Access to Schooling in Different Geographical Regions - A Case Study of South 24parganas District of West Bengal

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Abstract: India is a land of diverse geographical features with the second most populated country in the world. According to the Census of 2011, India has 158.8 million children in the age-group 0-6 years (total provisional population) and providing them with minimal education is the responsibility of the nation. The recent Right to Education Act (2009) declares to provide equal geographical and social access to elementary education to all children of the nation. The present study is an attempt to analyse the spatial distribution of primary and upper primary schools in different geographical regions and thereafter the cumulative effect of access on pupil's enrolment. An 'Index of physical infrastructure' has been done by applying Kendall's ranking method to find out the bivariate association between the infrastructure and enrolment. The study revealed that enrolment in primary section has increased enormously in the last few years. But these schools are not well equipped with infrastructure. The general trend of enrolment is high in well equipped schools. However, in some areas due to geographical barriers students cannot opt for better schools and they have to enrol in the nearby schools which may not have good infrastructural facilities.

Keywords: Physical Access, Universalisation, Enrolment, School Infrastructure, Physical Infrastructure Index

1. Introduction

India is a land of diverse geographical features with its mountain ranges, valleys, desert regions, forests, fertile plains, dry plateaus, coastal areas etc. It is the second most populated country in the world. Due to the high population density, even the remote geographical areas are populated. According to the Census of 2011, India has 158.8 million children in the age-group 0-6 years (total provisional population) and providing them with minimal education is the responsibility of the nation. Free and compulsory education to all children up to the age of fourteen is the constitutional commitment in India. According to the Right of Children to Free and Compulsory Education Act, (RTE, 2009) it is the duty of the State Government or local authorities to identify all children, including those in remote areas, with disabilities, those belonging to disadvantaged groups (e.g., SC/ST) and those belonging to weaker section within a period of one year from the date of publication of the Rules and every year thereafter. The Act tries to provide equal geographical and social access to elementary education to all children of the nation. If RTE norms are properly implemented in the near future. India can achieve the desired Universal Elementary Education.

The present study is an attempt to analyse the spatial distribution of primary and upper primary schools in different geographical regions and enrolment in those schools. Here the term *access* has been discussed in two regards - geographical access and access to physical infrastructure.

The database of the present study has been collected from District Report Cards, School Report Cards published by DISE (District Information System on Education) for the years of 2006-07 to 20011-12. Four blocks of South 24 Parganas district of West Bengal have been selected for the present research. The samples blocks are selected so as to cover varied geographical locations and educational scenarios. A multistage stratified sampling process has been used. The district (see Fig1) has two types of geographical area- forested blocks (13 blocks) and non-forested blocks (16 blocks). Taking this into consideration, four blocks has been selected that differ in geographic and educational characteristics. Geographical differentiation was based on forested and non-forested area, and educational differentiation comprised of the lower completion rate, i.e. proportion of children who actually completed the upper primary education cycle in four years. So two blocks have been selected from the forested area with lower completion rate and two blocks have been from non-forested area with lower completion rate.

The selected non-forested blocks are Diamond Harbour-I and Magrahat-I and the selected forested blocks are Mathurapur-II and Basanti.

2. Findings of Secondary Data Analysis

1. Geographical Access

The selected blocks had long history of establishment of schools. All the selected four blocks have schools since from 1900. The non-forested block Magrahat-I has schools since 1860. The number of schools was gradually increased post 1900 and in 2011-12 the total number of elementary school was 159 in Diamond Harbour-I, 251 in Magrahat-I, 270 in Mathurapur-II and 303 in Basanti.

In all the four blocks there had been a sudden increase in the number of schools in the year 2000-2001 (Fig-2). Forested block Basanti had the highest increase in the number of schools. The main reason for the rise is attributed to the establishment of a registered organization named 'State Implementation Society' (SIS) as an autonomous and independent body, by the Government of West Bengal in 1995, for implementation of the elementary education

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project in West Bengal. The implementation of the Sarva Siksha Aaviyan in the State was assigned to this organization with some alterations and the name of SIS was also changed to 'Paschim Banga Sarva Siksha Mission'. SSA interventions included opening of large number of new schools and making available alternate schooling facilities in all the blocks, particularly in vulnerable areas. Basanti is one of the main deltaic islands in the Sundarban region, bounded by the Matala and Vidyadhari creeks. Hence, Basanti got highest number of schools. Nearly 50 schools were established in Basanti during 2001-2002.

The distribution of primary and upper primary schools on Table 1 shows that forested blocks have higher number of primary schools than non forested blocks. Basanti block had higher population (2001 census) as well as higher projected children of 5 to 9 years age group (projection by Department of School Education for the year 2010). Therefore it is justified that this block has highest number of elementary schools. On the other hand non-forested block Magrahat-I had higher population than Mathurapur II block but lower number of schools. In the last five years (2006-07-2011-12) about 32 new schools were established in Basanti followed by 24 in Mathurapur-II, 18 in Magrahat-I and 11 in Diamond Harbour-I. Forested blocks got more significant number of schools than non-forested blocks. This is because of the fact that the forested blocks are part of Sundarban mangrove forest, a heritage Biosphere Reserve, and the centre of attraction of many scientists, NGOs and social workers. Hence, these blocks got much importance than the non-forested blocks of the district. But in doing so the nonforested blocks are getting neglected. If the number of schools is justified according to population norm which is one primary school for 300 populations, there is a huge gap between total population and required number of schools. To satisfy this norm a huge number of new primary schools have to be established. The actual figure of required new primary school is, 323 in Diamond Harbour-I, 553 in Magrahat-I, 440 in Mathurapur-II and 678 in Basanti.

The number of upper primary school is quite low for all the blocks. In both non-forested blocks and forested blocks the ratio is almost double than the national average. The ratio is 4.8 in Basanti, 4.5 in Mathurapur II, 4.8 in Magrahat I, 4.5 in Diamond Harbour I and the national average is 2.4. In the last five years 30 new upper primary schools in Basanti were added followed by 18 schools in Mathurapur II, 16 schools in Magrahat I and 9 schools in Diamond Harbour-I. The numbers of students who desire to continue their study beyond class IV were 8221 in Basanti, 5130 in Mathurapur-II, 3199 in Diamond Harbour-I and 6340 in Magrahat I in 2011-12 (Grade IV enrolment). So the average students per school (Student School Ratio) is 158 in Basanti, 105 in Mathurapur-II, 164 in Diamond Harbour-I and 147 in Magrahat-I. Though there is no norm for student-school ratio but to admit large number of students, a school should have required number of teachers and good infrastructure according to RTE norm. Otherwise this very fact will affects all the variables related to enrolment and drop-out of the school goers.

2. Access to Physical Infrastructure

Availability of schools, do not guarantee the availability of minimum infrastructure facilities required for smooth classroom transaction. Physical infrastructure and facilities provide a comfortable learning environment, accelerate the learning procedure and increases the students' interest (Pritchett, Pande 2006 and Iyengar, 2004). The main task of school is to provide education which involves a series of programmes and activities. The successful conduct of these programmes and activities depend mainly upon the availability of proper infrastructure in the school. The term 'Physical Infrastructure' stands for the physical facilities of the school. It is referred to buildings, grounds, furniture and apparatus along with equipments essential for imparting education. Over the time in the last few decades, different government interventions like the District Primary Education Program (DPEP) and Sarva Shiksha Abhiyan (SSA) have tried to ensure infrastructure to the schools. Recently, the RTE Act stipulated that all new schools should have basic infrastructure facilities like an all-weather building with at least one classroom for every teacher etc. Some of the parameters are discussed here:

2.1. Condition of School Building

The condition of classrooms at primary and upper primary level is an important factor for elementary school development. The conditions of school building are not so good in several elementary schools in the selected blocks. In this study three types of school buildings are consideredpucca, partially pucca and kuchha. Table 2 shows that as of 2009-10 DISE data non forested blocks have higher number of pucca school building. In Diamond Harbour I nearly 70% and in Magrahat I more than 60% schools have pucca school building. However the percentage is lower in the forested block. In Mathurapur II 58% and in Basanti 54% schools have all weather school building. So in Mathurapur II nearly 88 schools (62% of 206) and in Basanti 110 schools (66% of 244) should be upgraded into all weather building to fulfil RTE norm by 2013. The situations of upper primary schools are better than primary schools in terms of school building. But like primary schools non-forested blocks have more pucca building than forested blocks.

2.2. Class Rooms

The next important information that needs to be analysed is the total number of rooms available in the schools. According to the RTE norm the classroom requirement of the schools depend on the number of teachers and teacher requirement depends on student enrolment. 'Thus, as per RTE, it would be perfectly within law if a primary school, with sixty students, has two teachers and two class rooms, even if the school runs all the classes' (IIMC Report, 2011). Table 3 shows availability of classrooms in primary and upper primary schools in the selected blocks. It is observed that all the schools have at least one classroom for the students in primary level. One class room schools are highest in the forested block of Basanti. Higher numbers (>4 rooms) of class rooms are found in the non forested blocks.

According to the RTE norm the classroom requirement of the schools depend on the number of teachers in the schools. It has been observed (see Table 4) that in all the four selected blocks the number of teachers is more than the number of rooms in the school. In the forested blocks nearly 85 percent schools do not have one class room for one teacher. In non-forested blocks, Dismond Harbour-I has 60 percent and Magrahat-I has 90 percent schools which do not have one room per teacher. The percentage is higher in Magrahat I block because of higher number of Private Unaided schools with higher number of teachers per school.

2.3. Ancillary facilities

Even though a school might have a building and required number of instructional rooms, there is no guarantee that it has the minimal ancillary facilities in the schools. Research evidences (Fisher, 2001, Jalan, 2010, Mukherjee, 2012 etc.), show that availability of these facilities in schools improves enrolment especially of girls and also improves retains children over the years. Table 5 provides important comparative statistics of school infrastructure. The table shows that infrastructures in primary schools in the blocks are below expectation in (1) Electricity (2) Computer (3) Kitchen Shed and (4) Boundary Wall. Nationally availability of electricity and computers in primary schools are matters of great concern and all the blocks as well as West Bengal's performances on these two counts have been inferior to the national average. None of the schools in the forested blocks have computer facility and only 5 percent schools have electricity. There is a huge gap between the top states with 100 percent electricity and 90 percent computer facilitated schools and West Bengal. The selected blocks' condition is worse than even average West Bengal standards. The conditions of upper primary schools are only slightly better than the primary schools.

In order to trace out the association between levels of educational attainment and physical infrastructure provisions in primary schools, a disaggregate analysis has been done for each of the schools in the selected blocks. The level of educational attainment was measured by enrolment in every schools and this was correlated with infrastructures of those schools for the year 20011-12. For this purpose Physical Infrastructure Index has been prepared using Kendall's ranking method. Using this method all the infrastructures were ranked separately. After ranking each infrastructure, these ranks were added row-wise to get total rank of one school. The infrastructure that are taken are- number of rooms in school (schools with highest number of rooms got the rank 1 and lower the number of room higher the rank), number of rooms in good condition per, common toilet (yes or no), girl's toilet (yes/no), computer aided learning lab (yes/no), electricity (yes/no), drinking water facilities (yes/no), library (yes/no) and number of black boards per schools. In some cases the variable of few schools are same. In those cases the rank was decided by the averaging the successive ranks with same value. Here the rank indicates quality of infrastructure- higher the rank, lower the quality of infrastructure. Among the chosen four blocks best infrastructure index has been found in Diamond harbour-I block where 81 percent schools have index 5 to 10 and no school have index more than 10 (Table 6). Basanti is the lowest performing block where 84% schools have infrastructure rank >10. The other two blocks have moderate results.

In order to check the bivariate association between the physical infrastructure supply in the primary grade and the total enrolment, a correlation analysis has been performed. In case of all the blocks, a negative association between two variables is seen. It means lower the infrastructure quality lower the enrolment (Fig 3). The 'r' values of correlation coefficient for the bivariate association between the physical infrastructure supply in the primary grade and the enrolment are as follows:

Correlation	Analysis	between	Enrolment	& Physical			
Infracture							

mitastructure						
Block	'r' values					
Basanti	-0.449**					
Mathurapur-II	-0.428**					
Diamond Harbour-I	-0.350**					
Magrahat-I	-0.420**					

Note:**Correlation is significant at the 0.01 level

Here, the negative values depict a negative relation between the schools with lower quality of infrastructure (higher rank) and enrolment. It confirms that the preference of students in selecting schools is based on school infrastructure in all the blocks.

There is an increasing trend in primary enrolment in all the blocks, but the trend is higher in the forested blocks (Basanti-31.20% increase, Mathurapur-II 23.86% increase, see Table-7) than non-forested blocks (Diamond Harbour-I 6.05%, Magrahat-I 17.99%). In the forested blocks of Basanti and Mathurapur-II, large numbers of SC students are found than non-forested blocks. In Basanti block there is 27.61% increase in SC enrolment was noticed followed by Mathurapur-II (20.02%). But in Magrahat-I, SC enrolment has decreased by 4.46%. Similarly, enrolment of ST students is also increased in forested. Minority enrolment has increased remarkably in Diamond Harbour-I and Basanti block with increase in minority population (according to 2001census). However, in spite of the overall lower infrastructure quality in the forested block, the enrolment in this block is high particularly in Basanti. The main reasons behind the fact are poverty scenario of the block and its geographical inaccessibility. The District Human Development Report of South 24 Parganas by Development and Planning Department Government of West Bengal (2009) reveals that in the block Basanti, 65 per cent of households are poor, making Basanti one of the poorest block in the whole country. In this scenario, the incentive like Mid Day Meal attracts huge number of children to schools. In addition to this, the geographical inaccessibility, force the students to enrol in a school which is nearest to the house.

In upper primary classes the highest enrolment is found in Basanti followed by Magrahat-I , Mathurapur-II and diamond Harbour-I . In last five years highest increase in upper primary enrolment are noticed in Magrahat-I (40.63%) followed by Basanti (35.31%), Diamond Harbour-I (14.86%) and Mathurapur (11.23%) (Table-7). A significant change in SC enrolment has been found in the forested blocks. Yet, alarmingly decrease (80%) has been observed in ST enrolment of Basanti block indicating huge dropout during primary to upper primary transition.

3. Conclusion

The quantitative analysis of secondary data reveals some issues and prospects of forested and non-forested blocks. The available data revealed that there is a significant forest and non-forest divide. It is evident from the study that the forested blocks are growing faster than non-forested blocks. Most of localities within the forested area have been identified and primary schools were established. However, only opening up of school building does not guarantee quality education. Many schools established particularly after SSA programme have been started with minimal infrastructural provision under SSK guidelines. The spread of education in the forested blocks are focused almost exclusively on increasing the quantity of schools. Several schools are one room buildings with a single teacher. The quantitative analysis of physical infrastructure revealed that the quality of school infrastructure has a positive correlation with student enrolment, i.e. schools with better infrastructure have higher enrolment. But at block level, the analysed picture is quite different, where physical infrastructure does not influence enrolment. The overall enrolment has increased especially in the forested blocks, and so has the SC and ST enrolment in spite of lower level of infrastructure. Whereas among non-forested blocks Diamond Harbour-I shows better infrastructure but increase in enrolment is not as high as non-forested blocks. The primary problem of these non-forested blocks is the nonavailability of schools within the scheduled distance. Some of the results of this study are quite expected, like higher enrolment in the schools with good infrastructure, in both forested and non-forested blocks. But some results are quite unexpected, like the spatial distribution of schools in the forested blocks being better than non-forested blocks or that in spite of low infrastructural quality the enrolment is high in the forested blocks. These factors need an in-depth analysis based on primary data. In the further study with the help of primary data the reason behind these unusual results will be discussed thoroughly.

The scenarios of upper primary education in all the blocks are very challenging with high primary to upper primary schools ratio and high PTR. After 8 years of DPEP intervention some of the major challenges in the primary education have been mitigated particularly in the nonforested blocks. But no such intervention was there for the upper primary education. So it is the challenge for all the blocks to uplift the status of upper primary education.

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Figure 2: Increase in Elementary Schools in the Selected Blocks

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Figure 3: Relation between Infrastructure and Enrolment in the selected Blocks

Tables

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Block		Projected	Required no of	2011-12			2006-07		
	Population (2001)	(5yrs-9yrs) 2010	ulation primary schools as (s-9yrs) per population (2010 norm (total population/300)*	Total Schools	Primary	Upper Primary	Total Schools	Primary	Upper Primary
Diamond Harbour I	133366	12309	445	149	122	27	99	81	18
Magrahat I	228335	22008	761	251	208	43	138	111	27
Mathurapur II	198381	17134	661	270	221	49	156	125	31
Basanti	278592	29734	929	303	251	52	169	147	22

Table 1: Percentage of schools by Category: 2011-12

Source: Census data, DISE Data and Department of School Education, Gov of West Bengal, *Calculated from census data.

Table 2: Types of School Building, 2011-12

				_ -		
State/Distrat/Ploak	Type of School	No. of	$\mathbf{D}_{\mathbf{U} \in \mathcal{O}}(0)$	Partially	Kuchha	No Information
State/ Distret/Block	Type of School	schools	1 ucca(%)	Pucca (%)	(%)	(%)
Diamond Harbour-1	Primary	122	70%	10	0	20
Block	Upper Primary	19	89%	5	0	5
Magrabat I	Primary	177	64%	14	.6	22
Magranat I	Upper Primary	42	71%	17	0	12
Mathurapur II	Primary	206	58%	6	0	36
	Upper Primary	38	68%	13	0	18

Desenti	Primary	244	55%	7	1	37
Dasallu	Upper Primary	30	63%	3	0	33

Source: Calculated from DISE Data

Table 3: Percentage Distribution of Schools according to Class Room for Teaching in Primary class

No. of Rooms	Diamond Harbour I (%)	Magrahat I	Mathurapur II	Basanti
0	0	0	0	0
1	25	20	21	28
2	30	14	24	21
3	20	22	24	17
4	34	31	33	27
>4	11	11	5	7

Source: Calculated from DISE Data

Table 4: Percentage of One classroom school for one teacher, Primary division

Block	Total number of	Teacher more,	Teacher less,
	Teacher = class	Classroom	Classroom
	room	less	more
Diamond Harbour I	28	53	19
Magrahat I	10	68	22%
Mathurapur II	15	63	22
Basanti	15	74	11

Source: Calculated from DISE Data

Table 5: School Infrastructure in the Selected Blocks- 2009-10

	Diamond Harbour-1		Magrahat I		Mathurapur II		Basanti		West Bengal	India	Best State/UT	Value
Parameter	Primary	Upper primary	Primary	Upper primary	Primary	Upper primary	Primary	Upper primary	Primary	Primary	Primary	(%)
% of schools having Drinking Water Facility	97	95	73	88	92	100	85	100	95.7	91.5	Chandigarh Daman &Diu Delhi Lakshadweep Puducherry	100 100 100 100 100
% of schools having Common Toilet	72	100	81	90	76	89	76	77	80.5	54.1	Punjab	92.4
% of schools having Boundary Wall	21	63	21	57	18	39	12	50	25.6	51.5	Chandigarh	99.4
% of schools having Computer	3	5	2	12	0	3	0	7	7.5	16.7	Lakshadweep	93.2
% of schools having Kitchen Shed	0	0	0	0	50	0	0	0	57.7	47.8	Tamil Nadu	96.9
% of schools having Electricity	20	79	14	67	8	39	3	7	18.79	27.7	Chandigarh Daman & Diu Lakshadweep	100 100 100

Table 6: Rank of Infrastructure

Donk of	% of Schools						
Infrastructure	Diamond	Magrahar I	Decenti	Mathurapur-			
	Harbour-I	Harbour-I		II			
<5	19	0.4	0	0.4			
0510	81	46.6	16	54			
>10	0	53	84	45.6			

Source: Calculated from DISE Data (by Infrastructure Index)

Table 7: Change in Enrolment, 2011-12 to 2006-07

		Pr	imary		Upper Primary				
	Basanti	Mathurapur- II	Diamond Harbour-I	Magrahat-I	Basanti	Mathurapur-II	Diamond Harbour-I	Magrahat-I	
Enrolment	31.20	23.86	6.05	17.99	35.31	11.23	14.86	40.63	
SC	27.61	20.02	4.62	-4.46	1309.96	24.33	0	22.16	
ST	26.44	48.69	-100.00		-80.77	15.95	0		
OBC	211.31	-12.73	651.40	84.20	122.47	85.26	-32.21	271.67	

Source: Calculated from DISE Data