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Gender Disparity in Literacy Rate and Its Association with Work Participation: A Geographical Enquiry

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Abstract:

The gender disparity in literacy rate is a significant parameter in understanding the overall educational level and work participation rate. In this study, gender disparity in literacy rate has been computed for Purulia district, one of the backward districts of West Bengal, to portray the gender disparity in literacy rate (GDLR) in 2001 and 2011 and its spatial distribution across the district. The result shows that Purulia district stands second and last in terms of gender disparity index (GDI) in 2001 (0.417) and 2011 (0.276), respectively, in West Bengal. The paired t-test reveals a significant difference ($p< 0.025$) in the GDI of literacy rate between the 2001 and 2011 census years. The district experienced a higher rate of dependency ratio of population in 2001 (74.95%) and 2011 (65.98%), which was more than the state average. Moreover, the correlation value of the percentage of literacy and work participation rate of the female population is calculated to be – 0.62 in 2001 and – 0.37 in 2011. Most of the district's people are marginal workers and mainly engaged in the agricultural sector as low-wage labourers. The district needs more employment opportunities to enjoy a good quality of life.

1. Introduction

Basic education is our fundamental right. It always acts as a catalyst in the development of a nation (Mandal et al., 2018; Subba, 2021). The overall growth of human civilization is only possible by enhancing the proper education among people. It is noted that the biggest obstacle to developing countries in terms of development

is illiteracy, and India is no exception (Mandal et al., 2018). The global adult literacy rate was 86% (for 15 years and older), while male and female literacy rates were 90% and 83% respectively. It is worth mentioning that Central Asia, Europe, and Northern America enjoyed almost 100% male and female literacy. In contrast, around half of the world's illiterate persons lived in Southern Asia, and the average adult literacy rate in this region was 72%. In contrast, the respective male and female literacy rates were 86% and 63%. However, the worst scenario concerning the adult literacy rate was found in Sub-Saharan Africa, where the average literacy rate was 65%, and the male and female literacy rates were 72% and 57% respectively (UNESCO, 2017). So, a sharp distinction was observed between the average adult literacy rate and male and female literacy rate between developed and developing countries. This disparity in literacy rate is a significant concern of developing nations as it leads to poor socio-economic conditions (Koster et al., 2006). In the case of India, the literacy rate ranged between 60% to 69% (UNESCO, 2017). During the last two decades, India has experienced a substantial improvement in terms of the human development index (Census of India, 2011). India has also witnessed significant progress in literacy rate from 1951 (18.33%) to 2011 (74.04%) and a decreasing trend of the Gender Disparity in Literacy Rate (GDLR) during this period (Census of India, 1951, 2011). In 2011, India's literacy rate was 74.04%, while male and female literacy rates were 82.14% and 65.46% respectively. The GDLR was 16.68% in 2011 (Mundhe et al., 2017) and 21.59% in 2001 (Census of India, 2001). However, the variation in literacy rate was observed across the countries based on different geographical factors (Siddiqui, 2011). The Indian state of Kerala recorded the highest literacy rate, i.e., 94%, whereas the male and female literacy rates were 96.10% and 92.10%, respectively. On the contrary, Bihar experienced the lowest literacy rate, 61.80%, while the respective male and female literacy rates were 71.20% and 51.50%. Rural India documented a literacy rate of 68.91% (male- 78.57% and female- 58.75%), whereas the value is 84.98% (male- 89.67% and female- 79.92%) for urban areas in 2011 (Jhariya & Jain, 2014).

However, the prevalence of GDLR is higher in rural areas than in urban areas (Singh & Sharn, 2015). This disparity emerges from gender discrimination in obtaining education (Mandal et al., 2018). The background of such a situation is low per capita income, poverty, caste, religion, superstition, etc. In our society, the son is given more importance than the daughter in obtaining higher education. It is believed that the male counterpart is supposed to earn for his family, while the female will look after the family internally (Subba, 2021). The dowry system is another critical curse to society, where a father must always think about managing a lump sum dowry for his daughter during marriage. So, more emphasis is placed on raising the money for the dowry rather than investing in her education (Nithya, 2013). It is often not considered that the higher illiteracy rate among females will bring misfortune to society as it will be reflected in different social aspects of future generations. A well-educated mother with more awareness will give birth to a healthy baby, a flag bearer

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for the country (Mondal et al., 2014). A society with fewer educated people will struggle to find employment (World Bank, 2024). Thus, developed countries allocate and spend more of their gross domestic product (GDP) on education and health (Government of India, 2021).

In the case of some Asian countries, such as Bhutan, Nepal, China, and Japan, the respective government expenditure on education GDP is 6.90% (2018), 5.10% (2018), 3.50% (2019) and 3.20% (2017), while it is 7.80% (2017) for Denmark, 6.50% (2019) for South Africa, 5.01% (2017) for Australia and 5% (2014) for United States of America (Kumar et al., 2016). In the case of India, the share of GDP on education is only 2.67% for 2021-22 (Chandra, 2019), and only 3.54% was spent on the health sector for its people in 2018. The country like Germany, France, Japan, Denmark, Australia, South Africa, Nepal, and China allocated 11.43%, 11.26%, 10.96%, 10.07%, 9.28%, 8.25%, 5.84%, and 5.38% respectively on health sector of their GDP in 2018 (Katiyar, 2016). The lower rate of investment of a country's GDP on education turns out to be a severe issue in the development of underdeveloped and developing countries, and ultimately, it is reflected through illiteracy, unemployment, poverty, deprivation, and poor health of people (Government of India, 2021). Despite several plans and programs, the GDLR is high in India and exists in different parts of the country (Hira & Das, 2018). There is no single state in India where the literacy rate of females is higher than males (Singh & Sharn, 2015). The socioeconomic development and reduction of gender disparity in terms of the country's literacy rate is possible only by increasing female education levels using all possible means (Government of India, 2017; Mandal et al., 2017; Hira & Das, 2018;).

To understand the gender disparity regarding literacy rate, the Purulia district of West Bengal, India, is selected for this work. Since Purulia is one of the backward districts of West Bengal in terms of human development index (HDI), gender development index (Mandal & Ghosh, 2019), and human poverty, deprivation, and poverty have been part and parcel of the district for decades (Mandal et al., 2023). Thus, an endeavour has been made here to examine whether there is any gender disparity in the literacy rate in the Purulia district. If it persists, then it will be compared with other districts of West Bengal and the state level to know the rank of the study of interest in the case of GDLR. Moreover, the occupational structure and work participation rates of the district's male and female populations will be discussed in the context of GDLR.

2. Area of investigation: Purulia

Purulia, experiencing the hot and dry sub-tropical climate, mainly comprises Precambrian metamorphic rocks with low porosity and a higher evaporation rate, resulting in water scarcity and frequent drought-prone conditions (Government of West Bengal, 2015). Cultivation is not possible for Purulia throughout the year due

to a lack of irrigation facilities and skeleton-type soils (Government of India, 2018). Purulia's adverse geophysical factors have brought misery to its people since immemorial (Bhattacharya, 1986; Mandal et al., 2018). The district's total population was 2927365 in 2011, with the male population at 51.18% and the female population at 48.91. In contrast, Purulia's rural and urban populations are 89.93% and 10.07%, respectively. The district has a higher rate of Scheduled Caste (SC) and Scheduled Tribe (ST) populations, with a proportion of 18.29% and 18.27%, respectively, compared to other districts of West Bengal. The sex ratio of the district is noted as 955, which is better than other state districts. The population density is recorded to be lowest for Purulia in West Bengal, i.e., 468 persons per km^{-2}. Only 64.48% of the total population is literate in the district. The share of main and marginal workers is 20.93% and 21.71%, respectively, while 57.35% of people are noted as non-workers (Census of India, 2011).

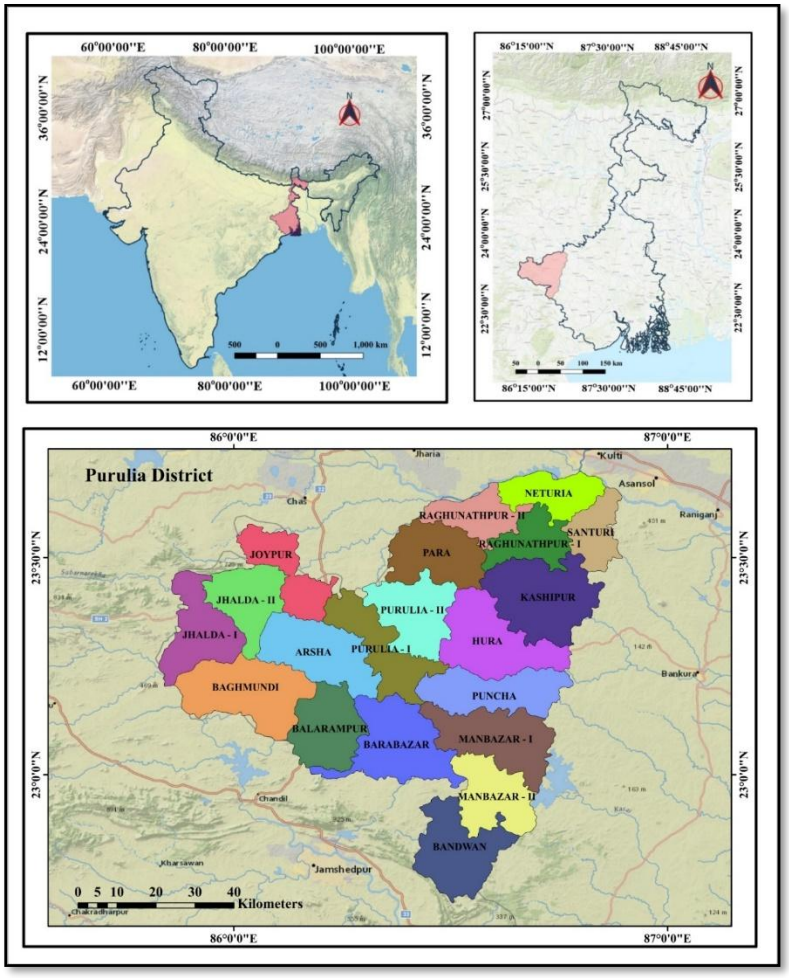

Fig. 1. Location of the study area

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3. Materials and methods

3.1. Database

This study is mainly based on secondary data from the Census of India, 1961, 1971, 1981, 1991, 2001 & 2011; District Statistical Handbook, Purulia, 2014; Primary Census Abstract of Purulia District, 2011; Statistical Abstract of West Bengal, 2015. The district map of Purulia is collected from the 18th all India livestock census, agriculture implements & machinery, fishery statistics West Bengal, 2007. The health and occupation status of the district is also reviewed from the reports of the National Family Health Survey (NFHS) and District Statistical Handbook, Purulia, 2014, with the level of education. The necessary secondary database is analyzed in Microsoft Office (Excel) 2007, and the derived results are then tabulated. The statistical test is performed in IBM SPSS Statistics 23 software.

3.2. Computation of gender disparity index in literacy rate

To compute the GDLR of Purulia and West Bengal for 2001 and 2011, Sopher's Disparity Index of 1974 is employed. This index is recognized as one of the suitable measures for calculating disparity (Mundhe et al., 2017; Hira & Das, 2018), and the following formula (equation – 1) is used to compute the GDLR.

$$DI = Log(X2/X1) + Log\{(100 - X1)/(100 - X2)\} \quad (1)$$

Where *DI* refers to the disparity index, *X1* signifies the percentage of female literacy, and *X2* depicts the male literacy rate. Despite being a popular technique for measuring disparity, the Sopher's Disparity Index has some limitations and does not meet axioms like multiplicative monotonicity, additive monotonicity, repetitive transfer, and redistribution (Kundu and Rao, 1985). To overcome these shortcomings, Kundu and Rao (1985) modified the Sopher's Disparity Index and proposed the following (equation – 2) gender disparity index (GDI), which is more popular and widely used (Hira and Das, 2018). The DI value generally varies between 0 and 1, where a value close to 1 indicates higher disparity, and zero denotes no disparity. So, there is a positive correlation between disparity and *DI*.

$$DI = Log(X2/X1) + Log\{(200 - X1)/(200 - X2)\} \quad (2)$$

3.3. Computation of statistical tests

Since the study attempts to determine the GDI in literacy rate, it is assumed that there is a significant difference between the GDI of 2001 and 2011 (H_1). It is often seen that the gap in literacy rate between males and females has been reducing over time due to several programs and schemes implemented by governments to encourage parents to send their children to school (Kumar et al., 2016). A paired t-test (equation – 3) is performed and checked at a 0.05 significance level to satisfy the hypothesis. Here, $\bar{X}$ refers to the mean of X, S^2 depicts sample variance, and n signifies the number of observations. To compute the correlation of SCs and STs

literacy rate with total literacy rate, Pearson's product-moment correlation coefficient is calculated using the following formula (equation – 4). Where, r is the product moment of the correlation coefficient, N refers to the number of data pairs, $\bar{X}\ and\ \bar{Y}$ are mean of X and Y respectively, $\sum XY$ indicates the sum of the products of X and Y, σ refers to standard deviation. The coefficient of determination is also performed to understand the explained variation, and equation – 5 is used, where, R^2 is the coefficient of determination, ΣD_S^2 refers to unexplained variation and ΣD^2 explained variation.

$$t = \frac{\bar{X}}{\sqrt{S^2/n}} \tag{3}$$

$$r = \frac{\frac{\sum XY}{N} - \bar{X}.\bar{Y}}{\sigma_X \sigma_Y} \tag{4}$$

$$R^2 = 1 - \frac{\Sigma D_S^2}{\Sigma D^2} \tag{5}$$

4. Result and discussion

4.1. Scenario of literacy rate

Educational attainment is one of the significant parameters of social development, and it can be traced by literacy rate. Since Purulia is conceived as a backward district of West Bengal, the literacy rate and gender disparity may be critical compared to West Bengal (Table 1). It is observed that the literacy rate of Purulia (62.84%) is less than the state average (76.26%) and even the national average (74.04%) of 2011. The highest literacy rate is enjoyed in West Bengal by Purba Medinipur district (87.02%) in 2011, while Purulia stands third last in the literacy rate (Census of India, 2011). On the contrary, the range of literacy rate in 2011 is 15.50% for Purulia, where maximum and minimum literacy rate is observed at Kashipur and Jhalda-II community development (CD) blocks, respectively (Table 2), but the change in literacy rate is found to be slightly higher in Purulia than West Bengal from 2001 to 2011 (Table 1). The change in higher literacy rate is achieved in Purulia by Bandwan CD block, followed by Raghunathpur-II, Jhalda-I, and Balarampur. In contrast, Manbazar-II, Purulia-II, Neturia, and Joypur experience a lower rate of change (Table 2). This spatial variation in terms of the distribution of literacy rate and its change over time may result from different socio-economic conditions at the CD block level (Rao and Gupta, 2006). This study also revealed a positive correlation between SC and ST literacy rates and the total literacy rate. The correlation value for SC and total literacy rate is computed as 0.56, which is moderately positive, and the coefficient of determination is 0.31. In contrast, the correlation value turns up 0.88 (highly positive) for ST and total literacy rate with a coefficient of determination of 0.77. This situation denotes that those CD blocks enjoying higher literacy rates possess greater SC and ST literacy rates. Sedwal and Kamat also noted the same problem in their study at the national level (Sedwal & Kamat, 2008).

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Table 1: Decadal literacy rate and its change

District/State	Literacy Rate (%) 2001		Change (%)
	2011	2001	
Purulia	62.84	53.41	9.43
West Bengal	76.26	68.64	7.62

Source: Census of India, 2001, 2011

Table 2: Distribution of literacy rate and its change over time in Purulia district

Sl. No.	CD Blocks	2011	2001	Change (%)
		Literacy Rate (%)	Literacy Rate (%)	
1	Arsha	54.78	46.00	8.78
2	Baghmundi	57.17	46.95	10.22
3	Balarampur	58.80	47.80	11.00
4	Barabazar	62.84	51.90	10.94
5	Bandwan	60.82	47.70	13.12
6	Hura	68.79	59.00	9.79
7	Joypur	57.58	50.10	7.48
8	Jhalda-II	54.68	43.80	10.88
9	Jhalda-I	66.42	53.80	12.62
10	Kashipur	70.18	63.00	7.18
11	Manbazar-I	63.18	55.10	8.08
12	Manbazar-II	60.27	53.50	6.77
13	Neturai	64.10	56.75	7.35
14	Para	65.40	56.85	8.55
15	Puncha	66.14	57.30	8.84
16	Purulia-I	64.68	54.40	10.28
17	Purulia-II	63.47	56.20	7.27
18	Raghunathpur-I	65.77	57.10	8.67
19	Raghunathpur-II	67.11	54.40	12.71
20	Santuri	64.62	56.50	8.12
	Purulia	62.84	53.41	9.43

Source: Computed by authors based on census data of India, 2001, 2011

4.2. Gender disparity in literacy rate

The GDLR significantly contributes to society's socio-economic development. In developed countries, this disparity is relatively insignificant. Purulia has substantially reduced gender disparity (10.99%) from 2001 to 2011. The mean male literacy rate in 2001 and 2011 was 72.25% and 76.82%, respectively, while 33.67% in 2001 and 49.23% in 2011 for female literacy rate. The disparity between male and female literacy rates was 38.58% in 2001, down to 27.59% in 2011 (Table 3). In the case of West Bengal, the disparity in male and female literacy rates was 17.41% and 11.05% in 2001 and 2011, respectively (Census of India, 2001 & 2011), while this disparity was recorded as 16.68% for India in 2011 (Census of India, 2011). These statistics are pretty enough to provide a clear picture of Purulia's GDLR. The district is far behind the state and national average of GDLR. It is worth mentioning that the district ranks last in West Bengal in this context.

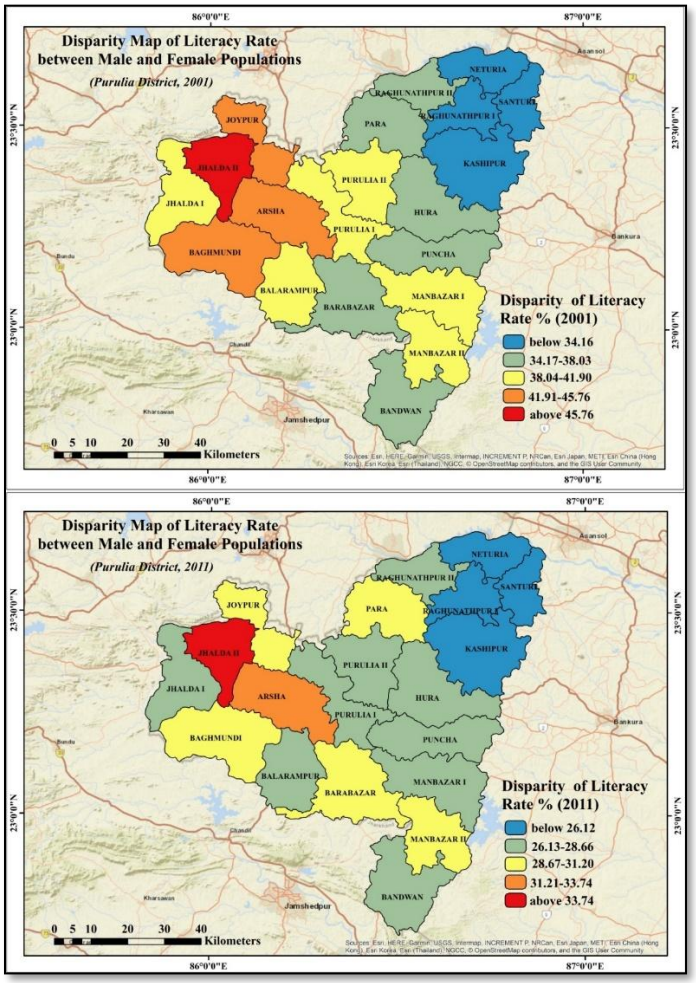

Fig. 2 Gender disparity map of literacy rate

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The highest gender disparity was found at the Jhalda-II CD block (36.24%) in 2011, followed by Arsha (31.61%) and Baghmundi (30.72%), while the lowest gender disparity was enjoyed by Raghunathpur-I CD block (23.59%) followed by Kashipur (23.92%) and Santuri (24.87%). In 2001, Jhalda-II (49.60%) also remained in the top position in GDLR, while Raghunathpur-I enjoyed the lowest gender disparity (31.40%). The standard deviation (SD) of the GDLR is computed as 2.78%, which is significantly low for the Purulia district in 2011. Being recorded as the highest GDLR district in West Bengal, thus the SD of the state was observed to be 5.11% in 2011 (Table 3 & Fig. 2). Interestingly, the SD value is calculated as 3.60% for the same year if the Purulia district is skipped from the list. It is easy to understand that Purulia has not improved significantly concerning GDLR compared to other state districts from 2001 to 2011 (gender disparity was 37.22% and stood second last after Maldha in 2001). Purulia's consistent nature of poor performance exhibits the incidence of deprivation and poverty for decades. Several earlier studies well document that *Zamindars*, *Mahajans*, money lenders, and village rice merchants deprived the poor peasants for decades. Subsequently, the people of Purulia had also gone through severe forms of deprivation and poverty during the British reign (Bhattacharya, 1986). In the post-independence period, India and Purulia had witnessed rapid population growth. The pressure of population growth was immense on agricultural lands, and the increased unemployment rate and disguised unemployment were reflected through poverty and malnutrition (Mandal et al., 2018; Mandal and Ghosh, 2019).

Table 3: Descriptive statistics of male and female literacy rate in Purulia district

Gender	Census Year	Literacy Rate			
		Mean	Minimum	Maximum	Range
Male	2001	72.25 (3.48)	66.50	79.15	12.65
Female		33.67 (6.98)	18.40	46.20	27.80
Male	2011	76.82 (3.62)	70.36	82.34	11.98
Female		49.23 (6.25)	36.12	60.76	24.64

Source: Computed by authors. Note: Values in parenthesis are standard deviation.

4.3. Gender disparity index of literacy rate

The measure of GDLR shows the disparity between male and female literacy. The higher value of the disparity index (based on Sopher's index) near 1 explains a higher disparity, and 0 indicates no disparity. In this study, disparity indices of 2001 and 2011 of Purulia district reveal a new picture. It is observed that the gender disparity index in literacy rate was reduced from 2001 to 2011 for all CD blocks of the district. The highest disparity index is observed at Jhalda-II (0.409 in 2011),

which was 0.706 in 2001, followed by Arsha, Baghmundi, Joypur, and Barabazar. The value of these CD blocks ranges between 0.40 and 0.30, and the rest experienced a disparity between 0.30 and 0.20 in 2011 (Table 4 & Fig. 3). In the case of West Bengal, the highest GDI is noted in Purulia district in 2011 (0.276), where Kolkata documents the lowest GDI (0.038). The range of disparity index between Purulia and Kolkata is computed to be 0.238, which is relatively high for consideration. In 2001, the highest GDI was observed in Maldha district (0.544), Purulia was the second highest with a value of 0.417, and Kolkata was the lowest one (0.059). If the range of GDI is calculated between Purulia and Kolkata instead of Maldha, the value would be 0.358. It is good to see that Maldha has improved well in minimizing the GDLR from 2001 to 2011 (Table 5 & Fig. 4).

Unfortunately, Purulia tried to perform well in GDI during this period but settled down at the bottom of the table. The paired *t*-test of GDI in literacy rate of 2001 and 2011 census years is calculated to be 13.073, greater than the tabulated value of 2.093 ($p< 0.025$) for 19 degrees of freedom. This means a significant difference exists between the GDI of 2001 and 2011. Over time, the gender disparity has been decreasing nationwide due to the increasing literacy rate between male and female children (Hira & Das, 2018). The Government of India has launched several schemes at different times, such as Mid-Day Meal Scheme, 1995, (Sinha, 2019); Sarba Siksha Abhijan, 2001 (Dasari and Alam, 2019); Right to Education Act, 2009 (MHRD, 2009; Ojha, 2013) to enhance the educational attainment and minimize the school dropout among children. All attempts made by the different governments to bring all children to receive free and elementary education have significantly increased the overall literacy rate and reduced gender disparity on different occasions (Halawar, 2019).

Table 4. Distribution of gender disparity index in literacy rate in Purulia district

Sl. No.	CD Blocks	Male Literacy	Female Literacy	Disparity Index	Male Literacy	Female Literacy	Disparity Index
		2001			2011		
1	Arsha	67.40	23.60	0.580	70.36	38.75	0.354
2	Baghmundi	67.60	25.10	0.551	72.14	41.42	0.334
3	Balarampur	68.30	30.20	0.465	74.18	45.82	0.298
4	Barabazar	72.70	32.00	0.477	77.84	48.37	0.300
5	Bandwan	66.50	28.50	0.477	74.61	48.03	0.275
6	Hura	76.40	41.20	0.377	81.95	55.27	0.260
7	Joypur	71.30	26.90	0.552	72.06	42.80	0.316

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8	Jhalda II	68.00	18.40	0.706	72.53	36.29	0.409
9	Jhalda-I	73.70	33.20	0.467	80.15	51.61	0.284
10	Kashipur	79.80	47.90	0.324	82.83	58.91	0.229
11	Manbazar-I	74.00	35.90	0.429	77.88	49.38	0.289
12	Manbazar-II	73.00	33.40	0.457	74.64	48.76	0.303
13	Neturai	73.00	41.30	0.342	76.38	52.06	0.254
14	Para	76.40	38.50	0.414	79.61	50.73	0.289
15	Puncha	75.30	39.10	0.395	81.16	54.82	0.257
16	Purulia-I	73.80	33.50	0.463	78.37	50.37	0.282
17	Purulia-II	75.50	35.70	0.446	76.72	49.51	0.277
18	Raghunathpur-I	73.60	43.30	0.324	78.73	55.14	0.232
19	Raghunathpur-II	72.20	36.50	0.403	80.95	52.79	0.278
20	Santuri	72.00	40.00	0.352	76.32	51.45	0.251
	Purulia	72.51	35.71	0.418	77.02	48.96	0.286

Source: Computed by authors based on census data of India

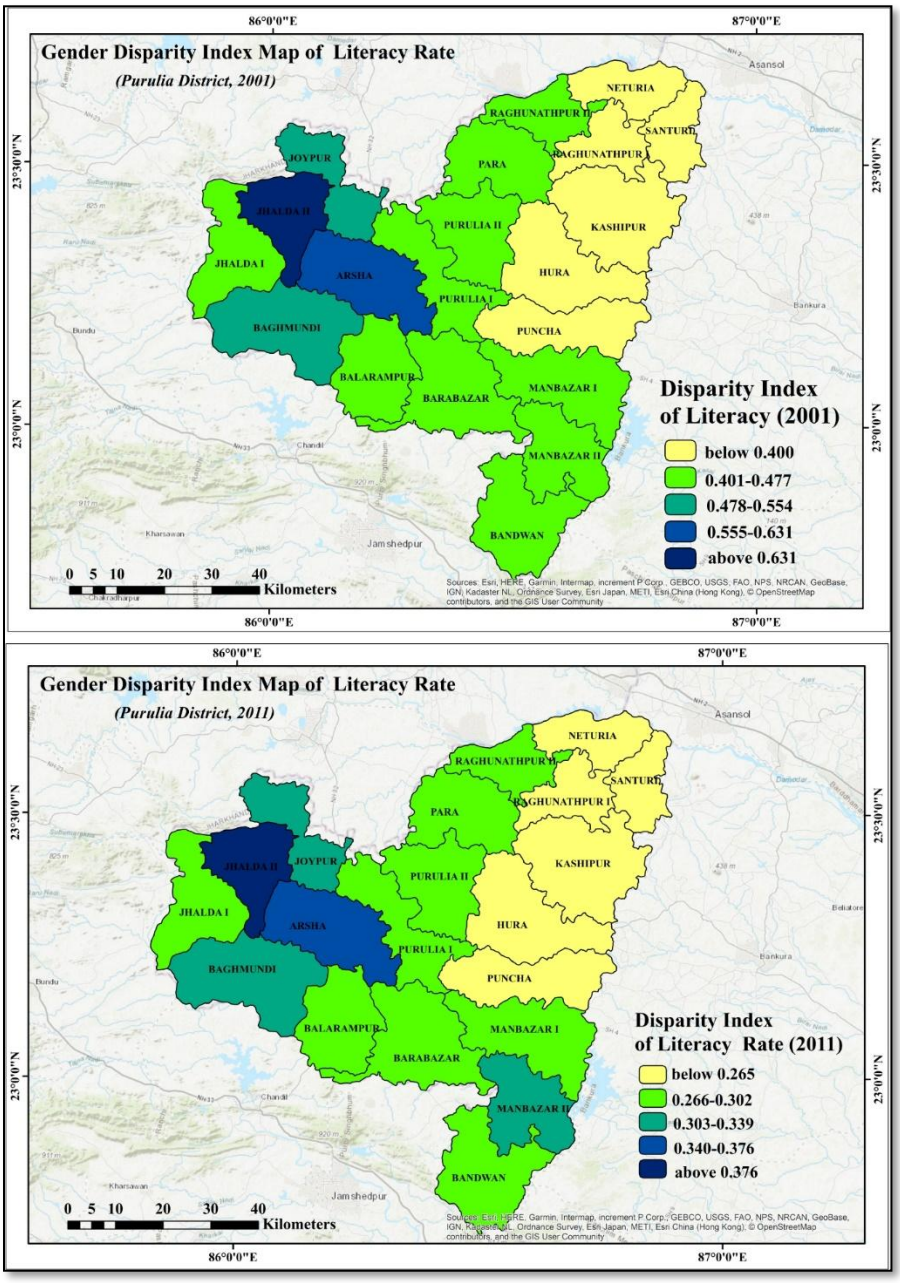

Fig. 3 Gender disparity map of literacy rate

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Table 5. District-wise distribution of gender disparity index in literacy rate in West Bengal

Sl. No.	Districts	Male Literacy	Female Literacy	Disparity Index	Male Literacy	Female Literacy	Disparity Index
			2001			2011	
1	Burdwan	78.63	60.95	0.170	82.42	69.63	0.118
2	Birbhum	70.89	51.55	0.199	76.92	64.14	0.122
3	Bankura	76.76	49.43	0.278	80.05	60.05	0.192
4	Purba Medinipur	84.91	62.64	0.209	92.32	81.37	0.097
5	Paschim Medinipur				85.26	70.50	0.135
6	Howrah	83.22	70.11	0.121	86.95	79.43	0.067
7	Hooghly	82.59	67.21	0.143	87.03	76.36	0.096
8	24 Parganas (N)	83.92	71.72	0.112	87.61	80.34	0.065
9	24 Parganas (S)	79.19	59.01	0.195	83.35	71.40	0.110
10	Kolkata	83.79	77.30	0.059	88.34	84.06	0.038
11	Nadia	72.31	59.58	0.125	78.75	70.98	0.072
12	Murshidabad	60.71	47.63	0.144	69.95	63.09	0.067
13	Uttar Dinajpur	58.48	36.51	0.267	65.52	52.17	0.140
14	Dakshin Dinajpur	72.43	54.28	0.183	78.37	67.01	0.107
15	Maldha	58.80	21.25	0.544	66.24	56.96	0.095
16	Jalpaiguri	72.83	52.21	0.210	79.95	66.23	0.129
17	Darjeeling	80.05	62.94	0.162	85.61	73.33	0.112
18	Cooch Behar	75.93	56.12	0.196	80.71	68.49	0.114
19	Purulia	73.72	36.50	0.417	77.86	50.52	0.276
	West Bengal	74.95	55.38	0.210	80.69	68.74	0.113

Source: Computed by authors based on census data of India

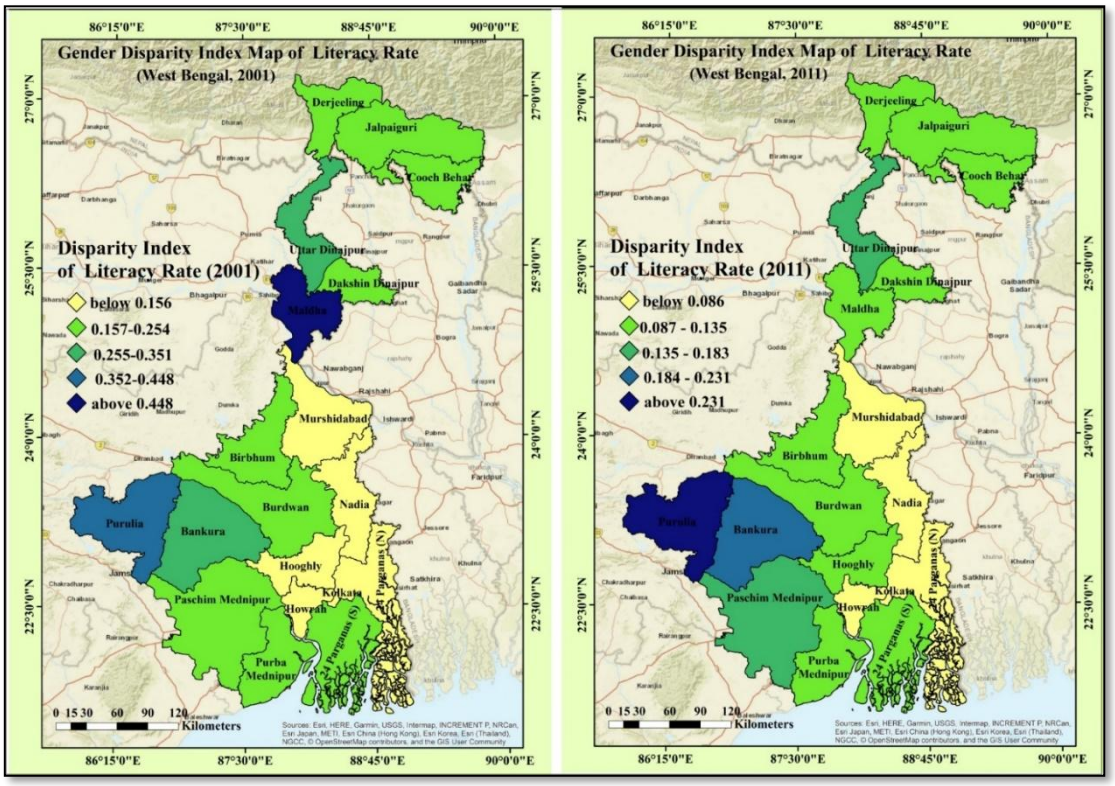

Fig. 4 Gender disparity index in literacy rate in West Bengal

4.4. Work participation rate

In 2011, the district accounted for around 1.25 million (42.65%) working populations, of which main and marginal workers are 20.93% and 21.72%, respectively. The situation was different in the earlier census reports. It is observed that the main working population has been decreasing from 1961 (48.68%) onwards, while the marginal working population increased significantly, almost seven times from 1971 to 2011. Of the total working population of the district, the majority of the people (60.90%) were engaged in the agricultural sector (21.51% were cultivators and 39.39% were agricultural labourers). A small proportion (7.01%) of workers were associated with the household industry, and the remaining 32.10% were engaged in other works. Around 88% of the male population were cultivators in the case of the main working population. In comparison, around 12% of females were cultivators at the district level, and the highest and lowest female participation rates were observed at Barabazar (21.95%) and Raghunathpur – II (4.69%) CD blocks, respectively. The proportion of male and female agriculture labourers was 71.85% and 28.15%, respectively, with Hura being the highest (42.40%) and Raghunathpur – II being the lowest (17.75%) female participation. In Purulia, the average percentage of male and female people engaged in household work was 62.62% and 33.38%,

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respectively (Arsha – 53.16% and Baghmundi – 13.80%). In contrast, around 85% of male and 15% of female populations were associated with other works, whereas Bundwan recorded 24.90% female engagement, and Para accounted for 9.56% (Census of India, 2011). Female participation in all sectors is much less than that of their counterpart (Fig. 3).

Here, an attempt is also made to understand the relation between the percentage of female literacy rate and the percentage of female workers. Data from two census years, i.e., 2001 and 2011, are considered to compute the correlation. It is observed that the correlation value for 2001 of adopted parameters is – 0.62, while it is – 0.37 for 2011. Indeed, both results are negative, but there is a substantial positive change in outcomes from 2001 to 2011 (the correlation value reduced to – 0.25). The female literacy rate increased by 13.25% from 2001 to 2011, whereas the total female work participation rate decreased by 4.13%. According to the report of the NFHS in 2015–16, the women's literacy rate of the Purulia district was 48.10%, while the proportion of women who completed ten or more years of schooling was 15.70% (IIPS, 2017). The education level of women has not progressed well over time, which is reflected in their work participation rate in both main and marginal working categories. On the contrary, the male worker participation rate increased by 4.13% from 2001 to 2011 (Census of India, 2011). The study finds that the proportion of the main working male and female workers was 76.40% and 23.60%, respectively, whereas the respective male and female marginal workers were 37.48% and 62.52% in 2001. Most male populations were engaged as main workers, while their female counterparts were more associated as marginal workers (Census of India, 2001). On the contrary, the main (80.08%) and marginal (48.22%) working male populations increased by 3.68% and 10.74% in 2011, while the situation completely reversed for the female population (main and marginal worker rate – 19.92% and 51.78% respectively). Their participation rate in the working category decreased over the decade (Census of India, 2011). It is also revealed that the overall dependency ratio of the district was 74.95% in 2001, where the ratio for both males and females was 73.63% and 76.63%, respectively. In contrast, the number was 68.02%, 66.01%, and 70.23% for the overall male and female dependency ratio of West Bengal. In 2011, the overall male and female dependency ratio of Purulia was 65.98%, 64.52%, and 67.54%, respectively, while it was 55.54%, 54.71%, and 56.42% for overall male and female dependency ratio, respectively, in West Bengal. In the case of both census years, West Bengal was in a better position than Purulia in every parameter. The dependency ratio reduced from 2001 to 2011, but Purulia lagged at the state level.

5. Conclusion

The study brings forth the literacy rate scenario with particular reference to Purulia's GDLR. It is compared with the state of West Bengal to understand the district's literacy rate better. It is revealed that Purulia ranked 3rd last among other districts of

West Bengal in 2011 concerning literacy rate, and over the census years, the district has been a poor performer. In addition, Purulia recorded the highest GDI in literacy rate in West Bengal in 2001 and 2011. The district's literacy rate in both male and female populations was enhanced. Still, the share of passed-out students from secondary onwards was found inadequate, resulting in limited well-educated students. This situation depicts the distressed condition of the district, and it is well-linked to the occupational structure of the district. The share of the main working population is less than the marginal workers in 2011, and most of the workers are associated with agricultural activities, promoting disguised unemployment. Moreover, the adverse geophysical nature of the district impedes development. In a nutshell, education and employment are very closely associated and influence each other. Furthermore, the issue of GDLR plays a significant role in this context. There are several schemes of state and national governments to enhance educational levels among male and female children to minimize gender disparity in every aspect. Still, more emphasis should be placed on raising awareness among parents.

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