Spatial Structure of Retail Development in Planned Residential Area of Dhanmondi, Dhaka, Bangladesh

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Abstract

Evolutionary process of Urban Dhaka suggests that the contemporary urban morphology cannot be fully understood without some reference to its past. It is also constrained and directed by some socio-economic and political process with time. Physical development of Dhaka is therefore a planning dilemma. It has a history of about 400 years, where trade and commerce flourished to support the life system of the city and its inhabitants. Dhaka's retail shopping settings changed gradually throughout this period. A planned settlement has been selected here as a representative case to observe the characteristics of spatial structure of retail development. A field data study was carried out to investigate how socioeconomic pressures and changing city spatial configuration influenced the spatial structure of retail expansion in planned residential settlement. As a result, it aids in determining the effects of socioeconomic and geographical elements on the changing retail environment and the spatial outcome of the process. According to the findings, the spatial characteristics of accessible location are the primary considerations in modifying and developing urban retail land uses. This study also contributes to an understanding of how a symbiotic relationship between "place specific" socioeconomic issues and the "modernization effect" in a changing retail environment played an important role in the growth of urban retail environments and should be considered for socio-spatial sustainability.

Subject Areas

Architecture

1. Introduction

Cities are products of their shifting conditions, culture, communities, politics, and economics. A city's economic activities are as ancient as the city itself. Dhaka has a history that dates back almost 400 years [1] and the city has grown and evolved into a metropolis since (**Figure 1**). The retail shopping environments of Dhaka city have also developed throughout time [2] [3]. Before 1950, the principal location for retail shopping activities in Dhaka was "Chawk Bazar," "Babubazar," and so on. Between 1950 and 1960, specifically in 1953, a retail shopping market known as "New Market" was created to service the Dhanmondi district. The contemporary New Market typology had evolved from the fusion of indigenous concept of hat and katra and western shopping precinct [4]. Following this, the government created several markets in various sections of Dhaka. Almost all of them had one or two stories. Some multistory markets began to arise between 1981 and 1990. That time is exemplified by the term "Sharif Market." Between 1990 and 2000, new multistory retail marketplaces with facilities such as escalators and air conditioning were built. Examples include "Eastern Plaza," "Karnaphuli Garden City Shopping Complex," "Russel Square," and others. After 2000, the development of retail marketplaces increased; between 2001 and 2010, several such markets were established throughout Dhaka. Some examples from this period are "Plaza A R," "Bashundhara City," and "AnamRangs Plaza." These retail shopping settings house a variety of different purposes, such as a Cineplex, a department store, and a convention center, among others. The bazaar was transformed into a market place throughout the emergence of retail shopping locations. Later, it was transformed into a plaza, square, or city. As a result, the shopping settings resemble metropolitan public spaces. In diverse emerging environments, local socio-cultural and economic forces have interpreted the dual character of spontaneous retail expansion and "modernizing" processes in different ways [5]. As a result, understanding retailing in developing nations from a spatial standpoint necessitates a comprehension of the unique social milieu.

According to Maitland, "retail activity is considerably more affected by economic and social variables than capable of changing them" [6]. This argument is more compelling in a fast urbanizing metropolis. Within a process of fast and uncontrolled urbanization [7], the majority of retail centers are emerging organically in response to the rising demand of customers and merchant groupings. In the absence of any retail planning theory or regulation, the behavioral dynamics of these two groups of individuals shape the spatial character of Dhaka's retail hubs.

In modern practice, cities have been separated function-wise. In the 1920s and 1930s, urban divisions and neighborhood isolation was established as ideal by the works of French Architect Le Corbusier, among others [8]. This is the basis that gave rise to the 1960s' huge residential complexes and split cities. This is also the line of thought that gave rise to the first shopping malls, with the goal of bringing together various sorts of stores under one roof: the shopping function was to be centered in one location. This method to urban planning has been called into question for many years. The city's segmentation generated boring zones with much too identical buildings. Going through these locations is not enjoyable. As a result of this evolution, the roles of cities are now viewed of as being intertwined. Future cities are built as a combination of functions in the same locations. This is happening because functional separation is no longer essential or desirable. Modern firms do not pollute and are frequently located in residential or business neighborhoods. New urban areas, such as the waterfront, are being developed as a combination of commerce, housing, and recreation. Golf courses are being incorporated into residential and commercial areas. In modern city living, the several classical functions merge into one another. Rather of the rigid demarcation of the urban environment into different city functions that many large and medium-sized cities have, the future tendency will be to enable function folding via urban planning. We are increasingly moving across many areas at the same time. We are present in several places at the same time thanks to modern communication technologies, most notably the mobile phone and the internet. The emergence of new forms, such as web 3.0, will amplify this trend in the coming years. The inclination reflects a shift in life perspective. Our mental and physical mobility has advanced to the point that we no longer feel constrained by the normal spatiotemporal constraints, *i.e.* restrictions in time and location. Future cities will be marked by increased heterogeneity. The population will be more diverse, and the range of goods, services, and leisure activities will be much broader. Corporations and institutions will become more distinct. However, the major cities of the Nordic nations and the rest of the globe will become more similar at the same time. They will all have the same diverse personality and worldwide offers. Large cities will be distinguished by their homogeneous heterogeneity (mixed use development to gain spatial sustainability).
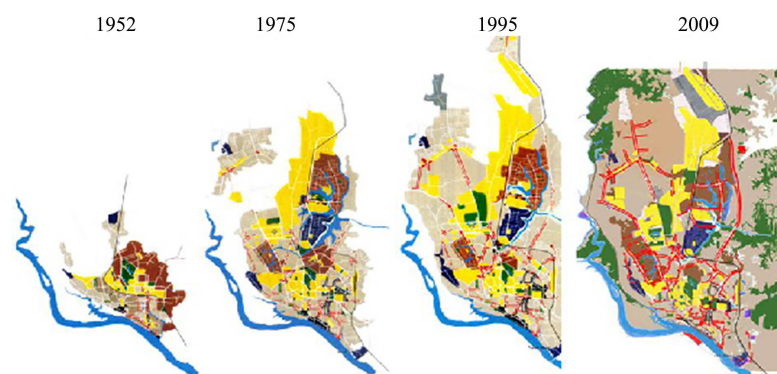

Figure 1. Evolution of Dhaka city land use (Hossain, 2014a).

The main objective of this study is to identify the spatial characteristics of the organization of retail activities in space as guided by the socio-economic behavior and the clustering patterns of the business types (generative, shared, suscipient and service) will be tested here in terms of spatial accessibility within the selected area. This will clarify whether the clustering patterns within a socio-economic setting, have any spatial logic from a locational viewpoint.

2. Literature Review

The literature review serves as a broad framework for understanding the problem's background holistically for the current investigation.

2.1. Attraction, Configuration and Movement in Urban Retail Center

"Socio-economic forces shape the city primarily through the relations between movement and the structure of the urban grid"—Bill Hillier.

Hillier asserts that space and movement have a symbiotic relationship. A well-functioning city is thought of as a "movement economy," in which spatial configuration, attraction of diverse urban services, and mobility are brought into common accord, giving cities their distinctive structures [9]. Varied land uses, *i.e.* different attractor functions, aim to exploit this space-movement link by acting as a "multiplier" of the underlying pattern of movement. According to Hillier's idea of "Natural movement," a deformed grid structure creates movement patterns and densities by varying configurationally in different portions of the structure. As a result, different functions are distributed around the grid to take use of natural mobility. Movement has also been demonstrated to be important in the proper operation of structures. This reasoning, however, contradicts the usual attraction theory of pedestrian movement, which holds that the attraction of urban function is the primary producer of movement [10]. This attraction hypothesis gave rise to the basic notion of "magnets" in western retail malls, which draw customer flow through planned distribution within a center. A well-planned retail center is one, which modulates and channels consumer movement through different retail attractions. Thus, in the developed context the planning pattern of shopping centers is based on a spatial agreement between the mall system and the siting of magnets or attractors [11]. In contrast to this the "magnets" do not appear to exist in the spontaneous retail developments in Dhaka.

2.2. Socio-Spatial Nature of Attraction

This section of the research aims to discover the recurring pattern of socio-spatial behavior, *i.e.* the profit-motivated attitude of merchants and customers in the specialization process, as well as the pattern of different retail facilities. A direct land use observation within the projects revealed the layout of store clusters in the retail centers under consideration. The centers' functional structure has been categorized according to "Nelson's" three profit oriented business

locations, namely the generating, sharing, and suscipient company kinds [12].

2.3. Retailers Socio-Economic Concerns in Generating Spatial Strategies to Different Retail Attraction

In the developed countries, the location of different stores in a planned shopping center originates from the rent paying ability of different retail types [13]. From retail geographer Dawson's point of view, the rent policy in a planned shopping center should be dependent on the proportion of floor space or number of units of the major threshold functions and the relative location of different retail types within a center which is known as its "tenant mix" policy [14]. The study findings do not show any fixed policy regarding rent in relation to tenant mix in shopping centers in the study area; rather groups of particular shop's *i.e.*, different retail types of secure different locations to maximize their sales in a center. As a result, understanding the specialization process and pattern of retail attractions in Dhaka's complex socioeconomic retail environment demands an analysis of individual merchants' locational strategies for diverse retail activities within a shopping precinct.

2.4. Consumer Behavior and Retail Cluster

From the perspective of the customer, inquiries about preplanned stores visited, other shops visited, and shops planned to visit next identify the generative, suscipient, and sharing business categories [15]. According to these findings, the functional structure of retail projects has been classified as follows (case study):

Functional Structure in New Gausia Shopping Centre; Elephant Road Development

GENERATIVE BUSINESS

- Ladies ready-made clothing, Men's and children's ready-made clothing (traditional clothing)—Ladies Shari, clothing (traditional),
- Women's clothes (material)—Ready-made clothing for men and children,
- Western-style ready-made clothing for men and children (local made)—Footwear,
- Household Goods—Carpets, Furniture, Curtains, and so on.

SHARED BUSINESS

- Ladies ready-made clothing,
- Ladies Tailor and Embroidery,
- Electronics,
- Restaurants.

SUSCIPIENT BUSINESS

- Accessories—Mechanical parts, Commodities,
- Music—CD, DVD stores,
- Photo studio,
- Household items,
- Snacks.

2.5. Retailers' Attitude and Retail Cluster

To begin with, retailers' placement decisions constitute a nucleated and linear cluster of generative and shared business kinds, as opposed to a widely dispersed nature of distribution of suscipient functions. The generating functions tend to cluster linearly along the corridors in the individual marketplaces inside Gausia retail mall. This tendency becomes more pronounced at the upper floor levels, when selling is increasingly based on demand purchases than impulsive purchases. The shared business types show the interdependence of individuals and different floor levels. To provide a good variety to ordinary customers, the entry points on the ground floor exhibit a random and distributed distribution of three business types.

The generative functions, *i.e.* the clothes store, tend to generate a clustering pattern with increasing shop numbers in both retail developments. This reflects the merchants' profit-driven competitive mindset by allowing comparative shopping for these things. The considerable bargaining given by the various groups of retailers within a cluster of comparable shop types emphasizes this spatial patterning. The generative nature of shoe and household stores has structured them in spatial clusters in New Elephant Ribbon Development. To provide better parking on the neighboring local street, the carpet and furniture stores are positioned at the far end of both side shopping corridors. The noteworthy problem noted in the overall usage pattern of Gausia Shopping Centre is that the shared circulation corridors occupy comparable shop kinds on either side servicing two separate markets. These five markets have been functionally and visually combined into a single complex character.

Consumer spatial behavior and the resulting functional connectivity inside retail locations are used to identify the generative, shared, and suscipient business kinds. Retailers profit maximization concepts in relation to a consumer's decision-making process have generated different kinds of spatial clusters for these three business categories. The natural demand and attraction of the generative business types have arranged them in spatially less significant locations within a center. They attract shoppers through a large cluster offering different price ranges and variety by different class of retailers. This segregated spatial location of generative business is further enhanced by the routinized responsive shopping behavior of the female consumers in the shopping centers. The male dominated retail centers show a reverse pattern in the selection of locations within the entire development. The specific demand of a generative business type has introduced shared business types in different shopping centers within same precincts. Their natural demand has also resulted in spatial clusters in segregated locations within a center. However, the suscipient functions attempt to increase impulse buying among the moving consumers by dispersing themselves near the entry points and in the most accessible locations. The findings suggest that space and use patterns in spontaneous retail developments have a strong social logic. The location and spatial clustering of different retail functions, uncontrolled

growth of shops, different circulation patterns in space and their morphological variations, location of entry points, spatial link between centers and hawkers have all resulted from the behavioral dynamics of consumers and retailers in space.

2.6. Study Area

The Dhanmondi hamlet grew out of a local paddy (Dhan) market (Mondi) in the early 17th century. The presence of several ponds, an Eidgah (site of biannual religious assemblage), and a number of Mosques dating from the early 17th century all point to a thriving community here. With the collapse of the Mughal Empire, the settlement dwindled. After Dhaka was designated as the provincial capital of East Bengal in 1947, a new region of superior housing was created in Dhanmondi in the early 1950s to accommodate the rapidly expanding city's housing requirement (Figure 2 and Figure 3). Transformations in urban areas have occurred in a variety of ways over the years, including those relevant to form size, land use, encroachments, structure heights, floor area coverage (in other words, unlawful constructions), and so on. This has also occurred in the city's official developments, which have proceeded outside of the legal framework. However, while the expansion may not be in conformity with the city's planning standards, its very presence indicates its scale. Following paragraphs describe some of the significant alterations occurring in urban areas in general and Dhanmondi in particular.

The level of consolidation, horizontal coverage, encroachments, structural quality, and streetscapes have all changed. People tend to extend the plot's covered area to meet their desire for usable space. To suit their requirements, there are encroachments on communal open areas or the road. Figure 4 shows the land use map and axial map of Dhanmondi area. The living units are changed to commercial purposes such as retail stores, and the residential activities are accommodated on an extra level, which contributes to the height transition that occurs in planned buildings. This sort of informality is evident in formal communities with relatively limited areas of housing units that become challenging to govern over time. The fundamental cause for this sort of transition is social pressure, since a rising population must be accommodated in the limited designed area. Both social and economic considerations have a role in driving such shifts. In Dhanmondi, for example, residential structures along the road or streets near a planned market or business districts are being converted to commercial spaces, and open areas are being encroached upon for housing, businesses, and so on. The primary cause of this sort of shift is economic pressure, when the value of economics outweighs that of habitation.

3. Methodology

This research has applied a methodology that combines both theoretical base of market economy and spatial dimension of the retails in the study area. Spatial

distribution of retails in urban fabric is a widely researched topic in urban literature [16]. For a better understanding of the context, both qualitative and quantitative data have been used in this research. Functional and physical aspects of the morphological changes can be identified by studying spatial patterns and relevant social determinants.

A preliminary field research was conducted to gain a particular contextual knowledge of the social effect on retail operations and their geographical characteristics in the study region. The following concerns were examined in this study based on a review of the literature and a field investigation:
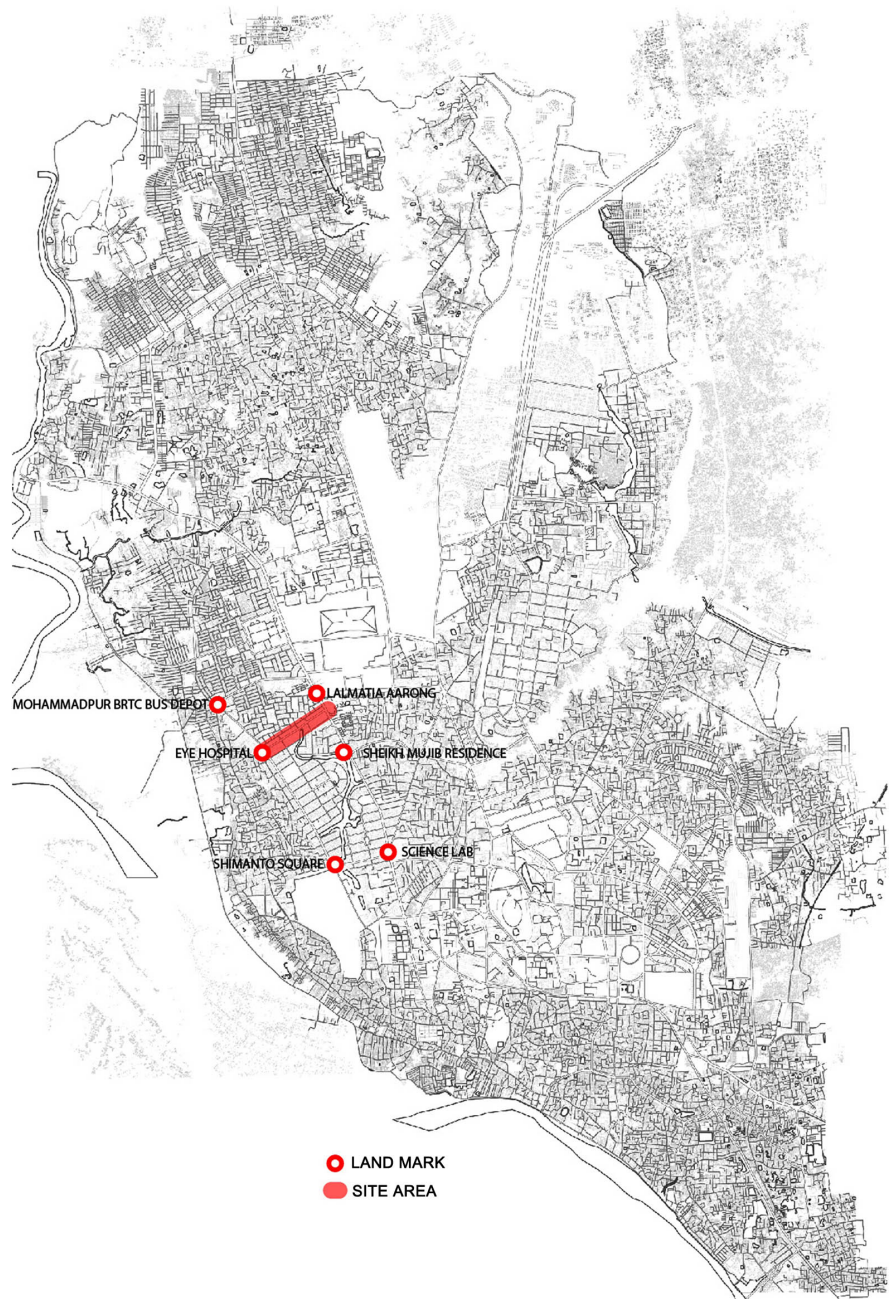

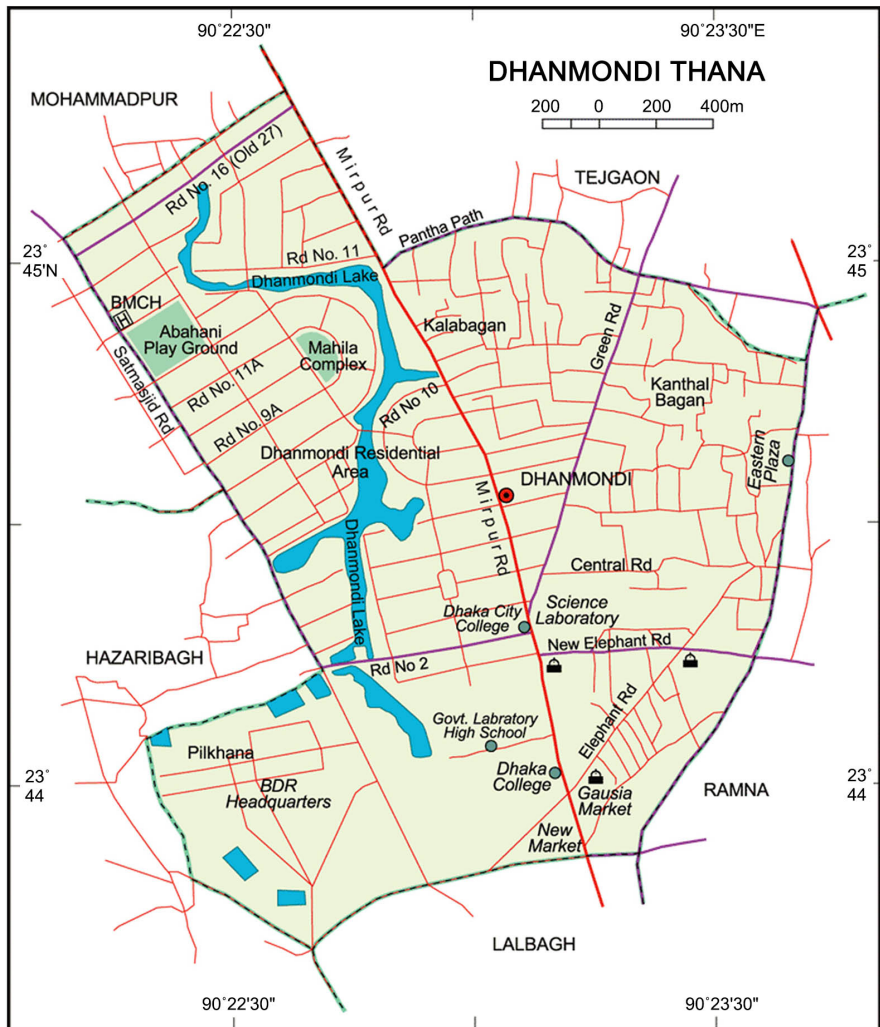**Figure 2.** Location of Dhanmondi-27 in Dhaka morphology (Source: LGED, 2022).

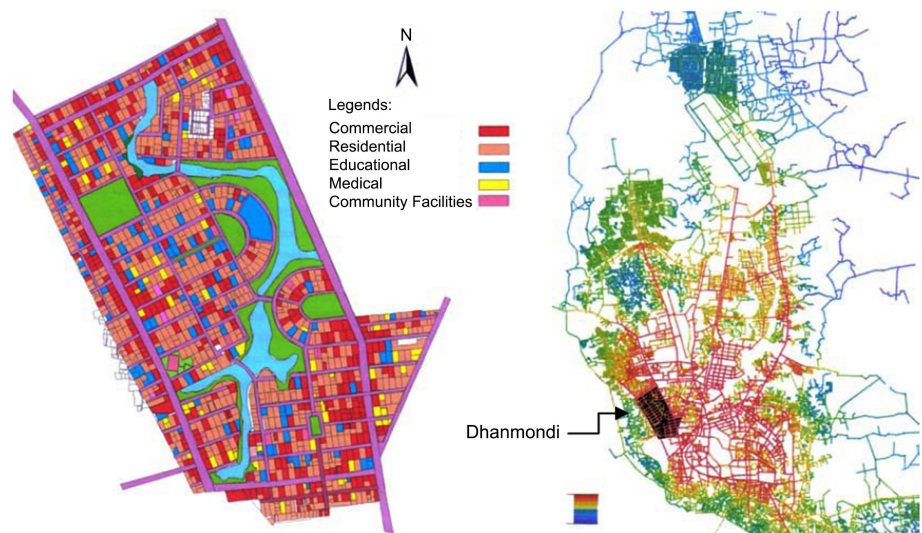**Figure 3.** Thana Boundary map of Dhanmondi, Dhaka (Source: LGED, 2022).

Figure 4. Land use map of Dhanmondi (2007) & Axial map of Dhaka City (2007) (source: Khan, N. 2008).

3.1. Literature Review

1) Economic Theory;

2) Consumers & Retailers Behavior Theory;

3) Tenant Mix Policy Understanding (Business Categories);

4) Theory of Natural movement, Attractor & Multiplier Effect.

3.2. Observation

1) Existing Spatial Network (street pattern, street hierarchy);

2) Existing Surrounding land use;

3) Existing Retail Land Use Pattern;

4) Previous Retail Land Use Pattern (Primary data collection and Interview);

5) Questionnaire-Consumer's Behavior;

6) Catchment area.

A previously available map was collected from GIS data and the map was interpreted in respect to land use and built height. Later on, a more updated and precise mapping was done through field survey. Through field survey an updated layout plan was developed to interpret the spatial pattern of retail growth and other socio-spatial features. A group of Consumers were selected questionnaire survey to get information about their origin and shopping activity. This information helped to relate the changes of the socio-spatial pattern, commercial factors and catchment area of retail activity.

4. Analysis & Findings

4.1. Street Network and Street Hierarchy

Though the inception of Dhanmondi area was as a residential area; over the course of time it has transformed into mixed use area. Figure 5 shows the existing road hierarchy of the study area. Inarguably Road-27 is the ideal path that changed immensely due to rapid urbanization in the surrounding areas. Road 27 is an important connection that made contact with two of the major veins of Dhaka city transport; Mirpur road and Satmasjid Road. This connection draws attention of the retailers and they found suitable for their business. In the road hierarchy, road 27 is a major road but not an arterial one, which made it so successful to be transformed into an important mixed use retail area of the locality.

4.2. Land Use and Retail Development Pattern

The retail development of road 27 is relatively new in comparison with the other parts of city and it's constant in changes (Figure 6). Numerous plots which were being used as residential purposes have left extinct due to high demand for retailers. As the plots alongside road 27 are primarily owned by private owners, land use transformation is fast and immediate. Banks, departmental stores, restaurants, brand clothing retail shops etc. are the major business that have grown in the past few years or so. Retails are supported by a large residential area adja-

cent within walking distances. Dhanmondi residential area and Lalmatia residential area both are resided by high middle class families in general who are very much habituated with standard retail products and find it very comfortable with the changes happening.

At present, there are still some residential land use remains at the roadside plots. But how long they will keep their use unchanged is a matter of question with the exceptions of some newly constructed high-rise apartments. Duplexes, Triplexes and other low rise buildings are expected to give away to the retailer in next few years if current trend continues.

Figure 5. Road hierarchy along dhanmondi-27.

LAND USE PATTERN

RESIDENTIL ■ MIXED USE ■ BANK BUILDING ■ EDUCATIONAL ■ OTHERS ■

Figure 6. Land use plan alongside Dhanmondi 27.

4.3. Typology Identification and Chart Formulation

Dhanmondi-27 has grown as a retail activity area with a target of daily needs of surrounding locality. Due it's high level of integrity with the transport system, these retailers have large catchment area than the usual retailers.

During physical survey conducted by the authors, there were number of retail services were identified and later classified into General, Shared, Suscipient and others category to understand the retail character of the street fabric. Table 1 shows the collected data on the types of retail activity along the study area.

Table 1. Typology of retail environment in Dhanmondi-27.

Generative Business	Shared Business	Suscipient Business	Others category
ready-made brand shop (traditional)	snacks, confectionaries	photo studio labs	boutique
ready-made brand shop (western fashion)	ATM & monetgram booths	music and video shops	grameenphone center (mobile phone company)
departmental shop	book shop	home appliances	
women's parlour	pharmacy	tailor	
restaurants	stationary		
brand electronics	tea stall, juice bar		

4.4. Street View Experience

The retail character of Dhanmondi-27 is at present very suitable to the local needs and does not cross the scale beyond community perception (Figure 7). Through physical survey a continuous elevation of the streetscape has been prepared to understand the character of the retail development.

Figure 7. Retail character of Dhanmondi -27 in Plan view and Elevation view.

4.5. Catchment Area

By conducting a questionnaire survey, an attempt was undertaken to study the catchment area of the retail services. To do so, four different types of retails were selected.

- Rapa plaza: Market;
- Persona: Women's parlor;
- Meena Bazaar: Departmental store;
- Barb-q-tonite: Restaurant.

From every function 10 samples were taken to study the diagrams of the human behavior. Survey results are illustrated in Figures 8-11. Figure 12 shows the catchment area of the selected retail outlets. In the survey the following statistics were evident:
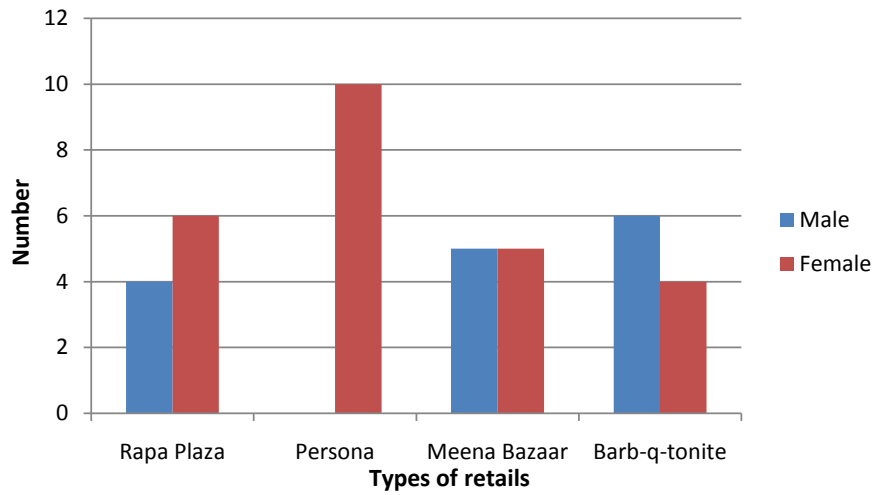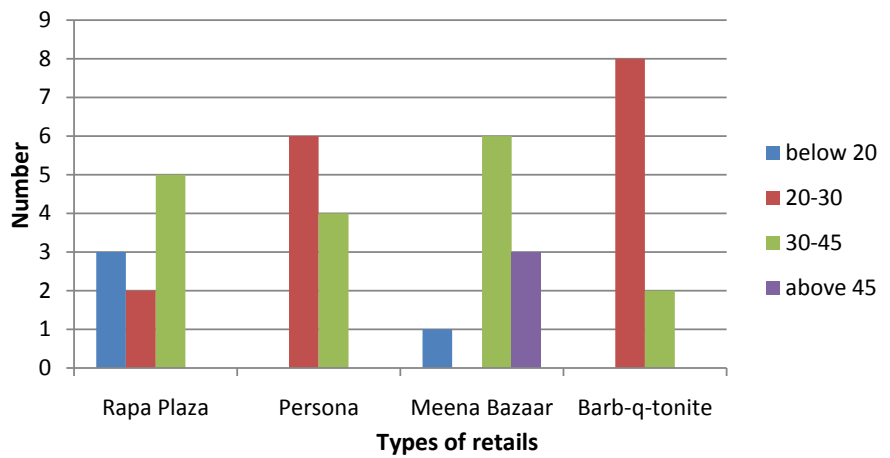
Figure 8. Male Female ratio at the retails.

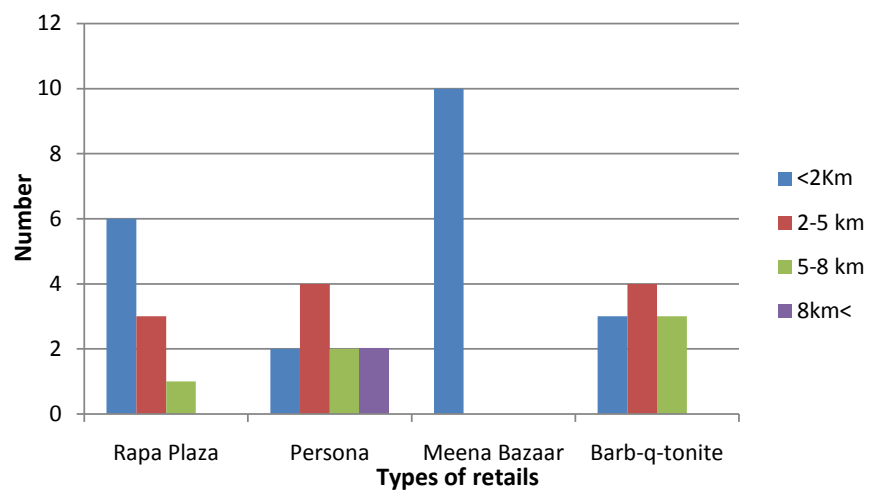**Figure 9.** Customers age group at the retails.

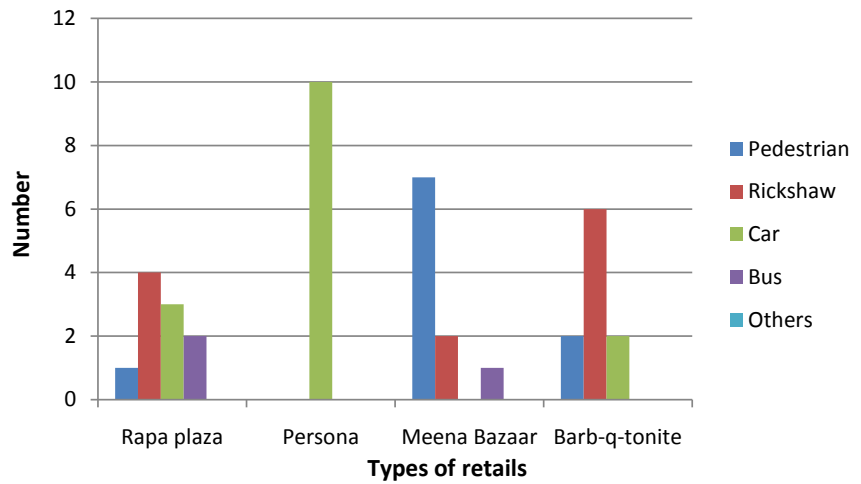**Figure 10.** Travelling distance of the customers.

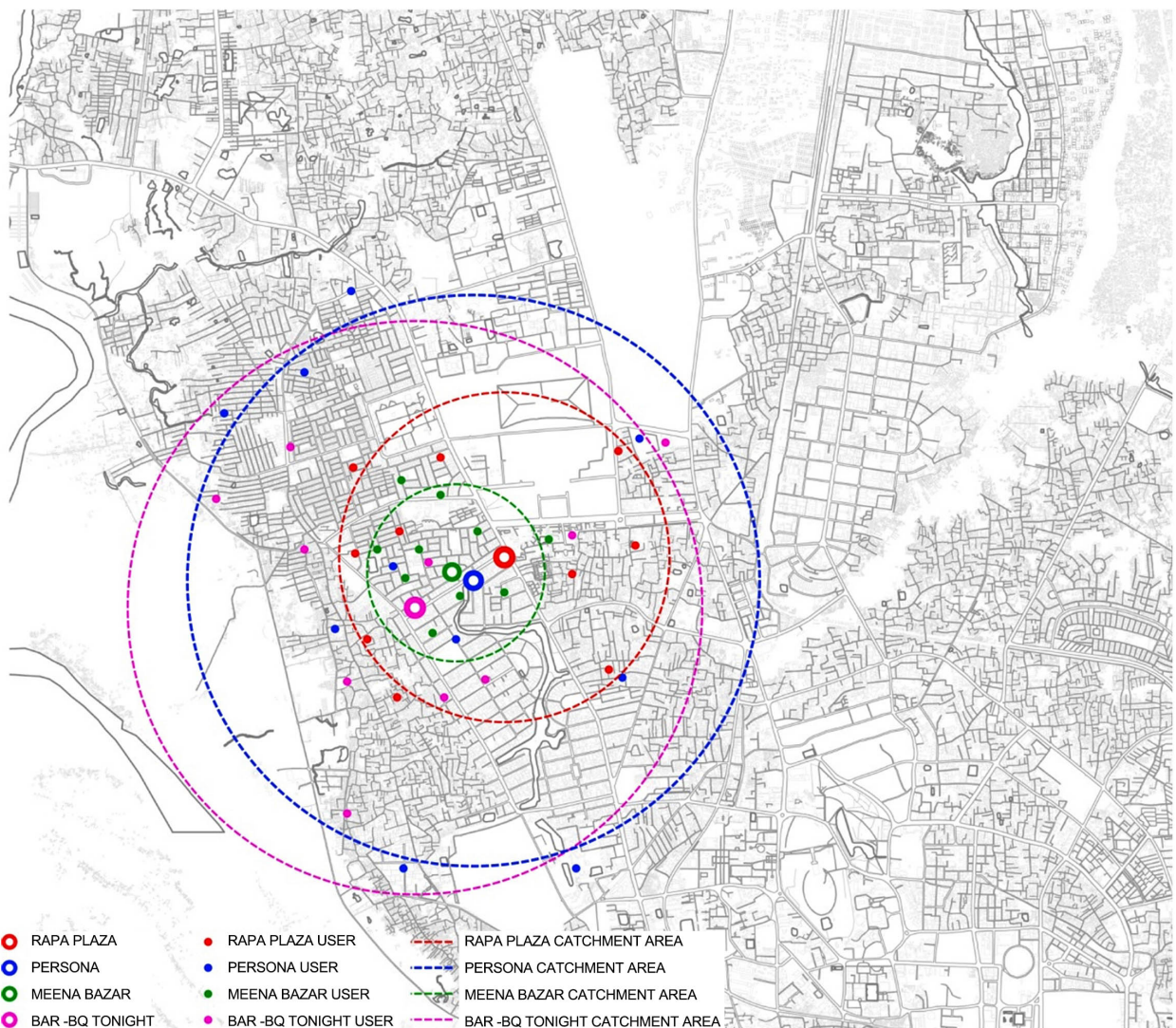**Figure 11.** Transport mode used by the customers.

Figure 12. Catchment area of the selected retail outlet.

1) Rapa Plaza: It's a large market with numerous shops and retails of various types. Rapa plaza was a very prominent shopping complex when it was first inaugurated but in the recent years more and more shopping options were built up around the area competing with the existing ones. But still Rapa plaza makes a good name for itself and have a long range of catchment area.

2) Persona: It's a women's parlor and widely regarded as one of the best in the city. It has a much larger catchment area due it's fame and popularity. Users are dominantly females.

3) Meena Bazaar: Is a departmental store with all the daily needs for the people. It's a chain departmental store and one branch is at Dhanmondi-15 not far from 27. These stores are usually designed to serve a community with close contact and ease of access. So does this Meena Bazaar have a large set of customers but a smaller radius of catchment area.

4) Barb-q-tonite: A restaurant with semi-outdoor sitting arrangement. It does not have any branches in the city and only opens in the evening. People not only from Dhanmondi, but also from distant areas may travel to meet their appetite in this restaurant. So it does possess a quite a large catchment area.

4.6. Spatial Analysis

Space syntax analysis is a logical tool to determine the highly integrated connections of a road system [17]. It has emerged in scientific community as an objective way of explaining the linkages between morphological structure of built environments and social events.

Transport system ensures ease of access for the commuters to pass through certain roads. And naturally most integrated parts of transport also promote commercial retails land uses to flourish. We can see ribbon development which is a good example of the transport-retail linkage.

In the axial map shown in Figure 13, the axial lines have an integration value that differs from one another. Here, the integration value reflects its relative importance in the connected system of lines. Lines that are most integrated in the axial map are termed as the integration core. According to Hillier et al., the most integrated lines in an axial map also represent the most familiar road connections of a city [18].

The integration values of all the axial lines in the map can be used to interpret important aspects of the network. Considering the integration values as number of levels, the measurement of how deep or shallow each line is from all other lines is termed as global integration (Figure 14). Counting of the values up to three levels can be called as local integration or radius 3 integration (Figure 15). If only level is counted, a connectivity map can also be generated, as shown in Figure 16. The measure of local integration is used for pedestrian movement study whereas typical vehicular movement is usually limited by radius 10 integration.

Space syntax analysis is showing that in the larger extent of its catchment radius, Dhanmondi-27 has got the logical advantage to support more of the retail

activity of the area. Both in the local and global integration analysis, Dhanmondi-27 road is shown red as a major connection of the city alongside Mirpur road and Satmasjid road (Figure 14 and Figure 15). In the connectivity analysis, it is clear that after Mirpur road, Dhanmondi 27 connects with more area with ease and comfort. Whether it is pedestrian mode or vehicular mode, this road is friendly to the customers to come and manage their trade-offs.

From the global integration vs local integration graph (Figure 17), it is seen that they are co-related with a fair margin (r squared value is 0.604261), which indicates both globally and locally Dhanmondi-27 is integrated well enough. It can be implied from the above data analysis, due to high values of integration and correlation, Dhanmondi-27 road area can support various types of retail business. Having versatile range of catchment, ease transport modes and hospitable to people of all ages have made this area suitable for rapid retail growth.

Figure 13. Axial map of Dhanmondi 27 and surroundings area.

Figure 14. Global Integration (R = n).

Figure 15. Local integration (R = 3).
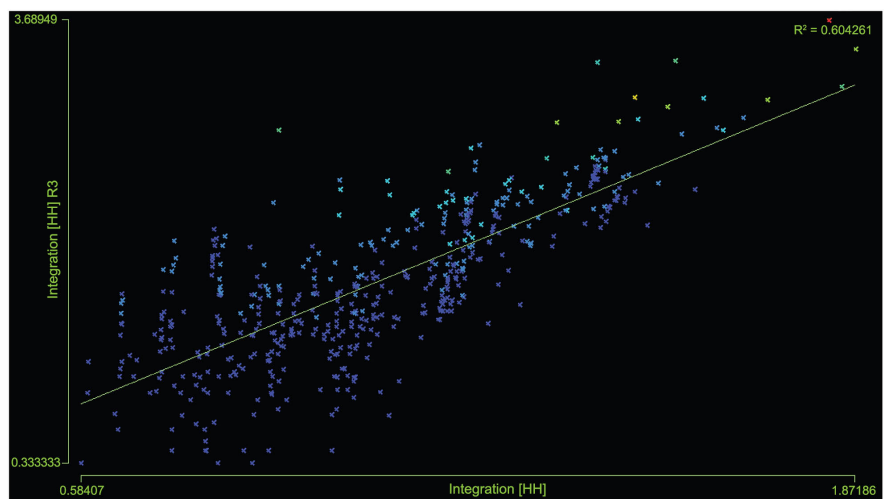

Figure 16. Connectivity analysis map.

Figure 17. Graph analysis of Global integration vs Local integration (r squared = 0.604261).

5. Conclusions

The geographical pattern is entirely contextual, deriving from the retailer's and consumer society's socioeconomic characteristics. A huge number of store units formed as a consequence of a spontaneous expansion process have resulted in an incomprehensible spatial organization in retail centers. Retailers and consumers' socioeconomic behavioral standards have established a clustering pattern of diverse retail functions that exhibit a particular geographical pattern in connection to the profit maximization idea of various company categories.

In general, the generative and the shared retail categories cluster in segregated locations within the buildings, as they attract general shoppers through their natural demand in the area. On the contrary, suscipient functions organize themselves at various integrated places inside the developments to increase impulse purchase among diverse consumer groups. The socio-spatial sustainability of urban retail growth, on the other hand, might be maintained by a symbiotic interaction between various business sectors that characterize a developing economy.

Conflicts of Interest

The authors declare no conflicts of interest.

References

[1] Nilufar, F. (2010) Urban Morphology of Dhaka City: Spatial Dynamics of Growing City and the Urban Core. *International Seminar on the History, Heritage, and Urban Issues of Capital Dhaka, on the Celebration of 400 Years of the Capital Dhaka*, 17-19 February 2010.

[2] Hossain, N. (2002) The Socio-Spatial of "Spontaneous" Retail Development in Dhaka City. Unpublished PHD Dissertation, Faculty of the Built Environment, Bartlett School of Graduate Studies, University College London, London.

[3] Hossain, N. (2014) Socio-Spatial Dialectic of Retail Environment in Developing Countries: Perception of Retail Trends in Dhaka. *Asian Journal of Humanities of Social Science*, **2**, 10-21.

[4] Mowla, Q.A. (2011) Urban Aesthetics: A Study on Dhaka. In: Ahmed, S.U., Hafiz, R. and Golam Rabbani, A.K.M. Eds., *The History Heritage and Urban Issues of Capital Dhaka, Volume-III, Urbanization and Urban Development*, Asiatic Society of Bangladesh, Dhaka, 169-262.

[5] Hossain, N. (2014) History of Commercial Development in Dhaka and the Spatial Significance of Spontaneous Retail Growth. *IOSR Journal of Humanities and Social Science*, **7**, 66-73. https://doi.org/10.9790/0837-191176673

[6] Maitland, B. (1990) The New Architecture of the Retail Mall. Architecture, Design and Technology Press, London.

[7] Islam, N. (1996) Dhaka from City to Megacity: Perspectives on People, Places, Planning and Development Issues. Urban Studies Program, Department of Geography, University of Dhaka, Dhaka.

[8] Jensen, J. (2007) Future Consumer Tendencies and Shopping Behavior. Center for Future Studies, Denmark, Fremforsk.

[9]   Hillier, B. (1996). Space Is the Machine. Cambridge University Press, Cambridge.

[10]   Pushkarev, B. and Zupan, J. (1975) Urban Space for Pedestrians. MIT Press, MA, Cambridge.

[11]   Matiland, B. (1985) Shopping Malls: Planning and Design. Construction Press, London.

[12]   Nelson, R.L. (1958). The Selection of Retail Locations. F.W. Dodge, New York.

[13]   Garner, B.J. (1966). The Internal Structure of Retail Nucleations. Northwestern University Studies in Geography No. 12, Northwestern University, Evanston.

[14]   Dawson, J. (1980) Retail Geography. Croom Helm, Ltd., Kent.

[15]   Simmons, J. and Jones, K. (1990) The Retail Environment. Routledge, London, New York.

[16]   Sevtsuk, A. (2014) Location and Agglomeration: The Distribution of Retail and Food Businesses in Dense Urban Environments. *Journal of Planning Education and Research*, **34**, 374-393. https://doi.org/10.1177/0739456X14550401

[17]   Hillier, B. (1999) The Hidden Geometry of Deformed Grids: Or, Why Space Syntax Works, When It Looks as Though It Shouldn't. *Environment and Planning B: planning and Design*, **26**, 169-191. https://doi.org/10.1068/b4125

[18]   Hillier, B. and Hanson, J. (1989) The Social Logic of Space. Cambridge University Press, Cambridge.

Appendix

Questionnaire Survey form

Dear Consumer,

It is to let you know that as part of a research project, we are conducting a shopping survey. It would be really appreciated if you could answer a few questions. All responses will be treated with the strictest confidentially. (Please choose the response that best represents your point of view.)

Sample No: Date:

Name of the Shopping Center: Time:

Residential Address:

1) Gender: a) male b) female

2) Age: a) below 15 b) 25 - 30 c) 30 - 45 d) above 46

3) Occupation:

a) service b) business c) student d) retired e) housewife f) others

4) How far is the mall that you visit from your home?

a) less than 2 km b) 2 - 5 km c) 5 - 10 km d) more than 10 km

5) How frequently you visit this mall?

a) once in a week b) twice in a week c) once in every 15 days

d) once in month e) as and when required

6) What is the purpose of purchase?

a) personal use b) to gift c) regular home use d) events & celebration

7) Which type of products do you purchase more in this shop?

a) process food & staples b) clothing & fashion c) home fashion d) others

8) What mode of transportation do you use mostly to come to this shopping center?

a) pedestrian b) rickshaw c) private car d) bus e) others

9) Why do you prefer to shop in this shopping center?

a) near to House b) ease of transport & time saving c) near to workplace

d) offers variety of item e) low price of goods f) items with different price

g) allow bargaining h) others

10) From where did you set up on this trip?

11) Do you come to this shopping street for following purpose also?

a) restaurant b) business c) only shopping d) socialization e) others

{Thank you very much for your kind Co-operation}