

Spatial Distribution of Market Centers

Md. Morshedul Islam

Environmental Science, School of Environment, Beijing Normal University, Beijing

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ABSTRACT

The present study is attempt to find the location pattern, distribution and their sphere of influences of market centers in Rangpur City Corporation, Bangladesh. Rangpur is facing some problems like traffic jam, noisy environment, population pressure etc due to the over population in full day long in the centre of this city, all of the whole sale and retail sale markets are located in the middle. Location of Market is always influencing the daily life of the city population who are directly or indirectly connected with the market. If the market strategically distributed in an area they don't faces such kind of problems. Analysis or investigation shows that, at about all of the market centers are located in the center of Rangpur and in the residential area of Rangpur. The maximum 67% market centers are found in the high income residential area. Rangpur City Corporation, Bangladesh Bureau of Statistics and survey of Bangladesh provided the maps, reports and relevant documents of the study. The spatial dispersion pattern of market centers is clustered together at one place 0.33(Nearest Neighbor Index value, R) found in the study area. Geographical Information System (GIS) and other software also used to analyze the maps and diagrams. Investigation refers that, market of Rangpur city have a clustered pattern and different levels of market centers found on the bases of centrality scores. By this centrality scores or levels, found the variation of influencing spheres of market centers in Rangpur City.

SARI PATI

Penelitian ini mencoba menemukan pola lokasi, distribusi, dan lingkup pengaruh pusat pasar di Rangpur City Corporation, Bangladesh. Rangpur menghadapi beberapa masalah seperti kemacetan, lingkungan yang bising, tekanan penduduk, dan lain-lain, karena populasi di siang hari di pusat kota ini penuh, seluruh penjualan dan pasar penjualan eceran berada di tengah. Lokasi pasar selalu mempengaruhi kehidupan sehari-hari penduduk kota yang secara langsung atau tidak langsung terhubung dengan pasar. Jika pasar terdistribusi secara strategis di suatu daerah, mereka tidak menghadapi masalah seperti itu. Analisis atau investigasi menunjukkan bahwa, di hampir semua pusat pasar terletak di pusat kota Rangpur dan di daerah perumahan Rangpur. Sampai maksimal 67% pusat pasar ditemukan di daerah perumahan berpenghasilan tinggi. Rangpur City Corporation, Biro Statistik dan Survei Bangladesh

Corresponding author:
201629180012@mail.bnu.edu.cn

menyediakan peta, laporan, dan dokumen penelitian yang relevan ini. Pola penyebaran spasial pusat pasar dikelompokkan bersama pada satu tempat 0,33 (Nilai Indeks Tetangga Terdekat, R) yang ditemukan di wilayah studi. Sistem Informasi Geografis (SIG) dan perangkat lunak lainnya juga digunakan untuk menganalisa peta dan diagram. Investigasi menyebutkan bahwa, pasar kota Rangpur memiliki pola berkerumun dan tingkat pusat pasar yang berbeda ditemukan di basis nilai sentralitas. Dengan nilai sentralitas atau tingkat ini, ditemukan variasi lingkup yang mempengaruhi pusat pasar di Kota Rangpur.

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INTRODUCTION

Bangladesh is a developing country and the cities of Bangladesh are not so developed. One of the most traditional businesses of Bangladesh is the retail and whole sale trade. Due to the growth of population it's always expanding and changes the consumption pattern (PAS/USDA, 2004). Market center is the very new addition to the retail sector in Rangpur where 251699 people live. Basically market centers are considered as a large shop in a clean and friendly environment with a wide range of product at affordable prices. To see, touch, feel and select the products, customers are free to move around the well displayed shelves and also buy without bargaining (O'Brien and Harries 1991). Super centre and departmental store are differentiated by the variety of products and size of the outlets (HMC, 2000). Varieties of products or the first moving consumer goods like household, stationeries, cosmetics etc are include as the daily goods.

The city as a collective project exists because its public spaces exist as well (Ruben, 2012). These public spaces have an important role regarding the environmental, economic and social context in the city as well as sources or provides of life, quality and sustainability (Chiesura, 2004). Basically the public spaces are spaces of socialization where the interpersonal relationships are generated and these relationships are generated and these relationships and different kinds of them or their

intensity may vary regarding place characteristics, time of use and frequency of social interactions. (Ghel, 1956).

As urbanization and industrialization swept through Bangladesh in 20th centuries, the business of producing food and distributing it to consumers grew more and more specialized and food production and trade were conducted on a national scale as larger and larger businesses' used railroads, highways and refrigeration to broaden their reach. These trends eroded the sales and support of public markets, and by the 2000s, supermarkets had eclipsed and the old public markets in both convenience and sales volume and many public markets either closed or fell into disrepair. Architectural historian Helen Tangires began the research for her 2003 study of public markets in 19th century America under the assumption that these markets were relics of the past, the public market will continue to be vital in sustaining agriculture, biodiversity and a healthy relationship between urban and rural populations, economics and production. Despite the changes in society and in cities that led to the decline of public markets.

Markets can take many forms. Just as shopping centers can be broadly categorized by prototypes (e.g., community center, power center etc.); there are several different types of public market. Markets range in size, complexity, physical plant,

capital requirements and level of risk for market sponsors.

The market adjusted conversions since the late 1990s have led to spectacular changes in urban Bangladesh. Among other results, accelerated financial development, fast urbanization and radical spatial restructuring are the most important and will persist to have far reaching outcomes on urban development. Bangladesh became almost in the middle income economic country in the world in 2012, and its level of urbanization raised from less than 2.9% in 1980 to over 23% in 2011. Throughout this obscured process, urban space has understood not only development on a large scale but also expansion in inner areas (Ma & Wu, 2005). Rangpur is facing some problems like traffic jam, noisy environment, population pressure etc due to the over population in full day long in the centre of this city, all of the whole sale and retail sale markets are located in the middle. Location of Market is always influencing the daily life of the city population who are directly or indirectly connected with the market.

To deal with these problems and to gain greater urban expansion goals, including advanced quality of life, safety and social agreement, schemes such as elegant cities, low carbon cities, natural cities and being familiarized urbanization (Chen, Wang, Zhang, & Zhang, 2011; Chen & Zhu, 2009; Qiu, 2009) have been recommended. However, these collections do not make available a clear outline, particularly from a spatial point of view. The space time behavioral approach can not simply present a unique standpoint for understanding the multifaceted relationships between human movement and the urban environment (Kwan, 1999) but also exact planning approaches from the perspective of dweller's daily life requires (Obergh, 2005; Ratti, Pulselli, Williams, & Frenchman, 2006). A main objective of this study is to focus the location and distribution pattern of market centers with the sphere of influences to the resident's daily life and also built sustainable environment.

Aim and Objectives

The aim of this study is to explore the location analysis of whole sale and retail sale trade centers or market in Rangpur city. In addition, to gain an understanding of the associated influences of location of market for the individuals who are closely related to the market. The main objectives of this study are:

1. To identify the location and distribution pattern or spatial variation of market centers.
2. To investigate the sphere of influence of market.
3. To document the strategies of market centers development in Rangpur city.
4. To figure out the influencing ranking of the market according to their location.

Literature Review

Bangladesh Context

Markets are the very authentic places where reflect the scenario of the country. So market is an important indicator to know the economic conditions of the country. By knowing the prices we can justify the socio-economic situation of a particular area (**RDRS Bangladesh, 2013**). The marketing system and structure is one of the main circumstances of socio economic condition of the local people and production system of any area. With intra-linkage and inter-linkage from production sector to consumer sector, it is a chain of various systems involved in marketing. Production is a necessary part of the marketing process to make a whole complete (**Alam, 2010**). In Bangladesh, marketing is almost exclusively maintained by the private sector. Four distinct tiers viz. primary, secondary, higher secondary and consumer market of marketing systems are observed in the process of distribution in Bangladesh (**GoB, 2005**).

Main constraints of marketing are related to infrastructure, plant management and institutional management aspect. From the infrastructural constraints, lack of modern, hygienic centers; illiteracy, ignorance, lack of awareness and poor

socio-economic condition of the traders; shortage of adequate freezer storage; lack of handling and preservation facilities etc are the most severe (Elahi, 1972). Lack of proper knowledge of modern sanitation techniques in controlling plants; ignorance or careless in managing personal hygiene of the worker, etc are also regard as the constraints of marketing. Extra pressure on the producers to provide undergrad products in order to maintain a quantitative balance between demand and supply exists (Eusuf, 1995).

However, the urban producers may have knowledge of other factors that are highly relevant for the innovation process, such as local socio-economic dynamics, opportunities to get access to resources, the market situation or typical urban risks, and the capacity to innovate and learn from experiences. Urban producers tend to engage more in direct marketing of their produce, in the form of fresh products (farm sales, local outlets and mobile shops, farmers' markets, direct sales to shops, restaurants and supermarkets), processed foods (preparation and vending of foods in local food stands and small restaurants, packaging, etc.) (Zahan, 2010).

International context

“KERRY VANDELL and CHARLES CARTER (1994),” most research and writing in the area of retail store

location and market analysis has been undertaken by marketing researchers and urban geographers. “P. Waddell and A. Boming(2003),”urbanism is a new urban simulation model, developed over the past several years, which is now operational in three urban areas in the United States. Benjamin Hibbard (1921) notes that, whenever people fail to produce all the goods they need to live, they try to exchange some of what they have for some of what they don't. Markets are where such people meet. Geographer Jane Pyle's (1971) essay on American farmers markets notes that special boards controlled markets in ancient Greece, that the senate claimed the right to establish markets in ancient Rome, and that kings in the European middle ages continued to assert rights over market establishment. Helen Tangires and Peter Faneuil's (1742), prior to the construction of market house, early open air markets were subject to the vagaries of weather, which led to demand from both buyers and sellers for sheltered markets that would permit the conduct of business regardless of conditions. Charles Mulford Robinson (1893), the rise of city planning also contributed to the public markets decline in importance. Donofrio (1913), Public retail markets experienced a resurgence in the years around world war one. The United States department of agriculture developed an office of public markets in 1913 in order to aid local food production and distribution.

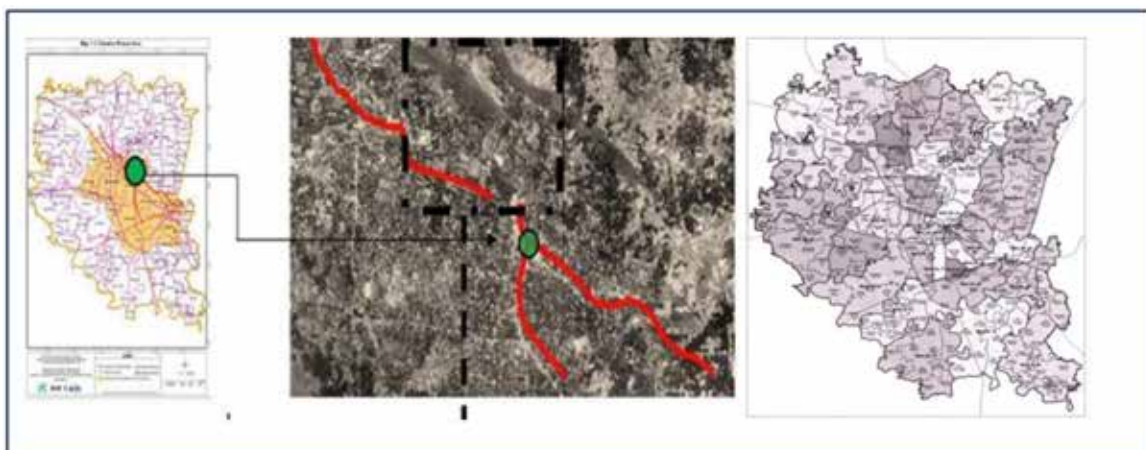


Figure 1. Study Area and aerial view of study area

METHODS

To fulfill this objective, intensive field work is done for this analysis. Through the secondary sources the necessary data are collected which are involved in the study. Reconnaissance survey has been formulated having three main parts. All of these were designed to collect data from necessary persons like market officer of City Corporation, secretary of dokanmaliksomiti and the related officers of market and also some important primary data are collected from customers, administrators and sales forces in the reconnaissance survey in study area. Nearest neighbor method is applied for measurement the expansion of market centers which method evolved by Clark and Evans (1954).

Where,

$$R = \frac{D_{obs}}{D_{ran}}$$

R = nearest neighbor index,

D_{obs} = measured mean distance between nearest neighbor point.

D_{ran} = expected mean distance if all points are randomly distributed.

$$D_{obs} = \frac{\sum X}{N}$$

Where,

$\sum X$ = point total,

N = point number

$$D_{ran} = \frac{1}{2\sqrt{\frac{N}{A}}}$$

Where,

N = point number and,

A = Total area of Rangpur city

Centrality score is help to determine the hierarchy of trade centers and origin of respondents is help to found the sphere of influence of the market centers.

RESULTS AND DISCUSSION

Market centers over time in Rangpur

At first only a few markets were established in Rangpur city in 2000. After that the number of market has increased year by year and reached at about 25 in 2015. Maximum establishment of markets is observed in 2007, which is three times more than that of the previous year 2005, due to the dramatic changes of marketing style of the city dwellers. The percentages of growth of markets were in decreasing trend in 2009. However, this trend of growth did not last for long and increase of percentage growth rose again in 2011 and that was 20. This trend of growth remains in different rate till today. These markets are also expanding for local products, encouraging new entrepreneurs and also catering for a variety of imported products.

Location Analysis of Market centers

The maximum numbers of markets are located in the high income residential area (67%) in which about 39% in Jahaj Company followed by 18% in medical area and 5% in Grand hotel more area.

Nearly 25% Markets are located in the middle income residential area, modern mor, lalbag, terminal area, mahigang, c.o bazar, shapla etc.

Spatial Dispersion of Market Centers

The result of computation according to the nearest neighbor statistic on the spatial dispersion pattern of markets in the study area shows their geographical distribution. The value of nearest neighbor "R" is found 0.33 which explain that the patterns of markets are clustered. The value of $R=0$ means all the markets are clustered together at one place, where $R=1.0$ indicates random which implies that there is clustering as well as widely distributed centers.

In Figure 3 the point denotes an area of Rangpur City Corporation, which is also may called the center point of the markets of Rangpur city corporation. Rangpur is a very new city corporation in Bangladesh, due to this reason the city markets are not so well planned.

Table 1. Year of establishment of market in Rangpur city

Year of establishment	Frequency	Cumulative frequency	Percentage of change
2001	5	5	0
2003	3	8	60
2005	1	9	11.33
2007	8	17	1
2009	1	18	10
2011	2	20	20
2013	1	21	10
2015	4	25	

Source: City Corporation Rangpur.

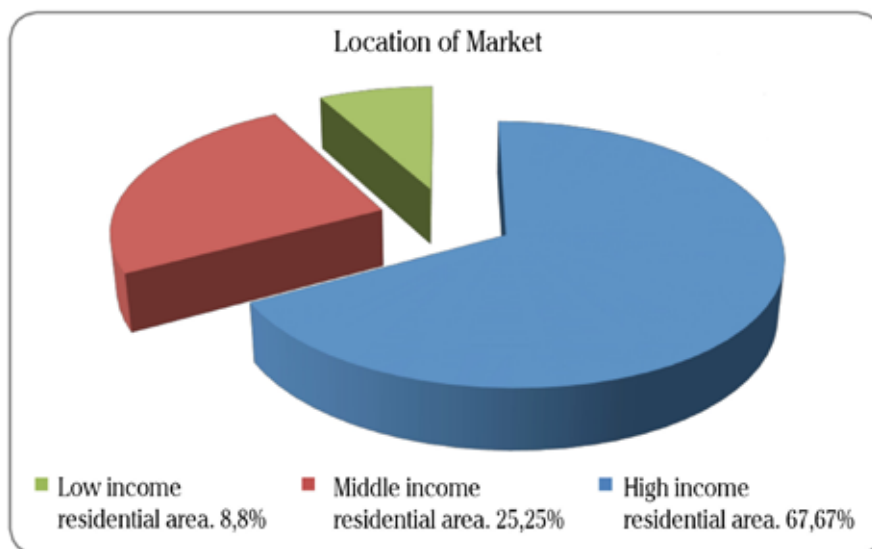


Figure 2. Location of Market in Rangpur City

Basically maximum markets of this city located in the Jahaj Company area or near with the area. Payrachattar is one of the most trading or business area of Rangpur, which is situated just near with the Jahaj Company area Figure (a).

Figure (b), denotes that market which is the most facilitated market in Rangpur City Corporation, this denotes the location of Jahaj Company shopping complex. This is also located near with the Jahaj company area. As like that, super market,

community market, city bazaar and shah amanot shah market, which are in the figure c, d, e, and f are also proved that these market situated near or around an specific area, that's why its proved that the market centers of Rangpur city corporation have a clustered pattern.

Sphere of Influence of Some Market centers

Due to an in depth analysis or study of present position potentialities etc. of market centers of an area, identification of hierarchical order of centers

Table 2. Name of the Markets, their Locations and distributions in Rangpur city

Market			Market			
Area	Name	% of Grand total	Area	Name	% of Grand total	
High Residential Area	Jahaj Company Mor	Shopping complex		Modern Mor	Ashraf Market	7
		Amanot shah			Modern Bazar	
		Super market			Parker Mor Bazar	
		Jahaj company mor Market		Lalbag Bazar	Lalbagh Plaza	4
	Medical Mor, Dhap	Karuponno market	Lalbagh Bazar			
		BGB market	KhamarMor Bazar			
		BGB market	ShaplaMor	Station road Bazar	7	
	C.O bazaar	Shapla Bazar				
	City Bazar	Community Market		Kamar Para		
		Raja Ram Mohan Market	Terminal Mor	Terminal Bazar	4	
		City Bazar		Badarganj Road		
	Grand Hotel Mor	Salek Market	3	Mahiganj Bazar	Satmatha Bazar	2
Jaman Market		Mahiganj Bazar				
Grand Hotel Bazar						

Source: City Corporation Rangpur

is very important. A selective approach is considered in respect of the provided service. The services scores and total scores of the services considered are given in Table 3, and After the calculation according to the score we can stratify the hierarchy level of market centers, see Table 4.

MANAGERIAL IMPLICATIONS

This study investigated that, Rangpur's market are located in clustered position, we know the cluster means maximum markets are in together. These kind of location creates such kind of problems on

the residents of Rangpur city corporation. These results also shows that the supermarkets and even maximum wholesale and retail sale trade centers are located in the high and middle income residential area of the city and these markets also giving the benefits which may seeking the customers that's why people from the long distance also coming to these markets for taking their staff. The result also gave the clear evidence that, cluster pattern market location in city corporation creating more problems.

Clustered pattern of Rangpur city Markets

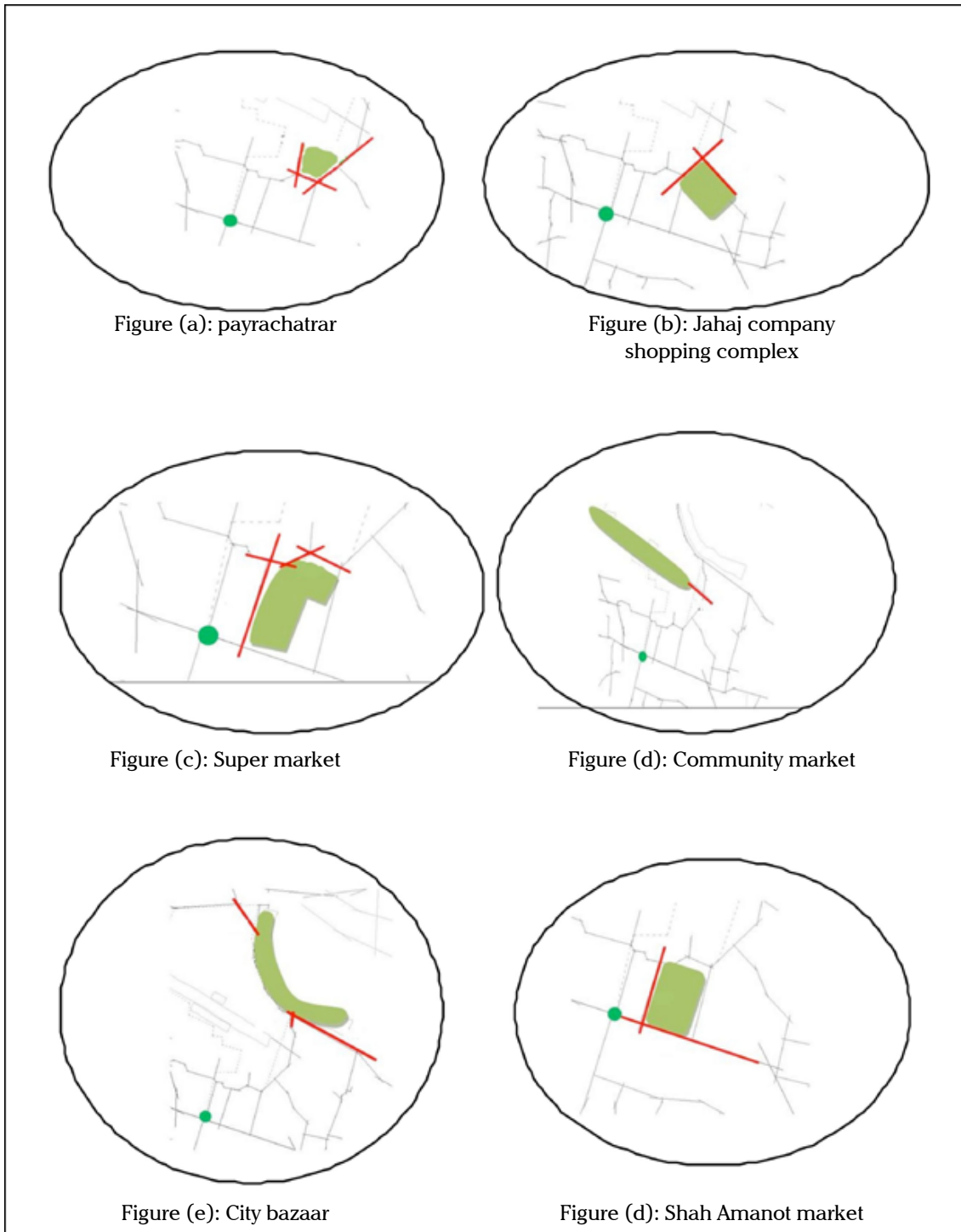


Figure 3. Clustered Pattern of Rangpur city Markets

Table 3. Services scores and total scores of the services

Service facilities	Weight age
Variety of products in number – 6	10
Monthly sales in taka – 7000	10
Number of daily customers in person – 100	10
Product line in number – 500	10
Parking facilities available	10
Parking facilities not available	00
Total number of staff in number – 5	10
Have security force	10
Don't have security force	00
Opening hour per day – 10	10

Service facility on the basis of public opinion

Service facilities	Weight age
Maximum percentage of satisfaction has been considered as bad	00
Maximum percentage of satisfaction has been considered as good	10
Maximum percentage of satisfaction has been considered as very good	20

Table 4. Level of Market Centers

Market center	Score
Jahaj company shopping complex	90
Super market	80
Karuponno, Rangpur	80
Golden tower	70
Raja rammohonroy market	70
Community shopping centre	70
Salek market	70
Jaman market	70
Lalbag plaza	60
BGB market	60
Ashraf market	40
City market	80
Nowabganj Bazar	50
Terminal Bazar	60
Shah Amanot Shah Market	40
Mahiganj Bazar	40
C. O. Bazar	60
Dhap Bazar	70
Modern Bazar	60
Station Bazar	60

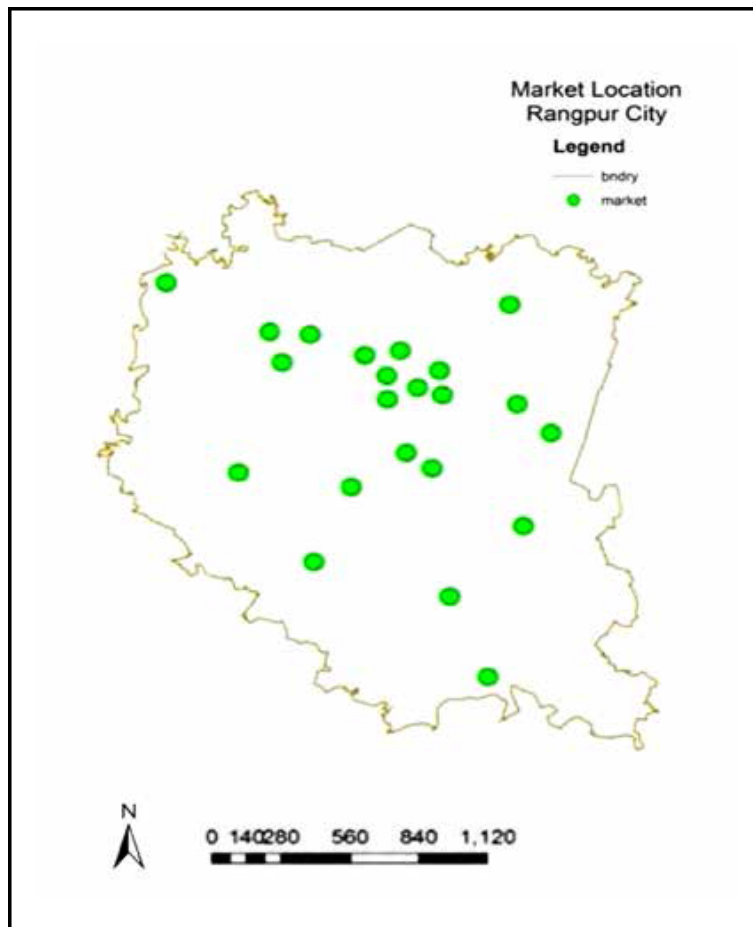


Figure 4. Location of Market in Rangpur City

If you compare to the Rangpur city corporation to the other city of the world which are well planned you may found one of the major difference is market location. The markets of well planned city basically their nearest neighbor index value always focus the scattered pattern of market and their sphere of influence almost same all over the city markets.

CONCLUSION

Almost 70 per cent of us live and work in towns and cities. Nearly all of us depend on them for meeting friends and colleagues, for shopping, entertainment, leisure, culture, public services and transport. As individuals and families, we depend on them for jobs. As businesses, we depend on them for our survival, profits and growth.

But high streets are changing, and there is a realization that retail space may have to shrink in some cases to survive. This does not mean that high streets should disappear or stop reinventing themselves, just that they will be simply different in the future. Market oriented conversions in urban Bangladesh have led to a essential restructuring of not only urban area but also citizens lifestyles. As a demonstration of the communication between behavior and urban space, citizens daily movement space conversion from daily life circle stand on socialist production to an interlinked and expanded condition. Though dwellers have enjoyed noticeable improvements in superiority of life, especially in material reverences, the problems of long travels, high carbon discharges and social separation have become barriers to social and environmental sustainability in urban development. ■

REFERENCES

- Alam , M. J. et al, 2010, A study on fish marketing system in Swarighat, Dhaka, Department of Fisheries, University of Dhaka, Dhaka-1000, Bangladesh, pp. 96.
- Alamgir, M. 1973, Problems of Urbanization in Bangladesh. Dhaka: Bangladesh Institute of Development Studies (Mimeo).
- Chen, F., & Zhu, D. (2009). Research on the content models and strategies of low carbon cities. *Urban Planning Forum*, 7e13.
- Chen, M., Wang, Q., Zhang, X., & Zhang, X. (2011). Study on the system of evaluation for wisdom city constructionNanjing as the case. *Urban Studies*, 18, 84e89.
- Clark, P.J. and Evans, F.C. 1954, Distance to Nearest Neighbor as a measure of relationship in populations *Ecology*, Vol. 35, pp, 445-453.
- Dixit, R. S. 1984. *MarketCentersandtheirSpatialDevelopmentin Upland of Kanpur*. Allahabad: KitabMahal,pp.2---10.
- Elahi, K. M. 1972, *Urbanization in Bangladesh*. Centre for Urban Studies, Department of Geography, Dhaka: Dhaka University.
- FAS/USDA. 2004. *Bangladesh: Retail Food Sector*. US Embassy, Dhaka, Bangladesh.
- Fugate, D.L. (2007), 'Neuromarketing; a layman's look at neuroscience and its potential application to marketing practice', *Journal of Consumer Marketing*, 24(7): 385–94.
- Galliers, R.D. and Sutherland, A.R. (2009), 'The evolving information systems strategy', in Galliers, R.D., Leidner, E.D. and Baker, B.S.H. (eds), *Strategic Information Management*, 2nd edn, pp. 31–60.
- General Economics Division, Government of the Peoples Republic of Bangladesh, *Perspective Plan of Bangladesh (2010-2021)*
- GoB and UN. 2005, *Millennium Development Goals: Bangladesh Progress Report*, Government of Bangladesh.
- Gounaris, S.P., Panigayrakis, G.G. and Chatzipanagiotou. K.C. (2007), 'Measuring the effectiveness of marketing information systems: an empirically validated instrument', *Marketing Intelligence and Planning*, 25(6): 612–31.
- Government of the people's republic of Bangladesh Ministry of local government, rural development and co operative's Local government engineering department. Consultants; joint venture of engineering and planning consultants ltd. (EPC), Ehsan khan Architects ltd. (EKAR), data experts pvt. Ltd. 2012, "Preparation of Master plan for Rangpur divisional town under district town's infrastructure development project- inception report."
- HMC. 2004. *The American Heritage, Dictionary of the English Language*. Fourth Edition. Houghton Mifflin Company. New York.
- Kenning, P., Plassman, H. and Ahlert, D. (2007), 'Applications of functional magnetic resonance imaging for marketing research', *Qualitative Market Research: An International Journal*, 10(2): 135–52.
- Kotler, P. and Keller, K. (2009), *Marketing Management*, 13th edn, London: Prentice- Hall, p. 107.
- Kwan, M. (1999). Gender, the home-work link, and space-time patterns of nonemployment activities. *Economic Geography*, 75, 370e394.
- Lancaster, G. (1993), 'Marketing and engineering: can there ever be synergy?', *Journal of Marketing Management*, 9: 141–53.
- Lancaster, G. and Massingham, L.C. (2002), *Essentials of Marketing*, 4th edn, Maidenhead: McGraw-Hill, pp. 175–6.
- Lee, N. and Broderick, A.J. (2007), 'The past, present and future of observational research in marketing', *Qualitative Market Research*, 10(2): 121–9.
- Lee, N. and Broderick, A.J. (2007), 'The past, present and future of observational research in marketing', *Qualitative Market Research*, 10(2): 121–9.
- Lorenzen, D.N. (1978). "Warrior Ascetics in Indian History.". *Journal of the American Oriental Society*. (American Oriental Society) 98 (1): 617–75. Doi: 10.2307/600151. JSTOR 600151.
- Ma, L. J. C., & Wu, F. (2005). *Restructuring the Chinese city changing society, economy and space*. USA and Canada: Routledge.
- McCarthy, E.J. (1960), "Basic Marketing: A Managerial Approach", Richard D. Irwin, Homewood, IL.
- O'Brien, Larry and Frank Harris. 1991. *Retailing: Shopping, Society, Space*. David Fulton Publishers, London.
- Oberg, S. (2005). H € agerstrand and the remaking of Sweden. € Progress in Human Geography, 29, 340e349.
- Our Correspondent, Rangpur (2012-07-02). "Rangpur turns City Corporation". *TheDailyStar.net*. Retrieved 2013-06-11.
- Qiu, B. (2009). The transformation trends of urban development model in Chinadlow carbon eco-city. *Urban Studies*, 16, 1e6
- Rangpur, Rangpur, RangpurSadar". *Geopostcodes.com*. Retrieved 2013-06-11.
- Ratti, C., Pulselli, R. M., Williams, S., & Frenchman, D. (2006). Mobile landscapes: using location data from cell-phones for urban analysis. *Environment and Planning B: Planning and Design*, 33, 727e748.
- Rouf and Jahan, 2009, *Spatial and Temporal Patterns of Urbanization in Bangladesh*.
- Senior, C., Smyth, H., Cooke, R., Shaw, R.L. and Peel, E. (2007), 'Mapping the mind for the modern market researcher', *Qualitative Market Research: An International Journal*, 10(2): 153–67.
- Senior, C., Smyth, H., Cooke, R., Shaw, R.L. and Peel, E. (2007), 'Mapping the mind for the modern market researcher', *Qualitative Market Research: An International Journal*, 10(2): 153–67.

Tariq, T. and Nilufer, F. 2013, integrating the recreational spaces of Rangpur City Corporation, Bangladesh: a perspective from space syntax, Ninth International Space Syntax Symposium.

Urban Planning. Editorial forms, 2005, Urban Geography, Delta Book Publishers, Dhaka, Bangladesh, 310-340.

Vetschera R., (1986), "Sensitivity analysis for the ELECTRE multicriteria method", Zeitschrift Operations Research, vol. 30, pp. B99-B117

www.geopostcodes.com, Geo Postcodes, ZIP codes, ZIP Codes, gazetteer, Postcodes. "ZIP Code database of Bangladesh.

"Journey to Rangpur City Corporation". Archived from the original on 2015-06-17. Retrieved 2015-06-17.

"Rangpur". Britannica. Archived from the original on 2015-06-17. Retrieved 2015-06-17.