

Empowering Women: Exploring the Dynamics of Female Employment, Literacy and Dependency Ratio in Indian States

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Abstract - The Empowerment of women is an important indicator of social development. The UN's sustainable development goal focuses on empowering women by eliminating gender inequality and discrimination. Female's involvement in the labour force is a crucial determinant of economic empowerment of females. This paper through extensive data analysis of 33 Indian states / Union territories, examines the impact of Female literacy and dependency ratio on the female Labour Force Participation rates. Female literacy and dependency ratio are both important factors to consider. Enhancing the education of females on one hand helps to push the females into the workforce while the dependency ratio (the ratio of children and elderly in the household) pull the females out of workforce due to care giving responsibilities of females. The findings reveal the crucial role of education in increasing the participation of females in the labour market. The paper provides few policy measures to make the education accessible to females in the country.

Keywords - Female Labour force participation, Female Literacy, Care giving, Dependency ratio, Fixed Effect panel regression

I. Introduction

The global conversation about gender equality has gathered considerable attention in the last few decades, igniting debates and initiatives to break down the obstacles standing in the way of women's development and empowerment. From the standpoint of social change, women's empowerment poses a persistent obstacle to development and prosperity in nations where gender inequality is prevalent (World Bank, 2015). One key measure of the nation's economic empowerment is the percentage of women in the labor force (Chaudhary & Verick, 2014). It is also a cause and result of a country's progress and development. The goal of the UN's 2030 Sustainable Development (SDG Goal 5) is to eradicate gender inequality and discrimination against women. Additionally, it plans to take action to ensure that women have equal access to financial resources. In order to achieve inclusive growth and the Sustainable Development Goals (SDGs), particularly SDG 5 ("Achieve gender equality and empower all women and girls"), women's participation in the labor market is essential (Verick, 2018). One of the main areas of attention in this context has been women's participation in the workforce, which is closely related to socioeconomic indicators like female literacy rates and dependency ratios. This study explores the complex interplay among female employment, literacy, and the dependency ratio in the various Indian states. We hope to discover more about the intricate dynamics influencing women's empowerment in the Indian context by looking at these connections. With its enormous cultural, linguistic, and socioeconomic diversity, India offers an exclusive context for researching women's empowerment. Gender inequality still exists in many facets of life, even with recent improvements, and real empowerment is still a difficult task (Akhtar et al., 2023). Increasing the number of women working is a critical step toward empowerment because it increases their economic independence and advances societal development as a whole. But this goal is closely linked to the literacy rates of women because education gives women the information and abilities needed to enter and thrive in a highly competitive labor market (Klasen & Pieters, 2012).

Furthermore, a significant variable that impacts the nature of female employment and education is the ratio of dependency, which represents the proportion of dependent individuals to the working-age population (usually the elderly and children). A high level of dependence may make it more difficult for women to hold formal jobs because they are frequently the ones who take on an unfair share of the caregiving duties (Chevalier et al., 2002; Mitra, 2005). On the other hand, a lower dependency ratio can free up females from such caregiving responsibilities and increase their access to economic opportunities. Thus, developing effective policies that advance women's empowerment requires an understanding of the multifaceted connection between female employment, literacy, and dependency ratio. The research questions of this study are listed as:

RQ1: What are the interstate differences among male and female participation in labour market in Indian States?

RQ2: What is the impact of female literacy on female labour force participation in Indian States?

RQ3: What is the impact of dependency ratio on female participation in Indian States?

RQ4: What policy measures can be adopted to enhance women empowerment through participation of females in employment?

Through an analysis of the complex interactions among these three variables, our aim is to identify the fundamental elements that impede or promote women's endeavours towards empowerment. The important insights from this investigation that will help shape policy interventions meant to advance female literacy, gender equity, and sustainable economic growth in India's various states. We will explore the methodology, data sources, and conclusions that clarify this intricate web of relationships in the sections that follow, hopefully adding to the larger conversation on women's empowerment in the Indian context.

II. Theoretical Background and Hypothesis

Lewis (1954) asserted that the shift of women's labor from domestic to commercial employment is one of the key drivers of economic progress. One of the most frequently studied phenomena is the U-shaped relationship between women's labor force participation rates and economic development (Boserup, 1970; Schultz, 1990; Goldin, 1994). This argument is made by Goldin (1994), who contends that development will cause an early decline in women's labor force participation. Men are entering new blue-collar jobs, which increases family income and decreases the participation of women. In addition, if men abandon agriculture in favor of paid labor and urbanization picks up speed, there may be fewer family farms or businesses where women can find employment, which would limit the opportunities available to them overall. The types of jobs available to women may change when economic growth accelerates.

A. Education and Female Participation

A large body of research on the effect of education on female participation is reviewed. Women are less likely than men to be employed in the majority of economies (Psacharopoulos & Tzannatos, 1989). The research supported the hypothesis that women's participation in the labor force initially decreases as an agricultural subsistence economy shifts to a market economy, but eventually increases until a certain degree of development is attained. Education is seen in developing countries as having the potential to increase the number of women in the labor force.

Tansel (2002) uses time series data to investigate the cross-provincial drivers of female labor force participation in Turkey. Time series data indicates that female labor force participation has recently slowed after a period of sharp decline. This rate is probably going to increase over the next few decades. Per capita Gross Provincial Product is the development metric used in cross-provincial factors of female labor force participation. Data from 67 provinces over three distinct historical eras—1980, 1985, and 1990—form the basis of the models. The results lend credence to the hypothesis that the impact of economic development is U-shaped. Furthermore, female labor market participation was significantly impacted negatively by unemployment but positively by education.

Ejaz (2007) examined the factors that influence Pakistani women's participation in the labor force. The information was obtained from a nationwide survey that documented specific characteristics of women in the 15–49 age range. The findings of this indicate that women's participation in the labor force is positively impacted by educational attainment. There is a claim that higher female labor force participation may result from lessening the load of child care obligations combined with improvements in educational attainment.

The relative strength of the income and substitution effects determines how education affects female labor force participation in the stable supply of labor model. To begin with, education increases future earning potential, increasing the opportunity cost of not working. Second, an individual chooses leisure over work and works fewer hours as a result of increased wealth. Which of the force is dominant determines the net impact. Numerous studies have found that women outperform men in terms of educational returns (Schultz, 1994; Duraisamy, 2000; Psacharopoulos, 1994). On the other hand, there isn't a strong direct relationship between female labor force participation and educational attainment. Prior studies (Kottis, 1990; Dasgupta and Goldar, 2005; Das and Desai, 2003) have even discovered a negative association.

Hypothesis: Female Literacy has positive impact on female labour force participation rate in India

B. Domestic Duties and care giving

Given that their value within the household is determined by their caregiving role, women's high burden of domestic work and role play a significant role in the decision to participate. According to Cunningham (2001), single women in Mexico have the same employment prospects as men, but married women's labor force participation is influenced by the number and stability of their children as well as the presence of small children. The value of idle time increases with decreasing fertility, so it makes sense that rates of female labor force participation would increase. According to Sudarshan and Bhattacharya (2009), women's participation is significantly hampered by their household workload, informational gaps, and worries about their safety and mobility. Therefore, rather than the woman's personal qualities, the decision to work is primarily influenced by the external environment (such as childcare arrangements and public safety) and the ideology of the married household.

One of the main barriers to women's labor market choice, according to Mitra (2005), is the dual burden of traditional productive work and household responsibilities. Men typically decide where households should reside, and women rely on unofficial networks to find paid jobs close to their homes. Because childcare is expensive and there is uncertainty about its quality or preferences, it also affects the labor force participation of women. The study backs up the idea that a lack of childcare facilities limits women's ability to enter the workforce (Chevalier and Viitanen 2002). FLPR is also significantly impacted by fertility rate. According to Bloom et al. (2009), a study conducted on 97 countries using panel data and abortion legislation as a fertility instrument indicates that the removal of legal restrictions on abortions significantly lowers the fertility rate and, as a result, on average, shortens a woman's labour supply by nearly two years for each child born. Dependency ratio is considered as a proxy variable for care giving responsibilities of females. Dependency ratio means persons of age 0 to 14 years or 65 years and above per 100 persons of age 15 to 64 years in a state/UT of India.

Hypothesis: Dependency ratio has positive impact on female labour force participation rate in India

III. Research Methodology

A. Data sources

The Data from Periodic Labour Force Survey which is conducted annually is used for analysis. Periodic Labour Force Survey is conducted by NSO which provides significant labour force parameters. The data considered for this study is used from five survey rounds of the year 2017-18, 2018-19, 2019-20, 2020-21 and 2021-22 for 33 states and Union territories.

B. Methodology

Balanced Panel is created from the PLFS state wise data from the years 2017-18, 2018-19, 2019-20, 2020-21 and 2021-22. There can be many state - specific factors that impact the female labour supply and demand therefore Fixed effect Panel Regression model is applied as follows:

The relationship among female participation, Literacy rate and Dependency ratio among Indian States is depicted through panel regression model is as follows (Ruhm,1996):

$$FPR_{it} = \beta_1 LT_{it} + \beta_2 DP_{it} + \alpha_i + \lambda_t + \mu_{it}$$

Where LT is Female Literacy of Indian States, DP is the Dependency ratio of Indian States

FPR is female participation among Indian states

$$\alpha_i = \beta_0 + \beta_2 \rho_i$$

ρ_i = unobserved variables that vary from State to State but is constant for overtime

$$\lambda_t = \beta'_0 + \beta'_2 \varphi_t$$

φ_t = unobserved variables that vary overtime but is constant across States

IV. Results and Discussion

This study examines the impact of female literacy and dependency ratio (independent variables) on female labour force participation rate (dependent variable).

Table I: Descriptive statistics of Variables – Female Labour force Participation rate, Female literacy, Dependency ratio for Indian states

	Observations	Mean	Standard Deviation	Min	Max
Female LFPR	165	31.55	12.89	4.11	66.08
Female Literacy	165	74.48	12.13	49.3	99.8
Dependency Ratio	165	43.57	7.260	25.7	66.7

The variables are summarized in Table (I). There are 65 observations for each variable. The Female LFPR range from 4.11per cent to 66.08 per cent, Female literacy range from 49.3 percent to 99.8 percent, Dependency Ratio range from 25.7 per cent to 66.7 percent. The mean value for Female LFPR, Female Literacy and Dependency Ratio are 31.55, 74.48 and 43.57 respectively.

Table II: Labour Force Participation Rate (LFPR) (in per cent) according to usual status (ps+ss) for each State/UT – Rural (age group:15 years and above)

Sr. No.	Indian State	Males	Females	Sr. No.	Indian State	Males	Females
1	JAMMU & KASHMIR	77.1	44.9	20	JHARKHAND	79.3	45.2
2	HIMACHAL PRADESH	82.7	66.1	21	ODISHA	78.9	32.9
3	PUNJAB	77.2	24.0	22	CHHATTISGARH	81.9	51.6
4	CHANDIGARH	70.5	16.8	23	MADHYA PRADESH	81.9	41.0
5	UTTARAKHAND	71.7	33.1	24	GUJARAT	79.9	34.4
6	HARYANA	71.4	19.1	25	DAMAN & DIU	88.5	43.0
7	DELHI	72.6	12.2	26	MAHARASHTRA	76.4	38.4

8	RAJASTHAN	74.6	40.0	27	ANDHRA PRADESH	78.2	43.3
9	UTTAR PRADESH	77.0	26.3	28	KARNATAKA	77.2	31.8
10	BIHAR	72.2	10.2	29	GOA	73.6	20.7
11	SIKKIM	83.6	57.8	30	LAKSHADWEEP	73.2	16.8
12	ARUNACHAL PRADESH	69.5	31.2	31	KERALA	73.4	37.0
13	NAGALAND	75.8	51.5	32	TAMIL NADU	77.5	40.7
14	MANIPUR	65.5	23.4	33	PUDUCHERRY	74.4	35.7
15	MIZORAM	67.4	34.7	34	A & N ISLANDS	82.0	45.7
16	TRIPURA	76.7	26.7	35	TELANGANA	76.6	44.7
17	MEGHALAYA	74.4	50.2	36	LEH & LADAKH	73.6	46.5
18	ASSAM	79.5	28.2	37	ALL INDIA	77.2	32.8
19	WEST BENGAL	80.7	27.9				

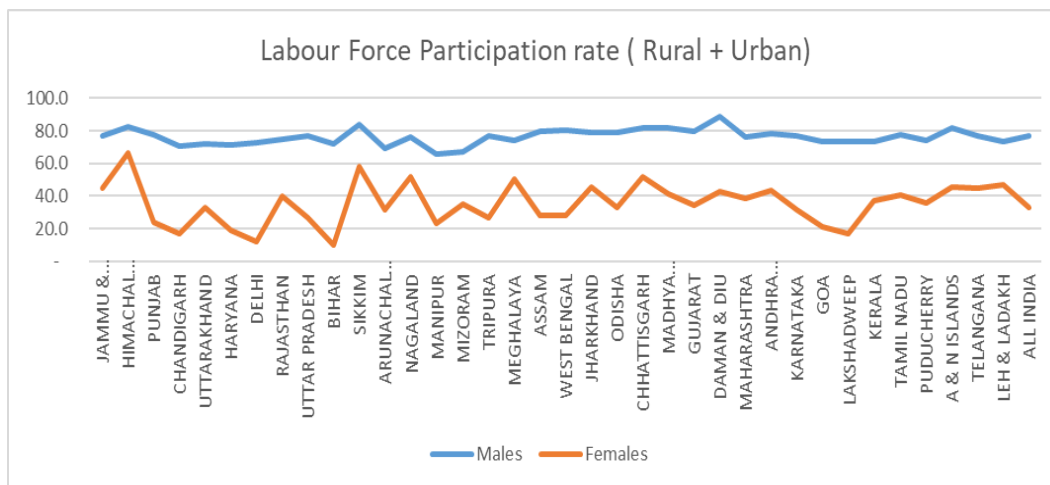


Figure I: Labour Force Participation Rate (LFPR) (in per cent) according to usual status (ps+ss) for each State/UT – Rural age group:15 years and above

There huge variation in labour force participation rates of males and females (Figure I). The labour force participation rate of males is 77.2 and females is 32.8 as reported by Periodic Labour force survey conducted by NSO for the year 2021-2022. The participation of females in the economic activity is far less than males. There is huge variation in female labour force participation is observed amongst various states in India. The States Himachal Pradesh, Sikkim and Chhattisgarh have high labour force participation rate of 66.1, 57.8 and 51.6 respectively. While the states / Union territories of Bihar, Delhi and Lakshadweep have relatively low female participation rate of 10.2, 12.2 and 16.8 respectively (Table II).

The random effect regression model and fixed effect regression model are used to find the impact of female literacy and dependency ratio on female labour force participation rate of India using state – wise data of 33 States/ UTs. Hausman test is used to identify the apt model for analysis (Hausman & Taylor, 1981).

Table III: Hausman Test Statistics

	Coefficients	
	Fixed (b)	Random (B)
Female literacy	1.152086	0.5247981
Dependency Ratio	0.0804009	0.0395282

The P value is 0.0006 at 5% significance level. Therefore, the fixed effect regression model is most apt for tracing the relationship between female labour force participation with female literacy and dependency ratio (Table III).

Table IV: Fixed effect Model predicting Female Labour force participation in Indian states

	Fixed effect Model		
	Coefficient	SE	P value
Female Literacy	1.152086*	0.2201886	0.000
Dependency Ratio	0.0804009	0.1601042	0.616
Constant	-57.76518*	18.57592	0.002

The value with * sign is significant at 5% level of significance.

The fixed effect regression model suggests that the independent variable female literacy is significant and Dependency ratio is insignificant at 5% level of significance. The 1 per cent change in female literacy can increase the female labour force participation rate by 1.15 (approx.) per cent (Table IV). The dependency ratio does not turn out to be a significant variable amongst Indian states. The results are contrary to the research in various countries. The increase in the population of aged people (more than 65 years of age) and children (less than 14 years of age) can impact the labour market participation decisions of females (Cunningham, 2001). A country's economic performance can be greatly impacted by changes in its age structure because people's economic behaviour varies depending on their stage of life. Countries with a large proportion of children are also likely to spend a large proportion of their resources on child care, which slows down economic growth. (Bloom et al., 1985).

Policy Measures

As per the results of the fixed effect regression model, education is a critical factor that can contribute towards enhancing the participation in labour market, followed by empowering women in terms of presence in economic activity, social status and financial decision making. There are few policy interventions which can help to enhance the female literacy in the country leading to increased participation of females in the labour force. The Primary focus of government schemes should be the access to education for females. To encourage women to read, the government started the Saakshar Bharat Programme in 2009. The program's objectives are to increase the number of women enrolled in schools and close the gender disparity in literacy. Women from underprivileged communities can receive fundamental numeracy and literacy abilities through this program. In order to increase the enrolment ration of females in the schools, the financial incentives can be provided to the families. Improving the school infrastructure for providing the safe environment to female students. The basic amenities, like clean toilets to be maintained in all schools. Flexible school timings for girls catering to the domestic duties has not fetched the attention of policy makers yet. Adult females who were deprived of education in earlier years of life, should also be provided the opportunities for education in the schools and colleges. Moreover, it is a high time to protect the right to education for females. It is important to engage communities to generate awareness and also strengthen the legal framework for protection of the right to education. Enhancement of ICT usage can make the education accessible in the remote areas. Vocation education can help the young females to swiftly move into the workforce.

Apart from providing schemes helping to uplift the female literacy, it is equally important to address the reasons of female withdrawal from labour force due to culturally embedded reasons. It is important to break the stereotype of gender inequality through education. The content in primary and middle education should be able to eradicate the gender inequality and bias.

V. Conclusion

This research paper explores the multi-faceted aspect of female labour force participation, female literacy and dependency ratio. The findings reveal the relationship of female labour force participation with female literacy and dependency ration on the basis of state – wise data from Indian states. The findings show that there is a significant impact of female literacy on female labour force participation rate in Indian states. It highlights the crucial role of education in enhancing female participation in economic activity and hence leading to economic empowerment of females in the country. On the other hand, the dependency ratio does not turn out to be a significant variable impacting the female labour force participation rate in India. Each state in India is different in terms of socio-economic and cultural contexts. Therefore, it is important to consider the other factors like economic development, infrastructure, urbanization, religious norms, child care services that can impact the female's decision to enter the workforce.

Future Scope of Research

In this research paper, two variables education and dependency ratio are considered in Indian context to study the impact on female labour force participation rate. The other factors such as Economic Factors like Income levels, Life expectancy, Sectoral contribution in GDP, Population growth, industrial growth, occupational segregation; Cultural and social norms; regional factors like Marriage and Fertility Patterns, Childcare Support, Policy measures can be considered in future research to identify regional patterns of female participation in labour market.

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