An Analysis of Regional Inequality in Bangladesh on the Basis of District Development Index

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Abstract

Bangladesh is a developing country. Different studies show there is a considerable amount of regional disparity exists among the districts of Bangladesh. Some districts are prosperous and some are lagging behind. This study explores this regional inequality and attempts to reveal the extent of inequality in different sectors namely education, health, infrastructure and socio-economic sector. This study used 27 variables to determine this extent of regional inequality among the 64 districts of Bangladesh. Equal weightage indexing method was used to determine the development score of each district. This development score will represent the development conditions of the district in 0 to 1 scale. Then ranking was done by the districts of Bangladesh according to this development score.

Keywords: *Development Index, Socio-Economic Variable, Equal Weightage Index, Development Variable.*

1. Introduction

During last several years, Bangladesh has experienced economic growth in gross domestic product (GDP) and other socio-economic development indicators like literacy, infant mortality etc. It has continuously improved in the state from a low-income country to a middle-income status (World Bank, 2008). But it is argued that the spatial distribution of this growth is not equal. Considering the administrative units of the country, the development level of the districts is not equal. Also, it is argued that a large amount of inequality exist in different socio-economic indicators of the districts which also argued to be increasing day by day. This part of this study tries to reveal the district level development condition of each of the 64 districts of Bangladesh in the selected indicators.

2. The District Development Index of Bangladesh

2.1 Inequality and construction of index:

Although the countries general economic performance is satisfactory, economic development among its district has diverged. Growth has become faster in the more developed districts like capital Dhaka than in the less developed districts. On the other hand, it has become slow particularly in the least developed hill tract and the northern fringe of the country. The regional disparities are growing. The average per capita GDP is 1035 dollar per person for Dhaka and in the hill tract districts Khagrachari it is 295 dollars per person which is 4 times less than Dhaka (CPD, 2008). This shows a tremendous amount of regional disparities among the districts. This analysis is focused on the determination of the district level inequalities which exist in Bangladesh using selected nine indicators. Construction of index for each district has been conducted using the selected nine indicators representing 27 development variables. This index forms the basis of the district development index. The district development index will represent a specific districts' relative position compared to the other districts. Also, this district development indexing system will represent the overall development condition of the districts considering all the aspects of the development.

2.2 The method of construction of the development index:

The index system measures the level of development in different dimensions. As this index system used twenty-seven variables in the construction of the index it is an important issue of determining the weights of the

variables in the construction of the index. There are mainly three alternative ways of setting weights to the variables. These are weighting based on judgment from the expert, statistical weight determination and giving equal weight to the each variable. The different statistical analysis shows that a simple scheme based on equal weights is not only convenient but also consistent with the views of experts (Chowdury and Squire, 2013). Also, it is seen that the simple average equal weighting and weight based index by different statistical procedure gives similar results when the number of variables is relatively large (Wang, 2007). So an equal weighting approach for the variables has been adopted for constructing development index for the districts of Bangladesh. For constructing the index at first index for the districts in each variable is developed. After calculating the index of the each variables average of the index is done dividing the sum of the index values by the number of variables. The equation used for the construction of the index is given below both for positive and negative variables. This indexing system is adapted from the study of Wang (2007).

For positive variables (the variables whose higher values indicates a higher level of development like income, literacy rate etc) the index is calculated by the following equation.

$$i^{th} \text{ district } = (V_i - V_{min}) / (V_{max} - V_{min}) \quad (1)$$

For the negative variables (the variables whose higher values indicates a lower level of development like infant mortality rate, unemployment rate etc) the index is calculated by the following equation.

$$i^{th} \text{ district} = (V_{max} - V_i) / (V_{max} - V_{min}) \quad (2)$$

In these two equations –equation (1) and equation (2), the symbols used are:
Vi = The value of the i^{th} district on a specific variable
Vmax= The highest value of that specific variable among the district
Vmin= The lowest value of that specific variable among the district.

This indexing system calculated values for a district in 0 to 1 scales. The indicator wise index is calculated by averaging the index value of the variables under this indicator for a specific district.
This indexing system calculated values for a district in 0 to 1 scales. For example, if a value for literacy rate is 55% for any X district, the highest literacy rate is 75% and the lowest literacy rate is 30% for the district. So the index value for literacy rate variable for X district will be
(55 – 30) / (75 – 30) = 0.55.
For a negative variable like unemployment rate for example if district X has an unemployment rate is 10 percent and the highest unemployment rate is 20 percent and lowest is 5 percent among the districts than index score in this variable for the district X will be
(20 – 10) / (20 – 5) = 0.67.
The composite index value is found from averaging the index values for all the variables as for this analysis 27 selected variables as the same above process. In this process analysis of the condition of the district, both indicator wise and the total holistic way will be done.

2.3 The composite district development index:
The composite district development index has been calculated using all the variables. In general, the index shows the relative position of the development of each district, in particular, relates to the districts with the best or least performance overall and in different indicators. The composite index indicates the overall performance of the district and their specific ranks. In table 1 the composite index of the 64 districts of Bangladesh and their specific ranks are shown. It is seen that the Dhaka district has the highest value in the index with 0.65 and lowest is Netrakona 0.25. Also, the variation between values of the rank one and the second rank indicates a high concentration of the development in Dhaka district and also indicates a huge inequality exist among the capital district and other districts development condition. The variation between the index values of the districts indicates a spatial variation in the development condition in Bangladesh. Also, the ranking shows that development is concentrated in the major districts like Dhaka, Chittagong, Narayangonj etc as these are the economic and business hub of the country. The Narayanganj and Gazipur hold the second and fourth rank which indicates development is concentrated largely on the Dhaka and its surrounding areas. Geographical proximity to the capital city is also a major determinant for development as these two districts are benefited from the proximity to Dhaka. The low level of development is observed in the hill tract districts of Bangladesh. Also, low level of development is observed in the northeastern districts of Bangladesh. The indexing system shows that most of the district of Bangladesh has low development condition. Some districts like Dhaka, Chittagong, Gazipur and Narayanganj composite development condition is good compared to other districts. Also this indexing system measure development at 0 to 1 scale. The highest development score is found for Dhaka district

is 0.654 which is much less than 1. This indicates in all the selected nine indicators Dhaka districts condition is not good compared to other districts. This is true for the other moderately developed districts as their value is much low compared to 1.

Table 1. The district development index and their associated ranks

District	Index Value	Rank	District	Index Value	Rank
Dhaka	0.654	1	Sylhet	0.378	33
Narayanganj	0.524	2	Sirajganj	0.373	34
Chittagong	0.485	3	Bagerhat	0.373	35
Gazipur	0.476	4	Naogaon	0.372	36
Jhenaidah	0.453	5	Faridpur	0.370	37
Jhalokati	0.443	6	Chuadanga	0.368	38
Rajshahi	0.432	7	Cox's Bazar	0.368	39
Feni	0.431	8	Meherpur	0.365	40
Comilla	0.425	9	Madaripur	0.364	41
Jaipurhat	0.419	10	Patuakhali	0.361	42
Thakurgaon	0.418	11	Lakshmipur	0.361	43
Jessore	0.418	12	Noakhali	0.361	44
Pirojpur	0.417	13	Gopalganj	0.360	45
Barisal	0.416	14	Habiganj	0.355	46
Khulna	0.415	15	Rajbari	0.355	47
Narsingdi	0.412	16	Mymensingh	0.351	48
Narail	0.409	17	Jamalpur	0.351	49
Kushtia	0.408	18	Barguna	0.344	50
Bogra	0.405	19	Maulvibazar	0.344	51
Natore	0.400	20	Lalmonirhat	0.343	52
Pabna	0.400	21	Bandarban	0.335	53
Munshiganj	0.398	22	Kurigram	0.330	54
Magura	0.396	23	Satkhira	0.330	55
Chandpur	0.393	24	Tangail	0.329	56
Dinajpur	0.393	25	Gaibandha	0.319	57
Rangamati	0.389	26	Bhola	0.317	58
Manikganj	0.384	27	Khagrachari	0.312	59
Rangpur	0.382	28	Brahmanbaria	0.311	60
Nawabganj	0.382	29	Kishoreganj	0.304	61
Nilphamari	0.382	30	Sherpur	0.291	62
Panchagarh	0.381	31	Sunamganj	0.255	63
Shariatpur	0.378	32	Netrakona	0.253	64

3. The Analysis of the Indicator Wise Development Condition of Districts of Bangladesh

The previous section is focused on the holistic development condition of the districts. In this section, the indicator wise development condition of the districts will be analyzed. This portion will analyze the district wise development condition of Bangladesh on the basis of the selected nine indicators. For this analysis, the 64 districts of Bangladesh are assessed against the selected nine indicators. An indicator wise index has been

developed for each district for assessing the development condition of the district against this indicator and ranking has been done for assessing the position of a district compared to other districts in a specific indicator.

3.1 Analysis of the condition of districts in economic development indicator:
The economic development indicator consists of four variables such as GDP per capita, the density of population, Income per capita and level of urbanization. These variables represent the economic development condition of a district. Per capita GDP, income and urbanization are mainly used around the world for determining the development condition of any geographic area. High per capita GDP along with high income and urbanization level is considered to be the indication of the development of an area. Most of the countries development objective is concerned with achieving high per capita income and high level of urbanization. It is seen that a huge amount of disparity exists in the economic development condition among the districts. The economic development with high density, urbanization level, per capita highest income and GDP is highly concentrated in Dhaka district. Moderate level of economic development condition is seen in a district like Narayanganj, Gazipur, and Chittagong. Other districts are very much lagging behind in economic development variables compared to Dhaka district. Most of the district's economic development condition is very poor with a score value less than 0.15 in the scale of 1. So in the economic development indicator, it is observed that the development is concentrated in some district.

3.2 Analysis of the condition of districts in agricultural indicator:
The agricultural sector is important for a country like Bangladesh where most of the people are employed in the agricultural sector. Almost 80 percent of Bangladesh's population lives in the rural areas, with 54 percent of them employed in agriculture and the remainder in the rural non-farm (RNF) sector. The rural economy constitutes a significant component of the national GDP, with agriculture accounting for 21 percent and the non-farm sector, which is also driven primarily by agriculture, for another 33 percent. So, development in agriculture in Bangladesh is linked with rural development (World Bank, 2014). The economy of this country is still dependent on the agricultural sector. The geographic distribution of productivity and intensity is very much concern for Bangladesh as this country is very much concerned with the district wise food security for combating the district wise food deficit (Rahman, 2004). In the agricultural condition districts like Jaipurhat, Bandarban, Dinajpur is in very good condition compared to other districts as are in the top rank districts in this indicator. Most of the northern and western districts of Bangladesh have a good condition in the agricultural indicator with high productivity and high cropping intensity. This situation is clearly depicted in the agricultural indicator of Bangladesh. The economically developed districts like Dhaka, Narayanganj, Chittagong and Gazipur are lagging behind in the agricultural condition. The reason behind this is the low level of cultivatable land and productivity. This is because the higher economic development tends to decrease the per capita cultivatable land and gives less attention to the agriculture which tends to reduce the productivity. This situation is seen in Dhaka having the lowest per capita cultivatable land compared to other districts of Bangladesh. The high economic development is reducing its per capita agricultural land by converting agricultural lands to other economic units. Also Narayanganj, Gazipur districts has also low per capita land and experiencing low productivity which is found by the low productivity index. However, these districts have a good condition in economic development indicator.

3.3 Analysis of the condition of districts in human development indicator:
The human development is nowadays a major concern among the policy makers in the developing and underdeveloped countries. In many studies of different countries relating to human development condition, different variables like population growth rate, human safety like safety from accidents, infant mortality rate have also been considered (Wang, 2007). In this study four variables are used such as population growth rate, sex ratio, infant mortality rate and death rate by the traffic accident has been considered. In the Human development indicators again Dhaka is in the second rank while the hill tract district Rangamati in the first rank. This indicates though having low economic development this hill tract district has made a considerable progress in the human development sector with achieving the infant mortality rate lowest among all the districts of Bangladesh. Other hill tract districts like Bandarban and Khagrachari have made good progress in the human development indicators. But a common pattern is observed that those districts with a good economic development condition tend to have good human development conditions like districts like Narayanganj, Gazipur with low road accident deaths, low infant mortality rate, and a balanced sex ratio etc. But this situation is not true for Chittagong district where it is seen through a good economic condition the performance in human development is poor due to very high infant mortality rate.

3.4 Analysis of the condition of districts in educational indicator:
Education is one single indicator that is considered very important for both developed and developing countries. Better educational condition with skilled labor force indicates a better opportunity for economic and other types of development. The literacy rate is the most common measure of the educational condition. In this study literacy

rate, school completion rate at primary level and population and teacher ratio are used for determining the real extent of the educational condition and its related service condition in the districts of Bangladesh. An interesting finding is that the districts having lower economic development condition tend to have a very good condition in the educational variables The districts like Pirojpur, Jhalokati, Feni, Thakurgaon have ranked the top most positions in the educational variables with high literacy rate, low population to teacher ratio. Though Dhaka district has the highest literacy rate among districts of Bangladesh, due to high population teacher ratio and low school completion rate the performance of Dhaka is moderate in the educational indicator. It is also seen that most of the economically developed districts either have a poor or moderate condition in educational indicator mostly due to their very high population to teacher ratio and low school completion rate at primary level. Brahmanbaria, Bhola, Cox's Bazar districts have got the lowest position in the educational indicator for low literacy rate and high teacher population ratio.

3.5 Analysis of the condition of districts in social equity indicator:

Social equity is a broad term nowadays a major concern to the policy makers. It is measured by the income inequality, employment opportunity in term of the unemployment rate, sex equality calculated by the girl to boy ratio (Wang, 2007). In this study solvency rate of the households, unemployment rate, and gender ratio at primary and secondary level is used for measuring the social equity condition of the districts of Bangladesh. It is seen that in the social equity indicator the economically developed districts are lagging behind. Districts like Nawabganj, Comilla are at the top ranked in this indicator with low unemployment rate and a good amount of solvent households. The economically developed districts like Dhaka, Gazipur are also suffering from the high unemployment rate and lower gender equity as a lower girl to boy ratio in the primary and secondary level. The three hill tract districts are having the lowest position in this indicator with high unemployment rate, lower solvency rate, and lower gender equity. It is seen that the western district's performance is poor in the social equity indicator than the eastern districts. Most of the eastern districts social equity condition is either good or moderate. Rangamati, Sherpur, Bandarban districts have a worse condition in this indicator which is found from their lower position in the ranking.

3.6 Analysis of the condition of districts health indicator:

Health is an important development indicator of a country. Access to better health facilities improves the quality of life for people. Better health is central to human happiness and well-being. Better health also makes an important contribution to economic progress, as healthy populations live longer, are more productive, and save more (WHO, 2014). Good health has a positive, sizable, and statistically significant effect on the aggregate output of a country (Bloom et al., 2004). This study determines the health condition of a district based on the health facilities of a district. For this reason, physician per 1000 populations and hospital bed per 1000 population are used for determining the condition of the health indicator across districts.

In the health indicators, it is seen that Dhaka, Jhenaidah, Nilphamari districts hold the top most position with high hospital bed ratio and high doctor to population ratio Sherpur, Sunamganj and Gaibanda districts have a very poor condition with very low doctors and hospital beds making these districts condition worse in the health situation. It is also seen that except Dhaka the health condition is not satisfactory for other economically developed districts. It is seen from the category that about ninety percent of the district's health condition is poor. This indicates the extent to which health inequality exist in Bangladesh.

3.7 Analysis of the condition of districts in infrastructure and market indicator:

The market and infrastructure are necessary for the efficient working of a modern country. Infrastructure deficiencies are the primary constraint to economic growth in Bangladesh (World Bank, 2014). Access to markets mainly growth centers are also very much necessary for the development of an area as this country’s economy is strongly agriculture based. Access to growth center provides rural-urban linkage which reduces the inequality among the rural and urban areas. Access to infrastructure combined with market facility tends to be very much necessary for economic development of a country. In this study infrastructure and market, development indicators consist of road density, electricity connection and growth center population ratio. In this indicator, Dhaka, Narayanganj, and Munsiganj hold the top rank in the infrastructure indicators. Also, it is seen that the infrastructure concentration is clustered around Dhaka district. Dhaka has the highest electricity connection among the districts of Bangladesh but a low growth center concentration compared to other districts due to the large urban area. Most of the economically developed and districts with high composite index value have shown a good condition in the market and infrastructure indicator. Netrakona, Panchagarh and Gaibandha districts (mostly the northern part of the country) is lacking from the infrastructure facility with low road density, market center and access to electricity connections. These districts are very much suffering from the provision of infrastructure. Also, the condition of the hill tract district is also poor except Rangamati largest concentration of growth centers compared to its population.

3.8 Analysis of the condition of the district in environmental indicator:
Environmental protection is nowadays a major concern in development policies. The importance of the environment is in the development policy is due to rise of concern towards the environment. In this study, access to safe drinking water, sanitary facility and source of fuel as gas connections are taken to measure the environmental indicator for districts. It is observed that most economically developed districts hold the top rank position in the environmental condition. Gazipur, Dhaka, Chittagong, Narayanganj hold the top most position in the environment indicators with a high percentage of people having sanitation and safe drinking water access and a high percentage of households having gas connections. But the hill tract districts of Bangladesh have a very low access to sanitary and safe drinking water. So, these districts hold the lower rank in this indicator having the worst condition in the environmental indicators.

3.9 Analysis of the condition of districts capital factor indicator:
Bank advances are an important factor for the economic development of a country. This provides an opportunity for development of business and trade in an area. In this study, per capita, bank advances in million takas have been used for determining the condition of the districts in capital factor. In the capital factor, it is seen that the bank advances amount are extremely high in Dhaka compared to its population. It is extremely high compared to other in Dhaka districts as Dhaka is the capital of Bangladesh and a huge centralization of economic activity is concentrated in this area. So a lot of bank advances is concentrated in this area. Also Chittagong, Sylhet, Narayanganj have a good amount of bank advances compared to other districts but very much less compared to the Dhaka district.

4. Conclusion

The construction of district development index and analysis of indicator wise district condition shows a huge amount of inequality exists among the districts of Bangladesh. The difference in the index values with developed regions and lagging regions reveals this huge amount of disparity among districts in Bangladesh. The economic development and facilities are concentrated in some selected districts which are mostly concentrated surrounding the capital district. Through some districts has made a good progress in human development like hill tract districts but most of them are lagging behind in the facility supply, income, and GDP. It is necessary that districts should be developed both in terms of economic factors and human development factors. But most of the districts are well in economic development tends to have a moderate or poor position in the human development and social equity indicators. For a balanced development of this country, each of its districts should have a satisfactory development in all the indicators representing the overall development condition of a district.

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