

## RESEARCH ARTICLE

## LITERACY AND WORK PARTICIPATION OF URBAN FEMALE POPULATION IN UTTAR PRADESH: A REGIONAL ANALYSIS

Shamshad, Prince Yadav\*

Department of Geography at Aligarh Muslim University (AMU), Aligarh, Uttar Pradesh, India.

\*Corresponding Author Email: [prince4amu@gmail.com](mailto:prince4amu@gmail.com)

This is an open access journal distributed under the Creative Commons Attribution License CC BY 4.0, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited

## ARTICLE DETAILS

## Article History:

Received 26 January 2026  
Revised 20 February 2026  
Accepted 25 February 2026  
Available online 05 March 2026

## ABSTRACT

This research paper aims to analyze the regional patterns of literacy and work participation of the urban female population and find out the correlation between female literacy (dependent variable) and work participation rates (independent variables) in the state of Uttar Pradesh. The entire research work is based on the secondary sources of data collected from the Census of India (2011) publications, New Delhi and the statistical handbook of Uttar Pradesh. The boundary of the district has been taken as a small unit of the study. The regional distribution of urban female literacy rates shows a steady increase from the eastern to the western parts and from the southern to the northern parts of the state. A high level of urban female work participation is concentrated in the southern and eastern parts of the state, except for a few districts in the western parts of Uttar Pradesh. The coefficients of correlation indicate a positive relationship between work participation, including main work participation and marginal work participation in the study area.

## KEYWORDS

Literacy; Work Participation; Female Population; Region: Uttar Pradesh.

## 1. INTRODUCTION

"Literacy and work participation attainment are the key indicators of development as they indicate socio-economic growth, quality of life, awareness level, and also measure the skill level of people in the society" (Census of India, 2011). They are broadly considered as the bases for the accomplishment of gender equality and inclusive sustainable development.

"Literacy is the ability to identify, understand, interpret, create, communicate, and compute, using printed and written materials associated with varying contexts. It involves a continuum of learning in enabling individuals to achieve their goals, to develop their knowledge and potential, and to participate fully in their community and wider society" (UNESCO, 2004). According to the Census of India (2011), literacy is defined as "A person aged 7 years and above who can both read and write with understanding in any language is considered literate". Females traditionally had less control over resources or ideology, and they also have limited access to decision-making power (Patkar, 1995). Literacy enables the female population to participate more effectively in decision-making and career-building processes in local body elections, such as panchayats and municipalities. These are signs that literacy enables women's autonomy in decision-making, education, health, hygiene, nutrition, family planning, childcare, and employment, among other areas (Ghosh, 2003). Thus, literacy for females is not simply the ability to read and write in any language; it is a means to gain self-confidence, knowledge, decision-making powers in society, fight for fundamental rights, and achieve economic independence. According to the World Bank, females face everyday barriers to education caused by poverty, cultural norms and practices, poor infrastructure, domestic violence, and fragility.

Work has been defined as participation in any economically productive activity; such participation may be physical or mental in nature. It involves not only actual work but also effective supervision and direction of work (Census of India, 1981). Simultaneously with literacy, the active

participation of women in the workforce, as reflected in the Gross Domestic Product (GDP), reflects not only individual empowerment and growth but also the extent of societal growth. We observe that future work participation growth depends on the evolution of attitudes towards literacy and the combination of paid work and children (Euwals et al., 2011). The contribution of both micro and macro levels to the economy is that female participation in the workforce is beneficial for the nation's overall growth (Labour Force Survey Reports, 2023-24). After the adoption of economic reform in 1991, the better economic growth the country, but the contribution of female work participation was not satisfactory (Chandrasekhar and Ghosh, 2013). There is a close relationship between education and depression, caused by work stress (Peter, 2013). Religion-wise, female work participation in developing countries like India, also low work participation due to low literacy, poverty, unemployment, unskilled labour, early marriage, institutional family marriage system, purdah system (i.e., Social and psychological restriction), rigid patriarchal practices, and political marginalization (Hussain and Siddiqui, 2013, and Das, 2003).

The Government of India is also promoting technical skills, online education, women's safety, and emergency assistance, as well as actions against workplace harassment of women, among a large number of females, and encouraging the widespread use of mobile applications (Munjal, 2024). As access to affordable technology significantly boosts female empowerment, and digital literacy serves as a foundational pillar of digital transformation and social innovation (Judijanto, 2025; Saleh Alshebami et al., 2025). According to study of Saurabh et al., (2013) female literacy is negatively related to some socio-economic parameters like total fertility rate (TFR), maternal mortality rate (MMR), population growth rate, infant and child mortality rate, and female literacy is positively correlated with age of marriage, health condition, domestic violence, and work participation in the modern sectors of the economy.

## 1.1 Objective of the Study

The present research work has been undertaken with the following

## Quick Response Code



## Access this article online

Website:  
[www.magg.com.my](http://www.magg.com.my)

DOI:  
10.26480/magg.01.2026.05.17

objectives:

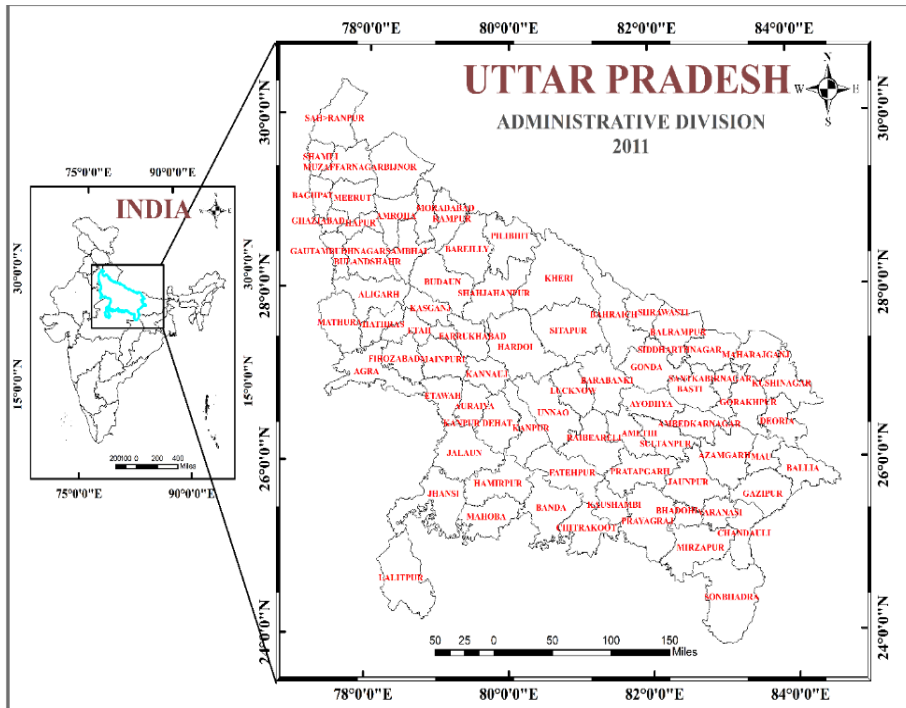
- to find out the temporal trends of literacy and work participation of the urban female population in the state of Uttar Pradesh,
- to analyse the spatial pattern of literacy and work participation of the urban female population in the study area, and
- to find out the relationship between literacy and work participation of the urban female population in the state.

**2. THE STUDY AREA**

The entire research study is based on secondary sources of data that have been taken from the Census of India (2011), New Delhi, and the Statistical Handbook of Uttar Pradesh. The state of Uttar Pradesh, situated in the northern part of the country, has been selected for the present research

work. In this analysis, a set of indicators is used to illustrate the spatial distribution of literacy and work participation among urban female populations in seventy-one districts of Uttar Pradesh, India.

Its geographical extension, i.e., from 23°52' N to 31°28' N latitudes and from 77°04' E to 84°38' E longitudes. The boundary as a state shares nine states and one international border. In the north, they share a border with Nepal and Uttarakhand, Himachal Pradesh in the northwest, Haryana and Delhi in the west, Rajasthan in the southwest, Madhya Pradesh and Chhattisgarh in the south, and Bihar and Jharkhand to the east. The state has extensive dominance of the physiographic Gangetic plain region in the northern parts. Like other states in the northern India, the state has three distinct seasons: winter, summer, and the monsoon, characterised by high temperatures in summer and low temperatures in the winter season. The monsoon season typically runs from late June to early July and lasts until October.



Source: Census of India, 2011

**3. DATABASE AND METHODOLOGY**

The present research work is based entirely on secondary data sources, collected from the 2011 Census of India, New Delhi. In the first step, collect the raw data for all dependent and independent variables that determine the areal differentiations of state levels in terms of literacy and work participation among urban female populations. These variables have been converted to percentages, commonly referred to as percentage changes. The raw data collected regarding the total number of literate females in the seventy-one districts of Uttar Pradesh are converted into their corresponding literacy rates of females.

$$P = \frac{X_i}{X_T} \times 100$$

Where;

P = Percentage of Variable

X<sub>i</sub> = Observed value of variable

X<sub>T</sub> = Total observed value of variables

To analyse the status of female literacy rates among urban female populations in all seventy-one districts of Uttar Pradesh, statistical data are processed and plotted on the latest administrative map of Uttar Pradesh, using the “Monochromatic map Scheme”. To show the correlation between literacy and work participation of the female population, we used the correlation coefficient, which was worked out between both variables (dependent variable (female literacy) and independent variable (female work participation)). The correlation coefficient has been calculated, which is based on Karl Pearson’s correlation coefficient (r) method, which is given below:

$$r = \frac{\sum xy - \frac{\sum x \sum y}{n}}{\sqrt{\sum x^2 - \frac{\sum x^2}{n}} \sqrt{\sum y^2 - \frac{\sum y^2}{n}}}$$

Where;

r = coefficient of correlation.

x, y = two given variables.

n = the number of observations.

To find out the computed 't' value, the student t-test technique is used, which is given below:

$$t = r \sqrt{\frac{n-2}{1-r^2}}$$

Where;

t = calculated value of 't' in the test of significance.

n = number of observations.

r = coefficient of correlation.

Additionally, advanced cartographic techniques, specifically Q-GIS (Version 3.42), and statistical software, such as SPSS, were employed to calculate the coefficient of correlation. These tools have been applied to show the spatial distribution of literacy and work participation of the urban female population in Uttar Pradesh, India, through maps.

**4. THE RESULTS AND DISCUSSION**

**4.1 Trends in Literacy and Work Participation.**

Literacy and work participation are key indicators that show both socio-economic and sustainable development within society. According to the Census of India (1981-2011), the state of Uttar Pradesh has shown a sustained improvement in urban female literacy rates, registering a shift from 35.8% in 1981 to 69.2% in 2011. (See Table 1).

**Table 1:** Trends in Literacy and Work Participation of Urban Female Population, 1981-2011

Years	Uttar Pradesh		India	
	Literacy Rate	Work Participation Rate	Literacy Rate	Work Participation Rate
1981	35.8	4.6	56.3	8.31
1991	50.3	4.7	64	9.1
2001	56.3	6.8	73.2	11.8
2011	69.2	11.3	79.1	15.5

Source: Census of India

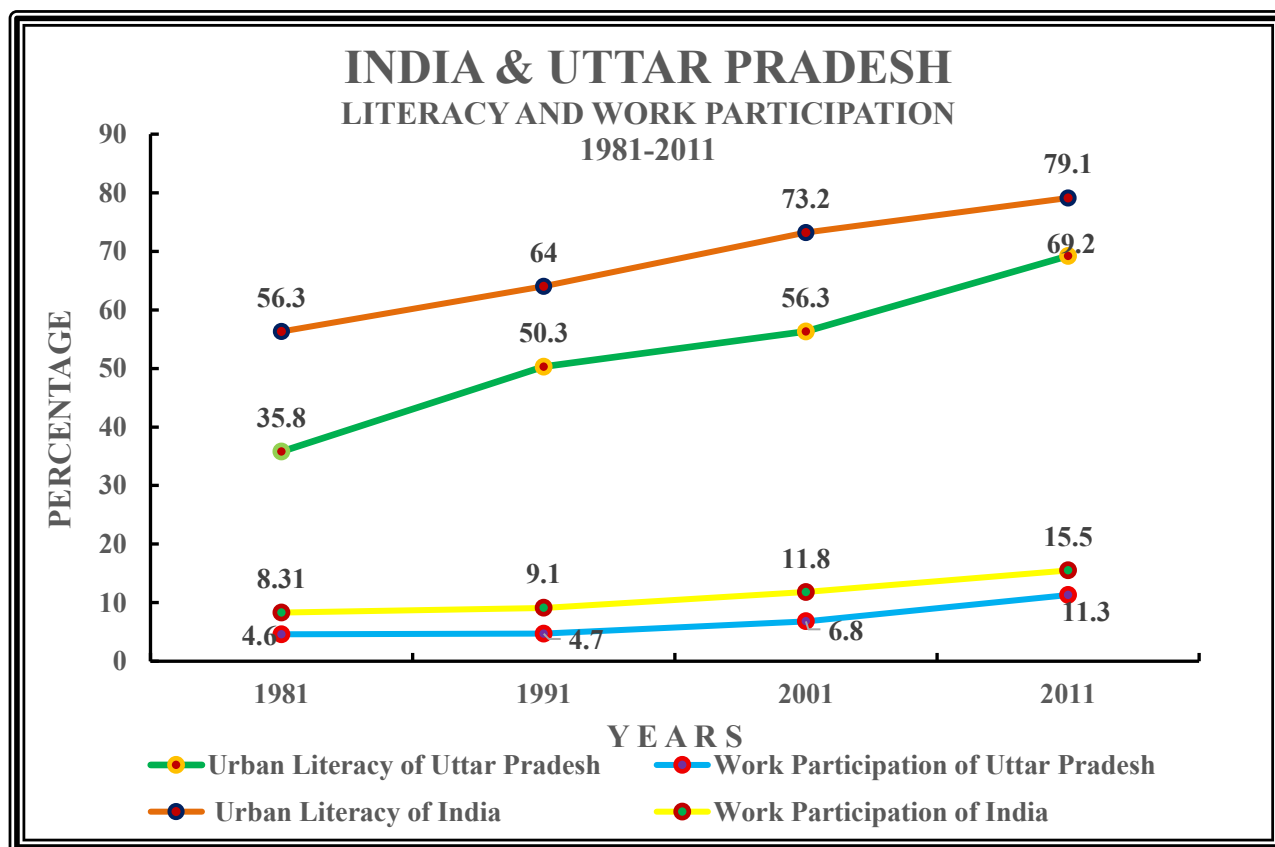


Figure 1: Source Based on Table 1

This upward trend in urban female literacy in Uttar Pradesh parallels the improvement seen at the national level, with an improvement of urban female literacy in India, from 56.35 per cent in 1981 to 79.1 per cent in 2011 (see Table 1), but the state's urban female literacy lags behind the national average of India during the same period of study.

Similarly, the urban female literacy rate and the work participation rate of urban females in Uttar Pradesh have increased continuously from 4.6 per

cent in 1981 to 11.3 per cent in 2011, according to the Census of India (see Table 1). This positive trend growth of urban female work participation of Uttar Pradesh parallels the improvements seen at the national level, with a work participation of urban female population of India, from growth of 8.31 percent in 1981 to 15.5 percent in 2011 but seen that the average urban female works participation of Uttar Pradesh lack behind the national average in census of 2011 (see table 1).

**Table 2:** Percent Distribution of Literacy and Work Participation of Urban Female Population in Uttar Pradesh, 2011

Districts	Literacy Rate	Work Participation Rate	Main Work Participation Rate	Marginal Work Participation Rate
Saharanpur	69.1	7.5	5.3	2.2
Muzaffarnagar	63.5	6.9	4.7	2.2
Bijnor	63.7	4.8	4.5	2.2
Moradabad	58.8	8.0	5.2	2.9
Rampur	51.4	8.3	6.0	2.3
Jyotiba Phule Nagar	58.7	9.2	6.1	3.1
Meerut	68.2	10.1	6.8	3.3
Baghpat	64.0	7.3	4.9	2.5

**Table 2 (cont):** Percent Distribution of Literacy and Work Participation of Urban Female Population in Uttar Pradesh, 2011

<b>Ghaziabad</b>	73.9	12.3	8.3	4.0
<b>Gautam Buddha Nagar</b>	77.2	16.3	12.2	4.1
<b>Bulandshahr</b>	60.7	8.6	5.9	2.7
<b>Aligarh</b>	61.3	9.5	6.0	3.5
<b>Mahamaya Nagar</b>	64.6	7.7	4.1	3.6
<b>Mathura</b>	66.4	9.4	5.8	3.6
<b>Agra</b>	66.5	13.2	7.6	5.6
<b>Firozabad</b>	64.0	15.4	9.6	5.7
<b>Mainpuri</b>	74.1	7.5	4.8	2.7
<b>Budaun</b>	52.4	6.5	4.1	2.4
<b>Bareilly</b>	56.5	12.5	7.7	4.8
<b>Pilibhit</b>	57.8	8.5	5.3	3.2
<b>Shahjahanpur</b>	58.8	7.4	4.8	2.6
<b>Kheri</b>	66.5	8.9	5.3	3.6
<b>Sitapur</b>	67.4	10.9	6.6	4.3
<b>Hardoi</b>	65.6	9.2	5.7	3.6
<b>Unnao</b>	69.9	9.8	5.6	4.2
<b>Lucknow</b>	77.9	13.7	8.7	5.0
<b>Rae Bareli</b>	73.3	12.3	7.3	5.0
<b>Farrukhabad</b>	67.8	9.3	6.1	3.2
<b>Kannauj</b>	64.7	14.6	9.5	5.1
<b>Etawah</b>	77.2	8.8	5.5	3.3
<b>Auraiya</b>	81.0	8.4	5.8	2.6
<b>Kanpur Dehat</b>	74.4	9.8	5.7	4.0
<b>Kanpur Nagar</b>	79.5	11.0	7.3	3.7
<b>Jalaun</b>	70.1	9.4	5.5	3.9
<b>Jhansi</b>	74.1	14.7	8.1	6.6
<b>Lalitpur</b>	73.5	13.9	8.3	5.6
<b>Hamirpur</b>	67.8	14.1	8.2	5.9
<b>Mahoba</b>	64.5	11.5	7.1	4.4
<b>Banda</b>	71.5	11.8	7.4	4.4
<b>Chitrakoot</b>	67.6	9.2	6.2	3.0
<b>Fatehpur</b>	69.3	11.7	6.3	5.4
<b>Pratapgarh</b>	72.5	14.6	7.1	7.5
<b>Kaushambi</b>	61.9	18.1	10.5	7.6
<b>Allahabad</b>	77.3	16.9	9.1	7.8
<b>Bara Banki</b>	64.6	12.4	7.3	5.0
<b>Faizabad</b>	75.1	12.1	6.9	5.2
<b>Ambedkar Nagar</b>	70.8	12.1	6.0	6.1
<b>Sultanpur</b>	77.2	11.1	7.0	4.1
<b>Bahraich</b>	65.2	10.0	6.0	3.9

<b>Table 2 (cont):</b> Percent Distribution of Literacy and Work Participation of Urban Female Population in Uttar Pradesh, 2011				
Shrawasti	58.1	4.9	2.9	2.0
Balrampur	61.0	8.5	4.6	3.9
Gonda	71.6	10.3	6.2	4.2
Siddharthnagar	64.3	12.8	6.7	6.1
Basti	76.3	8.6	5.3	3.3
Sant Kabir Nagar	66.8	12.4	5.7	6.7
Mahrajganj	70.0	9.2	5.2	4.0
Gorakhpur	76.5	12.4	7.0	5.4
Kushinagar	67.8	8.8	4.9	3.8
Deoria	72.8	7.8	4.4	3.4
Azamgarh	71.7	16.0	9.7	6.2
Mau	71.8	20.1	13.8	6.2
Ballia	70.4	13.6	6.4	7.1
Jaunpur	74.0	9.7	6.4	3.4
Ghazipur	73.3	10.7	7.2	3.5
Chandauli	70.0	10.7	5.2	5.5
Varanasi	72.9	13.4	9.1	4.2
Sant Ravidas Nagar (Bhadohi)	64.5	11.1	6.7	4.5
Mirzapur	67.8	14.4	7.9	6.5
Sonbhadra	76.9	8.8	5.7	3.1
Etah	70.7	9.0	5.9	3.1
Kanshiram Nagar	57.6	9.5	6.6	3.0
Uttar Pradesh	69.2	11.3	6.7	4.6

Source: Census of India, 2011.

#### 4.2 Urban Female Literacy

Literacy is considered one of the key indicators of the socio-economic development of the society. According to the Census of India (2011), the urban female literacy rate was recorded 69.2 per cent in the state of Uttar Pradesh. Table 2 illustrates the district-wise spatial distribution of urban female literacy, revealing a wide range of regional variations in female literacy across the state, which varies from the highest 81 per cent in Auraiya district to the lowest 51.4 per cent in Rampur district. This range of variation in urban female literacy is classified into five categories, i.e., very high (above 75.4 per cent), high (75.4 to 69.5 per cent), medium (69.5 to 63.6 per cent), low (63.6 to 57.7 per cent), and very low (below 57.7 per cent) (Table 3 and Figure 2).

Table 3 shows that ten districts of the state experienced a very high level (above 75.4 per cent) of urban female literacy. Among these districts, only

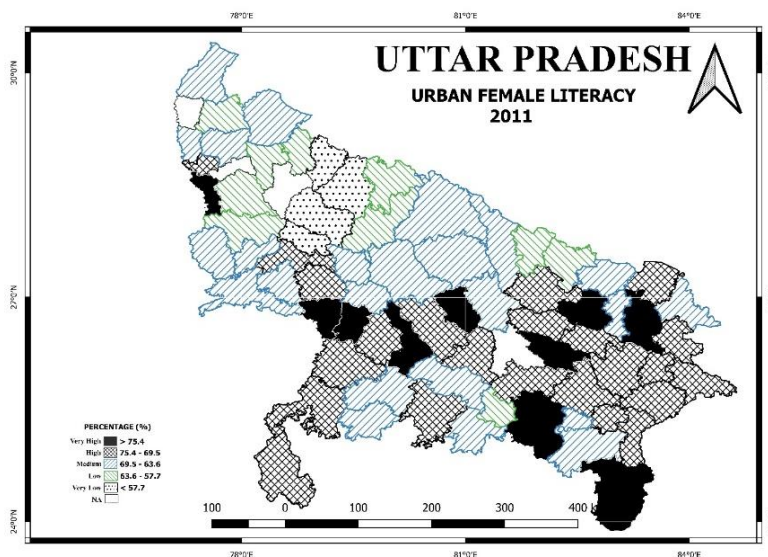
a small region is formed by Auraiya and Etawah in the western part, and the rest of the districts are scattered throughout the study area, not forming any notable region in the state. The twenty-three districts of the state have a high literacy rate, ranging from 75.4 to 69.5 per cent among urban females. Among these districts, twelve districts, constituted a contiguous macro region in the eastern part, north-eastern part, and central part (viz. Azamgarh, Ballia, Chandauli, Deoria, Ghazipur, Faizabad, Jaunpur, Ambedkar Nagar, Varanasi, Pratapgarh, Rae Bareilly and Unnao), and four districts of the state made a long linear region in the south-western parts (Jalaun, Kanpur Dehat, and Mainpuri and Faizabad), constituting four outstanding regions of high urban female literacy, where the rest of the districts of same category are scattered in the study area. The reasons for high female literacy may include the availability of good transportation connectivity and educational infrastructure, a positive attitude toward female literacy, moderate socio-economic conditions among the urban female population, and other factors (Kim, 2025).

<b>Table 3:</b> Distribution of Urban Female Literacy in Uttar Pradesh, 2011			
Category	Range (%)	No. of Districts	Name of Districts
Very High	Above 75.4	10	Allahabad, Auraiya, Basti, Etawah, Gautam Buddha Nagar, Gorakhpur, Kanpur Nagar, Lucknow, Sonbhadra, Sultanpur
High	75.4 To 69.5	23	Ambedkar Nagar, Azamgarh, Ballia, Banda, Chandauli, Deoria, Etah, Faizabad, Ghaziabad, Ghazipur, Gonda, Jalaun, Jaunpur, Kanpur Dehat, Lalitpur, Mahrajganj, Mainpuri, Mau, Pratapgarh, Rae Bareilly, Varanasi, Unnao, Jhansi.

**Table 3 (cont):** Distribution of Urban Female Literacy in Uttar Pradesh, 2011

<b>Medium</b>	69.5 To 63.5	24	Agra, Bahraich, Baghpat, Bara Banki, Saharanpur, Bijnor, Chitrakoot, Farrukhabad, Fatehpur, Firozabad, Hamirpur, Hardoi, Sant Ravidas Nagar (Bhadohi), Kannauj, Kheri, Kushinagar, Mahamaya Nagar, Mathura, Meerut, Mirzapur, Sant Kabir Nagar, Mahoba, Siddharthnagar, Sitapur
<b>Low</b>	63.6 To 57.7	10	Aligarh, Balrampur, Bulandshahr, Jyotiba Phule Nagar, Kaushambi, Moradabad, Muzaffarnagar, Pilibhit, Shahjahanpur, Shrawasti
<b>Very Low</b>	Below 57.7	4	Rampur, Budaun, Bareilly, Kanshiram Nagar

Source: Based on Table 2.



**Figure 2:** Source Based on Table 3

The twenty-four districts of the state of Uttar Pradesh experienced a medium level of literacy rate of 69.5 to 63.5 per cent among the urban female population. Among these districts, seven districts constituted an extensive region on the northern part (Bahraich, Bara Banki, Farrukhabad, Kannauj, Hardoi, Kheri, Sitapur), two pockets of four districts each lie in the southern parts (Mahoba, Hamirpur, Fetehpur, Chitrakoot), and the western parts (Firozabad, Mathura, Hathras, Agra) respectively, and three districts are lie in the north-western parts (Baghpat, Meerut, Bijnor), and two micro regions spreading in the north-eastern part (Santh Kabir Nagar, Siddhnagar) south-eastern parts ( Mirzapur, Bhadohi), and rest of districts of same categories are scattered in the study area (Figure 2). Ten districts of the state experienced a low level of literacy rate, ranging between 63.5 to 57.7 per cent of the urban female population. Among these districts, they form three regions: three districts lie in the north-western part (Aligarh, Moradabad, Amroha, and Bulandshahr), and two pockets of two districts lie in both the northern parts (Pilibhit, Shajahanpur, and Shrawasti, Balrampur).

Only four districts have recorded a very low literacy rate of less than 57.7 per cent among the urban female population. These districts form a macro region in the north-western part (Rampur, Budaun, Bareilly, and Kanshiram Nagar). The reasons behind a low, and very low female literacy in Uttar Pradesh are poor institutional infrastructure, like school facilities and long distances to schools can discourage attendance, separate toilet facilities, especially among girls, safety concerns, and societal norms like early marriage, dominance of patriarchal thought, low income of the parents poverty, unemployment, early marriage, sex selective migration for education and work, digital gap, mainly among females, etc. (Sakshi and Bano, 2023).

**4.3 Urban Female Work Participation**

Active female work participation in the Gross Domestic Product (GDP) reflects not only individual female empowerment but also serves as a driving force for the nation's rapid socio-economic development (Jha et al., 2019). According to the Census of India (2011), the urban female work participation of Uttar Pradesh is 11.3 per cent, which is below the national average. Table 4 shows that the distribution of urban female work participation, which represents a wide range of regional variation, lies the highest to 20.1 per cent in Mau district to the lowest of 4.8 per cent in Rampur district in the state of Uttar Pradesh. This wide range of variation in work participation of the urban female population, divided into five categories, i.e, very high (above 17 per cent), high (17 to 13.9 per cent), medium (13.9 to 10.9 per cent), low (10.9 to 7.8 per cent), and very low below 7.8 per cent (Table 4).

Table 4 exhibits a very high level of urban female work participation (above 17 per cent) in two districts of the study area, i.e, Kaushambi and Mau. They don't make any remarkable region and are scattered in the state of Uttar Pradesh. Ten districts have high urban female work participation rates (17 to 13.9 per cent), and it has been observed that they are located in two specific regions. Among these districts four districts lie in the eastern part of the state (Allahabad, Pratapgarh, Azamgarh, and Mirzapur), three districts in the southern parts (Hamirpur, Jhansi, and Lalitpur), and the rest of the districts don't form any constituted region and are scattered in the study area (Figure 3). These very high and high female work participation, likely due to education, play a key role, increased engagement in agricultural activities, self-employment, participation in informal sectors, targeted government initiatives promoting women's employment, a safe and productive nature of society, and good socio-economic condition of the urban female population, etc (Chakrabarty, 2025).

**Table 4:** Distribution of Urban Female Work Participation in Uttar Pradesh, 2011

Category	Range (%)	No. of Districts	Name of Districts
Very High	Above 17	2	Kaushambi and Mau.

Table 4 (cont): Distribution of Urban Female Work Participation in Uttar Pradesh, 2011			
High	17 - 13.9	10	Allahabad, Azamgarh, Firozabad, Gautam Buddha Nagar, Hamirpur, Jhansi, Kannauj, Lalitpur, Mirzapur, and Pratapgarh.
Medium	13.9 - 10.9	20	Agra, Ambedkar Nagar, Ballia, Banda, Bara Banki, Bareilly, Faizabad, Fatehpur, Ghaziabad, Gorakhpur, Kanpur Nagar, Lucknow, Mahoba, Rae Bareli, Sant Kabir Nagar, Sant Ravidas Nagar (Bhadohi), Siddharthnagar, Sitapur, Sultanpur, and Varanasi.
Low	10.9 - 7.8	30	Aligarh, Auraiya, Bahraich, Balrampur, Basti, Bulandshahr, Chandauli, Chitrakoot, Deoria, Etah, Etawah, Farrukhabad, Ghazipur, Gonda, Hardoi, Jalaun, Jaunpur, Jyotiba Phule Nagar, Kanshiram Nagar, Kanpur Dehat, Kheri, Kushinagar, Mahrajganj, Mathura, Meerut, Moradabad, Pilibhit, Rampur, Sonbhadra, and Unnao.
Very Low	Below 7.8	9	Baghpat, Bijnor, Budaun, Mahamaya Nagar, Mainpuri, Muzaffarnagar, Saharanpur, Shahjahanpur, and Shrawasti.

Source: Based on Table 2.

The reason behind low and very low urban female work participation is that household responsibilities, social obligations, and security concerns often force females to accept rather unfavorable terms of working

conditions, low wages, and long working hours (Institute of Applied Manpower Research (India) and International Labour Organisation, 2013).

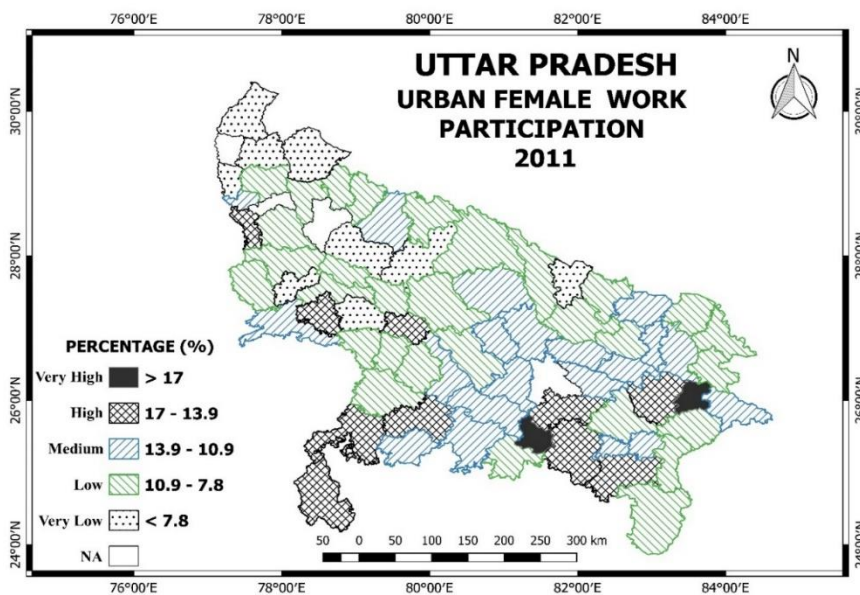


Figure 3: Source Based on Table 4

The work participation rate (13.9 to 10.9 per cent) encompasses twenty districts, indicating a medium level of engagement by the urban female population in the workforce. These constituted two remarkable regions in the study area. Among these sixteen districts of the state, the first region constituted an extensive region, lies in the central and the north-eastern parts (Agra, Ambedkar Nagar, Banda, Bara Banki, Bareilly, Faizabad, Fatehpur, Gorakhpur, Kanpur Nagar, Lucknow, Mahoba, Rae Bareli, Sant Kabir Nagar, Siddharthnagar, Sitapur, and Sultanpur), and remaining districts don't make any contiguous region and are scattered in in the study area. The thirty districts experiencing a low work participation rate, 10.9 to 7.8 per cent, indicate a low level of engagement by the urban female population in the workforce. Among these districts, they formed three remarkable regions. The first region covers an extensive area containing seventeen districts concentrated in the northern, central, and north-western parts (See figure 3), the second region contains four districts that lie in the south-western parts (Jalaun, Kanpur Dehat, Etawah, Auraiya), the third region also contains three districts that are concentrated in the

north-eastern parts (Mahrajganj, Kushinagar, Deoria), and the rest of districts don't make any continuous region, and are dispersed in the study area. The nine districts experience very low work participation rates, with less than 7.8 per cent of the urban female workforce. These districts are from two remarkable regions, the first region consists of four districts (Baghpat, Bijnor, Muzaffarnagar, and Saharanpur) concentrated in the north-western part of the study area, and the second region contains two districts (Badaun and Shahjahanpur) that lie in the northern part of the study region, and the rest of the districts do not form any remarkable region, and are scattered in the state of Uttar Pradesh (Figure 3).

#### 4.4 Urban Female Main Work Participation

According to the Census of India, 1981, "The marginal workers are those who have worked any time at all in the year preceding the enumeration more than 180 days but have not worked for a major part of the year". Table 2 also shows that there is a wide range of spatial distribution in the

female workforce, with district-wise urban female main work participation rate 6.7 per cent, and in the study area, which varies from the highest of 13.8 per cent in Mau district and the lowest of 2.9 per cent in Shrawasti district. This wide range of regional variation in the urban main

work participation is grouped into five categories, i.e, very high above 11.6 per cent, high (11.6 to 9.4 per cent), medium (9.4 to 7.2 per cent), low (7.2 to 5 per cent), and very low below 5 per cent (Table 5).

Table 5: Distribution of Urban Female Main Work Participation in Uttar Pradesh, 2011			
Category	Range (%)	No. of Districts	Name of Districts
Very High	Above 11.6	02	Gautam Budh Nagar and Mau
High	11.6 - 9.4	04	Azamgarh, Firozabad, Kannauj, and Kaushambi
Medium	9.4 - 7.2	15	Agra, Allahabad, Banda, Bara Banki, Bareilly, Ghaziabad, Ghazipur, Hamirpur, Jhansi, Kanpur Nagar, Lalitpur, Lucknow, Mirzapur, Rae Bareli, and Varanasi
Low	7.2 - 5.0	39	Aligarh, Ambedkar Nagar, Bulandshahr, Auraiya, Bahraich, Ballia, Basti, Chandauli, Chitrakoot, Etah, Farrukhabad, Mathura, Meerut, Fatehpur, Gonda, Hardoi, Jaunpur, Jalaun, Jyotiba Phule Nagar, Kanshiram Nagar, Sant Kabir Nagar, Kanpur Dehat, Kheri, Mahoba, Mahrajganj, Moradabad, Pilibhit, Pratapgarh, Rampur, Etawah, Faizabad, Saharanpur, Gorakhpur, Sant Ravidas Nagar (Bhadohi), Siddharthnagar, Sitapur, Sonbhadra, Sultanpur, and Unnao
Very Low	Below 5.0	11	Baghpat, Balrampur, Bijnor, Budaun, Deoria, Kushinagar, Mahamaya Nagar, Mainpuri, Muzaffarnagar, Shahjahanpur and Shrawasti.

Source: Based on Table 2

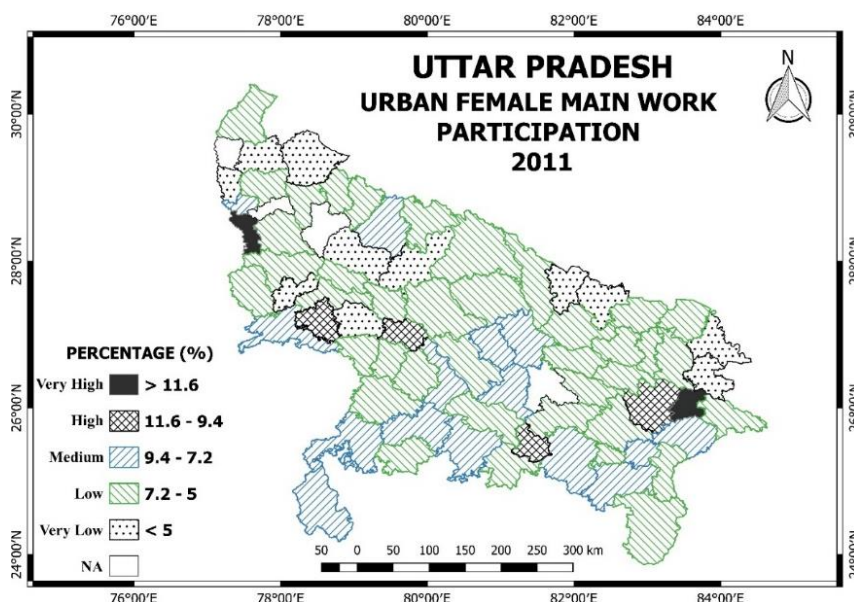


Figure 4: Source Based on Table 5

Table 5 indicates that a very high level of urban female main work participation, above 11.6 per cent, has been observed in two districts (Gautam Budh Nagar and Mau), which do not form a continuous region and were scattered throughout the study area. Four districts (Azamgarh, Firozabad, Kannauj, and Kaushambi) exhibit a high urban female work participation rate (11.6 to 9.4 per cent). Among these districts, they do not form any notable regions and are dispersed in the state of Uttar Pradesh. The very high and high urban female workforce could be due to such engagement in Agro-based industry, IT-industry, self-employment, participation in informal sectors like manufacturing industries, and government initiatives promoting women's employment.

The medium female main work participation rate (9.4 to 7.2 per cent) of urban females, which was registered in the fifteen districts, constitutes three outstanding regions in the study area. Among these districts, five districts lie in the southern part (Jhansi, Lalitpur, Kanpur Nagar, Hamirpur, Banda), four pocket districts concentrated in the south-eastern parts (Varanasi, Prayagraj, Mirzapur, Ghazipur), the third region constituted three districts which lies the central parts (Agra, Lucknow, Rae Bareli), and rest of districts lie in the same category scattered in the state of Uttar Pradesh (Figure 4).

A low main work participation rate (7.2 to 5 per cent) was recorded in thirty-nine districts, which account for fifty-four per cent of the area's urban female population in Uttar Pradesh. Among these districts, they form both major and micro regions, which are concentrated in the

northern, eastern, and western parts of the state of Uttar Pradesh (Figure 4). The eleven districts, which experience very low main work participation (below 5.0 per cent) of urban females. These districts are formed of four identical micro-level regions: the first region contains three are located in the north-western part (Baghpat, Muzaffarnagar, Bijnor), three small pocket regions each contain two districts, located in the north-western part (Budaun, Mahamaya Nagar), the northern parts (Shrawasti, Balrampur), and the north-eastern parts (Deoria, Kushinagar) and the rest of the districts are scattered in the study area. The cause behind low urban female main work participation could be low literacy, less industrial environment, lower wages unskilled labour poverty, fewer job opportunities, early marriage, and rigid patriarchal thought, generally the both socio-economic backwards, indigent's, and most underprivileged section of the society, live into low standard of living (pathetic and pitiable situations) and female labors do dual duty they works both: inside their homes and outside office, agriculture field and industry etc. which directly and indirectly effects health of female populations (Parveen, 2014).

4.5 Urban Female Marginal Work Participation

As per the Census of India, 2011, a marginal work participant refers to an individual, "a person who worked for 3 months or less, but less than six months of the reference period in any economic activity". Table 2 shows that district-wise urban female marginal work participation, indicating a broad range of regional variations in work participation among the districts of Uttar Pradesh. The highest variation of 7.8 per cent is observed

in the Allahabad (Prayagraj) district, while the lowest variation of 2.0 per cent is found in the Shrawasti district. They are divided into five categories: very high (above 6.7 per cent), high (6.7 to 5.6 per cent),

medium (5.6 to 4.5 per cent), low (4.5 to 3.4 per cent), and very low below 3.4 per cent (Table 6).

Table 6: Urban Female Marginal Work Participation in Uttar Pradesh, 2011			
Category	Range (%)	No. of Districts	Name of Districts
Very High	Above 6.7	06	Allahabad, Ballia, Jhansi, Kaushambi, Pratapgarh, and Sant Kabir Nagar
High	6.7 - 5.6	09	Agra, Ambedkar Nagar, Azamgarh, Firozabad, Hirpur, Lalitpur, Mau, Mirzapur, and Siddharthnagar
Medium	5.6 - 4.5	10	Bareilly, Bara Banki, Chandauli, Faizabad, Fatehpur, Gorakhpur, Kannauj, Lucknow, Rae Bareli, and Sant Ravidas Nagar (Bhadohi)
Low	4.5 - 3.4	24	Aligarh, Bahraich, Balrampur, Banda, Deoria, Gautam Buddha Nagar, Ghazipur, Gonda, Hardoi, Jalaun, Jaunpur, Kanpur Dehat, Kanpur Nagar, Kheri, Kushinagar, Mahamaya Nagar, Mahoba, Mahrajanj, Mathura, Sitapur, Sultanpur, Jaunpur, Ghazipur, Unnao, Ghaziabad, and Varanasi
Very Low	Below 3.4	22	Auraiya, Baghpat, Basti, Bulandshahr, Budaun, Chitrakoot, Etah, Etawah, Jyotiba Phule Nagar, Mainpuri, Meerut, Moradabad, Muzaffarnagar, Pilibhit, Rampur, Saharanpur, Etawah, Shahjahanpur, Bijnor, Farrukhabad, Kanshiram Nagar, Shrawasti, and Sonbhadra

Source: Based on Table 2.

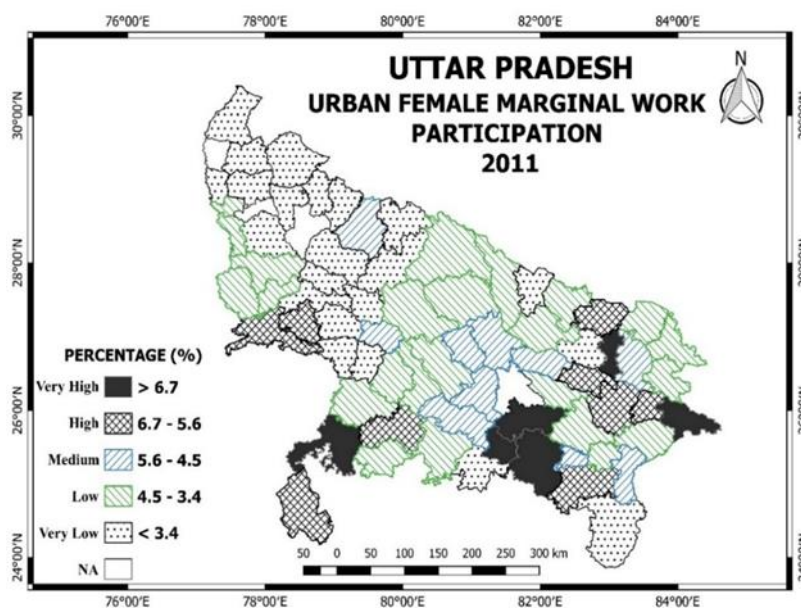


Figure 5: Source Based on Table 6

Table 6 illustrates that six districts experienced a very high level of urban female marginal work participation (above 6.7 per cent) in the study region. Among these districts, one region was constituted, which lies in the eastern parts (Allahabad (Prayagraj), Kaushambi, Pratapgarh), and the remaining districts do not form a contiguous region and are scattered throughout the study area. The high urban female work participation is distinguished within the range of (6.7 to 5.6 per cent), and concentrated in the nine districts in the study area. These districts are formed into two micro-regions: the first region comprises three districts situated in the eastern part (Azamgarh, Ambedkar Nagar, Mau), and the second region contains two districts located in the western part (Firozabad, Agra) in the state of Uttar Pradesh.

A medium level of engagement with the urban female population in marginal work participation (5.6 to 4.5 per cent) was enumerated in ten districts in the state of Uttar Pradesh. Among these, five districts that constitute an outstanding region are located in the central part (Bara Banki, Faizabad, Fatehpur, Lucknow, and Rae Bareli), and the rest of the districts are scattered throughout the state of Uttar Pradesh.

Twenty-four districts of the state recorded a low level of marginal work participation rate (4.5 to 3.4 per cent) among the urban female population. Amid these districts farm major and Minor regions in the state of Uttar Pradesh, nine districts lie in the central parts ( Bahraich, Gonda, Hardoi, Jalaun, Kanpur Dehat, Kanpur Nagar, Kheri, Kushinagar, Shrawasti, and Unnao), three undistinguishable region are concentrated in the study area: first contain three districts lie in the western part (Noida, Aligarh and Mathura), second contain three districts concentrated in the north-western part (Deoria, Mahrajanj and Kushinagar), four districts lie in the eastern parts (Varansi, Jaunpur, Gazipur and Sultanpur), two districts are located in the southern part (Mahoba and Banda) and the rest of the same category districts does not form any identical region and were scattered in the state of Uttar Pradesh. A very low marginal work participation of below 3.4 per cent was experienced in the twenty-two districts that contain urban females. These districts formed a micro region, located in the western and northwestern parts of the study area (Figure 5). The low and very low-level urban female marginal work participation rate in the state is observed could be not fulfill the requirements of better educational infrastructure, weak involvement in the informal and agricultural sectors,

sex selective rural urban male migration in industrially advanced districts, not receive the advantages of government initiatives that promote women's employment, and good socio-economic condition of the female population, etc.

**4.6 Relationship Between Literacy and Work Participation**

Table 7 shows the relationship between literacy and work participation of the urban female population. The spatial variations in literacy and female work participation among urban female populations can be categorised into three groups: high, medium, and low. The horizontal axis represents

female literacy and the vertical axis shows female work participation. In the state of Uttar Pradesh, seven districts witnessed high literacy and high work participation among the urban female population. Among these seven districts, three distinct pockets are identified in the eastern part (Gautam Budh Nagar and Mau), the south-eastern part (Prayagraj and Azamgarh), and the southern parts (Jhansi and Lalitpur) (Figure 6). The reason behind these high levels of literacy and work participation rate among urban females in the study area may be attributed to the availability of better educational infrastructure, skilled labour, and strong involvement in the agricultural sectors and allied activities (Biswas and Banu, 2022).

**Table 7: Literacy v/s Work Participation of Urban Female Population, 2011**

Literacy / Work Participation	Low	Medium	High
Low	Budaun, Muzaffarnagar, Shahjahanpur, Shravasti Kanshiram Nagar, Rampur Aligarh, Balrampur, Bulandshahr, Jyotiba Phule Nagar, Moradabad, Pilibhit	Baghpat, Bijnor, Mahamaya Nagar, Saharanpur, Bahraich, Chitrakoot, Hardoi, Farrukhabad, Kheri, Kushinagar, Mathura, Meerut	Mainpuri, Chandauli, Deoria, Etah, Ghazipur, Gonda, Jalaun, Jaunpur, Kanpur Dehat, Maharajganj, Unnao Auraiyya, Basti, Etawah, Sonbhadra
Medium	Bareilly, Agra	Barabanki, Fatehpur, Mahoba, Sant Kabir Nagar, Sant Ravidas Nagar (Bhadohi), Siddharthnagar, Sitapur	Ambedkar Nagar, Ballia, Banda, Faizabad, Ghaziabad, Rae Bareli, Varanasi, Gorakhpur, Kanpur Nagar, Lucknow, Sultanpur
High	Kaushambi	Firozabad, Hamirpur, Kannauj, Mirzapur	Azamgarh, Jhansi, Lalitpur, Pratapgarh, Allahabad, Gautam Buddha Nagar, Mau

Source: Based on Table 2

Eight districts of the state recorded a medium level of both female literacy and work participation. Among these, four districts formed two identical regions, located in the northern part (Sitapur and Barabanki) and the north-eastern part (Siddharthnagar and Sant Kabir Nagar), while the remaining districts of the same category are widely scattered throughout the state of Uttar Pradesh. The districts with high literacy and low work participation are experienced by the fifteen districts of the state. Out of these, ten districts constituted two major regions; the first region, four districts lie in the south-eastern parts (Jaunpur, Ghazipur, Sonbhadra and Chandauli), the second region contains six districts that are located in the western part (Mainpuri, Kanpur Dehat, Etah, Etawah and Jalaun), and the rest of the districts do not form any region in the study area.

Further, the twenty districts experienced both low literacy and low work participation among the urban female population; where in, nine districts located in the north-western part, i.e. Shahjahanpur, Budaun, Kanshiram Nagar, Rampur, Aligarh, Bulandshahr, Jyotiba Phule Nagar, Moradabad and Pilibhit, made a remarkable region and the remaining districts do not form any region in the state. According to the study of Sakshi and Bano, 2023, the reason behind these conditions may be the negative parental attitudes towards the education of girls' children, inadequate school infrastructure, limited accessibility to schools, unfavourable daily attendance rates, a deficiency of qualified teachers, issues related to teaching quality, and rigid patriarchal thought thus cause less skilled female population, which having low job availability.

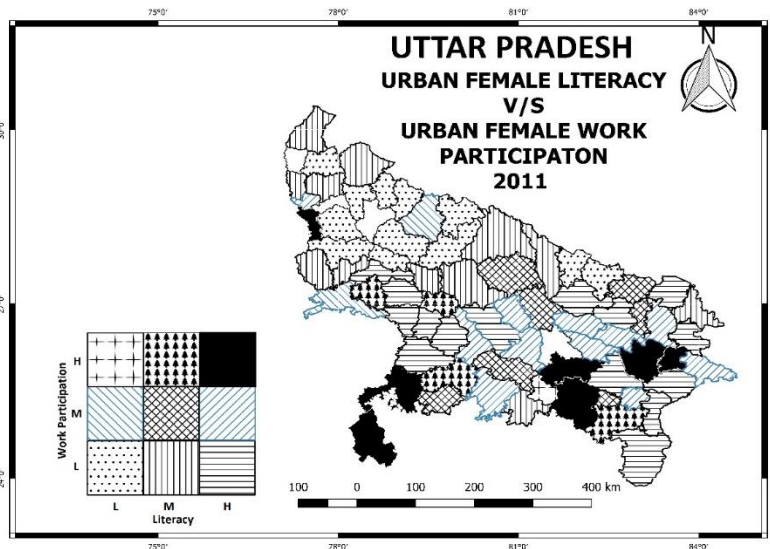


Figure 6: SourceBased on Table 7

**4.7 Relationship of Literacy and Main Work Participation**

Table 8 illustrates the district-wise relationship between female literacy and female main work participation. In this table, the horizontal axis represents female literacy and the vertical axis shows female main work participation. The range of spatial variations in female literacy and main work participation is categorised into three groups: high, medium and low.

A high level of relationship between female literacy and the main work participation rate was observed only in three districts, namely Mau and

Azamgarh, located in the eastern part of the region, except for Gautam Buddha Nagar. Ten districts fall in the class characterised by high female literacy but a medium level of main work participation. These same category districts formed three small regions; the first region is located in the eastern part (Varanasi and Ghazipur), the second region is in the central part (Rae Bareli and Lucknow) and the third region is in the south-western part (Lalitpur, Jhansi) of the state while the remaining districts do not form any remarkable region in the study area.

The four districts experienced a medium level of literacy and main work

participation, but do not form any region. The alarming condition is evident in twenty districts, wherein a high level of female literacy coexists with low female work participation. These districts constitute three regions in the study area, which one is lies the eastern part (Ambedkar Nagar, Ballia, Faizabad, Gonda, Jaunpur, Maharajganj, Pratapgarh, Auraiya, Basti, Gorakhpur, Sonbhadra, Sultanpur, and Deoria); the second is located in the south-eastern part (Sonbhadra and Chandauli), and the third one is in the western part (Jalaun, Auraiya, Etawah and Mainpuri). The category of medium-level female literacy and low main work participation formed three macro-regions in the study area. The region of five districts lies in the northern part (Kheri, Sitapur, Bahraich, Farrukhabad, and Hardoi), the second region of three districts is concentrated in the north-western part (Baghpat, Bijnor and Meerat), the third region of two districts is located in

the southern part (Fatehpur and Chitrakoot), and the rest of the remaining districts do not form any outstanding region and were scattered in the study area.

The alarming conditions for government organizations and policymakers are where the urban female population experiences low levels of both literacy and labour force participation. This region mainly lies in the northern and north-western parts of the state of Uttar Pradesh. According to a study (Lin et al., 2025), the level of urbanization and industrialization is positively correlated with socio-economic status to achieve a fair allocation of resources in that region, but there are noticeable conditions; they are near the major metropolitan cities like Delhi, Noida, Ghaziabad, etc., but these regions have low levels of both literacy and work participation among the urban female population.

**Table 8: Literacy v/s Main Work Participation among Urban Female Population, 2011**

Literacy / Work Participation	Low	Medium	High
Low	Budaun, Balrampur, Muzaffarnagar, Shahjahanpur, Shrawasti Kanshiram Nagar, Rampur, Aligarh, Bulandshahr, Jyotiba Phule Nagar, Muradabad, Pilibhit	Baghpat, Kushinagar, Mahamaya Nagar Bahraich, Chitrakoot, Farrukhabad, Bijnor, Fatehpur, Hardoi, Kheri, Mahoba, Mathura, Meerut, Saharanpur, Sant Kabir Nagar, Sitapur Sant Ravidas Nagar, Siddharthnagar	Deoria, Mainpuri Ambedkar Nagar, Ballia, Chandauli, Etah, Faizabad, Gonda, Jalaun, Jaunpur, Kanpur Dehat, Maharajganj, Pratapgarh, Unnao, Auraiya, Basti, Etawah, Gorakhpur, Sonbhadra, Sultanpur
Medium	Bareilly	Agra, Barabanki, Hamirpur, Mirzapur	Banda, Ghaziabad, Ghazipur, Jhansi, Lalitpur, Rae Bareli, Varanasi, Allahabad, Kanpur Nagar, Lucknow
High	Kaushambi	Firozabad, Kannauj	Azamgarh, Mau, Gautam Buddha Nagar

Source: Based on Table 2

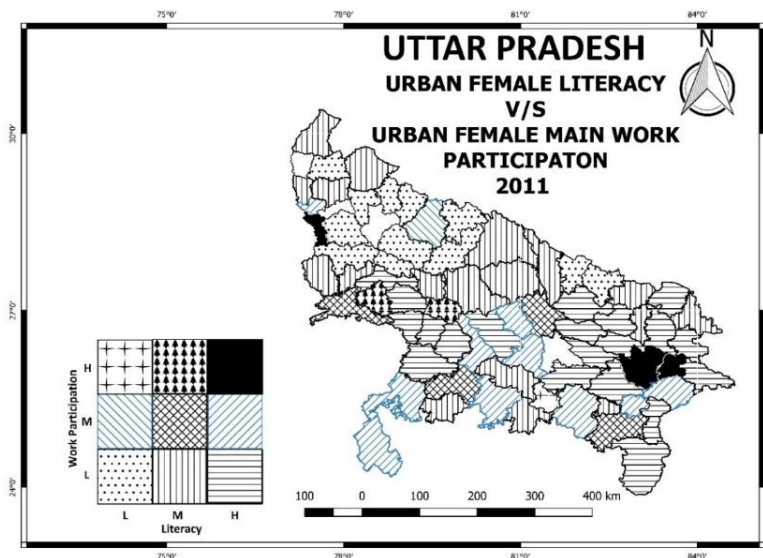


Figure 7: Source Based on Table 8

**4.8 Relationship between literacy and Marginal Work Participation**

Table 9 shows the district-wise relationship between literacy and marginal work participation among the urban female population. The

table shows female literacy on the horizontal axis, while the marginal work participation is on the vertical axis. The range of variation in female literacy and female marginal work participation has been categorised into three levels: high, medium and low.

**Table 9: Literacy v/s Marginal Work Participation among Urban Female Population, 2011**

Literacy /Work Participation	Low	Medium	High
Low	Basti, Budaun, Kanshiram Nagar, Rampur, Aligarh, Bulandshahr, Jyotiba Phule Nagar, Moradabad, Muzaffarnagar, Pilibhit, Shahjahanpur, Shrawasti, Balrampur, Siddharth Nagar	Baghpat, Bijnor, Farrukhabad, Meerut, Sitapur, Saharanpur, Kheri, Bahraich, Hardoi, Kushinagar, Mahamaya Nagar, Mahoba, Mathura,	Chitrakkot, Mainpuri, Auraiya, Etawah, Etah, Sonbhadra, Banda, Deoria, Ghaziabad, Ghazipur, Gonda, Jalaun, Jaunpur, Kanpur Dehat, Unnao, Mahrajganj, Varanasi Gautam Buddha Nagar, Kanpur Nagar, Sultanpur

**Table 9 (cont):** Literacy v/s Marginal Work Participation among Urban Female Population, 2011

<b>Medium</b>	Bareilly	Barabanki, Fatehpur, Kannauj, Sant Ravidas Nagar (Bhadohi)	Chandauli, Faizabad, Gorakhpur, Rae Bareli Lucknow
<b>High</b>	Kaushambi	Agra, Firozabad, Hamirpur, Mirazapur, Sant Kabir Nagar	Ambedkar Nagar, Lalitpur, Mau, Azamgarh, Ballia, Jhansi, Pratapgarh Allahabad

Source: Based on Table 2

The spatial relationship between female literacy and female marginal work participation depicts that high literacy and high marginal work participation are recorded in eight districts and they form three remarkable macro-regions in the study area wherein the first region contains four districts located in the eastern part (Azamgarh, Mau, Ballia and Ambedkar Nagar); the second region is comprised of two districts in the southern part (Jhansi and Lalitpur) and the third one region is composed of two districts in the south-eastern part (Allahabad and Pratapgarh). The twenty districts of the state have high literacy and low work participation among urban female population and they form four outstanding regions: first region contains eight districts in the western and central part (Etah, Mainpuri, Etawah, Auraiya, Kanpur Dehat, Kanpur Nagar, Jalaun and Unnao), second region constituted of four districts in the eastern part (Sultanpur, Jaunpur, Varanasi and Ghazipur ) while two

identical regions each containing two districts: one is in the western part (Gautam Budh Nagar and Ghaziabad) and second is in southern part (Banda and Chitrakoot), and rest of districts do not form any region in the state of Uttar Pradesh (Figure 8). The four districts of the state exhibit both a medium level of female literacy and female marginal work participation, and they do not form any outstanding region in the study area. The districts, which have experienced low literacy and low marginal work participation, are recorded in the thirteen districts of the state. Among these districts, twelve districts located in the north-western part (Basti, Budaun, Kanshiram Nagar, Rampur, Aligarh, Bulandshahr, Jyotiba Phule Nagar, Moradabad, Muzaffarnagar, Pilibhit, Shahjahanpur and Balrampur) formed a very large region, and two districts make a small region in the northern part (Shrawasti and Siddharth Nagar) (See Figure 8).

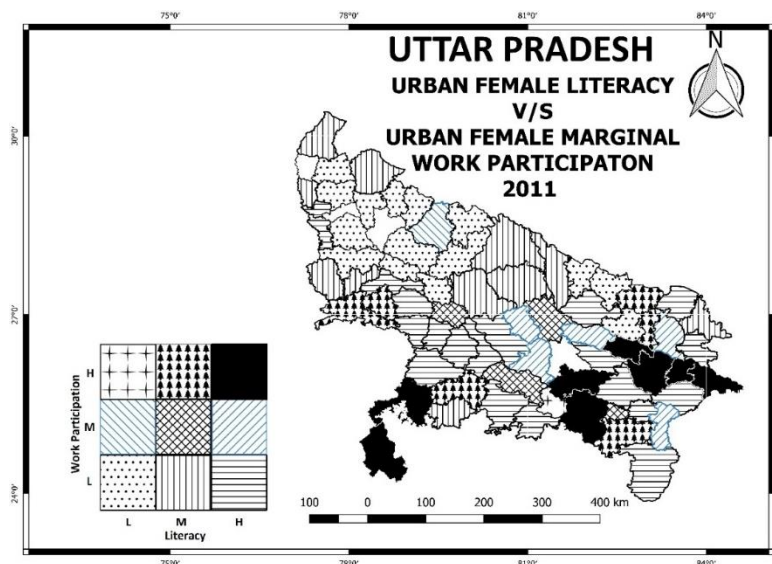


Figure 8 : Source Based on Table 9

**4.9 Correlation between Female Literacy and Female Work Participation**

The analysis of simple correlation between the female literacy rate (independent variable) and female work participation (dependent

variable) is listed in Table 10. Out of three dependent variables (X<sub>1</sub>, X<sub>2</sub>, and X<sub>3</sub>), the coefficient of correlation of X<sub>1</sub> is significant at the confidence level of 99 per cent with female literacy, while the remaining X<sub>2</sub> and X<sub>3</sub> are significant at 95 per cent confidence level with female literacy and all three variables are positively correlated with the urban female literacy rate.

**Table 10:** Correlation between female literacy and work participation, 2011

Variables	Definitions	Female Literacy
X1	Total Work Participation	0.322**
X2	Main Work Participation	0.297*
X3	Marginal Work Participation	0.275*

Source: Census of India, 2011

**5. CONCLUSION**

The overall analysis of the study reveals that the urban female population in Uttar Pradesh has shown a continuous growth in both literacy and work participation since 1981-2011, but it is lagging behind than the national average. The high level of urban female literacy is prevalent in the eastern and central parts of the state while there is a gradual decrease in the southern, northern and north-eastern districts of Uttar Pradesh. The level of urban female work participation is high in the districts of the eastern and southern regions whereas it decreases towards the north-western, eastern and northern parts of the state. The spatial analysis of urban

female main work participation reveals that most of the districts fall under the low and very low level of female main work participation. The study highlights that the level of female marginal work participation is also high in the eastern and southern districts, and it decreases uniformly towards the northern, western and north-eastern districts.

Moreover, the analysis of relationship between female literacy and female work participation reveals that most of the districts in the north-western and northern parts of the study area recorded low literacy and low work participation. The relationship of literacy and main work participation depicts that majority of the districts witnessed low literacy and low work

participation in the north-western and northern parts while the relationship of female literacy and female marginal work participation exhibits that most of the districts with low literacy and low work participation are in the north-western and northern parts of the state, and the districts having high literacy and high marginal work participation were found in the eastern and south-western part of the state. The coefficients of correlation of variables (X1, X2, X3), which are significantly weakly positively correlated with female literacy.

By analyzing the study, there is need to improve the status of female literacy and work participation in the terms of increasing female enrolment rates, quality of education, technical and vocational education, reservation in governmental jobs, strict implementation of several schemes like Sarva Shiksha Abhiyan (SSA), National Literacy Mission (NLM), Digital India Initiative, Beti Bachao Beti Padhao, Skill India Programs, etc. for inclusive and sustainable development of the country.

## REFERENCES

- Annual Periodic Labour Force Survey Reports 2023-24, Ministry of Statistics and Programme Implementation, India, [https://dge.gov.in/dge/sites/default/files/2023-05/Female\\_Labour\\_Utilization\\_in\\_India\\_April\\_2023](https://dge.gov.in/dge/sites/default/files/2023-05/Female_Labour_Utilization_in_India_April_2023).
- Biswas, B., and Banu, N., 2022. Economic empowerment of rural and urban women in India: A comparative analysis. *Spatial Information Research*, 31(1), Pp. 73–89. <https://doi.org/10.1007/s41324-022-00472-3>
- Census of India, 1981, series -1, paper 3, provisional population total worker and non-worker, Registrar General and Census Commissioner of India, Ministry of Home Affairs, Govt. of India, New Delhi, <http://www.censusindia.gov.in>
- Census of India, 1991, Registrar General and Census Commissioner of India, State Handbook Uttar Pradesh, Ministry of Home Affairs, Govt. of India, New Delhi, <http://www.censusindia.gov.in>
- Census of India, 2001, Registrar General and Census Commissioner of India, State Handbook Uttar Pradesh, Ministry of Home Affairs, Govt. of India, New Delhi, <http://www.censusindia.gov.in>
- Census of India, 2011, Registrar General and Census Commissioner of India, State Handbook Uttar Pradesh, Ministry of Home Affairs, Govt. of India, New Delhi, <http://www.censusindia.gov.in>
- Chakrabarty, S., 2025, January 31. Rise in female labour force participation driven by rural push, says Economic Survey. *The Hindu*. <https://www.thehindu.com/business/budget/rise-in-female-labour-force-participation-driven-by-rural-push-says-economic-survey/article69163968.ece>
- Chandrasekhar, C. P., and Ghosh, J. 2013. Where have All the Women Workers Gone? *Hindu Business Line*, 11. <https://www.thehindubusinessline.com/opinion/columns/c-pchandrasekhar/where-have-all-the-women-workers-gone/article20688064.ece1>. Accessed 10 February 2020.
- Das, M. B., 2003. Muslim Women's Low Labour Force Participation in India: Some Structural Explanations.
- Euwals, R., Knoef, M., and Van Vuuren, D., 2011. The trend in female labour force participation: What can be expected for the future? *Empirical Economics*, 40(3), Pp. 729–753. <https://doi.org/10.1007/s00181-010-0364-9>
- Ghosh, A. K., 2003. Female literacy and social development. *Social Change*, 33(4), Pp. 65–72. <https://doi.org/10.1177/004908570303300405>
- Hussain, N., and Siddiqui, F. A., 2013. Muslim Female Work Participation In West Bengal, India. *Women's Studies*, 42(3), Pp. 291–313. <https://doi.org/10.1080/00497878.2013.764237>
- Institute of Applied Manpower Research (India) and International Labour Organization (Eds.), 2013. Low female employment in a period of high growth: Insights from a primary survey in Uttar Pradesh and Gujarat. International Labour Organization, ILO DWT for South Asian and ILO Country Office for India, ISBN 9789221283508; 9789221283515
- Jha, N. K., Saritha, R., and Duraisamy, N., 2019. Female Labour Force Participation (FLFP) and its Significance in Economic Growth of India: An Overview. *Research Journal of Humanities and Social Sciences*, 10(2), Pp. 270. <https://doi.org/10.5958/2321-5828.2019.00049.4>
- Judijanto, L., 2025. A Bibliometric Analysis of Digital Literacy and Social Enterprise Development. 03(06). *West Science Interdisciplinary Studies* 3(06): Pp. 993-1003, DOI:10.58812/wsis.v3i06.2015
- Kim, W., 2025. Impact of accessibility to educational facilities on commuters' transportation choices: Married Females and School-Age children. *Sustainability*, 17(9), 3920. <https://doi.org/10.3390/su17093920>
- Lin, W., Lin, P., Wu, C., Liang, W., and Kuo, H., 2025. Urbanization, socioeconomic status, and exposure to PM2.5, associated with township-based cerebrovascular disease (CBD) mortality. *PLoS ONE*, 20(6), e0324070. <https://doi.org/10.1371/journal.pone.0324070>
- Munjal, T., 2024. The Complex Relationship Between Education and Female Labour: The Curious Case Of India. *IOSR Journal of Humanities and Social Science*, 29(11), Pp. 66–82. <https://doi.org/10.9790/0837-2911046682>
- Parveen, S., 2015. Causes of Women Labour and Earnings in Urban Informal Sector: A Case Study of Aligarh City. *International Journal of Interdisciplinary and Multidisciplinary Studies (IJIMS)*, 2014, Vol 2, No.1, 52-61, ISSN: 2348 – 0343
- Patkar, A., 1995. Socio-economic status and female literacy in India. *International Journal of Educational Development*, 15(4), Pp. 401–409. [https://doi.org/10.1016/0738-0593\(95\)00023-v](https://doi.org/10.1016/0738-0593(95)00023-v)
- Peter, R. H., HM., 2013. Work, age, health and work participation – a model. *Das Gesundheitswesen*, 75(08/09), A300. <https://doi.org/10.1055/s-0033-1354241>
- Sakshi, N., and Bano, S., 2023. Gender disparity in literacy in Uttar Pradesh: a spatial analysis. *Humanities and Social Sciences Communications*, 10(1). <https://doi.org/10.1057/s41599-023-02457-5>
- Saleh Alshebami, A., Ali Fazal, S., M. Aljarodi, A., Zarin, N., Hamoud Ali Seraj, A., and Alzain, E., 2025. The influence of access to technology and digital literacy on female empowerment and digital entrepreneurial intentions. *Problems and Perspectives in Management*, 23(3), Pp. 1–12. [https://doi.org/10.21511/ppm.23\(3\).2025.01](https://doi.org/10.21511/ppm.23(3).2025.01)
- Saurabh, S., Sarkar, S., and Pandey, D., 2013. Female literacy rate is a better predictor of birth rate and infant mortality rate in India. *Journal of Family Medicine and Primary Care*, 2(4), Pp. 349. <https://doi.org/10.4103/2249-4863.123889>
- UNESCO, 2019. From access to empowerment: Operational tools to advance gender equality in and through education (67 pp.). United Nations Educational, Scientific and Cultural Organisation. ISBN 978-92-3-100489-6. <https://doi.org/10.54675/UMWH8332>

