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PLAN 434: Regional Planning Studio

A Report on

Formal Regionalization Based on Human Development Index: A District Level Analysis in Bangladesh

Level-4 Term-1

Department of Urban & Regional Planning, BUET

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LIST OF ABBREVIATION

UNDP- United Nations Development Programme

HDI- Human Development Index

GNP-Gross National Product

GDP-Gross Domestic Product

ADP-Annual Development Programme

GED-General Economic Division

CMSMEs- Cottage,Micro, Small and Medium Enterprises.

HDR-Human Development Report

ABSTRACT

Human development measurement is an important approach to assess people's quality of life living in a society in terms of access to resources and basic services, condition of health and education. The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development (UNDP, 1990). The purpose of the study is to explore the level of human development in the districts of Bangladesh. First, human development index (HDI) was generated for each district using the crude death rate, literacy rate and total consumption of households. After that, HDI values of the districts were classified into five category using the equal interval classification method and formal regions were delineated. The study has identified the developed and underdeveloped regions of Bangladesh. The results shows that Dhaka, Gazipur, Feni are the most developed districts and Kurigram, Jamalpur, Joypurhat are the least developed among all the districts. Majority of the districts from eastern part of the country are within developed region, while districts from western and northwestern part are underdeveloped. The study has tried to identify the factors that influence the human development in the regions. High urbanization rate, lower incidence of poverty, less occurrence of disasters facilitate infrastructural growth and economic opportunities in the developed regions. Higher incidence of poverty, high mortality rate due to less concentration of health facilities, lack of infrastructural development, high vulnerability to disasters are the main reasons behind lower human development in the underdeveloped districts of the country. The findings of this study highlights the existing disparity in different aspects between developed and underdeveloped regions. This study will help planners and policymakers determine which districts are leading or lagging in terms of human development and formulate appropriate policies for the lagging region.

CHAPTER 1: INTRODUCTION

1.1 Background

Human development can be defined as the process of extending the choice of people, more critically to lead a long and healthy life, to be educated and to have a better standard of living and additionally also include political freedom, guaranteed human right and self-respect (UNDP, 1990). The aspects of developments are multitudinous (Maurya et al., 2015). The traditional practices of measuring developments had been changed after the United Nation Development Program (UNDP) launched a new human development approach and released Human Development Report (HDR) in 1990 (UNDP, 1990; Sagar and Najham, 1997). This report had used HDI index, constructed by Pakistani economist Mahbub-Ul-Haque and Indian economist Amartya Sen in 1990, a milestone framework for measuring human development (Sagar and Najham, 1997; Goyal and Singh, 2020). It is a composite index that assess the long and healthy life, knowledge and access to resources for better standard of living (UNDP, 1990). It is a paradigm shift from assessing the development of a country on the basis of economic growth alone to accentuate on people and their capabilities (Jamal and Khan, 2007). According to UNDP (2013), the improvement in human development index of Bangladesh is praiseworthy. The HDI index of this country is gradually increasing from 1990 to 2021 and the gap between the global HDI index and Bangladesh is also reducing (UNDP, 2021). Hence, recent developing trends cause attention for linking the economic growth and the human development resources because many fast growing and developing countries like Bangladesh are having high GNP and GDP growth but failed to reduce the socio-economic disparities across the regions of Bangladesh (Nayek, 2008; Hatemi and Shamsuddin, 2016). On contrary, low-income countries like Vietnam, Georgia and Indonesia have low GDP growth but successfully expanding the human capabilities (Nayek, 2008). Thus, Bangladesh requires an assessment of human development index to focus on the particular issues such as access to knowledge and resources and health. But, for better policy interventions aggregates estimates of national level can not be implemented as disaggregate level properly. Disaggregate approach is better comparison tool and a justifiable approach for regional comparison because it shows which indicators require more attention on which districts (Arak et al., 2013; Katoch, 2003; De la Torre and Moreno, 2010). So, this study aims to find out the HDI index of the districts of Bangladesh and the possible reasons for the indicators which are lagging or developing in those districts.

1.2 Literature Review

The idea of defining development is not a new approach and it has been done in several ways by Aristotle, Smith, Ricardo, Marx and Mill (Chaurasia, 2019). To measure the development in a systematic way numerous methods have been developed such as Physical Quality of Life Index (PQLI), Quality of Life Index (QLI), Theory of Human Needs (THN), Fundamental Human Needs (FHN), Happy Planet Index (HPI), Human Development Index (Chowdhury, 1991; Doyal and Gough, 1984; Marks et al., 2006, Bhanojirao, 1991). But among these methods, HDI index is simple and easy to interpret (Goyal and Singh, 2020).

Research works on HDI have reviewed. Compare to other countries, very few research has been conducted in Bangladesh based on HDI index. Kumar (1991) used UNDP's methodology and ranked 17 states of India. The absence of health and life expectancy data on the norther states of the India is one of the reasons of excluding it in the computation of the HDI. Nayak and Tomas (2007) have found that the trend of human development in Meghalaya have substantial degree of unevenness between urban and rural areas. They have found that all the 7 districts in Meghalaya have variation in rural and urban areas based on primary and secondary data. Tripathy (2010) estimated the human development index for Orissa, India. The author ranked all the 30 districts based on the HDI index to highlight the backward and developed regions using beta method.

Sarkar et al, (2013) analyzed the performance of human development of Bangladesh form the South Asian perspective. This study compares the parameters of HDI index among the south Asian countries and the effect of human development on the environment sustainability. Farida et al. (2016) identified the factors which are affecting the Human Development Index (HDI) by applying ordinal logistic regression method in East Java, Indonesia. They have found that high school participation and health facilities significantly influence the human development index. Hatemi and Shamsuddin (2016) found out the relationship among the financial development and human development index in Bangladesh to conclude which development affect most each other. Goyal and Singh (2020) conducted a study on Punjab state and analyze by district level. The study compares the HDI index since 1991 and calculate the status of HDI index of Panjab in year 2001, 2011, 2017.

Reviewing the literatures, it has been concluded that HDI index is calculated by three basic parameters that are health, knowledge and access to resources and district wise analysis have

been occurred to identify which parameters are affecting the human development in which particular region. No regional analysis has been occurred in Bangladesh based on HDI index.

1.3 Objective of the Study

1. To find out the HDI index for all the districts of Bangladesh.
2. To compare and highlight the human development levels among all the districts across the country.
3. To explore the possible reasons of backward and developed regions based on the parameters of the HDI.

1.4 Scope of the Study

This study would guide the policy makers and planners to identify the districts that are performing well or lagging behind in terms of human development. It will examine the components of HDI that will ease to figure out the specific areas of improvement. This study will help to evaluate the plans and policies regarding HDI components in regional level.

1.5 Limitation of the Study

The collected data of each parameter (health, education, income) are from different years because of unavailability of data. The single districts may have variation in development levels in urban and rural areas which remains unaddressed in this study. The study considers only three parameters of the study which may not identify the root cause of development disparities. Human development is a dynamic process and the temporal aspects of this trend may be neglected by this type of study.

1.6 Methodology

The human development index is calculated considering three dimensions and they are long and healthy lives, knowledge and access to resources for better standard of living. For this study, crude death rate, literacy rate and consumption of households are considered as proxy variables of the basic parameters of the HDI. The unit of each variable may vary requiring normalization process to make these unitless one (Goyal and Singh, 2020). The normalization techniques ensure equal contribution of all three indicators to the HDI, preventing any single indicator from dominating the index due to scale differences. The death rate and literacy rate are normalized using the min-max scaling formula and the consumption is normalized using the log formula. As the death rate is the negative index, thus the value is subtracted from 1 (Singh and Keshari, 2016). The reason of using log in consumption is that it shows marginal utility and to make it linear by transforming (Anand and Sen, 2000).

Death rate index =1- $\frac{Actual\ Value - Minimum\ Value}{Maximum\ Value - Minimum\ Value}$

Literacy rate index = $\frac{Actual\ Value - Minimum\ Value}{Maximum\ Value - Minimum\ Value}$

Consumption index = $\frac{Log(Actual\ Value) - Log(Minimum\ Value)}{Log(Maximum\ Value) - Log(Minimum\ Value)}$

The HDI is calculated by multiplying the three-dimension indices together and then taking the cube root of the product. HDI= (Crude death rate* Literacy rate* Consumption)$^{1/3}$

Equal Class Interval

The Equal Class Interval Method categorizes districts into equal intervals based on their HDI values, simplifying comparisons between countries with similar development levels.

X= $\frac{B-A}{N}$ X= Class interval, B= Largest value of HDI, A= Smallest value of HDI, N= Desire number of classes.

Mean and Standard Deviation Techniques In this technique, interval is determined based on mean and standard deviation of HDI values.

Class Intervals
(Mean-3std) – (Mean-2std)
(Mean-2std) – (Mean-1std)
(Mean-1std) – Mean
Mean – (Mean+1std)
(Mean+1std) – (Mean+ 2std)
(Mean+2std) – (Mean+3std)

Arithmetic Techniques

In this technique, class intervals are calculated consecutively.

A+X+2X+3X+……. NX = B

The class interval is calculated as [A-(A+X)], [(A+X) - (A+X+2X)], ……...

X= Class interval, B= Largest value of HDI, A= Smallest value of HDI, N= Desire number of classes.

Nazmun et al., 2018; Islam et al., 2018

Geometric Progression Techniques

The HDI values are chosen in geometric progression to cover the span of several orders of different magnitude.

$B=AX^N$

Log B = log A+ N log X

Log X= $\frac{LogB - LogA}{N}$

X= Class interval, B= Largest value of HDI, A= Smallest value of HDI, N= Desire number of classes.In geometric progression, the lowest value 0 is not taken into account due to log error. Thus, for this study, second lowest value is considered.

CHAPTER 3: FORMAL REGIONALIZATION BASED ON HDI INDEX

Formal regions have been delineated based on human development index (HDI) of the 64 districts of Bangladesh. The districts were grouped into five classes, from very high to very low according to their HDI value (Appendix 1).

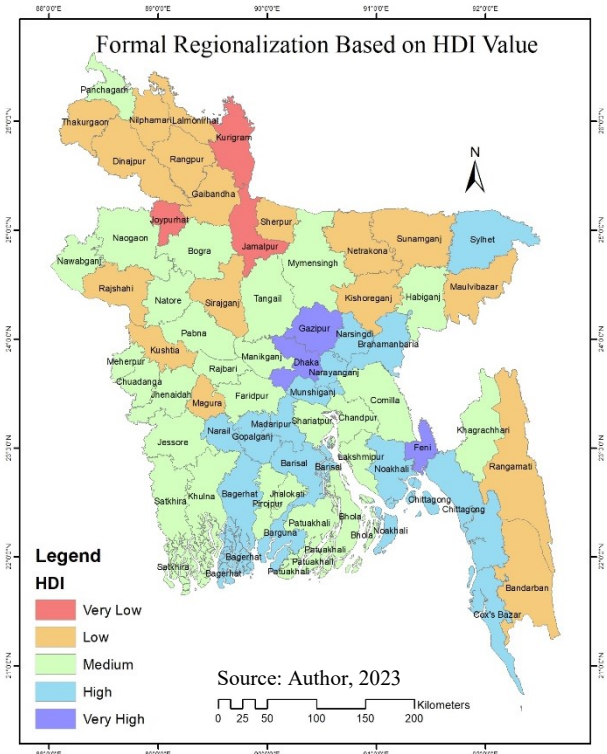

Figure 01: Formal Regionalization Based on HDI

The result shows that only 3 districts, Dhaka, Gazipur, and Feni, have very high HDI value. These are the most developed regions in the country. 13 districts have high HDI value forming the developed region in the country. Majority of the districts of developed regions are from eastern and southeastern part of Bangladesh. In the northern part of the country, only Sylhet district has high HDI value than its adjacent districts. 27 districts of the country are within the medium range forming the moderately developed region. The distribution of moderately developed is dispersed, spreading all over the country.

17 districts have low HDI value forming the under developed regions. Kurigram, Joypurhat, Jamalpur, are the least developed district with very low HDI value. Majority of the districts having low and very low HDI are located in western and northern part of the country. Though Chittagong and Cox's Bazar have high HDI value, the adjacent Chittagong Hill Tract region is underdeveloped as Bandarban, Rangamati, Khagrachhari districts have lower HDI value. In the 7th five-year plan, eastern regions are mentioned as leading regions and western regions are lagging regions (GED, 2015).

3.1 Factors Influencing Human Development Index in Developed Region

More over two-thirds of the urban population lives in the country's eastern region, which includes the capital, Dhaka and largest port city, Chittagong and western districts of Bangladesh have low urbanization rate as shown in the map (Appendix 03). As a result, compared to the western area, the eastern region has far more important urban facilities which contribute in higher human development (Hayes, 2015). Higher urbanization rate leads to urban

agglomeration which is characterized by the development of large-scale communities, services and facilities, industries, economic activity centers, and the interconnectedness of the transportation network system (Surya et al., 2021). Dhaka and its adjacent districts, Gazipur, Narayanganj, Munshiganj, Manikganj, form one of the largest urban agglomeration (Swapan et al., 2017). Urban agglomeration and better regional connectivity lead to growth of service infrastructure including hospitals and educational institutions (M. A. Hossain et al., 2021). Cities in the eastern regions with higher urbanization rate contain a concentration of significant non-agricultural activities, including manufacturing, construction, transportation, health, education, and other service sectors (Hayes, 2015). Therefore, Chittagong, Feni, Dhaka, Gazipur, Narayanganj, and surrounding districts show higher human development index.

More than 95% of households have access to safe drinking water and 85% households have good sanitation facility in greater Dhaka region, which includes Dhaka, Gazipur, Narayanganj, Narshingdi, Munshiganj and Manikganj districts (M. A. Hossain et al., 2021). As a result, these districts might have better health condition and lower death rate than other regions. Because human health is negatively impacted by a lack of access to clean water and adequate sanitation, which raises the incidence of water borne diseases such diarrhea, cholera, malaria, and dengue (Waziri et al., 2018). World Health Organization (2018) stated that around 1,000 children die every year from water-related diseases globally. Dhaka district has higher quantity of doctors both in public and private hospitals. Both Dhaka and Manikganj have higher number of hospital bed per capita (M. A. Hossain et al., 2021).

Dhaka district has higher accessibility and intensity of educational institutions which led to high level of literacy rate (M. A. Hossain et al., 2021). Gazipur district has higher number of per capita school and college, which contributes to higher human development in this district. In Dhaka and its adjacent areas, exponential growth of industries, textile firms lead to high economic growth, alleviated poverty, and increased per capita income (Hussein, 2020). About 80% of the garments industries in Bangladesh is situated in Dhaka city (World Bank, 2015). Due to better economic opportunities, Dhaka district attracts 41.9% of the migrants from rural areas (Hayes, 2015). In Dhaka, Gazipur and Manikganj districts, there is high concentration of private hospitals and clinics (Appendix 7), which facilitates health services for the people and lower the mortality rate.

Chittagong has become important district for its business facility through its seaport (Hanif et al., 2015). Due to improver infrastructural facilities, Chittagong district has high accessibility

to educational and health facility. This district is a location of various government and non-government offices, industrial and commercial organizations, educational institutions etc.

Feni is one of the most developed districts which located in a vital point between the largest cities of the country, Dhaka and Chittagong (Akther, 2015). Feni district has well established regional connectivity with Dhaka-Chittagong highway. Mass media, education, utility services and health services are becoming more widespread because of improving transport network in this district (Akther, 2015). Between 2000 and 2010, employment in the informal sector, business, industry, or mill increased by 16%, while employment in the rural non-farm sector increased by 33% in Feni (Akther, 2015).

Sylhet is the only developed district in the northern part of the country. Remittance is one of the biggest source behind the economic growth of Sylhet, which contributes in overall human development in the district (Gardner, 2008). A study reveals that more than two-thirds of household expenditures are made using remittances and 45% of total expenditure is spent on consumption, food and daily necessities (Hossain et al., 2017). Sylhet has higher literacy rate because remittances from abroad enhanced purchasing capacity, which facilitated the household members' access to higher education (Hossain et al., 2017). Sylhet is one of the most popular tourist destinations in Bangladesh. This district's tourism sector facilitates job opportunities and new business options for households and communities, raising the standard of living (Halim et al., 2022).

Bagerhat district is a potential place for shrimp culture, which is the third largest foreign exchange commodity and has 9% contribution in GDP (Mitro et al., 2014). Shrimp industry plays an important role for economic development in this district (Mitro et al., 2014). Mongla port act as a catalyst for economic development in Bagerhat which supports variety of light and heavy industries (Akter et al., 2022).

Incidence of poverty is lower in the districts of developed region as shown in the map (Appendix 04). Lower poverty rate has a positive impact on improving education level and overall health condition (Rajan et al., 2013). Moreover, public investment component in the annual budget to some extent is tilted towards the more developed regions (GED, 2015). The districts in developed region have higher human development index due to more concentration of health facilities such as private hospitals and clinics (Appendix 7). Also, developed districts in the eastern region of the country are not vulnerable to natural disasters (Appendix 6), which facilitates infrastructural development.

3.2 Factors Influencing Human Development Index in Underdeveloped Region

Kurigram, Dinajpur, Lalmonirhat, Gaibandha, Rangpur districts are underdeveloped with a low HDI index. Per capita income is the lowest in these districts (Ali, 2019). As result, these districts have lower access to education and health services. In 8th five-year plan, it was mentioned that concentration of the poorest districts is more in the western districts of Rangpur division, Kurigram, Dinajpur, Gaibandha, Rangpur, and Lalmonirhat districts (GED, 2020). Poverty incidence has a direct relationship with human development index as increase in per capita income and reduction of poverty have profound influence on human development (Singh, 2012). Kurigram, Gaibandha, Dinajpur, Thakurgaon districts have poor asset base and more dependency on day labour, lack of access to infrastructure, microcredit and social safety net programs (Ali, 2019; Maîtrot et al., 2021). In Kurigram and Gaibandha districts, high exposure to various shocks and incidences of natural hazards and cause huge loss of land, which results in lower human development (Ali, 2019).

Jamalpur is one of the least developed district. This district is located in northern part of the country and on the right bank of Jamuna river. High flood frequency and intensity in this district brings people under devastating situation and migration is a common practice in Jamalpur (Nahin et al., 2023). This district has higher maternal and infant mortality rate due to lack of provision of safe menstrual regulation services, poor service and lack of access to health care facilities (Gruebner et al., 2017; Maknun et al., 2017). In Jamalpur and Gaibandha districts, there is less concentration of private hospitals and clinics (Appendix 7), which results in high maternal mortality rate and lower human development.

Rajshahi district is underdeveloped with low HDI value. The major economic sectors including manufacturing, wholesale and retail trade, service education and health, are not flourishing in this district (Islam et al., 2022). Income diversification is low in Rajshahi district due to higher dependency on agriculture and rural people are vulnerable to drought, scarcity of irrigation water, poverty (Dev et al., 2016). Majority of the households in this district are not food secured due to lower income and poverty (Dev et al., 2016). In rural areas of Rajshahi district, there is lack of hygienic sanitation facility, drainage system and waste disposal system (Ferdous et al., 2017), which might have worsen the overall health condition. Majority of the people lack of access to the educational institutions because they are concentrated in core areas of Rajshahi city only rather than distributed randomly (Islam et al., 2019).

Sirajganj district is a underdeveloped district in terms of human development due to its vulnerability to natural hazards. Severe river bank erosion of Jamuna results in loss of settlement, household assets, agricultural land and induce poverty (M. R. Ali et al., 2021). Char areas of Sirajganj are vulnerable due to the river bank erosion, flooding, cold wave, and sand flash (Azam et al., 2021). Therefore, people possess lower capital and assets, have less access to education and health services, which results in lower human development (Azam et al., 2021).

Chittagong Hill Tract is an underdeveloped region which includes Bardarban, Rangamati, Khagrachhari. People in these districts lack access to basic public services such as health, education and income generating support from different socia Chittagong Hill Tract service departments (Barkat et. al., 2009). The poverty scenario in rural CHT is about 1.6 times higher than other parts of rural Bangladesh (Barkat et. al., 2009). Maternal mortality in high in hilly regions (Ahmed & Hill, 2011). Deficiency of physical infrastructure, large school distance, relocation of schools are the major reasons behind low enrollment rate of children in CHT (Popy, 2022). In the CHT, economy mostly depends on tourism and agriculture, majority of households live in poverty or extreme poverty and unemployment is high (Jamaluddin, 2010; Rasul, 2003).

Kushtia district is underdeveloped due to lack of educational and health facilities and declining economy. There is lack of proper facilities in primary and secondary schools of Kushtia (Kabir, 2010). Besides rural people in Kushtia district have lower access to education and additional facilities (Biswas et al., 2016). Lack government funds, qualified doctors and supply of medicines in Kushtia district are the reason behind higher death rate (Sobuj, 2022).

Jhalokathi and Bhola district has low HDI value. Despite of having higher literacy rate, the consumption is much lower in this district due to natural hazard such as flood (BBS, 2011).

There are severe natural disasters or risks in the char-island, Bhola District. The general education standard was below par, and the district's residents had a lesser preference for education (Ahmmed et al., 2020). The crude death rate is high in Bhola due to accessing health care facilities is a challenge for the people living in coastal areas (Huda et al., 2020).

Sunamganj district located in haor region of Bangladesh has low HDI vale. This district is underdeveloped due to some locational disadvantages. This district has lower literacy rate due to high poverty, fragile communication system, inadequate educational infrastructure and lack of good quality teachers (Mia, 2021). The main reasons behind students' dropout are seasonal

work and extreme weather condition (Mehrin et al., 2016). Due to lack health facilities, maternal mortality is higher in this district (Ahmed & Hill, 2011). Sunamganj district has higher infant and under five years mortality rate than any other districts in Bangladesh (Gruebner et al., 2017).

The districts within underdeveloped region have higher incidence of poverty and lower income growth. As a result, these districts have less access to quality education because education is costly for a poor household both in monetary terms and in terms of opportunity cost (World Bank, 2015). The districts in the western part of the country have less access to growth center due to lack of infrastructural facility, which hinders the way of economic growth (GED, 2011). North Western districts of Bangladesh are exposed to drought, especially districts like Rajshahi, Chapai Nawabganj, Rangpur, Natore, Meherpur, Jessore and Satkhira, which affects agricultural production and food security (GED, 2015). The districts of underdeveloped region are deprived of ADP allocation which negatively impact the development of education and health facilities (GED, 2011).

3.3 Factors Influencing Human Development Index in Moderately Developed Region

Mymensingh district is one of the moderately developed districts with medium HDI value. Mymensingh has improved because of the implementation of development projects in agriculture, education, health and infrastructure, in the district in the last 14 years (BSS, 2023). The commercial zone in this district has grown with the construction of the Mymensingh railway station (Nilufar, 2014). The Dhaka-Mymensingh highway is being widened, and new commercial facilities are growing along the routes that connect this district to the highway (Nilufar, 2014). Important educational facilities are located in this district, and development of the district's eastern portion was significantly aided by the founding of the Agricultural University (Nilufar, 2014).

Cox’s Bazar falls within moderately developed region with medium HDI value because tourism industry is flourishing in this district which has led to creation of economic opportunities, infrastructural and development (Bhattacharjee et al., 2018; Ahammed, 2010). Though economic growth has occurred, there is lack of health and educational facilities in this district. There exists lack of human resources and hospital bed capacity leads to gaps in basic emergency care (Schnabel, L. and Huang, C., 2019). There is lack of educational facilities, rohingya refugees do not have access to education and skill development activities (Guglielmi et al., 2020).

Nawabganj district is moderately developed because it has better whole sale and trading facility due to connectivity with borders, location of rivers. Chapai Nawabganj is connected with India through N6 national highway at border, which contributes to the trading facility for this district. Growth centers serve as basic facility in this district (Appendix 8). Growth centers are well distributed across the district facilitating economic activities. Rural periodic markets are developed due to communication facilities and surplus production in this district (Kamruzzaman, 2014). There is high concentration of rural markets in Nawabganj district (Appendix 9).

Khulna is moderately developed district in terms of human development index. There is lower incidence of poverty in this district (Appendix 4), which contributes in higher consumption. The death rate of Khulna is lower due to the presence of two government hospitals, 15 private hospitals and KDA is establishing new hospitals (BBS, 2011). In this district, maternal mortality is lower (Appendix 5). The number of school, college, universities are higher in Khulna than any other districts (Sarani, 2011).

Faridpur district is within moderately developed region with medium HDI value. This district is located in central Bangladesh, which is geographically and economically important from several perspectives. The soil in this district is highly fertile as the district lies in the floodplain of the Padma river, which facilitates agricultural production of diversified crops (Islam, 2017). As a result, consumption is higher in Faridpur and majority of the households are food secured (Saha et al., 2018). Faridpur has well established regional connectivity which have facilitates trade and economy, development of education and health facilities. Construction of Padma bridge will boost economy and infrastructural development in this district, which will change the socio-economic condition of the people (Kamal, 2022). Results from our previous project showed that there is concentration of private hospitals and clinics in Faridpur district (Appendix 7).

There are government health facilities in union level, upazila level and district level. But there is insufficient and lack of qualified doctors in that region. Moreover, adequate equipment is not available in those health facilities. Therefore, the shortest of medicine also worsens the condition of the facilities (Huda et al., 2020). The major percentage of classrooms are affected by the natural disaster while their learning process is hampered by shortage of classrooms. The connectivity or access road to educational institutions also get affected during any disaster in coastal region (Islam, 2015).

CHAPTER 3: REVIEW OF PLANS AND POLICIES REGARDING HUMAN DEVELOPMENT

1. Five Year Plans: Particularly for lagging districts, special efforts will be given for expansion of migrant workers. Two development program skill development for training and financing of migration would have been conducted for lagging districts. Efficient micro credit system is established for focusing more on the lagging districts. The poor people of Rangpur not only suffer by natural shocks but also idiosyncratic shocks such as health related shocks which cause sufferings to poor people in both short and long run and it can be prevented by this micro credit system to some extent (GED, 2011). More likely, In 7th five year plan, it is mentioned again for expanding of micro credit programs but this time focusing on consumption. Moreover, Annual Development Programme (ADP) will create a fund name lagging region fund for supporting technical development, vocational institutes. Rangpur, Rajshahi, Barisal and Khulna will be appropriate region for allocating this fund (GED, 2016). In 8th five year plan, It has been stated specifically to reduce poverty in all dimensions, not only lack of income but also lack of health and educational access, vulnerability to shocks and all dimensions should be addressed. Poverty reduction strategies are formulated to improve the consumption distribution. For recovering the shock of covid, various social protection programs, Cottage, Micro, Small and Medium Enterprises (CMSMEs) through low-cost credit schemes and emphasizing on education focusing on the poor (GED, 2020). In 8th five year plan the human development parameters are addressed more precisely.

2. National Education Policy, 2010: To eradicate the discrimination of knowledge, educational institutes will be opened for socio economically backward regions. It is mentioned that special steps will be taken in the backward regions for educational advancement. However, the special steps are not specified to increase educational facilities in underdeveloped regions.

3. National Health Policy, 2011: The primary objective of this policy to ensure health care services for those people specifically who live in the backward region.

4. Monetary Policy Statement, 2023: The main objectives are formulated considering the macroeconomic developments, its dynamics. Hence, there is scant attention on the micro economic development issues. To achieve the objectives of the monetary policy, investment will increase in CMSMEs as stated in 8th Five Year Plan.

CHAPTER 4: MAJOR FINDINGS, RECOMMENDATION AND CONCLUSION

4.1 Major Findings

1. Among all the districts, Dhaka, Gazipur, Feni are the most developed regions due to rapid urbanization, established regional connectivity, infrastructural development and better access to education and health facilities. The adjacent districts of Dhaka are developed due to urban agglomeration and infrastructural development.
2. Chittagong district has developed due to the establishment of seaport and growth of business and industries. In Cox's Bazar, tourism industry has led to the development of economic activities, infrastructure. However, Rangamati, Khagrachhari, Bardarban districts located in Chittagong Hill Tract remain underdevleped due to locational disadvantages. These districts are deprived of physical infrastructure, health and educational facilities.
3. In the northern district, only Sylhet is developed for receiving higher foreign remittances that contributes in poverty reduction, higher investment in business and economic activities, growth of infrastructure and increased accessibility to education and health services.
4. Sunamganj district is underdeveloped due to its location in haor region. There is lack of physical infrastructure, educational and health facilities. Sunamganj, Jamalpur, Gaibandha have higher maternal mortality rate due to lack of health facilities.
5. Sirajganj district remains an underdeveloped district due to flood hazards and river bank erosion pushing people under extreme poverty and lowe human development.
6. The districts located in northwestern part of the country are undeveloped. Kurigram, Dinajpur, Lalmonirhat, Gaibandha, Rangpur districts have higher incidence of poverty, lower economic opportunities, low per capita income, lack of access to quality education and health. Also, the underdeveloped regions receive lower budget allocation for human development.

4.2 Recommendation

1. Formulatation of policies to decentralize basic services and facilities including educational institutions and tertiary hospitals and clinics from Dhaka and its adjacent district to other under developed regions.

2. Compared to developed regions, lagging regions have less access to government funding and budget allocation. Therefore, implication of critical policies are needed for balanced regional growth.
3. Investment in local potential industries in the underdeveloped districts to reduce poverty and economic growth. Small and medium enterprises can encouraged with low cost financing facilities to create employment opportunities.
4. Establishment of better regional connerctivity with the northwestern districts of the country to promote trading facility and access to education and health services.
5. Hazard prone areas need special focus in developing plans. Formulation of effective adaptation policies and mitigation measures for coastal regions, flood prone areas haor areas, and comprehensive riverbank erosion management policy for char areas. Provide irrigation facility for drought prone areas in the northwestern part of the country.
6. Improvement of infrastructure and service facilities in hill tract regions and promote tourism internationally. Provision of education and health facilities through different measures in Khagchari, Bandarban, Rangamati and Cox's Bazar district.
7. Increase government fund for health services in northern regions, Jamalpur, Gaibandha Nilphamari, Lalmonirhat, Kurigram, Thakurgaon and Joypurhat districts.
8. Inclusion of human development and social protection policies in the national plans for reducing regional disparity between developed and underdeveloped regions.

4.3 Conclusion

The purpose of the study was to find the level of human development in the districts of Bangladesh. Formal regions have been delineated after generating human development index for the districts. The study has identified the developed and underdeveloped regions in terms of human development in the country. Findings shows that the districts in the eastern and south eastern part of the country, Dhaka, Gazipur, Narayanganj, Feni, Chittagong are developed due to higher infrastructural development, regional connectivity, better access to health and education. The northern districts of the country are less developed due to higher incidence of poverty, lack of access to basic services, lack of economic opportunities and financial resources. Finally, this study has recommended some strategies which can help in reducing regional disparity and balance regional growth across the country.

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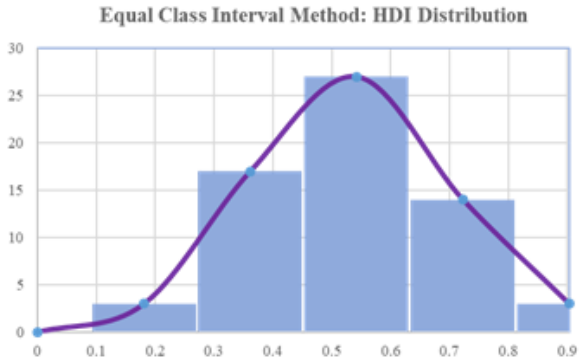
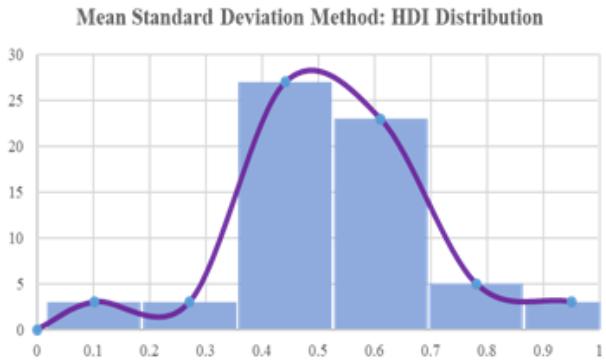
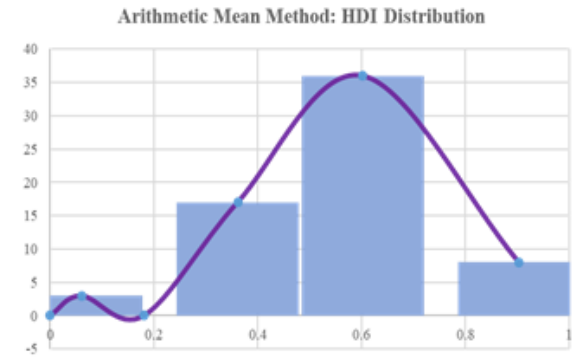
APPENDICES

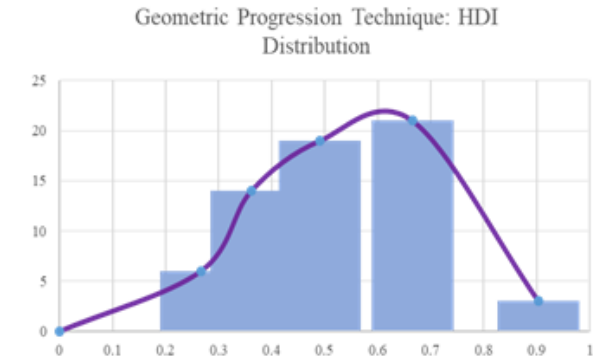
Appendix 01:

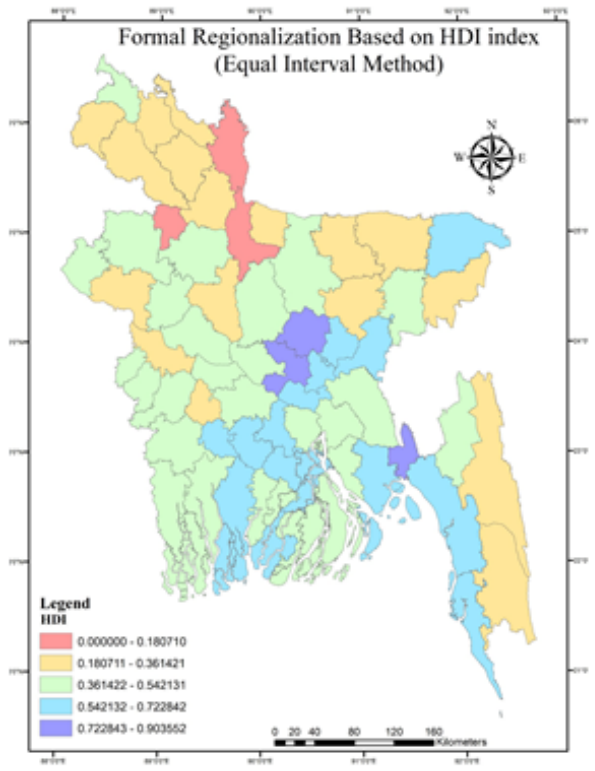
Human Development Index (HDI)			Data Source
Dimension	**Selected Variable**	**Nature of Indicator**	
Health	Crude Death Rate	Negative	Bangladesh Sample Vital Statistics, 2020
Education	Literacy Rate	Positive	Population and Hosing Census, 2022
Standard of living	Consumption	Positive	Household Income and Expenditure Survey, 2016

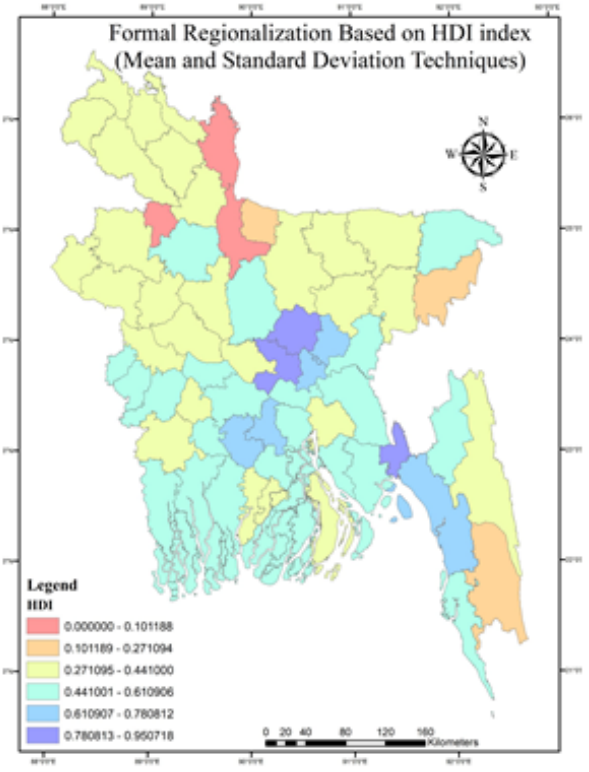


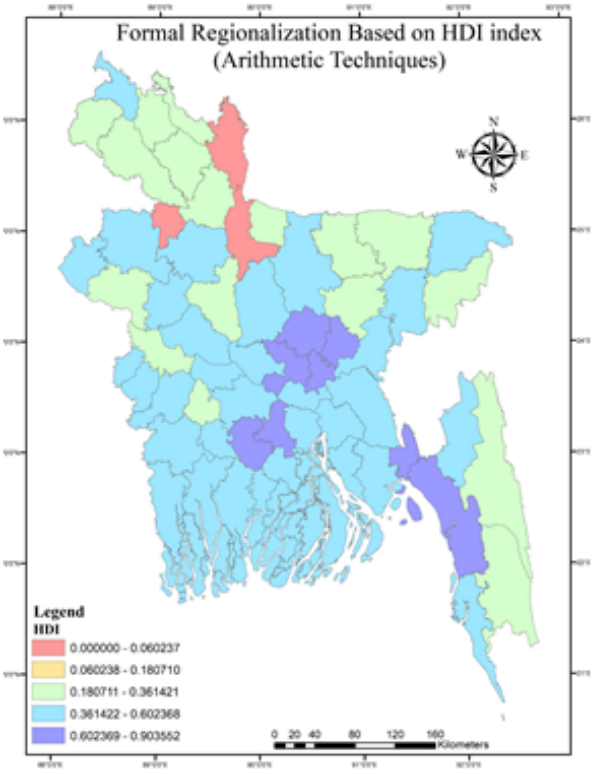


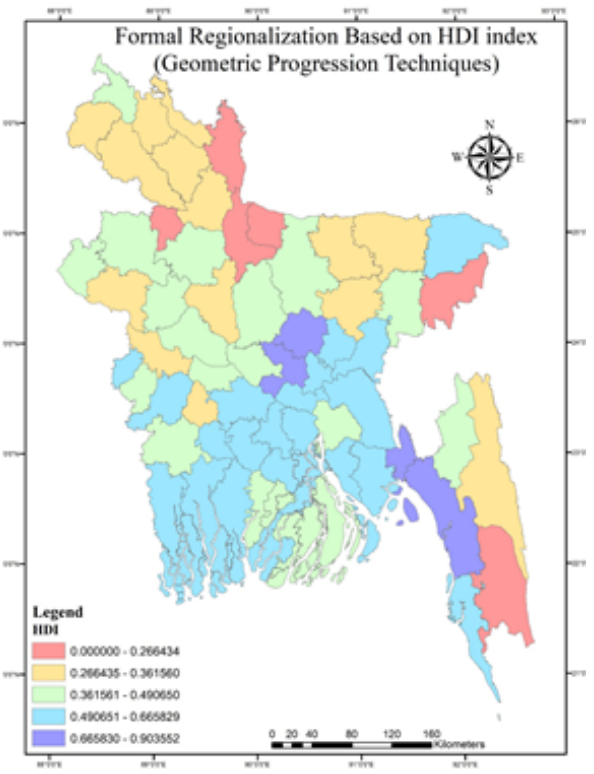





Formal Regionalization Based on HDI index
(Equal Interval Method)
N
W
E
S
Legend
HDI
0.000000 - 0.180710
0.180711 - 0.361421
0.361422 - 0.542131
0.542132 - 0.722842
0.722843 - 0.903552
0 20 40 80 120 160
Kilometers


Formal Regionalization Based on HDI index
(Mean and Standard Deviation Techniques)
N
W
E
S
Legend
HDI
0.000000 - 0.101188
0.101189 - 0.271094
0.271095 - 0.441000
0.441001 - 0.610906
0.610907 - 0.780812
0.780813 - 0.950718
0 20 40 80 120 160
Kilometers

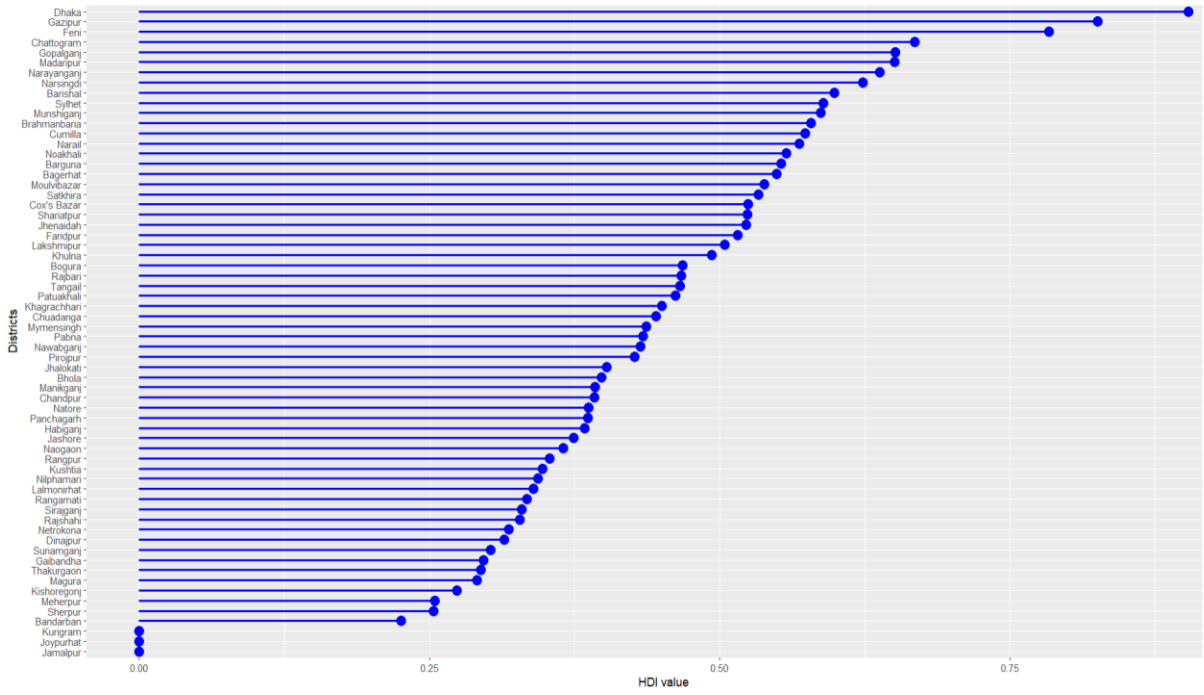

Formal Regionalization Based on HDI index
(Arithmetic Techniques)
N
W
E
S
Legend
HDI
0.000000 - 0.060237
0.060238 - 0.180710
0.180711 - 0.361421
0.361422 - 0.602368
0.602369 - 0.903552
0 20 40 80 120 160
Kilometers


Formal Regionalization Based on HDI index
(Geometric Progression Techniques)
N
W
E
S
Legend
HDI
0.000000 - 0.266434
0.266435 - 0.361560
0.361561 - 0.490650
0.490651 - 0.665829
0.665830 - 0.903552
0 20 40 80 120 160
Kilometers

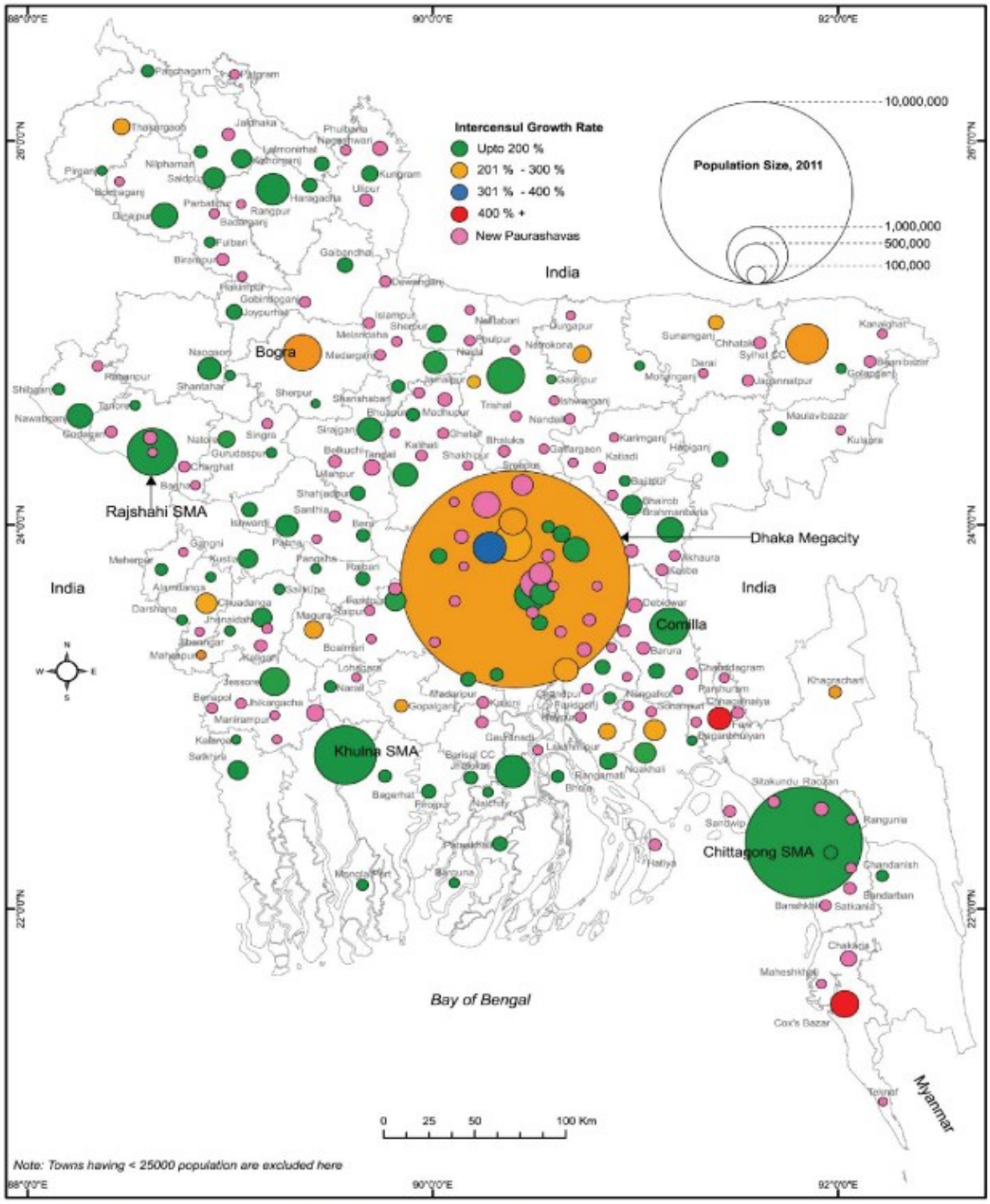
Appendix 1.1: Developed and underdeveloped regions based on human development index (HDI): Formal Regions based on Equal Interval Method

Districts	Range	Category	Region
Jamalpur, Joypurhat, Kurigram	0.0-0.18	Very Low	Least Developed
Bandarban, Sherpur, Meherpur, Kishoregonj, Magura Thakurgaon, Gaibandha, Sunamganj, Dinajpur, Netrokona, Rajshahi, Sirajganj, Rangamati ,Lalmonirhat, Nilphamari, Kushtia, Rangpur	0.18-0.36	Low	Under Developed
Naogaon, Jashore, Habiganj, Panchagarh, Natore, Chandpur, Manikganj, Bhola, Jhalokati, Pirojpur, Nawabganj, Pabna, Mymensingh, Chuadanga, Khagrachhari, Patuakhali, Tangail, Rajbari, Bogura, Khulna, Lakshmipur, Faridpur, Jhenaidah, Shariatpur, Cox's Bazar, Satkhira, Moulvibazar	0.36-0.54	Medium	Moderately Developed
Bagerhat, Barguna, Noakhali, Narail, Cumilla, Brahmanbaria, Munshiganj, Sylhet, Barishal, Narsingdi, Narayanganj, Madaripur, Gopalganj, Chattogram	0.54-0.72	High	Developed
Feni, Gazipur, Dhaka	0.72-0.90	Very High	Most Developed

Appendix 02: Ranking of the districts based on HDI value

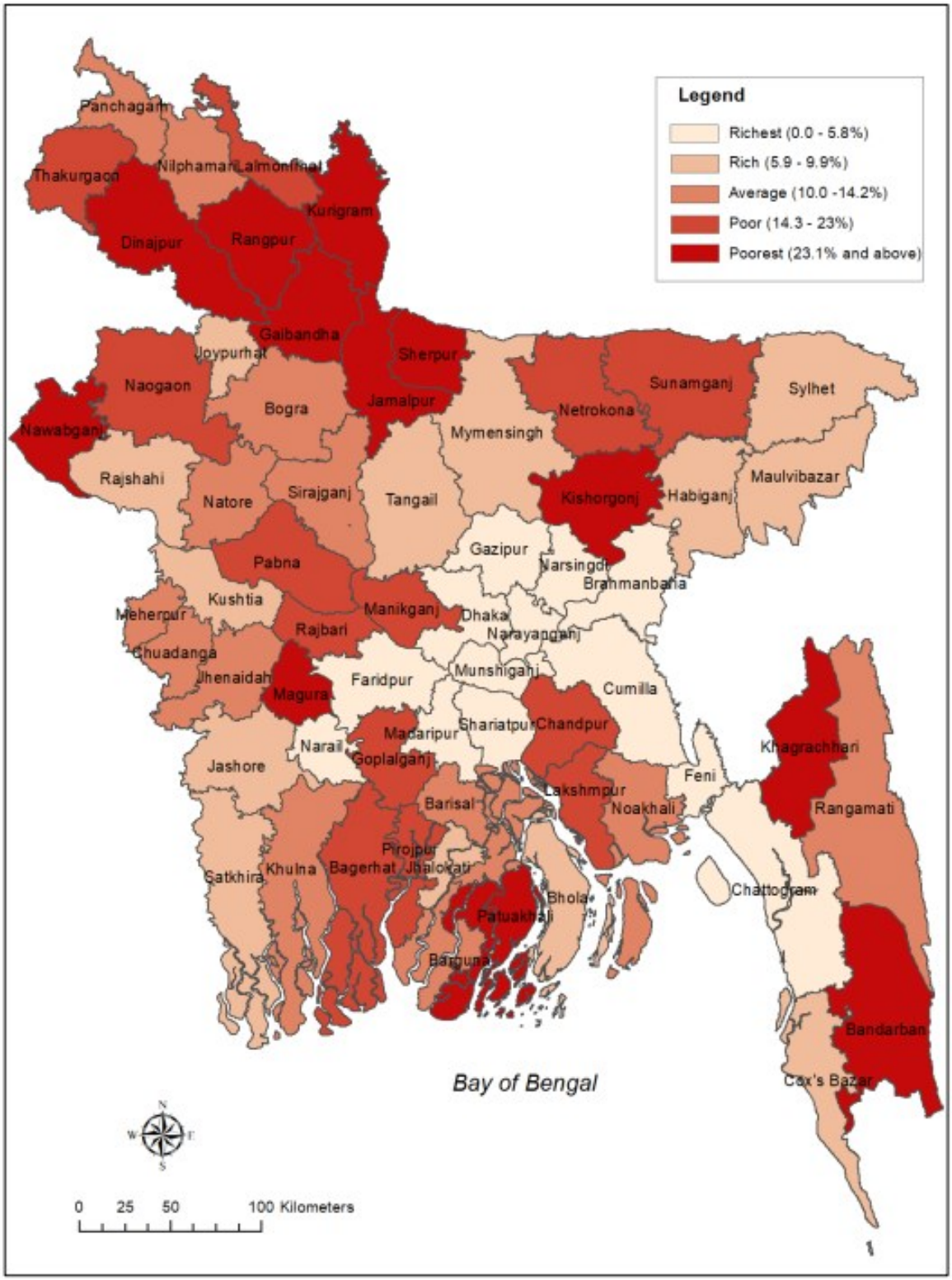


Appendix 3: Urbanization rate of the districts of Bangladesh



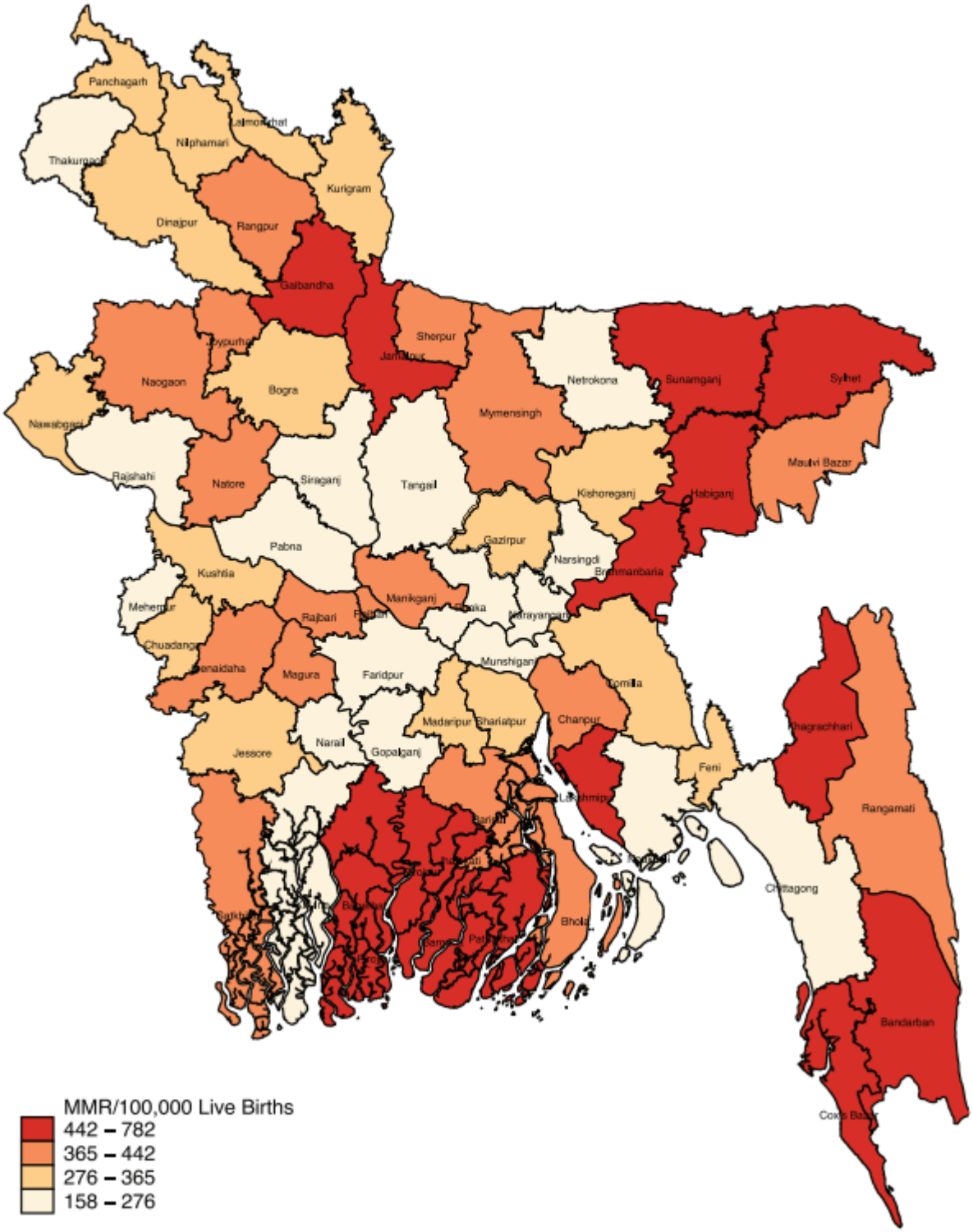
Source: Hayes, 2015

Appendix 4: Extreme Poverty Headcount Distribution in the Districts



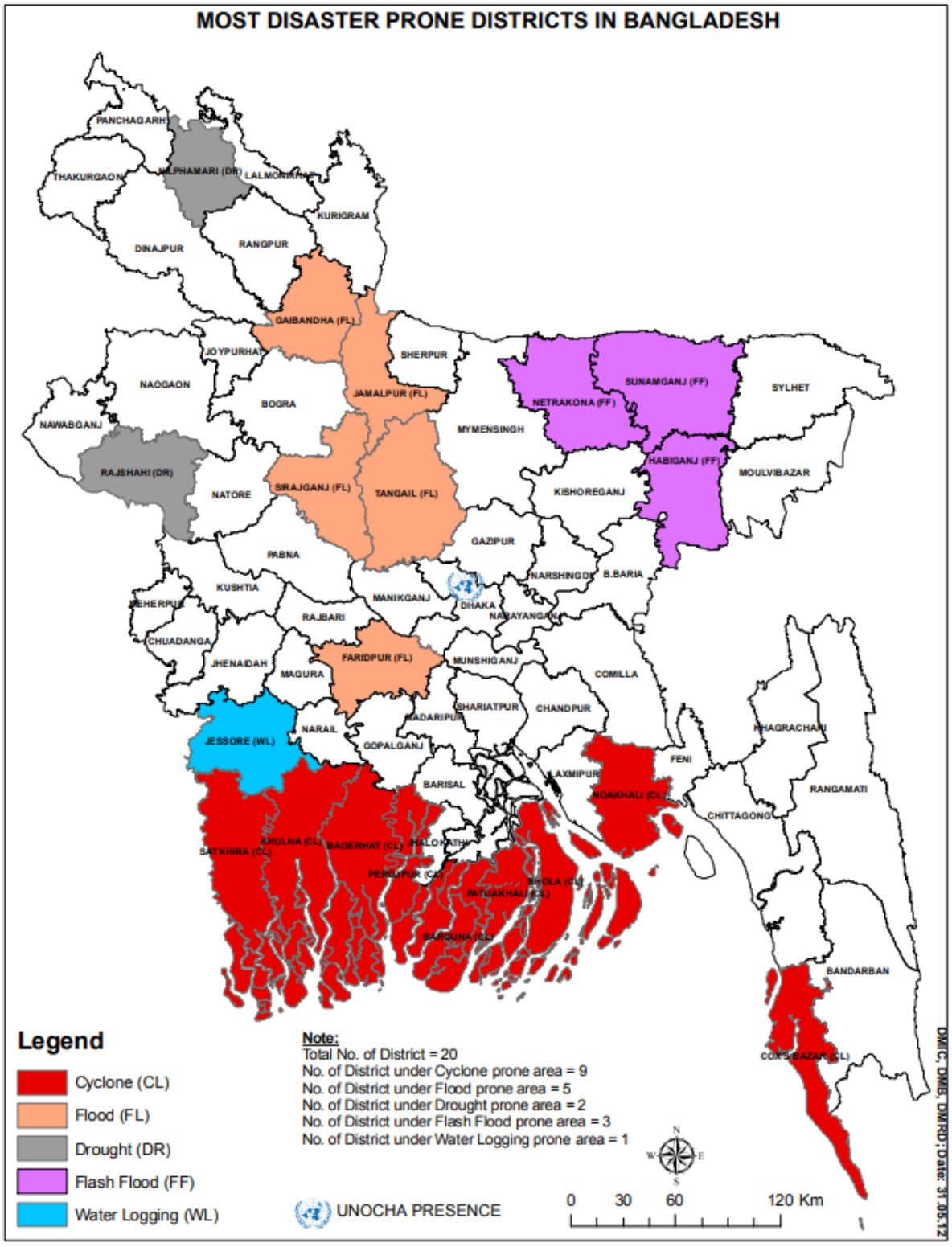
Source: HIES 2016

Appendix 5: Maternal Mortality Ratio in the Districts of Bangladesh



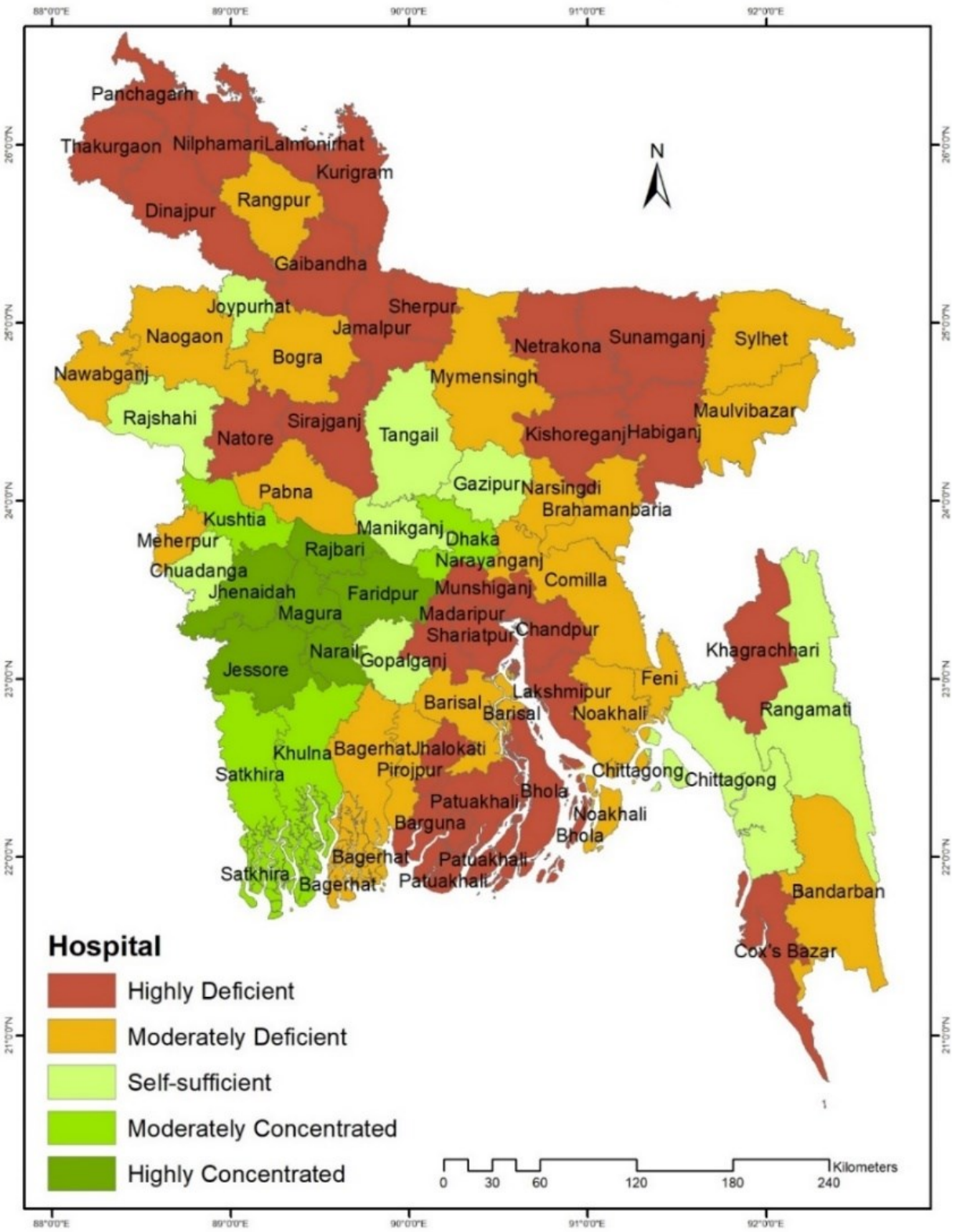
Source: Ahmed & Hill, 2011

Appendix 6: Disaster Prone Areas of Bangladesh

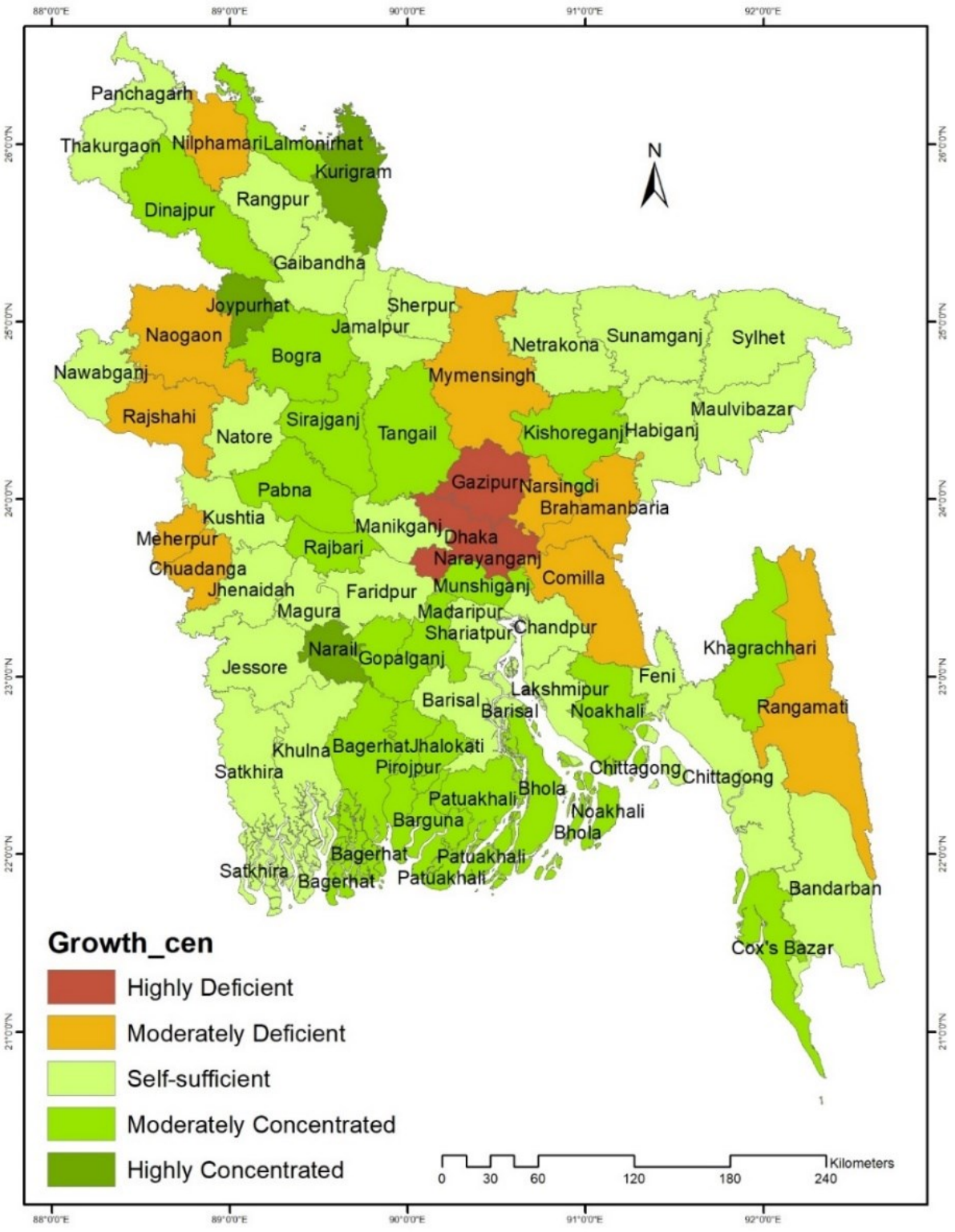


Source: UNOCHA, 2012

Appendix 7: Concentration of Private Hospitals and Clinic



Appendix 8: Concentration of Growth Centers



Appendix 9: Concentration of Rural Market