



STRUCTURAL CHARACTERISTICS AND SPATIAL ORGANISATION OF RAW FOOD MARKETS IN RAJSHAHI CITY, BANGLADESH

Md. Shahidul Islam ¹, Md. Masud Parves Rana ², Raquib Ahmed ² and
Md. Mujibor Rahman ^{3*}

¹Department of Geography, Pabna College, Pabna, Bangladesh

²Department of Geography & Environmental Studies, Rajshahi University, Rajshahi 6205, Bangladesh

³Environmental Science Discipline, Khulna University, Khulna 9208, Bangladesh

KUS 07/36-051107

Manuscript received: November 5, 2007; Accepted: December 30, 2007

Abstract: The urban raw food markets of the Rajshahi City play a pivotal role to supply foods to the urban people. These food markets are very essential places in the commercial areas, which are dispersedly distributed over the city. The markets are found not grown up according to a master plan of the city. From this point of view, this study focuses on the structural characteristics and spatial organisation of the raw food markets of the city. The study also attempts to discuss historical background of the markets and their service area. It is revealed that the structural characteristics of all markets of the city are not sufficiently developed and also their spatial distribution are not well organised.

Key words: Food market, market structure, spatial organisation, CBD

Introduction

Market places are sites with social, economic, cultural and other referents where there are a number of buyers and sellers, and where price offered and paid by each is affected by the decision of the others (Belshaw, 1965; Berry, 1967). The food markets are primarily meant to supply of foods and they also have a few pottery shops, flour mills, tea stalls and others. The number of shops of different categories depends mainly upon the number and income of the families served and secondarily upon the food habits of the buyers, and the special facilities offered by the markets (Khan, 1963). Raw food markets are very important to the urban dwellers. The people of the city collect their everyday needs from these markets. It is one kind of meeting place where a number of buyers and sellers get together to exchange their demands (Berry, 1967). The most distinctive feature of the retail structure of Rajshahi is the overwhelming predominance of only one node, named Shaheb Bazar. Half of all the shops of the city are situated within a distance of less

* Corresponding author: E-mail: mujibor_rahman@yahoo.com ; mujib@ku.ac.bd ; Cell: 01712 218847
DOI: <https://doi.org/10.53808/KUS.2007.8.2.0736-L>

than one-third of a mile from the peak land value intersection (Arephin and Ahmed 1990). With the pace of urban development or urbanisation, the city's raw food markets have been developed in nature and number. Although, this development was not occurred according to a master plan of the city.

The significant growth of Rajshahi City occurred during the last 55 years, which is located on the bank of the River Padma. This City is the headquarters of the Rajshahi division and the forth-largest city of Bangladesh. It became a municipality in 1876, and became City Corporation in 1987. It is also a metropolitan city designated in 1992. At present, the city's metropolitan area looks like an inverted 'T'. The growth pattern of the city (metropolitan area) covers about 127 square kilometres, although the developed portion is only 51 square kilometres (Khan, 2002).

In Rajshahi City, there are 28 raw food markets, which are randomly located over the city area. Shaheb Bazar is the central and large market of the city. This market is characterised by both wholesale and retail marketing system. The rest of the city markets have been established being influenced by this large central market. The structural pattern of raw food markets of Rajshahi City is not uniformly distributed and organised. Service pattern is also not up to the marks as the people demand. This is because of the unplanned growth and distribution of markets. This paper seeks to identify the structural characteristics and organisation of raw food markets of Rajshahi City. The specific objectives were-

- (i) to explain the historical background of raw food markets in Rajshahi City;
- (ii) to show the structural characteristics of raw food markets; and,
- (iii) to examine the spatial organisation and service area of the raw food markets of Rajshahi City.

Material and Methods

The methods of this study include empirical field observation and data collection through questionnaire survey. Primary data was collected from 28 raw food markets of Rajshahi City. The sample size of the data was fixed on the basis of stratified random sampling. From all the markets, every seventh shop of different categories was surveyed through structured questionnaire. By this way, out of 3,741 sellers, 500 sellers were questioned as respondents' to collect necessary data on marketing and selling system. On the other hand, data was also collected from 500 consumers through spot survey by structured questionnaire. The secondary data was also used to make conceptual framework and discuss historical background. The data was analysed through general statistical methods. In order to rank the market according to their centrality, a location coefficient was calculated for each functional type by the following formula:

$C = t/T \times 100$ where, C= Location Coefficient; t= an outlet of a particular category (which means 1, a constant everywhere) and T= Total number of outlets of the same category in the city.

The multiplication of the relevant location coefficient by the number of outlets of a particular category present in a nucleation gives a centrality value of that centre for the same category. The functional index, indicating the degree of centrality of a nucleation, is derived by the additional of centrality values of all categories present in the nucleation (Ahmed, 1993).

Results

Establishment of raw food markets in Rajshahi city: There are 28 raw food markets in the city. Shaheb Bazar is the oldest, largest and central market of the city, which was established during Mughal Period. Other 27 markets are comparatively smaller and have been grown up since early nineteenth century. Generally, the causes of market establishment are better socio-economic conditions, local supply of goods, better transport facilities, population demands, individual and political patronisation etc. It is found from the study that there are three main causes of establishment of raw food markets Table 1.

The Table 1 reveals that population pressure or urban people demand, better transportation facilities and individual patronization are the major causes of market establishment. It was found that more than 57% respondents think population demand as the main causes of growth of markets followed by better transportation system (25%) and individual endeavor (17.86%). Moreover, urbanization and increasing rate of economic activities are conducive to the establishment of urban markets.

Table 1. Causes of establishment of raw food markets.

Causes	No.	%
Population Demand	16	57.14
Transportation System	7	25.00
Individual Endeavour	5	17.86
Total	28	100

The ward wise locational distribution of markets and their period of establishment are shown in table 2. It is found that after Shaheb Bazar, Haragram and Talaimari Market were established in the early 19th century. Till 1930, total numbers of markets were only 3. It was doubled to 6 by 1950 having three more new markets in the ward number of 1 and 17. In Pakistan Period, another 6 markets were established in the study area. But, after the independence of Bangladesh, during 1971 to 1990, 12 more markets were newly established and the city got its peak of 24 markets. Only 4 markets were grown up from 1990 to 2005. It is mentionable that in this period, facilities and qualities of raw food markets have been developed instead of growing in number.

Table 2. Location and period of establishment of raw food markets.

Name of markets	Location (Ward No.)	Date of establishment
Shaheb Bazar	12	Moghul Period
Haragram	4	Early 19 th Century
Talaimari	25	Early 19 th Century
Bara Bangram	17	1934-1935
Kasiadanga	1	1943-1944
Naodapara	17	1950-1951
Maldoho Kolony	16	1955-1956
New Marker	13	1960-1961
Shiroil Station	27	1965-1966
Court station	5	1967-1968
Ghoramara	22	1967-1968
Binodpur	30	1968-1969
Lakshmipur Bazar	6	1973-1974
Terokhadia	14	1975-1976
Kathalbari	1	1976-1977
Khorkori	26	1976-1977
Shalbagan	15	1978-1979
Shadur More	24	1978-1979
Kazla	28	1980-1981
Upashahar Newmarket	15	1982-1983
Vodra more	26	1982-1983
Khorbana	13	1984-1985
Beldarpara	20	1984-1985
Kanar more	19	1985-1986
Bodhpara	30	1997-1998
RU Station	30	1997-1998
Shahid Minar	24	2001-2002
Bau bazar	28	2003-2004

Locational classification of raw food markets: The markets were classified considering eight variables All eight variables were used to classify raw food markets of Rajshahi City based on

locational distribution. The variables were number of shops, service area, goods and centrality of services, market area, annual tender price, population, shopping period and structural facilities. Table 3 reveals four categories of locational class of raw food markets considering mentioned eight variables.

Table 3. Locational classification of raw markets in Rajshahi city.

Categories	Name of markets	Characteristics	Comments
First Category	Shaheb Bazar	Central City Market which has maximum opportunities	Only one in the Rajshahi City
Second Category	Haragram, Lakshmipur, Shalbagan, Binodpur, Seroil Station, Bara Bangram and New Market	Nearer to the urban center and posses same opportunities like central city market	Only 7 markets are belonged to this category
Third Category	Court Station, Upasahar Newmarket, Sadur More, Talaimari, Kathalbari, Vodra More, R.U. Station, Kazla, Naudapara, Kashiadanga, Khorkhori Madyapara and Terokhadia	Located in the populated nodal places and locational and infrastructural facilities are not good enough	12 markets are in this category and randomly located over the city area
Fourth Category	Khorbona, Bodhpara, Baupara, Kanar More, Shahid Minar, Beldar Para, Ghoramara and Maldaha Kolony	Located in the fringe area and less locational and infrastructural facilities	This category is far away from city center and their number is 8.

It was found that Shaheb Bazar is the only market included in First Category raw food markets in the Rajshahi City, which has the maximum service threshold as the central functional node. Second Category markets include 7 raw food markets of the city. These markets are near the urban centre and possess almost same functionality like the central city market. There are 12 markets belonging to the Third Category, which are distributed randomly over the city area and located in the populated nodal point of the transport network. Infrastructurally this type of market does not posses enough facilities and opportunities like First and Second Category. The last and Fourth Category markets are situated in the fringe area or far away from the central business district. This category includes 8 raw food markets of Rajshahi City where locational and infrastructural facilities are significantly poorer than other categories. It was found that Shaheb Bazar has maximum and better functionality in terms of location, structure and function than others. Third Category includes highest number of markets because of their locational advantage in the populated area.

Functional classification of raw food markets: The functional indices of the 28 markets nucleation in Rajshahi City are shown in Table 4. The difference between the scores of the market nucleation is also shown in successive order in the last column of the table.

The 28 raw food markets of Rajshahi City has also been classified into four categories on the basis of functional indices (Table 4). The highest functional index (155.93) was found against the First Order for the market of Shaheb Bazar. There were 6 markets in the category of Second Order whose range of functional index runs between 28-70. Third Order markets include the highest (12) number of raw food markets having range of functional index is 5-24. Finally, the table reveals that 7 raw food markets are belonging to the last category in which functional index lies between 2 and 5 (Fig. 1).

From the Table 3 and 4, it is observed that in the study area, in terms of locational and functional classification, there was no variation in First Category and in First Order markets. But, some variation was found in Second, Third and in Fourth category markets, which has been due to pattern of services, population demands and transport facilities.

Market structure in Rajshahi city: The central business district represents the retail heart of each city (Proudfoot, 1967). The city conforms to the general form of retail structure found in other western and non-western cities i.e. the nucleation form, the ribbon form an isolated location of commercial outlets. Nucleations are the most dominant form elements in the early stage of a city's growth. Around which, ribbons or the string street development takes place through time. As the city sprawls, the dependence on nucleated market centres diminishes; or in other words, the threshold size of the commercial nucleation crosses the critical limit of its influence. As a result, commercial outlets came out along the roads to supplement the service rendered by the nucleation. Thus ribbon developed, but often this process reflects the nature of the road traffic type and surrounding land uses and developed as specialised business performers (Ahmed, 2002). In Rajshahi City different types of ribbon developments are found (Table 5).

There are two types of shopping ribbons, business thoroughfare connecting two significant centres in the central part of the city, and commercial ribbons along major roads. Interestingly, although not in exact form, shopping centres tend to be organised in a modified form of vertical and horizontal nesting, analogous to the Christaller's Central Place Model. The functional overlapping in compositional nesting is organised in ascending order and its modification has been found to be related to the social pattern, land use and road network structure of the city. The vertical ordering is found to be step-like but not in regular ratio. Certainly this is due to the result of human interference in land use modification on a complicated road network and socio-administrative system in contrast to the rural system which is more spontaneous. It is already mentioned that the biggest centre found in the city is Shaheb Bazar, located in the functional centre, and

Table 4. Functional indices of 28 raw food markets Nucleation in Rajshahi city.

Order	Name of Markets/ Nucleation	Functional index	Variation
First Order	Shaheb Bazar	155.93	-
	Haragram	69.62	86.31
	Lakshmipur Bazar	56.05	13.57
Second order	Shalbagan	39.77	16.28
	Binodpur	32.12	7.65
	New Market	29.68	2.44
	Shiroil Station	28.26	1.42
	Upashahar	23.67	4.59
	Newmarket		
	Talaimari	19.67	4.00
	Shadur More	16.04	3.63
	Kathalbari	14.86	1.19
	Bara Bangram	13.27	1.58
RU Station	12.86	0.41	
Third order	Kazla	10.75	2.11
	Vodra more	9.61	1.14
	Bodhpara	7.75	1.86
	Court station	7.46	0.29
	Naodapara	6.74	0.72
	Kasiadanga	6.68	0.06
	Khorbana	6.24	0.44
	Terokhadia	5.79	0.43
	Bau bazar	4.67	1.13
	Khorkori	4.58	0.08
Fourth order	Maldoho Kolony	4.48	0.10
	Kanar more	3.18	1.30
	Beldarpara	3.01	0.16
	Ghoramara	2.19	0.81
	Shahid Minar	2.17	0.027

Table 5. Functional structure of markets in Rajshahi city.

Types	Numbers of outlets/shops	%
Nucleation	204	40.80
Ribbon	140	28.00
Isolated	156	31.20
Total	500	100

strongly dominating the city's total commercial functions. The city's 28 raw food market or kutchra bazar are located symbiotically in the shopping centres, which do not maintain nesting links of the parent centres. Each food market is functionally considered as one shopping unit where individual traders work under the markets functional shelter. Food markets are always frequently needed very low threshold type functions and take the advantage of the parent centre to attract customers.

Table 6 reveals that more than 87% owner of the shop does not deploy seller. They themselves or their family member execute all the necessary activities. Only, 12.20 % retail shops are directed by sellers in which 42.62% are directed by 1 seller followed by 27.87% and 29.50% directed by 1-3 and 3+ number of sellers respectively.

Table 6. Employment pattern of raw food markets retailers.

Pattern	%	No. of sellers		
		1	1-3	3+
Self-employment	69.60	-	-	-
Directed by seller	12.20	42.62	27.87	29.50
Familial	18.20	-	-	-
Total	100	26	17	18

Table 7. Total working hour of raw food markets retailers.

Duration (Hour)	Haragram	Lokshnipur	Shaheb Bazar	New Market	Upasahar Newmarket	Shalbagan	Seroil	Talaimari	Binodpur
< 5	8.33	2.04	5.30	17.21	12.50	11.11	12.50	20.00	15.32
6-10	55.00	71.43	43.94	52.63	43.75	55.55	58.33	60.00	36.00
11-15	33.33	20.41	41.67	30.16	43.75	33.33	20.83	20.00	40.68
>15	3.33	6.12	9.09	-	-	-	8.33	-	8.00

Table 7 explains duration of sell or total working hour of the retailers of the nine leading markets of the city. These markets are selected on the basis of their functional opportunities and services. Duration of selling has been categorised into four types. In case of below 5 hours, Talaimari has highest number of shops (20%) and Lokshnipur has lowest number of shops (2.04%) of the total. According to the respondents' sellers, it is because of less number of consumers and permanent shops, and also huge presence of temporary shops on the roadsides in the morning. In case of 6-10 hours, Lokshnipur has highest number of shops (71.43%) followed by Talaimari (60%), Seroil (58.33%), Shalbagan (55.55%) and so on. More than 43% shops of Upashahar Newmarket remain open for 11-15 hours in a day. In case of 15 and above, only 5 markets are found in which 9.09% shops of Shaheb Bazar is highest followed by 8.33%, 8.00%, 6.12% and 3.33% in Seroil, Binodpur, Lokshnipur and Haragram respectively.

Table 8 reveals the locational characteristic of the shops in the markets. The shops were categorised into three; i.e. insides the markets (40.80%), besides the roads (28%) and open places (31.20%). Most of the groceries (65.28%), vegetables (46.67%) and fish (52.21%) shops were found inside the markets. Moreover, meat shop (47.95%) and fruits shops (46.67%) were found besides the roads and in open places respectively.

Table 8. Location of shops in the markets.

Type of Shops	Location of the shops (%)		
	Inside the markets	Besides the roads	Open places
Groceries	65.28	27.04	7.69
Vegetables	44.67	12.97	42.36
Fruits	27.45	25.88	46.67
Fish	52.21	9.37	38.42
Meat	38.20	47.95	13.85
Miscellaneous	16.99	44.79	38.22
Total	40.80	28.00	31.20

The overall infrastructural conditions of shops are medium. It was found that 36.67% of the shops are semi-pacca and 27.46% are pacca.

The rest of the shops are kutcha and situated on the footpath temporarily. The quality of groceries and fish shops was found comparatively good. On the other hand, fruits and vegetables shops conditions were poor, because of their presence on the footpath.

Spatial organisation of raw food markets:

Locational distribution of markets over the city area produces a particular spatial organisation. In planning perspective, the study of spatial distribution of markets is very important. The characteristics of markets determine the service area and quality of services. Historically, markets of Rajshahi City have been originated or nucleated centering the city's large market named Shaheb Bazar. The following sections will discuss spatial distribution and service pattern of raw food markets.

Table 9. Infrastructural conditions of the shops in Rajshahi city.

Type of shops	Infrastructural condition of the shops			
	Pacca	Semi-pacca	Kutcha	Footpath
Groceries	60.82	37.11	2.06	-
Vegetables	15.66	23.74	16.16	44.44
Fruits	7.55	43.44	7.75	41.51
Fish	35.06	15.58	19.48	29.87
Meat	32.07	54.72	1.89	11.32
Miscellaneous	13.64	45.45	13.64	27.27
Total	27.46	36.67	10.13	25.73

Distribution pattern of raw food markets: Nearest Neighbour Index has been used to observe distribution pattern raw food markets of the study area. The Index is:

$$Rn = 2D \sqrt{\frac{N}{A}}$$

where, Rn= Nearest Neighbour Index Value; D= Distance between markets; N= Number of markets and A= Services area.

The Index Values (Rn) in the Table 10 represent the random pattern of distribution of raw food markets of the study area nature of distribution is not organised uniformly. But, in the recent period, index value reveals comparatively better than the past two periods, which is 1.77.

Table 10. Trends of distribution of raw food markets in Rajshahi City.

Year	Distance between Markets (in km)	'Rn' index	Trends
1800-1947	3.33	3.13	Random
1948-1971	2.07	3.10	Random
1972-2004	1.16	1.77	Random

Source: Field survey, 2005.

Discussion

The city's central area or the central business district is quite different in its characteristics and function from those of western cities and even from Dhaka, Capital City of Bangladesh. However, the delimited central business district of Rajshahi City also bears internal zones of functional segregation within the central business district. As in other central business district's, the most significant commercial activity in Rajshahi City are the retail functions of more central and more frequently needed type. Also, there has been a rapid increase of land price and the very recent vertical expansion reflects central business district of Rajshahi in growing process (Ahmed, 2002).

Spatial organisation and service pattern of raw food markets: The numbers of urban raw food markets are positively correlated with population size and their demands (Table 1). With the increase of number of markets, the service area becomes extended

proportionately. A good spatial organisation of markets gives maximum services to the urban people. The study found that spatial organisation of the raw food markets was not organised and also not providing services equally to the urban people. It was observed that spatial organisation of raw food markets and changing pattern of service area follows Four-tier System of Market Centre. According to the concept, the service area may be classified into four categories (Table 11 and Fig. 1).

Central Business District (CBD): Generally, the central place of a city, central business district, has distinctive characteristics as it serves the whole city. Shaheb Bazar is of this type of market found in the study area. More than 3.5 thousands consumers come to this type of market daily. The average distance between this market and markets of fringe area is 18.17 kilometres. The area of zone of influence is more than 15 square kilometres with the population size 40 thousands and above (Table 11).

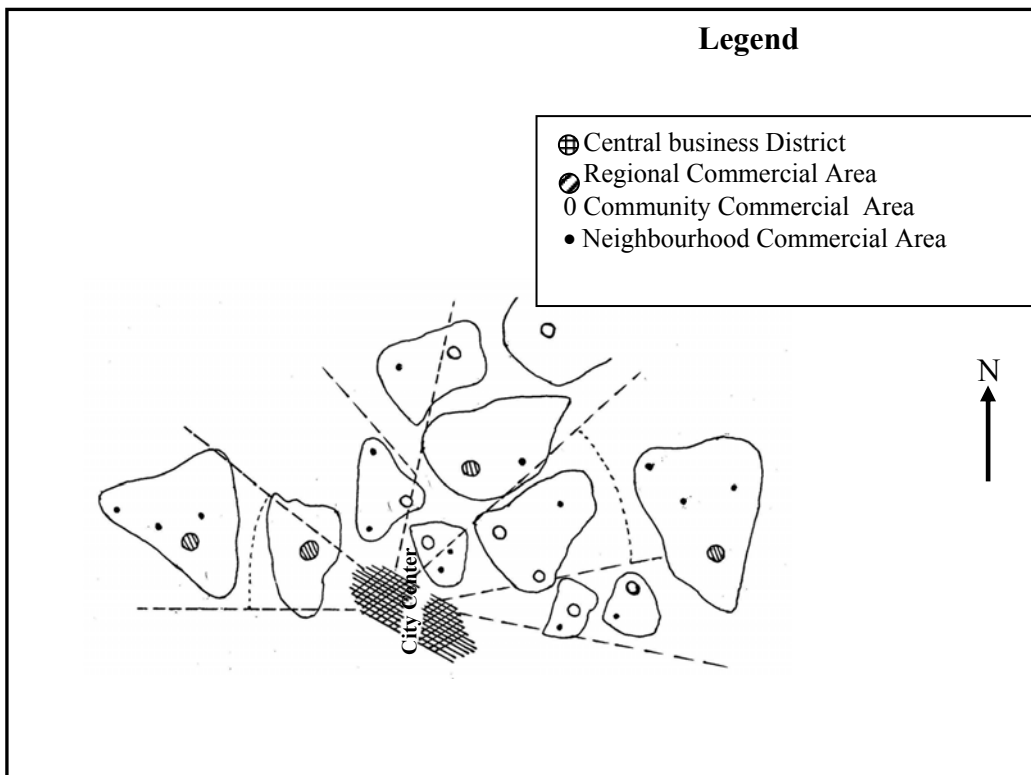


Fig.1. Four-tier system of marketing centres in Rajshahi city.

Regional commercial area: The area around the central business district is treated as regional commercial area; where generally, bank, educational institutions, market complex, wholesale and retail marketing are present. In the study area, Haragram, Lokshmipur, Shalbagan and Bidodpur Markets were of this type. More than 1.5

thousands consumers come to these types of market daily. The average distance among these markets was 8.7 kilometres. The area of zone of influence was approximately 8 square kilometres with the population size 21-40 thousands.

Community commercial area: This area of a city includes shopping centres, bank, hotel, rail station, bus stand and markets of medium categories. This area also located far away from central business district. In the study area, Newmarket, Upashahar newmarket, Shirol, Talaimari, Kazla, RU Station market, Court station market and Naodapara Bazar were of this type. More than 4 hundreds consumers visit to these types of market daily. The average distance among the markets was 6.06 kilometres. The area of zone of influence

Table 11. Different categories of service area in Rajshahi city.

Service area	Consumers ('00)	Distance (km.)	Zone of influence	
			Area (sq. km.)	Population (000)
Central business district	36	18.17	15.82	40+
Regional commercial area	8.7	8.7	8.02	21-40
Community commercial area	4.5	6.06	2.40	11-20
Neighbourhood commercial area	1.5	3.5	0.95	0-10

was more than 2-3 square kilometres with the population size 11-20 thousands.

Neighbourhood commercial area: This type of area resembles the characteristics of fringe area, which includes small markets inside the small settlements and small groceries beside the roads. Kashiadanga, Kathalbari, Terokhadia, Khorbona, Vodra, Goramara, Beldarpara, Kanarmore, Bodhpara and Baubazar were of this type. More than 1.5 hundreds consumers come to this type of market daily. The distance among these markets was 3.5 kilometres. The area of zone of influence was 0.95 square kilometres with the population size 0-10 thousands (Table 11).

Conclusion

Raw food markets are very important basic demand of urban people. It is primarily meant to supply of foods to the consumers. The different categories of markets depend upon locational and functional characteristics and also service area. It is one kind of meeting place where buyers and sellers exchange their demands. There are 28 raw food markets in the Rajshahi City, which is distributed randomly over the city area in an unplanned way. Structurally and spatially these markets are not uniformly organised. Shaheb Bazar has been found as the only market, which is structurally and functionally developed. The other markets of the city have been developed being influenced by this market. The quality, facilities and service area of the markets are increasing with time. But, the increase of markets in number is not significant after 1990. Modern super markets, departmental store etc are very rare in the city area. Structural characteristics of most of the markets are not developed. The area of the markets is very compact and shops are not distributed precisely. Spatial distribution of the markets has been originated because of transport facilities and population demands. The patterns of services of urban raw food markets are not equally accessible to all. It is because of uneven and unplanned distribution of markets and settlements. Now, it is postulated that urban raw food markets of the Rajshahi City function importantly and inevitably in

the city area to supply foods. That is why; it deserves inclusion in up-to-date development planning and special attention from people and Bangladesh Government.

Reference

- Ahmed, R. 1993. Intra urban retailing and the application of Central Place Concept. Proceedings of the Tokyo and Kobe, IGU Commission on Geography of Commercial Activities, International Geographical Union, Tokyo, pp. 77-84.
- Ahmed, R. 2002. Rajshahi City: Its Internal Structure. *CUS Bulletin on Urbanization and Development*. Center for Urban Studies, Dhaka, 42: 29-31.
- Arephin, S. and Ahmed, R. 1990. Retail Distribution in Rajshahi city; a locational analysis. *The Journal of the Institute of Bangladesh Studies*. Rajshahi University, Bangladesh, XIII: 85-102.
- Belshaw, C.S. 1965. *Tradiational Exchange and Modern Markets*. Prentice-Hall, Inc., Englewood Cliffs, N.J., pp. 205-223.
- Berry, B.J.L. 1967. *Geography of Market Centres and Retail Distribution*. Prentice-Hall, Inc., Englewood Cliffs, N.J., pp. 105-140.
- Khan, F.K. 1963. Food markets in Dacca City, *The Oriental Geographer*, 7(2): 125-139.
- Khan, M.S.A. 2002. The Rajshahi Metropolitan Development Plan for a better today without sacrificing tomorrow. *CUS Bulletin on Urbanization and Development*, Center for Urban Studies, Dhaka, 42: 32-35.
- Proudfoot, M.J. 1967. City retail structure. In: Mayer, H.M. and Kohn, C.F. (ed.), *Readings in Urban Geography*. Central Book Depot, Alahabad, India, pp. 99-113.