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Block-Level Socio-Economic Development Statusin North 24 Parganas District of West Bengal, India

Chandra Shekhar Sarkar 1[1*], Aritra Chakraborty 2[2]
[1]Research Scholar, Department of Geography, Presidency University, Kolkata, India
[2]Assistant Professor, Department of Geography, Presidency University, Kolkata, India
*cssarkar36@gmail.com

ABSTRACT

The study assesses the block-level socio-economic development status in the North 24 Parganas district of West Bengal, applying the factor analysis technique based on thirty selected socio-economic indicators. The factor analysis of 30 indicators related to socio-economic of North 24 Parganas yielded seven factors which together account for 84.12 percent of the total variance. The results of the study highlight that there is a wide disparity in block-level social-economic development in the North 24 Parganas district. The study shows that Rajarhat (0.776), Habra-I (0.623) and Hingalganj (0.537) are the most developed blocks, whereas the most backward blocks are Haroa (-0.814) and Minakhan (-0.578) in the district. The Government should take the proper development plans for backward blocks of the North 24 Parganas district.

Keywords
Indicators; Factor analysis; Composite index score; Level of development; Socio-economic development

Introduction

Socio-economic development is a multidimensional phenomenon, which brings changes in society (Kundu & Mondal, 2012). Proper socio-economic development can improve the overall condition of the citizen. Socio-economic development planning includes policies, programs, plans and strategies for the location of different amenities or conveniences and services (Rishi &Roy, 2020). The Government has taken the various development programmes with the primary objective of improvement in the social and economic condition of the people (Ohlan, 2013). However, it can be seen that the implementation of such development plans varies from region to region, resulting in regional inequalities. The regional inequality in India is now a matter of concern, threatening the peace and integrity of nations(Tripathy et al, 2011).

Literature Review

In the literature review, it has been observed that some studies are examining the level of socio-economic development at the macro, meso and micro levels in India. Aditya Kumar Patra and Arabinda Acharya (Patra & Acharya, 2011) attempted a study on regional disparity, infrastructure development of sixteen major states of India. Umakanta Tripathy, Mili Das and Pragnya Laxmi Padhi (Tripathy et al, 2011) analyzed the inter-district variation in development across different districts in the Orissa. Suman Kumar Kundu and Debabrata Mondal (Kundu & Mondal, 2012) did an important study on the spatial pattern of development levels in Murshidabad district using the Census data. Bipul Chandra Sarkar (Sarkar, 2013) also conducted a study on the role of social and economic elements on regional development in West Bengal. RamphulOhlan (Ohlan, 2013) examined the district-level socio-economic disparities in India. Mohammed Nizamuddin (Nizamuddin, 2014) conducted an important study on regional disparities in the state-level development in India using the Wroclaw Taxonomic Method. RajeebSamanta, Atreya Paul and Tanmay Patra (Samanta et al, 2015) attempted a study on the block-level disparity of social development of Paschim Medinipur district. MosfudarRahaman (Rahaman, 2016) did a study on the pattern of socio-economic development of

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Dakshin Dinajpur district using the factor analysis method. Chand Sultana and Nasim Aktar (Sultana &Aktar, 2016) examined the socio-economic development pattern at the blocklevel in Malda district using Kendall's ranking co-efficient method. Mithun Ray and MijanurRahaman (Ray &Rahaman, 2017) also attempted a study on inter-block variations in levels of social and economic development in Cooch Behar district using secondary data from the District Statistical Handbook and the District Census Handbook. Hiranmay Rishi and Ratnadeep Ray (Rishi & Ray, 2020) did an important study on the socio-economic disparity in the development of the Maldah district using the Principal Component Analysis (PCA) method. Research work of Debapriya Poddar, Jayanta Das and Tapash Mandal (Poddar et al, 2018) and Sangita Karmakar, Bhupen Barman and Ranjan Roy (Karmakar, 2020) are also significant in socio-economic development study.

Based on the literature review, it is observed that many research works have been conducted on socio-economic development in different districts of West Bengal. Still, no research work has been done on block-level socio-economic development in the North 24 Parganas district.

Objectives

There are two objectives of the study-
1. To measure the block-level socio-economic development status in the North 24 Parganas district.
2. To identify the developed and backward blocks in the North 24 Parganas district.

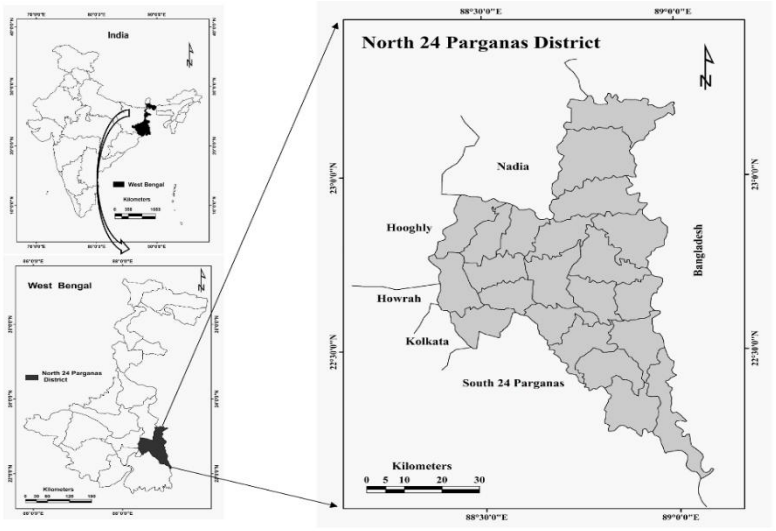

Figure 1. Location map of the study area

Study Area

North 24 Parganas is a district of West Bengal under the Presidency Division. It locates in the eastern part of West Bengal, bounded by the district of Nadia in the north, Bangladesh in the north and east, Hooghly and Howrah district in the west, South 24 Parganas and Kolkata district in the south. The district situates between 22°11'6''N and 23°15'2''N latitude and 88°20'E to 89°5'E longitude, covering the total area of about 4094 sq. km. The administrative headquarter of the district is Barasart. There are five subdivisions, 47 police stations, 27 municipalities, 22 blocks, 200-gram panchayats and 1518 inhabited villages in the district. The district's total population is 10009781,

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population density is 2445, and the male and female populations are 51.14% and 48.86% of the total population as per the 2011 census.

Materials and Method

The present research work is secondary data based. Data are collected from the District Census Handbook, 2011 and the District Statistical Handbook, 2014, of North 24 Parganas district. A total of 30 indicators are selected to study the spatial socio-economic development in the North 24 Parganas. These indicators are grouped into four categories like health (6 indicators), education (8 indicators), economy (6 indicators) and infrastructure (10 indicators). The indicators are-

Table 1. Socio-economic indicators

Category	Symbol	Indicators
Health	X1	Number of health centers per 10,000 population
	X2	Number of sub-centers per 10,000 population
	X3	Number of family welfare centers per 10,000 population
	X4	% of inhabited village with medical facilities
	X5	Number of beds per 10,000 population
	X6	Number of doctors per 10,000 population
Education	X7	Number of primary schools per 10,000 population
	X8	Number of upper-primary schools per 10,000 population
	X9	Number of secondary and higher secondary schools per 10,000 population
	X10	Number of public libraries per 10,000 population
	X11	Number of free reading rooms per 10,000 population
	X12	Number of mass literacy centers per 10,000 population
	X13	Percentage of total literacy
	X14	Percentage of female literacy
Economy	X15	Percentageof workers to the total population
	X16	Number of commercial banks per 10,000 population
	X17	Number of gramin banks per 10,000 population
	X18	Number of co-operative societies per 10,000 population
	X19	Percentage of cultivable area to the total area
	X20	Percentage of irrigated area to the total cultivated area
Infrastructure	X21	Number of fair price shops per 10,000 population
	X22	Number of fertiliser depots per10,000 population
	X23	Percentage of household under safe drinking water
	X24	Percentage of electrification household
	X25	Percentage of household having latrine
	X26	Percentage of household having bathroom
	X27	Percentage of household having own house
	X28	Percentage of household having waste water drainage system
	X29	Length of roads maintained by PWD per 10,000 population

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	X30	Percentage of inhabited villages with post office

References: Kundu1 & Mondal (2012), Samanta et al. (2015), Rahaman (2016), Sam &ChakmaĪ (2016), Sultana &Aktar (2016), Ray &Rahaman (2017), Karmakar et al. (2020) and Rishi & Roy (2020).

The factor analysis methodology by Statistical Package for the Social Science (SPSS) software has been applied in the study. Through this technique, Initial Eigen values, percentage of variance, factor scoring and factor load have been calculated. Both Principal Component Analysis (PCA) method and the Rotation method have been used for data reduction. The composite index score has been calculated using the seven factors' averages score, which identifies the block-level socio-economic development status in North 24 Parganas district.

Results and Discussions

1. Detection of factors and relationship

The factor analysis of 30 socio-economic indicators of the North 24 Parganas district generated seven factors that account for 84.12 percent (Table-2) of the total variance. The first factor accounts for 28.67 percent of the total variance. On the other hand, second, third, fourth, fifth, sixth and seventh factors account for 13.54%, 11.51%, 9.79%, 9.30%, 6.29% and5.02% variance respectively.
From Table-3, it can be easily identified that Factor-1 is highly positively associated with percentage of household having bathroom (0.979), followed by percentage of household having waste water drainage system (0.920) and have highly negatively associated with percentage of household having own house (-0.940) followed by the number of primary schools per 10,000 population. Factor-2 is highly positively correlated with the number of gramin banks per 10,000 population (0.899) and highly negatively correlated with the percentage of the irrigated area to the total cultivated area (-0.385). Factor-3 highly positively correlated with the number of fair price shops per 10,000 population (0.776), followed by the number of secondary and higher secondary schools per 10,0000 population (0.736), percentage of workers to the total population (0.702) and negatively correlated with the number of health sub-centres per 10,000 population (-0.393) followed by percentage of household under safe drinking water (-0.340). The rotated component matrix table (Table-3) shows that Factor-4 is highly positively associated with the percentage of cultivable area to the total area (0.769), length of roads maintained by PWD per 10,000 population (0.720) and the number of fertilizer depots per10,000 population (0.660). On the other hand, Factor-5 is highly positively correlated with the number of free reading rooms per 10,000 population and the number of public libraries per 10,000 population. Factor-6 is highly positively correlated with the number of upper-primary schools per 10,000 population (0.850) and Factor-7 is highly positively correlated with the number of co-operative societies per 10,000 population (0.891).

Table 2. Initial Eigen values, Extraction sums and Rotation sums of squared loadings

Component	Initial Eigen values			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.233	34.109	34.109	10.233	34.109	34.109	8.602	28.674	28.674

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2	4.570	15.232	49.341	4.570	15.232	49.341	4.063	13.542	42.217
3	3.043	10.143	59.484	3.043	10.143	59.484	3.453	11.509	53.726
4	2.715	9.051	68.535	2.715	9.051	68.535	2.938	9.794	63.520
5	2.195	7.315	75.851	2.195	7.315	75.851	2.790	9.300	72.819
6	1.315	4.383	80.234	1.315	4.383	80.234	1.886	6.288	79.108
7	1.169	3.897	84.131	1.169	3.897	84.131	1.507	5.023	84.131

Source: Computed by the authors

Table 3. Rotated component matrix of socio-economic indicators

Indicators		Component						
		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7
X26	Percentage of household having bathroom	.979	-.051	-.087	-.034	-.087	-.040	-.005
X27	Percentage of household having own house	-.940	.015	.066	.155	.152	.010	-.196
X28	Percentage of household having waste water drainage system	.920	.004	-.214	.009	-.214	.064	.094
X24	Percentage of electrification household	.855	-.130	-.320	.250	-.102	.098	.167
X13	Percentage of total literacy	.840	.081	.185	.326	.091	.220	-.172
X14	Percentage of female literacy	.827	-.056	.039	.403	.033	.286	-.066
X7	Number of primary schools per 10,000 population	-.803	.137	.485	.158	.037	.021	.042
X5	Number of beds per 10,000 population	.800	-.037	.023	-.276	-.228	-.170	.026
X16	Number of commercial banks per 10,000 population	.767	-.245	-.230	-.048	-.006	.175	.375
X25	Percentage of household having latrine	.711	-.134	-.190	.469	-.210	.013	-.153
X23	Percentage of household under safe drinking water	-.469	-.372	-.340	.299	-.094	.162	-.360
X17	Number of gramin banks per 10,000 population	-.009	.899	.118	.184	.055	-.102	.176
X3	Number of family welfare centres per 10,000 population	-.443	.710	.205	-.088	-.182	-.109	.096
X2	Number of health sub-centres per 10,000 population	.097	.692	.381	-.471	.003	-.144	.001
X6	Number of doctors per 10,000 population	.140	.659	-.393	.118	-.290	.198	.038
X1	Number of health centres per 10,000 population	-.492	.648	.234	.088	-.275	-.090	.004
X12	Number of mass literacy centres per 10,000 population	-.050	.588	.008	-.254	.511	.187	-.053
X21	Number of fair price shops per 10,000 population	-.207	-.217	.776	-.079	-.165	.249	.000
X9	Number of secondary and higher secondary schools per 10,0000 population	-.265	.444	.736	.020	.350	-.071	-.056
X15	Percentage of workers to the total population	-.373	.257	.702	.166	.169	-.183	-.052
X4	% of inhabited village with medical facilities	.215	.268	.624	-.003	-.069	.481	.219
X30	Percentage of inhabited villages with post office	-.282	.456	.563	-.368	.218	-.101	-.132
X19	Percentage of cultivable area to the total area	.178	.003	-.113	.769	-.032	-.095	.307
X29	Length of roads maintained by PWD per 10,000 population	.076	.099	.145	.720	.141	.253	.074
X22	Number of fertilizer depots per10,000 population	-.325	-.109	-.022	.660	-.267	.046	-.217
X11	Number of free reading rooms per 10,000 population	-.185	-.093	.061	-.007	.923	-.056	.108
X10	Number of public libraries per 10,000 population	-.185	-.093	.061	-.007	.923	-.056	.108
X8	Number of upper-primary schools per 10,000 population	-.008	-.027	.079	.076	.020	.850	-.117
X20	Percentage of irrigated area to the total cultivated area	.356	-.385	-.125	.265	-.255	.616	.097
X18	Number of co-operative societies per 10,000 population	.069	.163	-.002	.168	.193	-.058	.891
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.								

Source: Computed by the authors

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2. Block-level socio-economic development status of North 24 Parganas district

Table-4, Table-5 and Figure-2 represent the socio-economic development status of twenty-two blocks in North 24 Parganas districts. Socio-economic development is highest in Rajarhat (0.776) and lowest in Haroa (-0.814). All the blocks of the district are arranged into five categories (Table-5, Figure-2) according to the composite index score, such as very high, high, moderate, low and very low socio-economic development region.

Table 4. Block-level composite index score of socio-economic indicators

Sl. No.	Block name	Factor score-1	Factor score-2	Factor score-3	Factor score-4	Factor score-5	Factor score-6	Factor score-7	Composite index score	Rank within district	Level of development
1	Amdanga	-0.15593	1.04956	-0.61857	0.19616	-0.0508	1.59345	-0.20302	0.263	5	High
2	Baduria	-0.75946	-1.27524	1.60405	1.21611	-2.29244	-0.01777	0.95164	-0.090	15	Moderate
3	Bagdah	-0.48836	0.9493	-0.69809	1.61315	-0.4197	-1.44172	-0.79221	-0.180	17	Low
4	Barasat-I	0.82873	-0.61826	-0.34999	-0.31163	-0.42514	0.50606	0.03372	-0.048	12	Moderate
5	Barasat-II	-0.2492	0.82739	-1.53718	0.09311	-1.96469	1.18812	-0.23399	-0.263	18	Low
6	Barrackpur-I	1.80461	-0.50198	-0.53732	-0.47568	0.75605	-0.39826	-1.15451	-0.071	13	Moderate
7	Barrackpur-II	2.8897	-0.53732	0.65657	-1.03184	-0.94336	-0.97362	-0.19213	-0.022	9	Moderate
8	Basirhat-I	-0.8482	-1.35776	-0.22057	-0.34007	0.76747	-0.08272	2.57569	0.070	8	Moderate
9	Basirhat-II	-0.33846	-0.82657	-0.48946	-0.12282	1.20111	-0.57216	0.21159	-0.134	16	Moderate
10	Bongaon	-0.11677	-0.92758	0.43689	0.70247	0.03778	-0.10993	-0.53921	-0.076	14	Moderate
11	Deganga	-0.33787	-0.48921	-0.32031	0.2652	-0.41993	2.04888	-0.98263	-0.033	11	Moderate
12	Gaighata	0.37471	0.33404	0.2307	1.56902	-0.25462	-0.39765	-1.14359	0.101	7	Moderate
13	Habra-I	0.59461	-1.01596	0.65514	0.77253	1.55473	1.88404	-0.0759	0.623	2	Very high
14	Habra-II	0.13726	0.76027	-0.97171	1.15403	1.7284	-0.27826	0.3461	0.415	4	High
15	Haroa	-0.62461	-1.42618	-0.696	-0.50392	-0.45917	-1.53216	-0.44585	-0.814	22	Very low
16	Hasnabad	-1.05328	0.6739	-0.49433	-0.42222	-0.43517	-0.84261	0.60642	-0.280	19	Low
17	Hingalganj	-0.36102	1.33797	2.95285	0.3134	0.45627	-0.61943	-0.27227	0.537	3	Very high
18	Minakhan	-0.75324	-0.25388	-1.25494	-0.68413	0.18911	-0.97492	-0.33057	-0.578	21	Very low
19	Rajarhat	1.55893	1.93158	-0.26938	-0.14677	-0.40227	0.12341	2.60375	0.776	1	Very high
20	Sandeshkhali-I	-0.90966	0.2051	0.71863	-2.81732	-0.33376	0.77783	-0.62983	-0.429	20	Low
21	Sandeshkhali-II	-0.88255	1.482	0.66448	-1.19088	0.80377	-0.3004	-0.73651	-0.023	10	Moderate
22	Swarupnagar	-0.30995	-0.32117	0.53853	0.15208	0.90635	0.41981	0.40332	0.255	6	High

Source: Computed by the authors

Table 5. Block-level development and composite index score

Sl. no.	Level of development	Composite index score	Name of blocks	Total no. of blocks
1	Very high	0.416 – 0.776	Rajarhat, Habra-I andHingalganj.	3
2	High	0.102 – 0.415	Habra-II, Amdanga, Swarupnagar.	3
3	Moderate	-0.181– 0.101	Gaighata, Basirhat-I, Barrackpur-II, Sandeshkhali-II, Deganga, Barasat-I. Barrackpur-I, Bongaon, Baduria and Basirhat-II.	10
4	Low	-.579 – -0.180	Bagdah, Barasat-II, Hasnabad and Sandeshkhali-I.	4
5	Very low	-0.814 – -.0578	Minakhan and Haroa.	2

Source: Computed by the authors

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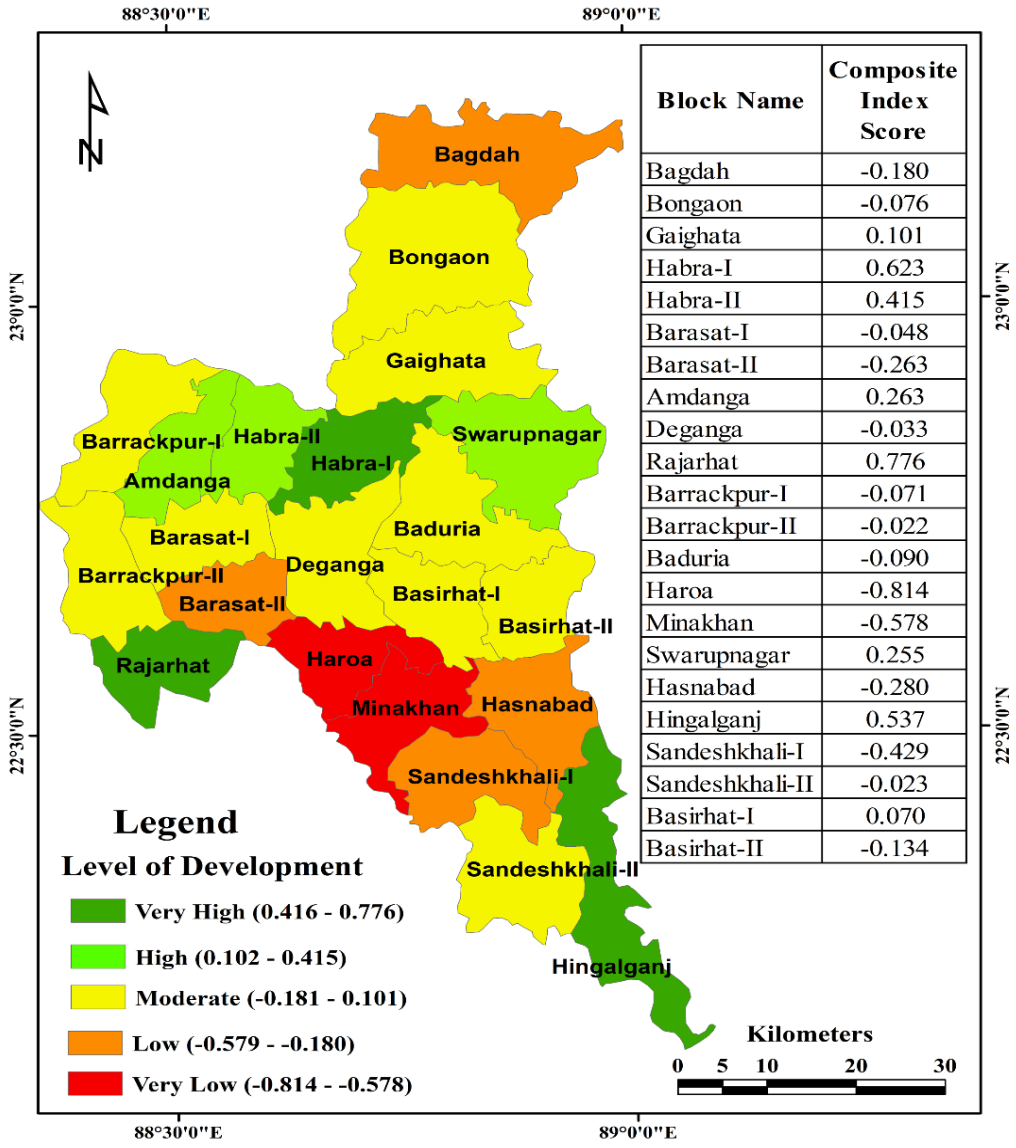

Block Name	Composite Index Score
Bagdah	-0.180
Bongaon	-0.076
Gaighata	0.101
Habra-I	0.623
Habra-II	0.415
Barasat-I	-0.048
Barasat-II	-0.263
Amdanga	0.263
Deganga	-0.033
Rajarhat	0.776
Barrackpur-I	-0.071
Barrackpur-II	-0.022
Baduria	-0.090
Haroa	-0.814
Minakhan	-0.578
Swarupnagar	0.255
Hasnabad	-0.280
Hingalganj	0.537
Sandeshkhali-I	-0.429
Sandeshkhali-II	-0.023
Basirhat-I	0.070
Basirhat-II	-0.134

Figure 2: Block-level socio-economic development status of North 24 Parganas district

2.1 Very high socio-economic development region (0.416 – 0.776)

Very high socio-economic development region consists of three blocks, namely Rajarhat (0.776), Habra-I (0.623) and Hingalganj (0.537). Rajarhat block has better health, education and infrastructure condition. Nine urban areas likeRaigachhi, Rekjuani, Bhatenda, Basina, Bishnupur, ChandapurChampagachhi, Jatragachhi, Ghuni and Sulanggari are located near Rajarhat block, which acts as growth pole of socio-economic development in the block. Habra-I block has better education, economic and infrastructure condition. Six urban areas like Nokpul, Maslandapur, Sadpur, Betpuli, Anarbaria and PurbbaNarayanpur are located near Habra-I block,which is also an important in socio-economic development in the block. On the other hand, Hingalganj block has a better number of health centers, doctors, primary schools, secondary and higher secondary schools, free reading rooms, co-operative societies, fair price shops per 10,000 population and better percentage of workers to the total population, household having own house and inhabited villages with the post office. Two urban areas like Hingalganj and Bankra are located near

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Hingalganj block, contributing to the socio-economic development in the block.

2.2 High socio-economic development region (0.102 – 0.415)

The high socio-economic development region comprises three blocks like Habra-II (0.415), Amdanga (0.263) and Swarupnagar (0.255). Habra-II has a higher number of public libraries, free reading rooms,commercial banks per 10,000 population and length of roads maintained by PWD per 10,000 population. Four urban areas, such as Guma, Bara Bamonia, Khorddabamonia and Bira are located near Habra-II block, helping to the socio-economic development of the block. Amdanga block has better education and economic condition. One urban area namely Dhania is located near Amdanga block, contributing to the block's socio-economic development. Swarupnagar block has a higher number of primary schools, secondary and higher secondary schools, public libraries, gramin banks, length of roads maintained by PWD per 10,000 and a higher percentage of workers to the total population, household having own house and inhabited villages with the post office. One urban area like Deora is located near Swarupnagar block, which also helps the socio-economic development of the block.

2.3 Moderate socio-economic development region (-0.181– 0.101)

Half of the total blocks belong to the moderate socio-economic development region. Ten blocks are fall in this category such as Gaighata (0.101), Basirhat-I (0.070), Barrackpur-II (-0.022), Sandeshkhali-II (-0.023), Deganga (-0.033), Barasat-I (-0.048), Barrackpur-I (-0.071), Bongaon (-0.076), Baduria (-0.090) and Basirhat-II (-0.134). These blocks have an adequate level of development in health, education, economy and infrastructure.

2.4 Low socio-economic development region (-.579 – -0.180)

The low level of development is observed in four blocks, namely Bagdah (-0.180), Barasat-II (-0.263), Hasnabad (-0.280) and Sandeshkhali-I (-0.429). Health and educational condition are satisfactory but economic and infrastructure condition is poor in the Bagdah block and there is no urban area in the block. On the other hand, infrastructure condition is better in Barasat-II but health, education and economic condition are poor in the block. Although one urban area like Deara is located in the Barasat-II block, the overall socio-economic development status of the block is low. Health and educational conditions are adequate but due to poor economy and infrastructure, the overall socio-economic development status of the Hasnabad block is low. One existing urban area in Hasnabad block can not ensure adequate socio-economic development. Education condition is satisfactory but health, economy and infrastructure conditions are poor in Sandeshkhali-I and there is no urban area in the block.

2.5 Very low socio-economic development region (-0.814 – -.0578)

Minakhan (-0.578) and Haroa (-0.814) belong to the very low socio-economic development region. These two blocks are located in the south-eastern part of the North 24 Parganas district. The absence of proper education, health, economic activities and poor infrastructure affects these blocks' socio-economic development. There is no urban area near Haroa and Minakhan block. These blocks are mainly dominated by the Muslim population, which is one of the marginalized sections in our country. Besides, a large number of people depend on primary activities, especially in agriculture and fishing in the block but due to inadequate irrigation facility and flood agricultural and fishing activities are not developed here.

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Conclusion

The development of a region not only depends on a single indicator but also the interplay of various socio-economic indicators regulates the development. In the present study, 30 socio-economic indicators measure the block-level socio-economic development in the North 24 Parganas district. The factor analysis shows that infrastructure and educational indicators are the main factors for socio-economic development in the district. It has been observed that there is a wide disparity in block-level socio-economic development in North 24 Parganas. The most developed blocks are Rajarhat, Habra-I, Hingalganj, whereas Haroa, Minakhan, Bagdah, Barasat-II, Hasnabad, and Sandeshkhali-I are the backward blocks. It is expected that this type of study will provide an adequate suggestion of the problems and prosperity of the block-level socio-economic development. It is anticipated that the Centra Government, as well as State Government, should take proper development plans for each backward block of the North 24 Parganas district.

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