	73.7	20.4
2019-20	77.9	33.0	74.6	23.3
2020-21	78.1	36.5	74.6	23.2
2021-22	78.2	36.6	74.7	23.8
2022-23	80.2	41.5	74.5	25.4
2023-24	80.2	47.6	75.6	28.0

Source: Author's estimations derived from PLFS unit-level data

For people of all ages, urban males likely to have a higher LFPR than their rural counterparts, and rural females tend to have a higher LFPR than urban females. The LFPR for boys living in rural areas has been steadily increasing, going from 54.9 in 2017–18 to 57.9 in 2023–24. Urban males, on the other hand, started with a marginally higher LFPR of 57 in 2017–18 and rose to 59 by 2023–24. In the meantime, the LFPR for rural females increased significantly, from 18.2 in 2017–18 to 35.5 in 2023–24. Urban females, on the other hand, increased more gradually, from 15.9 to 22.3 by 2023–2024. There are several factors that lead to urban males having a greater LFPR than rural guys across all age groups. In general, there are more career options in urban locations, particularly in formal industries like manufacturing, services, and technology, which frequently require greater levels of education and ability. Participation rates are greater among urban guys because they are more likely to engage in different job marketplaces. Additionally, compared to their rural counterparts, urban males are better able to enter and maintain their jobs in the labor market due to the infrastructure in metropolitan regions, such as better transportation and easier access to educational institutions.
Conversely, across all age groups, rural girls typically have a greater LFPR than their urban counterparts, primarily as a result of distinct socioeconomic variables. In rural areas, where family labor is common, women are often involved in informal jobs and agricultural work. Cultural norms that encourage women's contributions to home income through a variety of activities, including agriculture and cottage enterprises, influence this engagement. In addition, women in rural regions frequently believe that employment opportunities are easier to reach than in formal metropolitan labor markets, where social barriers, poor educational attainment, and skill requirements may restrict participation. As a result of their significant workforce engagement, rural women have higher LFPRs than their urban counterparts.

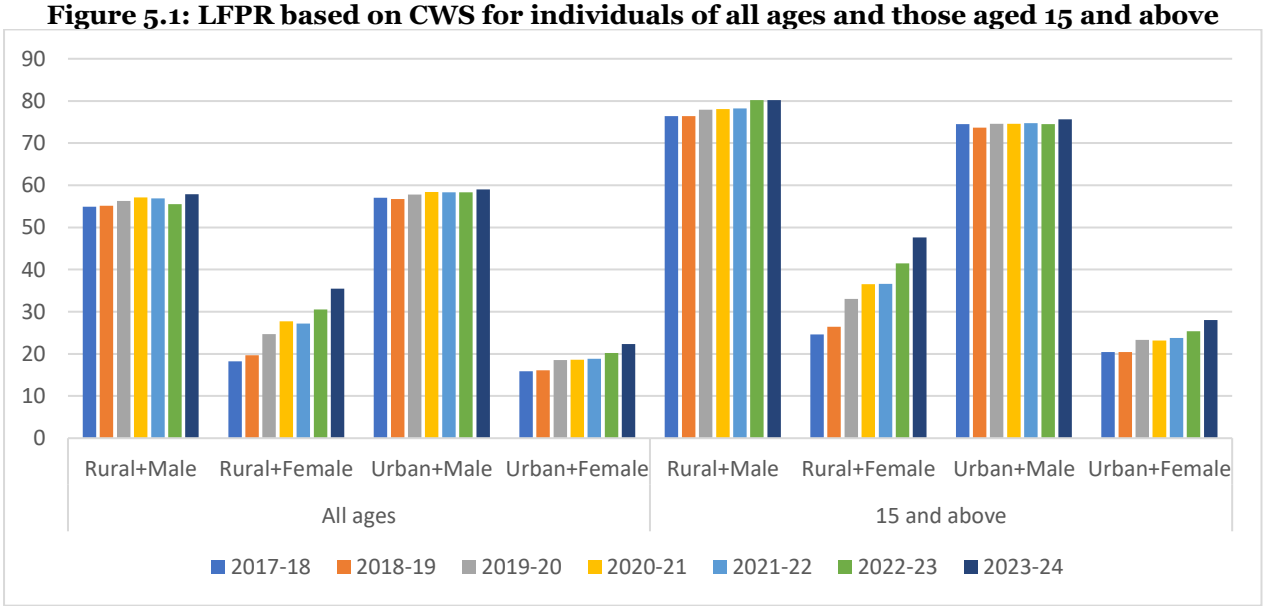
Table 5.2: LFPR based on CWS for individuals of all ages

	Rural		**Urban**	
Years/Gender	Male	Female	Male	Female
2017-18	54.9	18.2	57.0	15.9
2018-19	55.1	19.7	56.7	16.1
2019-20	56.3	24.7	57.8	18.5
2020-21	57.1	27.7	58.4	18.6
2021-22	56.9	27.2	58.3	18.8
2022-23	55.5	30.5	58.3	20.2
2023-24	57.9	35.5	59.0	22.3

Source: Author's estimations derived from PLFS unit-level data

The figure below illustrates that while male labor force participation has remained relatively stable over the years, female LFPR has shown a notable upward trend in recent periods. This increase is particularly evident among women aged 15 and above, indicating a gradual yet consistent rise in female participation in the labor market.

Figure 5.1: LFPR based on CWS for individuals of all ages and those aged 15 and above



5.2.2 Worker Population Ratio (WPR)

For individuals aged 15 and older, rural males consistently displayed a higher WPR over the years, fluctuating between 72% and 78.1% from 2017-18 to 2023-24. On the other hand, while at somewhat lower rates, urban males also had a progressive increase in their WPR, with rates rising from 69.3% to 72.3% during the same period. In contrast, WPR increased more significantly for rural females, who saw a rise from 23.7% in 2017–18 to 46.5% in 2023–24, reflecting their increasing participation in the labor force. Urban females showed a more modest rise, from 18.2% to 26%, over the same span. The greater degree of agricultural and informal employment involvement among rural women is primarily responsible for the gender gap in female engagement between rural and urban areas.

Males in rural areas had higher WPRs than males in urban areas, which makes logical considering that agriculture is the primary source of income in these areas. This industry provides additional job prospects due to its labour-intensive nature. Conversely, formal businesses like manufacturing and services, which frequently call for greater skill levels and credentials, are more likely to be found in urban regions. As a result, employment opportunities for those without specialized training are reduced. Similarly, rural women have a higher WPR than urban women, primarily because they work in agricultural and informal jobs more frequently. Numerous rural women contribute significantly to the workforce by engaging in small-scale farming or working as unpaid household labourers, despite the fact that their occupations are occasionally informal.

Table 5.3: WPR based on CWS for individuals aged 15 and above

	Rural		**Urban**	
Years/Gender	Male	Female	Male	Female
2017-18	72.0	23.7	69.3	18.2
2018-19	72.2	25.5	68.6	18.4
2019-20	74.4	32.2	69.9	21.3
2020-21	75.1	35.8	70.0	21.2
2021-22	75.3	35.8	70.4	21.9
2022-23	78.0	40.7	71.0	23.5
2023-24	78.1	46.5	72.3	26.0

Source: Author's estimations derived from PLFS unit-level data

Urban males typically have a somewhat higher WPR than rural males for people of all ages. In particular, urban males' WPR increased from 53% to 56.4% over time, but rural guys' WPR varied between 51.7% and 56.3%. This trend can be attributed to the wider variety of formal employment options available in urban areas, particularly in sectors such as industry, services, and trade, which tend to provide more stable and higher-paying positions. On the other hand, men living in rural areas are more likely to work in agriculture and other informal jobs, which are steady but don't always provide access to formal job opportunities.. On the other hand, as compared to their urban counterparts, rural women continuously have a larger WPR. Rural female WPR increased from 17.5% to 34.8% during that time due to their substantial involvement in the informal and agricultural sectors, frequently as small-scale farmers or unpaid family labor. Meanwhile, urban females, who began at 14.2% and increased to 20.7%, have fewer job opportunities, higher socioeconomic barriers, and are constrained by traditional gender norms, all of which reduce their participation in formal employment. Despite these challenges, female labor force participation has gradually increased for both rural and urban residents; however, the rate of improvement has been slower in urban areas.

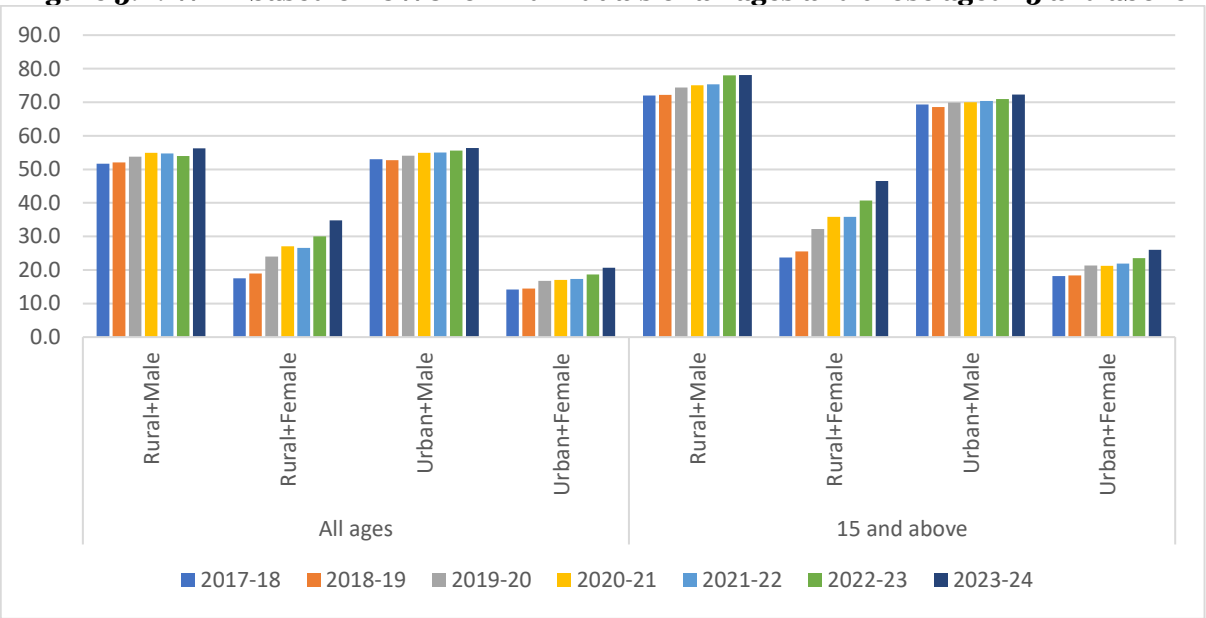
Table 5.4: WPR based on CWS for individuals of all ages

	Rural		**Urban**	
Years/Gender	Male	Female	Male	Female
2017-18	51.7	17.5	53.0	14.2
2018-19	52.1	19.0	52.7	14.5
2019-20	53.8	24.0	54.1	16.8
2020-21	54.9	27.1	54.9	17.0
2021-22	54.7	26.6	55.0	17.3
2022-23	54.0	30.0	55.6	18.7
2023-24	56.3	34.8	56.4	20.7

Source: Author's estimations derived from PLFS unit-level data

The figure below illustrates that while male labor force participation has remained relatively stable over the years, female LFPR has shown a notable upward trend in recent periods. This increase is particularly evident among women aged 15 and above, indicating a gradual yet consistent rise in female participation in the labor market. Despite seven decades of independence, women's participation in the workforce in India remains significantly lower compared to men. This issue is especially pronounced among urban women, where work participation rates are still unsatisfactory. It is concerning that, despite the greater availability of job opportunities and higher wages in urban areas, a smaller proportion of women are engaged in the workforce compared to rural areas.

Figure 5.2: WPR based on CWS for individuals of all ages and those aged 15 and above



5.2.3 Unemployment Rate (UR)

Comparable trends in UR for those over the age of 15 are seen by the data for both urban and rural populations. Male unemployment in rural areas varied over time, falling gradually from 5.7% in 2017–18 to 2.7% in 2023–24. On the other hand, urban male unemployment was marginally greater from 2017–18, peaking at 6.9%, but fell to 4.4% by 2023–24, indicating a similar downward trajectory, however from a higher baseline. More notable difficulties were faced by rural women, whose unemployment rate fell from 3.8% in 2017–18 to 2.1% in 2021–22 before levelling off around 2.1% again in 2023–24. This implies that even with the decline, rural women had significant obstacles in the job market. In contrast, the unemployment rate for urban females decreased over time, from 10.8% in 2017–18 to 7.1% in 2023–2024. This suggests that urban women encountered more significant employment challenges at the outset; however, they have gradually experienced improvements over the years. Overall, unemployment rates decreased for both urban and rural men and women, but they remained higher for urban women, indicating persistent differences in opportunities and access to the job market.

Table 5.5: UR based on CWS for individuals aged 15 and above

	Rural		**Urban**	
Years/Gender	Male	Female	Male	Female
2017-18	5.7	3.8	6.9	10.8
2018-19	5.5	3.5	7.0	9.8
2019-20	4.5	2.6	6.4	8.9
2020-21	3.8	2.1	6.1	8.6
2021-22	3.8	2.1	5.8	7.9
2022-23	2.7	1.8	4.7	7.5
2023-24	2.7	2.1	4.4	7.1

Source: Author's estimations derived from PLFS unit-level data

For individuals of all ages, the unemployment rate (UR) for rural males has displayed a consistent downward trend, starting at 5.8% in 2017-18 and declining to 2.7% by 2023-24. Urban males have similarly seen a decrease in their unemployment rates, beginning at 7.1% and dropping to 4.4% during the same period. In contrast, rural females have maintained a lower unemployment rate over the years, starting at 3.8% and ending at 2.1% in 2023-24 after some minor fluctuations. Urban females, on the other hand, began with a higher unemployment rate of 10.8%, which has gradually decreased to 7.1% during this timeframe.

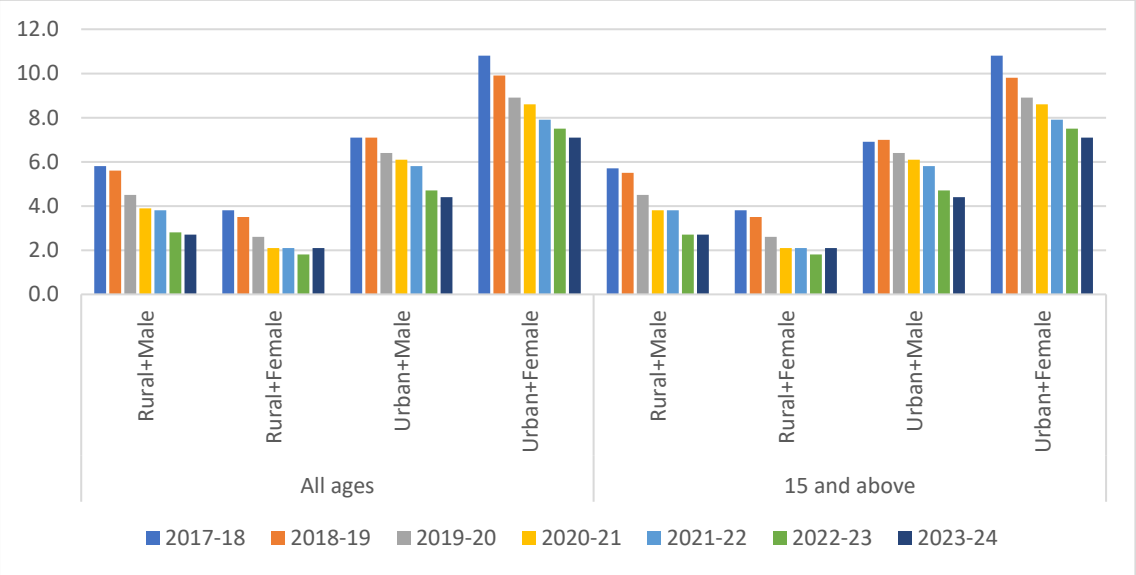
Table 5.6: UR based on CWS for individuals of all ages

	Rural		Urban	
Years/Gender	Male	Female	Male	Female
2017-18	5.8	3.8	7.1	10.8
2018-19	5.6	3.5	7.1	9.9
2019-20	4.5	2.6	6.4	8.9
2020-21	3.9	2.1	6.1	8.6
2021-22	3.8	2.1	5.8	7.9
2022-23	2.8	1.8	4.7	7.5
2023-24	2.7	2.1	4.4	7.1

Source: Author's estimations derived from PLFS unit-level data

Figure below shows that overall, while both rural and urban males show decreasing unemployment rates, rural females consistently have lower rates compared to their urban counterparts, who initially faced a significantly higher unemployment rate but have also seen improvements in recent years.

Figure 5.3: UR based on CWS for individuals of all ages and those aged 15 and above



5.3 Distribution based on employment type

In order to do this, we have distinguished three main categories as outlined in the PLFS: self-employed, regular wage/salaried workers, and casual workers. The CWS technique is used to document these categories. A detailed study of each of these three occupation categories is necessary to comprehend how the workforce is distributed among them.

4.2.1 Regular workers

The regular wage or salaried employment category offers a more stable and higher income compared to other types of work. Therefore, a rise in the percentage of regular wage/salaried workers points to better labor market circumstances. Unfortunately, these stable job options significantly decreased as a result of the COVID-19 epidemic and the lockdowns that followed, forcing many workers to look for work in the less stable and lower-paying categories of self-employment or casual work.

Figure 5.4: Distribution in usual status for Regular worker

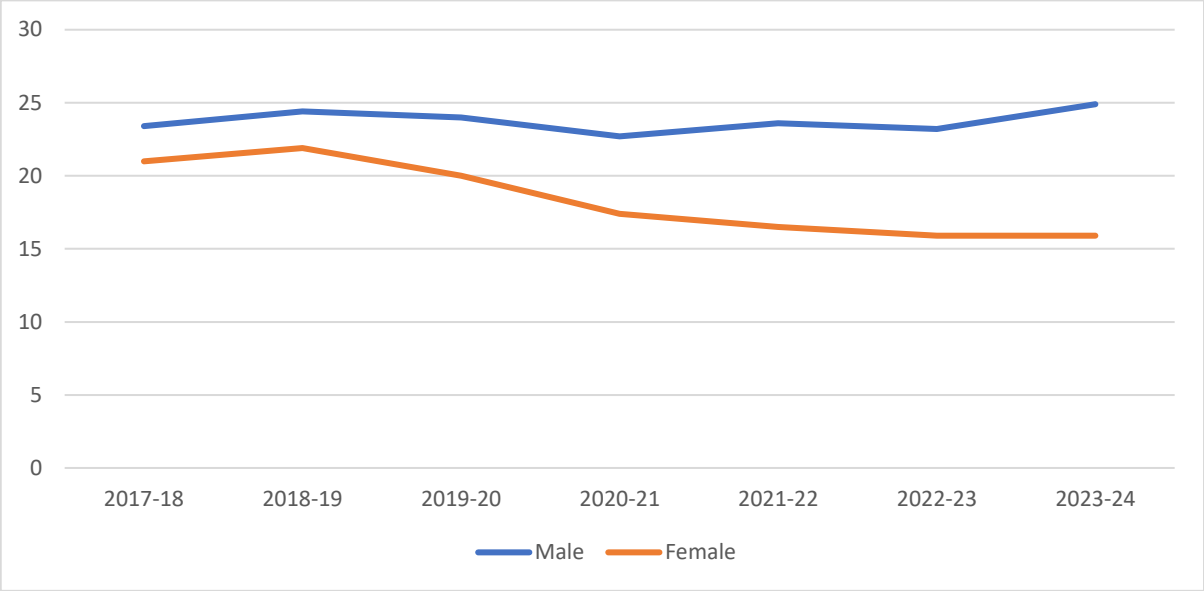


Table 5.6 indicates that there was a rise in the proportion of workers in regular employment from 2017–18 to 2019–20, with a slight decrease during the COVID-19 period and then a subsequent rise. This upward trend in the share of regular wage or salaried workers has significant policy implications. This suggests that people choose salaried or secure wage jobs because they offer more financial incentives, stability, and security. Their increasing level of education also affects the careers they choose. Therefore, keeping an educated workforce is crucial to the economy's continued growth and sustainability. The market must create more salaried or regular pay jobs in order to address this problem. Due to their size and operational constraints, micro, small, and medium-sized businesses (MSMEs) have historically had trouble hiring additional staff. Therefore, it is crucial to draw in fresh investments in larger businesses in order to create the kinds of jobs that people are looking for. To support this shift, the government should adjust its policies.

The percentage of men who are regular employees has been relatively stable over the years under study, ranging between 23% and 25%, according to the data. This constancy implies that men can still find steady employment opportunities, particularly in sectors that have not experienced significant upheavals in recent years, such as manufacturing, information technology, and public services. On the other hand, the proportion of women who work regularly has drastically decreased, falling from 21% in 2017–18 to 15.9% in 2023–24. There are a number of reasons for this trend, such as cultural norms, ongoing gender gaps in securing stable employment, and challenges juggling work and personal obligations, all of which may deter women from seeking or keeping long-term jobs. Figure 4.4 illustrates the gender disparity in regular employment, showing a decreasing percentage of female workers over time and an increasing percentage of male workers.

Table 5.6: Percentage distribution of workers in usual status (ps+ss) by status in employment

	Regular worker		**Casual worker**		**Self-employed**	
Years/Gender	Male	Female	Male	Female	Male	Female
2017-18	23.4	21	24.3	27	52.3	51.9
2018-19	24.4	21.9	24	24.7	51.7	53.4
2019-20	24	20	23.6	23.7	52.4	56.3
2020-21	22.7	17.4	23.3	23.2	53.9	59.4
2021-22	23.6	16.5	23.2	21.4	53.2	62.1
2022-23	23.2	15.9	23.2	18.8	53.6	65.3
2023-24	24.9	15.9	21.5	16.7	53.6	67.4

Source: Author's estimations derived from PLFS unit-level data

5.2.2 Casual worker

Casual workers, characterized by irregular or short-term employment, exhibit a decreasing trend for both genders. For males, The percentage fell from 24.3% in 2017–18 to 21.5% in 2023–24. This decline might point to a shift in the labor market, implying that fewer men are engaging in casual work as a result of less opportunities or a preference for more secure employment. The trend among female casual workers is particularly striking, falling from 27% to 16.7% in the same time frame. This significant drop suggests that a

reduced number of women are engaged in casual work, which could be explained by the erratic nature of these jobs and the lack of social security benefits, which make them less appealing as long-term career options. The gender disparity in this category may arise from the tendency of women to take on informal and unpaid care work, which limits their availability for casual employment. Furthermore, women's mobility and access to these employment may be restricted by societal norms and safety concerns, especially in situations where informal work requires travel or working irregular hours.

Figure 5.5: Distribution in usual status for Casual worker

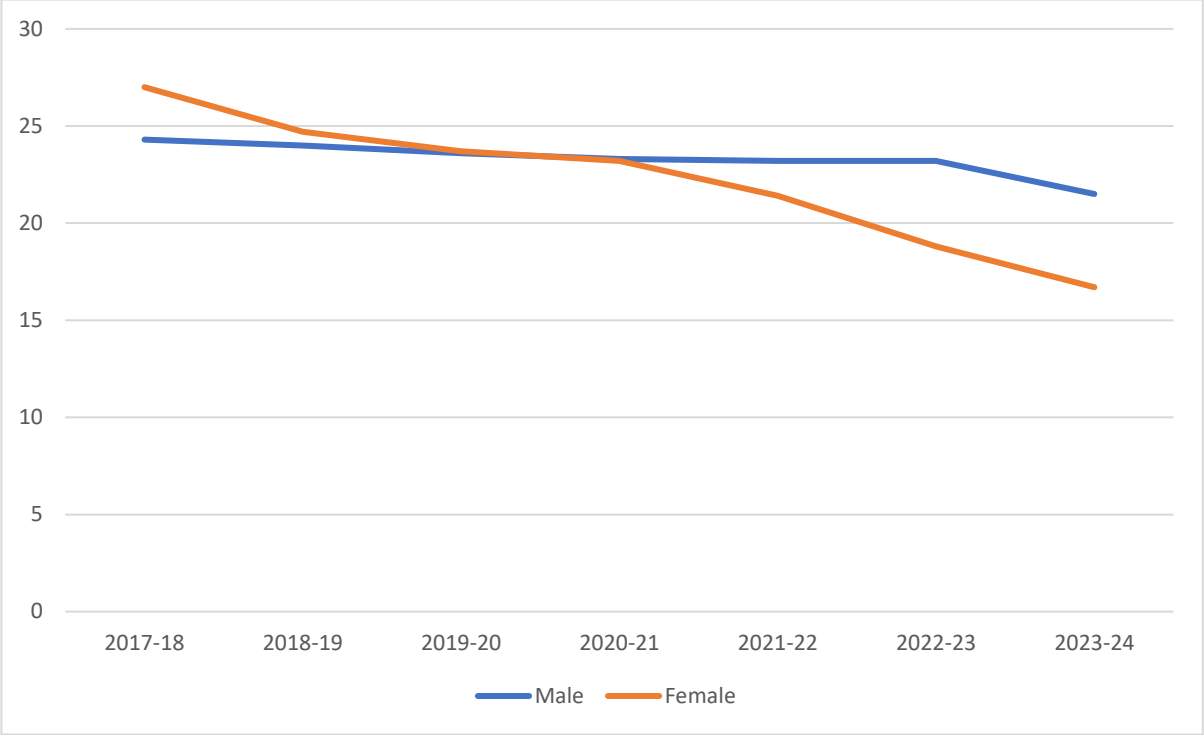
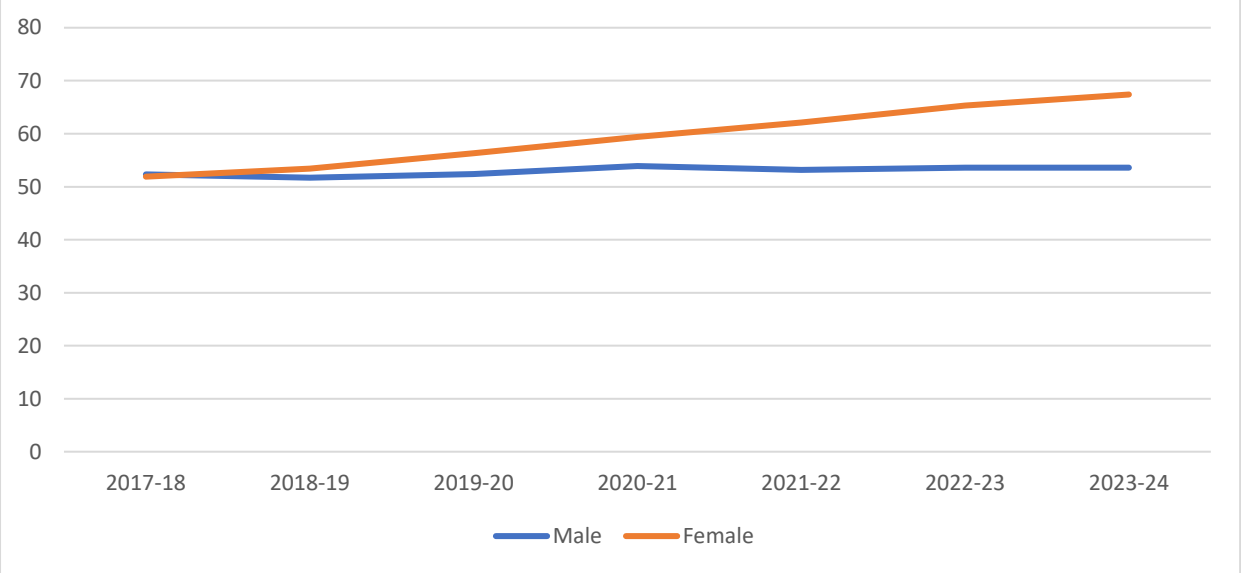


Figure 5.5 indicates that prior to the COVID-19 pandemic, proportion of female workers exceeded that of male workers. This was mainly because industries such as healthcare, education, and retail offered more flexible and part-time employment alternatives. In addition, government programs like the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in India, which aims to guarantee women's job security, and other skill development initiatives that promote women's empowerment in the workforce also contributed significantly to the increase in women's participation. But during the epidemic, this pattern changed as women lost a lot of their jobs in sectors like hospitality and tourism that were badly hit. There was a decline in female labor force participation compared to male workers as a result of many women being forced to leave the job or reduce their working hours due to the increased duty for unpaid care work during lockdowns. This change highlights the ongoing systemic challenges that women encounter, especially in times of crisis.

5.2.3 Self-employed

In the self-employed category, there is a noticeable difference in the patterns of male and female participation. Male self-employment has stayed relatively constant across time, ranging from 52% to 54%, indicating that men have a persistent desire or tendency for independent work. Conversely, the proportion of self-employed females has risen substantially from 51.9% in 2017-18 to 67.4% in 2023-24. Furthermore, Figure 4.6 clearly demonstrates that, in the wake of the epidemic, the gaps between male and female workers have grown. This increase may be attributed to several factors, including a rising trend of women pursuing entrepreneurship, entrepreneurship, which often provides greater freedom than traditional employment. In addition, the rise in self-employment may be the result of necessity, as women frequently encounter significant obstacles in obtaining formal employment opportunities. The gender gap in self-employment may be shaped by women's desire for flexible work options that accommodate their household duties. Moreover, social conventions and limited access to formal job opportunities may encourage women to seek self-employment as a workable alternative.

Figure 5.6: Distribution in usual status for Self-employed



However, compared to their male counterparts, women who work for themselves often face barriers like limited professional networks, difficulty obtaining funding, and less support for business growth, which can impede their success relative to male counterparts.

5.3 Distribution based on education levels

Table 5.7 illustrates the percentage distribution of individuals aged 15 and above by education levels in India from 2017-18 to 2023-24. The data indicates a steady decrease in the proportion of illiterate people, falling from 26.8% in 2017-18 to 22.3% in 2023-24. This is a result of continuous efforts to raise literacy levels through expanded educational outreach programs, government initiatives, and improved access to education in both urban and rural areas. The proportions of people who have completed both middle and secondary school have stayed mostly unchanged; however, there has been a minor decline in the primary level, indicating that more students may be advancing to higher education. The proportion of individuals who completed secondary school has not changed throughout time, ranging between 13.8% and 14%, suggesting stable enrolment and completion rates at this level. However, there is a noticeable increase in the proportion of individuals attaining higher secondary education, rising from 10.8% in 2017-18 to 12.7% in 2023-24, signifying growing awareness and access to senior secondary schooling, potentially due to educational reforms and policy changes aimed at encouraging students to continue their studies beyond secondary school.

Over time, the percentage of people with diplomas has stayed quite low, ranging from 1.1% to 1.3%. However, the percentage of graduates has increased steadily, from 7.9% in 2017–18 to 10.1% in 2023–24, indicating an increasing trend toward university degrees and higher education. Comparably, over this time there has been a minor increase in the proportion of those completing postgraduate degrees, going from 2.5% to 2.9%. This suggests that advanced degrees are becoming more valued in India's increasingly competitive job market.

Table 5.7: Percentage distribution of persons of age 15 years and above by general educational

Years/Educational levels	Illiterate	Primary	Middle	Secondary
2017-18	26.8	16.7	20.3	13.8
2018-19	25.4	16.7	20.1	13.9
2019-20	25	16.8	19.7	13.8
2020-21	24.1	16.6	20.2	14
2021-22	23.4	16.4	21	14
2022-23	23.3	17.7	20.1	13.9
2023-24	22.3	16.5	20.2	13.9

Source: Author's estimations derived from PLFS unit-level data

Table 5.7: Continued

Years/Educational levels	Higher secondary	Diploma	Graduate	Postgraduate and above
2017-18	10.8	1.1	7.9	2.5
2018-19	11.4	1.2	8.5	2.6
2019-20	11.7	1.3	8.9	2.9
2020-21	12.1	1.3	9	2.7
2021-22	12	1.3	9.2	2.7
2022-23	12	1.2	9.1	2.6
2023-24	12.7	1.3	10.1	2.9

Source: Author's estimations derived from PLFS unit-level data

These patterns can be linked to various factors, including governmental programs like the Sarva Shiksha Abhiyan and the Right to Education Act, which aim to enhance access to education across different levels. The increasing focus on higher education, especially in urban regions, aligns with the country's economic shift, where the demand for skilled labor is rising. Furthermore, social factors such as the growing emphasis on educational qualifications for obtaining employment and advancing socially have probably played a role in the increase in the number of graduates and postgraduates. Lastly, the consistent percentage of diploma holders may suggest that vocational education has not yet gained significant traction or may need additional institutional support to become a more appealing choice for students in India.

Figure 5.7: Percentage distribution of persons of age 15 years and above by general educational for the year 2023-24.

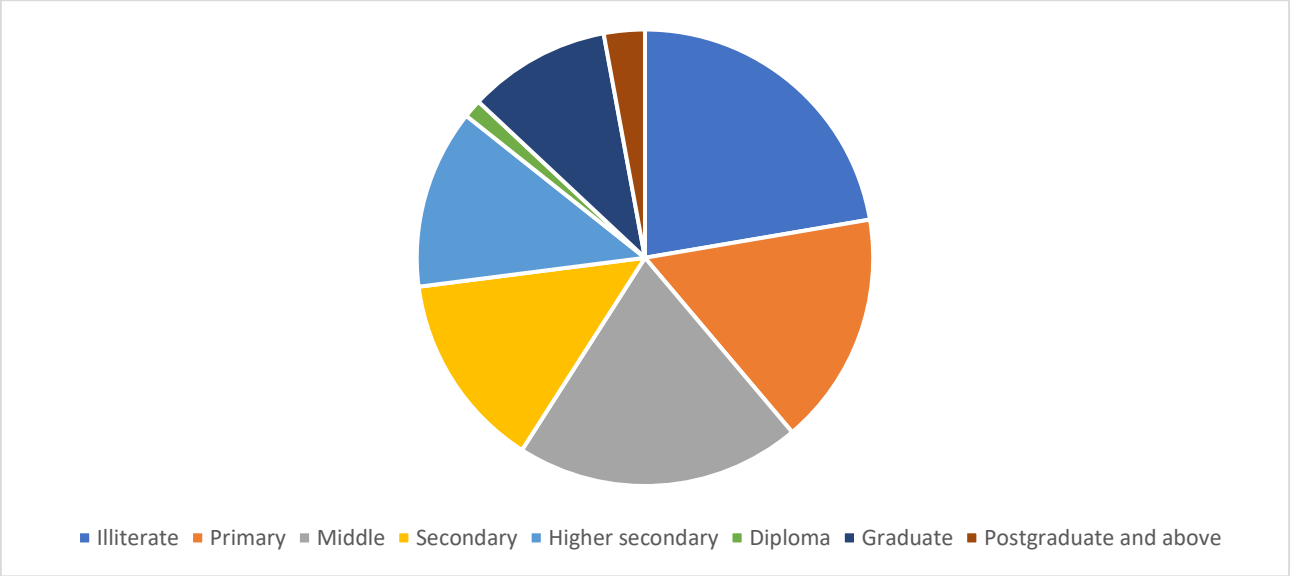


Figure 5.7 makes it abundantly evident that a significant portion of the population still falls between the categories of illiteracy and secondary education. On the other hand, there is a discernible increase trend in the number of people pursuing postgraduate and graduate degrees. This development reflects the objectives of India's educational policies and the growing need for advanced qualifications in the job market.

5.4 Education-earning relationship

To analyse the earnings across different employment types, data from the Periodic Labour Force Survey (PLFS) is utilized. This data categorizes workers into three main groups: self-employed, regular wage/salaried employees, and casual workers (Kar and Mohanan, 2022). The earnings are documented over varying reference periods: self-employed individuals report their income for the past 30 days, regular wage/salaried workers provide figures for the last calendar month, and casual wage workers report their daily wages for the previous seven days. Additionally, the survey captures employment status through the Current Weekly Status (CWS), which considers a seven-day reference period. Due to this lack of uniformity in data collection, the authors have analysed the trends in education and income across these three categories to derive generalized conclusions for comparative analysis..

5.4.2 Regular worker

Numerous empirical studies have demonstrated a positive relationship between education and income, which is also evident among regular wage and salaried workers in India. Table 4.8 illustrates the average earnings of regular wage and salaried employees according to their educational qualifications. It demonstrates a strong relationship between income and education, with those with a secondary education typically earning higher average wages than those with only a middle education. The average salary/wage of the higher education category is almost double than that of the secondary education category. As a result, incomes increase exponentially with education level. Up to 2019–20, earnings for the majority of education level categories increased steadily; however, the pandemic resulted in a fall in these. Furthermore, while conditions are considerably better for those with higher levels of education, the incomes of workers who are illiterate and only have a primary education have not been able to return to their pre-pandemic levels. Likewise, the nearly identical incomes of individuals with only a primary education and those without it demonstrate that a primary education has not been associated with greater incomes.

Table 5.8: Education earnings relationship: Regular worker

Educational level/Years	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Illiterate	8,066	8,144	8,421	7,892	9,651	10,264	10,703
Below Primary	9,228	9,500	9,846	8,973	11,483	12,049	12,509
Primary	10,631	11,335	12,158	11,442	13,822	14,564	15,257
Middle	12,089	12,500	14,327	13,951	16,308	17,078	17,092
Secondary	15,115	16,136	17,185	16,678	20,123	21,054	22,062
Higher Secondary	21,066	22,881	23,275	22,095	27,372	28,550	30,603
Diploma courses	25,023	26,065	29,094	28,218	35,254	36,511	38,211
Graduate	28,634	30,406	36,898	34,406	43,505	45,432	48,254
Postgraduate and above	35,072	37,249	44,190	42,481	50,314	52,231	55,603

Source: Author's estimations derived from PLFS unit-level data

5.4.3 Casual worker

The data demonstrates that the incomes of casual workers are continuously lower than those of regular employees and self-employed individuals, underscoring the unattractive aspects of casual work. This trend is reflected in the modest income levels across various educational backgrounds, which supports the decreasing proportion of workers engaged in casual employment. In 2023-24, illiterate casual workers had a monthly income of ₹6,861, whereas those with a primary education earned ₹9,542. Meanwhile, casual workers with higher education levels, such as graduates, received ₹24,039, and postgraduates earned ₹29,215. Although there is a rise in earnings associated with higher education, these increases are still insufficient to make casual employment appealing, especially when compared to the pay levels found in the self-employment or regular job sectors.

The modest rise in income associated with higher education for casual workers fails to justify the expected returns on their educational investments. For instance, although postgraduate workers earn more than those with primary education, their income remains considerably lower than that of workers in other employment sectors. This indicates that even individuals with advanced qualifications encounter financial limitations in casual roles, which contributes to the ongoing decrease in the number of workers choosing these positions. Ultimately, casual employment remains an unattractive option due to its insufficient pay and lack of stability, irrespective of the level of education attained.

Table 5.9: Education earnings relationship: Casual worker

Educational level/Years	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Illiterate	5,928	5,828	6,045	5,202	6,142	6,499	6,861
Below Primary	6,476	6,474	6,676	5,783	7,017	7,512	8,153
Primary	7,550	7,482	8,167	7,011	8,836	9,218	9,542
Middle	8,308	8,336	9,681	8,563	10,198	10,818	11,513
Secondary	10,228	10,548	11,192	10,064	12,874	13,545	14,054
Higher Secondary	13,684	13,034	14,111	12,001	14,763	15,522	16,257
Diploma courses	16,022	16,569	17,459	15,132	18,465	19,216	20,028

Graduate	20,752	18,535	20,205	18,311	22,511	22,986	24,039
Postgraduate and above	25,818	22,430	24,515	22,018	27,013	28,023	29,215

Source: Author's estimations derived from PLFS unit-level data

5.4.4 Self-employed

According to the data, self-employed worker's monthly earnings are not significantly impacted by their educational background, especially if they have a lower level of education. For those with less than a primary or elementary education, the yearly earnings rise has been modest, suggesting that educational background has little impact on income levels in this kind of work. While the number of self-employed people has grown, earnings growth has not kept pace with this expansion. This suggests that self-employment is more often the result of necessity than of choice for many people. This pattern indicates that there are often no viable alternatives for obtaining better employment possibilities, as people tend to turn to self-employment in the absence of stable or higher-paying options.

According to the research, people with higher education levels—including postgraduates and graduates—benefit from a sizable economic advantage over others with only a primary education or less education. Postgraduates who work for themselves, for instance, see a significant increase in pay—from ₹25,073 in 2017–18 to ₹38,098 in 2023–2024. This pattern emphasizes the financial advantages of having more education in the field of self-employment. This difference shows that, even while self-employment may not be very lucrative for many people, people with higher levels of education typically make more money in this field. Still, their pay is not as high as that for regular employees. Overall, the income trends suggest that self-employment is not a favourable livelihood choice for the majority, especially for individuals lacking advanced educational qualifications.

Table 5.10: Education earnings relationship: Self-employed

Educational level/Years	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Illiterate	6,594	6,375	6,763	6,021	7,513	8,016	8,498
Below Primary	7,505	7,821	8,517	7,098	9,039	9,456	10,222
Primary	8,603	8,573	9,462	8,526	10,528	11,026	11,621
Middle	10,511	10,497	11,773	10,107	12,706	13,523	14,222
Secondary	13,061	13,243	14,126	12,073	15,831	16,493	17,276
Higher Secondary	17,038	15,785	18,289	16,266	19,295	20,013	21,333
Diploma courses	19,012	19,028	22,516	20,094	24,586	25,523	26,534
Graduate	22,451	20,554	24,682	22,213	28,493	29,496	30,511
Postgraduate and above	25,073	26,771	30,198	27,317	35,312	36,525	38,098

Source: Author's estimations derived from PLFS unit-level data

5. Conclusion

In case of regular workers, the gradual increase in earnings from ₹8,066 in 2017-18 to ₹10,264 in 2022-23 reflects wage inflation and a tightening labor market. However, growth remains relatively low for illiterate workers, reflecting their limited access to well-paying jobs. During the crisis, many illiterate workers, especially in low-skilled fields, faced job losses or salary cuts. Post-pandemic recovery has been weak. Below Primary earnings increased from ₹9,228 to ₹12,049, showing greater opportunities for workers with limited education. This group continues to lag far behind higher-educated workers, highlighting limited upward mobility. Workers in industries like construction and manufacturing experienced major disruptions during the pandemic, but there has been slow recovery. Earnings of people with primary education is rising from ₹10,631 to ₹14,564, this group has seen a substantial wage improvement as primary education allows individuals enter semi-skilled jobs. However, industries like manufacturing and retail, where these workers tend to work, were hit hard by the epidemic, leading to wage disruptions. The post-COVID recovery is showing encouraging signs. Earnings of people with middle education increased from ₹12,089 to ₹17,078, suggesting that middle-level education leads to better-paying employment. Workers in retail, logistics, and semi-skilled jobs were affected by temporary layoffs during COVID but these industries recovered well. Earnings of people with secondary education increased from ₹15,115 to ₹22,062, which is a critical level at which employees can access more secure and rewarding jobs. Despite short-term setbacks brought on by COVID-19, workers with a secondary education had a higher chance of keeping their jobs in resilient industries like healthcare and services, where wages recovered more quickly. For people with higher secondary education, significant increase in income from ₹21,066 to ₹28,550 indicates that professional and technical jobs are accessible to those with higher

secondary education. These workers experienced disruptions during the epidemic, particularly in the IT and healthcare sectors, but they recovered more quickly, and their wages increased significantly after COVID. Earnings of people with Diploma Courses, profits increased from ₹25,023 to ₹36,511, demonstrating the great value placed on specialized technical capabilities. As vital services like plumbing, electrical work, and healthcare remained in demand, workers with technical qualifications saw fewer job losses during the epidemic and recovered more quickly. However, for graduates, the premium paid for grabbing well-paying positions is reflected in earnings, which increase from ₹28,634 to ₹45,432. During COVID, graduates sacrificed some white-collar employment, but the economic recovery and remote work options led to a quick normalization of wages. The largest increase in earnings, from ₹35,072 to ₹52,231, indicates that advanced degrees yield the highest returns by giving access to well-paying, specialized roles. Since many of the industries in which these individuals operate—such as education, IT, and finance—adapted well to remote work, salary recovery for these workers was accelerated during the epidemic.

For casual workers, wages grew slightly from ₹5,928 to ₹6,499, showing limited wage growth for unskilled workers in the informal sector. During COVID-19, casual workers were among the most severely affected; many of them lost their jobs completely, and recovery has been difficult. Earnings increased from ₹6,476 to ₹7,512, reflecting modest enhancement for workers with minimal education, although they remain restricted by the nature of informal work. This group faced significant job losses in industries like construction during the pandemic, followed by a slow and uneven recovery afterward. Earnings increased from ₹7,550 to ₹9,218, reflecting that basic education helps secure better-paying casual jobs. Although this group faced income reductions and job insecurity during COVID, they fared better in recovery, driven by higher demand in industries like construction and retail. Earnings grew from ₹8,308 to ₹10,818, reflecting better prospects for middle-educated workers in the unorganized sector. Despite brief closures during the pandemic, employees in small firms, logistics, and transportation recovered more quickly as these sectors rebounded post-COVID. Earnings increased from ₹10,228 to ₹13,545, indicating that workers with a secondary education had easier access to higher-paying informal jobs. Despite early setbacks, many workers recovered well after the epidemic, especially in unorganized industries like delivery and e-commerce. Earnings grew from ₹13,684 to ₹15,522, indicating that workers with higher secondary education have better possibilities, especially in casual work. Because of the critical demand in these industries, workers in vital services like healthcare recovered more quickly after the pandemic. Earnings raised from ₹16,022 to ₹19,216, reflecting the value of technical skills even in the unorganized sector. Because there was a constant need for their services during the epidemic, diploma holders in essential technical areas saw fewer job losses and recovered more quickly. Wages grew from ₹20,752 to ₹22,986, showing that even casually employed graduates benefit from higher pay. Although COVID initially resulted in salary cutbacks for graduates, the reopening of the professional and service-based informal sectors has helped them recover.

Those with advanced degrees had the largest returns among casual workers, with earnings rising from ₹25,818 to ₹28,023. These workers were resilient during the pandemic, particularly in informal education, consultancy, and IT roles, which accelerated the recovery of wages.

For self-employed earnings increased from ₹6,594 to ₹8,498, showing moderate growth for unskilled self-employed workers, who encountered major difficulties during the COVID lockdowns. However, small vendors and informal traders have gradually recovered post-pandemic as marketplaces reopened. Earnings increased from ₹7,505 to ₹9,456, indicating a slight improvement for self-employed individuals with minimal education. Their small enterprises suffered greatly during the pandemic, but they gradually recovered as economic activity picked up post-COVID. People with only a basic education, earnings improved from ₹8,603 to ₹11,026, indicating stronger development. They recovered swiftly despite suffering large income losses during the pandemic because of the rise in demand for small-scale products and services after the outbreak. Earnings grew from ₹10,511 to ₹13,523, demonstrating that middle-level education contributes business performance for self-employed workers. These workers experienced short-term difficulties during COVID, but they recovered more quickly because of favourable market conditions in the post-pandemic period. Earnings increased from ₹13,061 to ₹16,493, demonstrating the substantial benefit that secondary education offers for managing self-employed businesses. Despite the interruptions created by the pandemic, secondary-educated workers fared well as manufacturing, services, and retail demand increased. Earnings increased from ₹17,038 to ₹20,013, demonstrating the advantages of postsecondary education for business endeavours. Self-employed people in this category recovered more quickly despite COVID-related interruptions because they were able to adjust to changing conditions in the market. Income increased from ₹19,012 to ₹25,523, demonstrating that technical proficiency raises revenues for self-employed workers. Diploma holders in key service areas were better equipped to handle obstacles during the epidemic, which accelerated recovery after COVID. Earnings increased from ₹22,451 to ₹29,496, showcasing the advantages of higher education in self-employment. Graduates utilized digital platforms to adapt successfully throughout the epidemic, which resulted in a solid earnings rebound. Due to their advanced knowledge and skills, postgraduates enjoy the largest returns in self-employment, as seen by their earnings, which increased from ₹25,073 to ₹36,525. Despite initial difficulties during COVID, postgraduates recovered well by adjusting to digital and knowledge-based business models.

Statements and Declarations

Conflict of interest: The authors declare not competing interests.
Financial interests: The authors do not have any pertinent financial or non-financial interests to report..
Ethical approval and Informed consent: This article does not include any studies involving human participants conducted by any of the authors.
Data availability: The datasets generated during the current study are available at the website of the Ministry of Statistics and Programme Implementation (https://mospi.gov.in)
Author contributions: The study's conception and methodology were shaped through the collective contributions of all authors. A took charge of composing the manuscript and conducted result analyses. NKB, after reading the paper, made crucial corrections before its submission. Prior to submission, both authors carefully reviewed and endorsed the paper.

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