

# Analysis of Regional Disparity of Bangladesh on the Basis of utility Facilities in Last Two Decades

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## **ABSTRACT**

Bangladesh is a compactly populated country of the world which is experiencing speedy urbanization but the rate of urbanization is not so persuasive for all the regions or districts of the country. Inequality in social, physical, economic aspects beside with infrastructure provision has become a widespread attribute between the districts since its independence. Those inequalities mainly are seen in case of some utility facilities like sanitary condition, electricity connection, water supply system (tube well), these indicators are also representing high-quality of life. There are many tools available in regional study for finding out inequalities in a region. In this study, those inequalities can be determined by Location Quotient (LQ) and Gini index. Those two tools are very important for regional analysis all over the world. The study investigates, existing inequality level at those three facilities (electricity connection, water supply and sanitation) in 64 districts of Bangladesh using 2011, 2001 and 1991 Bangladesh Bureau of Statistics (BBS) data through the use of Location Quotient (LQ) and Gini index and try to find out the reasons behind the disparity. The study reveals that inequality of sanitary condition, electricity connection and water supply system (tube well) have decreased in Bangladesh from 1991 to 2011 due to some improvement schemes by Bangladesh government. Dhaka, Narayanganj, Gazipur are the highest electricity, sanitation connected households in Bangladesh except water supply system. But that's not a problem because for analyzing water supply system selecting criteria as tube well supply system, because this supply system is highest in context of national water supply system. But tap supply is used at a huge rate in Dhaka city. Bandarban, Rangamati districts are the lowest connected households in all of those aspects.

## **Introduction:**

Regional disparity refers to the differences among regions with respect to specified variables such as income, employment etc. (Pearson, 2005). People as well as infrastructure, resource, social, economic and public facilities are heavily concentrated in few large cities which in turn effect on rapid and uneven urbanization. Due to this uneven urbanization, inequity exists in all of the districts of Bangladesh in respect of investment, infrastructure, resource and other facilities. The existence of inequality in allocation of resources is a universal fact for the third world country like Bangladesh. Bangladesh has been facing countless problems for providing its entire citizen fundamental utility services like sanitation, water supply and electricity connection facilities. Regions which are under privileged suffer slow economic intensification due to lack of fundamental utility facilities and the region which have adequate facilities experience speedy economic growth. So, it is urgent for our government and policy makers to find out those districts which are lack of basic services and have slow economic growth for equilibrium progress of Bangladesh. It is also helpful for achieving Millennium Development Goals (MDGs) and gaining the title of middle income country.

**Methodology:**

Secondary data have been collected in 2011, 2001, 1991 from Bangladesh Bureau of statistics. LQ method has been applied to show the disparity among the districts in terms of electricity, sanitation and water supply facility. Gini Index is an important criterion to identify the disparity among the districts by fixing the range with the LQ data. The collected data and information have been analyzed and examined critically through statistical tools and techniques, graphs, figures in order to show how these utility service facilities are varied in different districts and factors behind in regional disparity among the districts.

**Theoretical framework:**

A number of indexes are available for the analysis of regional inequality. To reveal the departure of a region's electricity/sanitation/water supply from the national average, location quotient (LQ) technique is used. Mathematical expression of LQ is based on electricity connection, sanitation condition and water supply facilities in district  $i$ ,

$$LQ = \frac{n_i/p_i}{N_i/P_i}$$

$n_i$  = Electricity connections/sanitation/water quality in a district  $i$ ;

$p_i$  = Total number of households in the districts  $i$

$N_i$  = National Average electricity connection/ sanitation/water quality

$P_i$  = Total number of households in Bangladesh

If the value of LQ for any district is  $LQ=1.0$ , it means that the number of household connected with electricity/ sanitation/water quality in that district is equal to the national average supply of electricity/sanitation/water quality. So, those districts are getting equal facilities like national standard. If the value of LQ is less than 1.00, it means that the number of households allied with electricity/sanitation/water quality is less than the national average supply of electricity/sanitation/water quality, while the number greater than 1.00 indicates the reverse supply of electricity/ sanitation/ water quality.

**Gini index:**

The Gini co-efficient is a measure of inequality of a distribution. The value of Gini index shows the inequality level on any distribution. Value of Gini co-efficient varies between 0 and 1. If the value of index equals to zero, that means there is no disparity in the resource distribution among the different areas and the distribution is even in all the areas fulfilling the demand of the population. On the other hand if the value of Gini Index equals to 1, it means that the resource is perfectly unequally distributed among limited number of the population. For calculating the value of Gini index, the equal groups of the location quotient has been used. First and last groups have been kept open ended.

**Results:**

For the expediency of interpretation and analysis, 64 districts have been subdivided into 3 classes. Those classes are based on LQ value showing the scenario of the electricity

connection/sanitation/water quality condition and those classes are low service facility, moderate service facility and high service facility. Ranges of first and last classes range are kept open ended because of remaining the similarity between the LQ values of 2011, 2001 and 1991 data. Less service facilities means, these districts have the electricity connection/sanitation/water quality less than the national average and the number of electricity connection/sanitation/water quality is less than their demand, while high service facilities means the opposite. Moderate service facilities mean the number of districts those have unit or more tend to be unit electricity connection/ sanitation/water quality as compared with the national average.

### ***Electricity connection:***

**Table 1:** Electricity Connected districts of Bangladesh on the basis of LQ in 2011

Category based on LQ	Frequency	Service Facilities Level	Percent	Name of the District
Up to 0.69	20	Low Service Facility	31.25	Bandarban, Barguna, Bhola, Cox's Bazar, Jamalpur, Khagrachhari, Kurigram, Lalmonirhat, Naogaon, Netrokona, Nilphamari, Panchagarh, Patuakhali, Rajbari, Rangpur, Shariatpur, Thakurgaon, Rangamati, Bagerhat, Bogra
0.69– 0.99	22	Moderate Service Facility	34.38	Barisal, Chandpur, Faridpur, Joypurhat, Lakshmipur, Maulvibazar, Noakhali, Pabna, Tangail, Mymensingh, Norail, Pirojpur, Gopalganj, Jhalokati, Kishoreganj, Magura, Nawabganj, Satkhira, Sherpur, Manikganj, Habiganj, Siranganj
Over 1	22	High Service Facility	34.38	Comilla, Jessore, Khulna, Narsingdi, Sylhet, Gaibanda, Sunamganj, Bogra, Brahmanbaria, Habiganj, Jhenaidah, Rajshahi, Rangamati, Sirajganj, Kushtia, Madaripur, Manikganj, Meherpur, Chuadanga, Dhaka, Narayanganj, Feni

(Source: BBS, 2011, 2001 and 1991)

From the table 1, it is revealed that 31.25% districts have less electricity connection compared to the national unity. Moderate and high service facilities prevailing district numbers are equal in 2011 and its percentage is 34.38%. In 1991, 78.11% districts are plummeted in low service facilities districts and only 9.39% and 12.5% districts have high and medium electricity connected districts respectively. Whereas in 2001, 45.3%, 35.9% and 18.7% districts achieved at less, medium and high electricity service facilities respectively (Figure 1).(Sources: BBS 2011, 2001, 1991).So, electricity connected districts are increasing day by day which is indicating

progressive trend of our country and increasing infrastructure services. In comparing to year 1991, this trend had been increased almost 4 times in year 2011. From Table 1, it is clear that low service facilities districts are situated in hilly areas and containing rural characteristics in many years. Some districts are also situated in far away from national electricity grid connection service. So, it is really hard task to provide electricity connection in those secluded areas. As these districts are placed on inaccessible areas, so government has less initiative to increase the infrastructure facilities in those districts. Private investors also provide less interest in those districts than their demand. Here has no stretch effect due to unplanned distribution of money, resource and infrastructure facilities.

In case of moderate service categories, the districts which are getting electricity connection more or less near the national average and local government are able to fulfill the demand of its citizen in a rate of national electricity supply. Sufficient and standard supply of resource and infrastructure is a major opportunity for those districts. Those districts are predominantly concentrated in the centre of the country and in between the high and less service facilities areas. This indicates a hierarchy of development of utility facilities from urban to suburban and then to rural areas. In last two decades, Dhaka, Narayanganj, Gazipur and Munsiganj etc are the highest electricity connected households in Bangladesh and those districts have the more double electricity supply than the national average. This is possible because those districts are situated near Dhaka city and also have direct connections with Dhaka city both by National Highway and Railway services. Bardarban, Bagerhat, Rangpur are the lowest electricity connected households in Bangladesh.

### ***Sanitation services:***

Another utility service is sanitation service. Here only sanitation with water seal and without water seal category has been selected because percentages of those categories are larger in respect of national context. Those two categories are very common in developed region specially urban and suburban areas. But other two categories like non-sanitary, open space are commonly used in rural and hilly areas.

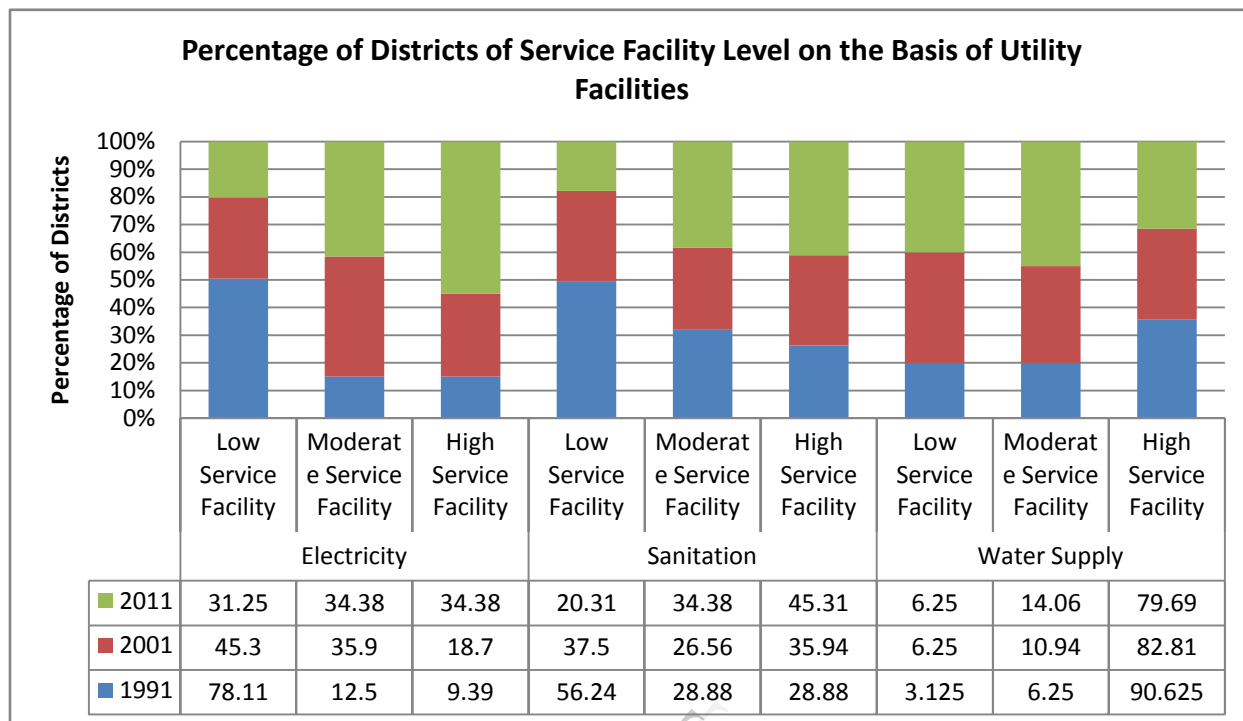
**Table 2:** Sanitation facilities in districts of Bangladesh on the basis of LQ in 2011

Category based on LQ	Frequency	Service Facility Level	Percentage	Name of the District
Up to 0.69	13	Low Service Facility	20.31	Gaibandha, Thakurgaon, Bandarban, Rangamati, Netrakona, Sunamganj, Nawabganj, Khagrachari, Naogaon, Habiganj, Meherpur, Nilphamari, Rangpur

0.69– 0.99	22	Moderate Service Facility	34.38	Chuadanga, Mymensingh, kishoreganj, Cox's Bazar, Joypurhat, Dhaka, Rajshahi, Dinajpur, Bhola, Jamalpur, Bogra, Satkhira, Jhenaidah, Sherpur, Sirajganj, Maulavibazar, Narshingdhi, Kurigram, Tangail, Mankikganj, Lalmonirhat, Kusthia
Over 1	29	High Service Facility	45.31	Comilla, Sylhet, Brahmanbaria, Munshiganj, Narayanganj, Pabna, Barguna, Jessore, Noakhali, Chandpur, Patuakhali, Madaripur, Barisal, Narail, Panchagarh, Lakshimpur, Pirojpur, Natore, Chittagong, Khulna, Rajbari, Gazipur, Feni, Shariatpur, Magura, Faridpur, Jhalakathi, Bagerhat, Gopalganj

(Source: BBS, 2011, 2001 and 1991)

From table 2, it is observed that, 20.31% districts have low sanitation facilities compared to national standard and 34.38% fall in moderate service facilities category with LQ values varying from 0.69 to 0.99. On the other hand, high sanitation facility holds 45.31% in comparing to national perspective and this category approximately covering 50% districts of Bangladesh. In 1991, 56.24% districts of the total 64 districts had LQ values less than 0.69; it means that 56% districts had low sanitation facilities on that period. In 1991 the services of moderate and high sanitation facilities were equal and the percentage was 28.88%. Whereas in 2001, 37.50%, 26.56% and 35.94% districts achieved at less, medium and high sanitation service facilities respectively (Figure 1). (Sources: BBS 2011, 2001, 1991). Comparing all of these data, it can be said that the sanitation facilities have improved admirably in last two decades. In 1991, the sanitation circumstance was appalled as majority of the district had low sanitation facilities but in 2001 this condition developed as the percentage of low sanitation service facilities had decreased nearly in half portion. In 2011 the higher sanitation facilities increased more than 2001. According to 2011 data 29 districts are getting high sanitation facilities whereas in 1991 this number was only 14. So it is definite that the sanitation facilities are improving all over the country as the time is going. Because Bangladesh Government Launched a community based "Total Sanitation Campaign" which was first introduced in rural areas named 'Total Rural Sanitation' project. The campaign aimed at achieving universal access to sanitation by 2010. National Policies for Safe Water Supply and Sanitation in 1998 was also adopted by Bangladesh government (WaterAid America, 2011) and that's why there is a less disparity among the districts of Bangladesh in 2011 in compare to 1991. At present, the highest sanitation facility is in Gopalganj, Bagerhat and Jhalakathi districts and Gaibandha, Thakurgaon, Bandarban are the lowest sanitation connected districts in Bangladesh.



(Source: BBS, 2011, 2001 and 1991)

**Figure 1:** utility facilities in last two decades according to service facility level

One thing is a matter of concern that, though Dhaka is the capital of Bangladesh but it has fallen to moderate sanitation facility group in 2011. But in 1991 and 2001, it was in high sanitation facility category. As the population of Dhaka city is increasing day by day, so there is a huge pressure on sanitation facilities for meeting the demand of this highly accelerated population. As a result, the sanitation facility in Dhaka city is deteriorating day by day.

### ***Water Supply System:***

**Table 3:** Water supply facility in districts of Bangladesh on the basis of LQ in 2011

Category based on LQ	Frequency	Service Facilities Level	Percent	Name of the District
Up to 0.69	4	Low Service Facility	6.25	Bandarban, Dhaka, Rangamati, Bagerhat
0.69– 0.99	9	Moderate Service Facility	14.06	Khagrachhari, Pirojpur, Sylhet, Satkhira, Chittagong, Moulvi Bazar, Khulna, Narayanganj, Gazipur
Over 1	51	High Service Facility	79.69	Barguna, Nawabganj, Chandppur, Habiganj, Rajshahi, Lakshmipur, Gopalganj, Comilla, Noakhali, Sunamganj, Meherpur, Jhalakati, Cox's Bazar, Pabna, Naogaon, Mymensingh, Gaibandha, Manikganj, Madaripur, Chuadanga, Feni, Nilphamari, Panchagarh, Netrokona, Jhenaidah, Narail, Bhola, Sirajganj, Faridpur, Sherpur, Barisal, Jessore, Shariatpur, Magura, Tangail, Narsingdi, Brahmanbaria, Munshiganj, Patuakhali, Lalmonirhat, Joypurhat, Kurigram, Rangpur, Jamalpur, Thakurgaon, Dinajpur, Bogra, Rajbari, Kishoreganj, Kushtia, Natore

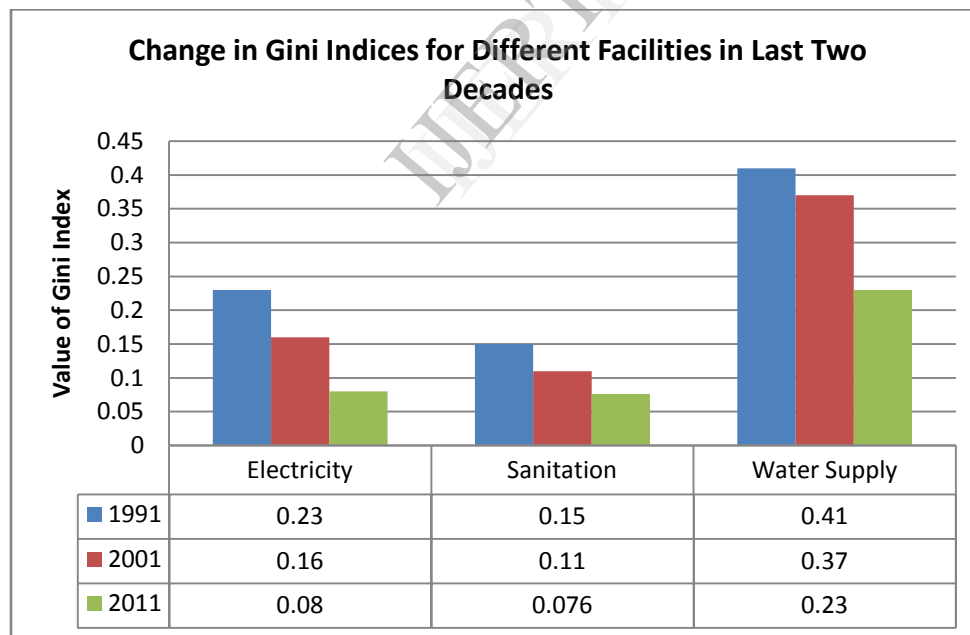
(Source: BBS, 2011, 2001 and 1991)

From the table 3, it is revealed that 6.25% districts in Bangladesh have less water supply facility compared to the national level of water supply in 2011. Moderate and high water supply service prevail in 14.06% and 79.69% districts respectively. In 1991, 3.125% districts have lower water supply facilities compared to national level and moderate and high level service facilities prevail in 6.25% and 90.625% districts respectively. Whereas in 2001, 6.25%, 10.94% and 82.81% districts have low, medium and high water supply respectively compared to national water supply rate.(Figure 1).(Sources: BBS 2011, 2001, 1991). By comparing the percentage of districts having different service levels in the past two decades, it is found that the number of districts with low water supply has been increased two times in 2011 from 1991 and at the same time the number of districts having high water supply has been decreased by about 10% per decade. But that's not a big deal here. Because in our analysis tube well and deep tube well water data is considered as the basis of drinking water supply for the districts of Bangladesh. As the



rural population (% of total population) in Bangladesh was last reported at 71.90% in 2010, according to a World Bank report published in 2012 and two-third area is rural area. So, it is relatively difficult to provide tap water supply for this huge population and large percentage of rural areas and tube well water acts as the major source of water supply in these areas. From table 3, it is also found that mostly hilly regions have low water supply facility than the national rate. As ground water table is much deeper in hilly regions, sinking a tube well here is so hard. Dhaka has the low service facility than the national unity. As Dhaka is the capital city of Bangladesh, tap water is the main source of water supply in this area. As a result considering tube well water as the indicator of drinking water supply, Dhaka shows the low service facility than the national level. The districts which are getting moderate water supply facility are fulfilling the demand of its citizen in a rate which is more or less near to the national water supply rate. Those districts are mostly concentrated in the suburban region of the country and some of those districts have higher percentage of urban area. High service facility districts are mostly located in floodplain and have large potentiality in agricultural activities for the availability of greater water supply than the national water supply rate. On the other hand, the variance of 64 districts is 0.01, which means that the variation level in these whole LQ values is 1% that means there are a least variation in the distribution of water supply facilities as well as a least variety in the field of agricultural, infrastructure and resource management.

### *Change in Gini index:*



(Source: BBS, 2011, 2001 and 1991)

**Figure 2:** Change in Gini Indices for Different Facilities in last two decades

Figure 2 show that, there has been a radical change in the Gini index value in case of electricity, sanitary and water supply facility in the period of 1991-2011. The Gini index value decreased in all of the cases in last two decades. Gini index value for electricity facility decreased from 0.23 to 0.08 within 1991 to 2011 i.e. inequality decreased by 15% within last two decades. Gini index



value for sanitation facility is 0.15 in 1991 while 0.076 in 2011. That denotes that inequality decreased from 7.4% within 20 years in Bangladesh. On the similar way, Gini index value of water supply is also decreased in the period of 1991-2011. Gini index value for water supply in 1991 was 0.41 and in 2011 it was 0.23. So, it is really good for Bangladesh that they can already able to reduce regional disparity in context of electricity, sanitary and water supply facility from the period of 1991 to today. But approximately 8% people all the time do not get access in all of those facilities. So, it stills an apprehension issue for our country.

### ***Discussion:***

Regional disparity reduces gradually in last two decades. This is a good sign but still many people are not getting enough utility facilities like electricity, sanitation and water supply system because economic growth, infrastructure development are not flourishing in many districts parallel with time. Electricity condition is improving day by day due to some initiatives by our government. But water supply and sanitation condition is deteriorating with time. Although 80% of the populations have access to tubewell water supply but arsenic contamination of wells has complicated the situation by causing considerable health problems. Between 16% and 25% of all existing wells in Bangladesh are contaminated by arsenic. Moreover, more than 25% of the people are using unsafe tubewells, leading to the recognition that water quality issues require immediate attention (ADB, 2009). From the above explanation, it is clear that, Dhaka and its surrounding regions are the most improved sections in Bangladesh. But this scenario is worst day by day due to its increasing population growth rate. On the other hand, Bandarban, Rangamati are the most deprived areas in respect of utility facilities. So, it is needed to provide suitable water, sanitation and electricity facilities for those areas. Already government has taken some steps for maintaining balance growth of the country. The Government has endorsed the MDGs, which include reduction by half the proportion of people without sustainable access to safe water supply and sanitation by 2015 (ADB, 2009).

### ***Conclusion:***

There has been a significant reduction of regional disparity in Bangladesh through the years. Decreasing value of Gini Index in 2011 compared to 1991 indicates major improvement in electricity, sanitary and water supply sectors in Bangladesh. Different Government steps are the main factor behind this progress. Development is like the economic cake sliced up more within the regions, which depends on development of infrastructure, internal situations, resources, policies and decisions on local government. Policies are needed to improve the conditions in existing less developed regions and develop at the disbursement of lagging regions. So, it is necessary to provide more infrastructures and public facilities in all of the regions for ensuring a balanced regional equity according to the demand of people.

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