

# Impact of Educational Institutions on Literacy and Gender Gap: A Geographical Appraisal through Correlation and Regression Model in West Bengal, India

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## Abstract

*The present paper attempts to analyze the literacy rate and pertinent gender gap in the light of different categories of educational institutions in West Bengal to understand its educational backwardness. The present work is based on secondary sources of data collected from various government organizations. The educational institutions are grouped into three categories i.e. (i) Primary School, (ii) Middle/ Secondary/ Senior Secondary School, and (iii) College/ University/ Others. Various correlation coefficient and regression methods have been applied to perceive the correlation of literacy rate with gender gap across the districts of the state. It has been examined that literacy rate in the state of West Bengal has a positive correlation with the number of different categories of educational institutions.*

**Keywords:** Educational institution, Literacy, Gender Gap, Correlation, Regression, West Bengal

## Introduction

Education is a lifelong process, which takes place from the womb to the tomb. Education is a human right. It is the mirror of our modern society and essential for human emancipation and social development (Sharma, 2003). It is a significant constituent, which determines the status of a person and an integral part of a country's developmental progression. It is considered as the soul of a community, which undoubtedly determines the economic, social, cultural and political development of a region. The development of a country depends on its augmentation of education in society because, education is one and only instrument which helps to create skilled, responsible, resourceful citizen (Dey and Halder, 2014). Development is not just

economic and material but also includes the development of an individual's personality, skills, and efficiency to contribute benefits to the society and the nation (Kothari and Jhala, 2007).

Literacy is one of the prime indicators to measure Human Development Index (HDI) at international, national and regional levels. The government policy- "Literacy for all" has always enlightened the human beings in our present society. The high rate of literacy will always ensure and increase the progress of any modern human society. According to United Nations Educational Scientific and Cultural Organization (UNESCO), literacy is the aptitude to recognize, comprehend, understand, produce, communicate, compute and use printed and written materials related

to varying context. According to the census of India, a person, who can both read and write with understanding in any languages, is taken as literate.

Educational institutions are competent tools for higher educational status and literacy rate, which is a good measure of human progress toward modernization (Siddiqui and Yadav, 2005). It is inevitable truth that higher the education facility, better the literacy rate and lesser the education facility, lower the literacy rate. The problems of gender inequality and discrimination start with access to schooling. Once girls are able to get enrolled in school, they are rather more likely than boys to continue their education with more success (UNESCO, 2004). Much of the improvement in literacy in the less developed countries, which are lagging behind, depends largely upon the availability and accessibility of amenities for getting educated. There exists a positive correlation between the literacy rates and the degree of availability of educational institutions. The availability of educational amenities with an easy access and within the reach of one's pocket works as a constructive factor in the proliferation of literacy and education (Chandana, 2004). The study of inequalities in higher education in India, Bahadur and Ahmad (1981) have highlighted that unevenly distributed educational facilities have created a pattern in educational development, which makes the problem of educational backwardness of the country more acute. The absence of a large number of girl's school and poverty are two major causes of poor female literacy rate in India (Mohisini, 1991). The adequate number of educational facilities not only has a positive impact on educational status

but also have a positive impact on female literacy rate (Rawal and Ahmed, 2014). It is found that gender disparity bears a strong inverse correlation with the level of general literacy. Similarly, gender disparity in literacy was lower among the urbanites than that among the ruralities. Roy (1998) in his study explained that an area with satisfactory literacy rate but the low level of educational standard is the outcome of unsatisfactory Secondary and College level education. The high literacy rate is due to free education only up to primary level. The research, attempted by Siddiqui and Hannan (2011), brings to light some pictures about the female literacy rate that may be increased by increasing high school and number of teachers in senior basic schools. Further, the study concluded that the major factor hindering the higher education of females in rural areas is the lack of colleges in or nearby the villages.

In recent years, India has reportedly revealed substantial improvement at each level of education for boys as well as for girls. Drawing on data from the national Census, many studies and reports have indicated that there has been a noteworthy development in literacy levels, and predominantly in the diminution of female illiteracy, during the decade of 2001-2011. India accounts for 30 percent of the world's total illiterate population and around 70 percent of these illiterates are women. As per 2011 Census data, women constitute 48 percent of the total population in India, but around 35 percent of women are still found to be illiterate. Notwithstanding being countrywide Govt. literacy programmes such as National Literacy Mission launched in 1988, Sarva Shiksha Abhiyan launched

in 2001, the literacy rate of India has not fulfilled expected condition till the present day at national, state or district levels because of the concentration of bulk percentage of illiteracy in rural sectors. As per Census of India-2011, the literacy rate of India in the rural and urban sector is 67.77 percent and 84.11 percent respectively. Besides these, there is also a prominent gender gap in literacy, which is the main impediment to the advancement of the socioeconomic progress of any nation (Kumar and Gupta, 2012).

### Study Area

The state of West Bengal has been selected as a study area, which is located between 21°25' to 26°50' north latitudes and 86°30' to 89°58' east longitudes with three international boundaries i.e., Bangladesh, Nepal and Bhutan (GoWB, 2011) (Fig. 1). It occupies a geographical area of about 88,752 Sq. km. (2.70 percent of the India's total geographical area) and extending from the Himalayas in the north to the Bay of Bengal in the south. It is surrounded by Sikkim and

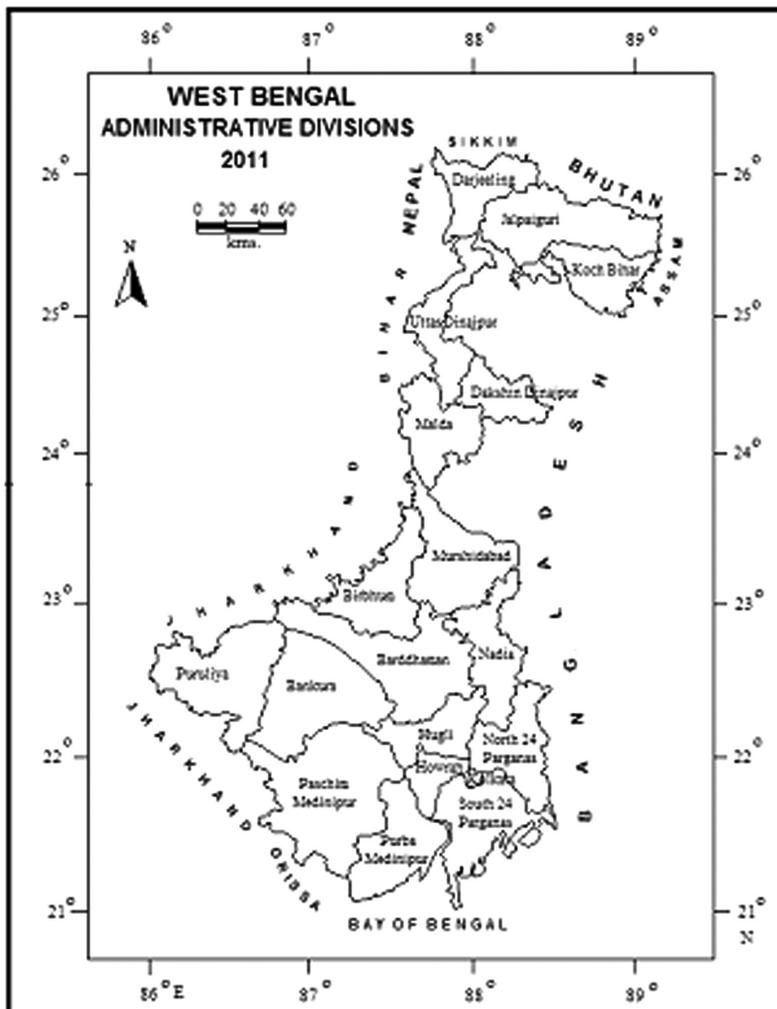


Fig. 1:  
Administrative  
Divisions of West  
Bengal, 2011

Bhutan in the north, Assam and Bangladesh in the east, the Bay of Bengal in the south and Orissa, Jharkhand, Bihar and Nepal in the west.

According to Census of India, 2011, its total population is 91,347,736 (7.55 percent of India's total population), density is 1029 persons per Sq. km. (in terms of population density West Bengal is the second among the Indian states). Since the time of British rule, West Bengal is a cultural heritage and educationally developed state than the other states of India, because, at that time, Kolkata was the capital of India. At present, West Bengal is on the 20th position in terms of literacy rate among all the Indian states and union territories. According to 2011 Census, the literacy rate of West Bengal is 77.08 percent, which is higher than the national average (74.04 percent). The literacy rate in the rural and urban sector is 72.13 percent and 84.78 percent respectively. There are 19 districts in the state with an increase of one district as compared to 2001 census.

### **Objectives**

The main objectives of the present paper are:

- i. To identify the inter-district disparity in literacy and the pertinent gender gap in respect of socioeconomic environment in the state of West Bengal.
- ii. To analyze the nature of the correlation between educational institutions and literacy rate in the state.
- iii. To suggest some policy measures for the development of literacy level as well as to minimize the gender gap.

### **Hypotheses**

The following hypotheses have been formulated:

- Better availability and accessibility of educational institutions have a positive impact on literacy rate.
- The overall literacy rate leads to higher female literacy rate.
- There is an inverse relationship between the availability of educational institutions and the gender gap.

### **Materials And Methods**

The present work is essentially based on secondary sources of data collected from different published sources at district level such as District Census Hand Books, District Statistical Hand Books, and Human Development Reports etc. All the statistics are meant for the year 2011. Various statistical techniques have been employed to analyze and obtain the accuracy of the data with the help of Spearman's Rank Correlation, Significance test of Correlation Coefficient, Karl Pearson's Product-Moment and Regression Line by Least Square method.

### **Progress of Literacy in West Bengal**

Literacy rate as provided by the Indian census covers the necessary information of each of the household and as such, it may be considered as one of the significant educational indicators that also appear to be a reliable data for educational development. It is remarked that literacy skills are fundamental to informed decision-making, personal empowerment, active and passive participation in local and global social

community (Stromquist, 2005). Considering its coverage and importance, a brief review of the literacy character of the state as per the Indian census data is given below:

The first census in free India was carried out in 1951 and at that time, only one-fourth of the total state population was literate. While in 2011, more than two-thirds of the total population (7+ and above age group) was found to be literate in the state. Over the last six decades, almost all the districts have made a literacy jump of more than 30 percent, but some of the districts recorded a higher jump than the others. In fact, a heterogeneous increase is being observed across the districts of the state. According to Census of India 2011, West Bengal ranks 13th out of 28 states and 20th among all 35 Indian states and union territories, achieving an average literacy rate of 77.08 percent, which is higher than the national average of 74.04 percent (Table 1). The Census of India also reveals that there has been an increasing trend in literacy rate in the state of West Bengal from 57.70 percent in 1991 to 68.64 percent in 2001 and 77.08 percent in 2011 i.e. an increase of 10.94 percent (1991-2001) and 8.44 percent (2001-2011) respectively. In case of rural areas, it has increased from 50.50 percent in 1991 to 63.42 percent in 2001, and 72.13 percent in 2011 i.e. a growth of 12.92 percent (1991-2001) and 8.71 percent (2001-2011) respectively and it has increased from 75.27 percent (1991) to 81.25 percent (2001) and 84.78 percent in 2011 in the urban areas i.e. an extent of 5.98 percent (1991-2001) and 3.53 percent (2001-2011) respectively. The district wise literacy rate (Census of India, 2011) expresses that Purba Medinipur achieved highest literacy rate of 87.66 percent followed by Kolkata

(87.14 percent), North 24 Parganas (84.95 percent), Haora (83.85 percent), Hugli (82.55 percent), Darjiling (79.92 percent), Paschim Medinipur (79.04 percent), South 24 Parganas (78.57 percent) and Barddhaman (77.15 percent) which are higher than the state average. These nine districts of the state recorded higher literacy rate than the state average because of some positive contributing factors i.e. the large number of educational institutions, Government's education policy, consciousness of people, awareness of mass education, low dropout rate especially among female students, concentration of educated family, expansion of urban area etc. The districts belong to literacy rate slightly lower than the state average are Nadia (75.58 percent), Koch Bihar (75.49 percent), Dakshin Dinajpur (73.86 percent), Jalpaiguri (73.79 percent), Bankura (70.95 percent) and Birbhum (70.90 percent). The remaining four districts namely Murshidabad, Puruliya, Maldah and Uttar Dinajpur of the concerned state are suffering from the poor rate of literacy because of poverty, a lesser number of educational institutions and failure of Government's education policy.

Table 1 : District wise Literacy Rate and Gender Gap in West Bengal, 2011

(in percent)

Sl. No.	Districts	Male Literacy	Female Literacy	Total Literacy	Gender Gap*
1	Darjiling	85.94	73.74	79.92	12.21
2	Jalpaiguri	80.61	66.65	73.79	13.97
3	Koch Bihar	81.52	69.08	75.49	12.44
4	Uttar Dinajpur	66.65	53.15	60.13	13.50

5	Dakshin Dinajpur	79.63	67.81	73.86	11.82
6	Maldah	67.27	57.84	62.71	9.43
7	Murshidabad	71.02	63.88	67.53	7.14
8	Birbhum	77.42	64.07	70.90	13.34
9	Bardhaman	83.44	70.47	77.15	12.97
10	Nadia	79.58	71.35	75.58	8.23
11	North 24 Parganas	88.66	81.05	84.95	7.61
12	Hugli	87.93	76.95	82.55	10.98
13	Bankura	81.00	60.44	70.95	20.56
14	Puruliya	78.85	51.29	65.38	27.55

15	Haora	87.69	79.73	83.85	7.96
16	Kolkata	89.08	84.98	87.14	4.10
17	South 24 Parganas	84.72	72.09	78.57	12.63
18	Paschim Medinipur	86.66	71.11	79.04	15.55
19	Purba Medinipur	93.14	81.81	87.66	11.32
West Bengal		82.67	71.16	77.08	11.51
India		82.14	65.46	74.04	16.68

\*Calculated by the Authors  
Source: Census of India, 2011

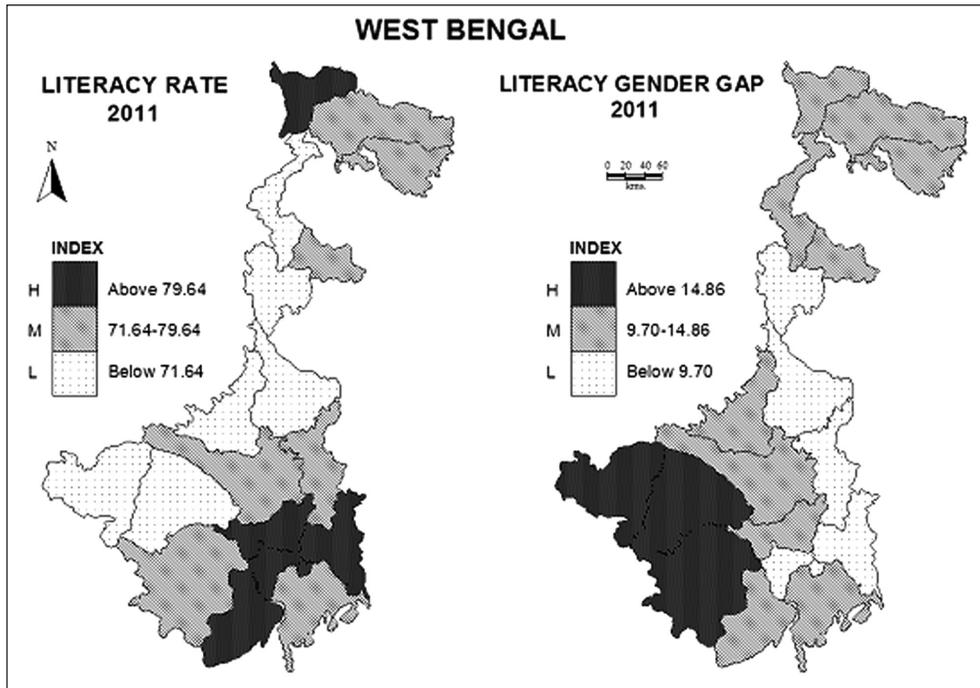


Fig. 2: District wise Spatial Pattern of Literacy and Gender Gap in West Bengal, 2011

### Male-Female Literacy And Gender Gap

As per the census of India, it is seen that the proportion of male literate in the state

is comparatively higher than the female literate (Table 1). According to 2011 census, male literate was 82.67 percent

whereas female literate was 71.16 percent with exhibiting gender gap of 11.51 percent, which is lower than the national average (16.68 percent). Among the 19 districts in the state, Puruliya recorded highest gender gap in literacy with 27.55 percent while Kolkata has lowest gender gap with 4.10 percent. The districts i.e. Bankura and Paschim Medinipur are portraying their rank in the vicinity of the owing highest gender gap districts. The southwestern part of the district has been recorded the highest share in gender gap whereas the lowest share is found in the central and eastern parts of the district (Fig.2).

From the district level analysis, it is found that there is a spatial disparity in the distribution of literacy in male and female. The highest male literacy rate is found in Purba Medinipur (93.14 percent) and lowest in Uttar Dinajpur (66.65 percent) whereas, the highest female literacy rate is observed in Kolkata (84.98 percent) and the lowest rate in Puruliya (51.29 percent). After analyzing the district level data of 2011, it is revealed that the highest literacy rate is found in Purba Medinipur (87.66 percent) followed by Kolkata (87.14 percent), North 24 Parganas (84.95 percent), Haora (83.85 percent), and Hugli (82.55 percent) whereas, lowest literacy rate is observed in Uttar Dinajpur (60.13 percent). The spatial pattern of total literacy rate in the district shows that the northern and southeastern parts are recorded the highest share whereas the western and central part has been recorded the lowest share (Fig. 2).

As far as the study across the rural and urban levels is considered (Table 3), it is found that the literacy rate in urban area (84.78 percent) is higher than

the rural (72.13 percent) West Bengal because of availability of educational infrastructure, developed socioeconomic condition, consciousness to literacy and concentration of educated family in urban areas. Comparing across the urban areas, the highest gender gap is recorded in Puruliya district (17.48 percent) with literacy rate 76.18 percent and Kolkata achieved lowest gender gap (4.13 percent) with literacy rate 79.80 percent. All municipalities or urban areas of all the districts gained more than and near about 80 percent literacy rate except Maldah, Murshidabad and Puruliya districts. On the contrary, as far as the rural areas are concerned, the highest gender gap is recorded in Puruliya (28.77 percent) with literacy rate 62.73 percent and Murshidabad achieved the lowest gender gap (6.39 percent) with literacy rate 65.30 percent. All the rural areas or blocks of all the districts gained more than 60 percent literacy rate except Uttar Dinajpur and Maldah districts due to less availability of educational institutions, underdeveloped socioeconomic condition etc. In terms of urban male literacy is concerned it is recorded the highest rate in Purba Medinipur (92.90 percent) whereas it is lowest in Murshidabad district (76.23 percent). The highest urban female literacy rate is observed in North 24 Parganas (85.84 percent) and lowest in Puruliya (67.15 percent). In terms of rural male literacy is concerned it is recorded the highest rate in Purba Medinipur (92.24 percent) whereas it is lowest in Uttar Dinajpur district (62.82 percent). The highest rural female literacy rate is observed in Purba Medinipur (81.03 percent) and lowest in Puruliya (48.06 percent).

Table 2 : District wise Literacy Rate and Gender Gap in Rural and Urban West Bengal, 2011  
(in percent)

Sl. No.	Name of the Districts	2011							
		Rural				Urban			
		M L	F L	G G*	T L	M L	F L	G G*	T L
1	Darjiling	81.76	66.59	15.17	74.27	91.37	83.48	7.89	87.48
2	Jalpaiguri	77.30	61.82	15.48	69.73	86.75	77.75	9.00	82.39
3	Koch Bihar	79.43	66.47	12.96	73.16	91.64	85.00	6.64	88.36
4	Uttar Dinajpur	62.82	48.72	14.10	55.99	83.91	76.32	7.59	80.28
5	Dakshin Dinajpur	76.11	63.79	12.32	70.10	91.78	85.52	6.26	88.68
6	Maldah	64.19	54.29	9.90	59.37	78.92	74.03	4.89	76.58
7	Murshidabad	68.42	62.03	6.39	65.30	76.23	67.34	8.89	71.85
8	Birbhum	75.56	62.33	13.23	69.10	85.97	76.01	9.96	81.07
9	Barddhaman	79.12	65.86	13.26	72.65	87.31	75.34	11.97	81.54
10	Nadia	74.76	66.69	8.07	70.85	88.95	81.63	7.32	85.35
11	North 24 Parganas	81.87	72.61	9.26	77.37	91.78	85.84	5.94	88.87
12	Hugli	84.78	72.09	12.69	78.53	90.51	83.12	7.39	86.91
13	Bankura	79.10	58.31	20.79	68.93	90.15	78.50	11.65	84.42
14	Puruliya	76.83	48.06	28.77	62.73	84.63	67.15	17.48	76.18
15	Haora	84.75	74.96	9.79	79.98	88.19	82.01	6.18	85.21
16	Kolkata**	-	-	-	-	81.76	77.63	4.13	79.80
17	South 24 Parganas	82.14	68.90	13.24	75.68	86.76	78.42	8.34	82.67
18	Paschim Medinipur	84.52	68.94	15.58	76.87	90.45	81.35	9.10	85.96
19	Purba Medinipur	92.24	81.03	11.21	86.81	92.90	83.95	8.95	88.60
West Bengal		78.44	65.51	12.93	72.13	88.37	80.98	7.39	84.78

Note: M L- Male Literacy, F L- Female Literacy, G G- Gender Gap, T L- Total Literacy

\*Calculated by the Authors

\*\*District does not have rural area

Source: District Census Hand Book, 2011

### Educational Institutions in West Bengal

The educational infrastructure of the state shows the formal education system. In the purpose of micro-level clarification, the educational sectors have been bifurcated into three categories namely i) Primary School, ii) Middle/Secondary/Senior Secondary

School, and iii) College/University/Others. The Table 4, 5 and 6 are showing the district wise distribution of educational facilities of different categories for the concerned state.

The Primary sectors are being treated as the base of the educational structure has presented major impact on literacy in the state. The total number of primary schools in the state are 69456 (Table 4) and the district i.e. Paschim Medinipur ranks highest for the presence of primary educational institute (7098), followed by Barddhaman (5759), North Twenty Four Parganas (5211), South Twenty Four Parganas (5065), Purba Medinipur (4966), Bankura (4689), Murshidabad (4389) and Hugli (3881). Gradually, smaller numbers of primary sectors are visible in the rest of the districts of which Dakshin Dinajpur owing to lowermost rank (1564). To identify the correlation between the primary institutions and the literacy rate for the concerned area with the help of Pearson's Product-moment analysis at the district level, it is seen that there is a moderate positive correlation between the two variables i.e. independent variable (primary institution) and dependent variable (literacy rate).

In the case of the second category of educational institutions, the numbers of middle, secondary and senior secondary schools are comparatively less in number as compared to primary institutions. From Table 5 it is evident that the numbers of such institutions in the state are 32676 of which North Twenty Four Parganas, Barddhaman, South Twenty Four Parganas, Paschim Medinipur, Purba Medinipur, Kolkata and Hugli retain higher number (above 2000) of educational institutions and Koch Bihar, Darjiling, Uttar Dinajpur and Dakshin Dinajpur districts belong to less than 1000 number of educational institutions, which are comparatively lower than the former. From the calculation, the correlation

between the two variables i.e. educational institution (independent variable) and literacy rate (dependent variable) with the help of Pearson's Product-moment analysis, it is obtained that there is a low positive correlation between the two variables in the state.

In the case of the third category of the educational sector, being less number of educational institutions at district level data has been picked up to analyze the nature of correlations between the two variables i.e. educational institution and literacy rate with the help of regression line by least square method. After examining the data, it is viewed that the highest average number (above 500) of educational institutions are concentrated in North Twenty Four Parganas, Haora, Paschim Medinipur, Barddhaman, Murshidabad, Jalpaiguri and South Twenty Four Parganas and lowest average number of educational institutions are found in Nadia, Dakshin Dinajpur, Darjiling, Maldah, Uttar Dinajpur, Koch Bihar and Kolkata. From the statistical analysis, it is found that there is a positive correlation between the variables across the districts in West Bengal.

### **Conclusion And Suggestions**

Today gender issues are getting more attention. After above discussion, it may be concluded that there is a gender gap in the literacy of male students as compared to female students in West Bengal. If this gap is not being reduced, then not only the state of West Bengal but also our country will be facing a big problem because education of women, especially the higher education plays a crucial role to manifest their inner and outer potentiality, which

can make them more efficient to chess challenges of ever changing society. It is undoubtedly clear from the foregoing discussion that, central and southern parts of the state with respect to educational facilities are more developed than the other parts of the state and are enjoying a low rate of the gender gap. The districts namely, Bankura, Birbhum, Murshidabad, Puruliya, Maldah and Uttar Dinajpur are backward on the basis of literacy rate as per 2011 census. An important aspect is that the maximum education facility is concentrated in the urban area than the rural area and representing a high rate of literacy with a low rate of the gender gap in West Bengal. It is also observed that there is a higher correlation between literacy and gender gap in case of primary institutions as compared to middle/secondary/senior secondary institutions. On the other hand, the urban level analysis also proves that there is a positive correlation between the educational institution and literacy. The overall study stands that literacy rate in the light of educational sphere varies from poor positive correlation to moderate positive correlation in the state. The high-grade scores of literacy rate are registered mainly in those districts where availability of educational facilities are high and vice-versa. Therefore, the availability of educational facilities with an easy access and within the reach of one's pocket works as a positive factor in the propagation of literacy rate and as a negative factor for gender gap of that region.

Under these circumstances, the assistance of Government and Private sectors is the urgent need to minimize the gender gap via increasing the number of educational institutions of almost all the

categories mentioned, which in turn will strengthen the overall socioeconomic and cultural life of the people in West Bengal. Utmost effort should be made in improving female literacy for the school-going children as well as for the adult illiterates. The colleges in the rural areas are very few in the whole state of West Bengal. Hence, the step should be taken to establish colleges in rural areas to provide educational and employment opportunities to rural females close to their residence.

In India, our government takes various initiatives and policies to diminish the gender gap at the level of higher education, but those are not enough to cope up with the problems of gender discrimination. The plans and policy formulation is not the last solution, its implementation is very much necessary. A clean linkage should be established by the central government with the state government to attain the gender equity through established more institutions and execute plans and policies. Now, in respect of this situation women should get some opportunities from enrollment to completion of their courses because it not only plays a significant role to empower women but also in engaging self-esteem, confidence and equal participation in all spheres of life.

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