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ASCERTAINING REGIONAL DISPARITIES IN LIVING CONDITION THROUGH FORMAL REGIONALIZATION: AN INSTANCE OF BANGLADESH

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ABSTRACT

Housing and basic amenities are the major determinants of people's living condition throughout the world. To improve the living condition of people, it is undoubtedly essential to facilitate them with decent housing and basic amenities. Bangladesh is one of the key developing countries with high population-land ratio throughout the Asian region as well as the whole world. Furthermore, due to rapid population growth, housing has become a vital concern for Bangladesh till date. The housing situation varies in different administrative area due to their different geographical characteristics and location attribute. In this particular study, the 64 administrative areas (District) of Bangladesh is delineated into different regions on the basis of three prime criteria of overall housing quality namely housing structure, sanitation, and electricity connection to identify the inequalities in living condition all through Bangladesh. The required database has been collected from Bangladesh Bureau of Statistics (BBS) and consequently been analyzed through composite index method to categorize the whole Bangladesh into three regions namely developed, moderately developed and backward region considering the housing quality and basic amenity facilities they serve. The reliability of the database is checked through different statistical parameters, to be precise the level of Skewness, Kurtosis, Standard Error of Mean and so on. As a major outcome, the study has revealed that almost all of the administrative areas of Bangladesh lies beneath moderately developed and backward region with incredibly nominal basic amenities and proper housing condition required for a better living. Therefore, the study findings can furthermore assist both governmental and development agencies for formulating profound and realistic strategies for the housing sector as well as will act as a guideline for setting the allocation priorities for the basic amenities in deprived regions all over Bangladesh.

KEYWORDS: Housing Condition, Basic Amenities, Backward Region, Formal Regionalization, Population-Land Ratio

1. INTRODUCTION

The advent of globalization has led to an emerging concern about the development of regions. It is envisaged that while the developed regions will continue to grow further, the underdeveloped or backward regions might further get marginalized (Mehta *et al.,* 2015). The combination of housing, sanitation facility, and electricity connection are preconditions to lead a qualified life. It also provides significant economic security and personal dignity to the residents in the society from the social point of view. Most importantly, the better is the housing condition and provision of basic amenities; the more improved the living condition of a person, more efficient he is in his work and it also has a direct impact on the health and education of him (Krishna *et al.,* 2010).

Alongside, lack of proper sanitation facilities and pitiable hygiene resulting from poor living condition cause millions of people to die from simply preventable diseases every year (Akter *et al.,* 2008). In the developing countries, like Bangladesh, these facilities are unequally distributed and the poorest section of the population always remains deprived of improved housing quality and these kinds of basic amenity facilities. Over the decades, the Government of Bangladesh along with different non-government organizations has targeted towards achieving its prime goal of removing regional disparity through providing more emphasis on the backward region (Pal *et al.,* 2015).

Given this backdrop, this particular paper study categorizes the whole Bangladesh into different regions on the basis of disparities in living condition and basic amenity facilities. Literature also supports that this kind of regionalization process under consideration can be fruitful in achieving the goal of regional disparity eradication in developing countries like Bangladesh through proper utilization of location potentials, resources, infrastructure and the provision of government subsidies (Bhuiya & Mohiuddin, 2013).

2. LITERATURE REVIEW

Regionalization is the process of delineating regions. The delineation of formal regions involves the grouping together of local units which have similar characteristics according to certain clearly defined criteria, but which differ significantly from units outside the region on the basis of the selected criteria. This process may take several forms depending on the purpose of regionalization, the criteria to be used and the availability of data (Glasson, 1974). Regionalization through composite index method has always been a traditional practice in planning. The basic theoretical ideas used here are not new. Kendar's (1939) early work tried to find out formal regions on the basis of crop productivity in Britain. The study was done only with the development of multi factor uniform regionalization. The methodological approach used in this study is derived almost wholly from the exertion of Berry who employed the most intriguing contributions in this field. He first studied the regional structure of economic development in many countries using factor analytic procedures.

Moreover, composite and multidimensional indices can prove valuable in economic structure analysis of a region (Joint Research Centre-European Commission, 2008). A number of measuring indicators can be used to measure inequalities in living condition; these include but are not limited to housing structure, sanitation, electricity connection and water connection etc. (Spence, 2007; Shields, 2003).

Alongside, literature supports the existence of a strong correlation between the living conditions of people with their overall satisfaction towards life. Peak and Kay Stewart (1985) in their study depicted that the life satisfaction of people is associated with the overall satisfaction with the housing condition. Better structural quality is significantly related to overall satisfaction with the quality of life.

Likewise, in the Fifth five-year plan of Bangladesh (Bangladesh Planning Commission, 1997) the concept of integrated rural development was proposed which further was accepted in 1976 as one of the central themes of development efforts. Therefore rural housing along with other aspects came under review at the national level through the formation rural development policy in Bangladesh. The committee divided the whole Bangladesh into four administrative divisions namely Dhaka, Chittagong, Khulna, Rajshahi and two other typical regions called Sylhet and coastal areas.

Henceforth, this particular research undertaking is grounded on the understanding of the inequalities in living condition of people of Bangladesh through formal regionalization. A scrutinized and comprehensive review of relevant literature has equipped the study with an exploration of all probable method how the study can be done and choice of what methods can be used. Considering all the criteria's, the composite score analysis is adopted as the best-chosen method for determining the inequalities in living condition of people throughout Bangladesh.

3. RESEARCH METHODOLOGY AND DATA

The principal objective of the study is to delineate different formal regions of Bangladesh for determining discrepancies in living condition and amenity facilities of people based on three predetermined criteria namely the housing structure, sanitation and electricity connection. All these variables are highly correlated with the overall development of a region. Due to the variability in the unit of measurement of the selected criteria's, composite index method is used for the purpose of regionalization. It is a useful statistical measure for grouping of database and combining different indexes or factors in a standardized way. The study area is selected for this research is whole Bangladesh. The required database is collected from the Bangladesh Bureau of Statistics (BBS) website (BBS, 2011).

The reckoning procedure commences with the statistical inspection of reliability of the composite index dataset. Data reliability is checked through different statistical methods namely standard error of the mean, skewness and kurtosis. The standard error of mean of this database is nearly zero (.016), which implies that the dataset will produce nearly same mean value in each instance of calculation. The negative value of Skewness (-.193) implies that the dataset is lefty skewed and there exist some large values in the dataset. But as the value of Skewness is nearly zero, it does not actually create any nuisance in the distribution of the database. The negative value of kurtosis (-.431) represents that the dataset follows a "Platykurtic Distribution". So most of the data values are dispersed from the modal value of the dataset. For this reason in some class of frequency distribution, the frequency of data is comparatively larger than the other classes. Finally, as an overall observation, the dataset is statistically reliable for further study as the value of Skewness, kurtosis and standard error of mean is very close to zero. The values of the statistical measures described here are shown in table 1

Table 1: Descriptive statistics for Data reliability check

Std. Error of Mean	.016467
Skewness	-.193
Std. Error of Skewness	.299
Kurtosis	-.431
Std. Error of Kurtosis	.590

Source : Prepared by the Authors, 2018

Composite indexes provide a quantitative measurement of living standard (ESRI, 2013). A majority of indicators involved in making a composite index come from varied measurement units; therefore, standardization (W-score) is commonly used. Standardization process converts all indicators involved to a common scale in which the values are reconfigured into standard deviations around the mean zero (Okumu, 2014).

Log value is used to formulate the factors as a unitless one. These summations of log values for a specific criterion indicate the weighted index for each individual criterion without any unit of measurement. Therefore all three standardized indicators (w values) is calculated for each living standard condition indicator in each district. The resulting standardized indicators are seemed and averaged to create index value for each of the districts. The data are arranged on a specific order for analysis. Then the value of composite score is calculated. The order of data arrangement and formula for calculation is shown below:

District	Variable1 (x_1)	$Log_{10}(x_1)$	Variable2 (x_2)	$Log_{10}(x_2)$	Variable3 (x_3)	$Log_{10}(x_3)$

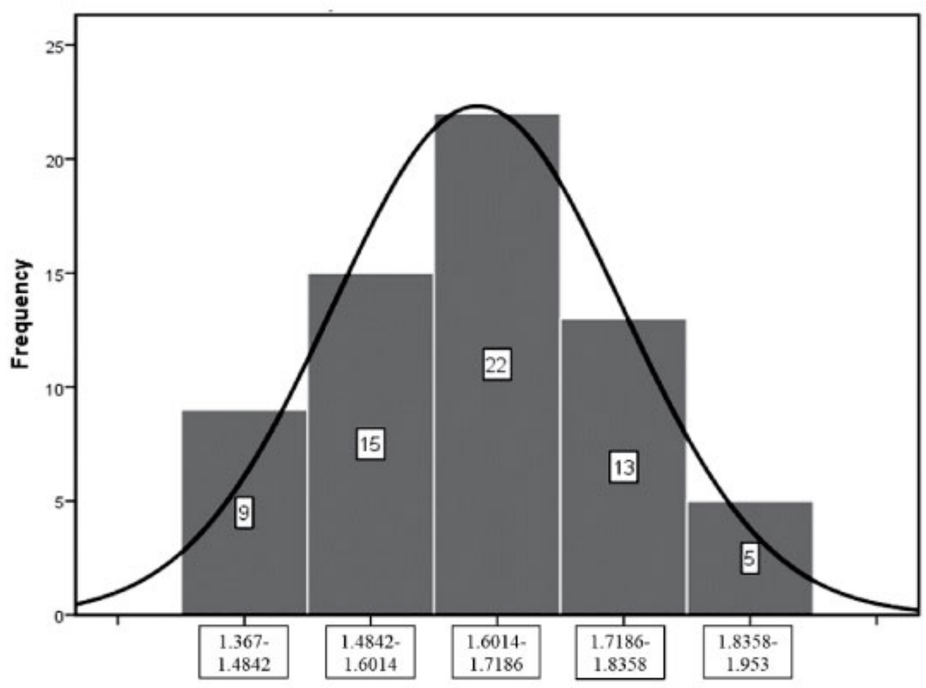
$$W_n = \frac{mean\ of\ \text{Log10}(x_n)}{(standard\ deviation\ of\ \text{Log10}(x_n))} \qquad [\text{where, } n=1, 2, 3]$$

$$W = \frac{[(\text{Log10}(x1)*W_1)+(\text{Log10}(x2)*W_2)+(\text{Log10}(x3)*W_3)]}{W_1+W_2+W_3}$$

Moreover, the frequency distribution of the composite indices is calculated. The number of required class is calculated using 2^k rule followed by the computation of frequency distribution using three procedures namely Equal class interval method, Mean-Standard deviation method and Arithmetic method. In Equal Class Interval Method firstly the class interval (X) is calculated by following formula. Then five equal classes are calculated.

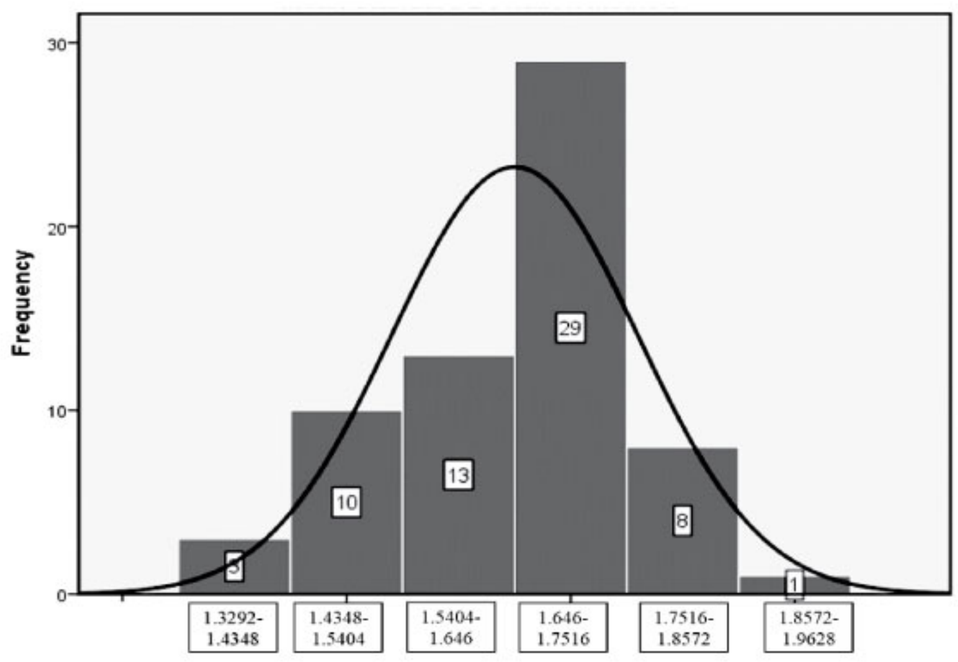
$$x = \frac{Highest\ value\text{-}Lowest\ value}{Number\ of\ class\ required}$$

In Mean-Standard Deviation Method, the mean and standard deviation of the composite score is calculated. Mean is 1.646 and Standard Deviation is 0.132. Then the class is found by calculating Mean ±0.8Standard Deviation, Mean ±1.6Standard Deviation, and Mean ±2.4Standard Deviation. The histograms of frequency distribution are shown in figure 1 and 2 respectively.



Source: Prepared by Authors, 2018

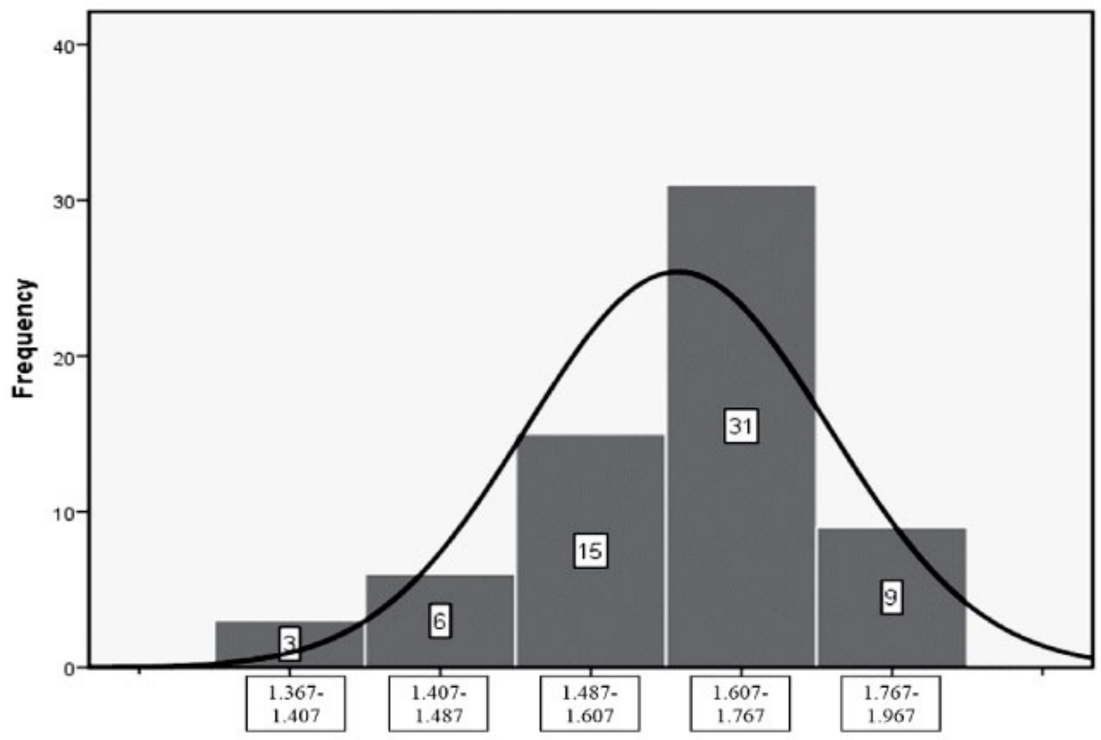
Figure 1: Equal Class Interval Method



Source: Prepared by Authors, 2018

Figure 2: Mean Standard Deviation Method

In Arithmetic Mean Method, the class interval is calculated and the five classes are calculated consecutively. After calculating the frequency, the data are plotted graphically and the histogram is not actually normally distributed which is exhibited in figure 3.



Source: Prepared by Authors, 2018

Figure 3: Arithmetic Mean Method

Finally, among the three procedure of frequency distribution, the well-suited one for our study is selected. The even distribution of data in each class is taken as the major selection criteria of the best-suited frequency distribution method. Depending on the criteria, the equal class interval method is best suitable for our study purpose. This method is best used for continuous data which predominates our dataset. Most importantly, the distribution of data somehow follows the shape of a normal distribution curve in case of "Equal class interval method" other than the remaining one. That is why the "Equal class interval method" is selected as the frequency distribution method for our study.

4. RESULTS AND DISCUSSION

Condition around us in which we live in is called living condition. lt refers to the circumstances of a person's life-shelter, food, safety, sanitation, access to clean water, access to electricity connection and so on (RegDwight, 2013). Housing structure and basic amenities determine the living condition of people. Improved housing structure will provide better shelter, privacy and a safer place from vulnerability. Sanitation facility determines the health status of people which ultimately determine the living condition. The access to electricity connection make our life easier, it also gives the feeling of safety, security at night. So it is indicating that there is a positive relationship between the living condition and housing structure, sanitation and electricity connection. A household that is facilitated with a better housing structure will certainly have standard sanitation facility and electricity connection. In this study, different scenario in the living condition in diverse district is analyzed thereon.

4.1. Region delineation

Total 64 districts are divided into three regions in this study on the basis of composite score. The considered three regions have been grouped as the developed, moderately developed and backward region and further scrutinized for detail scenario analysis.

4.1.1. Developed region

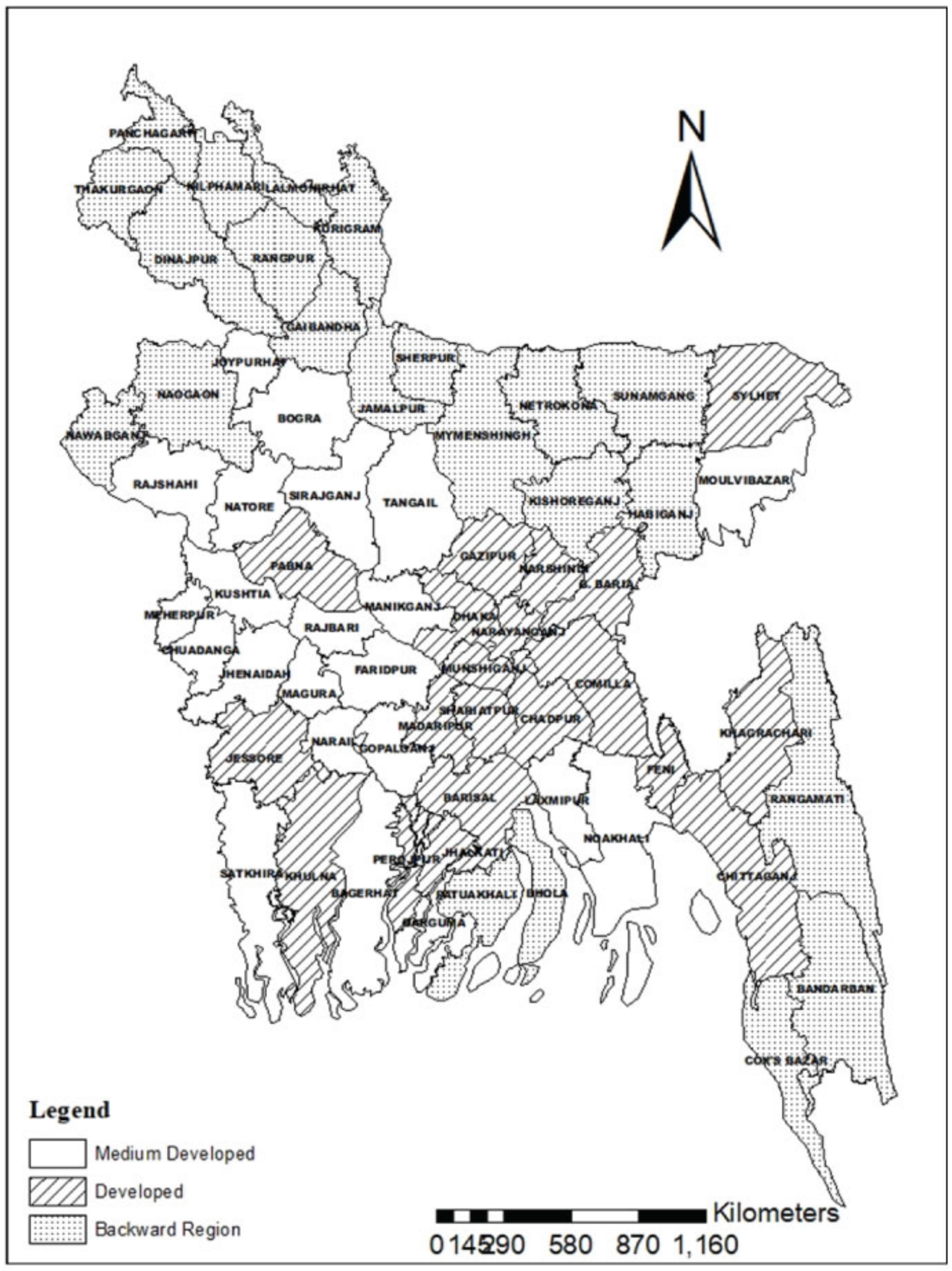
In the developing countries, living condition is correlated with higher economic and social status of people. In the developed region, around 28.13% districts of Bangladesh are under this category. Living condition of Madaripur, Chandpur, Gopalganj is relatively better than the other ones in this group. Because this region has lots of potentials. These very regions are located almost in Central Bangladesh. This region is well connected with Dhaka, Barisal even Khulna division easily because of its geographical locations. Another reason can be the political influence that changes the economy of any region very fast. This region also covered most of the divisional cities of the country. Dhaka, Barisal, Sylhet, Khulna, and Chittagong are the five most important divisional city of Bangladesh.

Availability of industry, important service center and offices largely contribute to the income of the people in the developed region. People living in the divisional city area got more opportunity and have better accessibility to the amenity facilities comparing to the rest of the country. Comilla, Feni, Gazipur, Munshiganj, Chittagong, Narayanganj are situated around the capital city. The spread effect is one of the main reasons behind the development of those districts which means that if one particular area in a country starts growing or developing, its effect spreads to its suburbs and in all the adjoining areas. This particular situation is very acute in this region. Regionalization of different districts of Bangladesh based on the living condition is exhibited in Table 2 and Figure 4.

Table 2: Regionalization Based on Living Condition in Bangladesh

Range of composite score	Attribute	Frequency	Percentage	District
1.7186-1.953	Developed Region	18	28.13	Madaripur, Chandpur, Gopalganj, Pabna, Jessore, Narsingdhi, Jhalokati,Barisal, Sylhet, Bramanbaria,Khulna,Comilla, Feni,Gazipur,Munshiganj, Chittagong, Narayanganj, Dhaka
1.6014-1.7186	Moderately Developed Region	22	34.37	Sirajganj, Joypurhat, Satkira, Maulvibazar, Pirojpur, Tangail, Magura, Shariatpur, Bagerhat, Meherpur, Chaudanga, Rajbari, Narail, Natore, Bogra, Manikganj, Lakshmipur, Rajshahi, Noakhali, Faridpur, Jhenaidah, Kustia
1.367-1.6014	Backward Region	24	37.50	Bandarban, Gaibandha, Takurgaon, Kurigram, Netrokona, Nilphamari, Lalmonirhat, Khagrachhari, Sunamganj, Bhola, Naogaon, Rangamati, Rangpur, Panchagarh, Sherpur, Mymensingh, Jamalpur, Cox's Bazar, Nawabganj, Dinajpur, Barguna, Kishoreganj, Patuakhali, Habiganj

Source: Prepared by the Authors, 2018



Source: Prepared by the Authors, 2018

Figure 4: Different Region in Bangladesh Exhibiting Disparity in Living Condition

4.1.2. Moderately developed region

Around 34.37% districts are in moderately developed regions. Living condition and electricity connection in this region is not satisfactory. But better than backward region. In Pirojpur, Faridpur, Kustia, Jhenaidah, Moulvibazar and other several districts of this region BRAC launched WASH programme I, II to develop the sanitary system in association with world Toilet Organization (WTO). (Akter *et al.,* 2008). NGOs also provide compensation to developing living condition in this area. That assists to improve the condition of the living in that region. But, still some portion of the people lacking standard living condition.

4.1.3. Backward region

Within this region, around 37.50% of the total districts are grouped. Mostly the coastal area, hilly region, the north Bengal and north-eastern part of Bangladesh fall under this category. Every year flood causes damage to the human settlement of the coastal area: walls may collapse, foundations may fail. Tropical cyclones, Storm surge, tornado and river erosion are other types of natural hazard, which causes damage to housing structure in the coastal areas. Natural hazard

is an integral part of the life of the people of the very region. The economic condition of the people of the coastal area is not being boosted up because every year they are affected by natural disaster. Due to the poor economic condition, they can't afford better housing that ultimately results in low living condition. Very few people can manage to rebuild the structure damaged by the disasters. Since this area is situated in the remote part of Bangladesh, they are lacking the attention of the government, when it is a matter of the provision of different basic amenities. Khaghrachari, Bandarban, Rangamati comprise the hilly region, where the construction cost of the pucca structure is too high. Transportation cost of raw materials is one of the main reasons behind this. Preparation of site is also difficult there. Provision of utility facility is always a challenge for the government. The scarcity of water and adequate provision of the technology and the lack of efforts to eliminate the knowledge gap have caused slow progress in providing access to sanitation. This region also covers north and north-east part of Bangladesh. Lack of cultivable land, natural calamities, non-availability of working facilities at the non-agricultural sector, lack of working facilities at agricultural sector due to natural calamities and lack of credit availability and high interest rate causes the poor economic condition in this area. Due to poor economic condition their housing condition and sanitation remains shabby and unserved over years.

5. CONCLUSION AND RECOMMENDATION

After delineating the region it is clear that the overall living condition of Bangladesh is not up to the mark. The condition varies from district to district. Some districts are well improved, on the other hand, some districts still lacking the standard of proper living condition. The key factor behind the inequality is the different economic structure in the different district, locational backwardness, varying rate of Urbanization, knowledge gap, climate change and activity of different NGOs like IRC, BRAC, Grameen Bank etc. throughout Bangladesh. Locational backwardness is one of the main reasons of inequality for economic activity as well as overall living condition (Begum, Zaman, & Khan, 2004). People living in rural areas and hilly region are often more deprived than people living in cities. Poor households and socially deprived classes have less productivity than others due to some unavoidable reasons. The initiative should take to make them more productive to increase GDP of the country. The study identified that the main reason for poor living condition lies in the locational backwardness of region and natural calamities. To conclude, this study would particularly be useful to mobilize and reallocate government loans (e.g. ADP loan, World Bank support etc.) to bring these people with economic solvency under better living coverage. Different housing development program can be initiated by the government to improve housing condition in backward reason like site and services scheme. This scheme will provide both the better housing structure and services like sanitation facility, electricity connection and so on.

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REFERENCES

Akter, N., Seraj. K. F. B., Ahmed, S. M., Sarkar, M. Q., Neelim, A. Z., Kamal, T. M., Rahman, M. M. (2008). WASH Program of BRAC: Towards Attaining the MDG Targets: Baseline Findings. Retrieved From: https://research.brac.ne publications/WASH Baseline findings.pdf&sa-U&ved-0ahUKFjCsl62cWAhVC5 CHBZEQFggXMAA&usg-AOvVaw laZwbmjdNmBi0hul jolEI

Bangladesh Planning Commission. (1997). The fifth five year plan (1997-2002). Ministry of Planning, Government of the People's Republic of Bangladesh, Dhaka.

Begum.S.F., Zaman.S.H. & Khan, M.S. (2004). Role of NGOs in rural poverty eradication: A Bangladesh observation. BRAC University Journal, vol. I. pp. 13-22. Retrieved From: http://dspace.bracu.ac.bd/xmlui/handled10361/483

BBS. (2011). Population Census Community Series, Planning Division, Ministry of Planning, and Government of the People's Republic of Bangladesh. Retrieved from: http://ivuw.bbs.gov.bd

Bhuiya, M.M.R., & Mohiuddin, II. (2013).Agricultural Regionalization of Bangladesh Based on Productivity and Analysis of Spatial Dependencies of for Productivity between the Districts of Bangladesh. Journal of Bangladesh Institute of Planners, Vol. 6, pp. 181-189.

Economic and Social Research Institute (ESRI), Cabinet Office. Government of Japan. (2013).Guide for using composite indexes and diffusion indexes. Retrieved from: http://iw.esri. cao.go.jp/emstadi/di2e.html

Glasson. J. (1974). An Introduction to Regional Planning. Hutchinson of london: Hutchinson &CoLtd.

Kendall, M.G. (1939).The geographical distribution of crop productivity in England.J.R.Statist.Soc.102.21-62.

Krishna, N. T., Al, S., Mohan. I., Singh. A. Gupta, Y. P., &Deshkar, M. W. (2009). Housing conditions in Delhi. Retrieved from: https://books.google.com.bd/books?Id=MR4hAQAAIAAJ&pg=PA

Mehta, D.P.K., Saxena, M.N.,& Mangla, M.B.(2015).IdentifyingBackwardnessofMewatRegionii7 Haryana A Block-. Level Analysis. Retrieved From: https://niti.gov.in/writereaddata/files/ document_publication/Identifying%2520Backwardness%2520of%2520Mewat%2520Region% 2520in%2520Haryana%2520A%2520 Block %2520Level%2520Analysis_final_0.pd-f&sa=U&ved=0ahUKEwi24sP_M_WAhWBYiYKHd8rDcoQFggYMAE&usg= AOvVaw1-JIQIgwuLbh69jqikKI7f4

Okumu, C.S. (2014).Economic distress: Composite index as a way of measuring economic distress in Nebraska. Masters of Community and Regional Planning, University of Nebraska.

Peck, C. & Stemart, K. (1985). Satisfaction with Housing and Quality of Life. Home Economics Research Journal, 13(4).363-372.doi: 10.1177t1077727X8501300403

Point Research Centre-European Commission. (2008).Handbook on constructing composite indicators: Methodology and user guide. Retrieved from: http://rav.oecd.org/std/42495745.pdf

Pal, R., Aneja, N., & Nagpal, D. (2015). Inequality in Housing and Basic Amenities in India. Retrieved from:https://mpra.ub.unimuenchen.de/61994/1/MPRA_paper_61931.pdf&sa=U&ved=0ahUKE wijr7G7M_WAhWJ2SYKHc8vBVoQFggZMAA&usg=AOvVaw3OoltG0sum8scEl1mVy7oW

Regdwight. (2013). English Language and Stack Exchange. Retrieved from: https://english.stackexchange/questions/139021/whats-the-difference-between-life-conditions-a nd-living-conditions

Shields, M. (2003). Using employment data to better understand your local economy. College of Agricultural Sciences, Agricultural Research and Cooperative Extension, Penn State University. Retrieved from http://pubs.Cas.Psu.edwfreepubs/pdfs/UA373.Pdf

Spence, N. A. (2007). A Multifactor Uniform Regionalization of British Counties on the Basis of Employment Data for 1961.