Full Length Review Article

SOCIO-ECONOMIC DEVELOPMENT OF DAKSHIN DINAJPUR, WEST BENGAL- A FACTORIAL ANALYSIS APPROACH

*Mosfudar Rahaman

Sanchari, New Green Park, Sonarpur Station Road, Kolkata 700150

ARTICLE INFO	ABSTRACT

The study analyses the pattern of socio-economic development of Dakshin Dinajpur using factor analysis method. Total 30 socio-economic variables are considered for the present investigation. The factor analysis of 30 variables related to socio-economic development of Dakshin Dinajpur yielded five factors which together account for 91.33% of total variance. The first component explains 27.19 percent of the total variance whereas second, third, fourth and fifth factors explain 21.62 %, 20.75%, 11.89%, 8.85 % respectively. The analyses show factor 1 that is Urbanization and infrastructure is the main factor of development. Composite factor score shows that Balurghat, Kumargunj, and Tapan blocks are highly developed and Harirampur, Hilli,blocks are least developed.

INTRODUCTION

Development being a multivariate concept having many dimensions. There are various types of macroeconomic and sociocultural indicators or "metrics" used by economists and geographers to assess the relative economic advancement of a given region or nation. The interest of the geographers in the subject of development is especially in seeking to understand the spatio-temporal variation in the level of development and to examine its determinants. The geographical study of development is concerned about discovering the patterns form by the levels of development. If the factors that have contributed to the particular pattern can be recognized, it may then be possible to understand about the process involved in high and low developed region. If this can be done, then a useful step can be taken towards the possibility of raising the living standard of people in less developed region. Such an attempt has been made in this chapter using the technique of factor analysis to determine the relative importance of different factors of socio-economic development. Factor analysis is a statistical method used to describe variability among observed, correlated variables in terms of a potentially lower number of unobserved variables called factors.

Corresponding author: Mosfudar Rahaman,
Sanchari, New Green Park, Sonarpur Station Road, Kolkata 700150

Objectives

- To understand the socio-economic condition of the district
- To study the spatial pattern of socio-economic development
- To understand the factors and process responsible for development
- To suggest remedial measure for minimizing the developmental gaps

Study Area

Dakshin Dinajpur has been selected as the region for present study. Dakshin Dinajpur or South Dinajpur is a district of of West Bengal, created on 1 April 1992 by the division of the erstwhile West Dinajpurdistrict. It comprises two subdivisions: Balurghat and Gangarampur. It lies in between 260 35' 15" N to 250 10' 55" N and 890 00' 30" E to 870 48' 37" E. Total area under Dakshin Dinajpur district is of about 2,219 sq.km. In 2011, Dakshin Dinajpur had population of 1,670,931 of which male and female were 855,104 and 815,827 respectively. There was a positional change of 11.16 percent in the population compared to population as per 2001.According to 2011 census it is the least one populated district of West Bengal. DakshinDinajpur is predominantly an agricultural district with large area of land being under cultivation. According to 2011 census 85.87% area is rural and 14.13%

area urban in nature. This district comprises 1579 inhabited village, 2 municipality, 8 blocks,65 Panchayets.

MATERIALS AND METHODS

The study is based on secondary source. Data are collected from District Census handbook 2011, District statistical handbook 2012. The present study 30 variables are selected to show the spatial pattern of development in Dakshin Dinajpur. The variables are –

1. % of Urban Population
2. % of total workers to the total population
3. Percentage of literacy
4. Number of primary school per 1000 population
5. Number of secondary school per thousand population
6. Higher secondary school per 1000 population
7. % of village with educational facilities
8. Number of PHC per 30000 population
9. Number of sub centers per 5000 population
10. Number of doctors per lakh population
11. Number of bed per 10000 population
12. % of village with medical facilities
13. Number of dispensaries
14. Road density
15. Number of originating bus stop
16. Number of core network
17. Percentage of connected habitant
18. % of village connected with pucca road
19. Number of bank per lakh population
20. Number of post office per thousand population
21. Percentage of cropped area under Rice
22. Percentage of cropped area under Wheat
23. Index of diversification
24. Number of fertilizer deposit
25. Percentage of irrigated area to total area
26. Percentage of mouza electrified
27. Percentage of cultivable area to total area
28. Number of agricultural establishment
29. Number of non-agricultural establishment
30. % of employment in establishment.

The methodology adopted here is "Factor analysis". Through this techniques factor scoring and factor load have been calculated. Composite index has producedfor level of development. In the table below eigenvalues are given which are the 'characteristic roots' of the principal components solution. Eigenvalues reflect the relative importance of the dimension. The first dimension always explains the most variance and has the largest eigenvalue, the next the second-most, and so on. The sum of eigenvalues is total variance. Extraction Method – Principal Component Analysis, Rotation Method (Varimax)
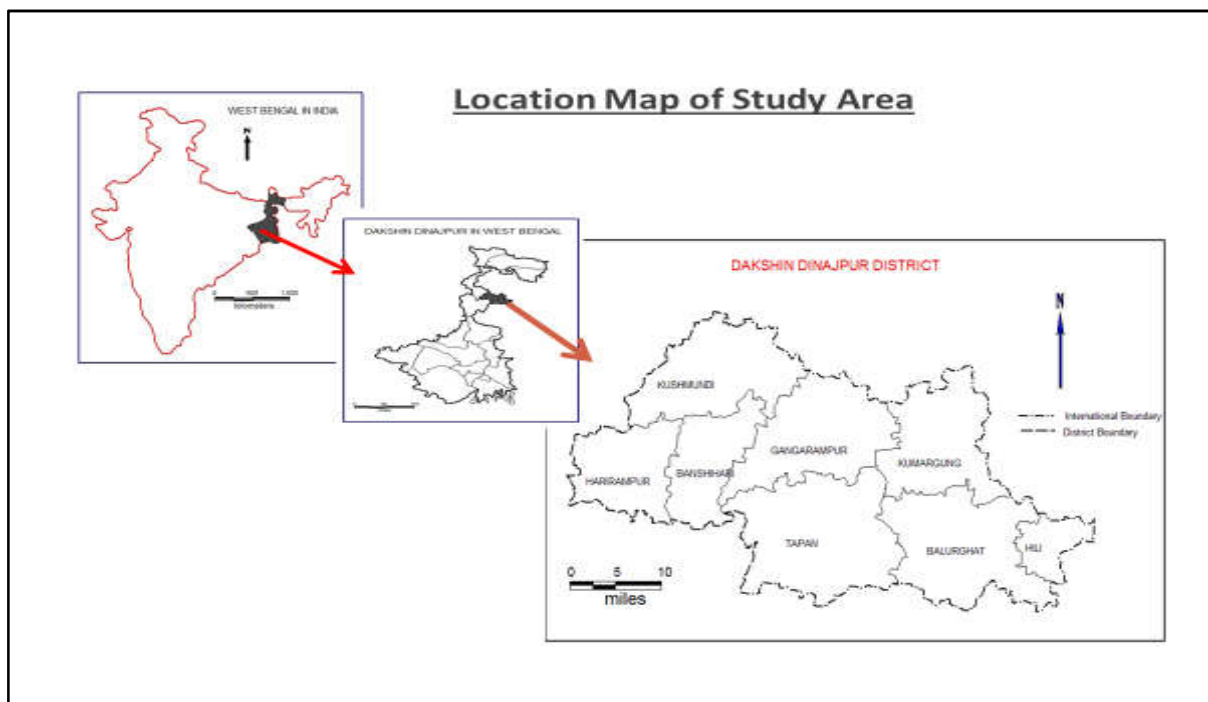
Factor structure

The factor analysis of 30 variables related to socio-economic development of dakshin dinajpur yielded five factors which together account for 91.33% of total variance in the spatial dimension of social and economic development. The first component explains 27.19 percent of the total variance whereas second, third, fourth and fifth factors explain 21.62 %, 20.75%, 11.89%, 8.85 % respectively.
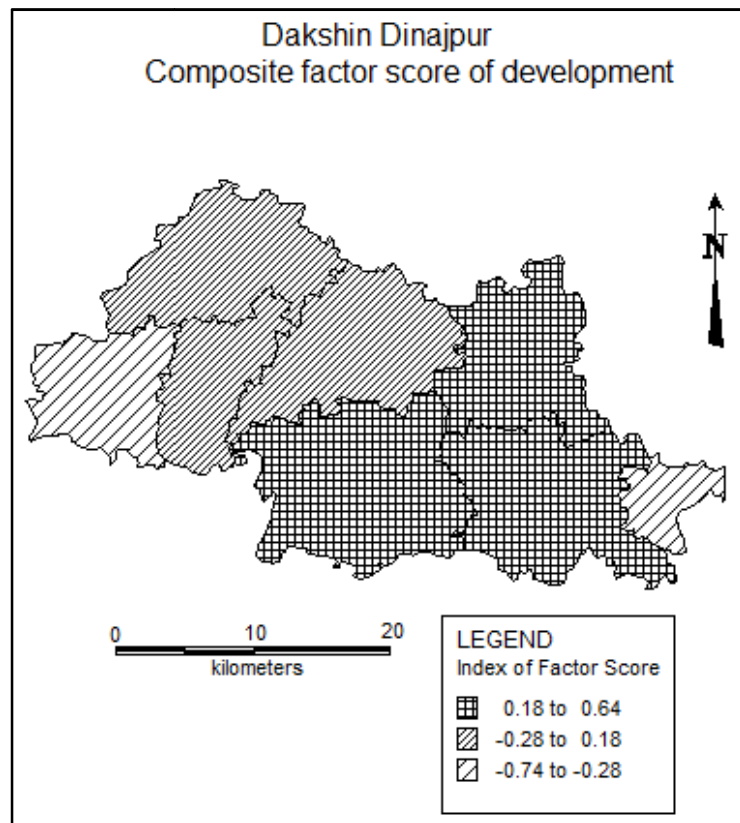
Factor 1

The first factor which accounts for 27.19 percent of the total variance of social and economic disparities is closely identified with urbanization and socio-economic development. The nature of the factors is defined by very high loadings for % of urban population (0.940031), Number of post office per thousand population (0.905211), number of bed per 10000 population (0.888772), number of bank per lakh population (0.877666), percentage of habitant connected with pucca road, number of doctor per lakh population (0.826772), number of origination bus stop (90.778363). The factor 1 is negatively correlate with Percentage of cropped area under Rice (-0.39717), percentage of village with medical facilities (-0.425260), index of crop diversification, number of agricultural establishment.

Factor 2

The second factor constitute 21.62 percent and 13 factor positively correlate with factor 1.

Location Map of Study Area

Dakshin Dinajpur
Composite factor score of development

LEGEND
Index of Factor Score

⊞	0.18 to 0.64
▨	-0.28 to 0.18
▨	-0.74 to -0.28

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.959983	33.19994	33.19994	9.959983	33.19994	33.19994	8.159752	27.19917	27.19917
2	6.917602	23.05867	56.25862	6.917602	23.05867	56.25862	6.487862	21.62621	48.82538
3	4.86592	16.21973	72.47835	4.86592	16.21973	72.47835	6.225389	20.7513	69.57668
4	3.432764	11.44255	83.9209	3.432764	11.44255	83.9209	3.569978	11.89993	81.47661
5	2.223089	7.410296	91.33119	2.223089	7.410296	91.33119	2.956375	9.854585	91.33119

Indicators		Factor1	Factor2	Factor3	Factor4	Factor5
1.	% of Urban Population	0.940031	0.044574	-0.01685	-0.3229	0.007642
2.	% of total workers to the total population	0.233458	0.374941	0.746061	-0.09276	-0.03116
3.	Percentage of literacy	0.327321	-0.19615	0.818222	-0.05703	0.344001
4.	Number of primary school per 1000 population	0.26791	0.39646	0.837323	-0.18583	-0.08421
5.	Number of secondary school per thousand population	0.460897	-0.23289	0.720555	0.142552	-0.34947
6.	Higher secondary school per 1000 population	0.292186	-0.89027	-0.1439	0.055063	-0.10077
7.	% of village with educational facilities	-0.1366	0.643787	0.565191	-0.41521	-0.16058
8.	Number of PHC per 30000 population	-0.19041	-0.1473	0.959487	-0.07451	0.030945
9.	Number of sub centers per 5000 population	0.543558	0.293227	0.7247	0.25882	0.033965
10.	Number of doctors per lakh population	0.826772	-0.1295	0.464194	-0.1864	-0.0178
11.	Number of bed per 10000 population	0.888772	-0.07625	-0.00135	-0.39074	0.126521
12.	% of village with medical facilities	-0.42526	-0.29601	-0.46252	-0.15322	0.315538
13.	Number of dispensaries	0.16884	0.827806	0.054488	-0.33922	0.185748
14.	Road density	-0.11264	-0.15027	-0.5539	0.274979	0.608239
15.	Number of originating bus stop	0.778363	-0.29218	-0.08999	-0.06833	-0.04049
16.	Number of core network	0.458222	0.79052	-0.28096	-0.04023	0.254846
17.	Percentage of connected habitant	0.837186	-0.14589	0.314354	-0.26462	0.243988
18.	% of village connected with pucca road	-0.42795	-0.21669	0.74656	-0.26439	0.05207
19.	Number of bank per lakh population	0.877666	0.063364	0.158573	-0.17478	-0.21593
20.	Number of post office per thousand population	0.905211	-0.20048	0.064943	0.326121	0.170698
21.	Percentage of cropped area under Rice	-0.39717	0.699761	0.138214	0.481802	0.123977
22.	Percentage of cropped area under Wheat	-0.05551	-0.30305	-0.38249	-0.02867	-0.86531
23.	Index of diversification	-0.3514	0.881964	0.057811	0.083079	-0.05868
24.	Number of fertilizer deposit	0.675289	0.516913	0.421286	0.087811	0.297658
25.	Percentage of irrigated area to total area	0.437946	0.721899	-0.12309	0.281929	0.343198
26.	Percentage of mouza electrified	0.128334	0.119653	-0.13153	0.16764	0.89373
27.	Percentage of cultivable area to total area	0.291251	-0.92215	0.030256	0.064656	0.160283
28.	Number of agricultural establishment	-0.25364	-0.27477	-0.15751	0.856735	0.196305
29.	Number of non-agricultural establishment	-0.13995	-0.01096	-0.04149	0.963872	0.199261
30.	% of employment in establishment.	0.540492	-0.22783	0.273636	-0.6663	0.261064

Source: Calculate by author from census of India 2011

Highest positive factor loading found with number of dispensaries (0.827806), index of crop diversification (0.881964), Number of core network (0.79052), Percentage of irrigated area to total area (0.721899), percentage of crop area under rice, number of fertilizer deport. The factor 2 is negatively correlate with percentage of crop area to total area, percentage of literacy, higher secondary population of 1000 population, percentage of village with medical facilities, percentage of crop area under rice, percentage of village with pucca road.

these scores means high level of education while negative value means low level of education. The table below shows that three blocks namely balurghat (0.451), kumargunj (0.636), Tapan (0.352) have a high level of development. Most of the factors are positive in nature. In Balurghat block level of urbanization is high. Balurghat town is the main administrative division of the district. That is why it experience with high level of infrastructural, educational and medical facilities. The composite value of -0.28 to 0.18 termed as medium level of development.

Blocks	F1	F2	F3	F4	F5	Composite Score
KUSHMUNDI	-0.4831	-0.01403	-0.77537	-0.27229	0.36252	-0.236
BANSHIHARI	-0.39105	-0.95976	-0.95048	0.91378	0.8306	-0.111
HARIRAMPUR	-0.31231	-0.34886	-0.82211	0.01372	-2.21236	-0.736
GANGARAMPUR	0.56139	0.0249	-0.83702	-0.95001	1.06498	-0.027
KUMARGUNJ	0.17049	-0.14026	1.10228	1.87299	0.17829	0.636
TAPAN	-0.74591	2.24434	0.19374	0.01653	0.05572	0.352
BALURGHAT	2.16469	0.13279	0.45947	-0.34556	-0.33476	0.415
HILI	-0.9642	-0.93912	1.62949	-1.24916	0.05501	-0.293

Source: Calculate by Author census of India 2011

Factor 3

Third factor which accounts 20.75 percentage of total variance. The rotated factor matrix shown in the table that highly positive factor loading has been loading number of PHC per 30000 population (0.959487), followed by number of primary school per 1000 population, percentage of literacy, number of secondary school per 1000 population, percentage of village with educational facilities, number of subcenter per 5000 population. This factor closely associate with health and education factors that is why it is term as health and educational determinant.

Factor 4

The fourth factor which accounts for 9.85 percent of the total variance can closely be identified as industrialization and agricultural development of the district. The nature of the factor is clearly defined by high positive loadings of number of non-agricultural establishment (0.9638752), number of agricultural establishment (0.856735), percentage of irrigated area to total area, percentage of mouza electrified ,percentage of crop area under rice, index of crop diversification, road density etc. The factor which negatively associate with percentage of urban population, percentage of literacy, number of primary school per 1000 population, number of bed per lakh population, number of dispensaries, percentage of village with medical facilities.

Factor 5

Factor five accounted with 9.85 percent of total variance. This factor highly positive loading with percentage of mouza electrified (0.89373), road density (0.608239) followed by percentage of irrigated area to total area, percentage of village with medical facilities, percentage of connected habitant, number of post office per thousand population number of core network etc. The factor which negatively associate with percentage of crop area under wheat, number of bank per lakh population, percentage of village with educational facilities, number of bank per lakh population.

Spatial Pattern of Development

Composite factorial scores show that there is spatial variation in level of socio-economic development. The positive value of

Kushmundi (-0.236), Gangarampur (-0.027), Banshihari (0.111) blocks fall under moderately developed. There are two blocks namely Harirampur (-0.736) and Hilli (-0.293) have a low level of development.

Conclusion and Suggestions

The basic findings of the foregoing study show that there are wide inter-district disparities in the level of socioeconomic development in Dakshin Dinajpur. Factor analysis shows that Infrastructure and agriculture is the main factor for development. The study area, Dakshin Dinajpur district requires more socio-economic facilities to attain an optimal organization of socio-economic facilities and hence for the balanced development. The development is pursued through optimum use of the existing natural and human resources of the region by formulating pragmatic planning. Public expenditure on infrastructural especially Transport, Communication, education and health should be enhanced in backward talukas with more rural areas.

REFERENCES

Ahmad, S. N. and Shamim, M. 1998. "Spatial Dimensions of Social and Economic Inequalities in Bihar", *The Geographer*, Vol. XLV, No. 2, pp. 70-77.

Banu N, Rawal SK 2015. Regional Disparities in Determinants of Educational Status in West Bengal, India: A Spatial Descriptive Approach, *IOSR Journal of Humanities and Social Science*, Volume 20, Issue 4, Ver. IV (Apr. 2015), PP 32-39

Huda S, Burke F. *et al*. 2013. Social and economic inequality in Sindh - A factorial Analysis approach, *International Journal of Sociology and Anthropology*, Vol. 5(6), pp. 205-218.

Julfikar, M., A., Deepika V. 2010. Factors of Inter-ward Socio-Economic Disparities in Aligarh City, Uttar Pradesh, *Indian Journal of Regional Science*, 42, 2, pp. 40-53.

Mohiuddin S, Hashia H 2012. Regional socio-economic disparities in the Kashmir Valley (India) – a geographical approach, *Bulletin of Geography. Socio–economic Series*, No. 18, pp 85–98

Patra and Acharya 2011. Regional Disparity, Infrastructure Development and Economic Growth: An Inter-State

Analysis, *Research and Practice in Social Sciences*, Vol. 6, No. 2, pp17-30.

Paul S 2012. Analysis of micro level disparities in urban facility-utility services: a study on Barasat city, West Bengal, India, *Journal of Urban and Regional Analysis*, vol. IV 2, p. 173 -188

PAUL, S. 2012. Factors and Dimensions of Inter-Ward Disparities in Urban Facility-Utility Services in Burdwan City, India", *Archives of Applied Science Research*, 4, 3, pp. 1376-1388.

Razzak H, Ali M *et al*. 2015. Principal Component Analysis of Socioeconomic Factors and Their Association With Life Expectancy at Birth in Asia, *International Journal of Multidisciplinary Academic Research*, Vol. 3, No. 1,

Siddiqui F.A, Hussain N 2010. Analysis of Microlevel Disparities in Malda District, West Bengal, *Asia Pacific Journal of Social Science*, Vol. II (1), Pp.39-61.

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