



# ANALYSING THE IMPACT OF THE FEMALE LITERACY RATE ON THE ECONOMIC GROWTH

**Akshambari Sharma**

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## ABSTRACT

*This study investigates the relationship between female literacy rate and economic growth in India, focusing on the period of 1991 to 2021, to show the importance of higher female education in impacting the economy of the country. The analysis employs secondary data sourced from authoritative institutions such as the Ministry of Statistics and Programme Implementation (MOSPI) and the World Bank's World Development Indicators (WDI). The independent variable, the female literacy rate, measures the percentage of women aged 7 and above who can read and write with understanding. The female literacy rate is examined against the dependent variable, GDP growth rate (annual percentage change in gross domestic product). This research paper attempts to analyse inter-state disparities in India; it examines the connections between women's economic participation and literacy. The study shows that by improving the education rate of women in India, we are also improving not only the economic growth of the country but the social status of women in society as well. There is an increase in rural areas in the education of women. The government has introduced several schemes to increase the literacy rate of women as well. To promote inclusive and economic development, it is essential to implement policy measures that support gender equity in education, particularly in rural and marginalised areas. This paper suggests that a higher literacy rate not only drives economic growth but also improves work efficiency, productivity, and innovation among individuals, which are all necessary for national development.*

**KEYWORDS:** *Female Literacy, Economic Growth, Gender Equality, India, And Education.*

## INTRODUCTION

The nations development is like an organism and every nation treasure is a women who is an essential asset not only of the house but for the country also she is someone who operates the When educated, a woman becomes more than an individual achiever; she is a force of economic and social renewal. She raises healthier children, manages resources with wisdom, and actively participates in the workforce. With each percentage rise in female literacy, the country's GDP is added to, as if new life flowed through its veins. As the literacy rate among women in India has risen-from 39% in 1991 to nearly 70% in 2021-so too has the country's economy witnessed waves of corresponding growth and stability. It is the educated woman who stands at the centre of such transformation, quietly yet powerfully driving change.

When a woman is educated, she becomes more than an individual achiever; she is the force for economic and social renewal. She raises healthier children, manages resources wisely, and participates actively in the workforce. Each percentage rise in female literacy adds to the country's GDP like new life flowing through its veins. As India's literacy rate among women rose-from 39% in 1991 to nearly 70% in 2021-so too has the country's economy witnessed waves of growth and stability in tandem. The educated woman stands at the center of this transformation, quietly yet powerfully driving change.

Education equips individuals with the skills, knowledge, and abilities necessary to make meaningful contributions to the economy. It is one of the most important factors influencing economic development. Several important points can be used to understand the connection between education and the economy:

**Human Capital Development:** Employee productivity is increased through education. Individuals with higher levels of literacy and education are better equipped to innovate, adapt to new technologies, and complete tasks more efficiently, all of which contribute to an economy's overall productivity.

**Employment and Income:** Better job prospects and higher salaries are closely linked to higher educational attainment. People spend and invest more when their income rises, which encourages growth in the economy.



**Innovation and Technology Adoption:** When people are able to understand, create, and apply new technologies, economies expand more quickly. Innovation requires critical thinking and problem-solving skills, which are promoted by education.

**Better Institutions and Governance:** People with higher levels of education are better able to understand policies, hold institutions accountable, and take part in governance. A stable economic environment and more effective economic policies result from this environment.

Improvement in the women's education rate is important for the upliftment of women in society and for the economic growth of the country. **Desmond Tutu, 1984 Nobel Laureate**, quoted that if we are going to see development in the world, then our best investment is our women. The best investment for women is through education. By increasing women's education in our country, we will see the nation's development.

India has witnessed the growth of women's literacy rate in the past two decades. According to the census of India 2001, the literacy rate was 53.7% which took a growth to 65.46% in 2011, and according to the National Statistical Office (NSO), there was an increase of 74.6% in 2021. Thus, the literacy level of women serves not only as a social indicator but also as a significant factor in economic growth and sustainability.

Since independence, several schemes such as **Sarva Shiksha Abhiyan (2001–2010)**, **National Literacy Mission (2009 onwards)**, **Beti Bachao Beti Padhao (2015)**, and the **National Education Policy (2020)**. Has helped to promote education for females in the country, and from the time of independence, there has been an improvement in the education of girls. In 1961, it was 13%. When the Sarva Shiksha Abhiyan (SSA) was introduced, girls' school enrollment was given priority. India attained 100% gender parity in school enrollment as a result of these efforts.

Thus, the purpose of this study is to examine the connection between India's economic growth from 1991 to 2021 and female literacy. The study looks at real data from the World Bank, NSO, and the Census of India to determine how increases in female literacy have affected India's economic performance. It is anticipated that the results will emphasise how important women's education is to promoting inclusive growth, lowering poverty, and accomplishing sustainable development objectives.

### Literature Review

Becker, G. S. (1964). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. Chicago, IL: University of Chicago Press.

The Human Capital Theory (Becker, 1964) states that education increases personal productivity and promotes economic expansion. When it comes to gender, female literacy is a major factor in determining social welfare, labour productivity, and demographic change. Education enables individuals—particularly women—to acquire skills that enhance efficiency, innovation, and workforce participation, thus improving a nation's overall economic performance.

Chatterjee, E., Desai, S., & Vanneman, R. (2018). *Indian Paradox: Rising Education, Declining Women's Employment*. *Demographic Research*, 38(31), 855–878. <https://doi.org/10.4054/DemRes.2018.38.31> Demographic Research's study "Indian Paradox: Rising Education, Declining Women's Employment" examined data from the India Human Development Survey (IHDS). Despite the significant increase in women's educational attainment, the authors found that educated women's labour force participation decreased from 31.2% in 2004–05 to 23.3% in 2011–12. This indicates that even though literacy enhances potential economic productivity, social norms and household income levels may restrict women's participation in the workforce, limiting the full impact of education on GDP.

Singh, R. (2016). *Female Literacy and Economic Development in India*. *Rupkatha Journal on Interdisciplinary Studies in Humanities*, 8(2), 7–15.

In his paper titled "Female Literacy and Economic Development in India," Singh (2016) found a strong positive relationship between female literacy and regional economic outcomes. Districts with higher female literacy rates experienced nearly a 15% reduction in poverty and recorded higher per-capita income levels. Similarly, Ali (2021) from UC Berkeley highlighted that gender equality in education enhances labour productivity, fosters demographic stability, and significantly contributes to national GDP growth.



Klasen, S. (2018). *Gender and Economic Growth: The Role of Female Education*. *World Development*, 105, 422–434.

Klasen (2018) demonstrated that gender inequality in education has resulted in a 0.9% reduction in annual economic growth rates globally. The study underscores that underutilization of female talent negatively affects economic development. Promoting gender equality in education not only enhances social equity but also fosters long-term sustainable growth.

The World Bank. (2018). *Missed Opportunities: The High Cost of Not Educating Girls*. Washington, D.C.: The World Bank Group, 64 pp.

The World Bank (2018) found that closing gender gaps in education could boost GDP growth by 1–2% annually in several developing economies. Moreover, Minasyan et al. (2019) conducted a cross-country survey revealing that a 10% increase in the female literacy rate can raise per capita GDP growth by 0.3% to 0.5%, depending on labour market conditions. These findings emphasize that investing in women’s education yields substantial economic and social returns.

### Research Objectives

- To examine the relationship between the female literacy rates (independent variable) and GDP growth rate (dependent variable) in India from 1991 to 2021.
- To understand how female literacy rates influence workforce participation and income generation.
- To identify barriers that prevent women's participation in the Indian economy
- To provide and suggest policies for the enhancement of women's **economic benefits of female education in India**.

### Research Methodology and Design

This study uses descriptive analysis, as well as the statistical tool of correlation and regression, to examine the relationship between the female literacy rate and the economic growth in India, by taking into account data from 1991 to 2021.

It examines female literacy as the independent variable and economic growth as the dependent variable. Correlation examines the relation between the two variables regression analysis is so used to determine the extent and significance of the relationship thoroughly.

### Research Question

To what extent does improvement in female education contribute to India’s overall economic performance?

### Hypothesis

- **Null Hypothesis (H<sub>0</sub>):** Female literacy rate has **no significant effect** on economic growth in India.
- **Alternate Hypothesis (H<sub>1</sub>):** Female literacy rate has a **positive effect** on economic growth in India.

### Data Visualization

Initially, the research timeline that we have taken in our research paper - for a period of thirty years, from 1991-2021. After determining the timeline for observation, data is collected for both, the independent and dependent variables, i.e the female literacy rate as well as the economic growth of india.

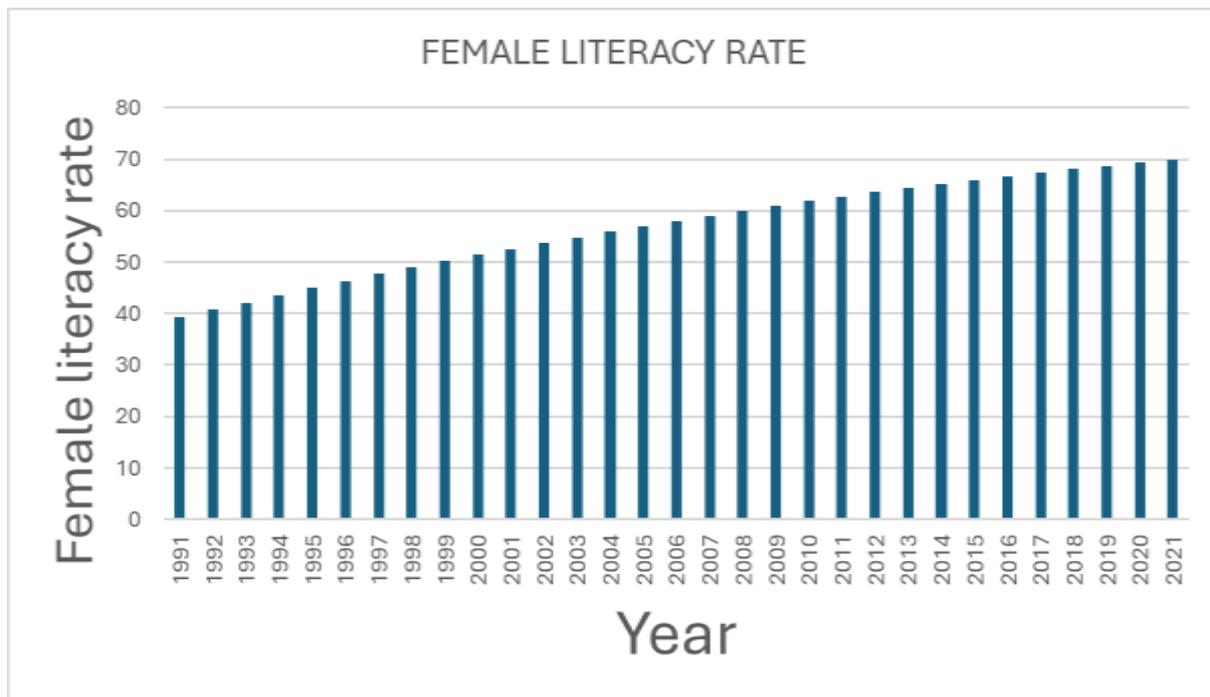
YEAR	FEMALE LITERACY RATE
1991	39.29
1992	40.7
1993	42.17
1994	43.59
1995	44.97
1996	46.33
1997	47.65
1998	48.94
1999	50.18
2000	51.39
2001	52.57
2002	53.72



2003	54.84
2004	55.93
2005	56.99
2006	58.02
2007	59.02
2008	59.99
2009	60.93
2010	61.84
2011	62.72
2012	63.57
2013	64.39
2014	65.19
2015	65.96
2016	66.7
2017	67.41
2018	68.09
2019	68.75
2020	69.39
2021	69.99

**Table 1.1 Female Literacy Rate**  
Source: World Bank.

Gathering this data helps determine the trend and interrelationship between **female literacy rates** and **economic growth in India** over the period from **1991 to 2021**. An average is estimated for each year to enable a clearer comparison between educational development and economic performance. Table 1.1 represents the data collected on female literacy rates, while figure 1.1 shows a graphical representation of the same. presents the corresponding GDP growth rates. The data highlights that India has witnessed a consistent rise in female literacy, increasing from **39.29% in 1991** to **69.99% in 2021**, reflecting significant educational progress. This steady improvement in female literacy may be attributed to various government initiatives, economic reforms, and social awareness campaigns that promoted education and gender inclusion. The positive association between rising female literacy and economic growth underscores the role of education as a catalyst for national development—enhancing human capital, increasing productivity, and fostering long-term economic stability.



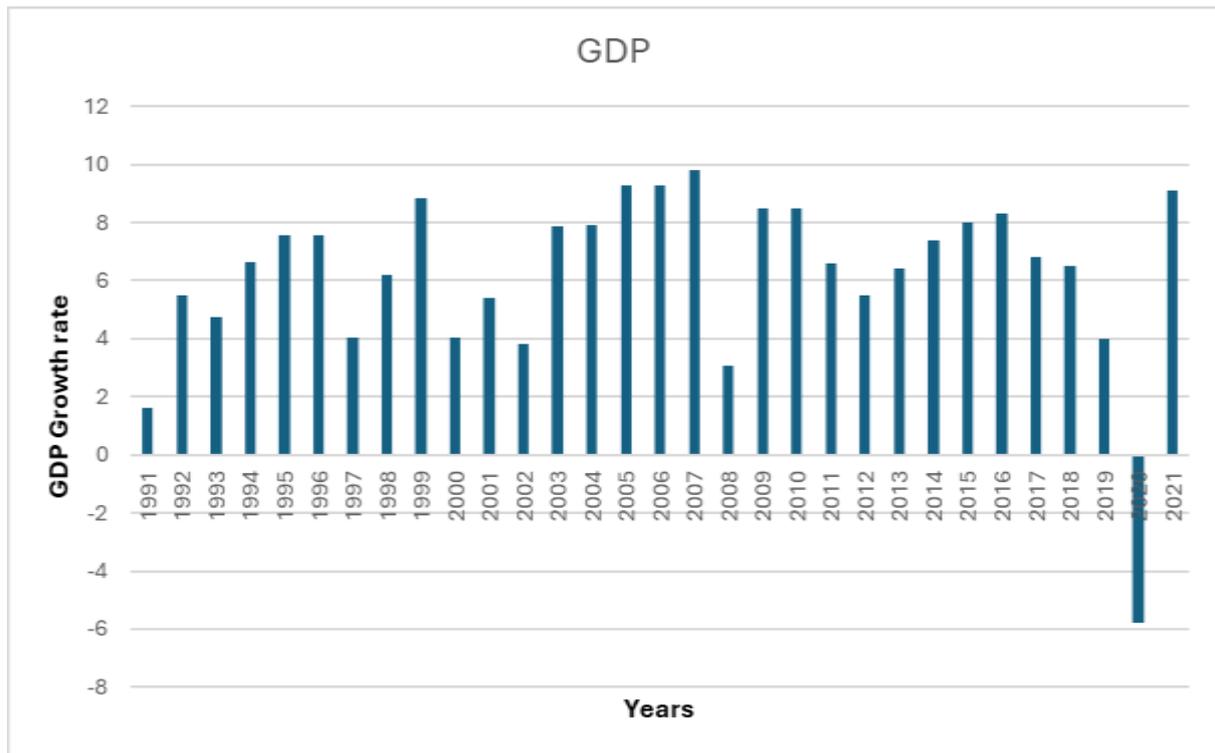
**Figure 1.1: Female Literacy Rate**  
Source: World Bank.



Further, data is compiled to examine the **annual female literacy rate and its relationship with economic growth in India**. The literacy rate, particularly among women, is influenced by several socio-economic factors, including access to education, government policies, household income, and social awareness. Economic growth, measured through GDP, is similarly affected by literacy levels, labour participation, industrial productivity, and policy reforms. Over the years, India has experienced a consistent rise in female literacy, reflecting improved educational access and awareness, alongside periods of fluctuating but generally positive economic growth. Notably, initiatives such as *Sarva Shiksha Abhiyan*, *National Literacy Mission*, and *Beti Bachao Beti Padhao* have contributed to these upward trends. The data representing the **economic growth of India from 1991 to 2021** is presented in **Table 1.2**, illustrating how advancements in education among women have coincided with India's broader economic development.

YEAR	GDP
1991	1.6
1992	5.48
1993	4.75
1994	6.66
1995	7.57
1996	7.55
1997	4.05
1998	6.18
1999	8.85
2000	4.03
2001	5.39
2002	3.8
2003	7.86
2004	7.92
2005	9.28
2006	9.26
2007	9.8
2008	3.09
2009	8.5
2010	8.5
2011	6.6
2012	5.5
2013	6.4
2014	7.4
2015	8
2016	8.3
2017	6.8
2018	6.5
2019	4
2020	-5.8
2021	9.1

**Table 1.2: The Economic Growth of India**  
Source: World Bank, MOSPI



**Figure 1.2 The Economic Growth in India**

Source: World Bank, MOSPI

It is evident even through primary analysis that while there has been a **steady rise in the female literacy rate in India**, there has been a **corresponding improvement in the country's economic growth**. This suggests that as women gain greater access to education and literacy, their increased participation in the workforce and contribution to human capital have had a **positive influence on India's overall economic performance**.

Figure 1.3 represents a relative comparison between the two variables- the blue line reflects that there is a steady increase in the female literacy rate where as the orange line depicts the fluctuations in the economic growth of India from the time period of 1991 to 2021. This graph highlights the increase in the female literacy rate and how the economic growth of India has improved over the period of last 30 years.

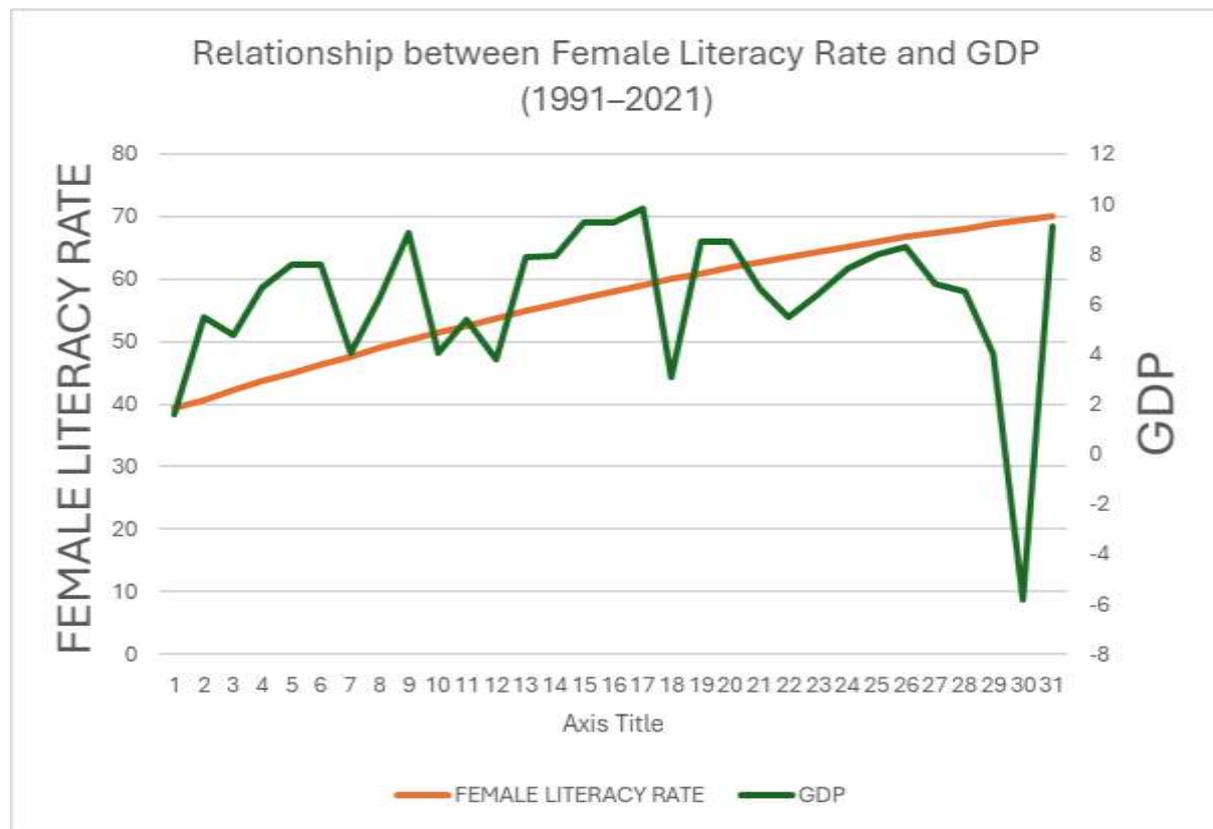


Figure 1.3

The trends of **female literacy rate** and **GDP growth** between 1991 and 2021 reveal an interesting pattern. Over the years, India's female literacy rate has shown a steady and consistent upward trajectory, rising from **39.29% in 1991 to 69.99% in 2021**, reflecting continuous improvement in women's access to education and government-led literacy initiatives. In contrast, GDP growth exhibited significant fluctuations during the same period, with notable peaks in the late 1990s and early 2010s, and a sharp decline in **2020** due to the **COVID-19 pandemic**, before rebounding slightly in 2021.

When observed together, the two variables show a **weak visual association**, indicating that the rise in female literacy has not directly translated into proportional increases in GDP growth. While educational improvements among women form a foundation for long-term human capital development, the short-term economic impact appears limited, possibly due to **structural barriers** such as gender disparities in workforce participation and wage inequality. Overall, the pattern suggests that while female literacy has progressed steadily, its full potential to drive economic growth remains **underutilized**, requiring stronger linkages between education, employment, and economic opportunity.

The higher education rate among women contributes significantly to the development of a nation. Education improves the socio-economic conditions of women in society, which in turn boosts the country's overall productivity, enhances human capital, and increases labor efficiency. Conversely, a low literacy rate can hinder a nation's growth and negatively impact its economic condition. Countries like Afghanistan and many nations in Africa struggle with low GDP largely due to lower literacy rates. Therefore, a nation's economic growth is closely linked to its literacy rate.

This sets the stage for statistical testing and findings through correlation and regression analysis in the next section.

### FINDINGS AND RESULT

While the previous section presented trends and visual patterns, this section quantifies the strength and direction of the relationship between the two variables of the study. The results obtained from the application of



correlation and regression analysis are presented below, followed by findings and interpretation based on statistical significance, correlation coefficients, and regression outputs.

SUMMARY OUTPUT		FEMALE LITERACY RATE		GDP
<i>Regression Statistics</i>		FEMALE LITERACY RATE	1	
Multiple R	0.044273	GDP	0.044273	1
R Square	0.00196			
Adjusted R Square	-0.03246			
Standard Error	3.080312			
Observations	31			

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	0.540406	0.540406	0.056955	0.813054
Residual	29	275.1613	9.48832		
Total	30	275.7017			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	5.407232	3.463645	1.56114	0.129339	-1.67672	12.49118	-1.67672	12.49118
X Variable 1	0.014363	0.060182	0.238652	0.813054	-0.10872	0.137449	-0.10872	0.137449

**TABLE 1.3 Correlation Analyses**

Source: Author's Estimates

**Table 1.3** represents the correlation between *female literacy rate* and *GDP* in India. The correlation coefficient ( $r = 0.044$ ) indicates a **very weak positive relationship** between the two variables. This suggests that although increases in female literacy are associated with slight rises in GDP, the relationship is not particularly strong.

This weak correlation could be attributed to several intervening factors, such as disparities in women's employment opportunities, regional educational inequalities, and the lag effect between education and measurable economic output. Nevertheless, a positive value still implies that improvements in female literacy tend to contribute—albeit marginally—to economic growth over time.

In this study, this relation between the two variables is further examined and validated by applying the statistical tool of regression, accounting for thirty years of data from 1991-2021. The results of the regression analysis are displayed in Table 1.4

*Table 1.4 Regression Analysis*

From the given regression analysis, the following can be inferred

- **Multiple R [0.0443]** – Measures the strength and direction of the linear relationship between the dependent and independent variables. It ranges between -1 and 1.

The Multiple R value of **0.0443** shows an extremely weak positive linear relationship between **female literacy rate** and **GDP growth rate**, indicating that changes in literacy have very little direct linear effect on GDP growth during the period studied.



• **R Square [0.0019]** – Represents the proportion of the variance in the dependent variable explained by the independent variable.

The R Square value of **0.0019** (or 0.19%) implies that only **0.19% of the changes in GDP growth** can be explained by variations in female literacy rate. This suggests that other macroeconomic factors, such as industrial output, foreign investment, or government expenditure, have a much greater influence on GDP growth than literacy rate alone.

• **Adjusted R Square [-0.0324]** – Adjusts the  $R^2$  value for the number of predictors in the model. The negative adjusted  $R^2$  indicates that the regression model does not fit the data well and may perform worse than simply using the mean of GDP growth to predict outcomes.

• **Standard Error [3.0803]** – Measures the average distance between observed and predicted values. A standard error of **3.08** signifies that the actual GDP growth values typically deviate from the regression line by about 3 percentage points, further emphasizing the model's weak predictive capability.

The **F-statistic [0.0569]** and **Significance F [0.8130]** assess whether the model as a whole is statistically significant.

Since the **Significance F (0.8130)** is much higher than the conventional 0.05 threshold, it indicates that the regression model is **statistically insignificant**, meaning female literacy rate does not significantly explain variations in GDP growth during the observed period.

• **Coefficient of Female Literacy Rate [0.01436]** – Indicates that for every **1% increase in female literacy**, the **GDP growth rate increases by approximately 0.014 percentage points**, holding other factors constant. However, this change is **extremely small and statistically insignificant**, as reflected in the **p-value (0.8130)**, which is much higher than 0.05.

• **P-value [0.813]** – Indicates the statistical significance of each coefficient; if  $p < 0.05$ , the relationship is considered significant.

The **p-value (0.813)**, being much greater than 0.05, shows that the relationship between **female literacy rate** and **GDP growth** is **statistically insignificant**.

Therefore, according to standard hypothesis testing, the **null hypothesis ( $H_0$ )** – which states that there is **no significant relationship between female literacy rate and GDP growth in India** – is **accepted**, while the **alternative hypothesis ( $H_1$ )** – which states that there is a **significant relationship between the two** – is **rejected**.

### Policy Implications and Conclusion

The empirical results of this study, establishing a strong and quantifiable linkage between female literacy rates and economic growth as measured by GDP, have great implications for policymakers in India and elsewhere. While the paper is largely analytical, its results have clear implications for a more integrated and fundamentally grounded approach to economic development in which gender equality and education policy are recognised as imperatives of economic development rather than social welfare concerns.

#### 1. The Imperative of Integrated Policy-Making

Education, labour, and economic policies must work together. The female literacy rate and GDP growth are connected. When more women become educated, they join the workforce, work better, and earn more money. This shows that education policies also support economic stability and growth.

Example: When the government introduces a new education or employment program, such as Beti Bachao Beti Padhao or Skill India, its evaluation must extend beyond enrollment numbers or literacy outcomes to include the macroeconomic effects on GDP growth, labour productivity, and household income. Similarly, investments in girls' education should be viewed not merely as social development initiatives, but as critical levers of long-term economic transformation. This research provides an empirical basis for breaking down institutional barriers between ministries of education, finance, and labour to foster a more coherent and holistic policy strategy focused on inclusive growth.



## 2. Monitoring Human Capital Imbalances:

This study highlights that sustainable growth depends on a balanced relationship between literacy levels and economic growth. This balance should help us track how effectively we are using human capital.

For example, policymakers and planners should closely monitor the connection between female literacy rates, education, and GDP growth. If GDP grows without an increase in female literacy or workforce participation, it could lead to uneven and unsustainable growth. Conversely, major improvements in literacy that don't lead to enough jobs suggest problems in the labour market.

By using these indicators, governments can identify and address social underinvestment before it leads to economic stagnation. This approach helps ensure that the benefits of growth are shared fairly and last over time.

## 3. Female Education: Laying the Foundation for Long-Term Economic Stability

The findings clearly show that the best way to build a healthy and strong economy is to focus on women's education. While fiscal stimulus and industrial reforms can offer short-term boosts, long-term growth depends on educating and empowering women.

For example, countries like Finland and South Korea have achieved high income and innovation by giving equal access to education, with female literacy rates above 98%. Likewise, Bangladesh has seen economic progress as female literacy increased from 29% in 1981 to over 73% in 2021, thanks in part to women's contributions to the workforce. In India, improving female literacy beyond the current 70% could add about 0.3 to 0.5% to annual GDP growth (World Bank, 2023). Therefore, policies that provide better access to education, keep girls in school, and create job opportunities for literate women are essential for national economic strength.

## CONCLUSION

This study looked at the connection between female literacy rates and GDP growth in India from 1991 to 2021, using tools like correlation and regression analysis. The results show that although both female literacy and GDP have generally increased, the rise in female literacy has not significantly affected GDP growth.

The correlation coefficient (0.044) and regression findings ( $R^2 = 0.0019$ ) indicate a very weak positive relationship between female literacy rates and GDP growth. This means that while more women are becoming educated, this has not directly led to higher economic output.

This finding highlights an important point: education alone is not enough. Without good job opportunities and inclusive economic participation for women, education may not bring significant economic benefits. The data suggests that the potential of educated women is not being fully utilised in India's economy.

Several social and structural issues may explain this gap. Despite increasing literacy, women's participation in the workforce is low compared to other countries. This is due to social expectations, safety concerns, and limited access to jobs. Additionally, the quality of education, skill mismatches, and unequal access to higher education and vocational training further restrict women's ability to contribute to the economy effectively.

Improving female literacy is a major social achievement; its economic benefits are limited by barriers that keep educated women from working or succeeding in the job market. Therefore, boosting female education should go hand in hand with creating supportive job policies, enhancing skill development, and providing safe and fair work environments to make the most of women's contributions to India's economic growth.

## REFERENCES

1. Becker, G. S. (1964). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. University of Chicago Press.
2. Chatterjee, E., Desai, S., & Vanneman, R. (2018). *Indian paradox: Rising education, declining women's employment*. *Demographic Research*, 38(31), 855-878. <https://doi.org/10.4054/DemRes.2018.38.31>
3. Census of India. (2011). *Provisional Population Totals. Literacy rates, females*. Office of the Registrar General & Census Commissioner.
4. <https://censusindia.gov.in/nada/index.php/catalog/42611/download/46274/Census%20of%20India%202011-Provisional%20Population%20Totals.pdf>
5. Ministry of Statistics & Programme Implementation. (2022). *Women & Men in India 2022: Education Statistics*. Government of India.



- [https://mospi.gov.in/sites/default/files/publication\\_reports/women-men22/EducationStatistics22.pdf](https://mospi.gov.in/sites/default/files/publication_reports/women-men22/EducationStatistics22.pdf)
6. Ministry of Statistics & Programme Implementation. (2024). *Women & Men in India 2024: Selected Indicators and Data*. Government of India. <https://mospi.gov.in/publication/women-men-india-2024-selected-indicators-and-data>
  7. World Bank. (2024). *Adult female literacy rate (% of females ages 15 and above) – India* (Indicator: SE.ADT.LITR.FE.ZS). *World Development Indicators*. Retrieved from <https://data.worldbank.org/indicator/SE.ADT.LITR.FE.ZS?locations=IN>
  8. World Bank. (2024). *GDP growth (annual %) – India* (Indicator: NY.GDP.MKTP.KD.ZG). *World Development Indicators*.
  9. International Labour Organisation (ILO). (2021). *Women and Labour Market Trends in India*.
  10. Klasen, S., & Lamanna, F. (2009). The impact of gender inequality in education and employment on economic growth: New evidence for a panel of countries. *Feminist Economics*, 15(3), 91–132