A STUDY OF EDUCATIONAL INFRASTRUCTURE IN SUNDARBAN, SOUTH 24 PARAGANAS, WEST BENGAL

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Abstract

Education is one of the most important elements of human development. Education is vital not only in itself, but also because of the numerous positive externalities created by the spread of education, like human capacity building, human empowerment, and spread of awareness in all fronts. Capacity building encompasses human resource development as an essential part of development. It is based on the concept that education and training lie at the heart of development efforts and that without human resource development most development interventions will be ineffective. People's access to education depends crucially on the educational infrastructure in place. The number of institutions, their intake capacity, their spatial spread and distance from habitats, teacher strength, amenities available in the institutions, etc. are significant elements through which affordable education can be reached to the people. Therefore, the present work has focused on the educational infrastructure presently available in Sundarban, the southernmost part of West Bengal. It has also emphasized on the educational achievements of the people and the disparity of educational infrastructure across region.

Key words: human development, capacity building, human empowerment, educational infrastructure, educational achievements, disparity

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Introduction

Education is a human right. Education is essential for human emancipation and social development. It contributes to better health, higher productivity, greater income, human freedom, capability and esteemed living, increased participation in community life (2009). It is an indicator as well as instrument of development. Education increases the quality of labour productivity in both rural and urban sectors, and economic returns to investment in education are generally high. Schooling alters perceptions, attitudes and behaviour; it generates consciousness and develops personality in such a way as to promote development and welfare of a nation. Formal education bears the responsibility for upgrading the person with the basic knowledge and for that the govt. has given the highest priority in improving the overall quality of formal education system.

Plenty of research works have done in post independence period to enumerate the overall condition of education in India. Kingdon, 1998 opined that both the family background and school influence have an effect upon the achievement of student in India. Grover and Singh, 2002 have conducted a case study of Madurai and Villupuram districts in Tamil Nadu to assess the quality of primary education in the concerned area. Ahmed, 2011 measures the quality of primary education in India, which is based on students' learning achievements, adopting the parameters like ability of read, write and do mathematics. A comparative analysis in educational sector between Kolkata and Jalpaiguri district has been done by Roy, 2010. Mondal, 2011 have represented the status of primary education in Bankura district. There are very few research works based on overall conventional education i.e., primary, upper primary, secondary, higher secondary and so on. Most of the researches have emphasized on elementary education and very few works have done based on overall availability of infrastructure in conventional studies. Due to unavailability of information regarding higher studies, the present paper is an attempt to highlight the existing infrastructure available for primary to higher secondary educational set up of Sundarban which is considered as one of the underdeveloped part in West Bengal. The region is characterised by developmental constraints in terms of rapidly growing population, poor transport and communication network, scarcity of drinking water, lack of electricity supply, health care services and educational facilities. The present work tries to highlight the existing

infrastructure available for conventional educational system and bringing out the intra-block regional variation of it over Sundarban.

Study area

The Sundarban is geographically a remote area, criss-crossed by the rivers. It is bounded by the river Hooghly on the west, the Bay of Bengal on the south, Ichamati-Kalindi-Raimangal rivers on the east and Minakhan, Hingalganj, Sandeshkhali –I and II blocks on the north. In this Ganga Plain delta building process is still very active. This active delta has a network of tidal channels, river creeks and numerous islands. The climate of the area is characterised by an oppressive hot summer, high humidity all through the year and well distributed rainfall during the monsoon season (2001). Figure1 represents location of the study area.

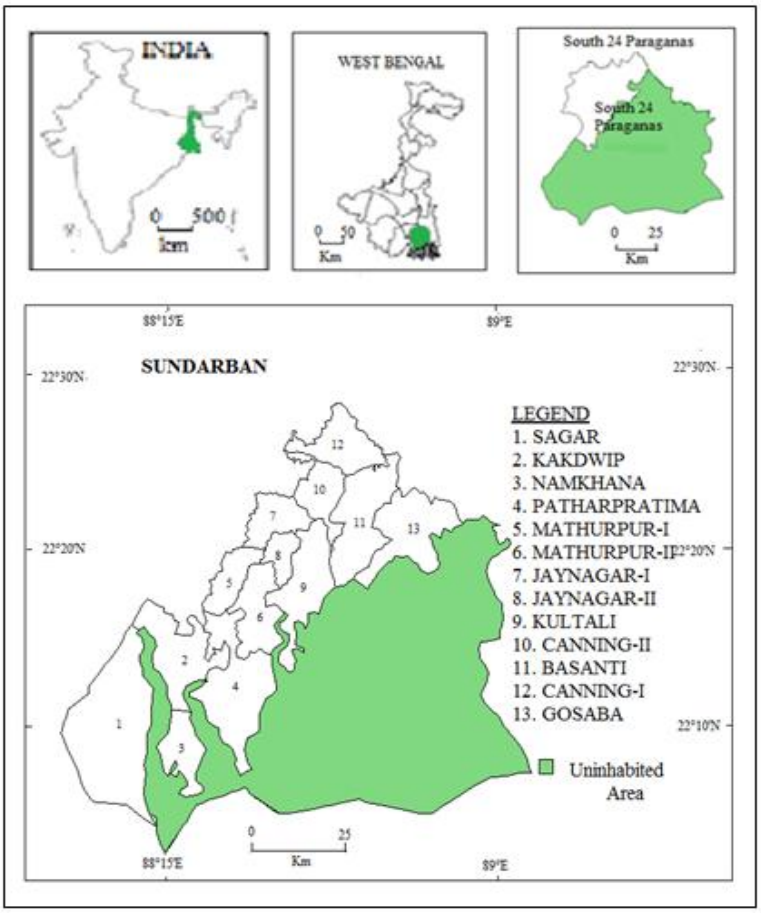

Figure 1: Location of the study area

The entire region recorded a growth rate of population to the extent of 18.4 percent during 2001-2011 as against 19.78 percent during the previous decade. Of the total population, 3083950 persons i.e. 93.18 percent live in the rural areas. The number of literates and workers are 2140283 and 1243503 respectively while the percentages are 65.03 and 37.57 respectively. The density of population has also increased from 800 in 2001 to 948 persons per sq.km (2011).

Materials and Methods

The present research work is entirely based on secondary sources of data. Due importance have been given upon District Information System for Education (DISE), 2008 of West Bengal Education Department. In addition, Provisional Census Abstract (2011) and District Statistical Handbook of West Bengal (2011) have been considered for analysis.

Infrastructure is a broad concept and includes several aspects. Infrastructure can be measured either in terms of investment towards a particular service or in terms of physical quantity of the services available to the end users. The present work sheds some light on respect of infrastructure in pre university education in Sundarban. Here community development blocks have been taken as the unit of the present work. In this study nine indicators have employed to construct the Education Infrastructure Index for Sundarban.

Table 1 shows the selected indicators of educational infrastructure

Symbols	Descriptions
X_1	Pupil-Teacher Ratio or Number of students per teacher
X_2	Teacher - Institution Ratio or Number of teacher per institutions
X_3	Institution-Student Ratio or Number of students per institutions
X_4	Number of schools per square kilometre
X_5	Classroom-Student Ratio or Number of students per classroom
X_6	Percentages of schools with electricity
X_7	Percentages of schools with drinking water facility
X_8	Percentages of schools with common toilet facility
X_9	Percentages of schools with girls' toilet facility

Source: Computed by author

To standardize the value of educational infrastructure indicators, Z scores have been computed. Therefore, Z_{ij} denotes the standardized value for the j^{th} block with respect to i^{th}indicator, which is expressed as:

$$Z_{ij} = \frac{X_{ij} - \overline{X}_i}{\sigma_i} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Where, X_{ij} denotes original value of i^{th}indicator and j^{th}block, $\overline{X}_i$ and σ_i represent mean and standard deviation of i^{th}indicator. However if $X_{ij}$is negatively associated with the status of infrastructural development, equation (1) can be written as:

$$Z_{ij} = \frac{\overline{X}_i - X_{ij}}{\sigma_i} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (2)$$

To identify the development regarding educational infrastructure, Education Infrastructure Indices have computed for four major stages (primary, upper primary, secondary and higher secondary) of conventional education. This is done by taking a simple average of the chosen indicators. It may be algebraically expressed as:

$$EII_j = \frac{\sum_{i=1}^{n} Z_{ij}}{N}$$

Where, N represents total number of selected indicators for educational infrastructure and EII_jdenotes Education Infrastructure Index for j^{th} block. But these values cannot able to depict the overall scenario of educational progress, to overcome this problem, Education Development Index has constructed. This is nothing but the simple average of EII_jvalues, which is expressed as:

$$EDI_j = \frac{\sum_{i=1}^{n} EII_j}{N}$$

Where, Where, N represents total number of EII_j and EDI_jdenotes Education Development Index for j^{th} block. The high value of EDI_jindicates high level of educational development and vice versa.

Result and Discussion

The present study have focused on the educational infrastructure in Sundarban comprises primary schools (classes I- IV), upper primary schools (classes VI- VIII), secondary schools (classes IX- X) and higher secondary schools (classes XI- XII). To be able to adapt to the workplace and fast-evolving technologies in competitive economies, all young people need to acquire the skills that a good quality primary and secondary education can offer. Lower secondary school extends and consolidates the basic skills learned in primary school; upper secondary school deepens general education and adds technical and vocational skills. Neither is possible, however, without ensuring that all children complete a good quality primary education as the first priority in building the skills that individual, society and economies need. Therefore, infrastructural progress in schools is utmost important in course of human resource development.

Primary and Upper Primary Education

Under the sphere of education system, primary education gets the highest priority regarding itself as the base of formal education. Being the first stage of formal education, primary education bears the responsibility for upgrading the children with the basic knowledge of reading - writing and for that the govt. has given the highest priority in improving the overall quality of primary education system. In spite of enormous importance of primary education, it is no longer enough to give young people a chance for decent work. Technological change is demanding stronger foundation skills. Therefore, upper primary education has considered very useful to all and it aims at consolidating and expanding the basic skills acquired in primary school.

. The present study shows immense regional disparities among several blocks of Sundarban based on selected nine educational infrastructural parameters, viz. Pupil-Teacher Ratio, Teacher - Institution Ratio, Institution-Student Ratio, Number of schools per square kilometre, Classroom-Student Ratio and some basic amenities like availability of electricity, toilet and safe drinking water etc. Table 2 and Table 3 represent the scenario of primary and upper primary education of the concerned region and it is evident that there is no consistency among the blocks of Sundarban regarding the selected parameters of primary and upper primary educational achievements.

Table 2: Primary Education Infrastructure in Sundarban

Blocks	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9
Canning-I	50.40	3.98	200.70	0.61	65.94	27.59	93.80	83.33	28.07
Canning-II	81.05	3.26	264.59	0.40	86.86	39.39	98.92	89.66	17.24
Mathurapur-I	58.49	2.29	134.11	0.84	55.92	9.76	95.89	78.05	38.21
Jaynagar-I	65.22	3.24	211.50	0.82	57.15	7.48	100.00	92.52	32.71
Jaynagar-II	75.19	2.90	218.06	0.59	67.19	11.82	93.75	86.36	19.09
Kultali	68.67	3.01	206.74	0.31	51.96	2.08	100.00	95.83	36.46
Basanti	47.85	3.84	183.92	0.36	52.91	6.8	92.26	87.07	42.18
Gosaba	39.70	3.58	142.32	0.54	42.14	3.14	91.96	73.58	25.16
Mathurapur-II	46.38	3.01	139.52	0.55	42.06	8.73	94.23	91.27	42.86
Kakdwip	44.61	3.44	153.50	0.57	43.38	8.39	93.33	82.52	30.77
Sagar	41.86	3.53	147.85	0.44	38.60	3.23	94.84	87.90	42.74
Namkhana	31.94	3.86	123.19	0.26	31.77	10.2	97.48	100.00	12.24
Patharpratima	41.61	3.10	129.11	0.42	35.74	1.47	93.88	96.08	19.12

Source: Computed by author from www.wbsed.gov.in

Table 3: Upper Primary Education Infrastructure in Sundarban

Blocks	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9
Canning-I	46.81	22.67	1061.13	0.08	75.80	93.33	100	86.67	86.67
Canning-II	44.61	17.10	762.80	0.05	60.06	80.00	100	70.00	90.00
Mathurapur-I	31.21	13.77	429.77	0.18	55.32	50.00	100	76.92	92.31
Jaynagar-I	42.09	16.87	710.09	0.18	69.79	73.91	100	95.65	91.30
Jaynagar-II	45.66	15.32	699.37	0.10	63.88	63.16	100	94.74	68.42
Kultali	49.25	16.73	824.07	0.05	73.58	20.00	100	80.00	86.67
Basanti	42.26	19.64	829.77	0.05	67.11	9.09	95.45	95.45	90.91
Gosaba	31.14	15.98	497.40	0.13	57.84	10.00	95	95.00	85.00
Mathurapur-II	33.78	16.13	544.87	0.14	58.65	48.39	100	83.87	90.32
Kakdwip	34.18	17.33	592.38	0.15	52.63	58.97	100	97.44	100.00
Sagar	32.34	18.97	613.35	0.11	52.09	22.58	100	100.00	96.77

Namkhana	37.62	18.50	695.91	0.06	52.98	81.82	100	100.00	100.00
Patharpratima	36.12	18.76	677.54	0.08	54.58	21.95	100	100.00	100.00

Source: Computed by author from www.wbsed.gov.in

Primary Education Infrastructure Index (PEII) and Upper Primary Education Infrastructure Index (UPEII) have constructed to realize the actual status of education. Table 5 depicts the condition of primary and upper primary educational infrastructure in Sundarban. Well developed educational infrastructure is an important pre-condition affecting the success of teaching-learning process. In case of primary education, Jaynagar-I have achieved the highest (0.39) position and Jaynagar-II is the worst performing block of Sundarban. In upper primary education, Kakdwip has performed satisfactory, on the contrary, position of Jaynagar-II, Kultali and Gosaba are really alarming. Therefore, there is a great deal of inequality in the status of primary and upper primary education at the sub-district block level.

Secondary and Higher Secondary Education

Secondary education offers the best hope for youth to develop skills that would put them in a strong position to get good jobs. It is important because, to be able to interface with the kind of technology that people need to be able to interface with today, computers and software for example. One needs more than a primary education (2012).

Table 4: Secondary and Higher Secondary Education Infrastructure Sundarban

Name of Blocks	Secondary Education				Higher Secondary Education			
	X_1	X_2	X_3	X_4	X_1	X_2	X_3	X_4
Canning-I	89.15	16.17	1441.33	0.03	86.37	21.78	1881.00	0.05
Canning-II	61.52	15.50	953.50	0.02	84.04	18.50	1554.67	0.03
Mathurapur-I	40.35	12.16	490.53	0.13	52.21	22.86	1193.29	0.05
Jaynagar-I	53.16	12.27	652.36	0.08	73.99	23.08	1707.46	0.10
Jaynagar-II	62.60	13.09	819.45	0.06	82.08	19.83	1628.00	0.03
Kultali	79.64	11.14	887.43	0.02	88.53	17.38	1538.13	0.03
Basanti	66.00	11.60	765.60	0.02	86.97	20.18	1755.27	0.03
Gosaba	63.89	8.58	548.42	0.08	69.12	19.25	1330.50	0.04

Mathurapur-II	51.21	14.47	740.87	0.07	52.33	22.50	1177.42	0.05
Kakdwip	46.53	12.59	585.76	0.07	58.77	21.74	1277.47	0.08
Sagar	67.07	10.75	720.95	0.07	73.80	20.89	1541.56	0.03
Namkhana	62.03	11.92	739.17	0.03	58.91	26.00	1531.78	0.02
Patharpratima	71.94	11.62	835.62	0.05	71.90	20.33	1462.00	0.02

Source: Computed by author from www.wbsed.gov.in and District Statistical Handbook of South 24 Paraganas.

Table 5: Primary Education Infrastructure Index (PEII), Upper Primary Education Infrastructure Index (UPEII), Secondary Education Infrastructure Index (SEII) and Higher Secondary Education Infrastructure Index (HSEII) of Sundarban

Name of Blocks	PEII	Rank	UPEII	Rank	SEII	Rank	HSEII	Rank
Canning-I	0.23	2	0.24	5	0.42	3	0.34	4
Canning-II	0.00	8	-0.25	9	0.23	4	-0.61	12
Mathurapur-I	-0.27	11	-0.06	8	0.66	1	0.30	6
Jaynagar-I	0.39	1	0.18	6	0.22	5	1.16	1
Jaynagar-II	-0.41	13	-0.40	12	0.11	7	-0.28	9
Kultali	0.04	6.5	-0.64	13	-0.68	13	-0.86	13
Basanti	0.04	6.5	-0.37	10	-0.48	11	-0.25	8
Gosaba	-0.31	12	-0.38	11	-0.57	12	-0.35	11
Mathurapur-II	0.10	5	0.00	7	0.47	2	0.31	5
Kakdwip	-0.04	9	0.53	1	0.18	6	0.50	3
Sagar	0.16	4	0.41	3	-0.27	8	-0.11	7
Namkhana	0.22	3	0.50	2	-0.33	10	0.63	2
Patharpratima	-0.17	10	0.33	4	-0.28	9	-0.32	10

Source: Computed by author

Higher secondary education represents the terminal point of formal schooling, not the terminal point of education because learning is a lifelong process, and the formal, non-formal and informal learning systems must be geared to facilitate that process. But quantitatively the numbers involved who will not be continuing continuously their schooling after this higher

secondary stage is large and impressive. For this substantial group, the learning experience at this stage of education becomes important for their living and decisive for their living gainful lives. On the other hand the foundations for higher learning are laid at this stage.

Due to unavailability of proper information in secondary and higher secondary educational infrastructure, only four parameters (Pupil-Teacher Ratio, Teacher - Institution Ratio, Institution-Student Ratio, Number of schools per square kilometre) have identified to highlight the educational infrastructure. Indian Government seeks to improve its education system by introducing a number of development initiatives suited for the country. Still the actuality tells another story. There is colossal regional disparity persist in different corner of the country. The study area, Sundarban is not an exception. Table 4 shows the block wise achievements in secondary and higher secondary education.

To obtain the idea about the infrastructural set up in secondary and higher secondary education, Secondary Education Infrastructure Index (SEII) and Higher Secondary Education Infrastructure Index (HSEII) have been worked out. It is quite vivid from table 5, that the development of secondary and higher secondary education is not impressive at all. In case of secondary and higher secondary education, Mathurpur-I and Jaynagar-I have achieved the first positions respectively where as Mathurpur-II and Canning-I have secured second and third rank in terms of the development of secondary education. Kultali and Gosaba are the poorest performing blocks of Sundarban in this context.

Comparative Analysis of Educational Infrastructure

Education is one of the significant determinant of social well-being and welfare as human development. Among all the primary educational facilities, highest coefficient of variability of 100.88 has been accounted in the availability of schools with electricity. However, among primary educational facilities, least coefficient of variation, i.e. CV = 2.94 has been computed in the availability of drinking water in schools. Table 6 reveals a similar figure in case of upper primary education. Among four selected educational facilities in secondary and higher secondary education, i.e. X1, X2 X3 and X4, X2 is much consistent than other three parameters. Among four educational level (Primary, upper primary, secondary and higher secondary), X1 (pupil-teacher ratio) is more consistent (CV= 16.38) in upper primary education. On the other hand, X2 (teacher-institution ratio) and X3 (institution-student ratio) are more reliable for higher

secondary level. In case of availability of schools per square km, performance is far better in primary education.

Table 6: Coefficient of Variations (CV) of selected parameters

Level of Education	Selected Educational Infrastructural Parameters								
	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9
Primary	28.27	14.08	25.19	33.78	29.60	100.88	2.94	8.47	35.44
Upper Primary	16.38	12.77	23.84	44.96	13.40	60.17	1.81	10.97	9.35
Secondary	21.05	16.23	30.44	54.97	_				
Higher Secondary	18.27	10.68	14.27	52.26	_				

Source: Computed by author

Overall scenario of educational development in Sundarban

After a detail analysis of the aforesaid parameters, Education Development Index (EDI) for each and every community development blocks have been computed to perceive the status of educational facilities in different blocks of Sundarban. Table 7 represents the Education Development Index (EDI) for Sundarban. This would enable us to identify the gaps in infrastructure development in educational achievements at the sub-district level in Sundarban and also help to make suggestions for appropriate policy interventions for achieving balanced infrastructure development in this area.

Table 7: Education Development Index (EDI) of Sundarban

Serial No.	Name of Blocks	EDI	Rank
1	Canning-I	0.31	2
2	Canning-II	-0.16	9
3	Mathurapur-I	0.16	6
4	Jaynagar-I	0.49	1
5	Jaynagar-II	-0.25	10
6	Kultali	-0.54	13

7	Basanti	-0.26	11
8	Gosaba	-0.40	12
9	Mathurapur-II	0.22	5
10	Kakdwip	0.29	3
11	Sagar	0.05	7
12	Namkhana	0.25	4
13	Patharpratima	-0.11	8

Source: Computed by author

It comes out from the above assessment that there is a wide range of regional variations in levels formal educational development among the blocks of study area. So far, Jaynagar-I (0.49) is at best position in providing educational facilities to its common people. It is followed by Canning-I, kakdwip, Namkhana having the rank of 2nd, 3rd and 4th respectively. On the contrary, the conditions of Basanti, Gosaba and Kultali are very miserable in educational services. The situation of Gosaba and kultali in every stages (Primary, Secondary and higher secondary) are really alarming. Table 8 portrays the overall scenario based on educational achievements in Sundarban.

Table 8: Level of Development in Formal Educational sector in Sundarban

Levels of Development in Education	Indices	Number of Blocks	Name of the Blocks
High	>0.4	1 (7.7)	Jaynagar-I
Moderate	0.4 to 0	6 (46.1)	Canning-I, Mathurpur-I, Mathurpur-II, Kakdwip, Sagar, Namkhana
Low	0 to -0.4	4 (30.8)	Canning-II, Jaynagar-II, Basanti, Patharpratima
Very Low	<-0.4	2 (15.4)	Gosaba, Kultali

Note: Figures in parenthesis indicate % to total number of blocks

Source: Computed by author

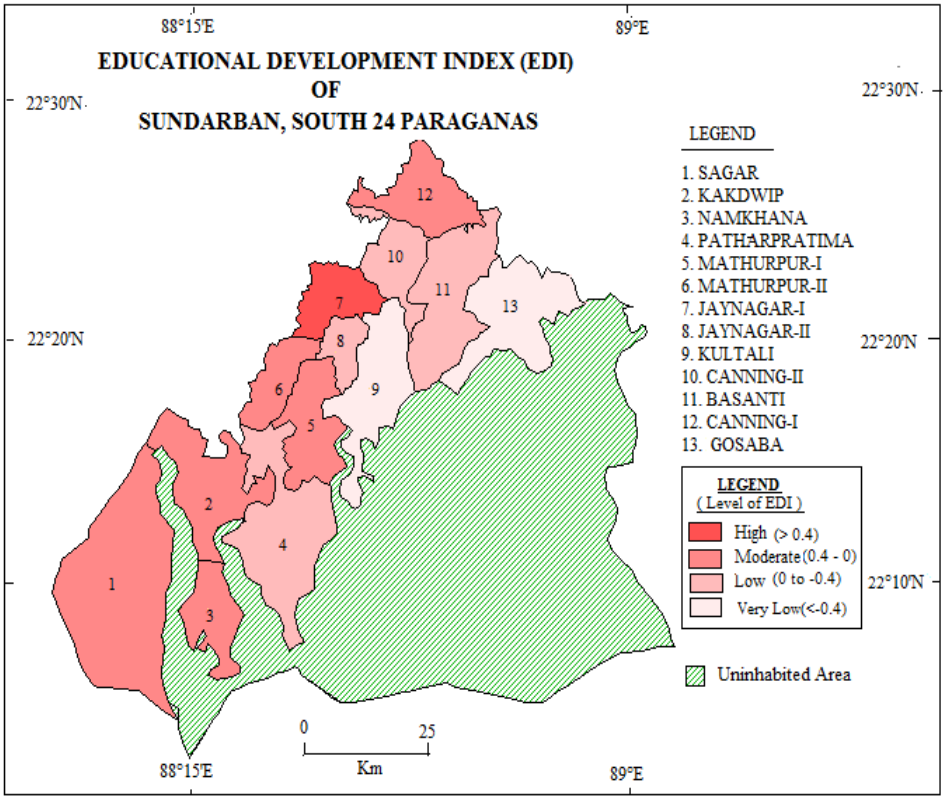

Figure 2: Educational Development Index for Sundarban

This level of variation in educational infrastructure may be arranged into four grades i.e. high (above 0.4), moderate (0.4 to 0), low (0 to -0.4) and very low (below -0.4). Table 8 and Figure 2 depict the imbalances in conventional educational development in Sundarban. In this region, only one block, Jaynagar-I has achieved relatively advantageous position and just six blocks (Canning-I, Mathurpur-I, Mathurpur-II, Kakdwip, Sagar, Namkhana) have performed moderately in educational infrastructure development. Out of thirteen blocks of Sunarban six blocks (46.15%) reflect low level of educational infrastructure. This is not a satisfactory environment regarding conventional education infrastructure development; we have a long way to go and it is urgent to implement special area specific programme to the backward regions of the study area.

Conclusion

Though educational development of any region does not solely depend on the infrastructural progress but no doubt, it is considered as one of the important criteria. Poor

transport and communication network, lack of conventional electricity supply and scarcity of potable water are major problem of this region along with natural calamity like cyclones and storm surges (Shabnam, 2012). Though the study area has made good progress in improving access to primary education but better availability and accessibility of education facilities has been recorded in very negligible parts in Sundarban. It is remarkable to note that there is an extreme shortage of institutions especially secondary and higher secondary levels and the cost of continuing those studies is very high. The literacy rate among girls is very low and a huge gender gap in literacy has taken place for all over the region. In many cases, limited access to educational institutions causes for discontinuing education. Rural poor households cannot afford the cost of transport. As majority of people in Sundarban depend on the government aided and government running institutions, Government needs ensure that the education provided is relevant to the skills needs of young people, so that they can secure good jobs. Since education is only way for the development of a nation, it is challenging task for the authorities to coordinate among various development initiatives and to provide proper, useful and relevant educational facilities for people of Sundarban irrespective of class, caste and so on. The ongoing efforts of the government to build up private-public partnership and involve the panchayats more effectively for providing awareness regarding necessity of formal education are expected to ensure better educational achievements.

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