

**DETERMINANTS OF LABOUR FORCE PARTICIPATION: A
CASE STUDY OF BIHAR**

*Dissertation submitted to Jawaharlal Nehru University in partial
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AKHILESH KUMAR



CENTRE FOR THE STUDY OF REGIONAL DEVELOPMENT

SCHOOL OF SOCIAL SCIENCES

JAWAHARLAL NEHRU UNIVERSITY

NEW DELHI- 110067

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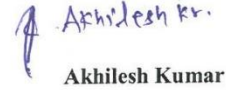


जवाहरलाल नेहरू विश्वविद्यालय
JAWAHARLAL NEHRU UNIVERSITY
Centre for the Study of Regional Development
School of Social Sciences
New Delhi-110067

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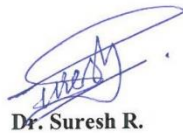
DECLARATION

I, **Akhilesh Kumar**, hereby declare that this dissertation entitled “**DETERMINANTS OF LABOUR FORCE PARTICIPATION: A CASE STUDY OF BIHAR**” submitted by me for the award of **Master of Philosophy** at the Centre for the Study of Regional Development, School of Social Sciences, Jawaharlal Nehru University, New Delhi, is based on my original research work and has not been submitted so far in part or in full, for any other degree or diploma of any University or Institution.

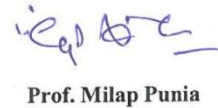

Akhilesh Kumar


CERTIFICATE

It is hereby recommended that this dissertation be placed before the examiners for evaluation.


Dr. Suresh R.

 **Supervisor**
Centre for the Study of Reg Dev.
School of Social Sciences
Jawaharlal Nehru University
New Delhi-110067


Prof. Milap Punia

 **Chairperson**
Centre for the Study of Reg Dev.
School of Social Sciences
Jawaharlal Nehru University
New Delhi-110067

Office Tel: 26704466.....26704463..... Office E-mail: csrd.jnu@gmail.com

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ABBREVIATIONS

CWS: Currently weekly status

FLFP: Female Labour Force participation

GEL: General education level

LFPR: Labour force participation rate

MPCE: Monthly Per capita Expenditure

NSSO: National Sample Survey Office

PLFS: Periodic labour Force Survey

PLFS: Periodic labour Force Survey

UR: Unemployment rate

WPR: Working Population ratio

CHAPTER-1

INTRODUCTION

1.1 Background

After the economic reforms in 1991, the Indian economy has seen the appearance of significant transformation. The economy has seen average GDP growth rates between 5 per cent to 9 per cent. After 1991, the enrolment label, public and private transportation facility, credit market system, domestic gas connectivity, electrification of households have improved significantly. Due to improved health infrastructure, the mortality rate has declined, leading to decreased fertility rate (Chatarjee U. et al., 2014). And all of this development leads to saving time spent on household activity, and females can utilise this extra time for participating in the labour market for getting salary and wages. However, the decline in female labour force participation is more in rural areas than urban areas, according to the latest NSSO survey.

The labour force participation rate for females dropped by almost 10 per cent between 2004-05 and 2010-11, amounting to 22.6 million in absolute number for those aged 15 years and above. This decline in female labour force participation can be observed in rural and urban areas, dropping by 11.5 per cent in rural areas and 5.0 per cent in urban areas if we talk about male labour force participation that has only declined by 3.4 per cent between the period 2005 and 2010. The survey conducted by (GoI 2013) shows that female participation dropped further in rural areas by about two percentage points since 2010. On the other hand, the urban areas showed the rate of female participation a positive trend and almost rose by 1.1 percentage points. In general, female participation, including rural and urban, decreased by 1.3 per cent, while the male participation rate decreased by only 0.8 per cent (ibid).

Many reports found that women are generally less paid than males at all levels of occupational structure. Oxfam report based on the NSSO survey (2011-12) found that the gender pay gap was 34 per cent, which means women get a wage 34 per cent less than men for performing with the same job and the same level of qualification. The wage difference is lesser for highly skilled workers than either semi-skilled or unskilled. Also, the wage difference is lesser for government, public sector, and private limited companies.

Due to the complexities of female labour force participation in developing nations, it is critical to examine how socioeconomic factors influence women's decision to work and their ability to do so. Female labour force participation is affected by various characteristics like individual, household, demographic, social norms, established institutional law, and benefit

from the government. The individual characteristics include education, age and marital status, and household characteristics include education of the household head, number of male and female dependents, number of children and per capita household income, etc. The economic variable includes the nature of development and growth and the availability of jobs in the economy. The societal established characters are caste, class and religion and regional customs.

The Indian labour market has several prominent characteristics, including low female labour force participation, variation among Indian states, and a higher share of men and women employed in the informal economy. In 2012, India had one of the lowest female labour force participation rates globally, at roughly 33 per cent at the national level. India's FLFP is around 50% lower than the global average and 63 per cent lower in East Asia. India has an enormous gender disparity among G-20 economies, at roughly 50 per cent. In contrast to most other regions, India's female labour force participation rate has decreased since 2004-05. At the end of 2014, India was the world's second-most populated country, with 1.26 billion inhabitants. According to a survey, 33 per cent of females, i.e., just approximately 125 million out of roughly 380 working-age Indian females, are working or seeking a job.

India has one of the enormous gender disparities among G-20 nations, at 50 per cent. India's future growth will draw more women to the workforce and more structural reforms to produce more jobs to realise the demographic dividend from its vast young labour population. Gender equality is more important today in determining the extent of economic development. Various studies have found a lack of economic growth due to low entrepreneurial activity, and this low entrepreneurial activity was due to low female labour force participation. According to the World Economic Forum study on gender equality (2014), there is a positive correlation between per capita income and gender equality.

1.2 Gender discrimination

In pre-industrialisation, sex segregation in the workplace remains a problem as a social norm restricts occupational choice by women and men. Men specialized in the labour market, and women engaged in domestic duties like cooking and child care. This work separation led to two possible outcomes: first, women were economically dependent on men, and second, men's participation in domestic duties decreased. The household activities were out of economic consideration, and thus the housewife termed coined. But with industrialization, women's work hours in the household activity reduced, and women started to participate in

the labour market. With time, the concept of division of labour developed, leading to an increase in the demand for a white-collar job. Women identify themselves beyond the duty of only reproductive role due to effective contraception method and started economic participation. But before capitalism, the patriarchal system already developed, which led to economic inequality in terms of employment opportunity and the pay gap.

1.3. Literature Review

The recent decline in rural's female labour force participation is due to higher household income. The increase in the share of the urban population, where low female labour force participation does not indicate an increase in income, empowers women with recent economic development with fast economic growth. The author argues that such a narrow supply-side interpretation is wrong because it ignores the local level's employment structure transformation. The variable education, marginal effect showing an Inverted U-shaped curve, means that labour force participation first decreases with schooling and then increases. The LFPR has a lower value at the primary level, and the graph shows the turning point has higher educational attainment, leading to higher LFPR at the secondary level. However, the Inverted-U implied in the estimates is almost a flatter curve in its downward-sloping part and a steeper curve in its upward-sloping part (Chatarjee U. et al., 2014).

A salient feature of this period is the collapse in the number of agricultural jobs without a parallel increase in regular non-agricultural jobs and other employment opportunities suited for women. The authors suggest that for India to revert the decline in female labour force participation rates, it needs to boost employment creation, especially non-agriculture regular employment.

Women continue to face many hurdles to entering the labour market and accessing suitable jobs because of household and child care responsibilities, lack of skills, limited mobility and safety issues, and other social and household restrictions. Women face several challenges relating to access to decent work, her choice of work, suitable working conditions, employment and social security, wage discrimination, and balancing the competing burdens of work and family responsibilities like child caring and household caring (Chaudhary R. et al., 2014).

Despite substantial economic growth, India's LFPR has been steadily falling. According to an econometric analysis of characteristics related to employment outcomes, higher education is crucial for women to enter regular wage and salaried occupations. The fall in rural labour

force participation is attributable to several issues, including the loss of agriculture jobs and a lack of non-farm employment, which causes females to remain unemployed. The salary situation for females in the rural labour market has improved, indicating that wage discrimination based on gender has begun to fade. However, rural India's work options, which are suitable with their educational degrees, are dwindling (Sanghi S. et al.,2015).

The editorial by E.P.W. (April 2019) shows the low level of female participation in India due to various reasons like lack of employment opportunities, rising educational attainment, increment in household income, and problems in measurement issue of women's work. However, the rural distress due to, most importantly, agriculture distress in a rural area in recent times affected females the most due to income generation opportunities has lost. It is due to labour demand constraints or lack of suitable job availability for women in rural areas because of the decline in agriculture and allied sector jobs availability and non-existence of non-agriculture jobs availability. The mechanization of agriculture and non-farm activities has reduced the employment opportunities for women. The burden of unpaid work on females has increased due to the reduction of family size and rural male migration.

To simplify the cause behind the decrease in female labour force participation in India and identify the factors underpinning the long-term stagnation in female labour force participation. The four primary root causes for the declining female participation, and their study found that several factors were responsible for the sharp decline in estimated labour force participation rates among working-age women.

These factors include increased school enrolment, increased household income levels, speedy economic development, and transformation. They also discovered that the difficulties of distinguishing between domestic responsibilities and family work contributed to the predicted reduction in female participation due to variations in the implementation of new measurement methodology across survey rounds. However, due to occupational segregation, India's women face a key long-term problem like a lack of employment opportunities (Kapsos S. et al., 2014).

The authors estimate that the effects of an increase in education level and higher household consumption levels accounted for around 18 per cent of the total decline in female participation between 2005 and 2010. An estimate finds that lack of employment opportunities and other factors accounted for approximately 42 per cent. While estimate accounted for 40 per cent of the total decline is due to changes in measurement methodology

between survey rounds. From 1994 to 2010, an estimate accounted for 38 per cent of the total decrease in the female labour force due to an increase in education level and household consumption level. At the same time, the 62 per cent decline of the total decline of the female labour force was due to decreased employment opportunities and other factors.

The empirical findings show that women's religious and social perceptions, level of education, household size and income, and small children in the home all influence their chances of participating in the labour market in India. We find that structural aspects of the labour market have had a more significant impact on participation rates than changes in the underlying factors of the female working-age population. These structural impediments, such as social norms that limit women's labour market options, as well as a steady drop in agricultural employment, are believed to be critical contributors in explaining female participation rates' long-term stagnation.

The participation of female labour supply in India follows a U-curve pattern with educational attainment. Women with less education are more likely to participate than those with primary or secondary education. This observation could be the result of socioeconomic factors. For low-income families, to meet the requirement of minimum subsistence living standard, women in impoverished homes may be forced to supplement their household's income through market labour (Dasgupta et al., 2005).

Domestic non-market work is regarded to have greater prestige than market work when household income rises. Hence women drop out of the labour force when household wealth rises. But women with greater levels of education and those who live in better-income homes, on the other hand, had higher involvement rates than women from lower-income families. According to some authors, these women gain from higher human capital investment and may secure positions with better working conditions and pay (Klasen et al., 2012).

The empirical findings show that social factors such as religion, caste, social perceptions of women as well as individual factors such as women's education level, household characteristics such as the number of person per household and per capita household income, and the number of young children in the household, all influence India's women's probability of participating in the labour market.

A joint report was released by World Bank and State planning organisation staff based on female labour force participation in Turkey. This report analyses and investigates the reason

behind low female labour force participation in Turkey relative to E.U. and OECD average and the reason behind decreasing. The paper analyses urbanization and agriculture shielding as the two main factors of falling female labour force participation in the last two decades. Due to urbanisation, females moved higher labour participation in rural areas to lower labour participation in urban areas. It increases the size of the working-age population larger in the urban area. Hence, overall female labour force participation has decreased due to a shift in occupations of many family's activities (especially a husband or household) in subsistence agriculture to other employment activity. It led to an increase in household income and the withdrawal of women from agriculture activity. A low level of education also is the reason behind low female labour force participation. Complex cultural and economic barriers also lead to lower female labour force participation. Financial barriers mainly due to lower wages in the informal sector, lack of childcare facility, long working hours, and cultural barriers like social demand women staying in the home lead to lower female participation in the workforce.

The author attempted to explain the relationship between female labour force participation, education, social norms, and patriarchy hinders by taking various data such as ILOSTAT, NSSO, NFHS and CMIE consumer Pyramid Household survey. According to the study, labour force participation has decreased, and the size of the overall female labour force has reduced in recent years. It also explains the demand and supply-side issues that influence women's engagement in the labour force. It illustrates how persisting societal conventions and sexism obstruct women's participation in the female labour sector despite their high level of education. It has been analysed that patriarchy is linked to many women dropping out of the workforce. It concludes that education is a sufficient factor for the likelihood of increasing female labour force participation in India. Government policy or schemes should emphasise a more liberalised social and cultural attitude of women in society, allowing women to easily enter the labour market (Ghai S., 2018).

The female labour force participation in Egypt and Germany tried to explain the relationships between educational attainment and Egyptian FLFP while considering other personal and household factors. This paper also tried how demographic factors influence Egyptian FLFP compared to German FLFP. They used a limited dependent variable technique for the study, the Probit model, to analyse the factor influencing the FLFP in both countries. The author has taken the Egyptian Labour Market Panel Survey (ELMPS) and German Socio-Economic

Panel (SOEP). Results indicate that higher educational attainment increases the chances of participating in the labour market.

Additionally, results show that several factors affect FLFP in both countries; some aspects show positive results, such as years of schooling and age. Some factors, such as being a married woman, living in an urban area, and having a large family, have negative consequences (Hosney et al., 2016).

A study showed that women's work status changes with economic development. The data study shows various patterns emerge, and there is plenty of variation across countries and regions within countries. According to the study, women's labour force participation first drops and then rises as the economy develops. As earnings rise, women transition from family-based labour enterprises to market employees, fertility reduces with money, and gender differences in schooling narrow. Women's labour market participation is influenced by their education and spouses' education levels. The women's work status in developing countries is different from the women who worked in developed countries. The author examined other welfare measures to assess welfare women's position in society. According to empirical research, in many developing countries, girls acquire less schooling than boys, female mortality is greater than male mortality in many countries, and women have relatively limited influence over land and other economic assets. The broad welfare indicators like mortality rate and education level improve with economic development, leading to increased participation in the labour market (Mammen K. et al., 2000).

The finding shows that women's empowerment and economic development are closely interrelated in their study. Economic development positively impacted women's empowerment and empowered women to participate in more decision-making, directly impacting development. They argue that a one-time surge in women's rights will not always lead to a vicious cycle in which women's empowerment and development support each other, and women eventually become equal participants in wealthy cultures. On the one hand, economic development alone cannot guarantee significant progress in key aspects of women's empowerment, particularly in decision-making, in the face of widespread prejudices about women's abilities. On the other hand, women's empowerment enhances some areas of children's welfare, such as health and nutrition, but at the expense of other ones, such as schooling. According to them, pursuing governmental moves that favour women at the cost of men will be vital to achieving gender equality. It may be necessary to do so for an extended period (Duflo E., 2012).

A study used the Indian National Sample Survey data for 1993-94 to analyse the relationship between women's education and labour force participation. The study has analysed that education is the main reason behind Asia's low female labour force participation rate. The low female force participation phenomenon is explained due to two competing theories: limited labour market options and cultural factors. Here cultural factors represent that women's draw out from the labour force has linked with improving the family's social status. The daughter of higher status families goes for education, but at the same time, their independence has narrowed due to withdrawal from the labour force (Das M. et al.,2003).

In contrast, structured arguments show that educated women, like educated males, choose white-collar occupations. The formal sector employment accounts for only 7% of all jobs; women's possibilities for these coveted jobs are limited, resulting in their draw out from the labour force. We suggest empirical tests to see if employment availability or patriarchal controls play a role in this relationship's formation. According to findings, cultural characteristics appear to be less important than employment opportunities.

Women in India, whether from general castes or Scheduled Castes and Scheduled Tribes, have lower labour force participation due to their educational attainment. (1) A structural explanation implies educated women are retreating from the labour force due to an absence of opportunities in white-collar occupations. (2) A cultural explanation implies that the link between women's education and work is fictitious, with better socioeconomic level households supporting both education and exit from the labour market. The findings back up the structural explanation.

In the case of India, unlike South East Asian countries, there has been no "feminization" of the workforce with increasing levels of G.D.P. growth. Indian women have been "at the bottom of the U" in terms of labour force participation, despite steady growth in the G.D.P. That brings us to the type of growth in India, which has not been accompanied by enormous scale employment opportunities leading to concern over "jobless growth" (Ghosh 1998; 2001).

The National rural employment Guarantee Act (NREGA) empowers women by increasing labour participation in the market and the implementation problem. NREGA is India's most extensive employment programme that employs rural households for 100 days. For examining the impact of NREGA on the socio-economic condition, they took six states in 2008 (Khera R. et al., 2009).

Despite the loophole in the implementation of the policy, it has a significant benefit to women for better access to local employment at a given minimum wage rate and a comparatively decent and safe workplace. It increases women's participation in the labour market because it belongs to the most disadvantaged group, as 70 per cent belongs to scheduled castes (S.C.s) and scheduled tribes (S.T.s). Most of the women are illiterate. This policy attracted many women because it is locally available, less exploitative, and socially accepted and dignified. It has a positive impact in terms of socially and economic terms. Providing cash in hand increases food security by purchasing larger quantities at lower prices. In the case of NREGA, it reduces the social barrier. It has some problems in implementation, such as the lack of availability of a child care system and the presence of illegal contractors (Khera R. et al., 2009).

By taking data from 100 countries, a study found that female labour force participation decreases as development progresses. The U-shaped curve for female labour force participation aligns with economic progress and the histories of modern advanced economies. The transition from family farms, family-based production, and modest self-employment to the larger market caused an initial drop in female labour force participation. In this case income effect increases but the substitution effect dominant the income effect at some point. The paper explains why a U-shaped curve exists. When women are less educated, there is a strong social stigma when they move from family-based production to manual work. But when they have a secondary education level, they enter the white-collar job and have no social stigma (Goldin C., 1994).

The author tried to analyse the Indian labour market that poses several challenges given the country's size and diversity. India has experienced jobless growth, and employment growth is concentrated in urban areas, particularly for men. The decline in female labour force participation after the 2000s has been an important puzzle for the Indian economy, where economic growth has an average growth rate of about 8 per cent between 2000 and 2010. The informal labour has increased in the formal organization as contract labour. At the same time, the structural transformation from agriculture to manufacturing in other countries has led to greater absorption of workers, particularly females, in the manufacturing sector. The paper focuses on this trend that will prevail shortly also by looking at future work. This means that workers will continue to move towards urban areas for seeking employment by continuing to leave agriculture jobs. But the manufacturing sector will generate limited jobs due to capital intensive based production. However, the wage employment will be generated

more, but it will face some challenges like workers will have access to social security and other benefits. If women's education level increases, their participation rate will likely increase, but various factors keep them out of paid employment (Verick S., 2018).

The study shows that gender discrimination negatively impacts economic development from the empirical analysis. According to the study, increasing the female-to-male management ratio in India by 10% would result in a 2% rise in overall production per capita. While a 10% rise in the female-to-male labour ratio would improve overall output per capita by 8%, Discrimination against women in management positions and the labour market has significant economic implications. The equilibrium wage and cut-off level of manager's talent declined due to difficulty getting access to a managerial position, leading to a decline in the average skill of entrepreneurs and economic growth (Berta E., 2004).

The results of the empirical study show that the effects of gender discrimination are more problematic in certain areas of the economy. In agricultural and non-agricultural sectors, lower female-to-male worker ratios significantly reduce total output. However, in the non-agricultural sector, lower female-to-male ratios at the management level reduce output, but not in the agricultural sector. It means that lack in the allocation of managerial skills plays an essential role in the sector where higher skills are required than the agriculture sector, which requires more physical abilities. Female-to-male labour participation ratios are lower in wealthier states, implying the existence of a binding discriminatory social norm. Gender discrimination endures despite its negative economic implications since society has a long-term social norm.

Gary S. Becker (1985) argues that rising returns from specialised human capital is necessary for building a division of labour in allocating time and investments in human capital even among identical persons. These increasing returns alone do not tell about the traditional sexual division of labour, but other factors are also responsible. Unless men and women have different competitive advantages in family and market operations, women are in charge of most domestic activities. Due to prejudice against women or high fertility-housework duties, the traditional sexual division of labour exists. These factors contribute to lower wages and impact jobs by decreasing women's time in the workforce and preventing them from investing in their human capital (G.S. Becker, 1985)). They also look at the influence of hours worked on hourly wage earnings, the impact of wage earnings on health investment, and the impact of increasing the amount of energy expended on each hour of work on the advantages of investing in human market capital. At the same level of human capital,

married women get lower hourly wages than married males. It's because married women spent more time doing housework and caring for their children and less time working for a living. Furthermore, even when they work the same hours as married men, their lower hourly wages diminish their investment in market capital (ibid).

According to the survey data, the percentage contribution of married males to housekeeping in the United States increased considerably throughout the 1980s. It has also grown due to the divorced father having partial or full custody of their children. Moreover, if these trends continue, women's energy and time spent in market activities will grow, resulting in higher wages and an increased motivation to invest in human market capital.

A study finds that women are paid only 79 cents for every dollar paid to men. Despite a huge increase in their educational attainment, millions of women have participated in the last few decades. The discrimination in the wage pay gap is not due to gender but a lack of statistical measuring to adjust for factors influencing earnings disparity between men and women. Gender bias, on the other hand, has an impact on the occupational differences between men and women. The occupational choice for women depends on the year of education, mentor guidance, expectations set by family members, hiring practise by the firm, and by setup societal social norms. And also focuses on why it matters and the solution because the gender gap hurts women worldwide by suppressing their wage income and making it difficult to manage the balance between work and family (Schieder J. et al., 2016).

This study examines why gender occupational constraints are part of the discrimination women endure due to cultural and economic causes, as well as why gender wage disparities exist even within jobs. Prejudice remains despite years of expertise, hours spent, and years of education moulded by society norms. The more work hours are positively correlated with, the higher paid job. But, women also have to perform household duties like cooking, child care, older age member care, etc. Even in the many professional jobs, women receive low wages compared to men.

1.4 Factors influencing female labour force participation

1.4.1 Theoretical framework

Female labour force participation (FLFP) represents women's labour market decisions to be active or inactive. Economists have tried to determine why women favour one alternative over another by analysing economic and demographic impacts. Some critical theories have been used to analyse the women labour supply. These include Mincers "Work leisure choice theory". "Household production theory by Mincer and Becker and "human Capital Theory" by Schultz and Becker.

1.4.2 Work- Leisure Choice Theory

The simplest analysis of women's work choice is based on the neoclassical microeconomics model, the Work leisure choice model, where labour supplied by the household is rational and maximizes their utility and decide how much time to devote to work for leisure. For females, there will be a trade-off between two alternatives, Work and Leisure. The trade-off has an opportunity cost associated with choosing one alternative over other alternatives. The female's binary decision of work and leisure is based on the wage rate at which the market is willing to pay. Leisure is treated as a normal good. If higher the wage rate, lesser time spent on leisure and more time spent on work. The substitution effect and the income effect are two impacts of this type of relationship. A higher-income may encourage unemployed persons to enter the labour market. And for those working, a higher salary makes leisure more expensive, so more labour hours are devoted to the labour market.¹

1.4.3 Household Production Theory

Mincer (1962) and Becker (1965) gave a household production theory. The families are a producer as well as consumers. Families maximize their utility and allocate efficiently time and income and goods. Household production produces goods and services by using their capital and own unpaid labour. Ehrenberg and Smith (2012) gave the three different methods to describe Household theory. The first model assumes that market production and household production are the same. Therefore, work can be defined in any production, either household production or market production and choice are based on two alternatives work

¹ If the wage rate increases, working hours increase; it is called the substitution effect because leisure becomes more expensive. On the other hand, wage increases, then real income goes up, leading to the rise in the consumption of normal goods (leisure).

and leisure. The second model explains time spent at home, cleaning, cooking, childcare etc., treated as leisure. And the third model describes work as a choice among three alternatives household work, market work and leisure.

1.4.4 Human Capital Theory

Becker (1964) explains about human capital. It is the productive investment that includes individuals, skill ability development, habits, knowledge, a public investment like expenditure on education, Medical care and job training programme. The basic fundamental approach of human capital theory is that individuals will develop their skills, improve their careers, and generate income through investment in education, skill development, and medical care. The theory emphasizes education and job training; it is the key tool for labour participation. These tools increase the individual's productive capacity through education and training, leading to higher occupational status and an increase in income earning. This theory also explains that higher educational attainment individuals are more likely to participate in the labour market because they want to benefit from the positive relationship between educational attainment and wage rate. This theory can also explain the relationship between labour force participation and educational attainment with married women. Many eminent economists find out the relationship between education level and participation rate through the U-Shaped curve. Many studies found the highest participation rate for illiterate women, lower at primary and secondary levels and higher at higher education. The study found a positive relationship between wage and education level that can be explained by U-shaped Relation Given by Schultz (1961). A higher level of labour force participation at the lowest level of education explains that people need more income at a low wage rate (at subsistence wage), so they need more participation for survival purposes. Married women with primary and secondary education might have a lower labour force participation rate because they wanted specific job occupations. With a shortage of specific jobs, females wanted to stay at home. The low level of female labour force participation rate in a developing country is due to the low level of educated female or illiterate females working in the informal sector or unorganized sector, which does not come in the definition of labour force participation.

1.4.5 Macroeconomic analysis

Some of the above theories, like the Work-Leisure Choice Model and Household production theory, explained the nature of FLFP at a specific point in time. But if we also have to define aggregate variables like aggregate labour supply and labour demand with time trends. The labour market is altered over the period due to various factors. For example, if we study the

relationship between economic development and labour force participation in countries, we find the U-Shaped curve relationship. Looking at various studies, we find out high female labour force participation in low-income countries and high-level countries and low participation rate in middle-income level countries. The first U-shaped curve relationship between income and labour force participation is suggested by Sinha (1967). The study found that the female labour force participation rate changes with stages of economic development. In the initial phase, low-level-income countries have higher FLFP, and if the growth of income starts, then first decreases FLFP and after that increases with higher growth of income. Sinha also finds out that at the initial phase of industrialization, the female labour force rate falls because the loss of agricultural jobs (major agriculture activity done by women) is not offset by job creation in the industry at the initial phase. When development enters a later stage, it creates government job and services sector job which compensate the job losses in the agriculture sector. These U-shaped curve patterns of female labour force participation with economic development are found by many scholars such as Fatima sultana (2009), Schultz (1961), Goldin (1994).

This primary question is whether this U-shaped curve relation exists or does not exist from different kinds of international studies for other countries. Fatima and Sultan (2009) have taken the data set of Pakistan for analysis and were able to find a U-shaped curve pattern because Pakistan in recent times has developed at a fast rate, and these things encourage females to participate in the labour market. The female who had higher education was able to get benefit from the transformed economy. Goldin (1994) found a U-shaped curve relationship in the United States. In the late 20th century, many white-collar jobs were generated, which were convenient and manageable for a female. That's why female participation has increased in the labour market.

1.4.6 Educational Attainment

From the above discussion, we find out the U-shaped curve relation between development and female labour force participation. And we also know that development and educational attainment has a positive correlation. If economic growth increases, then access to female education also increases. The positive sloped of the U-curve shows higher economic growth leads to higher female labour force participation. Because of higher educational attainment, females have the availability of white-collar jobs suitable for them to participate (Tsani etal.2012). Educational attainment is important for the positive upward slope of the U-curve because it encourages participation in the labour market. It is also essential for policymakers

to make long-term development strategy tools from education. Education is also necessary for social and economic upliftment because it affects individual and household decisions of supply-side labour force participation for females. The most influencing factor for individual female decision is education level. Investment in education increases labour productivity efficiency, leading to higher production capacity and, hence, income growth.

The relation between female labour supply and economic development (U-Curve); initially, when the income is low, the agriculture economy dominates. Female labour force participation is high due to working to consume goods and services. Female labour force participation reduces as income grows, only to grow again when female education improves and, as a result, the value of women's time in the labour market rises. This process shows that at low levels of development, the income effect of adding more labour outweighs a small substitution effect; however, as income rises, substitution effects take over.

1.5 What explains low participation in India?

Females' ability to join in the labour market is influenced by a variety of individual and household traits and economic and social variables that interact at both the household and macro levels. Some of the most important major factors at the global level include educational attainment, fertility rates, family income level, marriage age, economic development and growth, and urbanisation. In addition to these challenges, societal norms play an essential role in shaping the participation of women in the labour market, which has an impact on LFPR.

In India, much of the debate and discussion on the declining trends have focused on four key explanations: 1) rising educational attainment of young women; 2) lack of employment opportunities in non-farm regular wage sector; 3) effect of household income on participation, basically explain income and substitution effect and 4) measurement (Chaudhary and Verick, Kapsos, et al., 2014; Mazumdar and Neetha, 2011).

1.6 Motivation For the study

A population drives the economy with high-quality labour. Females make up around half of our country's population. We can't absorb the economy's tremendous potential expansion if we don't consider women in the workforce. Female labour force participation is a driver of economic growth, and hence participation reflects a country's ability to grow significantly. The rate of female labour force participation differs between developing and rising nations. Economic and social variables such as economic growth, occupational structure, educational attainment, dropping fertility rate, and societal norms play a role in this diversity. Furthermore, gender disparities in the labour market are more prominent in developing nations, with the imbalance being greatest in South Asian countries.

1.7 Study area

The area of our study is to analyse the factors affecting the female labour force participation at the national level. We have included a case study for Bihar as well. At the national and Bihar level, female labour force participation declined more after 2004-05 despite the Indian and Bihar economies having significant growth after 2004-05. Despite the significant growth and economic transformation, India is much behind many developed and developing nations in female labour force participation. Among the Indian States, Bihar has performed worst in terms of female labour force participation. Hence, studying this low female labour force participation at the national and Bihar level is essential. This study also explains the main factors behind the wage gap between males and females.

1.8 Objectives of Study

Following are the important objectives of the present study.

- 1) To examine the trend and level of workforce participation of men and women in Bihar and India.
- 2) To identify the possible socio-economic and demographic factors that affect the female labour force participation of Bihar and overall India.
- 3) To explore the wage gap in the labour market due to gender bias and socio-economic influence.

1.9 Research questions

Following are the essential research questions of the present study.

1. What are the levels and trends of workforce participation of men and women in Bihar and India?

2. Is the decline in female labour force participation due to increased educational attainment and household income?
3. How does the supply-side factor affect the decision of females' participation in the labour market?
4. How does the wage gap difference between male and female workers relate to gender bias and the endowment effect?

1.10 Chapter Scheme

Chapter-I This chapter includes the background of the study, literature review, theoretical framework, research questions, and objective.

Chapter-II This chapter explains the data and methodology. The Data taken for the study is PLFS (2017-18), and the methodological part includes the logistic regression and Oaxaca decomposition analysis.

Chapter III This chapter explains how social, demographic and economic factors influence the female labour force participation in the labour market. And how some endowments like working hours, education level and year of experience affect the wage gap between males and females at all Indian levels.

Chapter-IV This chapter explains how social, demographic and economic factors influence the female labour force participation in the labour market and how some endowments like working hours, education level and year of experience affect the wage gap between males and females at Bihar levels. And it also compares the labour force participation rate between all India average level and Bihar.

Chapter-V This chapter includes the summary, conclusion and policy recommendations.

CHAPTER-2

DATA AND METHODOLOGY

DATA AND STYLIZED FACTS ON FEMALE LABOUR FORCE PARTICIPATION

2.1 Data and stylized facts on female labour force participation

The National Sample Survey organisation collects the most extensive statistics on employment and unemployment in India (NSSO). And this data has been taken for the data analysis for this research work. The NSS employment and unemployment survey is the primary data source on various labour parameters measures at the national and state levels. NSS survey with a large, nationally representative sample size has been done every five years throughout the country. The regular survey started quinquennially 27th round (1972-1973). And the last quinquennially surveyed by the NSSO was the 68th round (2011-2012).

The yearly estimates of employment and unemployment characteristics for rural and urban regions, as well as quarterly estimates for urban areas, were suggested by the standing committee on labour force statistics. There are two main objectives of the PLFS. The first goal was to assess features of labour force participation and employment status for three months in only metropolitan regions that were in the current weekly status (CWS) for a short time. The secondary goal was to measure labour force estimates on important parameters in usual status (ps+ss) and CWS in rural and urban locations. The data has been taken from the first annual report based on the Periodic labour force survey (July 2017- June 2018). It presents various aspects of employment and unemployment at the national and state level.

The first report is based on the periodic labour force Survey (PLFS) conducted by NSSO from July 2017 to June 2018. The survey sample covers more than 1, 00000 representative households. NSSO survey of employment and unemployment collected the data of 1, 02113 households ((56,108 households in rural areas and 46,005 households in urban areas), and the number of persons has surveyed 4, 33,339 persons (2, 46,809 persons in rural areas and 1, 86,530 persons in urban areas). It makes India the largest database of employment surveys in the world.

The National Survey of Labour Statistics (NSSO) Estimates of labour force indicators and features have been presented using the usual status (ps+ss) technique and the current weekly status methodology for classifying the population by activity statuses. The usual status (ps+ss) method has a one-year reference period, while the current weekly status approach has one week. In urban areas, a rotating based panel sampling design was adopted. Each

selected family in urban areas is visited four times under this rotating panel arrangement, commencing with the first visit schedule and thrice periodically after that with the revisit schedule. In the rural samples, there was no repeat. The estimates of household and population, labour force, workforce, and unemployment reported here are based on information gathered in the first visit's Schedules in rural and urban locations.

2.2 Methodology

Every research paper or thesis must have some goal that is fully filled by descriptive analysis or causal interferences. Our study aims to analyse the descriptive analysis and factors and characteristics that determine the study of female labour force participation in India and Bihar. To this, we have taken quantitative data for analysis. Quantitative data can be classified into three categories Cross-sectional data, panel data and time-series data. In our studies, we have taken cross-sectional data of NSSO. There is also a debate between qualitative and quantitative data approaches (Lijphart, 1971). Qualitative data is more appropriate for theory generating, while quantitative data is for statistical analysis for cause and effect relationships for large population observation. For convenience, our study has taken quantitative data to study the labour market.

This study will take a simple quantitative method approach for analysing the rate, ratio, and level pattern of male and female labour force participation. Various factors like socio-cultural, economic, and demographic factors influence female labour force participation in the labour market. For example, how these supply-side factors like age, number of children, Marital status, household size, per capita household income, level of development, educational attainment, land hold size, religion, caste, urbanization, etc., influence the women's decision for participating in the labour market. Therefore, the cross-tabulation method is used to see the relationship between the dependent and independent variables. This study has used different types of econometrics models for the analysis.

In some cases, the dependent variable is continuous, and in some cases, the dependent variable is discrete. We have taken the logit model and Oaxaca decomposition model to do so. In the first model, whether females are participating in the labour market is a dependent variable with a binary outcome (participating or not), so we have taken the logit model for the regression analysis. In the second model, the study took the Oaxaca decomposition analysis for the wage gap between males and females based on gender discrimination and other characteristics like years of schooling, work experience, and working hours.

2.3 Logistic Regression

In our study dependent variable, female labour force participation is a binary choice that either can participate in the labour market or not. So for the analysis, we can take either the logistic regression model or the Probit model used for statistical analysis. We have taken the logistic model because scholars believe there is not much difference in the predicted values of the Probit and logistic models. Many Scholars found both models give almost similar results, the only difference in regression curve, variance, error term, and the dependent variable's transformation. Skog (2004) found in his study difference in results are very small.

The fundamental concept of the logistic Model and OLS regression model is similar. They have some important differences, like the logistic model violating the assumption of the OLS regression model. In OLS, the error term follows a normal distribution, but the error term of logistic regression follows a binomial distribution; these things violate the assumption of normality condition. The variable of the binary choice model does not follow the homoscedasticity condition (Cameron and Trivedi, 2010). The predicted probability for an event lies within 0 and 1 for the logistic regression, but in the case of the OLS model, it is not necessary to lie within 0 and 1 (Skotlong).

Since the outcome has binary choices 0 and 1, the predicted probabilities must fall within 0 and 1. To show this range logistic model, use the logistic curve to show the relationship between dependent and independent variables. If the independent variable increases, the probability approaches 0. If the independent variable decreases, the probability approaches 1 for a given negative coefficient, and the positive coefficient follows vice versa. It gives the nonlinear form of relation.

The predicted probabilities do not exceed the range between 0 and 1; we take the odd ratio of the two probability outcomes.

Basic Model

The Outcome Variable, Y will take one of the two values

$Y = 1$, with probability P_0 .

$Y = 0$, with Probability $1-P_0$.

Y is a dependent Binary outcome variable that is the function of probability P. here, P is the function of $X'\beta$. Where x is the independent variable and β is a vector of the unknown parameter. In standard binary outcome with conditional can be represented as

Model-

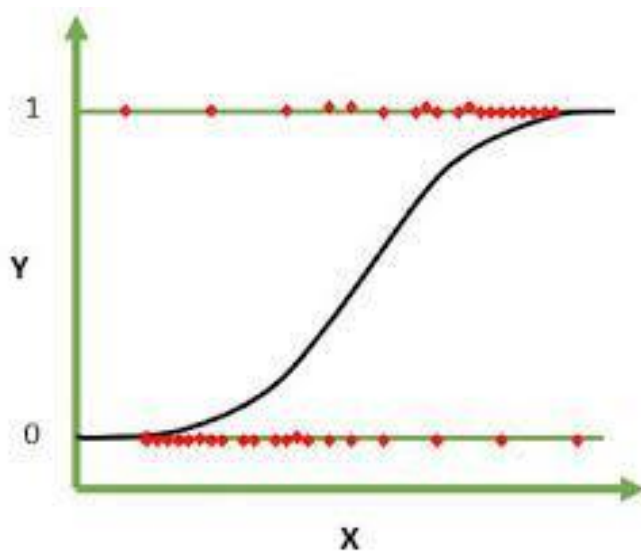
$$P_i = \Pr (Y_i = 1|X) = F(X_i'\beta)$$

$$P(Y=1|X_1, X_2, \dots, X_k) = F(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k) \\ = \{ 1 / (1 + e^{-(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k)}) \}$$

$$F(x) = \frac{1}{(1 + e^{-x})}$$

F(x) is the CDF of a standard logistically distributed random variable.

Distribution of Logistic Model:-



Both Probit and logit model is similar, almost in results, except that a different CDF is used for both.

$$F(x) = \frac{1}{(1 + e^{-x})}$$

It represents the CDF of the standard logistic model.

What is Logistic Regression?

A logistic function was invented by Verhulst, a French mathematician in the 19th century, for the description of the population growth and the study of an autocatalytic chemical reaction. Logistic regression is similar to linear regression model is part of generalized least square model that predicts the dependent variable for given one or more than one independent

variable when the dependent variable has a binary outcome. The complexity arises when the dependent variable has more than two outcomes, and to deal with this, we use the multinomial logit model. Logistic regression is more flexible in terms of assumption. The dependent variable does not follow the normality condition, and there is no assumption about the normality condition in the relation between a dependent variable and an independent variable. It can predict the probability of the outcome of the dependent variable for both given independent dummy and continuous variable.

We are interested in modelling probability P as a function of independent variables X_i . By doing this, there is no loss of generality for setting the binary outcome values 0 and 1.

Here the probability mass function for the observed outcome y is $P^y (1 - P)^{1-y}$ with a mean of Y is P and variance of Y is $P(1-P)$.

The conditional probability can be written as

$$P_i = \Pr (Y_i=1|X) = F (X' \beta)$$

$F(\cdot)$ is cumulative distribution function CDF has range $(-\infty, \infty)$ and Probability values lie between $0 \leq P \leq 1$.

Purpose of logistic Model

- To predict the change in probability of female labour force participation outcome when the factors like socio-cultural, socio-economic, and demographic factors change.
- To predict the odd ratio of events that affects the participation Behaviour.

Assumptions of Logistic regression

The Logistic regression does not follow the assumption of normality distribution, homogeneity of variance of the independent variable.

It follows Bernoulli or binomial distribution.

Y_i is the independent variable.

Logit $P (Y_i=1)$ is linear function of Covariates

Log odd $P (Y_i=1 / (1-Y_i=1))$ is linear function of Covariates

2.4 Method for estimating Logistic Regression Model

a) Observe the data of dependent variable Y_i and independent variable of $X_1, X_2, X_3, \dots, X_n$.

In this case, the dependent variable is females will participate in the labour market or not have a binary outcome. The independent variable is either continuous (age, years of schooling, work experience, etc.) or dummy variables (gender, caste, religion, etc.). So this logistic model is suited for analysing the data.

Estimation, Hypothesis and Specification test

b) Use a maximum likelihood estimator (MLE) for estimating the coefficient

Maximum likelihood estimator- We will take the MLE method for the logistic model because the dependent variable is a binary variable with a P_i function. This is different from the OLS model because in the OLS model dependent variable is a continuous variable and has a function of X_i . It takes the Bernoulli distribution for the estimation. It estimates the set of parameters for the model that maximizes the likelihood function.

The probability mass function for the observed outcome y is $P^y (1 - P)^{1-y}$

Where $P_i = \Pr (Y_i=1|X) = F (X' i\beta)$

The maximum likelihood estimator is obtained by an iterative method.

c) Draw the inferences of the confidence interval and calculate the value of marginal effect, odd ratio and Wald test.

Hypothesis and Specification Test

(a) **Wald test**

This test may be used for the interaction effect with one common independent variable. The null hypothesis is the coefficients of these repressors are all zeroes because we assume that there is no interaction effect.

(b) **Likelihood ratio test**

This test is used for alternative methods. It is almost similar to the Wald test if the model is correctly specified.

This test is used for modelling that is model is correctly specified or not.

2.5 Model comparison

For answering the question of which model is best, Probit or Logit. Although in most cases, the fitted probability is very similar. There is a need for a substantial sample to compare the two models. And we select those models that have a higher likelihood ratio.

2.6 Model diagnostics

Checking whether the model is correctly specified

Test for Normality

Test for Homoscedasticity

The goodness of fit and Prediction

For the test of the joint significance of the regressor, we can use the value of the log-likelihood ratio, the LR test and its p-value for the model. However, some measures of overall goodness of fit, such as those particular to the binary outcome model, are desirable.

Goodness of fit

$$R^2 = \left(\frac{ESS}{TSS} \right) = 1 - \left(\frac{RSS}{TSS} \right)$$

$$\text{Count } R^2 = (\text{No. of correct predictions} / \text{Total no. of Observation})$$

McFadden's Pseudo-R²

The logistic regression model used the method of maximum likelihood estimators, and that estimators are those value that maximizes the likelihood of the data that has been observed.

McFadden's Pseudo-R² can be expressed.

$$\text{Pseudo-R}^2 \text{ can be expressed} = 1 - \frac{\log(Lc)}{\log(Lnull)}$$

Here Log (Lc) represents the maximum likelihood values from the best-fitted line, and Log (Lnull) represents the only intercept term that takes from the model with only intercept term. The entire sum of squared deviations from the mean can be split into explained and residual sums of squares in linear regression, and R² measures the ratio of the explained sum of squares (ESS) to the total sum of squares (TSS), with 0 and 1 being the lower and upper bounds, respectively. Nonlinear regression does not have these qualities, however some measurements of the fit try to replicate the R² value of linear regression. Several R² measurements are available, one of which is included in the Stata result. LN (Mean Y) signifies the log-likelihood value in the intercept-only model, while McFadden's R² denotes

the maximised or fitted log-likelihood value. The lowest and upper bounds of the pseudo-R² measure are 0 and 1, respectively, when applied to models with binary and multinomial outcomes.

Marginal effects

There are generally three different types of marginal effects, the average marginal effect (AME), marginal effects at a representative value (MER), and marginal effects at the mean (MEM). In a nonlinear model, marginal effects are more valuable in interpreting than coefficients interpreting.

The marginal effect at mean is calculated by taking the mean of all independent variables. The predicted probabilities are obtained by multiplying each logistic coefficient with the corresponding independent variable, then taking a summation of these values with intercept and will transform logistic into predicted probabilities.

Odd ratio Interpretation

$$\text{Logit}(P) = \text{LOG}\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k$$

$$\left(\frac{1-P}{P}\right) = \frac{1}{\text{Exp}(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k)}$$

$$P = \text{Exp}(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k) / 1 + \text{Exp}(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k)$$

In simplified form

The Odd is the ratio of the probability of success and probability of failure.

$$P [Y=1]= p \text{ and } P [Y=0]= 1-p$$

Both event can be expressed in terms of p.

We can write the distribution of Y as

$$\text{Odds (Y)} = \frac{P}{(1-P)} = \frac{P[Y=1]}{P[Y=0]}$$

Interpretation- Odds ratio measure the association between two binary variables. If the odds ratio is greater than 1, it explains a positive relationship, and if the odds ratio is less than 1, it explains the negative association. And if the odds ratio is equal to 1, it demonstrates there is no relation. And if the odds ratio is equal to 1, there is no relation.

Advantages of Logistic Model

- The logistic model is easier in interpretation implementation and very efficient to train.
- It can be easily applied to multiple classes of discrete dependent variables by using multinomial regression and can predict the probability of each class.
- It can measure both magnitude (Coefficient value) and direction of association of predictors that means positively correlated or negatively correlated.
- It has Good accuracy for many simple data sets, and it performs well for that linearly separable dataset.

Disadvantages of Logistic Model

- If the number of observations (n) is lesser than the number of attributes (k), we cannot use the logistic regression model because it may be overfitting the estimates.
- It constructs linear boundaries of predicted values.
- The major limitation of the logistic regression is the assumption of the linear relationship between the dependent and independent variables.
- It can be used only when the dependent variable is discrete.
- In the case of linear regression, dependent and independent variables are linearly related, but in logistic regression, model-independent variables are linearly correlated with $\text{Log} \left(\frac{p}{1-p} \right)$.

2.7 Oaxaca Decomposition Model – Gender wage gap and decomposition analysis

This method measures the outcome of the labour market based on sex, caste, race etc. It decomposes the difference between Log waged based on linear regression. It differentiates the wage differential between two groups (Groups can be the basis of sex, caste, race etc.). It also decomposes into two parts. The first part is the "explained" part based on group differences in productivity characteristics like years of education, daily working hours, and years of experience. The unexplained part measures the residual term representing the discrimination.

Methodology

We consider two groups, Male (M) and Female (F) working, and the outcome variable is log hourly wage Income. Here dependent variable is Log hourly wage-earning, and the independent variable is the year of education level, experience and average daily work hours.

We will measure the mean difference in wage income between males and females by taking the group differences based on males and females.

$$EG = E(W_m) - E(W_f) \dots\dots\dots(1)$$

Linear Model

$$W_i = \beta_0 + \beta_1 X_i + e_i, \quad E(e_i) = 0, \quad i = \{M, F\} \dots\dots\dots(2)$$

Here W represents the vector predictors, a constant term, and β represent the slope parameters and a random term.

The outcome of the mean wage difference can be represented as a difference in the linear outcome at the group-specific means of the independent variables.

$$EG = E(W_m) - E(W_f) = E(X_m) * \beta_m - E(X_f) * \beta_f \dots\dots\dots(3)$$

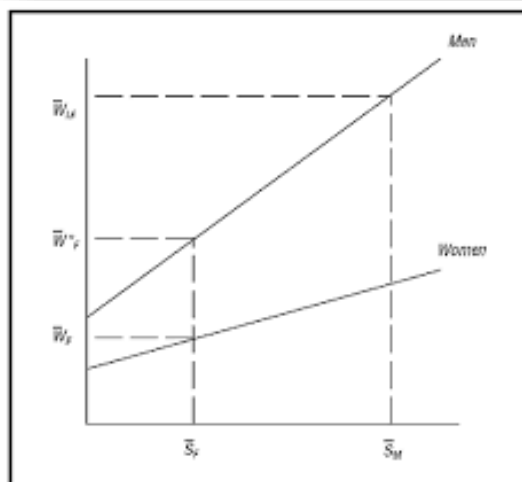
$$EG_f = [E(X_m) - E(X_f)] * (\beta_f) + E(X_f) * (\beta_m - \beta_f) + [E(X_m) - E(X_f)] * (\beta_m - \beta_f)^2 \dots\dots\dots(4a)$$

$$EG_m = [E(X_m) - E(X_f)] * (\beta_m) + E(X_m) * (\beta_m - \beta_f) + [E(X_m) - E(X_f)] * (\beta_m - \beta_f) \dots\dots\dots(4b)$$

$[E(X_m) - E(X_f)] * (\beta_m) =$ characteristic effects (Explained variation)

$E(X_f) * (\beta_m - \beta_f) =$ Coefficient effect (Unexplained part)

$$W_m - W_f = [E(X_m) - E(X_f)] * (\beta_m) + E(X_f) * (\beta_m - \beta_f)$$



Oaxaca decomposition analysis

$$W^m - W^f = \beta^m * (X^m - E(X^f)) + (\beta^m - \beta^f) * (X^f)$$

$$\Delta = \Delta_m + \Delta_x + \Delta_0 + \Delta_f$$

In Simplified form Oaxaca decomposition

Male Earning Function

$$W_m = \alpha_m + \beta_m * S_m \dots \dots \dots (1)$$

Female Earning Function

$$W_f = \alpha_f + \beta_f * S_f \dots \dots \dots (2)$$

$$\begin{aligned} \Delta \bar{W} = \bar{W}_m - \bar{W}_f &= \alpha_m - \beta_m * \bar{S}_m - \alpha_f + \beta_f * \bar{S}_f \\ &= \alpha_m - \alpha_f + (\beta_m - \beta_f) * \bar{S}_f + \beta_m * (\bar{S}_m - \bar{S}_f) \end{aligned}$$

The term $\alpha_m - \alpha_f + (\beta_m - \beta_f) * \bar{S}_f$ determines the differential due to gender discrimination, and $\beta_m * (\bar{S}_m - \bar{S}_f)$ determine differential that can be explained due to characteristics like years of education, work experience, working hours etc.

CHAPTER- 3

LABOUR FORCE PARTICIPATION IN INDIA

3.1 Introduction

The Indian Labour market shows several notable features: low female labour force participation and varies across states and a larger share of men and women engaged in the Informal economy. In 2012, India had one of the lowest female labour force participation rates globally, at roughly 33 per cent at the national level. India's FLFP is much behind the worldwide average of roughly 50 per cent female involvement, whereas East Asian countries average 63 per cent. With a gender difference of nearly 50 per cent India is in the poorest position and has an enormous gap among G-20 economies. Unlike most other areas, India's female labour force participation rate has dropped during 2004-05. India is the second-most populous country having 1.26 billion people by the end of 2014 by world estimate. Approx to 33 per cent female labour force participation, only about 125 million out of approximately 380 million working-age Indian women was working or seeking a job.

When it comes to the gender disparity in participation (males vs females), India has one of the enormous disparities among G-20 economies, at 50 per cent. As India seeks to capture the demographic dividend from its massive and vibrant labour force, more women joining the workforce and more structural reforms that might provide more work opportunities would be a source of future development.

Gender equality is more important today in determining the extent of economic development. Various studies find a lack of economic growth due to low entrepreneurial activity and low entrepreneurial activity due to low female labour force participation. According to the World Economic forum study based on gender equality (2014), gender equality, per capita income, competitiveness index, and human development index have positively correlated.

The Indian economy has transformed after 2004-05 and has average annual GDP growth of 5-9 per cent. The School enrolment has increased, mortality and fertility have decreased, house gas connectivity has increased, electrification, transportation services have increased, and domestic duty has decreased. Despite this economic development and social and physical infrastructure improvements, female labour force participation declined after 2004-05.

3.2 Level and trend analysis

Table 1. Labour force participation of males and females at the national level in urban areas

Year	Urban-Female (CWS)	Urban-Male (CWS)	Urban-Female (Usual)	Urban-Female (Usual)
1993-1994	15.2	53.8	16.5	54.3
1999-2000	13.8	53.9	14.7	54.2
2004-2005	16.8	56.6	17.8	57
2009-2010	14.1	55.6	14.6	55.9
2011-2012	14.8	56.1	15.5	56.3
2017-2018	15.3	56.7	15.9	57

Table 2. Labour force participation of males and females at the national level in rural areas

Year	Rural-Female (CWS)	Rural-Male (CWS)	Rural-Female (Usual)	Rural-Female (Usual)
1993-1994	27.6	54.7	33	56.1
1999-2000	26.3	53.1	30.2	54
2004-2005	28.7	54.5	33.3	55.5
2009-2010	23.1	54.8	26.5	55.6
2011-2012	21.5	54.5	25.3	55.3
2017-2018	16.1	54.4	18.2	54.9

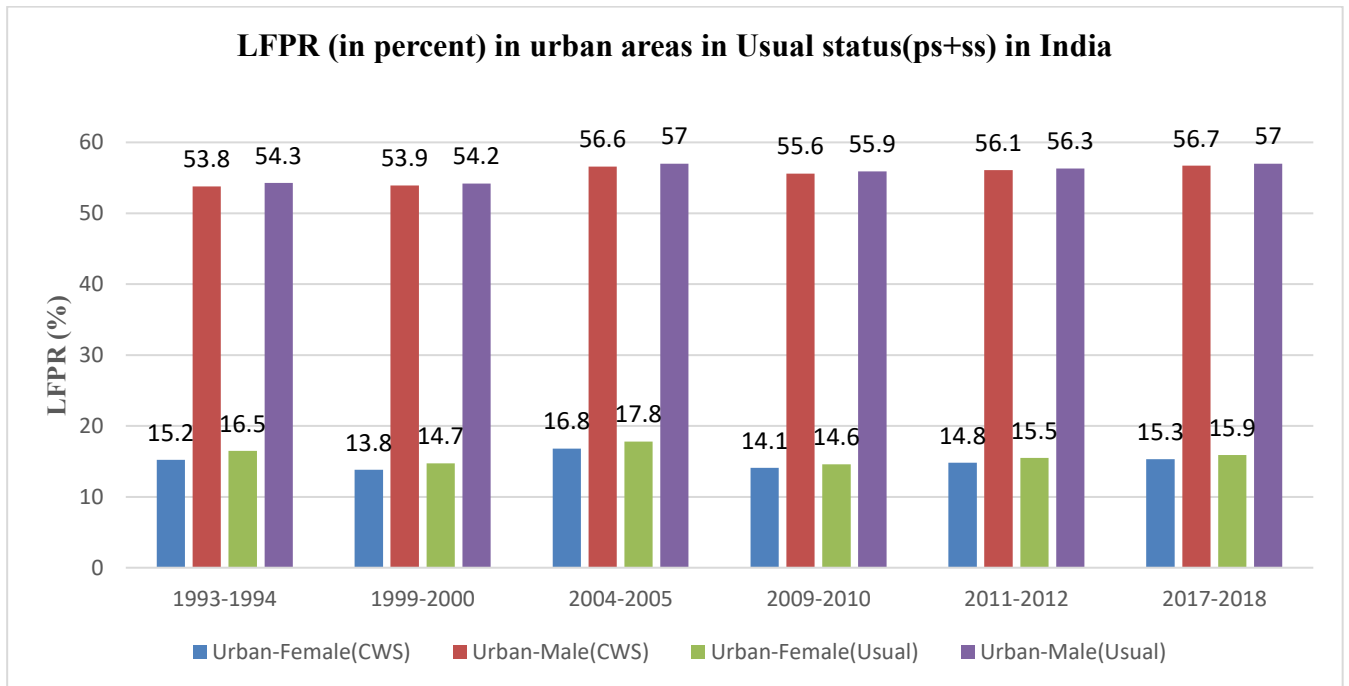
Source: Annual report, PLFS 2017-18²

The NSS data shows that the male labour force participation rate based on the Usual (ps+ss) status and Currently Weekly Status was 56.1 per cent and 54.3 per cent in 1993-94 in rural India and 54.3 per cent 53.8 per cent in the urban area. And it is the almost same in the period between 1993-94 and 2017-18 in rural India and urban areas. The female labour force participation rate based on the Usual (ps+ss) status and current weekly status was 33.0 per cent and 26.30 per cent in 1993-94 in rural India and 16.5 per cent and 15.2 per cent in urban India. In rural India, The female labour force participation based on usual status (ps+ss) first declined from 33.0 per cent to 30.2 per cent between 1993-94 and 1999-2000. Then increases from 30.2 per cent to 33.3 per cent between 1999-2000 and 2004-05. And it is continuously

² Labourforce participation (in per cent)

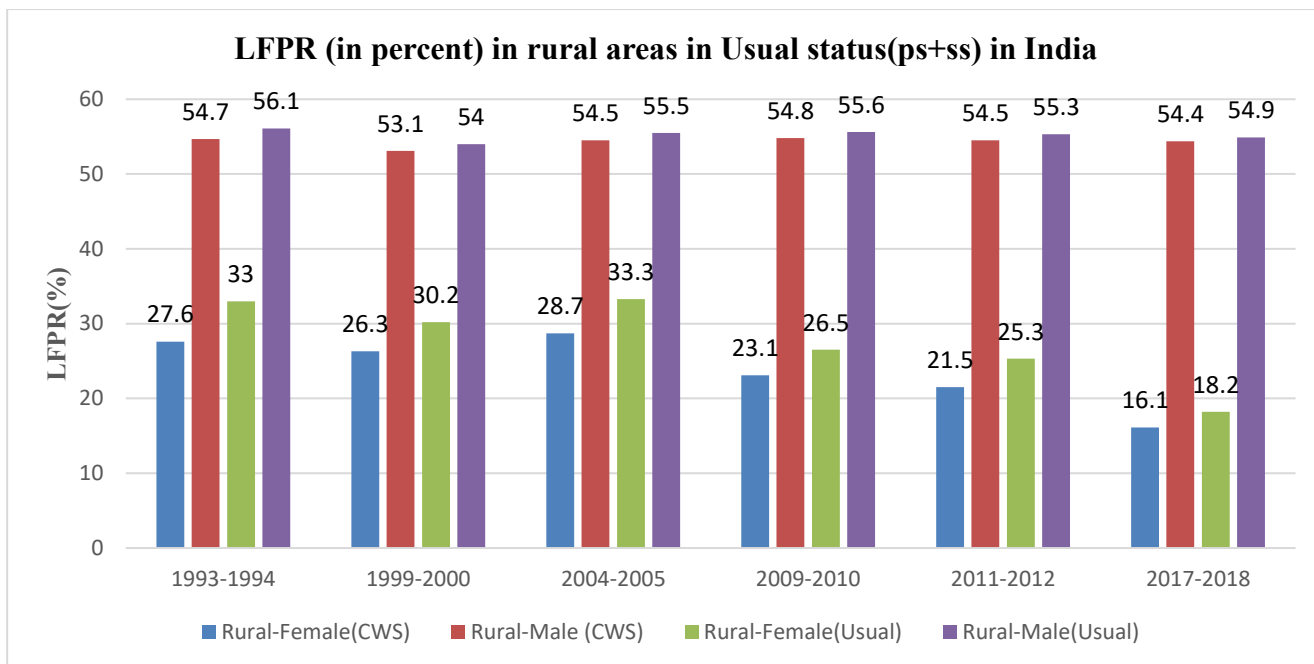
declining from 2004-05 to 2007-08 and reached at 18.2 per cent. But in urban India, female labour force participation is almost 16 per cent and stagnant between 1993-94 and 2017-18.

Figure 1. Labour force participation of males and females at the national level in the urban area



Source: Annual Report, PLFS 2017-18

Figure 2. Labour force participation of male and females for overall India in the rural area



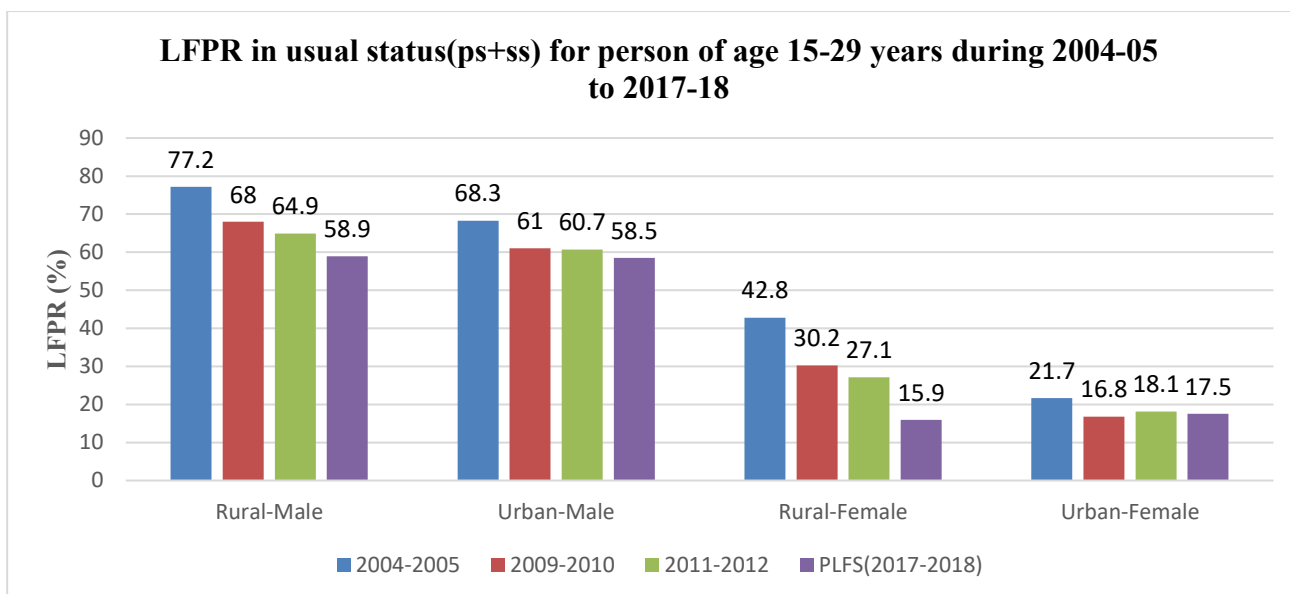
Source: Annual Report, PLFS 2017-18

Table 3. Labour force participation of persons aged 15-29 years at all Indian levels during 2004-05 to 2017-18

Year	Rural-Male	Urban-Male	Rural-Female	Urban-Female
2004-2005	77.2	68.3	42.8	21.7
2009-2010	68	61	30.2	16.8
2011-2012	64.9	60.7	27.1	18.1
PLFS(2017-2018)	58.9	58.5	15.9	17.5

Source: Annual Report, PLFS 2017-18

Figure 3. LFPR in usual status for a person of age 15-29 years during 2004-05 to 2017-18



Source: Annual Report, PLFS 2017-18

Figure 3 shows that the labour force participation rate of persons aged between 15-29 has continuously declined from 2004-05 to 2017-18 for males and females in rural areas. But, the female participation rate has declined at a faster speed compared to males. But on the other hand, in the urban area, the labour force participation has dropped slightly and is almost stagnant for both male and female labour during the same period.

Table-4 LFPR (in per cent) among person in the different social groups during 2017-18

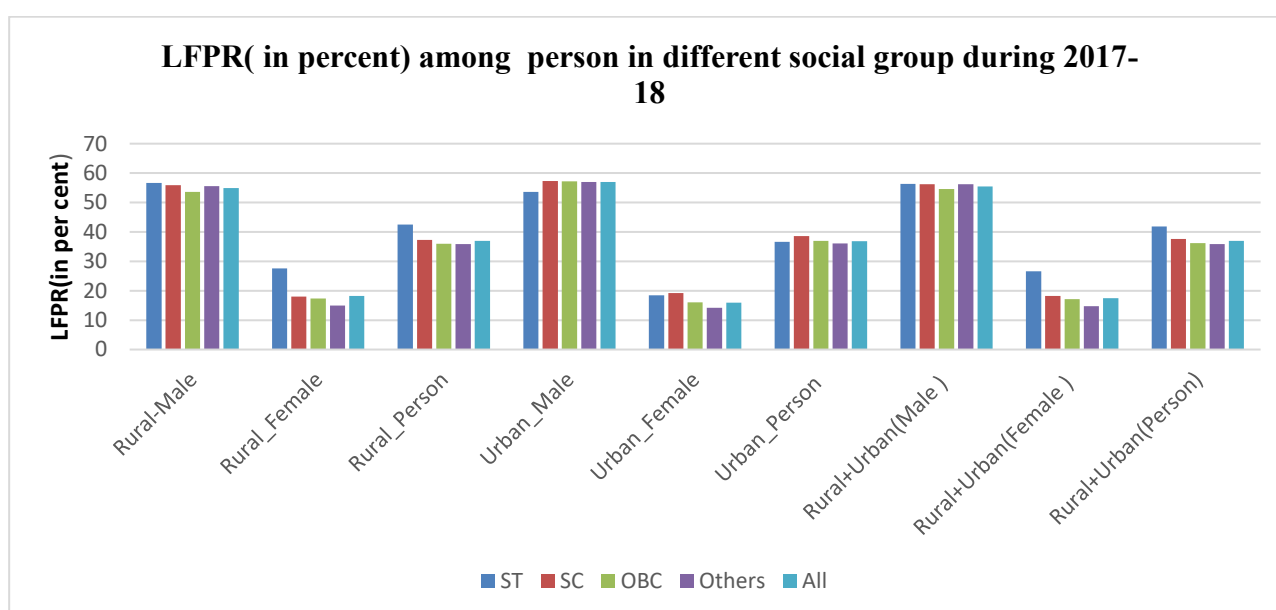
Social Group	Rural-Male	Rural-Female	Rural Person	Urban Male	Urban Female	Urban Person	Rural+ Urban(Male)	Rural+ Urban(F emale)	Rural+ Urban(P erson)
ST	56.6	27.6	42.5	53.6	18.4	36.6	56.3	26.6	41.8
SC	55.9	18	37.3	57.3	19.2	38.6	56.2	18.2	37.6
OBC	53.6	17.4	36	57.2	16.1	36.9	54.6	17.1	36.2
Others	55.6	15	35.9	57	14.2	36.1	56.2	14.7	35.9
All	54.9	18.2	37	57	15.9	36.8	55.5	17.5	36.9

Source: Annual Report, PLFS 2017-18

Table 4 represents the labour force participation rate (LFPR) in usual status (ps+ss) among persons (males and females) belonging to different social groups like ST, SC, OBC, and others during 2017-18. The table shows that in India, LFPR among the social group was highest for ST (41.8 per cent) followed by SC (37.6 per cent), OBC (36.2 per cent), and it

was the lowest among the 'others' (35.9 per cent). In rural areas, LFPR was the highest among both the males (56.6 per cent) and females (27.6 per cent) belonging to ST, while in urban areas among both males (57.3 per cent) and females (19.2 per cent), the LFPR was the highest for SC and lowest for ST (53.6 per cent). Still, it was almost at the same level for SC, OBC and 'others' among males. In Rural areas, LFPR is lowest for OBC (53.6 per cent) among males lowest for others (15 per cent) among females .while LFPR was the lowest for 'others' (14.2 per cent) among females, and LFPR was the lowest among ST (53.6 per cent) among male in urban areas.

Figure 4. LFPR among person in the different social groups during 2017-18 (%)



Source: Annual Report, PLFS 2017-18

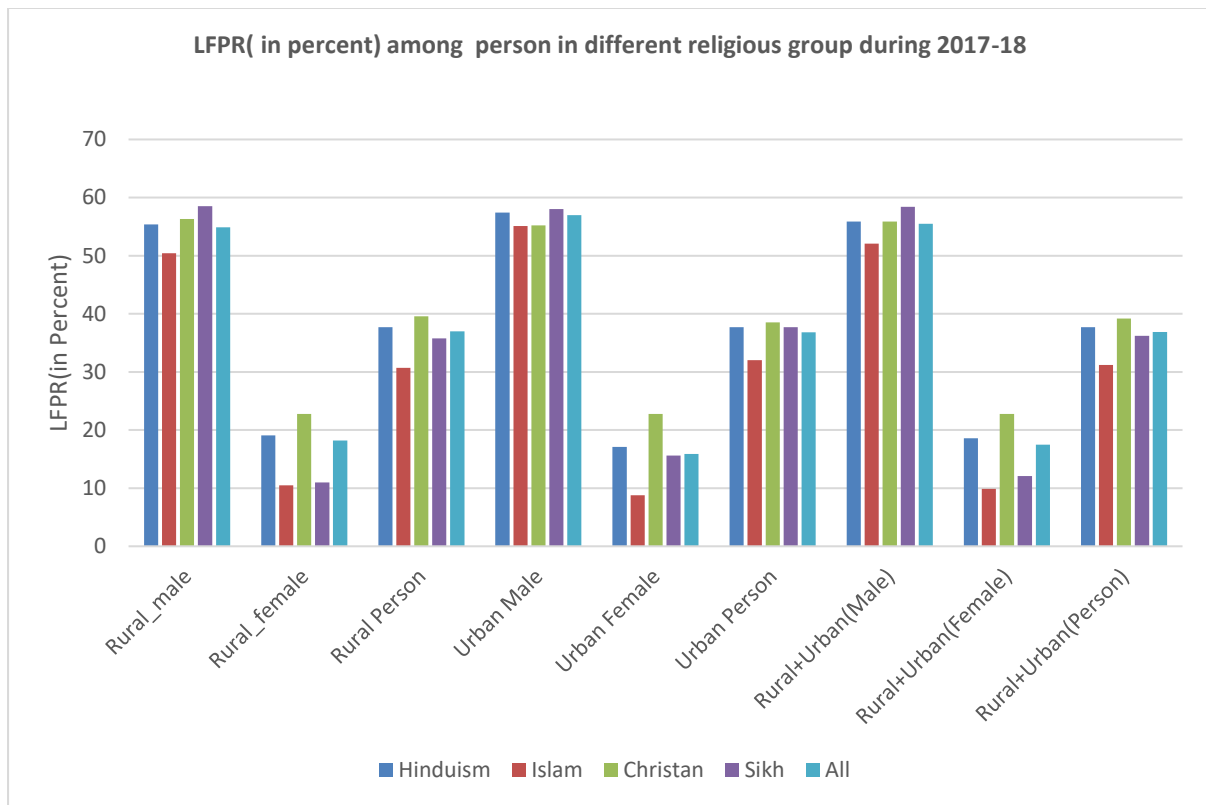
Table-5 LFPR among person in the different religious groups during 2017-18 (%)

Religious Group	Rural male	Rural female	Rural Person	Urban Male	Urban Female	Urban Person	Rural+ Urban(Male)	Rural+ Urban(Female)	Rural+ Urban(Person)
Hinduism	55.4	19.1	37.7	57.4	17.1	37.7	55.9	18.6	37.7
Islam	50.4	10.5	30.7	55.1	8.8	32	52.1	9.9	31.2
Christian	56.3	22.8	39.6	55.2	22.8	38.5	55.9	22.8	39.2
Sikh	58.5	11	35.8	58	15.6	37.7	58.4	12.1	36.2
All	54.9	18.2	37	57	15.9	36.8	55.5	17.5	36.9

Source: Annual Report, PLFS 2017-18

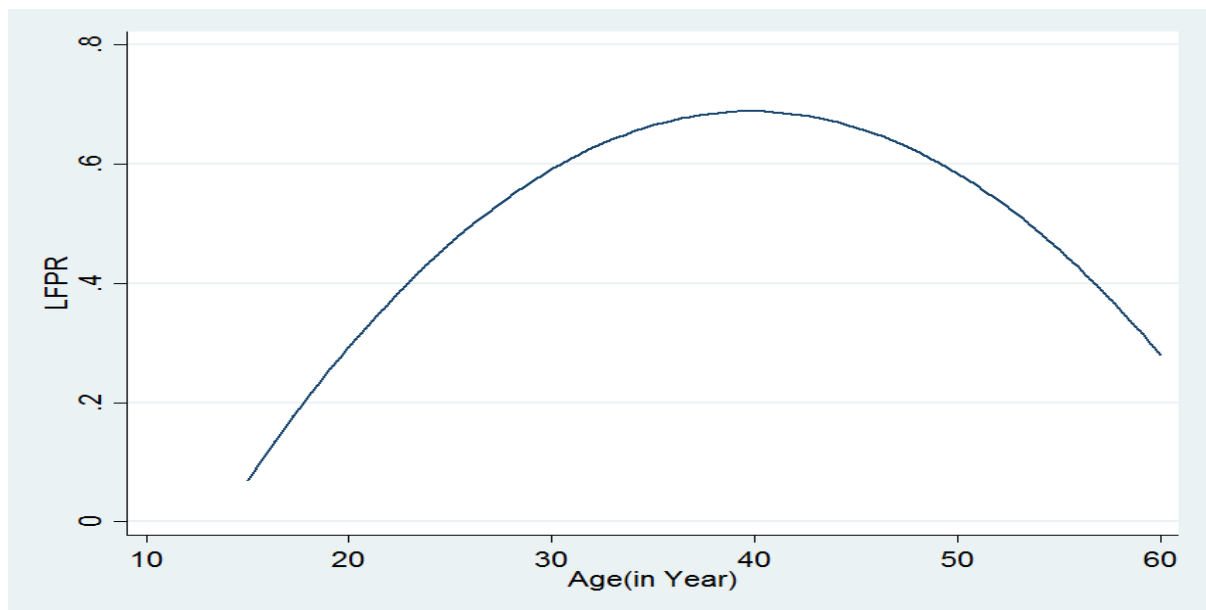
Table 5 represents LFPRs (in per cent) among males and females belonging to the major religious groups like Hinduism, Islam, Christian, Sikh and all during 2017-18. The table shows that in India, LFPR among the religious group was highest for Christians (39.2 per cent) followed by Hinduism (37.7 per cent), All (36.9 per cent), Sikh (36.2 per cent), and it was lowest among 'Islam' (31.2 per cent). LFPR was the highest belonging to Sikhs among males for rural (58.5 per cent) and urban areas (58 per cent), while the lowest belonging to Islam among males rural (50.4 per cent) and urban areas (55.1 per cent). LFPR was the highest belonging to Christians among females for rural (22.8 per cent) and urban areas (22.8 per cent), while the lowest belonging to Islam among females rural (10.5 per cent) and urban areas (8.8 per cent).

Figure 5. LFPR among person in the different religious groups during 2017-18 (%)



Source: Annual Report, PLFS 2017-18

Figure 6. The relation between female labour force participation and the age of females in years.

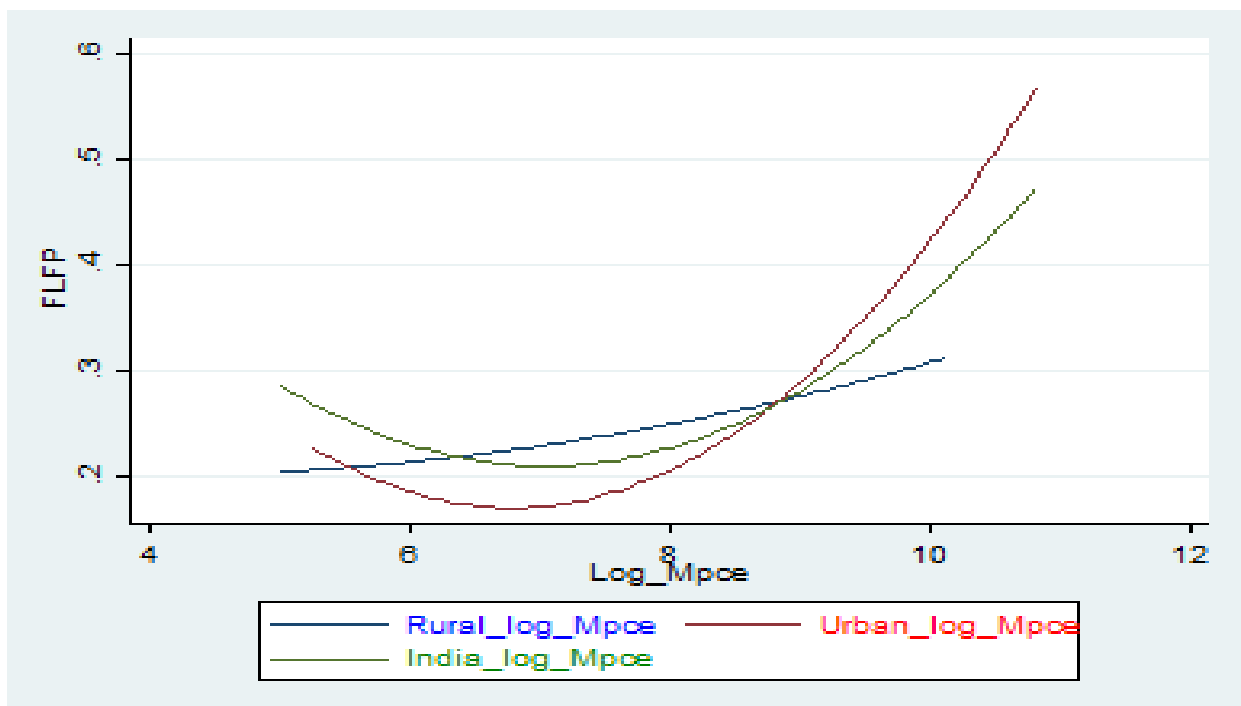


LFPR: Labour force participation rate in per cent (for female)

Source: Graph-based on PLFS 2017-18

Figure 6, based on PLFS (2017-18) data, shows that female labour force participation increases with age, and after a particular point, the participation rate decreases with age. It shows an inverse U-shaped curve relation between age and female labour force participation. The decreasing trend can be due to marriage, Childcare, domestic household duties etc.

Figure 7. The relation between female labour force participation and monthly per capita expenditure (MPCE) at the rural and urban levels in India



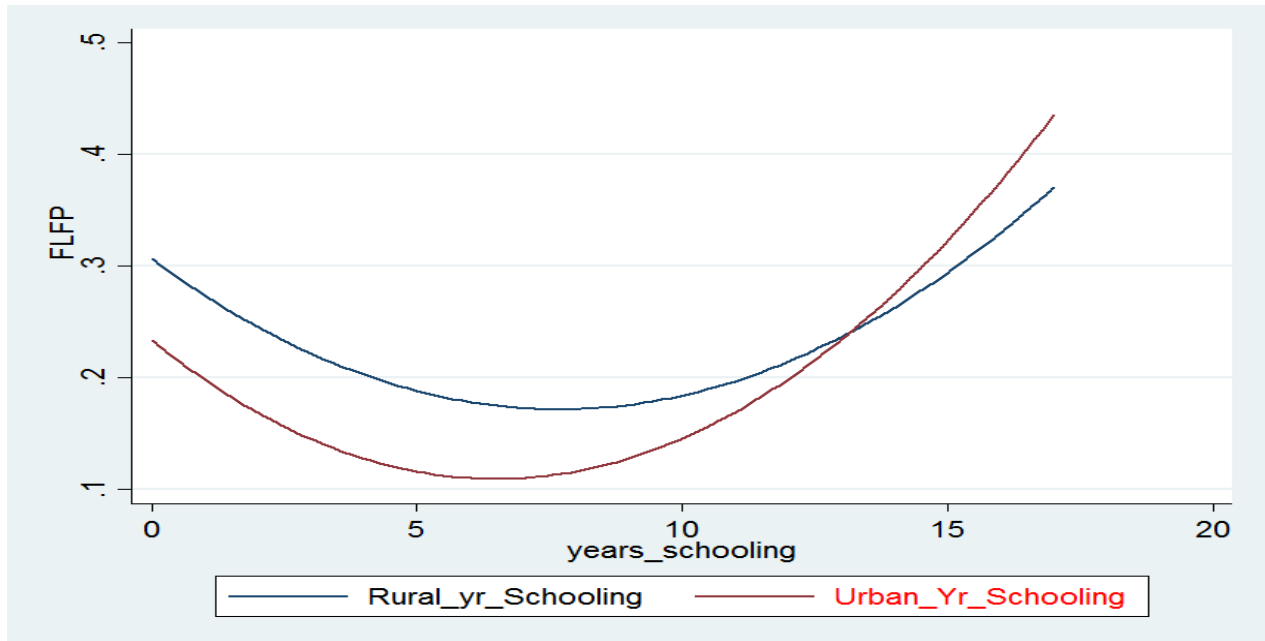
FLFP: Female labour force participation, Log_MPCE: Monthly per capita expenditure in log

Source: Figure-based on PLFS 2017-18

Figure 7 shows a positive relationship between female labour force participation and per capita household expenditure in rural areas. But in the urban area, there is U-shaped curve relation between female labour force participation and household per capita expenditure. The positive relationship in the rural area can be due to the substitution effect dominating the income effect. Because the rural area have low-income families who want to maintain the minimum subsistence standard of living, and for these reasons, females from these families participate in the labour market. But for the urban area, if household income increases, female participation declines as domestic work has a greater social prestige than market work.

Women with greater levels of education and those who live in better-income homes, on the other hand, had higher involvement rates than women from lower-income families. According to some researchers, these women gain from increased human capital investment and may secure positions with better working conditions and pay (Klasen et al., 2012).

Figure 8 The relation between female labour force participation (FLFP) and year of schooling for India's rural and urban areas, PLFS (2017-18)



Note: FLFP - Female labour force participation, Rural_yr_Schooling- Years of schooling for the rural area, Urban_yr_Schooling: Years of schooling for the urban area

Source: Figure-based on PLFS 2017-18

Figure 8 shows that the female labour force participation rate follows the U-shaped curve with educational attainment for rural and urban areas. Some authors supported the U-shaped curve theory by their empirical evidence-based study (Dasgupta et al., 2005 and Tsani et al., 2012). Females at a low level of schooling have a higher labour participation rate. The participation rate declines up to primary and secondary levels and then increases after the higher secondary level. The positive sloped of the U-curve show higher economic growth have a higher participation rate because of the availability of white-collar job that is suitable for them to participate because of higher salary and social prestige.

3.3 Status in employment among workers in usual status (ps+ss)

Table 6. Percentage distribution of households by household type during 2011-12 (NSS 68th round) and 2017-18 (PLFS)

Status in employment	NSS 68 th round (2011-12)	PLFS (2017-18)	NSS 68 th round (2011-12)	PLFS (2017-18)
(1)Self-Employed in:	Rural	Rural	Urban	Urban
(a)Agriculture	34.3	37.8	-	-
(b)Non-Agriculture	15.5	14.3	-	-
Self-employed	49.8	52.2	35.3	32.4
(2)Regular wage/salary earning	9.6	12.7	41.7	41.4
Casual Labour in				
Agriculture	21.0	12.1	-	-
Non-agriculture	13.5	12.9	-	-
Casual Labour	34.5	25.0	11.8	11.8
(3) others	6.1	10.1	11.2	14.4
All	100.0	100.0	100.0	100.0

Source: Annual Report, PLFS 2017-18

Table 6 shows that in the rural area, the total household participation in self-employed increased 49.8% in 2011-12 to 52.2% in 2017-18, especially in agriculture. But in the urban household, participation in self-employed has decreased 35.3% in 2011-12 to 32.4%. In 2017-18. The regular wage salary participation rate has increased in rural areas. The casual labour in other activities has decreased in rural areas and almost remained constant in urban areas between 2011-12 and 2017-18. The participation in other activities has increased in rural and urban areas between 2011-12 and 2017-18.

Table 7. Logistic Regression for rural India

Dependent variable- Female participation in the labour market (binary choice, if yes Y=1, or No=0)

Independent VARIABLES	Regression coefficient	Odds Ratio
Age	0.370***	1.448***
	(0.00608)	(0.00880)
Age-square	-0.00440***	0.996***
	(7.79e-05)	(7.75e-05)
Years of schooling	-0.127***	0.880***
	(0.00587)	(0.00517)
Schooling_Square	0.0111***	1.011***
	(0.000430)	(0.000434)
Benchmark- Marital status (Single)		
Marital_status (Married)	-0.820***	0.440***
	(0.0275)	(0.0121)
Monthly per capita Expenditure in Quintile(MPCE)		
Benchmark MPCE-1 st Quintile (Lowest level expenditure Category)		
MPCE-2 nd (lower level expenditure category)	-0.0686**	0.934**
	(0.0271)	(0.0253)
MPCE-3 rd (Middle level expenditure cateogry)	-0.161***	0.851***
	(0.0276)	(0.0235)
MPCE-4 th (Higher level Expenditure cateogry)	-0.344***	0.709***
	(0.0334)	(0.0236)

MPCE-5th(Highest level expenditure category)	-0.434***	0.648***
	(0.0425)	(0.0275)
Benchmark-Household Size Less than Four(<4)		
Household size(5-8)	-0.213***	0.808***
	(0.0218)	(0.0176)
Household size(>8)	-0.259***	0.772***
	(0.0496)	(0.0383)
Benchmark (No Child)		
Child (One Child)	-0.00834	0.992
	(0.0229)	(0.0228)
Child (Two Child)	-0.0442	0.957
	(0.0324)	(0.0310)
Child (More than two Child)	-0.0471	0.954
	(0.0503)	(0.0480)
Female Dependent	0.103***	1.108***
	(0.0204)	(0.0226)
Male Dependent	0.0190	1.019
	(0.0198)	(0.0202)
Female Adult	0.000433	1.000
	(0.00765)	(0.00765)
Social Group		
Benchmark(General Category)		
ST	0.402***	1.495***
	(0.0341)	(0.0510)
SC	0.158***	1.172***
	(0.0311)	(0.0364)
OBC	0.162***	1.176***
	(0.0268)	(0.0315)
Regious Group		

Benchmark (Hindu)		
Muslim	-0.276***	0.759***
	(0.0384)	(0.0291)
Other(Sikh, Jain)	0.135***	1.144***
	(0.0391)	(0.0447)
Benchmark(Self Employed in Agriculture)		
Self_employed in non_agriculture	-0.258***	0.773***
	(0.0289)	(0.0223)
Casual labour(in agriculture and non-agriculture)	-0.0856***	0.918***
	(0.0214)	(0.0196)
Other	-1.658***	0.191***
	(0.0655)	(0.0125)
Constant	-6.767***	0.00115***
	(0.124)	(0.000143)
Observations	81,402	81,402

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Source: Author's own calculations from PLFS data 2017-18

3.4. Analysis of determinants of female labour force participation in the rural area

3.4.1 Interpretation of logistic coefficient

Initially, females will more likely participate in the labour market if their age increases by one year. But, they are less likely to participate in the labour market after a particular period when age increases. It shows an inverse U-shaped curve with age. Initially, if years of schooling increase by one year, there is less likely to participate in the labour market, but it is more likely to participate in the labour market after particular schooling years. It shows a U-shaped curve relation with years of education. Some authors also support this U-shaped curve evidence by their empirical analysis (Dasgupta et al., 2005 & Tsani et al., 2012). Married women are less likely to participate in the labour market than women who have single, and this evidence is also supported by (Panda. 1999).

Because married women spend more time in domestic duty and child care, some authors

show the negative impact of being married women and the number of children (Hosney et al., 2016). The variable number of children shows an insignificant result. Women who have a household size of more than four are less likely to participate in the labour market than those whose family size is lesser than four. Because the household size increases, females have to spend more time on household duty, making less time available for paid market jobs. Women who belong to a high monthly per capita expenditure family are less likely to participate in the labour market than women with fewer monthly per capita expenditure families. Because low-income families want to maintain the minimum subsistence standard of living, females from these families participate in the labour market. The independent variables male dependent and female adult shows an insignificant result. Women who belong to the ST, SC, and OBC families are more likely to participate in the labour market than those in the General category. Because generally, women who belong to OBC, ST and SC categories are poor and less educated than the General category. They also have to maintain a minimum standard of living. Hence, they prefer to go to the labour market.

Because they are less educated, they work in locally unskilled jobs, have greater decision-making autonomy within their household, and experience greater freedom of movement in society. Women belong to Muslim families and are less likely to participate in the labour market than Hindu families. It can be due to more social restrictions on Muslim women than Hindu women. Some authors find that Muslim women face more religious conservatism based on the empirical study on Turkey and Chile (O' Neil and Bilgin, 2013; Pastore and Tenaglia, 2013). Muslim women also have more children (higher fertility rate) than Hindu women, so most of the time is spent in domestic duty and child care. Women belonging to other religions (Sikh, Jain, etc.) are more likely to participate in the labour market than Hindu families. Because these women are more educated and so go for a higher wage in the labour market. The above analysis shows that cultural and societal norms like caste and religion significantly impact female participation in the labour force (Das and Desai, 2003 & Desai and Jain, 1994). In rural areas, females are less likely to join self-employed in non-agriculture activity and other jobs than self-employment in agriculture. The author also shows this evidence in their empirical analysis (Chaudhary et al., 2014).

3.4.2 Interpretation of odds ratio

If age increases by one year, then predicted odds of female participation in the labour market increase by a multiplicative factor by 1.45, holding the other predictors constant. After a particular period when age increases, the predicted odds of female participation in the labour

market decreases by a multiplicative factor of 0.99. If years of schooling increase by one year, then predicted odds of female participation in the labour market decreases by a multiplicative factor by 0.88. After a particular period when years of education increase by one year, predicted odds of female participation in the labour market increase by a multiplicative factor by 1.01. Compared with single women, predicted odds of married women participation decreases by a multiplicative factor of 0.44. As compared with household size (1-4), the predicted odds of Women who have a household size (5-8) and household size (>9), participation decreases by a multiplicative factor by 0.81 and 0.77. The variable number of children shows an insignificant result. Compared with women who belong to the lowest monthly per capita expenditure families, the predicted odds of women who belong to the lower-middle-income family and middle-income female participation decreases by a multiplicative factor of 0.93 and 0.85. The predicted odds of women participation in the labour market who have female dependent increases by a multiplicative factor by 1.11 than those who don't have female dependence in their family. The variable male dependent is showing an insignificant result. The predicted odds of women participation in the labour market who belong to the ST category are 1.50 times higher, belong to the SC category is 1.72 times higher and belong to the OBC category 1.18 times higher than those of the general family. The predicted odds of women participating in the labour market who belong to Muslim families are 0.76 times lower and belong to other religious families (Jain, Sikh, etc.) are 1.14 times higher than those of Hindu families. The predicted odds of women participation in Self-employed in non-agriculture activities are 0.77 times lower, and casual labour activities are 0.92 times lower than self-employed in agriculture.

Table 8. Logistic regression for urban India

Dependent variable-Female participation in the labour market (binary choice, if yes Y=1, or No=0)

Independent Variables	Regression coefficient	Odd ratio
Age	0.392*** (0.00748)	1.480*** (0.0111)
Age Square	-0.00488*** (9.78e-05)	0.995*** (9.73e-05)
Years of schooling	-0.207***	0.813***

	(0.00674)	(0.00548)
Schooling square	0.0161***	1.016***
	(0.000397)	(0.000404)
Benchmark(Single)		
Marital_status(Married)	-1.340***	0.262***
	(0.0302)	(0.00792)
Monthly per capita Expenditure in Quintile(MPCE)		
Benchmark MPCE-1 st Quintile (Lowest level expenditure Category)		
MPCE-2 nd (lower level expenditure category)	0.00315	1.003
	(0.0508)	(0.0510)
MPCE-3rd(Middle level expenditure cateogry)	-0.101**	0.904**
	(0.0468)	(0.0423)
MPCE-4th(Higher level Expenditure cateogry)	-0.186***	0.830***
	(0.0479)	(0.0398)
MPCE-5th(Highest level expenditure cateogry)	-0.271***	0.763***
	(0.0494)	(0.0377)
Benchmark(HH Size less than Four)		
Household size (5_8)	-0.222***	0.801***
	(0.0273)	(0.0218)
Household size(>8)	-0.538***	0.584***
	(0.0681)	(0.0398)
Benchmark(No Child)		

Child(One Child)	-0.184***	0.832***
	(0.0313)	(0.0260)
Child(Two Child)	-0.211***	0.810***
	(0.0583)	(0.0472)
Child(More than two Child)	0.0862	1.090
	(0.118)	(0.129)
Female Dependent	0.0146	1.015
	(0.0317)	(0.0322)
Male dependent	0.215***	1.240***
	(0.0305)	(0.0379)
Female_adult	0.0425***	1.043***
	(0.0125)	(0.0130)
Social Group (Caste)		
Benchmark (General)		
ST	0.463***	1.589***
	(0.0561)	(0.0892)
SC	0.362***	1.436***
	(0.0361)	(0.0519)
OBC	0.237***	1.267***
	(0.0284)	(0.0360)
Religious Group		
Benchmark(Hindu)		
Muslim	-0.510***	0.601***
	(0.0382)	(0.0229)
Other	0.0952**	1.100**
	(0.0421)	(0.0463)
Employment Status		
Benchmark(Self_Employed)		
Regular Wage	0.232***	1.261***

	(0.0247)	(0.0311)
Casual Labour	0.255***	1.290***
	(0.0382)	(0.0492)
Others	-1.173***	0.309***
	(0.0578)	(0.0179)
	(0.0858)	(0.0998)
Constant	-7.436***	0.000590***
	(0.156)	(9.19e-05)
Observations	63,710	63,710

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Source: Authors own calculations from PLFS data 2017-18

3.5 Analysis of determinants of female labour force participation in the urban area

3.5.1 Interpretation of logistic regression coefficient

Initially, females will more likely participate in the labour market if their age increases. But, they are less likely to participate in the labour market after a particular age when age increases. It shows an inverse U-shaped curve with age. Initially, if years of schooling increase by one year, there is less likely to participate in the labour market, but it is more likely to experience the labour market after particular schooling years. It shows an inverse u-shaped curve relation with years of education. Married women are less likely to participate in the labour market than women who have married. Women with one child and two children are less likely to participate in the labour market than those with no child. And this evidence is also supported by the author in their paper (Dasgupta et al., 2005 & Masood et al., 2009). Women who have a household size of more than four are less likely to participate in the labour market than those whose family size is lesser than four. Women who belong to a higher monthly per capita expenditure family category are less likely to participate in the labour market than women with low monthly per capita expenditure families because low-income families want to maintain the minimum subsistence standard of living.

The variable male dependent shows significant results. Females will be more likely to participate in the labour market with increased male dependence in the household.

Women who belong to the ST family, SC family and OBC family are more likely to participate in the labour market than those in the general category family. Women who

belong to Muslim families are less likely and belong to other religions (Sikh, Jain) are more likely to participate in the labour market than Hindu families. Females are more likely to participate in regular wage jobs and casual labour jobs than self-employed jobs in urban areas, as shown by the other author in their analysis (Chaudhary et al., 2014). The Casual variable labour shows insignificant results.

3.5.2 Interpretation of Odds ratio

If age increases by one year, then predicted odds of female participation in the labour market increase by a multiplicative factor of 1.48, holding the other predictors constant. After a particular age, when age increases, the predicted odds of female participation in the labour market decreases by a multiplicative factor of 0.995. If years of schooling increase by one year, then predicted odds of female participation in the labour market decreases by a multiplicative factor by 0.81. After a particular period when years of education increase by one year, predicted odds of female participation in the labour market increase by a multiplicative factor by 1.02. Compared with single women, predicted odds of married women participation decrease by a multiplicative factor of 0.26. Compared with women who belong to low monthly per capita expenditure families, the predicted odds of women who belong to the middle-income family and upper-middle-income female participation decreases by a multiplicative factor by 0.91 and 0.83. As compared with household size (1-4), the predicted odds of women who have a household size (5-8) and household size (>9), participation decreases by a multiplicative factor by 0.80 and 0.58.

Compared with women with no child, the odds of women who have one child female participation in the labour market decrease by a multiplicative factor by 0.83. Those who have two child decreases by the multiplicative factor by 0.81 compared to no child.

The Predicted odds of women participation in the labour market who have male dependent increases by a multiplicative factor by 1.24 than those who don't have male dependence in their family. The Female dependent variable shows insignificant results.

The predicted odds of women participation in the labour market who belong to the ST category are 1.59 times higher than those of the General category family. The predicted odds of women participation in the labour market who belong to the SC category are 1.44 times higher than those of the General category family. The predicted odds of women participation in the labour market who belong to the OBC category are 1.27 times higher than those of the General category family.

The predicted odds of women participating in the labour market who belong to Muslim families are 0.76 times lower than those of Hindu families. The predicted odds of women participating in the labour market who belong to other religious families (Jain, Sikh etc.) are 1.10 times higher than those of Hindu families. The predicted odds of women participation in regular wage are 1.26 times higher than self-employed. The predicted odds of women participation in casual labour jobs are 1.29 times lower than self-employed. The variable casual labour shows insignificant results.

Table 9. Oaxaca decomposition analysis for the wage gap between males and females for India

Model for Group 1 (Male)

Log Wage	Coefficient
General Education Level(GEL)	.1572517***
	0.000
Work experience	.0209772 ***
	0.000
Average daily work hours	.2037108***
	0.000
Constant	3.641258***
	0.000
Number of Observation	101,996
F(3, 101992)	15926.72
Prob > F	0.0000
Adj R-squared	0.3190
Root MSE	.87552

Model for Group 2 (Female)

Wage (in log)	Coefficient
General Education Level(GEL)	.1889584 ***
	0.000
Work experience	.0195408***
	0.000
Average daily work hours	.235517***
	0.000
Constant	2.963204***
	0.000
Number of Observation	22,115
F(3, 101992)	6232.32
Prob > F	0.0000
R-squared	0.4582
Adj R-squared	0.4581
Root MSE	.94012

Blinder-Oaxaca decomposition model (Linear)	Number of observation	124,111
Group 1: Gender =0 (Male)	Number of observation	101996
Group 2: Gender =1 (Female)	Number of observation	22115

Log_Wage	Coefficients
Overall	
group_1	6.904122***
	0.000
group_2	6.210492***
	0.000
difference	.6936305***
	0.000
endowments	.4465948***
	0.000
coefficients	.3127027***
	0.000
Interaction	-.065667***
	0.000
Endowments	Coefficients
General level of Education	.1594827***
	0.000
years of work experience	-.0006337
	0.767
Average daily work hours	.2877459***
	0.000
Coefficients	
General level of Education	-.2007867***
	0.000
Years of work experience	.0396081***
	0.022
Average daily work hours	-.2041729***
	0.000
Constant	.6780541***

	0.000
Interaction	
General level of Education	-.0267608***
	0.000
Years of Experience	-.0000466
	0.769
Average daily work hours	-.0388596***
	0.000

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Source: Authors own calculations from PLFS data 2017-18

3.6. Data analysis of Oaxaca decomposition model for India

The coefficient of group1 represents the average log wage of males, which is 6.90, and the coefficient of group 2 represents the log wage of females, which is 6.21. The mean log difference between men and women is 0.69. The male mean log earning is 0.69 is higher than the female mean log earning. The contribution in mean log difference is due to the endowment effect being 0.45. And the endowment effect includes characteristics like the general level of education, work experience and average working hours. The endowment effect would reflect the increase in wage if women had the same level of education, the same level of work experience, and the same average working hours. The contribution in mean log difference is due to the coefficient effect being 0.31. The coefficients represent the change in women wages when applying male coefficients. Due to gender discrimination, the male having the mean log wage is 0.31 higher than the female if both males and females have the same level of education, the same work experience, and the same level of working hours. The percentage of the wage gap explained is 65.21 per cent. The wage gap explained part is the ratio between coefficients of endowment and wage gap difference. And the average daily working hours are contributing the most in 65.21 per cent. The contribution of working hours in the endowment effect is 64.44 per cent. It is the ratio of coefficients of average daily working hours and endowment. Because men work more hours, they get paid 64.44 per cent more in the explained part. The empirical studies support the above finding that hours worked, investment in human capital and sexual division of labour is the main reason for wage discrimination against women (Becker, 1985). The gender gap hurts women worldwide, suppressing their wage income and making it challenging to balance work and family

CHAPTER-4

ANALYSIS OF THE FEMALE LABOUR FORCE PARTICIPATION IN BIHAR

4.1 Introduction

The state is called the land of Mahatma Buddha, located in the country's eastern region. According to the 2011 census, it covers about 3 per cent of the geographical area and about 9 per cent of the population of total India, which is the high population density state among Indian states. It has just 11.3 per cent urbanization, which is much lower among the Indian state (2011 census). After independence, it is among the slowest growing regions in terms of economy and development. However, it is poorer but growing faster rate from 2004-05. Bihar is among the poorest and has low-level development outcomes in education, employment, infrastructure, health, hunger, nutrition, etc. Historically, Bihar was known for agricultural labourers small and marginal farmers. It had an exploitative agrarian nature by introducing the Zamindari system by the British administration. This system led to a widespread increase in poverty, unemployment, and the economy. It also led to the rise in the inequality between caste, class, and landholdings. These dimensions negatively impact economic performance.

Due to the Zamindari system, agriculture was more exploitative for the agricultural labourer, small and marginal farmers. After the land reform in India, other states agricultural labourer's conditions improved to some extent, but Bihar has very low improvement in the situation of the agricultural labourers. And this leads to economic stagnant and widespread poverty and leads to the agricultural labourer's migration toward the northwest region. In the 1980s and 1990s, some critical development took place, leading to the rise of the backward caste in political empowerment. It breaks the semi-feudal relation to many extents. From the last 15 years, the state's image has changed from bad to better due to improvements in economic and social and law and order situations.

Economic growth is mainly due to increased transportation, trade, communication, and construction growth. The secondary and tertiary sectors drive economic growth. The agriculture sector contributes 20 per cent; the industry sector contributes 19 per cent, and the services sector 61 per cent in the total GDP (2018-19). The agriculture sector contributes 56 per cent, the industry sector contributes 8 per cent, and the services sector is 36 per cent in the total labour force (2015). Bihar has about half of the per capita expenditure to India's

average. The state plan has been continuously increasing for the last 15 years. It has very low labour productivity due to low per capita income and low levels of employment diversity. Bihar has seen some significant changes in political empowerment, economic and social. Political empowerment, especially to backward classes and economic growth, have an uneven pattern from the last three decade.

The pattern of landholding has changed in the past three decades. The number of landless people has increased, and it is primarily concentrated among OBC 1, schedule caste and lower Muslim class. The upper caste, prominent landlords, have engaged in the non-agriculture activity, schedule and OBC 1 caste situation improved after the land reform and end of the bonded labour. The household asset is very low, and mainly land and housing account the most. There is more inequality in the wealth among caste, class, work status, education, age and gender. The overall asset has increased for all, but the schedule caste and OBC 1 caste have higher growth of assets than the upper and middle caste.

The labour market in rural Bihar has changed in the recent decade from stagnant agriculture and exploitative agricultural labourer to more market wage labourers due to a more open market system. Due to more market available systems, the male agricultural labourer and bonded labour migrated towards different parts of India to seek higher wages. It reduces the relationship of the local dependency.

Due to the limited availability of land and increased population, the household dependency on wage labour has increased. Still, due to little local opportunity, the male labourer migrated toward the urban area in other parts of India. In the last three decades, male labour force participation has continued at a high level due to migration, leading to a diversified employment structure. The migration increased casual and regular labour in the industry and services sectors.

According to NSSO data, Bihar has the lowest female labour force participation among India's states, and the female labour force declined from 2004-05 to 2009-10. Among Indian states, Bihar was ranked lowest in position with a 7.2 per cent labour force participation rate (for both usual principal status and currently daily status) among women. Both Bihar and India's average female labour participation rate has declined in the recent decade. It is due to the loss of employment opportunities, mainly in rural areas. The overall number of female participation declined, but involvement in regular wage employment has increased. The proportion of casual labour relatively remains stable due to the lower mechanization of

agriculture. The rural female labour employment structure has been changed marginally due to the lack of locally limited and diversified jobs. They mainly engaged in agricultural activity and animal husbandry. Caste, class and religion are essential determinants for female labour force participation due to established social norms. The share of agriculture in total GDP has continuously decreased much faster than the decrease in the agriculture workforce share in the entire workforce.

Education plays a vital role in the opening of employment opportunities. Still, only primary education plays a crucial role in diversifying jobs and is limited to secondary level education. Higher education leads to higher wages in the services sector, like in professional and other white-collar jobs for both men and women.

Janine Rodgers focuses on men's economic activity and works status, women and children in Bihar. They have taken data from 36 villages to analyse inclusive development in Bihar for 30 years, 1980 to 2010. They found that men labour force participation has at the same level, but 11 per cent increase women's labour force participation rate. The employment structure has more changed for men compared to women.

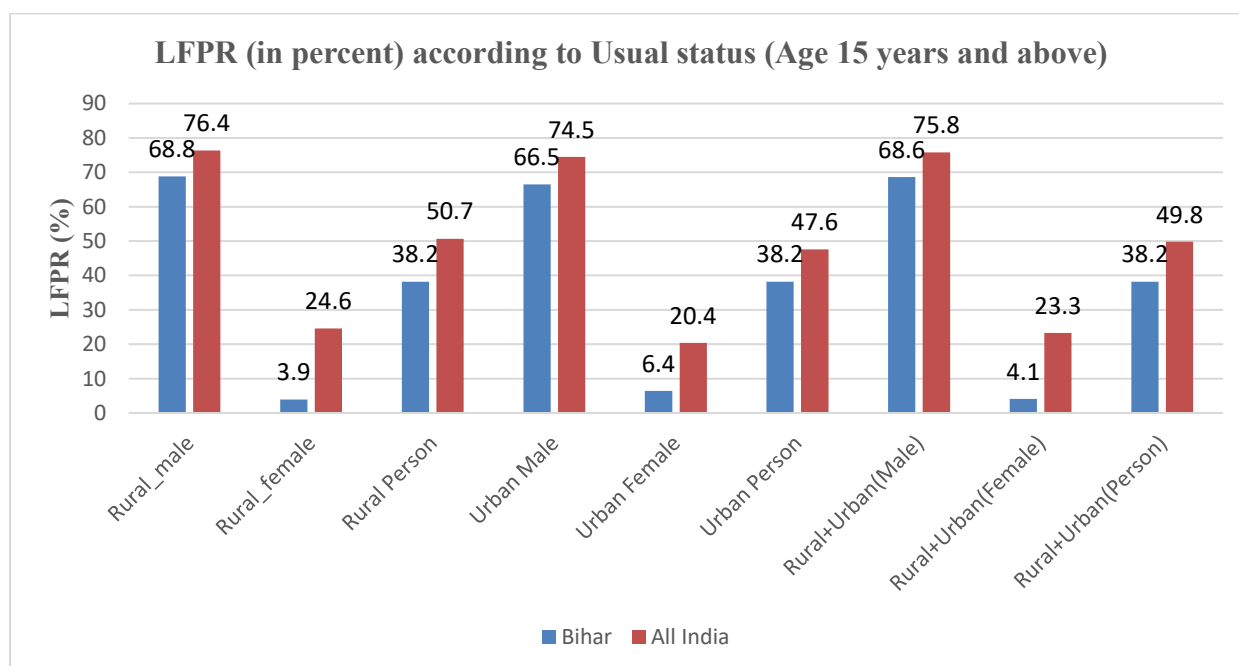
Men were able to find an alternate source of income due to migration and diversities of activity. The share of regular employment has increased for both skilled and unskilled labour for men at the cost of self-employment. The massive migration of male work outside Bihar increases female participation in the local market. But women activity more engaged in agricultural and allied activity due to limited diversification of alternate jobs and little skill constraint.

The female participation rate was highest in agriculture activity, about 81 per cent in the 1980s. And it has been continuously declining up to 40 per cent in the year 2010. It was mainly due to the mechanization of agriculture and the non-availability of large farm jobs. The lowest participation of women, about 31 per cent, engaged in the non-agricultural household activity. Most of the unpaid family workers belonged to small and medium peasants.

The share of women's self-employment activity increased at the cost of casual labour. Women's employment opportunities outside agriculture are minimal, and there are few opportunities for more educated women in the education and health care sectors. While class is a more important factor of job status than caste and caste appears to be a more important determinant of female labour force participation.

4.2 A comparison of labour force participation rate between India and Bihar

Figure 9. A comparison of LFPR (in per cent) among persons between India and Bihar of the age group 15 years and above, PLFS (2017-18)



Source: Authors own calculations from PLFS data 2017-18

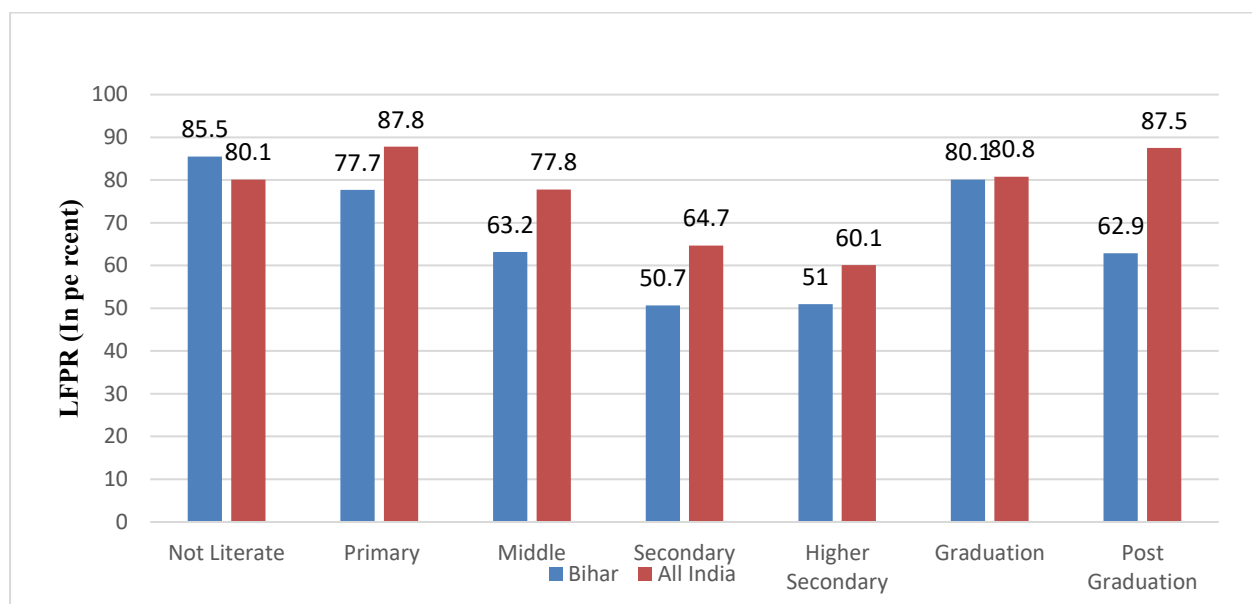
Table 10. LFPR (in per cent) among persons between India and Bihar of the age group 15 years and above, PLFS (2017-18)

Region	Rural Male	Rural Female	Rural Person	Urban Male	Urban Female	Urban Person	Rural-Urban Male	Rural-Urban Female	Rural-Urban Person
Bihar	68.8	3.9	38.2	66.5	6.4	38.2	68.6	4.1	38.2
India	76.4	24.6	50.7	74.5	20.4	47.6	75.8	23.3	49.8

Source: Authors own calculations from PLFS data 2017-18

Table 10 shows a low difference in LFPR at all Indian levels and Bihar among males, while females have a vast gap. The LFPR for a female is 23.3 per cent at all levels, while for Bihar, it has only 4.1 per cent. In rural India, the female LFPR is 24.6 per cent, while in rural Bihar, it has only 3.9 per cent. In urban India, the female LFPR is 20.4 per cent, while in urban Bihar, it has only 6.4 per cent.

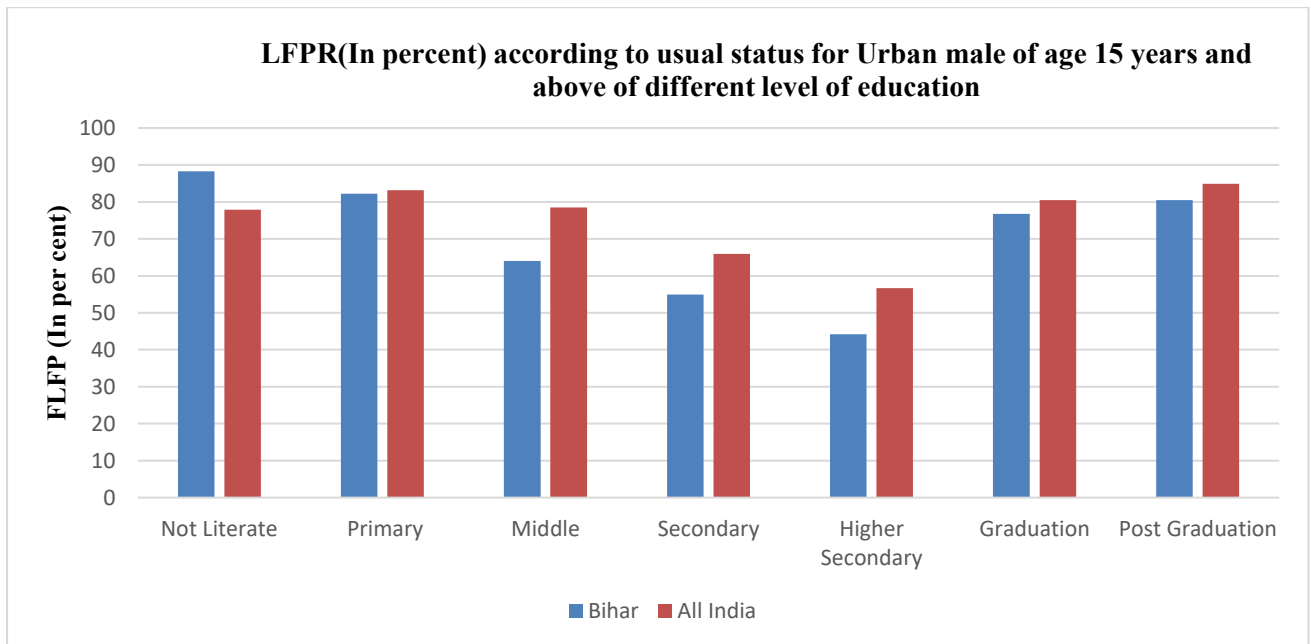
Figure 10. A comparison of LFPR (in per cent) among rural males at all India level and Bihar of the age group 15 years and above of different level of education, PLFS (2017-18).



Source: Authors own calculations from PLFS data 2017-18

Figure 10 shows that in rural Bihar, the LFPR for males first decreases from not literate (illiterate) to secondary level of education and then increases up to graduation level and again decreases at post-graduate level. Initially, male labour force participation fell because of the upsurge in enrolment of boys at the secondary and high secondary levels of education. It then increases at graduation level because, at this level of education, males acquire skills and motivate them to participate in the labour market because of higher wage-earning. The surprising result the male labour force again decline at the post-graduation level. It may be due to the unavailability of locally high skilled jobs or a skills mismatch between labour demand and supply. But In rural India, the LFPR for males first increase from not literate (illiterate) to the primary level of education and then decreases up to higher secondary level and after that increases up to post-graduate level.

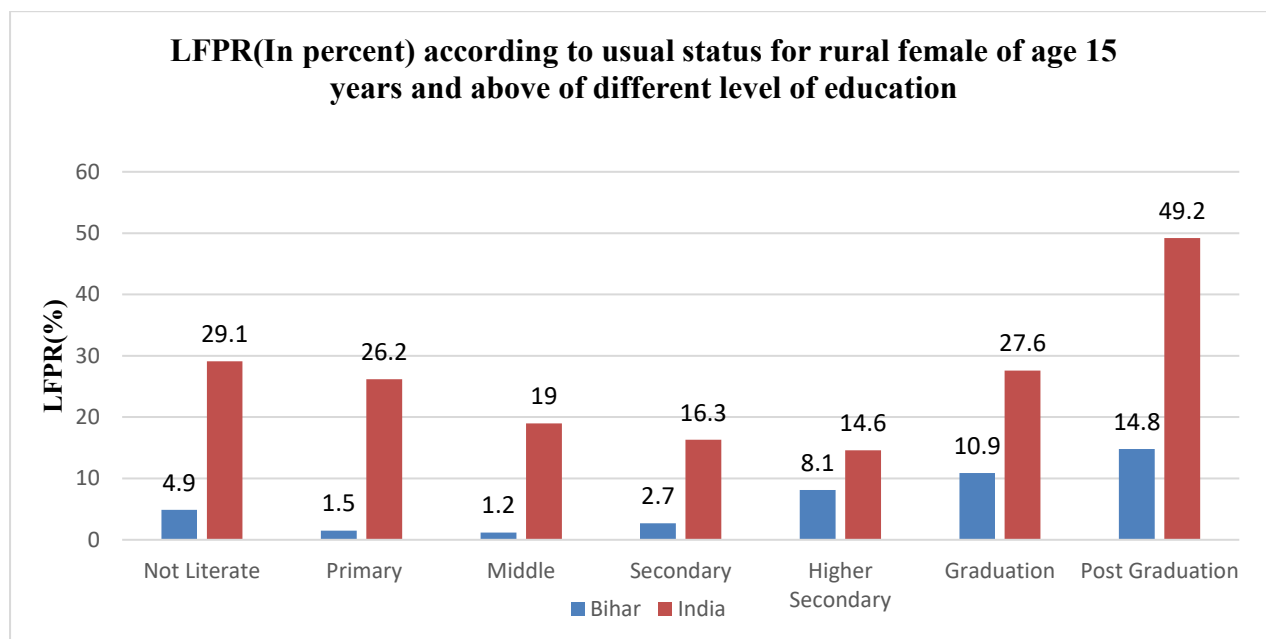
Figure 11. A comparison of LFPR (in per cent) among urban males in India and Bihar of the age group 15 years and above of different levels of education, PLFS (2017-18)



Source: Authors own calculations from PLFS data 2017-18

Figure 11 shows that in urban Bihar, the LFPR for male's first decreases from not literate (illiterate) to higher secondary level of education and then increases up to post-graduate level. But In urban India, the LFPR for males first increase from not literate (illiterate) to the primary level of education and then decreases up to higher secondary level and after that increases up to post-graduate level. The LFPR for males for urban Bihar is higher than the urban male for all India up to primary level education.

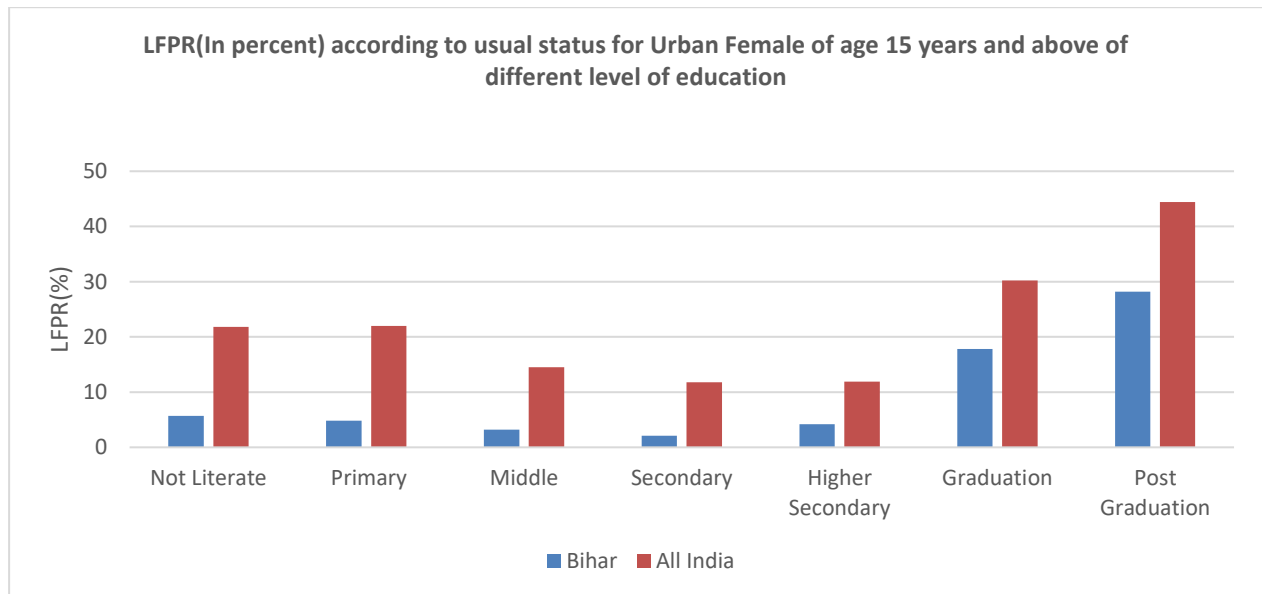
Figure 12. Comparison of LFPR (in per cent) among rural females in India and Bihar of the age group 15 years and above of different level of education, PLFS (2017-18)



Source: Source: Authors own calculations from PLFS data 2017-18

Figure 12 shows that in rural Bihar, the LFPR for female’s first decreases from not literate (illiterate) to the middle level of education and then increases up to post-graduation level. But In rural India, the LFPR for females first decreases from not literate (illiterate) to higher secondary level of education and then decreases up to higher secondary level and after that increases up to post-graduate level.

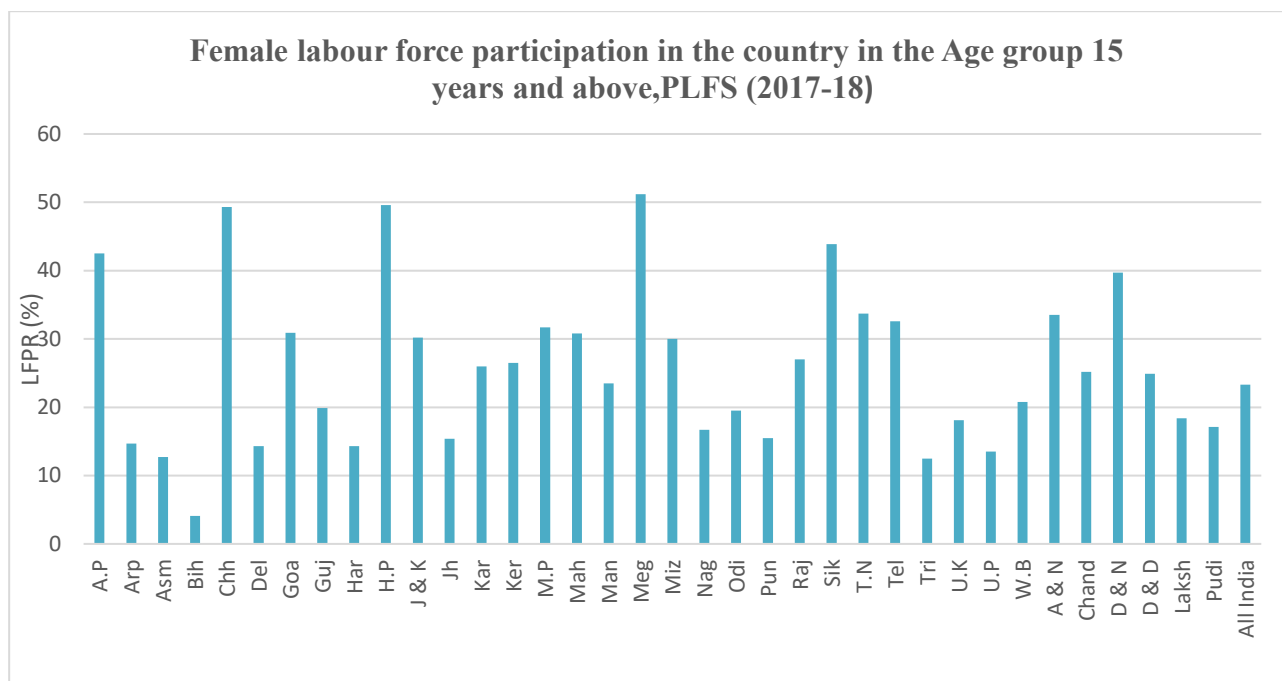
Figure 13. A comparison of LFPR (in per cent) among urban females in India and Bihar of the age group 15 years and above of different levels of education, PLFS (2017-18)



Source: Authors own calculations from PLFS data 2017-18

Figure 13 shows that in urban Bihar, the LFPR for female’s first decreases from not literate (illiterate) to the secondary level of education and then increases up to Post graduation level. But In urban India, the LFPR for females first decreases from not literate (illiterate) to higher secondary level of education and then decreases up to higher secondary level and then increases up to post-graduate level.

Figure 14. LFPR (in per cent) among females, Bihar has the lowest position among the Indian states and UT in the Age group 15 years and above

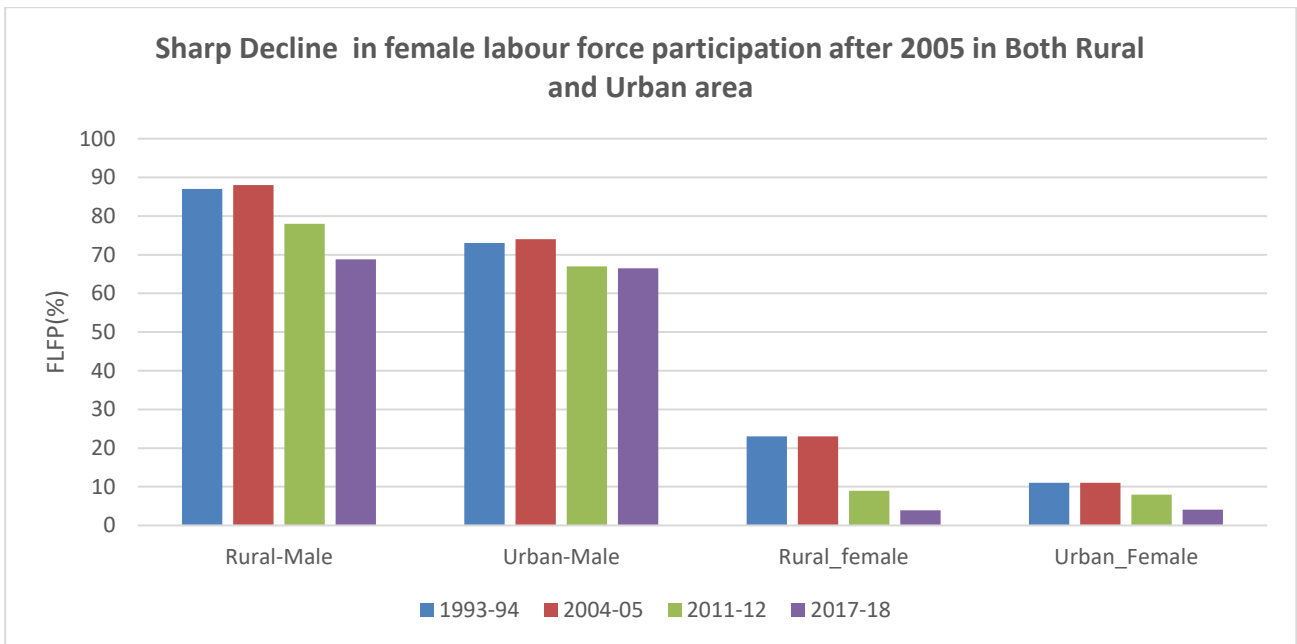


Source: Source: Authors own calculations from PLFS data 2017-18

Based on PLFS (2017-18), figure 14 shows that Bihar has the lowest female labour force participation, and Meghalaya has the highest participation among the Indian States & UT. The top four states regarding female participation rate are Andhra Pradesh, Chhattisgarh, Himachal Pradesh and Meghalaya. The lowest four states in female participation are Bihar, Assam, Tripura and Uttar Pradesh.

The decline in labour force participation in Bihar can be due to various factors like non-availability of jobs, mechanization of agriculture, increased enrolment in secondary level education, and higher education level.

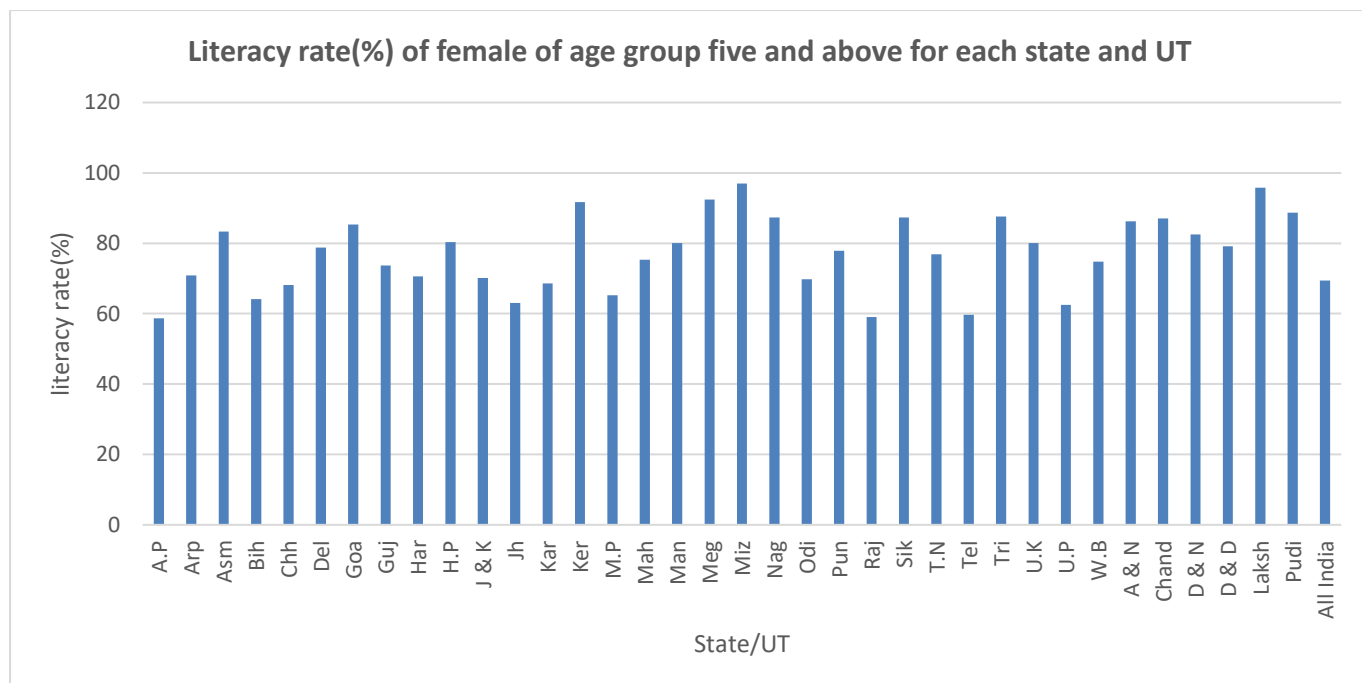
Figure 15. Sharp decline in female labour force participation after 2005 in both rural and urban areas of Bihar



Source: Authors own calculations from PLFS data 2017-18

Figure 15 shows the female labour force participation has declined more than males after 2005. The rural female participation rate has dropped faster than the urban area. Between 1993-94 and 2004-05, both males and females have a stagnant participation rate. But after 2004-05 labour force participation declined for both males and females, but the female declining rate is much faster than males.

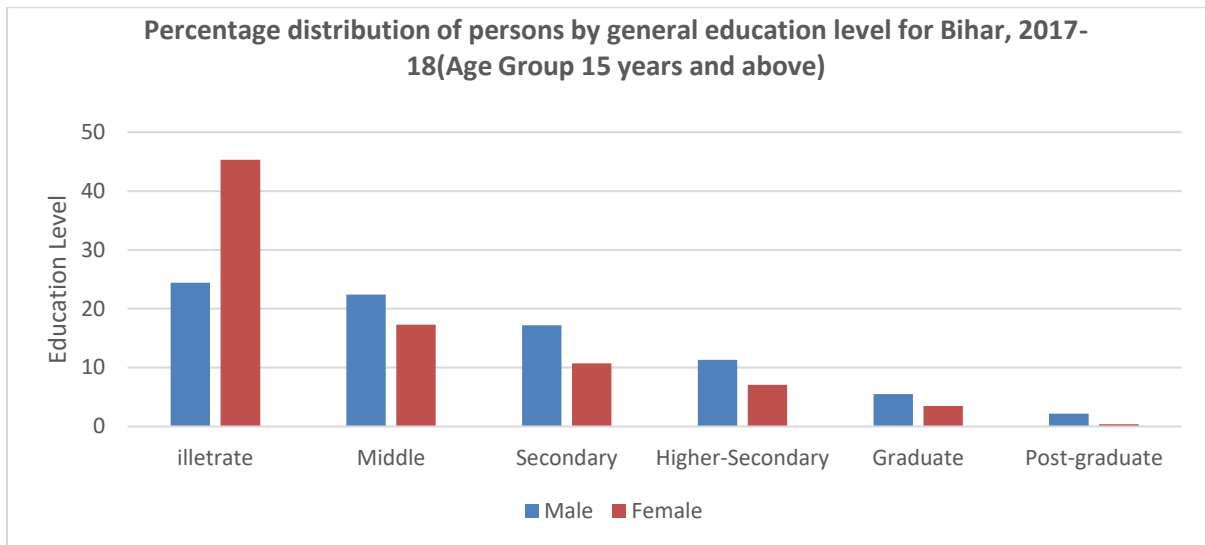
Figure 16. Literacy rate of females (in per cent) in the age group of five and above for each state and UTs



Source: Authors own calculations from PLFS data 2017-18

Based on PLFS (2017-18), figure 16 shows that the seven lowest literacy rate states are Andhra Pradesh, Bihar, Jharkhand, Madhya Pradesh Rajasthan, Telangana and Uttar Pradesh among the Indian States & UT. The top five highest literacy states are Mizoram, Manipur, Karnataka, Lakshadweep and Kerala.

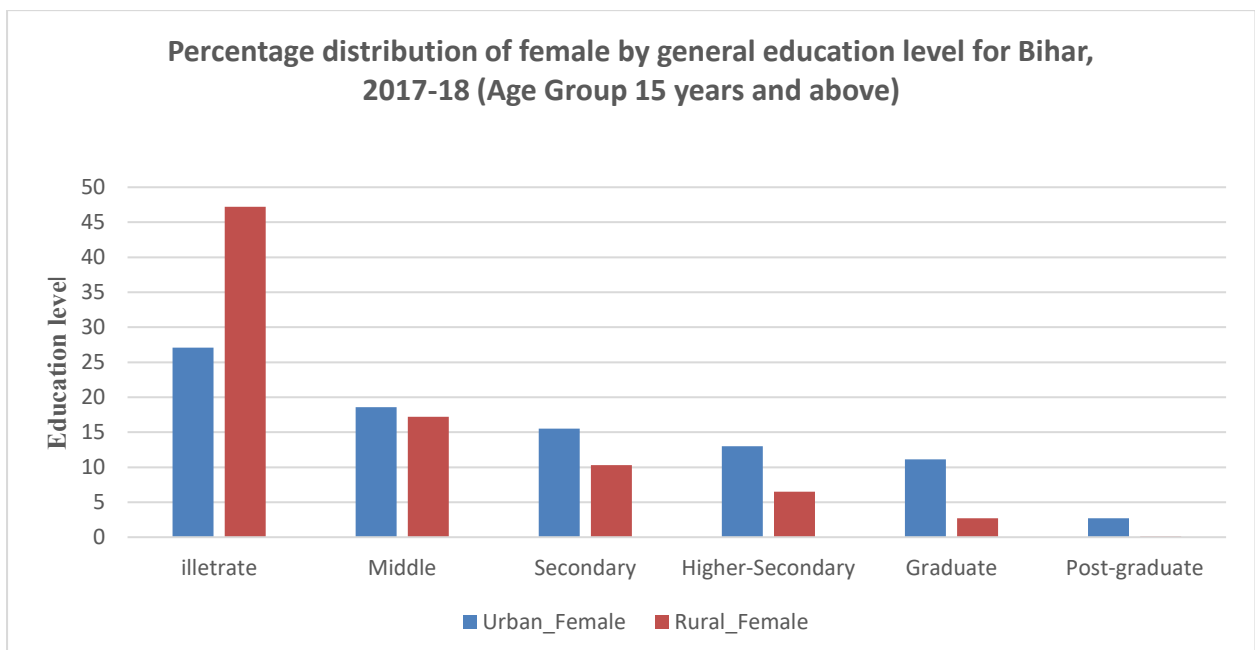
Figure 17. Percentage distribution of persons by general education level for Bihar, 2017-18 (Age Group 15 years and above)



Source: Authors own calculations from PLFS data 2017-18

Figure 17 shows a high difference in the educational disparity between males and females. The illiteracy rate among females is much higher than that of males.

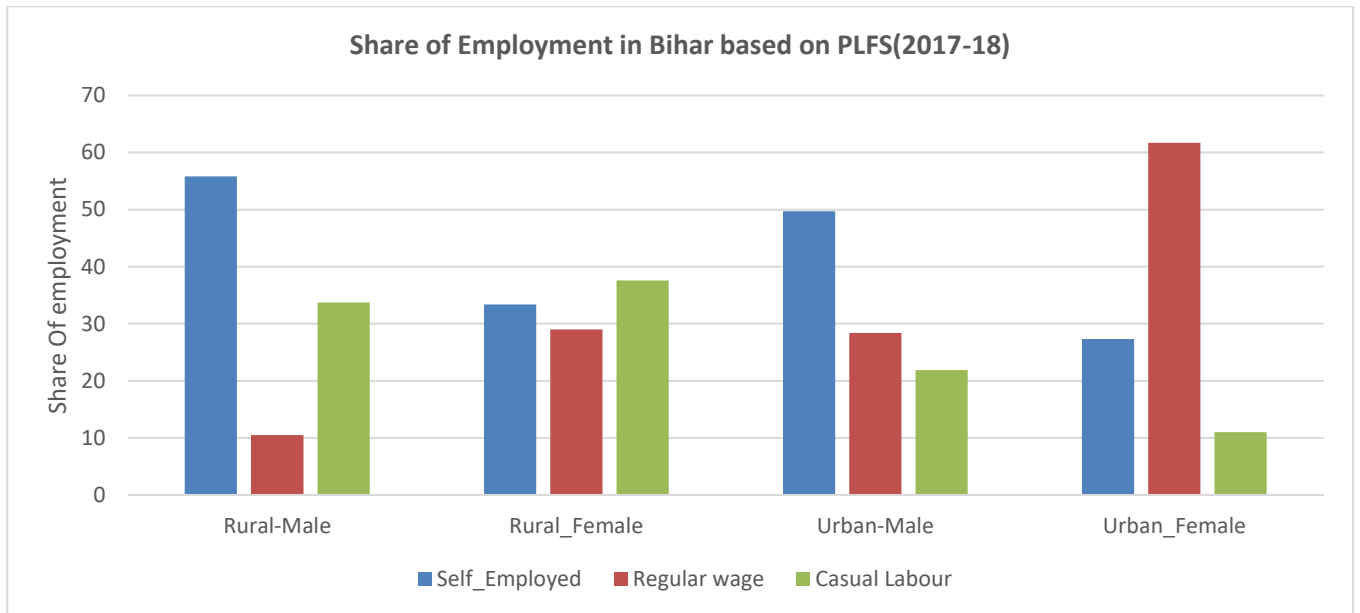
Figure 18. Percentage distribution of females by general education level for Bihar, 2017-18 (Age group 15 years and above)



Source: Authors own calculations from PLFS data 2017-18

Figure 18 shows a high difference in educational disparity between urban and rural females. The illiteracy rate among rural females is much higher than in urban areas. At the middle level of education, the disparity is less compared to other education levels.

Figure 19 Share of Employment in Bihar, PLFS (2017-18)



Source: Authors own calculations from PLFS data 2017-18

Figure 19 shows that the self-employed have the largest share for males for rural and urban areas. Casual labour has the largest share for females in rural areas, and the regular wage has the largest share in urban areas. Regular wage labour has the lowest share for males in rural areas and females in urban areas. The self-employed have the largest share for males for rural and urban areas.

Table 11. Logistic regression for female labour force participation for rural areas

Dependent variable-Female will participate in the labour market (Binary Choice, if yes Y=1, or No=0)

VARIABLES	Coefficient	Odds ratio
FLFP		
Age	0.619***	1.858***
	(0.0639)	(0.119)
Age_Square	-0.00695***	0.993***
	(0.000811)	(0.000805)

Years of schooling	-0.174***	0.840***
	(0.0566)	(0.0475)
Schooling squaring	0.0258***	1.026***
	(0.00406)	(0.00416)
Benchmark(Single)		
Married	0.0810***	2.5130.0810***
	(0.230)	(0.0187)
Benchmark(Household size less than four)		
Household Size(4-8)	-0.565***	0.568***
	(0.190)	(0.108)
Household size(>9)	-0.834*	0.434*
	(0.468)	(0.203)
Benchmark(No child)		
Child(one child)	-0.171	0.843
	(0.226)	(0.191)
Child (Two Child)	0.179	1.196
	(0.265)	(0.317)
Child (More than two Child)	0.521	1.683
	(0.394)	(0.664)
Female dependent	0.127	1.136
	(0.230)	(0.261)
Male Dependent	-0.210	0.811
	(0.205)	(0.166)
Monthly per capita expenditure in quintile		
Benchmark-MPCE_Rural(lowest expenditure Group)		
MPCE_Rural(Lower middle expenditure group)	-0.399*	0.671*

	(0.235)	(0.158)
MPCE_Rural(Middle expenditure group)	-0.604**	0.546**
	(0.294)	(0.161)
MPCE_Rural(Upper middle expenditure group)	-0.241	0.786
	(0.285)	(0.224)
MPCE_Rural(Highest expenditure group)	-0.231	0.793
	(0.334)	(0.265)
Social Group		
Benchmark(General Caste)		
ST	0.735	2.084
	(0.577)	(1.202)
SC	0.187	1.205
	(0.320)	(0.386)
OBC	0.460*	1.584*
	(0.239)	(0.379)
Religious Group		
Benchmark(Hindu)		
Muslims	0.432*	1.541*
	(0.250)	(0.386)
Others	0.387	1.472
	(0.777)	(1.143)
Benchmark(Self Employed in Agriculture		
Self-employed in non-agriculture	0.0448	1.046
	(0.244)	(0.256)

Casual labour	0.210	1.233
	(0.208)	(0.257)
other	-0.583*	0.558*
	(0.354)	(0.197)
Constant	-14.15***	7.14e-07***
	(1.233)	(8.80e-07)
Observations	4,650	4,650

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Source: Author's own calculations from PLFS data 2017-18

4.3. Data analysis of determinants of female labour force participation in the rural areas of Bihar

4.3.1 Interpretation of logistic coefficient

Initially, if age increases by one year, they are more likely to participate in labour. But after a particular period of age, females are less likely to participate in the labour market. It shows an inverse U-shaped curve with age. Initially, if years of schooling increase by one year, there is less likely to participate in the labour market, but it is more likely to experience the labour market after particular schooling years. It shows an inverse u-shaped curve relation with years of education. Married women are more likely to participate in the labour market than women who have non-married. Women who have one child are less likely to participate in the labour market than those with no child. But if women have more than one child is more likely to participate in the labour market than those who have no child. The variable number of children shows an insignificant result. Women who have a household size of more than four are less likely to participate in the labour market than those whose family size is lesser than four. Women who belong to a high monthly per capita expenditure family are less likely to participate in the labour market than women with fewer monthly per capita expenditure families. Because low-income families want to maintain the minimum subsistence standard of living, females from these families participate in the labour market. The share of female dependent and male dependent shows an insignificant result. Women who belong to the OBC family are more likely to participate in the labour market than those in general caste families. The ST and SC variables show insignificant results. Women belong to Muslim families and are more likely to participate in the labour market than Hindu families. Females are less likely to participate in other jobs than self-employment in agriculture. Self-employment and rural labour variables are showing insignificant results.

4.3.2 Interpretation of odds ratio

If age increases by one year, then predicted odds of female participation in the labour market increase by a multiplicative factor of 1.86, holding the other predictors constant. After a particular period when age increases, the predicted odds of female participation in the labour market decreases by a multiplicative factor of 0.99. If years of schooling increase by one year, then predicted odds of female participation in the labour market decreases by a multiplicative factor by 0.84. After a particular period when years of education increase by one year, predicted odds of female participation in the labour market increase by a multiplicative factor by 1.02. Compared with single women, predicted odds of married women participation increase by a multiplicative factor by 2.51. As compared with household size (1-4), the predicted odds of Women who have a household size (5-8) and household size (>9), participation decreases by a multiplicative factor by 0.57 and 0.43. Compared with women with no child, the odds of women who have one child participation decrease by a multiplicative factor by 0.84. Those who have two child increases by the multiplicative factor by 1.20. The variable number of children shows an insignificant result. Compared with women who belong to low monthly per capita expenditure families, the predicted odds of women who belong to the lower-middle-income family and middle-income family participation decreases by a multiplicative factor of 0.67 and 0.55. The share of female dependent and male dependent shows an insignificant result. The predicted odds of women participation in the labour market who belong to OBC are 1.84 times higher than those of the general family. The variables ST and SC show insignificant results. The predicted odds of women participating in the labour market who belong to Muslim families are 1.54 times higher than those of Hindu families. The predicted odds of women participation in other activities are 0.56 times lower than self-employed in agriculture. The variable self-employed in non-agriculture and rural labour showed insignificant results.

Table 12. Logistic regression for female labour force participation for urban areas of Bihar

Dependent variable - Female will participate in the labour market (Binary Choice, if yes Y=1, or No=0)

VARIABLES	Logit Coeff	Odds ratio
FLFP		
Age	0.659***	1.933***
	(0.0906)	(0.175)

Age square	-0.00769***	0.992***
	(0.00116)	(0.00115)
Years of Schooling	-0.179***	0.836***
	(0.0683)	(0.0571)
Schooling square	0.0206***	1.021***
	(0.00415)	(0.00424)
Benchmark(Single)		
Marital_status(Married)	-1.961***	0.141***
	(0.288)	(0.0405)
Benchmark(HH Size less than Four)		
Household size (5-8)	0.0867	1.091
	(0.254)	(0.277)
Household Size (>8)	0.390	1.477
	(0.514)	(0.758)
Benchmark(No Child)		
Child (One Child)	-0.247	0.781
	(0.328)	(0.257)
Child(Two Child)	0.0983	1.103
	(0.421)	(0.464)
Child(more than Two Child)	-1.342	0.261
	(1.122)	(0.293)
Fem Dependent	-0.0725	0.930
	(0.336)	(0.312)
Male Dependent	-0.318	0.728
	(0.312)	(0.227)
Benchmark(Lowest expenditure group)		
MPCE_Urban(lower Middle expenditure group)	0.0537	1.055
	(0.286)	(0.301)

MPCE_Urban(Middle expenditure group)	-0.393	0.675
	(0.447)	(0.301)
MPCE_Urban (Upper middle expenditure group)	-0.303	0.738
	(0.386)	(0.285)
MPCE_Urban (Highest expenditure group)	0.0514	1.053
	(0.413)	(0.435)
Social Group		
Benchmark(General)		
ST	-0.0324	0.968
	(0.828)	(0.801)
SC	0.809**	2.245**
	(0.357)	(0.801)
OBC	-0.341	0.711
	(0.265)	(0.188)
Benchmark(HINDU)		
Muslim	-0.607	0.545
	(0.459)	(0.250)
Other	-	-
Benchmark(Self-employed)		
Regular wage	0.438*	1.549*
	(0.240)	(0.372)
Casual labour	-0.524	0.592
	(0.469)	(0.278)
Others	-1.295**	0.274**
	(0.525)	(0.144)
Constant	-14.77***	3.85e-07***
	(1.716)	(6.61e-07)
Observations	1,979	1,979

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0

Source: Author's own calculations from PLFS data 2017-18

4.4 Data analysis of determinants of female labour force participation in the urban area of Bihar

4.4.1 Interpretation of Logistic coefficient

Initially, females will more likely participate in the labour market if their age increases by one year. But after a particular level, when age increases, they are less likely to participate in the labour market. It shows an inverse U-shaped curve with age. Initially, if years of schooling increase by one year, there is less likely to participate in the labour market, but it is more likely to experience the labour market after particular schooling years. It shows an inverse u-shaped curve relation with years of education. Married women are less likely to participate in the labour market than women who have married. The variable number of children, female dependent, male dependent and monthly per capita expenditure shows insignificant results.

Women who belong to the SC family are more likely to participate than those in the general category. The variable ST, the OBC variable, shows insignificant results. Women belong to Muslim families and are less likely to participate in the labour market than those in Hindu families, but it shows insignificant results. Females are more likely to participate in regular wage jobs and are less likely to participate in other employment than self-employed. Variable Casual labour showing insignificant results.

4.4.2 Interpretation of odds ratio

If age increases by one year, then predicted odds of female participation in the labour market increase by a multiplicative factor of 1.93, holding the other predictors constant. After a particular period when age increases, the predicted odds of female participation in the labour market decreases by a multiplicative factor of 0.99. If years of schooling increase by one year, then predicted odds of female participation in the labour market decreases by a multiplicative factor by 0.84. After a particular period when years of education increase by one year, predicted odds of female participation in the labour market increase by a multiplicative factor by 1.02. Compared with single women, predicted odds of married women participation decrease by a multiplicative factor of 0.14. The variable household size, number of children, monthly per capita expenditure, female dependent, and male dependent show insignificant results. The predicted odds of women participation in the labour market who belong to SC are 2.25 times higher than those of the general family. The variables ST and OBC show insignificant results. The predicted odds of women participation in the labour

market who belong to Muslim families are 0.55 times lower than those of the Hindu family, but the variable Muslim shows insignificant results. The predicted odds of women participation in regular wage are 1.55 times higher than self-employed. The predicted odds of women participation in other jobs are 0.27 times lower than self-employed. The variable casual labour shows insignificant results.

Table 13. Oaxaca decomposition analysis

Model for Group 1 (Male)

Log Wage	Coefficient
General Education Level	.1258558***
	0.000
Years of Work experience	.0189048 ***
	0.000
Average daily work hours	.0966743***
	0.000
Constant	4.6548***
	0.000
Number of Observation	4,569
F (3, 101992)	406,18
Prob > F	0.0000
R-Squared	0.2102
Adj R-Squared	0.2102
Root MSE	.80319

Model for group 2 (Female)

Wage in log	Coefficient
General Education Level	.1760311***
	0.000
Years of Work experience	.0136606***
	0.012
Average daily work hours	.1791681***
	0.000
Constant	3.870405
	0.000
Number of Observation	249
F (3, 101992)	74.89
Prob > F	0.0000
R-Squared	0.4784
Adj R-Squared	0.4720

Blinder-Oaxaca decomposition model (Linear)	Number of observation	4,818
Group 1: Gender =0 (Male)	Number of observation	4569
Group 2: Gender =1 (Female)	Number of observation	249

Log_Wage	Coefficients
Overall	
group_1(Male)	6.743597***
	0.000
group_2(Female)	6.634814 ***
	0.000
difference	.1087832
	0.136
endowments	.1238547 ***
	0.029
coefficients	.0356059
	0.536
interaction	-.0506773
	0.133
Endowments	
General education level	-.0249889
	0.635
Years of experience	.0127103
	0.327
Average daily work hours	.1361333***
	0.000
Coefficients	
General education level	-.3336959***
	0.002
Years of work experience	.1448987
	0.340
Average daily work hours	-.5599924***
	0.017
Constant	.7843954 ***
	0.017

Interaction	
General level of education	.0071227
	0.639
Years of work experience	.0048793
	0.478
Average daily work hours	-.0626794***
	0.023

4.5. Oaxaca decomposition analysis

The coefficient of Group1 represents the average log wage of males, which is 6.74, and the coefficient of Group2 represents the log wage of females, which is 6.63. The difference between the average log wages is 0.11 and shows insignificant results. And this difference is due to the endowment effect being 0.12. And this endowment effect is due to characteristics like the general level of education, Work experience and average working hours. The endowment effect would reflect the increase in wage if women had the same characteristic as men. The coefficients represent the change in women wages when applying male coefficients. And the average daily working hours are contributing the most. The contribution of working hours in the endowment effect is almost 100 per cent. It is the ratio of coefficients of average daily working hours and endowment. Because men work more hours, they get paid 100 per cent more in the explained part.

CHAPTER-5

CONCLUSION AND POLICY IMPLICATIONS

5.1. Introduction

After the economic reform in 1991, the Indian economy has seen a major economic transformation. The economy has seen the average GDP growth rates 5-9 %. After 1991 the education level, enrolment level, public and private transportation facility, credit market system, domestic gas connectivity, electrification of households have improved significantly. Due to improvement in health infrastructure mortality rate has declined, and it led to a decrease in the fertility rate. These factors are expected to lessen women's domestic work time while increasing their chances of a paid job in the labour market. And however, the National Sample Survey Organization (NSSO) survey on Employment and Unemployment shows a substantial decline in female labour force participation in rural and urban areas in India. The Indian state Bihar has the lowest female labour force participation among all states and UTs.

Female labour force participation follows a U-shaped curve relation with the level of education in India (Dasgupta. et al., 2005). Due to a variety of factors, including family and child care duties, a lack of skills, limited mobility and safety concerns, and other societal and domestic limitations, women continue to encounter several difficulties in joining the labour market and obtaining acceptable professions (Chaudhary R. et al.,2014). The decline in labour force participation in rural areas is due to a combination of various factors, especially the loss of agriculture jobs and insufficient emergence of non-agriculture jobs that lead females to stay out of the labour market (Sanghi S. et al., 2015). The primary root cause for declining female participation is increased school enrolment and increased household income levels, rapid economic development, and lack of employment opportunities (Kapsos S. et al., 2014). How prevailing social norms and patriarchy hinder women's participation in female labour force participation despite the high level of education (Ghai S. 2018). The many empirical analysis shows that gender discrimination negatively impacts economic development. According to the study, increasing the female-to-male management ratio in India by 10% would result in a 2% rise in overall production per capita. While the female-to-male labour ratio rises by 10 %, overall production per capita rises by 8 % (Esteve-Volart B., 2004). Due to prejudice against women or high fertility-housework duties, the traditional sexual division of labour exists. These factors contribute to lower wages and have an impact on jobs by decreasing women's time in the workforce and preventing them from investing in

their human capital. The number of hours worked has a beneficial influence on hourly pay workers. At the same level of human capital, married women get lower hourly wages than married males. Even when married women work the same number of hours as married men, their lower hourly wages diminish their investment in market capital because they spend more time on domestic duties and childcare and less time on the wage labour market (Becker G.S., 1985). The gender occupational limitation is part of the cultural and economic discrimination that women endure, and it explains why gender wage gaps remain even within occupations. Prejudice still remains despite years of experience, hours spent, and years of education moulded by society standards. The more work hours are positively correlated with, the higher paid job. But, women also have to perform household duties like cooking, child care, older age member care, etc. Even in the many professional jobs, women receive low wages compared to men (Schieder J. et al., 2016).

Objectives of the Study are (a) to examine the trend and level of women's workforce participation in the context of Bihar and overall India. (b) To identify the possible socio-economic and demographic factors that affect the female labour force participation of Bihar and India. (c) To explore the wage gap in the labour market due to gender bias and Socio-cultural influence in Bihar and India.

The study aims to analyse the factors affecting female labour force participation at the national level. We have included a case study for Bihar as well. To this, we have taken quantitative data for analysis. For the data analysis, the secondary data is our analysis source. The National Sample survey organization collects the Most and Comprehensive data source of Employment and Unemployment in India (NSSO) taken in this paper. The employment and unemployment survey of NSS is the primary source of data on various labour indicators at the national and state levels. The PLFS (2017-18) of employment and unemployment covers 1, 02113 households (56,108 in rural areas and 46,005 in urban areas), and the number of persons has surveyed 4, 33,339 persons (2, 46,809 in rural areas and 1, 86,530 in urban areas).

In this study, the simple quantitative methods of rate, ratio, and proportion took to see the level and distribution of male and female workforce participation. The female's labour force participation is influenced by various factors like caste, religion, household asset, household income, level of educational attainment, education of the head of the household, no of children, size of family, age, sex, marital status etc. The logistic model has taken for the

binary dependent variable that is female is participating or not. The Oaxaca decomposition model is used for the gender wage gap and decomposition analysis.

5.2 Major Findings

Following are the significant findings of the core chapters.

- The PLFS (2017-18) data shows that the male labour force participation rate based on the Usual (ps+ss) status and Currently Weekly Status was 56.1 per cent and 54.3 per cent in 1993-94 in rural India and 54.3 per cent and 53.8 per cent in the urban area. And it is almost the same in the period between 1993-94 and 2017-18 in rural India and urban areas. The female labour force participation rate based on the Usual (ps+ss) status and Currently Weekly Status was 33.0 per cent and 26.30 per cent in 1993-94 in rural India and 16.5 per cent and 15.2 per cent in urban India. In rural India, The female labour force participation based on Usual status (ps+ss) first declined from 33.0 per cent to 30.2 per cent between 1993-94 and 1999-2000. Then increases from 30.2 per cent to 33.3 per cent between 1999-2000 and 2004-05. And it is continuously declining from 2004-05 to 2017-18 and reached at 18.2 per cent. But in urban India, female labour force participation is almost 16 per cent and stagnant between 1993-94 and 2017-18.
- The graph shows that in rural areas, the labour force participation rate of the age between 15-29 years has continuously declined from 2004-05 to 2017-18 for males and females. But, the female participation rate has declined at a faster speed compared to males. But on the other hand, in the urban area, the labour force participation has dropped slightly and is almost stagnant for both male and female labour during the same period. The PLFS (2017-18) graph shows that female labour force participation increases with age. After a particular point, the participation rate decreases with age for overall India and Bihar. It shows an inverse U-shaped curve relation between age and female labour force participation. The decreasing trend can be due to marriage, child caring, domestic household duties etc.
- The analysis shows a positive relationship between female labour force participation and per capita household expenditure in rural areas. But there is a U-shaped curve relation between female labour force participation and household per capita expenditure in the urban area. The positive relationship in the rural area can be due to the substitution effect dominating the income effect. Because the rural area have low-

income families who want to maintain the minimum subsistence standard of living, and for these reasons, females from these families participate in the labour market.

- The analysis shows that the female labour force participation rate follows the U-shaped curve with educational attainment for rural and urban areas. Some authors supported the U-shaped curve theory by their empirical evidence-based study (Dasgupta et al., 2005 and Tsani et al., 2012). Females at a low level of schooling have a higher labour participation rate. The participation rate declines up to primary and secondary levels and then increases after the higher secondary level. The positive sloped of the U-curve show higher economic growth have a higher participation rate because of the availability of white-collar job that is suitable for them to participate because of higher salary and social prestige.

5.2.1. Logistic regression analysis

Initially, females will more likely participate in the labour market if their age increases by one year. But they are less likely to participate in the labour market after a particular period when age increases. It shows an inverse U-shaped curve with age. Initially, if years of schooling increase by one year, there is less likely to participate in the labour market, but it is more likely to experience the labour market after particular schooling years. It shows a U-shaped curve relation with years of education for Rural India and Urban India and Rural Bihar and Urban Bihar. In rural India, urban India, and urban Bihar, Married women are less likely to participate in the labour market than single women. But in rural Bihar, Married women are more likely to participate in the labour market single women. It is showing opposite results. Women who have one child two-child are less likely to participate in the labour market than those with no child in urban India. But the variable number of a child for a household shows insignificant results for rural India, urban Bihar and rural Bihar.

Women who have a household size of more than four are less likely to participate in the labour market than those whose family size is lesser than four. Women who belong to a higher monthly per capita expenditure family category are less likely to participate in the labour market than women with fewer monthly per capita expenditure families. Because low-income families want to maintain the minimum subsistence standard of living, females from these families participate in the labour market—the variable female dependent and male dependent showing an insignificant result. Women who belong to the ST, SC, and OBC families are more likely to participate in the labour market than those in the general category for both rural India and urban India. But the ST and OBC variables showed an insignificant

result in rural Bihar and urban Bihar. Women belong to Muslim families and are less likely to participate in the labour market than Hindu families. Women belonging to other religions (Sikh, Jain, etc.) are more likely to participate in the labour market than Hindu families for rural India and urban India. But in rural Bihar, Women belong to Muslim families and are more likely to participate in the labour market than Hindu families. It can be due to Muslim household income being less than Hindu household income.

Muslim families want to maintain the minimum subsistence standard of living. Females from these families participate in the labour market. Females are less likely to participate in non-agriculture activities and other jobs than self-employment in rural India. In urban India, Females are more likely to participate in regular wage jobs and casual labour jobs than self-employed jobs. Variable Casual labour showing insignificant results. In rural Bihar, females are less likely to participate in other jobs than self-employment in agriculture. Self-employment and rural labour variables are showing insignificant results. In urban Bihar, females are more likely to participate in regular wage jobs and are less likely to participate in other employment than self-employed. Variable Casual labour showing insignificant results.

5.3 The gender wage gap and decomposition analysis for India

- The mean log difference between men and women is 0.69. The male mean log earning is 0.69 is higher than the female mean log earning. The contribution in mean log difference is due to the endowment effect being 0.45, and the endowment effect includes characteristics like the general level of Education, Work experience and average working hours. The endowment effect would reflect the increase in wage if women had the same level of education, the same level of work experience, and the same average working hours.
- The contribution in mean log difference is due to the coefficient effect being 0.31. The coefficients represent the change in women wages when applying male coefficients. Due to gender discrimination, the Male having the mean log wage is 0.31 higher than the female if both males and females have the same level of education, the same work experience, and the same working hours.
- The percentage of the wage gap explained is 65.21 per cent. The wage gap explained part is the ratio between coefficients of endowment and wage gap difference. And the average daily working hours are contributing the most in 65.21 per cent. The contribution of working hours in the endowment effect is 64.44 per cent. It is the ratio of coefficients of average daily working hours and endowment. Because men work

more hours, they get paid 64.44 per cent more in the explained part.

5.4 The gender wage gap and decomposition analysis for Bihar

The mean log difference between men and women is 0.10. The male mean log earning is 0.10, higher than the female mean log earning, but it is insignificant. The contribution in mean log difference is due to the endowment effect being 0.12. And the endowment effect includes characteristics like the general level of Education, Work experience and average working hours. The endowment effect would reflect the increase in wage if women had the same level of education, the same level of work experience, and the same average working hours. The coefficient effect is insignificant. The coefficients represent the change in women wages when applying male coefficients. And the average daily working hours are contributing the most. The contribution of working hours in the endowment effect is almost 100 per cent. It is the ratio of coefficients of average daily working hours and endowment. Because men work more hours, they get paid 100 per cent more in the explained part.

5.5. Policy Implications

- India's potential for economic development and prosperity is enormous. For taking the benefits of this potential, there must be a significant rise in female labour force participation and efforts to remove discriminatory societal norms by pushing policies and education that emphasise women's importance in society.
- It is necessary to consider targeted strategies that can alter societal norms and society's opinions of women's potential. Our understanding of what measures might effectively modify deeply ingrained cultural norms such as gender discrimination is quite limited in this environment.
- Education is an essential tool that can change the status of women. There is a need for the government to fund initiatives like Mahila Samakhya, a women's empowerment programme initiated in 1988 by the Government of India's Department of Education to improve the status of women in rural regions and those from disadvantaged groups. This programme benefits from building up self-confidence in women. It recognizes a positive image of women by recognizing their ability and contribution to society in economics, polity and developing critical thinking. It also helps to make decisions in education, employment and health.
- Investment in education has many social and economic benefits, like declining fertility rate, employment opportunity and economic growth. If potential earning and

employment opportunities are limited for educated women, then parental incentive to invest in girl's education may also be limited.

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