Regional Disparity in Literacy among the Scheduled Tribe Population: An Inter-Block Level Analysis of Alipurduar District of West Bengal

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Abstract: *Literacy and educational development is one of the key factors for the improvement of human development as well as socio-economic development of human society. Equal participation in education of every section of society is a good sign for social development which helps to acquire higher social status. In India the rural and tribal dominant regions are experienced low level of literacy as well as higher gender gap in literacy rate. The present study attempts to show the regional disparity in literacy in the context of gender and rural-urban differentiation in literacy of Scheduled Tribe population among the blocks of Alipurduar district of West Bengal. Rural and female literacy rate is comparatively low among the tribal people in this study area. In Alipuduar district, there is 26.76% Scheduled Tribe population to total population of the district with 60.38% literacy rate among them as per Census of India, 2011. The entire study is based on secondary data from District Census Handbook and Census of India, 2011. The main focus of this study is the spatial distribution of literacy in terms of gender and rural-urban differentiation among the blocks of the study area. For statistical analysis Z-Socre and Disparity Index have been followed and cartographic expressions like bar diagrams and maps have been used with the help of MS Excel and QGIS software in this study.*

Key Words: *Scheduled Tribe, Gender Gap, Rural-Urban Differentiation, Effective Literacy Rate, Z-Score, Disparity Index.*

1. INTRODUCTION:

Having a population with high literacy in a society helps to overcome different social challenges which expedites individual as well as community well-being and improve the overall development of the society. In India the rural and tribal dominant regions are experienced low level of literacy as well as higher gender gap in literacy rate. The definition of literate as per Census of India is 'a person aged 7 years and above who can both read and write with understanding in any language is taken as literate'(**Census of India, 2011**). Regional differentiation is the main matter of geography which deals with the analysis of inequalities on the different elements of the region to region(**Dholakia, 2003**). Education as an important parameter for any inclusive growth in an economy and the policies have to focus on inclusive rather than divisive growth strategies(**Abdulraheem, 2011**). Due to the language barrier the tribal children are unable to establish communication link with the teacher and thus leading to the termination of their education in some point or the other(**Rani, 2000**). Due to wrong medium of instruction, the appointment of non-tribal teachers in tribal areas and communication gap between the teachers and tribal children are the causes of high dropout rates in tribal schools(**Gautam, 2003**). Despite sincere efforts the performance of the tribes in education is much lower than the Scheduled Castes. Further they reported that the policy makers paid little attention to culturally linked education that led to drop outs and directly impacted overall educational status of scheduled tribes(**Brahmanandam & Babu, 2016**). This assumes larger importance in the context of education of scheduled tribe children because their mother tongue is often quite distinct from the major languages in the state or regional languages and it is needed to have a local tutor from the same tribal area(**Jha & Jhingran, 2002**). Female literacy is that prerequisite condition that could minimize gender gap in education and lead to women empowerment. But the status of female education in the districts of West Bengal is not impressive and associated with acute gender gap(**Lieten, 1992; Agarwal, 1997; & Southard, 1984**) and has also created a spatial variation in the distribution of literacy.

2. LITERATURE REVIEW:

The imparity of distribution scenario of gender gap and spatial pattern of literacy among the Scheduled Tribes in India is very crucial. The study reveals that the peculiar nature of habitation of tribal people creates disparity and male-female differentiation in literacy. Highest gender gap in literacy has been examined in Rajasthan and lowest in Meghalaya. The sates having high level of total, male and female literacy experience fewer gaps between male and female literacy rate. A lot of reasons behind the low performance in educational attainment and disparity in literacy have been considered in this study(**Auddya, 2018**). The present scenario of socio-economic status of Toto tribe of Alipurduar is comparatively deplorable. The study denotes that the educational status of the tribal people is very low due to the low parental economic background. It also states the parents are not very conscious about educational expenditure on their child education. Consequently the female literacy is also low. Less number of educational institutes(only one primary

and one high school) and lack of private tutors in the study area is a negative impression on tribal literacy in the rural areas**(Debnath, Das & Saha, 2019)**. The literacy rate of tribal women is very low and there is still a great extend of gap between male and female of Scheduled Tribes in India. Unawareness of several government programmes, policies, schemes etc and participation among them are the main reasons for inferior level of education as well as literacy. The medium of instruction in educaitional institutes is an obstacle for the progression of education of tribal children in rural areas in India**(Basha, 2018)**.

3. OBJECTIVES:
The main objectives of this study are as follows-
- To analyze the spatial pattern of literacy among the administrative blocks of Alipurduar district.
- To examine the gender gap, male-female disparity and rural-urban differentiation in literacy.

4. MATERIALS:
The entire work is based on secondary data. The data for analytical purpose have been collected in this study from District Census Handbook of Jalpaiguri district, 2011. As before the emergence of Alipurduar in 2014 as a new district of West Bengal, it was a sub-division of Jalpaiguri. So there is no distinct District Census Handbook for Alipurduar as per 2011 census.

5. METHOD:
Several research articles and books have been studied for the fulfilment of the study. The essential cartographic expression like bar diagram has been used with the help of MS Excel and for map making QGIS software has been utilized. To find out the result and complete the study some parametric measures have been adopted in this study. These are as follows-

5.1. Effective Literacy Rate:
Effective literacy rate has been considered as the total percentage of the population of an area at a particular time aged seven years or above who can read and write with understanding. Therefore the whole work is based on effective literacy rate instead of general literacy rate. It has been calculated by using the following formula-

Effective Literacy Rate = (total number of literates aged 7 years and above × 100) / total population aged 7 years and above

5.2. Standard Score:
Standard Score also known as Z-Score. To analyze the spatial distribution of gender gap in literacy standard score has been applied which is the sign number of standard deviations an observation or datum is above the mean. It is a dimensionless quantity that involves the varying means and varying standard deviations and therefore, it can be suitably used to examine the pattern of regional distribution of a variable**(Sarkar, 2013)**. Z-Score has been calculated with the help of following formula-

$$Z = (x - \bar{x})/\sigma$$

Where,
    Z = Standard Score or Z-Score,
    x = Variables to be examined,
    $\bar{x}$ = Mean value, and
    σ = Standard Deviation.

In standard score analysis, a positive value specifies a datum above the sample mean, while a negative value indicates a datum below the sample mean**(De Onis & Blossner, 1997)**.

5.3. Disparity Index:
Disparity Index by David E. Sopher or simply Sopher's disparity Index is well accepted technique to measure the gender disparity between male and female**(Sopher, 1974)**.

$$DI_S = log(X_2/X_1) + log(100-X_1)/(100-X_2)$$

Where,
    DI_S = Sopher's Disparity Index,
    X_1 = Value of deprived group(female),
    X_2 = Value of dominant group(male), and
    $X_2 \geq X_1$

The index measures disparity between groups in their possession of a particular property in terms of the logarithm of the odd ratio. The objective of taking log is to reduce the levelling off effect i.e. regions with higher literacy rate may show a lower level of disparity than the region having low literacy rate even though the gender gap is remain same for both region**(Sopher, 1980)**. But this index fails to satisfy the additive monotony axiom**(Kundu & Rao, 1986)**. The additive monotony axiom specifies that if a constant is added in all observations in a non-negative series, ceteris paribus,

the inequality index must report a decline(**Husain, 2010**). The modified disparity index proposed by Kundu and Rao(1986) is-

$$DI_{KR} = log(X_2/X_1) + log(200-X_1)/(200-X_2)$$

Where,

DI_{KR}= Modified Disparity Index by Kundu and Rao,

X_1= Value of deprived group,

X_2= Value of dominant group, and

$X_2 \geq X_1$

This method is more suitable to measure the inequality between two variables. If the value of DI is '0', it refers the perfect equality between two variables. Greater the value of DI indicates higher extent of disparity and vice versa. Statistically a better tool than the arithmetic difference or gap between the two percentages or the ratio of one to another, the disparity index has an additional property which relates to the question of distributive justice(**Raju, 1991**).

6. STUDY AREA:

Alipurduar is the 20th district in the Indian state West Bengal. Before its separation on 25th June, 2014 as a new district, it was a sub-division of Jalpaiguri district. Geographically the district is located in the North-Eastern part in the state of West Bengal and lies between 26°24' N to 26°51' N and 89°2' E to 89°53' E.
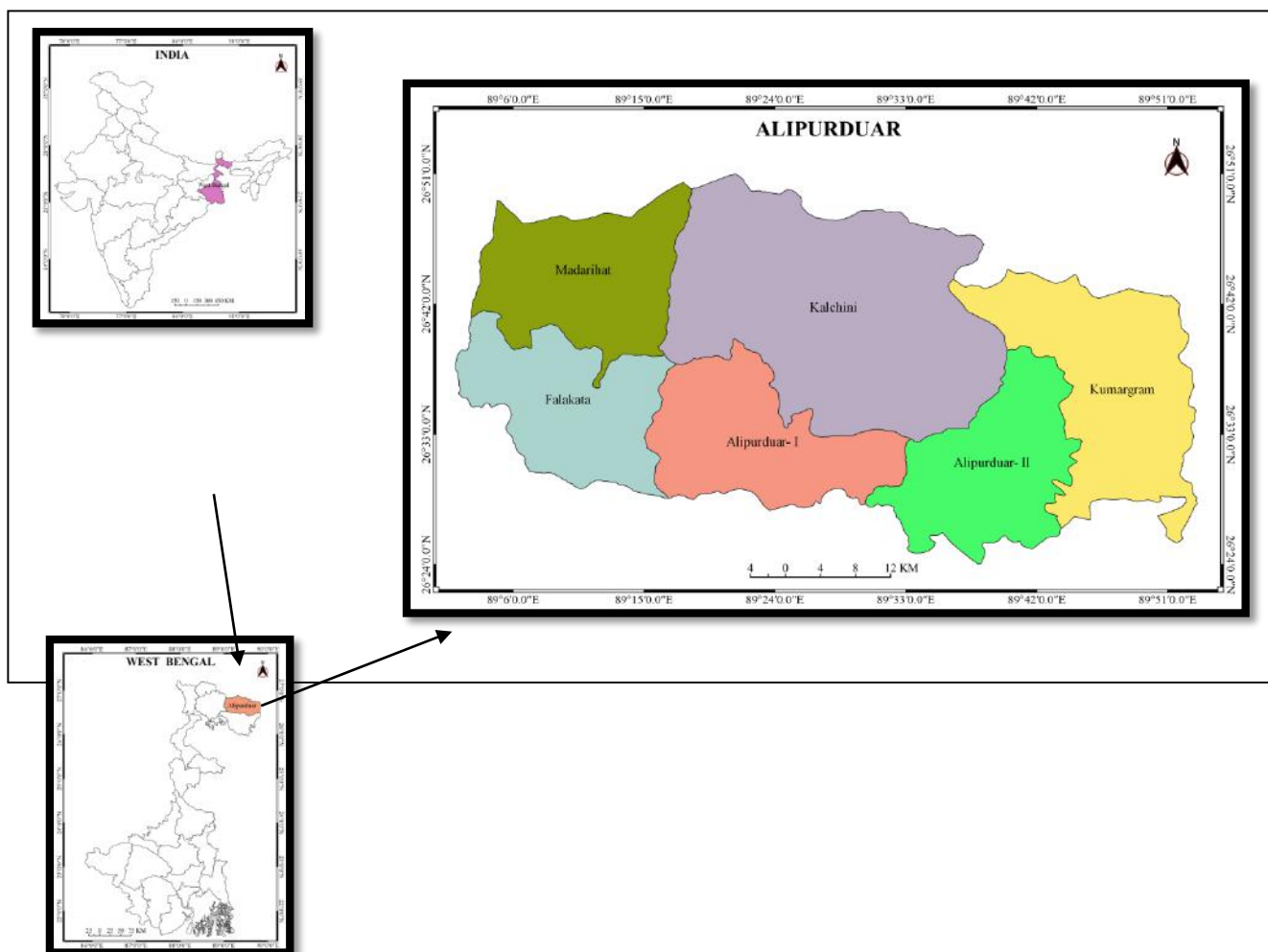

Figure 1. Location and Administrative Divisions of Alipurduar District

Basically it is a land locked district surrounded by dis trict boundary with Jalpaiguri and Cooch Behare in the West and South respectively, state boundary with Assam in the East and international boundary with Bhutan in the North. The total geographical area of district is 3136 sq.km. having 1426018 persons(In case of population under Scheduled Tribes category, Jalpaiguri district ranks 2nd with population of 7,31,704 just behind district Paschim Medinipur)(**District Census Handbook of Jalpaiguri, 2011**) as per census of India, 2011. 26.76% of total population of the district is under Scheduled Tribe. It mainly comprises of rural population. The average literacy rate of ST population of the district is 60.38%. The district includes six community development blocks i.e. Madarihat, Falakata,

Kalchini, Alipurduar- I, Alipurduar- II and Kumargram. It is the land of several ethnic tribes like Toto, Bodo, Santhals, Oraons, Madasia, Metch, Rabha etc.

7. RESULT AND DISCUSSION:
According to Census of India, 2011, the total Scheduled Tribe population of Alipurduar district is 381616 persons(which holds 26.76% of total population of the district) among which 50.22% is male and 49.78% is female. The proportion of rural ST population is 95.33% and urban ST population is 4.67% to total ST population of the district.
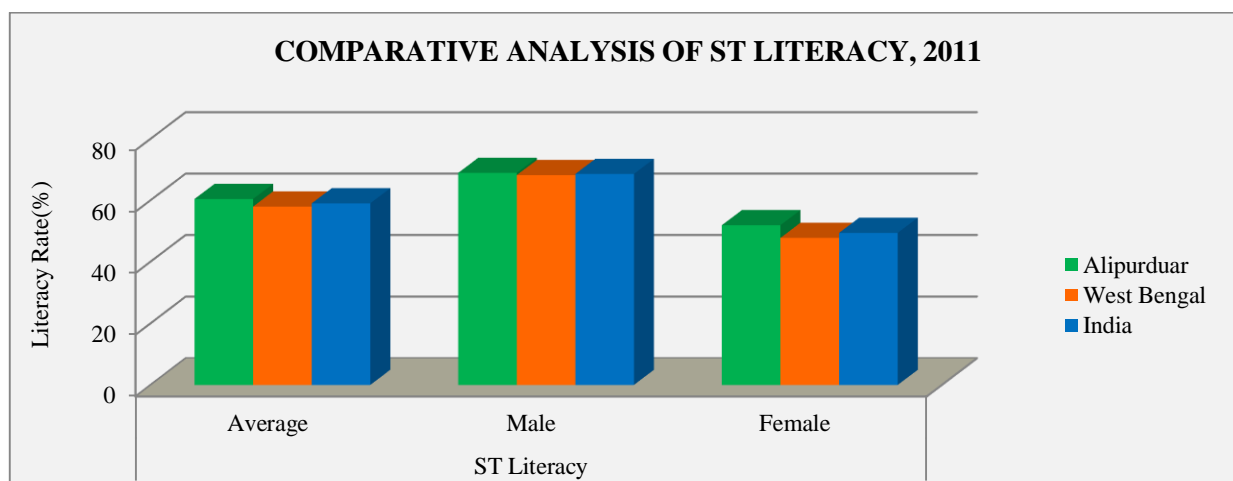
7.1. Comparative Analysis of ST literacy of Alipurduar with the State and National Average:
The following graph(Graph 1) depicts the comparative analysis of ST literacy rate of Alipurduar district with the state and national average. The ST literacy rate of Scheduled Tribe of Alipurduar district is 60.38% which is higher both than the state and national average of 57.92% and 58.96%(Table 1).

Table 1. Comparative Analysis of ST literacy and Gender Gap

Region	ST Literacy Rate(%)			Gender Gap
	Average	Male	Female	
Alipurduar	60.38	68.88	51.84	17.04
West Bengal	57.92	68.16	47.71	20.45
India	58.96	68.53	49.35	19.18

Source: Compiled by Author, Data from District Census Handbook of Jalpaiguri & Census of India, 2011

Graph 1: Comparative Analysis of ST literacy Rate

The male and female literacy rate of Alipurduar is 68.88% and 51.84% respectively. Hence the female literacy rate is significantly low in respect to male literacy among the ST population in this study area. Thereby the gender gap in literacy is 17.04 which is lower than the state(20.45) and national average(19.18).

7.2. Scenario of Inequality in Literacy Rate:
The imbalance in ST literacy rate is found among the blocks of the district. The average literacy rate is highest in Alipurduar-II(64.04%) followed by Alipurduar-I(63.38%) and lowest in Falakata(55.86%) followed by Madarihat(58.42%)(Table 2).

Table 2. Rural-Urban Differentiation and Gender Gap in ST Literacy Alipurduar, 2011

Block	Total/Rural/Urban	Literacy Rate(%)			Gender Gap	Rural-Urban Difference(%)	
		Person	Male	Female		Literacy	Gender Gap
Madarihat	Total	58.42	67.84	49.12	18.72	0.51	6.22
	Rural	58.41	67.92	49.03	18.89		
	Urban	58.92	65.06	52.39	12.67		
Falakata	Total	55.86	64.70	46.76	17.94	5.72	2.27
	Rural	55.51	64.42	46.36	18.06		
	Urban	61.23	68.93	53.14	15.79		

Kalchini	Total	61.62	70.57	52.84	17.73	5.85	5.36
	Rural	61.16	70.34	52.22	18.12		
	Urban	67.01	73.25	60.49	12.76		
Alipurduar- I	Total	63.38	71.57	54.79	16.78	16.18	1.57
	Rural	62.60	70.72	54.18	16.54		
	Urban	78.78	86.55	68.44	18.11		
Alipurduar- II	Total	64.04	70.56	57.39	13.17	7.95	7.45
	Rural	63.79	70.42	56.99	13.43		
	Urban	71.74	74.86	68.88	5.98		
Kumargram	Total	59.56	67.25	51.69	15.56	20.34	9.08
	Rural	59.37	67.10	51.46	15.64		
	Urban	79.71	82.93	76.37	6.56		

Source: Compiled by Author, data from District Census Handbook of Jalpaiguri, 2011

The highest male literacy rate is found in Alipurduar-I(71.57%) and lowest in Falakata(64.70%). But the female literacy rate is highest in Alipurduar-II(57.39%) followed by Alipurduar-I(54.79%) and lowest in Madarihat(49.12). So the performance of female literacy rate is relatively low in the district. The rural-urban difference in literacy rate is highest in Kumargram(20.34%) followed by Alipurduar-I(16.18%) and lowest in Madarihat(0.51%). But the scenario of rural-urban difference in gender gap is quite different and it reveals the disparity in the angle of male-female literacy rate between rural and urban areas. Consequently the rural-urban difference in terms of literacy rate is found lowest in Alipurduar-I(1.57%) followed by Falakata(2.27%), while the highest result is recorded in Kumargram(9.08%) followed by Alipurduar-II(7.45%), Madarihat(6.22%) and Kalchini(5.36%)(Table 2).

7.3. Inequality in Gender Gap in Literacy Rate:

Gender gap in literacy refers to the male-female difference in terms of literacy rate. Generally the male literacy rate is higher than the female literacy rate; so there is a difference between them, which indicates the performance of female literacy in respect to male literacy rate of a region. The spatial pattern of variation in literacy in the context of gender gap has been analysed here with the Z-Score method which is a dimensionless quantity.

Table 3. Z-Score of Average Gender Gap in ST Literacy of Alipurduar, 2011

Blocks	Gender Gap in Literacy(x)	$(x-\bar{x})$	$(x-\bar{x})^2$	Z-Scores	Parameters
Madarihat	18.72	2.07	4.28	1.12	
Falakata	17.94	1.29	1.66	0.70	$\bar{x} = (99.90/6) = 16.65$
Kalchini	17.73	1.08	1.17	0.59	
Alipurduar- I	16.78	0.13	0.02	0.07	$\sigma = \sqrt{(20.43/6)^2} = 1.85$
Alipurduar- II	13.17	-3.48	12.11	-1.89	
Kumargram	15.56	-1.09	1.19	-0.59	$Z = (x-\bar{x})/\sigma$
∑	99.90		20.43	0.00	

Source: Compiled by Author, Data from District Census Handbook of Jalpaiguri, 2011

Table 4. Z-Score of Rural Gender Gap in ST Literacy of Alipurduar, 2011

Blocks	Rural Gender Gap in Literacy(x)	$(x-\bar{x})$	$(x-\bar{x})^2$	Z-Scores	Parameters
Madarihat	18.89	2.11	4.45	1.14	
Falakata	18.06	1.28	1.64	0.69	$\bar{x} = (100.68/6) = 16.78$
Kalchini	18.12	1.34	1.80	0.73	
Alipurduar- I	16.54	-0.24	0.06	-0.13	$\sigma = \sqrt{(20.47/6)^2} = 1.85$
Alipurduar- II	13.43	-3.35	11.22	-1.81	
Kumargram	15.64	-1.14	1.30	-0.62	$Z = (x-\bar{x})/\sigma$
∑	100.68		20.47	0.00	

Source: Compiled by Author, Data from District Census Handbook of Jalpaiguri, 2011

Table 5. Z-Score of Urban Gender Gap in ST Literacy of Alipurduar, 2011

Blocks	Urban Gender Gap in Literacy(x)	(x-x̄)	(x-x̄)²	Z-Scores	Parameters
Madarihat	12.67	0.69	0.48	0.16	
Falakata	15.79	3.81	14.53	0.86	x̄ = (71.87/6) = 11.98
Kalchini	12.76	0.78	0.61	0.18	
Alipurduar- I	18.11	6.13	37.60	1.38	$\sigma = \sqrt{(118.55/6)^2} = 4.45$
Alipurduar- II	5.98	-6.00	35.98	-1.35	
Kumargram	6.56	-5.42	29.36	-1.22	$Z = (x-\bar{x})/\sigma$
∑	71.87		118.55	0.00	

Source: Compiled by Author, Data from District Census Handbook of Jalpaiguri, 2011

Above the mean or datum value of Z-Score of average gender gap in literacy in Alipurduar district have recorded in Madarihat block(1.12) followed by Falakata(0.70) and Kalchini(0.59) which indicates that the gender disparity in literacy in these blocks is high(Figure 2). Alipurduar-II(-1.89) and Kumargram(-0.59) have recorded below the datum which states comparatively low disparity in literacy in these blocks(Table 3). But the aspect in rural and urban areas is quite different. The Z-score analysis of rural gender gap in literacy rate shows(Figure 3) that three blocks namely Madarihat(1.14), Kalchini(0.73) and Falakata(0.69) have scored above the datum value which introduces that the gender disparity in literacy is more in these blocks. On the other hand Alipurduar-II(-1.81), Kumargram(-0.62) and Alipurduar-I(-0.13) are below the datum value as the disparity in these three blocks is comparatively less(Table 4). The condition of gender disparity in literacy in urban areas in the district is more or less same to rural areas but less good than the average gender gap in literacy. The Figure 5 delineates that only two blocks namely Alipurduar-II(-1.35) and Kumargram(-1.22) have recorded above the district mean that indicates the low level of gender disparity in literacy, while the remaining blocks- Alipurduar-I(1.38), Falakata(0.86), Kalchini(0.18) and Madarihat(0.16) have scored above the district mean which indicates comparatively more level of disparity in gender gap in literacy rate in urban areas(Table 5). The analysis depicts that Alipurduar-II and Kumargram play a positive role by minimising gender gap in literacy in all the aspects of literacy i.e. average gender gap, rural gender gap and urban gender gap in literacy. The position of Alipuduar-I is also good in terms of rural gender gap in literacy. Lower the disparity in gender gap is a good indication of gender development as well as socio-cultural development. On the other hand Madarihat, Falakata and Kalchini blocks are on bad position in terms of gender gap in average literacy, rural and urban literacy. The scenario of Alipurduar is also similar to these blocks in terms of its average and urban literacy rate. Highest disparity is found in Madarihat in terms of average and rural gender gap in literacy.
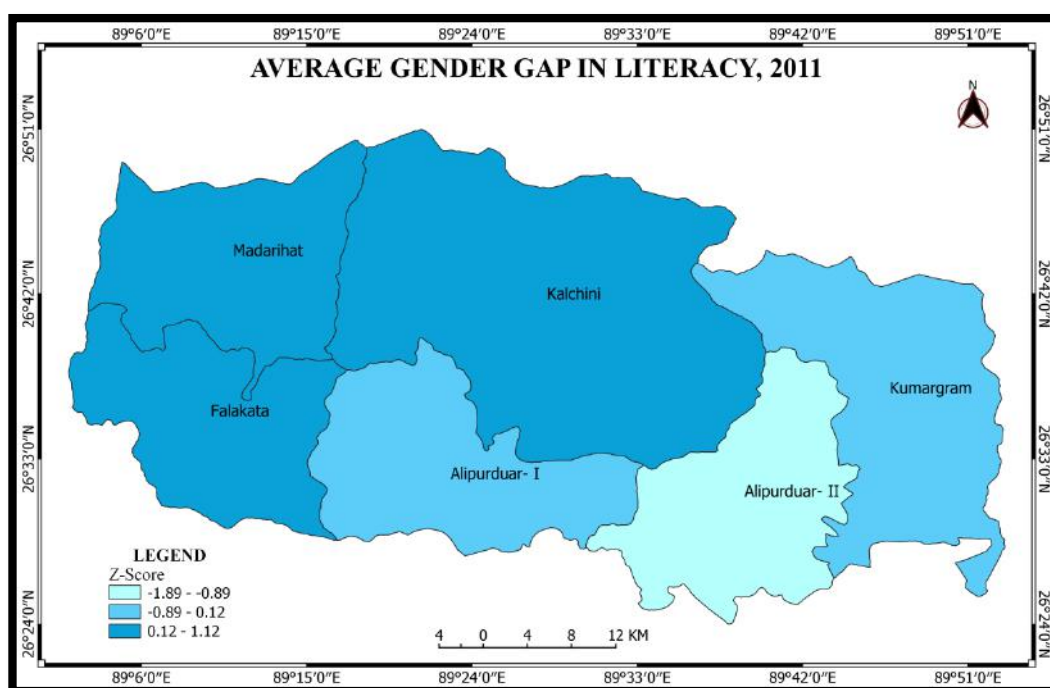

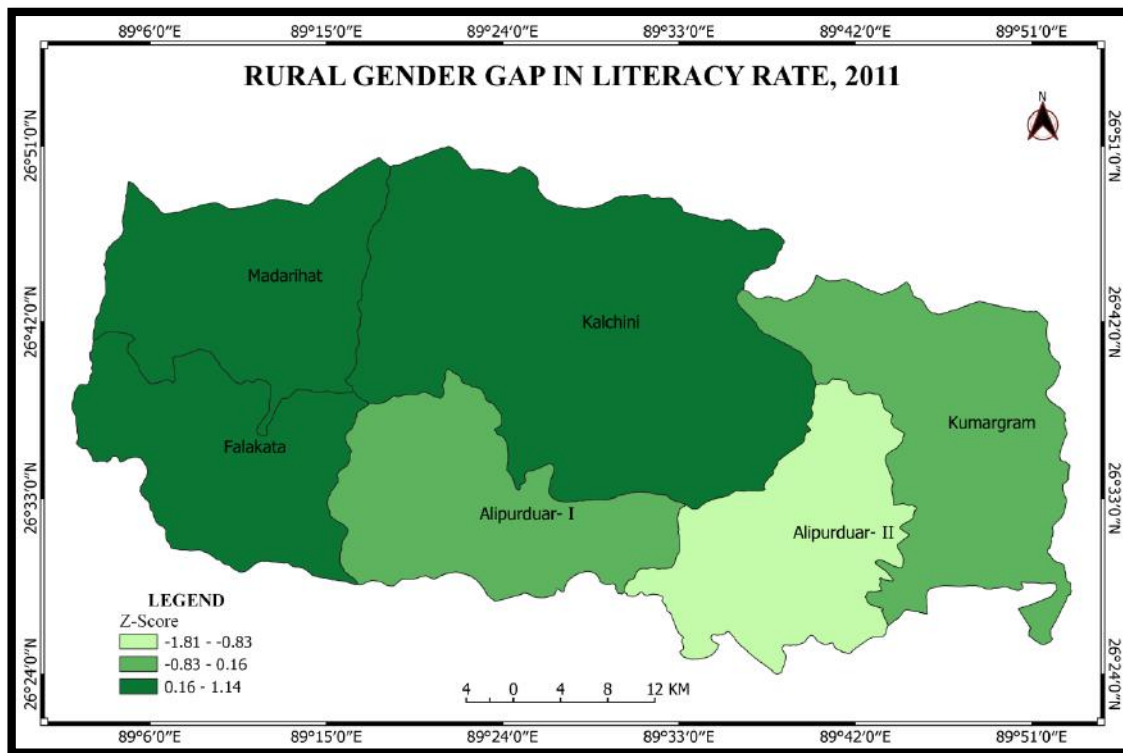Figure 2: Spatial Variation of Average Gender Gap in ST Literacy of Alipurduar, 2011

Figure 3. Spatial Variation of Rural Gender Gap in ST Literacy of Alipurduar, 2011
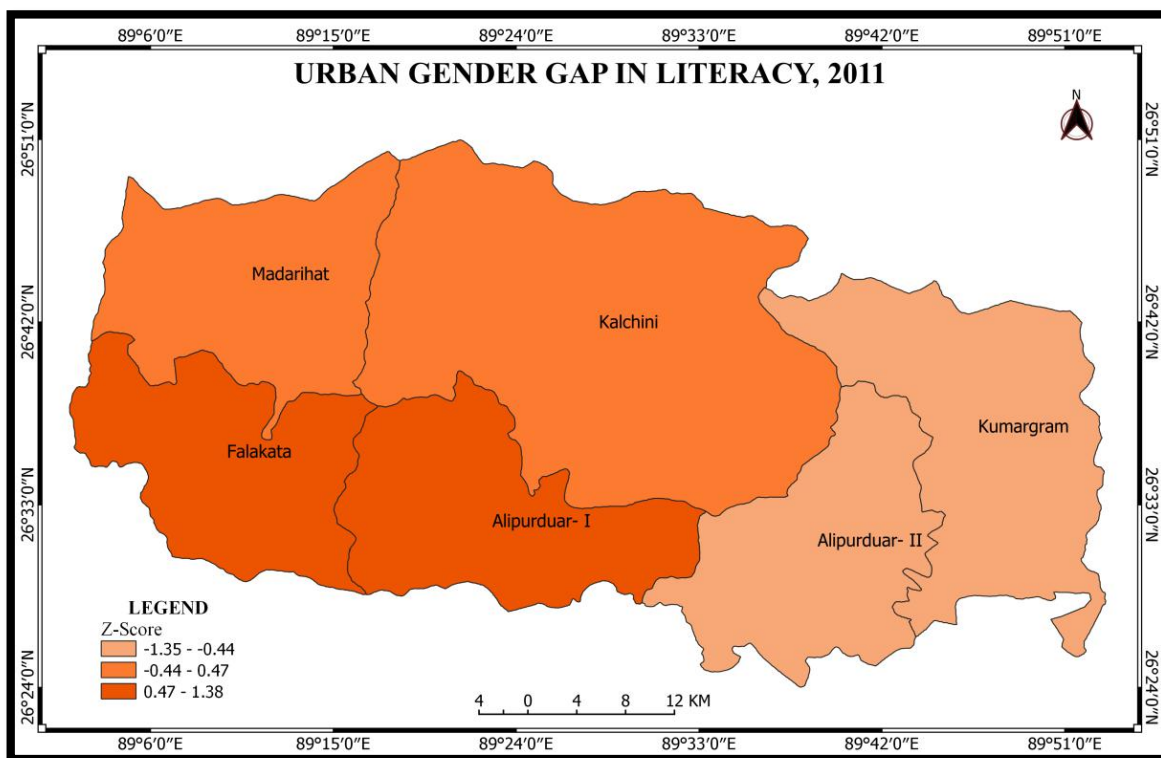

Figure 4: Spatial Variation of Gender Gap in ST Literacy of Alipurduar, 2011

7.4. Disparity in Male-Female and Rural-Urban Literacy Rate:

There is always a gap between male and female literacy rate in both rural and urban areas and rural and urban literacy. Generally the male and urban literacy rate is higher than that of female and rural literacy rate respectively. According to Census of India 2011, the male-female ST literacy gap of Alipurduar district is 17.04% and rural-urban ST literacy rate gap is 7.03%. Disparity Index(Kundu & Rao) analysis depicts the relative disparity in ST literacy rate among male and female and in rural and urban areas of all the blocks of the district.

Table 6. Disparity between Average Male and Female ST Literacy of Alipurduar, 2011

Blocks	Average Literacy Rate(%)		Disparity Index(DI)
	Female(X_1)	Male(X_2)	
Madarihat	49.12	67.84	0.20
Falakata	46.76	64.7	0.20
Kalchini	52.84	70.57	0.18
Alipurduar- I	54.79	71.57	0.17
Alipurduar- II	57.39	70.56	0.13
Kumargram	51.69	67.25	0.16

Source: Compiled by Author, Data from District Census Handbook of Jalpaiguri, 2011

Table 7: Disparity between Average Male and Female ST Literacy of Alipurduar, 2011

Blocks	Rural-Urban Literacy Rate(%)		Disparity Index(DI)
	Rural(X_1)	Urban(X_2)	
Madarihat	58.41	58.92	0.01
Falakata	55.51	61.23	0.06
Kalchini	61.16	67.01	0.06
Alipurduar- I	62.6	78.78	0.15
Alipurduar- II	63.79	71.74	0.08
Kumargram	59.37	79.71	0.20

Source: Compiled by Author, Data from District Census Handbook of Jalpaiguri, 2011

Table 8. Disparity between Average Male and Female ST Literacy of Alipurduar, 2011

Blocks	Rural Literacy Rate(%)		Disparity Index(DI)
	Female(X_1)	Male(X_2)	
Madarihat	49.03	67.92	0.20
Falakata	46.36	64.42	0.20
Kalchini	52.22	70.34	0.19
Alipurduar- I	54.18	70.72	0.17
Alipurduar- II	56.99	70.42	0.13
Kumargram	51.46	67.1	0.16

Source: Compiled by Author, Data from District Census Handbook of Jalpaiguri, 2011

Table 9. Disparity between Average Male and Female ST Literacy of Alipurduar, 2011

Blocks	Urban Literacy Rate(%)		Disparity Index(DI)
	Female(X_1)	Male(X_2)	
Madarihat	52.39	65.06	0.13
Falakata	53.14	68.93	0.16
Kalchini	60.49	73.25	0.12
Alipurduar- I	68.44	86.55	0.17
Alipurduar- II	68.88	74.86	0.06
Kumargram	76.37	82.93	0.06

Source: Compiled by Author, Data from District Census Handbook of Jalpaiguri, 2011

The Disparity Index analysis of the average ST literacy rate between male and female in Alipurduar district shows(Table 6) that Madarihat(0.20) and Falakata(0.20) have recorded the highest DI value which indicates the high level of gender disparity in literacy. Lowest gender disparity in literacy is found in Alipurduar-II(0.13) block. In case of rural-urban disparity in literacy the situation is totally different. A relatively high level of rural-urban disparity in

literacy has been observed(Figure 5) in Kumargram(0.20) and Alipurduar-I(0.15). Alipurduar-II(0.08) has recorded as moderate disparity in literacy and Madarihat(0.01), Falakata(0.06) and Kalchini(0.06) block have recorded comparatively low level of such disparity in the district(Table 7). In rural areas high gender disparity in literacy has examined in Madarihat(0.20), Falakata(0.20) and Kalchini(0.19) block and low disparity has examined in Alipurduar-II(0.13)(Table 8).
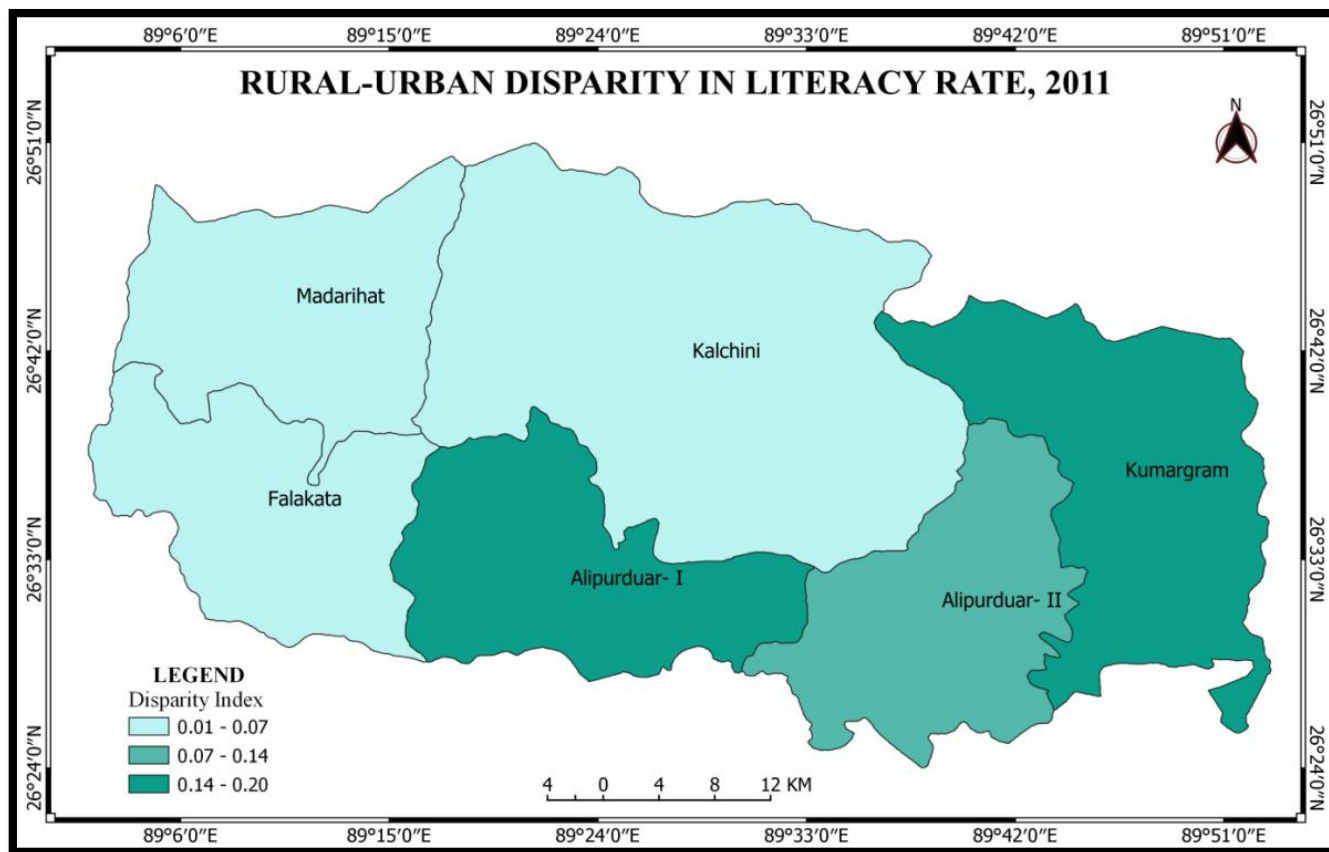

Figure 5. Spatial Distribution of Rural-Urban Disparity in ST Literacy of Alipurduar, 2011.

The condition in urban areas high gender disparity in literacy has observed in Alipurduar-I(0.17) and low disparity has observed in two blocks of the district namely Alipurduar-II(0.06) and Kumargram(0.06)(Table 9). Male-female disparity in literacy in both rural and urban areas as well as in terms of average literacy rate is high in Madarihat and Falakata but interestingly the scenario is opposite in rural-urban disparity in literacy rate. The pattern of male-female disparity in terms of average literacy and rural literacy rate is similar to each other among the blocks of the district. Gender disparity in average literacy and in both rural and urban literacy rate, Alipurduar-II plays a significant role which delimitates low level of male-female disparity among the blocks of the district. The districts headquarter Alipurduar and the only municipality Alipurduar of the district is located in Alipurduar-II block. Consequently the overall scenario of literacy is in better position in Alipurduar-II block. As opposed to the opposite condition is observed among majority of the blocks of the district.

8. CONCLUSION:

The above study reveals an insight into the existing variation of ST literacy rate as well as rural-urban differentiation in the context of gender in literacy rate. Higher gender gap and male-female disparity in literacy rate are experienced in rural areas due to poor economic background, lower parental educational attainment as well as lower attention on education of female children. Far distance of schools and language problem in educational institutes encourages the high dropout rate among the tribal children in rural areas of the district. Thereby the rural and female literacy rate is comparatively low in the study area and the block wise scenario of distribution of level of literacy is disparate. A society as well as region can never achieve its maximum potentiality or improvement due to such kind of inequality in literacy of it. The study gives a hint that the gender gap especially in rural areas can be reduced by public awareness campaigning, proper monitoring and surveying by government and NGOs with special attention. So there is a necessity of proper revised plans, policies and government investment to diminish the obstacles in literacy and educational development among backward and least developed parts of the administrative blocks of the study area.

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