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An Assessment of Educational Infrastructure at School Level in Birbhum District, West Bengal

Somnath Majhi
Research Scholar, Department of Geography, University of Calcutta

Abstract

School is considered the second home for the students. There is no denying how significant a school is in shaping a student's personality and holistic learning process. Proper educational infrastructure facilities maximize the accessibility and effectiveness of education being delivered. Presently the policymakers are also focusing on quality education for which good infrastructural facilities are one of the prerequisites. In this context it is very much relevant of accessing the infrastructural facilities of Birbhum district; one of the educationally backward districts in West Bengal. The gross enrolment ratio, literacy rate is low in comparison to the other districts of the state. The data analysis clearly shows that though the district has witnessed the remarkable expansion of educational facilities during the last two decades but some blocks especially located in the northern parts of the district lack educational facilities like the number of schools, teacher-student ratio, student-classroom ratio, etc. it is notable that the inter-block disparity exists in terms of educational facilities at the various educational level. So, this study throws light on the gaps in educational facilities at the school level in the Birbhum district. ***Keywords:*** *Educational Infrastructure Index, Gap Analysis, Pupil-teacher Ratio, Student-classroom Ratio, All Weather Road,*

Introduction: Birbhum is one of the backward districts in terms of educational development. Birbhum ranks 14th out of the 19 districts in terms of literacy rate (Census, 2011). The gross enrolment ratio at various educational levels is also very low in comparison to other districts of West Bengal. Educational infrastructure has a vital role in achieving the overall educational development of a region. The quality, equity and expansion of education largely depend on the educational infrastructure. The facilities like availability of teachers, classroom, playground, electricity, drinking water, toilet, library, laboratory, computer, hostel, etc. greatly determine the quality of education. The disparity in the availability of educational infrastructure widens the gap in quality education. The all-round development of the child cannot be achieved without proper educational infrastructure (Mahapatra, 2019). The expansion and progress in literacy rate and enrolment are observed from 1991 onwards due to the various initiatives of the District Primary Education Programme (DPEP) and Rashtriya Madhyamik Siksha Aviyan (RMSA) and Mass Literacy Campaign. But there is a high inter-block disparity that exists in literacy rate and enrolment rate. In this chapter, an attempt has been made to assess the present

educational infrastructural condition which has an impact on the educational attainment of the population in the district at different educational levels.

Study Area: Birbhum is the northernmost district of the Burdwan division. It extended between 23° 32' 30" north and 24° 35' 0" north latitude and 87° 5' 25" east and 88° 1' 40" east longitude. It extends over 4545 square kilometers. In shape, it looks like an isosceles triangle. Birbhum is bounded on the north and west by the Santal Parganas, on the east by the districts of Murshidabad and Burdwan and the south by Burdwan from which it is separated by the Ajay river.

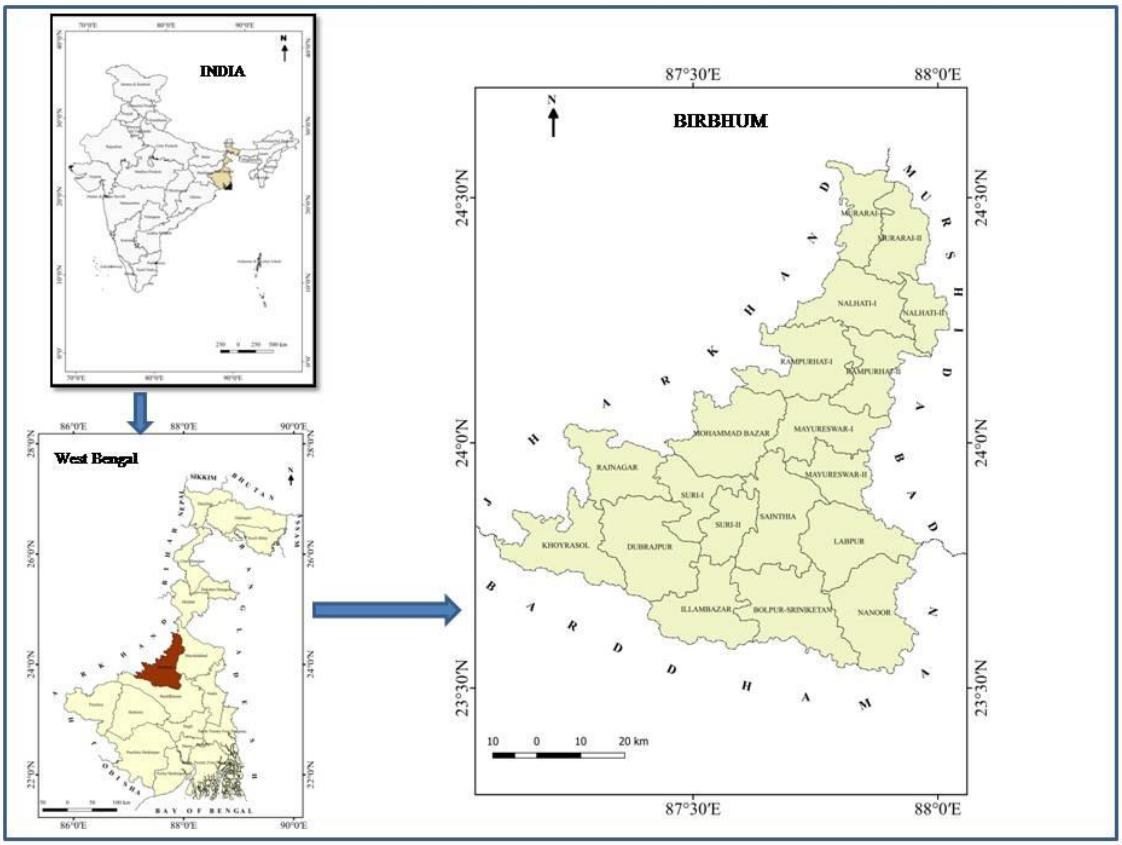

Fig: 1 Location Map of the Study Area ***Source: NATMO***

Objectives: The major objectives of the study are

1. To analyze the growth of institutions at the school level in the Birbhum district.
2. To access the gaps in educational institutions at the school level in the Birbhum district.
3. To evaluate the educational infrastructure at the school level in the Birbhum district.
4. To suggest the various measures for the educational development of Birbhum district.

Materials and Methods: This study is based on the secondary data which has been collected from the District Information of School Education of 2016-17. The data from the census of India in 2011 has also been used. To determine the shortage and surplus of any facilities the gap analysis of facilities is done. Here the following formula has been applied to determine the shortage or surplus of the educational institution at the school level in the blocks of the Birbhum district. Gap Analysis of Facilities- **Fg =N-(P/Pt),** Where, Fg= Gaps

for particular facilities, N= Existing number of facilities, P=Block population, Pt=Average population threshold for facilities (Iqbal, 2006). First, the total population of all the blocks has been added and divided by the total number of existing facilities to get the threshold population. After that, the total population of each block is divided by the threshold population to get the number of required facilities. Lastly, the number of required facilities is subtracted from existing facilities to determine the surplus and shortage of the facilities of that particular block. The positive value indicates the surplus of educational institutions and the negative value indicates the shortage of educational institutions. For calculation of the educational infrastructure index for the district at the school level, 10 indicators have been chosen i.e. Institution per/10000 population (X_1), Student-teacher ratio (X_2), Student-classroom ratio (X_3), The average number of teachers per school (X_4), School with electricity facilities (X_5), School approachable by an all-weather road (X_6), School with girl's toilet (X_7), School with playground (X_8), School with drinking water facilities (X_9), School with Mid Day Meal running (X_{10}). To calculate the infrastructure index, first, all the indicators have been normalized by the formula = (observed - minimum)/ (maximum-minimum). Then each of the indicators has an assigned rank. For the positive indicator highest rank is given to the best-performed block e.g. 19 and for the negative vice versa. To get the educational infrastructure index for each educational level, all the ranks have been added thereafter and divided by the total number of indicators like primary, upper primary, etc. To get the overall educational infrastructure index each of the educational infrastructure indexes is added and divided by 4.

Analysis:

I) History of Growth of Educational Institutions in Birbhum District

In 1823, the Magistrate Mr. Garnett proposed that schools should be open; where pupils should be kept as much and for as long or a period as possible from the contaminating society (Majumdar, 1975). E.G. Drake-Brockman (1898) reported that from the early days of British rule up to 1830; there were no schools either public or private. In W.W. Hunter's 'Annals of Rural Bengal' (1878), it is evident that there was one government-managed English high school at Suri, one government-managed and one government-aided vernacular school. During this time Sir George Cambell's administration of Bengal, a great expansion of primary education took place. As a result, the number of primary schools had increased. According to the L. S. S. O'Malley (1910) reported there were 7 high English schools with 1610 pupils of which the only Government managed institution i.e. Zilla school at Suri, other five was private aided and one is private unaided. There were no less than 25 Middle English schools of which 19 were in vernacular medium. Of the 928 primary schools, 99 schools were in upper primary and 828 were lower primary schools. Apart from the modern institution, there were some traditional institutions of education including 10 recognized Sanskrit *tols*, one *Madrasa, 19 Muktabs.*

According to the third report of William Adam (1937), there was 544 primary school of which 512 was in vernacular medium. The medium of Bengali was at 507 schools. The number *of tols* and *Chatuspathis* were 56. The numbers of students in 512 institutions were 6383. There was a representation of students from the socially deprived caste-like Dhoba, Dom, Keot, Bagdi, Baiti, Hari, Mal, Bahelia, Chamar, Bhuiya and Suri. The teachers were also found among the sub-caste Dhoba, Sunri, Jalo, Jalia-Kaibarta. With the time and

growing demand, there has been a remarkable expansion of primary, secondary, higher secondary, educational institutions in the district.

II) Recent Trend in Growth of School Educational Institutions

a) Block-wise Growth of Primary Schools

The growth of educational institutions at the block level during 2006-07 and 2016-17 has been presented with DISE data. The total number of primary schools in Birbhum district was 2382 in 2007 which has increased to 3363 in 2016-17. During 2007-2017, 981 new primary schools have been set up in this district which is a major achievement in spreading primary education to the remote areas of the district.

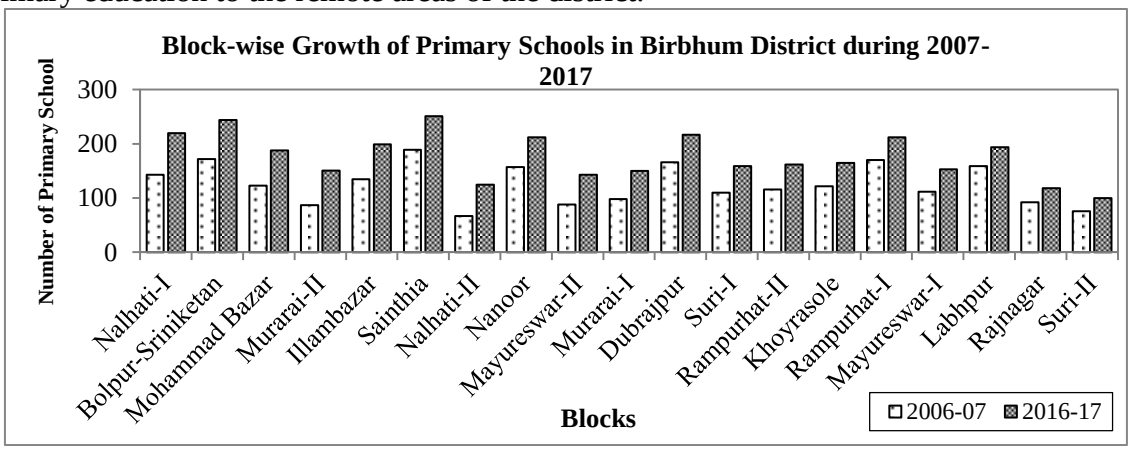

Fig: 2 ***Source: Prepared based on data DISE, 2007-2017***

The highest number of primary schools has been set up in Nalhati-I block (77), this number is also too high in Bolpur-Sriniketan (72), Mohammad Bazar (65), Murarai-II, Illambazar (64) and Sainthia (62) during 2007-2017. 50-60 primary schools have been opened in Dubrajpur, Murarai-I, Mayureswar-II, Nanoor, and Nalhati-II. The least priority has been given to setting up new primary schools are Suri-II (24), Rajnagar and Mayureswar-II (Fig. 2).

b) Block-wise Growth of Upper Primary Schools

A remarkable increase in the new set up middle schools is observed during 2007-2017. The total number of middle schools has increased from 80 to 391 during 2007-2017. The highest number of upper primary schools has been set up in Murarai-II and I (35) during 2007-2017. The number of the new set up upper primary schools is also higher in Mohammad

Bazar (31) Dubrajpur (33) and Rampurhat-I (30)

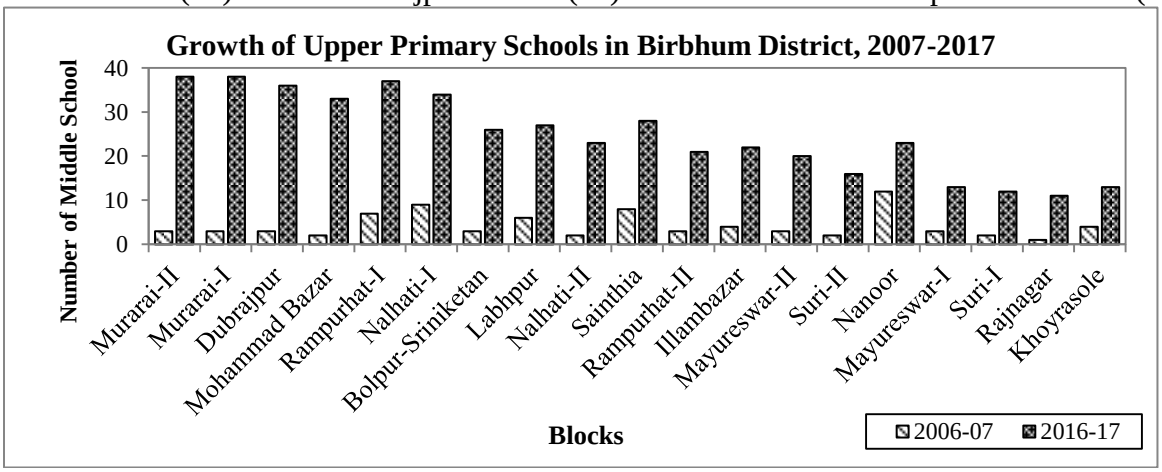

Fig: 3 ***Source: Prepared based on data DISE, 2007-2017***

During 2007-2017, 20-30 upper primary schools have been set up in the Nalhati-I, Bolpur-Sriniketan, Labpur, Nalhati-II and Sainthia. The least preference is given to Khoyrasol in setting up the new upper primary school during this period (Fig. 3). The setup of the new upper primary school is lowest in Rajnagar (10), Suri-I (10), Mayureswar-I (10) during 2007-2017.

c) Block-wise Growth of Secondary Schools

The number of secondary schools has decreased from 221 in 2007 to 169 in 2017. The decreasing pattern in the number of the secondary school indicates that secondary school has been upgraded to higher secondary level. But it also needs to upgrade the upper primary school to secondary school from time to time. During 2007-2017, an increase in the number of secondary schools is noticed in Nanoor and Mayureswar-II block. There is no change in the number of secondary schools in Rampurhat-I during this period. Apart from this, all the remaining blocks have shown a decrease in the number of secondary schools (Table 1).

Table- 1: Growth of Institutions at Secondary and Higher Secondary Educational Level in Birbhum District, 2007-2017

Blocks	Secondary		Higher Secondary	
	2006-07	2016-17	2006-07	2016-17
Nalhati-I	15	13	5	16
Nalhati-II	9	6	4	7
Murarai-I	10	6	5	10
Murarai-II	11	6	2	10
Mayureswar-I	17	12	4	13
Mayureswar-II	7	8	4	7
Rampurhat-I	12	12	10	16
Rampurhat-II	12	10	5	11
Mohammad Bazar	11	4	6	14
Sainthia	18	12	6	18
Dubrajpur	10	8	10	16

Rajnagar	6	3	2	6
Suri-I	12	9	11	20
Suri-II	6	5	4	6
Khoyrasole	9	10	6	9
Bolpur-Sriniketan	19	15	13	23
Labhpur	13	10	7	17
Nanoor	13	16	5	13
Illambazar	11	4	4	14
Total	**221**	**169**	**113**	**246**

Source: DISE, 2016-17

d) Block-wise Growth of Higher Secondary Schools

The district has witnessed remarkable progress in the growth of the higher secondary school. The total number of higher secondary schools has increased from 113 in 2017 to 246 in 2017. It is observed that the number of secondary schools has decreased by 52 during this period. At this time, the number of higher secondary schools has increased by 133. The setup of new higher secondary schools and up-gradation of secondary school to higher secondary is remarkable during this period. All the blocks of this district have witnessed an increase in the number of higher secondary schools during 2007-2017 (Table 1). The highest increase in the number of higher secondary schools is seen in Sainthia (12). In this regard, other notable blocks are Nalhati-I (11), Bolpur-Sriniketan (10), Labpur (10) and Illambazar (10). The increase in the number of secondary schools is only 2 in Suri-II, followed by Khoyrasole (3), Mayureswar-II (3), Nalhati-II (3) and Rajnagar (4)

III) Gap Analysis of School Educational Institutions

a) Gap Analysis of Institutions at Primary Education

Block-wise shortage and surplus of schools have been calculated to prepare specific strategies for the educational development at the schools of the district. Table 4.2 shows the number of existing primary schools in each block and the number of schools required or surplus in those blocks. Table 4.2 shows that the highest shortage in primary school is found in Murarai-II (-62). There is a wide gap between the number of existing primary schools (152) and the number of required schools (215). Higher gaps are also found in Murarai-I (-33) Bolpur-Sriniketan (-28) Rampurhat-I (-25), Rampurhat-II (-18) Nalhati-I (-17) and Suri-I (-13). On the other hand, Rajnagar (43) has the highest surplus primary school. The total number of existing primary schools in this block is 121 and the required number is 75 according to norms. A higher number of surplus primary schools is also found in Sainthia (21), Illambazar (36), Mohammad Bazar (30), Mayureswar-II (20) Khoyrasol (18) and Suri-II (16) (Fig. 4). Only Labpur and Mayureswar-I have balance conditions in terms of existing and required primary school.

b) Gap Analysis of Institutions at Upper Primary Education

It is found that the highest gaps existing and required in upper primary school are found in Bolpur-Sriniketan (12) and Suri-I (12), followed by Mayureswar-I (9) and Khoyrasol (8). The highest surplus of upper primary is found Murarai-I (12). The existing number of middle schools in this block is 38 and the required number of middle schools is 26. A higher surplus of upper primary school is observed in Mohammad Bazar (11), Murarai- II

(8), Dubrajpur, Nalhati-II. Rajnagar and Labpur are in a balanced situation in terms of availability of upper primary school facilities (Fig. 5).

c) Gap Analysis of Institutions at Secondary Education

The highest surplus school at the secondary level is found in Nanoor (5) (Fig. 6). Secondary school is also surplus in the blocks of Mayureswar-I, Khoyrasol, Mayureswar-II, Bolpur-Sriniketan, Nalhati-I, Rampurhat-II and Suri-II. The gap is highest at the secondary level in Murarai-II (5), followed by Illambazar, Mohammad Bazar, Murarai-I, Dubrajpur and Rajnagar. Balance condition is observed in Sainthia, Labpur, Rampurhat-I and Nalhati-II (Table 4.4).

d) Gap Analysis of Institutions at Higher Secondary Education

Suri-I (7) has the highest number of surplus higher secondary schools apart from that there are 8 blocks in which the number of existing higher secondary schools is more than the required namely Bolpur-Sriniketan, Labpur, Mohammad Bazar, Illambazar, Mayureswar-I, Sainthia, Dubrajpur and Rajnagar (Fig. 7). The gap between required and existing in the Higher Secondary level is worst in Murarai-II. In Murarai-II existing number of higher secondary schools is 10, while the required number is 16. The shortage of higher secondary schools is found in Murarai-I (-3), Nanoor (-2), Rampurhat-I (-2), Nalhati-II (-2), Mayureswar-II (-2),Khoyrasol (-2), Nalhati-I (-1), Rampurhat-II (-2) and Rampurhat-I (-1).

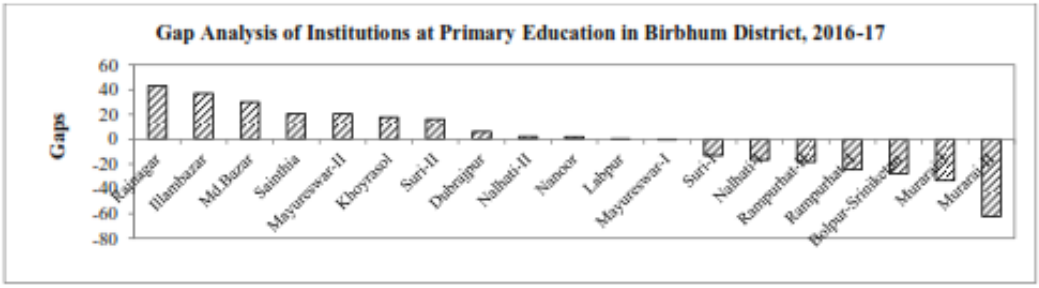

Fig: 4 ***Source: Prepared based on data DISE, 2016-17***

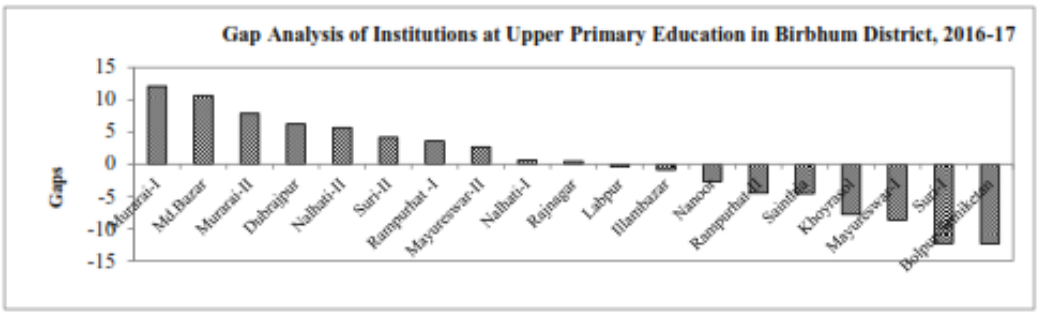

Fig: 5 ***Source: Prepared based on data DISE, 2016-17***

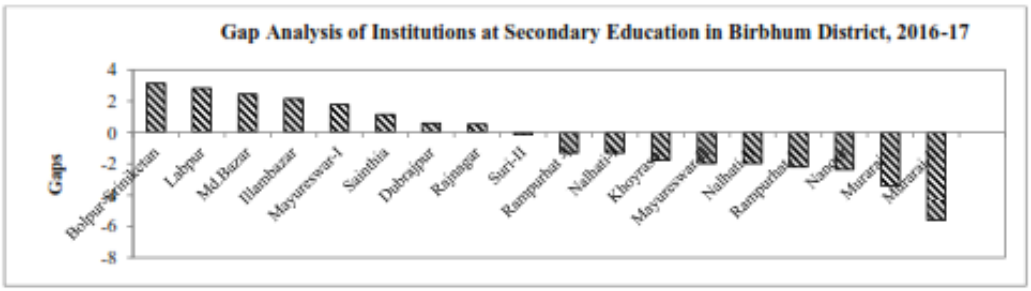

Fig: 6 ***Source: Prepared based on data DISE, 2016-17***

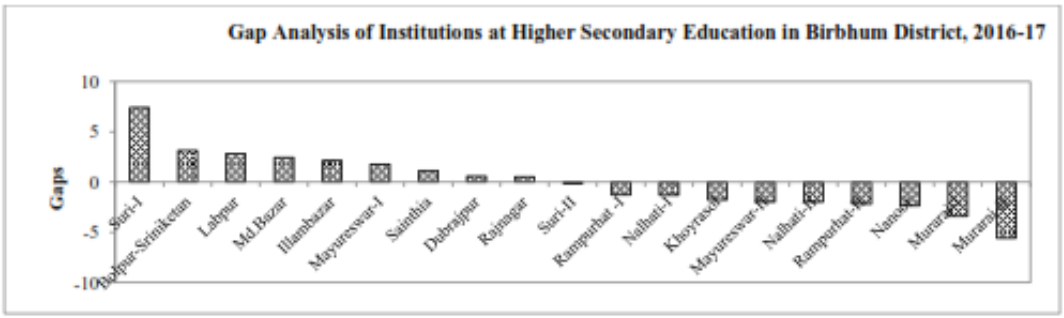

Fig: 7 ***Source: Prepared based on data DISE, 2016-17***

IV) Educational Infrastructure at School Education in Birbhum District:

The development of education depends on a large number of factors including the infrastructure resources available to a school (Bhunia et al., 2012). School infrastructure, such as the site, buildings, furniture and equipment contribute to a learning environment (Ayeni and Adelabu, 2012). People's access to education depends crucially on the educational infrastructure in place. The effective and fruitful functioning of schools relies on the provision of physical and human facilities (Ghosh, et al., 2018). According to the Right to Education Act (RTE) 2009 every school should have an all-weather building, adequate teachers, at least one classroom for every teacher, separate toilets for boys and girls, safe and adequate drinking water facility, a playground, a kitchen for the mid-day-meal and arrangements for keeping the school building secure by boundary wall or fencing. These are the basic minimum facilities that a school should have (Karmakar, 2016). The availability of school is one of the predetermined conditions for the educational development of an area. More availability of schools gives more accessibility to education. The unavailability of higher secondary school is one of the reasons for higher drop out at higher secondary levels, especially for the girl's students. Due to the distance, some parents are reluctant to send their children to school. Student-classroom ratio (SCR) represents the average number of pupil who can sit in one classroom over some time. So, the teacher can monitor each student where a low student-classroom ratio exists and vice versa.

Table-2: Indicators of Educational Infrastructure Index in Birbhum District

Blocks	School/10000 population	Average number of teachers/ schools	Student-Teacher ratio	Student-Classroom Ratio	Electricity Facility (in %)	Play Ground Facility (in %)	School Approachable by All Weather road(in%)	Girls Toilet Facility (in %)	Mid-Day Meal Facility (in %)	Drinking Water Facility (in %)
Bolpur-Sriniketan	13.13	4.97	22	25	94.74	58.65	91.73	99.62	90.6	99.25
Dubrajpur	12.46	4.29	29	28	80.97	32.3	94.25	98.67	95.58	99.56
Illambazar	14.17	4.3	26	27	79.08	58.16	93.31	100	88.7	100
Khoyrasol	12.85	4.7	31	32	80.2	40.61	93.95	100	94.42	100
Labpur	12.28	4.89	28	29	88.71	49.19	93.45	99.18	92.74	100
Mayureswar-I	11.95	4.73	30	30	83.77	44.5	88.48	98.95	93.72	100
Mayureswar-II	13.94	4.63	29	29	91.01	54.49	90.45	100	92.13	100
Mohammad Bazar	14.52	4.41	33	31	70.71	31.8	92.47	98.32	92.15	100
Murarai-I	10.74	4.61	43	42	76.59	31.71	92.2	99.51	90.73	98.54
Murarai-II	9.23	5.13	45	47	61.46	16.59	86.23	93.66	88.29	100
Nalhati-I	12.35	4.77	33	32	71.54	57.31	92.09	98.41	85.77	98.81
Nalhati-II	12.6	5.22	33	35	63.98	39.75	85.71	98.36	81.99	98.76
Nanoor	12.26	4.97	28	31	84.7	19.4	87.69	100	91.04	99.51
Rajnagar	17.7	3.64	28	26	76.81	63.04	99.28	100	94.03	99.28
Rampurhat- I	12.21	3.9	33	32	82.61	20	93.48	98.7	93.04	99.57

Rampurhat-II	10.86	5	29	30	86.76	23.53	93.14	96.08	89.71	99.51
Sainthia	14.28	3.93	27	26	81	26.52	86.38	96.4	93.91	99.28
Suri- I	13.02	4.94	28	27	78.62	60.69	88.97	94.48	86.21	99.31
Suri-II	14.53	4.45	30	26	85.04	62.2	93.7	97.64	92.91	100

Source: ***DISE, 2016-17***

a) Educational Infrastructure Index at Primary Level: Fig. 8 indicates that the blocks of the northern part of the district need special attention in terms of educational infrastructure at the primary level. Murarai-II has the lowest and Nalhati-II, Nalhati-I and Murarai-I also have low educational infrastructure index. Rampurhat-I & II, Nanoor, Sainthia, Mohammad Bazar shows moderate level educational facilities at primary school. The primary school located in the blocks of Bolpur-Sriniketan, Mayureswar-II, Suri-II and Rajnagar block comprises good educational infrastructural facilities at primary school.

b) Educational Infrastructure Index at Upper Primary Level: Fig.9 shows that infrastructural facilities at upper primary school are very poor in the blocks of Dubrajpur, Sainthia, Rajnagar and Labpur. The upper primary school in Mayureswar-I, Nalhati-I, Murarai-I, Khoyrasol and Illambazar comprise good educational infrastructural facilities. It is also noted that during the last decade priority has been given to open a new upper primary school in the northern blocks of the districts.

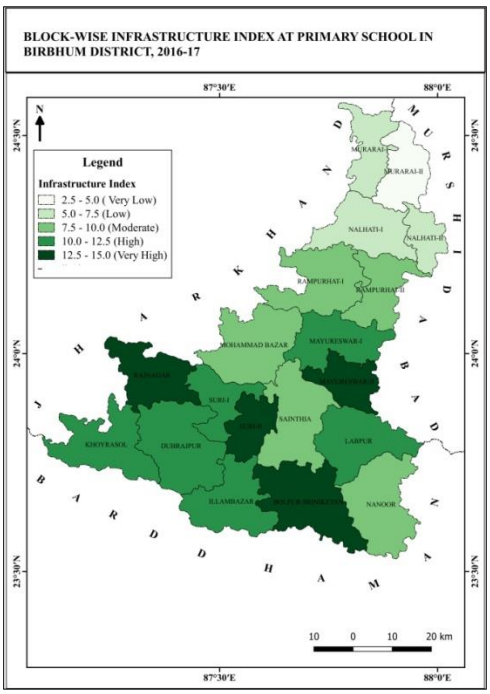

Fig: 8 Source: DISE, 2016-17

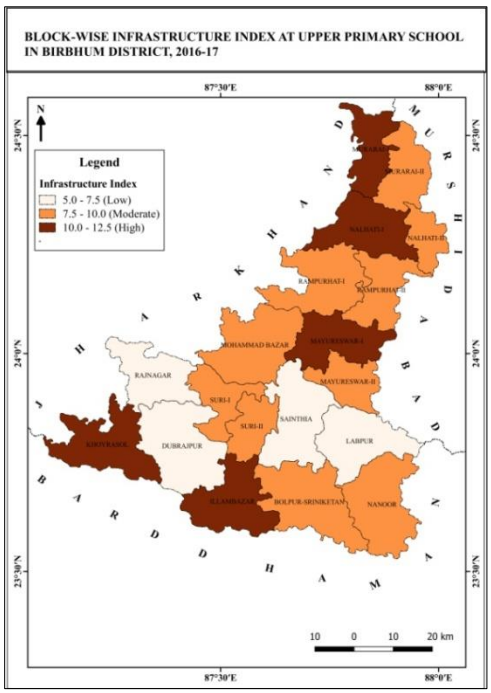

Fig: 9 Source: DISE, 2016-17

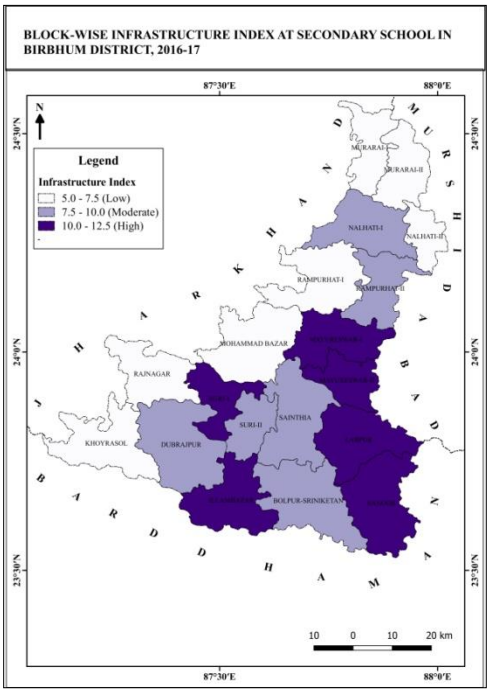

Fig: 10 Source: DISE, 2016-17

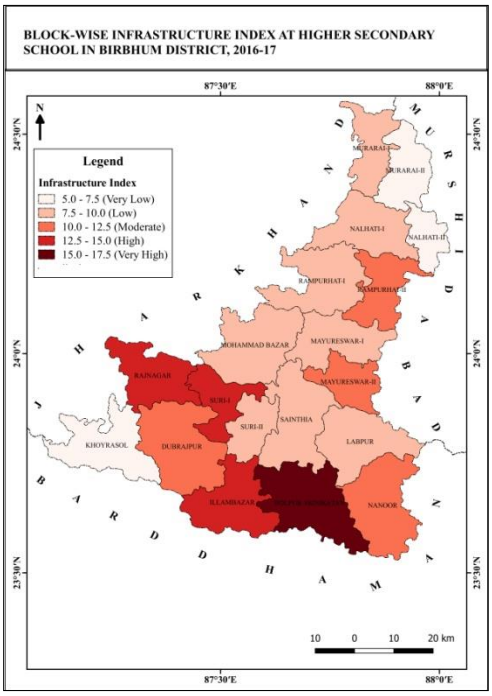

Fig: 11 Source: DISE, 2016-17

Table-3: Educational Infrastructure Index at School Education in Birbhum District, 2016-17

Blocks	Educational Infrastructure Index				Total Score	EII
	Primary	Upper Primary	Secondary	Higher Secondary		
Bolpur-Sriniketan	13.00	9.30	9.29	15.25	46.84	11.71
Dubrajpur	10.15	6.80	8.07	10.25	35.27	8.82
Illambazar	11.65	10.80	11.79	12.92	47.15	11.79
Khoyrasol	12.25	10.85	6.50	6.75	36.35	9.09
Labpur	11.85	7.40	11.14	9.08	39.48	9.87
Mayureswar-I	10.05	12.10	10.29	9.00	41.44	10.36
Mayureswar-II	13.05	9.15	10.71	10.25	43.16	10.79
Md.Bazar	9.45	9.10	7.14	9.92	35.61	8.90
Murarai-I	7.45	10.20	5.71	8.58	31.95	7.99
Murarai-II	3.50	8.20	5.71	5.75	23.16	5.79
Nalhati-I	7.30	11.00	9.00	10.00	37.30	9.33
Nalhati-II	6.70	9.30	5.71	7.25	28.96	7.24
Nanoor	8.35	8.20	10.14	10.42	37.11	9.28
Rajnagar	14.95	7.40	7.43	12.92	42.70	10.67
Rampurhat -I	8.05	8.50	5.43	9.42	31.40	7.85
Rampurhat-II	8.30	8.80	8.64	11.25	36.99	9.25
Sainthia	9.15	7.30	10.00	7.75	34.20	8.55
Suri-I	10.65	7.70	10.64	13.08	42.08	10.52

Suri-II	14.15	8.90	9.50	8.67	41.22	10.30

Source: Calculated by researcher from DISE data of 2016-17

c) Educational Infrastructure Index at Secondary Level: Fig. 10 demonstrates that educational infrastructural facilities at secondary school are very poor in the blocks of Rampurhat-I, Nalhati-II, Murarai-I & II, Khoyrasol, Mohammad Bazar and Rajnagar. The secondary school of Illambazar, Labpur, Mayureswar-II, Suri-I, Mayureswar-I, Nanoor and Sainthia comprises good educational infrastructural facilities.

d) Educational Infrastructure Index at Higher Secondary Level: Educational infrastructural facilities are very poor in the higher secondary school of Murarai-II, Khoyrasol, and Nalhati-II. Sainthia, Murarai-I, Suri-II, Mayureswar-I, Labpur, Rampurhat-I and Mohammad Bazar also lags in this regard. A good educational infrastructural facility is observed in the school of Rajnagar, Illambazar, Suri-I and Bolpur-Sriniketan (Fig. 11).

e) Educational Infrastructure Index at School Education: Fig.12 depicts that the overall educational infrastructure at school education is low in the blocks of Murarai-II and Nalhati-II, moderate in Murarai-I, Nalhati-I, Rampurhat-I & II, Mohammad Bazar, Sainthia, Labpur, Nanoor, Khoyrasol, and Dubrajpur. The Educational infrastructure is good in the blocks of Khoyrasol, Suri-I & II, Illambazar, Bolpur-Sriniketan and Mayureswar-I & II.

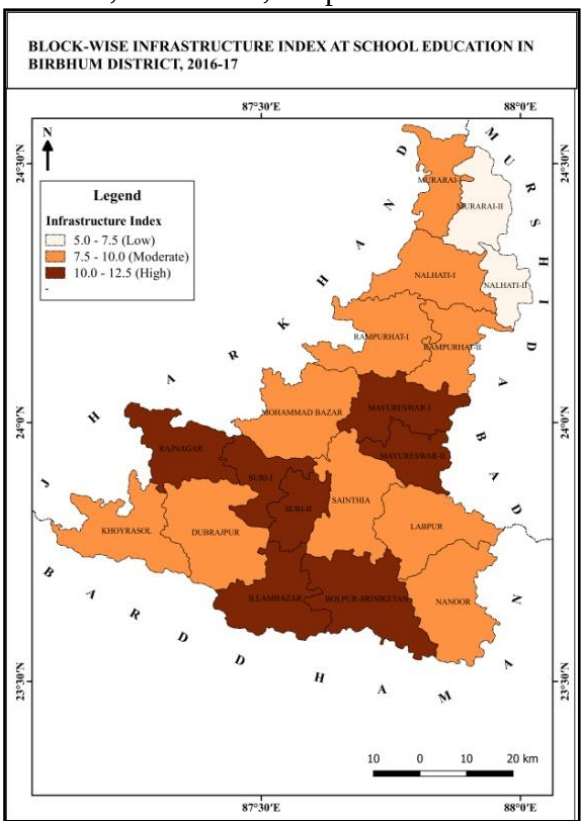

Fig: 12
Source: DISE, 2016-17

Suggestive Measures:

1. ***Priority on low Infrastructural development index blocks***

The educational infrastructure index is very low in Nalhati-II and Murarai-II. The education department should emphasize recruiting more teachers, construction of new classrooms, girl's toilets in these blocks.

2. *Opening of the new school in the deficient blocks*

It is observed that there is a shortage of primary, secondary and higher secondary schools in the blocks of Murarai-I, Murarai-II, Khoyrasol, Rampurhat-II, Nanoor, Nalhati-II, Suri-II. More thrust should be given in setting up of new primary school and up-gradation from upper primary to secondary and secondary to higher secondary.

3. *Role of SSA and DPEP*

Sarva Sikha Aviyan and District Primary Education Programme should allocate more funds to open the new school on a priority basis to improve the infrastructural facilities in the deficient blocks of the districts.

Conclusion: The attempt of the District Primary Education Programme (DPEP) and Rashtriya Madhyamik Siksha Aviyan (RMSA) has certainly upgraded the scenario of the educational infrastructure of the district but still, the disparity remains thorough the blocks the district. The correlation between educational infrastructure and literacy is 0.52. So, it can be said that there is an impact of educational infrastructure on the literacy rate in the district. It is clear from the analysis that there is a shortage of schools in Murarai-II, Nalhati-II and Khoyrasol blocks. The educational infrastructure index is also on the lower side in these blocks. The government should allocate more funds to set up new schools and educational infrastructure in these blocks.

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