

Development Based on Regionalization: A Case Study of Formal and Functional Regionalization of Kishorganj, Brahmanbaria and Narshingdi District

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Abstract

Regionalization is the way that an area of the word containing several countries becomes more economically or politically important than the particular countries within that area (Cambridge Business English Dictionary). It is the process of delineation of a region. The objective of the study is to justify the development of a region by both formal and functional regionalization process. So, there are mainly two types of analysis in two process like formal regionalization and functional regionalization to measure the findings through the necessary data of the study area. Here, three districts like Kishorganj, Brahmanbaria and Narshingdi are selected as study area. The selected sector of formal regionalization for the study is fisheries sector of the study area because fisheries sector plays a vital role in economical side in Bangladesh. Bangladesh earns about 500USD of foreign currency in every year. There are five factors are selected for formal regionalization. In functional regionalization process the analysis is mainly based on one sector that is population of the study area Kishorganj, Brahmanbaria and Narshingdi. To measure the analysis, the factor of functional regionalization process is influenced area of the three study areas by which it can be determined that the surrounding areas of the three study areas have how much influence on the study areas. The methodology of the study is also in two analysis formal and functional regionalization process. In formal regionalization methods, with the help of the data of five factors in fisheries sector (from BBS Data) Kishorganj, Brahmanbaria and Narshingdi districts can be classified into three classes like Mostly Developed, Average Developed and Under Developed by Equal Class Interval Method using Microsoft Excel. In other analysis of the study that means in functional regionalization methods, with the help of the data of population and geographical area (from BBS) influenced area of the three study areas can be calculated by GIS (Geographic Information System). On basis of the length of influenced area, Kishorganj, Brahmanbaria and Narshingdi districts can be ranked as 1, 2 and 3. It is shown by the findings that in between Kishorganj, Brahmanbaria and Narshingdi which region is in mostly developed class in fisheries sector in formal regionalization analysis that is also placed as rank 1 in the ranking on basis of total length of influenced area in functional regionalization analysis. As fisheries sector plays a vital role on economics of Bangladesh so the findings of the study is in which region there are a large amount of influenced area, the region are also economically developed. As a final argument the study strongly recommend that it's the duty of government to maintain the economic development through fisheries sector and influence of the central regions of the country.

Keywords: *Formal Regionalization, Functional Regionalization, Influenced Area, Economic Development, Local Government.*

1. Introduction

1.1 Background of the study

Regionalization is the way that an area of the word containing several countries becomes more economically or politically important than the particular countries within that area (Cambridge Business English

Dictionary). It is the tendency to form decentralized regions. It is the process of delineation of a region. There are two types of regionalization:

I. Formal Regionalization

II. Functional Regionalization.

Formal regionalization means grouping of units based on similar characteristics according to define certain criteria. Regionalization Based on Fisheries: Condition of fisheries sector in the 64 districts of Bangladesh is done by “Formal Regionalization” and the base of regionalization is fisheries. The factors behind the process are:

1. Number of Fisherman
2. Cultural pond
3. No of Growth center
4. Total annual production (metric ton)
5. Regional high way (km)

These factors can determine a regions fisheries development. The summarization of this five factors can easily determine the fisheries condition of a region. Fisheries sector is one of the important sectors in agricultural sector in Bangladesh. Fisheries sector plays a vital role in economical side in Bangladesh. Bangladesh earns about 500USD of foreign currency in every year. In this study we have focused on the development of fisheries sector in Bangladesh. There are five factors like Number of fisherman of regions, Number of Culturable water body in which fisheries has been grown up, Total Production (in metric ton), Number of Growth Center in which the fishes can buy and sell, Length of Regional highway by which production of fisheries can be transported in market for selling. All factors are linked between each other and all are about fisheries sector in Bangladesh. For these reasons, these five factors are selected.

A functional region is a unit or an area which shows the high frequency of intra-regional economic interaction, the interaction of intra-regional trade in goods and services, labor commuting, and household shopping. There are many types of interaction, such as population flows, trade in goods and services like fisheries, communications, traffic flows, goods flows, service connections, newspaper circulation, and financial flows.

Regionalization Based on Population is based on functional regionalization. The factor of this study is population on 28 upazillas of Kishorganj, B.Baria and Narshingdi district. The reason behind choosing Population as factor is to find data of population of Upazillas easily. There is no need any survey for collecting the data of this factor. For these reasons population has been taken as factor. This study tried to find out influence area of the 28 Upazilas of Kishorganj, B.Baria and Narshingdi District. Influence area of each upazila then declared as a functional region.

1.2 Objective

➤ To determine the development of fisheries sector in Bangladesh on basis of both formal and functional regionalization.

1.3 Scope of the study

Development of an area on basis of a specific sector like fisheries can be determined by formal or functional regionalization individually. But in the study the study team have determined the development of three districts on basis of fisheries sector by both formal and functional regionalization.

2. Literature Review

Mostofa Ali Reza Hossain said the importance of fisheries sector of Bangladesh as the population is rising day by day. To meet the potential demand of the growing population of the country fisheries sector can play a vital role. More than 11% of the people depend on fisheries sector.

Mansur Ahamed said that Bangladesh ranks third in the world among the fish producing countries. Fisheries in Bangladesh are broadly into four categories. They are inland capture, inland culture, marine industrial and marine artisanal. Bangladesh is earning about 500USD of foreign currency every year by exporting fish and contribute 3.78% of the GDP.

A functional region is usually understood as a region organized by functional relations. The term functional region has a general character and its meaning can easily be misconstrued or misinterpreted the functional region is based on the spatial flows or interactions that are maximized within the region and minimized across its borders so that the principles of internal cohesiveness and external separation regarding the spatial interactions are met. Generally, any kind of spatial flow or interaction can organize the functional region and its inner structure can be rather random and varied. (Klapka, P., Halas, M. Tonev, P., Bednar, M. (2013).)

Regionalization is the process of delineating regions. This process may take several forms depending on the purpose of regionalization, the creation to be used and data availability (Glasson, 1974).

3. Methodology

The composite index of each 64 districts are computed using the 'W' formula which is:

W=

$$\{(logx1 \times w1) + (logx2 \times w2) + (logx3 \times w3) + (logx4 \times w4) + (logx5 \times w5)\} / w1 + w2 + w3 + w4 + w5$$

Here,

W= Composite index

W1, W2, W3, W4, W5= Sum of log values for individual factors

X1, X2, X3, X4, X5= Individual factors in different factors

The frequency distribution of Formal Regionalization is being calculated using three formula. They are:

- i. Equal class interval method.
- ii. Mean standard deviation method.
- iii. Arithmetic method.

Among these three method, the most suited method was used for frequency distribution. Depending on the criteria Equal Class Interval Method is the best suited method for our study. The reason behind selecting the method is because of it shows the normal curve in histogram chart. Besides the positive value of skew ness shows that the data set is rightly skewed.

The study area is selected for this study is Kishorganj, B.Barria and Narshingdi district of Bangladesh. The data is collected from Bangladesh bureau of statistics (BBS) website. The data shows the situation of 2011.

The data is analyzed by gravitational analysis method. The influence area is directly proportional to the mass and inversely proportional to the distances of the adjacent center. The mass is the population and the distance is taken in mileage.

The formula for calculating the outer limit of its influence area from a region A to on the way to region B is

$$= \frac{\text{milage on road between adjacent centres}}{1 + \sqrt{\frac{\text{Population of region B}}{\text{Population of region A}}}}$$

4. Output Interpretation

4.1 Formal Regionalization based on Fisheries of 64 Districts

In the study using the Equal Class Interval Method the 64 districts were divided into 5 classes named as developed, under developed, mostly developed, average developed, poorly under developed. The classification was done on the basis of the value of W. A district condition is defined on the basis of the value of W. The highest value of W define the mostly developed region and the lowest value of W define the poorly under developed region.

Table 01: Development table based on Fisheries of 64 Districts in Bangladesh

Range of W value	Frequency	Percentage	District Name
2.46-2.75 (Poorly Under Developed)	1	1.57%	Bandarban
2.76-3.09 (Under Developed)	6	9.36%	Khagrachari, Jhalokathi, Munshiganj, Meherpur, Rangamati, Panchagarh.
3.10-3.44 (Average Developed)	16	25%	Lalmonirhat, Choudanga, Nilphamari, Thakurgaon, C.Nawabganj, Rajbari, Faridpur, Kurigram, Feni, Narayanganj, Joypurhat, Shariatpur, Jheneidah, Sherpur, Narshingdi, Narail
3.45-3.79 (Developed)	30	46.88%	Gazipur, Dhaka, Manikgonj, Gopalganj, Barisal, Natore, Khulna, Dinajpur, Habiganj, Phirojpur, Sirajgonj, Cox's Bazar, Barguna, Brahmanbaria, Lakhshipur, Moulovi Bazar, Bhola, Pabna, Netrokona, Bagherhat, Rajshahi, Noakhali, Shatkhira, Jamalpur, Rangpur, Kushtia, Madaripur, Tangail, Gaibandha, Magura,
3.80-4.14 (Mostly Developed)	11	17.19%	Bogra, Jessore, Potuakhali, Chandpur, Naogaon, Sunamgonj, Chittagong, Comilla, Kishorgonj, Shylet, Mymensingh

According to the value of W here highest amount of regions are in Developed class and the percentage is 46.88% . Then 25% regions are in Average Developed class, 17.19% regions are in Mostly Developed class, 9.36% regions are in Under Developed and only 1.57% regions are in Poorly Under Developed class. From the classification, it is shown that in Fisheries sector maximum regions are in developed class. So, in fisheries sector Bangladesh is moderately developed.

4.2 Functional Regionalization based on Population of the Upazilas of Kishorganj, Brahmanbaria and Narshingdi District

From the formula for calculating the outer limit of influenced area of a region or upazila is positively related to the distance between the adjacent Upazilas and the population of that region or upazila.

Table 02: Rank table based on influenced area of 28 Upazilas of Kishorganj, B.Baria and Narshingdi District

Zila	Upazila	Influenced Area Value (sq. km)	Rank of Influenced Area
Kishorganj	Austagram	18679	13
	Bajitpur	16648	17
	Bhairab	97704	2
	Hossainpur	10325	27
	Itna	28712	7
	Karimganj	16780	16
	Katiadi	17954	15
	K.Sadar	89686	3
	Kuliar-char	53635	5
	Mithamain	16438	18
	Nikli	12370	20
	Pakundia	11244	24
Tarail	10678	25	
Narshingdi	Belabo	10430	26
	Manohardi	12110	21
	N.Sadar	19530	10
	Palash	10156	28
	Roypura	23910	9
	Sibpur	99913	1

B.Baria	Akhaura	50827	6
	Ashuganj	78954	4
	Bancharampur	11393	23
	Bijoyagar	18761	12
	B.Baria Sadar	18183	14
	Kasba	11150	22
	Nabinagar	18952	11
	Nasirnagar	27019	8
	Sarail	14043	19

(Source: Prepared by Author,2018)

From the table of total amount of Influenced area it's shown that kishorganj District has the largest value of influenced area than Narshingdi and Brahmanbaria District.

5. Findings

Functional Regionalization is mainly based on population of 28 Upazilas of three districts Narshingdi, Kishorganj and Brahmanbaria. Functional regionalization can be based on various types of actors like Population flows, Communication, Traffic flows and trade marketing and products like fisheries. In this study, development is based on influenced area of Kishorganj, Narshingdi and Brahmanbaria districts.

The study objective was to regionalize the 64 districts of Bangladesh on the basis of Fisheries by Formal Regionalization. There are selected five factors for this study which are linked in each other like Number of fisherman who are involved in catching fishes, Cultural Pond in which the fishes are cultured, Total Production (in metric ton), Number of Growth Center in which the fishes can buy and sell, Length of Regional highway by which production of fisheries can be transported in market for selling.

From the list of this 64 districts by Formal Regionalization the development level of Kishoranj, Narshingdi and Brahmanbaria districts which are the study area for the study of Functional Regionalization can also be determined based on Fisheries sector.

Table 03: Development table based on Fiseries of Kishorganj, Narshingdi and B.Baria District by Formal Regionalization

Name of District	Interval	Class
Kishorganj	3.80-4.14	Mostly Developed
Brahmanbaria	3.45-3.79	Developed
Narshingdi	3.10-3.44	Average Developed

Table 04: Development table based on Influenced Area of Kishorganj, Narshingdi and B.Barria by Functional Regionalization

Name of District	Influenced Area (sq. km)	Rank
Kishorganj	379850	1
Brahmanbaria	249282	2
Narshingdi	165893	3

(Source: Prepared by Author, 2018)

From the table 03, it can be seen that Kishoranj District is in Mostly Developed part, Brahmanbaria district is in second position and that is Developed part and Narshingdi district is in the last position in development table based on fisheries and that is Average developed part which is calculated by Equal Class Interval Method in Formal Regionalization.

From the table 04, it can be seen that Here, Kishorganj district has the highest value for total area of Influenced area. The total amount of Influenced area of Kishorganj are 379850 sq. km. The total amount of Influenced area of Brahmanbaria district is 249282 sq. km that is larger than the influenced area of Narshingdi district which is 165893 sq. km. So, the ranking of Kishorganj, Brahmanbaria and Narshingdi district is 1,2 and 3 rapidly based on the influenced area. In Functional Regionalization Kishorganj is mostly developed than B.Barria and Narshingdi district, B.Barria is in second position and Narshingdi is in last position in development based on Population Factor.

So, Kishorganj is the most developed region based on both Fisheries and Influenced area, Brahmanbaria is in second position and Narshingdi is in last position among these three district.

So, In which region there are a large amount of influenced area, the region are also economically developed like Kishorganj.

6. Conclusion

Development status can be measured by both Formal and Functional Regionalization. In Formal Regionalization Development can be determined by five factors on Fisheries sector. In Functional Regionalization Development can be determined by amount of Influenced area of a region. Here, three districts are selected as study area for the measurement of development for both Formal and Functional Regionalization and they are Kishorganj, Brahmanbaria and Narshingdi. Kishorganj is in the top position in development status based on both fisheries and influenced area, B.Barria is in second position and Narshingdi is in last position for both among three districts. Fisheries sector is one of the important sectors in agricultural sector in Bangladesh. Bangladesh is ranked third in the world among the fish producing countries. Fisheries sector plays a vital role in economical side in Bangladesh. Bangladesh earns about 500USD of foreign currency in every year by exporting fish and contribute 3.78% of the GDP. So. The development of fisheries sector means the economic development of the country.

So, in which region there are a large amount of influenced area, the region are also economically developed.

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Reference:

1. Klapka, P., Halas, M. Tonev, P., Bednar, M. (2013). Functional Region of the CZECH Republic: Comparison of Simpler and more Advanced Methods of Regional Taxonomy. *Acta Universitatis Palackianae Olomucensis – Geographica*, 4 (1), 45-57.
2. Wang, y., Gu, Y., Dou, M., Qiao,. (2018). Using Spatial Semantics and Interactions to Identify Urban Functional Regions. *International Journal of Geo-Information*. doi:10.3390/ijgi7040130
3. Glasson,J. (1974). *An Introduction to Regional Planning*. Hutchinson of London: Hutchinson & Co Ltd