International Academy of Science, Engineering and Technology
Connecting Researchers; Nurturing Innovations

IASET

RURAL GROWTH CENTER IDENTIFICATION USING INDEX METHOD: A STUDY ON RANGPUR UNION, DUMURIAUPAZILA, BANGLADESH

Md. Kamrul Hasan[1], Ayesha Siddika[2] & Md. Tufajjal Hossain[3]

[1,2]Lecturer, Department of Urban & Regional Planning, Pabna University of Science & Technology, Pabna, Bangladesh

[3]Research Scholar, Department of Urban & Regional Planning, Pabna University of Science & Technology, Pabna, Bangladesh

ABSTRACT

Rural Center can be compared with the Central Business District (CBD) of the arena. The rural Center performs as Center of economic, social and cultural activities in the rural areas. These are the venues where people exchange their ideas with their neighbors regarding improved methods of production and marketing and also serve as center of recreation. In Bangladesh, rural markets are considered as growth centers. There are about 8000 rural markets (hats & bazaars) in Bangladesh i.e. assembly market, primary market, secondary market & terminal market. But it is difficult to assess contribution of growth center in the areas of trade volume and turn over, employment opportunities and economic upliftment, social services improvement, infrastructure development, place to exchange knowledge on production and marketing and place of social gathering. To ensure that all the growth centers are provided with consistent infrastructure following a standard, a manual titled 'Manual for Growth Center Planning' has been prepared by Local Government and Engineering Department (LGED). The purpose of the study is to identify the present centrality of existing growth centers of 12 no. Rangpur Union of Dumuriaupazila, Khulna. There are various methods to measure the centrality of growth center. The most convenient weighted indexing method is used in the study. For data collection various participatory planning approaches are studied like Participatory Rural Appraisal (PRA), Focus Group Discussion (FGD). Eight service facilities have been selected as criteria and given weight for the calculation of rural centrality score. The selected criteria are education, bazar, health facilities, road quality, administrative facilities, utility facilities, religious center and service coverage of NGOs. After calculation, it has been found that ward no 6 has the highest score of 189. So it has been decided that ward no. 6 is the existing growth center ofRangpur union. From the study problems associated with the existing growth center have been identified which can be useful for further planning of rural growth center of Rangpur union.

KEYWORDS: Focus Group Discussion, Participatory Rural Appraisal, Rural growth center, Weighted Index Method

INTRODUCTION

Rural Growth Centre can be compared with Central Business District (CBD) of the arena which mainly performs as Centre of economic, social and cultural activities in the rural areas. These are the venues where people exchange their ideas with their neighbors regarding improved methods of production and marketing and also serve as Centre of recreation.[1] Moreover, Growth center is the focal points with a specific level of facilities.[2] So, it's a 'growing point'

included with its vicinity and its effects as spread of development. However, in Bangladesh, rural markets are considered as growth centers.[3] There are about 8000 rural markets (hats & bazaars) in Bangladesh[4] i.e. assembly market, primary market, secondary market and terminal market. Again, in the context of Bangladesh, growth centers are rural markets that have been identified by the planning commission on the basis of socio- economic and administrative criteria for making development investment.[3] Therefore, rural growth center planning is an important issue for the development of a country like Bangladesh. By rural growth center planning the growth center that means the rural market can be developed in a planned way. It is very important for our country, because Bangladesh is an agricultural country. If the rural markets are developed, marketing of agricultural products will be much more flexible and that will help the economic condition of the rural people. So, by rural growth center planning the socio economic condition of the rural people can be developed. Objective of the study is to identify the centrality of the existing growth center with the inconveniences or problems associated with the growth center.

Study Area

12 no. Rangpur Union of Dumuriaupazila is considered as the concerned study area, situated at the southeast part of Bangladesh. Rangpur Union is a traditional area located the middle point of the BeelDakatia. Education, Culture, Religious Events, Sport and also various sides of the union has been developed in the course of time. Total area is 36.98 sq. kilometer. Total area is divided into 9 wards where number of village is 8 and number of mouza is only 4. Around 86% people are literate here (BBS 2001).
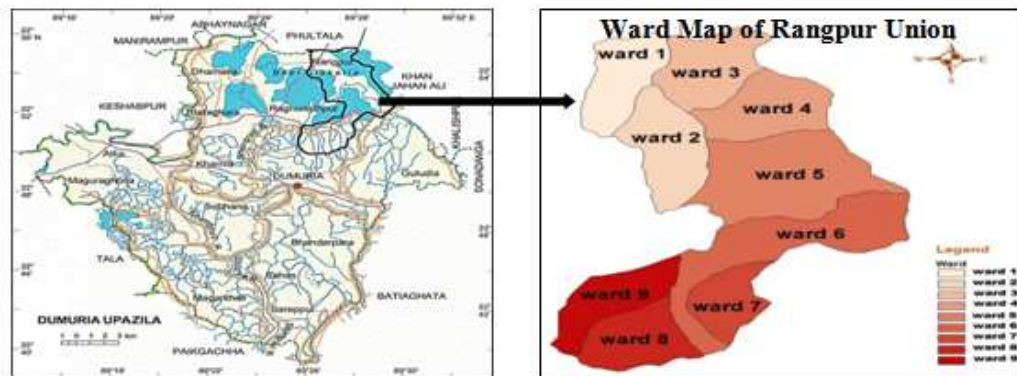

Figure 1: Location of the Study Area

LITERATURE REVIEW

Theoretical Framework

Participatory rural appraisal (PRA) is an approach used by Non-Governmental Organization (NGOs) and other agencies involved in international development. The approach aims to incorporate the knowledge and opinions of rural people in the planning and management of development projects and programs.

Social mapping is a visual method of showing the relative location of households and the distribution of different types of people (such as male, female, adult, child, landed, landless, literate, and illiterate) together with the social structure and institutions of an area.

Resource mapping a method for collating and plotting information on the occurrence, distribution, access and use of resources within the economic and cultural domain of a specific community Variations are introduced in selecting particular participant groups (e.g., gender) or in adding a further stage to generate a topographic map - related information

through a two-stage resource mapping process.

Mobility mapping aims at drawing attention to the various forms and types of academic mobility, allowing institutions to demonstrate the benefits, challenges and overall scope of mobility that extend beyond national or regionally prescribed quantitative measuring.

A Venn diagram or set diagram is a diagram that shows all possible logical relations between finite collections of sets. They are used to teach elementary set theory as well as illustrate simple set relationships in probability, logic, statistics, and linguistics and computer science.

The Determination of the Present Centrality of the Settlements

The material collected on functions, services amenities in combination with the spatial distribution of population can be used for the establishment of the existing hierarchy of rural centers. Two methods are used: Indexing and Guttman Scaling. The index method involves the collection of data on the nature and the number of services and facilities present in each of the settlements in the region concerned. These data are collected; it is possible to assign values to the functions that have been encountered per settlement. The totaling of these values per settlement results in the so-called centrality –score, which is actually an index for (the level of) functions in each settlement. The centrality-score is computed simply by means of noting the absence or the presence of a function and assigning the value accordingly. If a function is present in a settlement the value assigned may be 1, if it is absent it may be 0. Another technique for developing a weighting system, which is preferably based on a sliding scale per item, is used by Misra, Sundaram and Prakasa Rao [5]. Weighting system can be found in the application of methods that are ultimately based on threshold analysis or the minimum requirements method. This function is related to the population size of a settlement and assigning weights to a function accordingly. If a function occurs in a settlement with very small population weightage should be low. If it occurs in a settlement with a relatively large population weightage should be high. A final possibility to refine the weighting system is to take into account the number of the function of the same type. This procedure is very simple indeed: it calls only for the multiplication of the specific weight for a function by the number of same function present. Thus, if one shop accounts for 1 point, five shops bring the score to 1*5=5. Guttman scaling is especially useful in cases where data concerning the functional characteristics of settlements are largely lacking and if no time or money is available to gather them.

Case Study Based Literature Review

To establish different service areas and growth centers a study has been made in Suriname, Netherland; based on land used based aerial photographs, population density, geographical distribution of existing socio-economic services, settlement pattern and proposed land used using different PRA tools and techniques. Based on the concentration and functions of existing service areas a radius of 4 km was drawn to quantify it as a primary center in future. To qualify for the function of potential secondary centers a circle with a radius of 10 km was drawn around the existing centers on the basis of the already existing services. The final step was to check whether there was any need to place tertiary centers.

RESEARCH METHODS

The purpose of the study is to identify the present centrality of existing growth centers. There are various methods to measure the centrality. The most convenient weighted indexing method is used here. For data collection various participatory planning approaches are studied like Participatory Rural Appraisal (PRA), Focus Group Discussion (FGD). A reconnaissance survey is done to gather the general information of the study area like road network, connectivity and

geographical orientation. Three types of respondents are selected for the survey. Union Parisad chairman and the officials of union parishad office provide data about population, occupation, land distribution, crop production, poultry, fishery and livestock etc. Focus group people provide information needed to produce resource map of following area. Participatory rural appraisal (PRA) method is used to generate resource map by involving the focus group people. A survey is also conducted with involvement of the local people to determine the mobility between the wards. Three types of questionnaires are prepared for field survey. At first a checklist is prepared to collect data from union parishad office. Then ward wise information is collected through another questionnaire to address the problems and demand of local people. And at last one more questionnaire is designed to collect information required to produce a mobility map. After preparing the questionnaire, it is cross checked with Literature Review whether all required data would get from it. For data collection questionnaire survey was held by personal interview. Union parishad chairman and members helped by providing various census data. Participatory Rural Appraisal (PRA) and Focus Group Discussion (FGD) are used to collect data of individual wards. To determine the mobility between the wards, trip production data are also collected from general people. From the collected data required data are filtered and presented through various charts and table. At first, all the maps are produced by PRA method. Then the handmade map is digitized by using ArcGIS software for maximum accuracy. Detailed ward data are compared among each other. By this, potentiality of specific wards to specific services is determined. At first a suitable criteria is fixed to score the areas. Different services are weighted according to their importance. Eight service facilities with their following weight is given in Table 1.

Table 1: Selected Criteria and their Assigned Weightage (Designed by Authors)

Criteria	Weightage	% of Weight
Education	4	20
Bazar	4	20
Health Facility	3	15
Road Quality	3	15
Administrative Facilities	2	10
Utility Facilities	2	10
Religious Center	1	5
Service Coverage of NGOs	1	5
Total	**20**	**100**

It is necessary to select some sub weight for the categories under a service. Such as there are four categories in educational service like college, secondary school, primary school, kindergarten. And the weightage for these sub categories are considered as 4, 3, 2 and 1 respectively. In case of the services related to education, the service coverage is also considered. The higher coverage must have the higher weight. The final score is calculated using the following two criteria: **Score of the Criteria Education**= (Weight on service quality + Weight on Service Coverage) &**Score of other Criteria**= (Weight on service quality * No.). The result of the scoring process is further justified by some other criteria like connection with the city bypass, location & coverage and higher level service. The highest scoring areas have the maximum centrality. The inconveniences of the present growth center are determined by questionnaire survey. The constraints to the development of present growth center are identified and some recommendations are also made for the further development of this area.

Empirical Results based on Centrality Enquiry Analysis
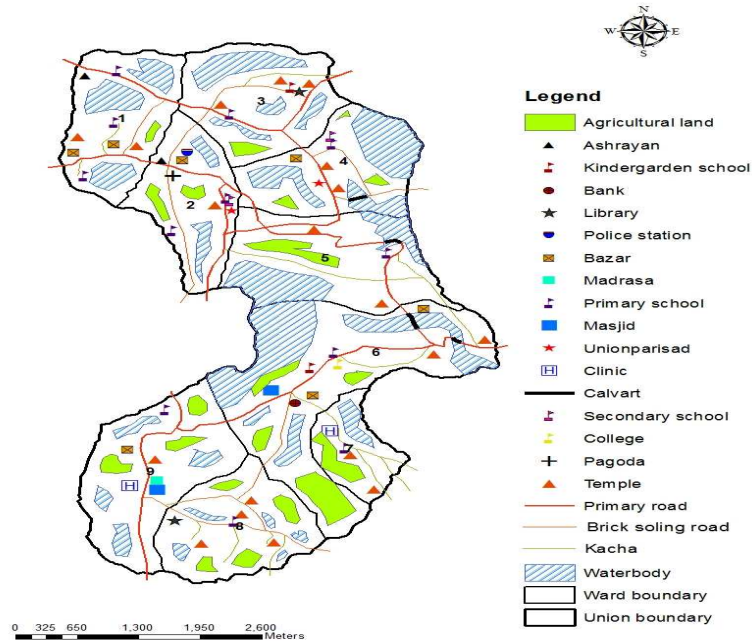

Figure 2: Resource Map of The Wards of Rangpur Union

On the basis of the criterion selected for the Centrality Enquiry Analysis a resource map has been produced showing the existing feature which would be helpful for the analysis. The resource map of our study area includes the location of Educational Institutions, Health facilities, Religious places, Policestation, Bazars etc. it also presents the existing road connection among the wards and to the facilities which are intend to be used for the analysis.
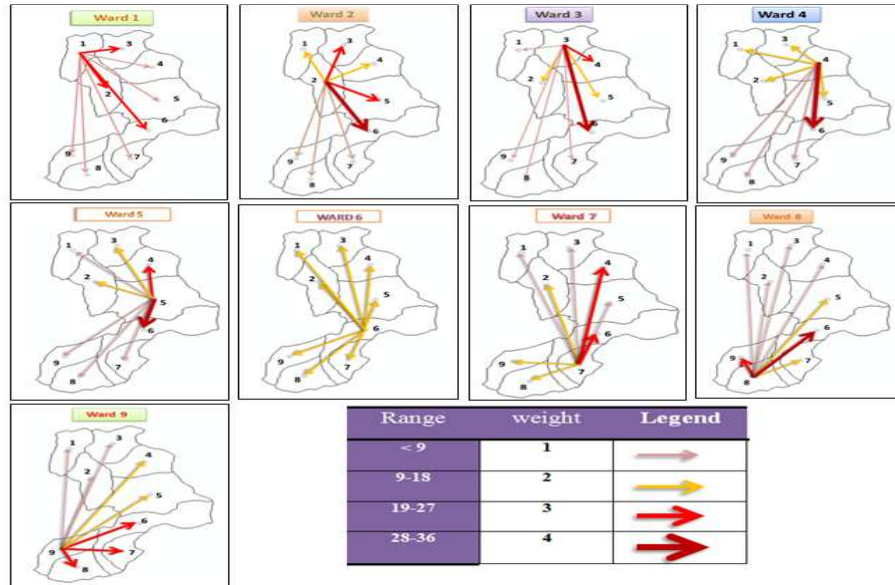
Figure 3: Mobility Map of the Wards of Rangpur Union

Based on criteria based service analysis in the study area a mobility map is produced considering various types of services like education facilities, health facilities, banking opportunities etc. which are responsible for generating mobility towards those wards.

Flow towards ward 06 is much higher for educational facilities, economical purposes, communications and other facilities. For ward 08 & 09 this flow is comparatively low and flow is generating towards them mainly for health facilities.

To find out potential growth center selected criteria is weighted and sub-scored. The criteria "Education" is sub-scored according to its service level (higher to lower) and service coverage (no of students). Other criteria are sub-scored according to their service coverage. After calculating the sub-score total, it was multiplied by its weight and adding all criteria's value the total score of a ward is found. Finally, the higher score represents the potentiality of an area to be developed as a growth center. For Ward No. 1 the final score is 74, for Ward No. 2 score is 83, for Ward No. 3 score is 63, for Ward No. 4 score is 100, for Ward No. 5 score is 64, for Ward No. 6 score is 189, for Ward No. 7 score is 74, for Ward No. 8 score is 77 and for Ward No. 9 score is 79.
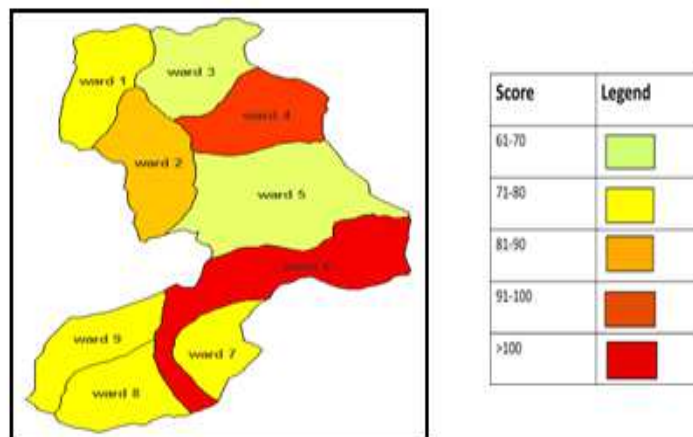

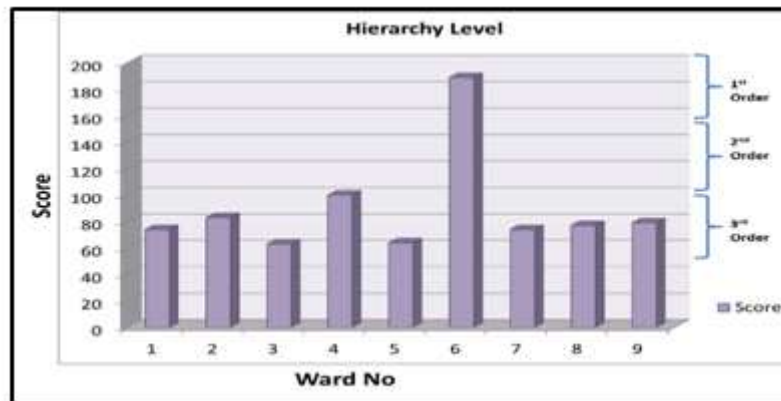**Figure 4: Map Showing Score of the Wards with Color Intensity**

Figure 5: Hierarchy Level of Different Wards based on Score

According to the score ward no 06 is the potential growth center of Rangpur Union and ward no 04 is the secondary center.

For the presence of direct connection with the city as well as well-established road network, among the nine wards only ward 06 has a direct connection with the Khulna city bypass road. Centrally located place can cover and serve the whole area uniformly and properly, as it generates a circular service zone. Geographically word no 06 is located centrally, so with a planned development the area can serve the whole Rangpur Union. With contrast to others, ward no 06 consumes higher level services, which is the primary consequence of a center. With the presence of higher level services, ward no 06 constitutes a very high score (score of ward 06 is 189 when the 2nd highest score is 100). So, the union has no other potential growth center which can conflict with the decision.

Based on the criteria fixed for the analysis, considering the present scenario of ward no. 6, there presents one primary school, one high school, one college, two bazars, a bank, a mosque and some religious places. From the study, it is found that there are some existing constraints regarding of the potential growth center. The center does not provide any health facilities, no adequate security system is present, and shape of the center is very arbitrary which can hamper its service distribution. Also there exist insufficient administrative facilities. As many water bodies present in the area it has been considered as flood prone area which is also a major problem for the development of potential growth center.

CONCLUSIONS

The constraints associated with the potential growth center may be overcome, if the local people and the local authority work together in many ways. To strengthen the area's economic base the center should be planning with a well-established **Fish market** as well as a fish processing center, a 250 bed hospital (according to the population density) should be established to ensure public health, necessary administrative office should be placed in the center, sufficient security facility should be provided and also special security services for the flood period like Flood rehabilitation center should be designed, communication network should be organized properly to make the center easily accessible by the whole union as well as the city and the center plan should be designed to control the growth of the area and placement of households.

REFERENCES

1. *Mondal, K., B., and Das, K. (2010). Role of Growth Center: A Rural Development Perspective. Journal of Bangladesh Institute of Planners, Vol. 3, pp. 129-141. Retrieved from http://www.bip.org.bd/SharingFiles/journal_book/20130722135304.pdf*

2. *Economic and Social Commission for Asia and the Pacific (1979). Economic and Social Survey of Asia and the Pacific 1979. Retrieved from*

3. *https://www.unescap.org/sites/default/files/publications/Economic%20and%20Social%20Survey%20of%20Asia%20and%20Pacific%2C%201979.pdf*

4. *Local Government and Engineering Department (1995). Manual for Rural Growth Center Planning, Dhaka.*

5. *World Bank (1996). World Development Report 1996: From Plan to Market. New York: Oxford University Press. © World Bank. Retrieved from*

6. *https://openknowledge.worldbank.org/handle/10986/5979*

7. *Misra, R. P., Sundaram, K. V., &Prakasa, R. (1974). Regional development planning in India. A new strategy. Vikas Publishing House.*