

Morphological Analysis of a Historical Urban Landscape: The Case of Midnapore, an Early Urban Centre of Eastern India

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Available online at: www.isca.in, www.isca.me

Received 2nd November 2016, revised 10th December 2016, accepted 22nd December 2016

Abstract

In Urban geography, the study of the pattern and morphology of building in urban centres concerted with land use categories, has a cherished legacy which started with formulating mode of the plan that underlies the expression of spatial heterogeneity in housing, commercial activities and industrial activities carried out in an urban system. The present treatise is a humble attempt to analyze the morphological components of Midnapore urban centre, Eastern India. It seeks to explain this urban landscape of historical importance as a post-modern space where built heritage and innovation design of space have become the competitive facets of the urban centre in terms of metamorphosis of urban structure under the influence of processes like urban redevelopment, gentrification, sprawling and intra-urban competition in economic and social context etc. In arriving at the above object, intensive survey has been conducted taking homogeneous building block as the basic unit of study. Building blocks separated by arterial roads were identified from the high resolution satellite images downloaded from open source. Information for each of such building blocks was collected and recorded using pre-designed field manual and questionnaires. Thus a model of urban morphology has been formulated.

Keywords: Legacy, Morphological Component, Built Heritage, Innovation Design, Gentrification.

Introduction

The term “Urban morphology” refers to the physical arrangement or formation of urban centre, its outline of streets, building blocks, their functions and densities. Simply, it is the layout of an urban centre and in brief, it is the study of urban landuse. It is the appearance, design and renovating processes, spatial arrangement and character of human settlements through an analysis of chronological development progressions¹. Therefore, urban morphology is applied as a process in determining the alteration processes of urban imprints, making sense of past ancestry of spatial and functional makeup and bringing them to the present day². Urban morphology is an independent scientific discipline of urban geography and it is use as a method in the analysis of layout, forms and functions of the urban centres times reverse to the first half of the Twentieth century³. Buildings (residential and commercial), architectures, streets and place of worship are among the foremost essentials of urban morphological analysis¹. Urban morphology is a part of urban settlement fabric. It is treated as an ‘organic whole’ with a distinction in built structure and the elements are persistently used and hence altered through point in time. The elements are in a position of rigid and active bond. A built structure is shaping and being shaped by the open space around it, a public street is serving and being used by the private land owners along them. The urban centres are dynamic in nature due to the omnipresent relationship between and among elements which

have led urban morphologists to have a preference the term “urban morphogenesis” to describe the evolution of urban form⁴. In the present time, various approaches have come into view for urban morphological analysis. Some of them are ISUF (International Seminar of Urban Form)’s approach, Conzen’s approach, Space Syntax approach etc.. The ISUF’s approach the morphological analysis is based on fundamental physical elements, understanding of elements at different level of resolution and continuous transformation and replacement of elements historically⁴. The Conzen’s approach of urban morphology is the study of the structure and shape of settlements. The approach focused on analyzing evolution and transformations of landuses, buildings structures, plot pattern and street pattern in historical urban space⁶. Urban morphology has become a general and significant research method for the analysis of the physical structures of urban centres through the numerical content (Space Syntax)⁷. Space syntax is a system that can be used for morphological analysis of residential and commercial buildings, architectural designs, and urban plans. Today, there are incalculable studies about Urban Morphology by space syntax method. But the present study is a humble attempt to analyze the morphological component of Midnapore, a historical urban centre of Eastern India. It seeks to explain the urban landscapes of historical importance where built heritage and innovation design of space have become the competitive facets of the urban centre in terms of metamorphosis of urban structure under the influence of

processes like urban redevelopment, gentrification, sprawling and intra-urban competition in economic and social context. The basic goal is to identify the urban morphological pattern and landscape view of Midnapore as an early urban centre of Eastern India. For fulfilling the above goal, the objective has been pigeonholed into three components. These are to classify residential areas based on socio-economic and morphological characteristics; to classify commercial areas on the basis of nature and type of activities and regional importance and to develop a morphological model of the internal structure of the city.

Materials and Methods

Study area: Midnapore urban centre is the headquarters of the district Paschim Medinipur in West Bengal⁸. Sea level fall and consequent isostatic adjustment (86000 B.P.) led this area to rise as an upland over which laterization became dominant process to shape its geomorphology⁹. The town was declared to be the headquarters on 22 September 1783⁸. The name of the town was recorded as an important port of Sarkar Jaleswar (Medinipur, Chakal, Bardhaman and Chetua) in Ain-e-Akbori and Medinipur was established and named after Medinikar (from 1200 to 1431 A.D.), the famous author of the lexicon 'Medinikosh'¹⁰. In 2002, Medinipur district was divided into two – Purba and Paschim Medinipur district for the sake of administrative efficiency. Paschim Medinipur district has four sub-divisions and Midnapore urban centre is under Medinipur Sadar sub-division. Presently, Midnapore urban area is mainly developed as an administrative cum commercial centre along with agricultural activities, industrial activities and different types of informal activities.

Methodology: In arriving at the above object, an intensive survey has been conducted taking homogeneous building block as the basic units of study. Building blocks separated by arterial roads were identified with the help of high resolution satellite images downloaded from open source (wikimapia.org). Information for each of such building block was collected and recorded using predesigned field manual and questionnaires. Thus, collected spatial information were organized and classified on the basis of external form, mode of functioning etc. All the categories of classified information were then employed in mapping in spatial segregation and /or aggregation of residential, commercial and industrial functions across the area under study. This had led to the identification of morphological analysis of Midnapore, a historical urban landscape in Eastern India in question, each of which can be considered as an expression of urbanization process operative over a long period of time since pre-historic period.

Results and Discussion

Residential Areas: Residential pattern of various groups of urban centre have received considerable attention in past few decades in both the urban academic literature and urban

morphological analysis¹¹. Residential areas are classified on the basis of environmental characteristics and socio-economic characteristics. This paper concentrates on the classification of residential areas on the basis of socio-economic characteristics. Further, on the basis of socio-economic characteristics, residential areas are classified in five categories.

Table-1
Bases for the classification of residential building blocks

Bases for Classification of residential areas
Characterization of residential areas by economic class
Characterization of residential areas by Social class
Morphological pattern of the residential areas according to average height of the buildings
Length, spacing and organization of the building blocks
Morphological pattern of the building blocks according to dominant architectural design

Characterization of residential areas by economic class: Residential segregation by income has increased during the past three decades across the developing countries¹². Usually, a household in a developing country utilizes its income to take care of the requirements of the family members. Housing is one of the important wishes for the family belonging to developing countries (Figure-2).

If the income is low or very low, the household may use mud or single floor house in the backward periphery of the urban centre, but as the income increases, it may then settle on to personal one. It is possible either by constructing or buying flat from the housing market¹³. In case of present treatise, household incomes of Midnapore urban area have been classified into five economic classes, namely, high, medium, low, very low and mixed income class¹⁴. The low income households have monthly incomes lies in between Rs. 5000 and 15000, while those earning between Rs. 15000 and 25000 are in the medium income group. The high income households include whose monthly incomes are greater than of Rs. 25000.

The low income class building blocks constituting about 21 percent and very low constituting about 19 percent of the total Midnapore urban area and have been located in Amtala, Gandhi ghat, Maliara, Najarguanj and Talkui, Jamunabali Basantapur, Amchhata golapi chak etc., where medium income group occupies 13 percent of the total urban area. Building blocks with medium income peoples consist of Rangamati, Ashoknagar and Michel Madhusudan nagar area.

Those building blocks belong to the high income group amount to 26 percent of the total urban area and have been centered mostly in Mitra compound, Bidhannagar, Rabindranagar, Joudge court para and Dharma. But mixed class residential areas have been developed mainly in the core of the city and it is mainly the commercial sector of Midnapore urban area.

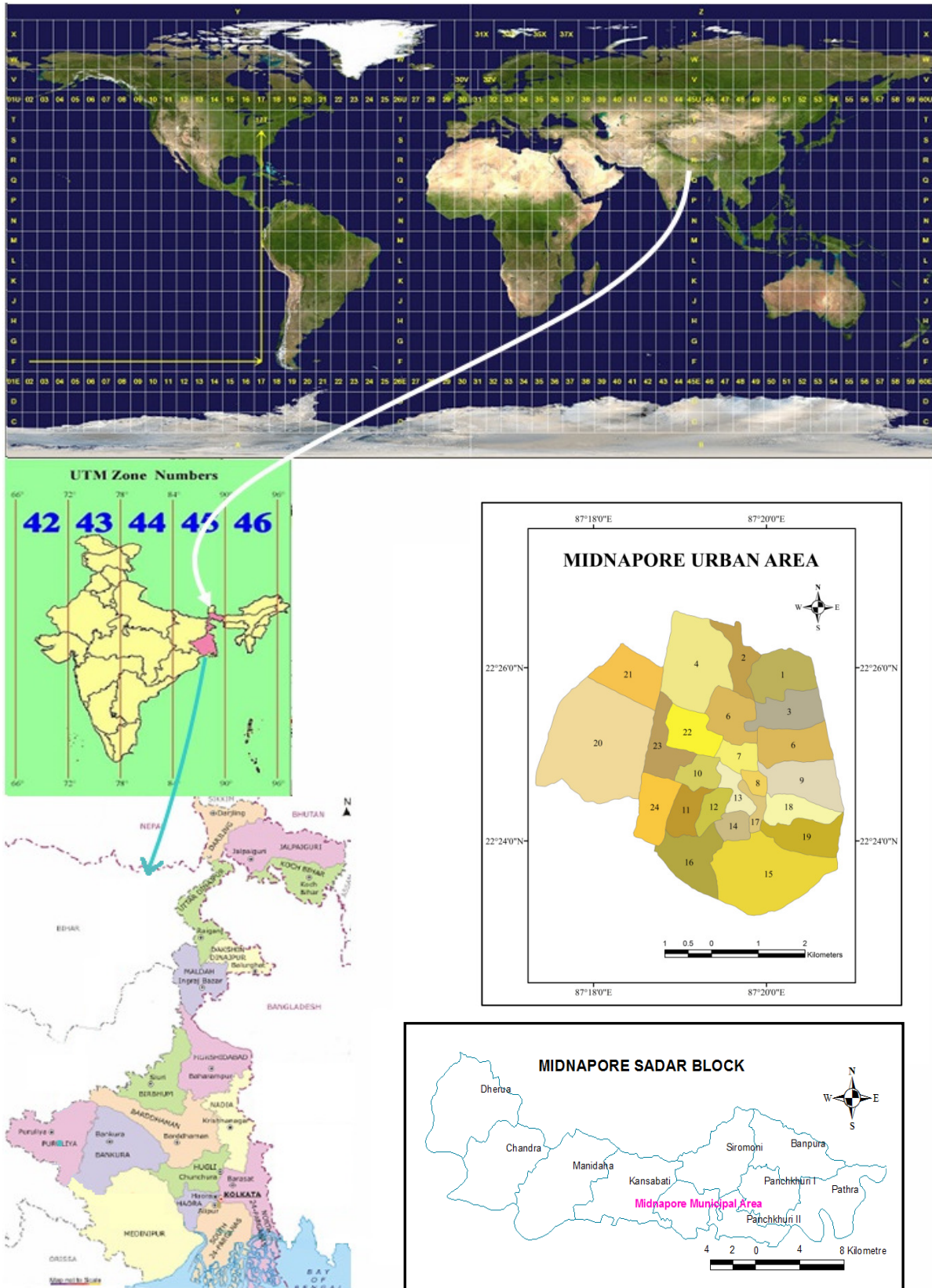


Figure-1
 The study area at a glance

Characterization of residential areas by social class: In case of present study, the professional allocation of Midnapore urban centre mirrors the economic support of the building blocks and the residents have been made of high, medium and low class government servants, professional, working class and industrial workers. All type social class has been found in each and every ward i.e. a mixed type of social class of the inhabitants has been highlighted. But most of the persons have been engaged themselves in working class, professional and low class govt. servants. High and medium class government servants are very much few. Industrial workers have no such specific location as they are distributed within the working class and has been engaged themselves mainly in Spinning mill. There has been some relationship between economic class and social class of Midnapore urban centre. By superimposing the two maps of

residential area by economic class and by social class, it has been cleared that the high class residential area and high class govt. servants or professional groups of workers have been coincided. It has been also applicable for the area of low class residence and working class or low class servants. The hearth areas of Midnapore urban centre included Bidhannagar, Mitra compound, Rabindranagar, Joudge court para, Barabazar. These areas and near about these areas have been used for the people living the apex of social class, either belong to high class govt. servants or managerial and professional services. Towards the outer margin from the urban centre, low class govt. servants and working class has been found except Dharma. Because the urban centre have a tendency to expand herself mainly towards Dharma (Figure-3).

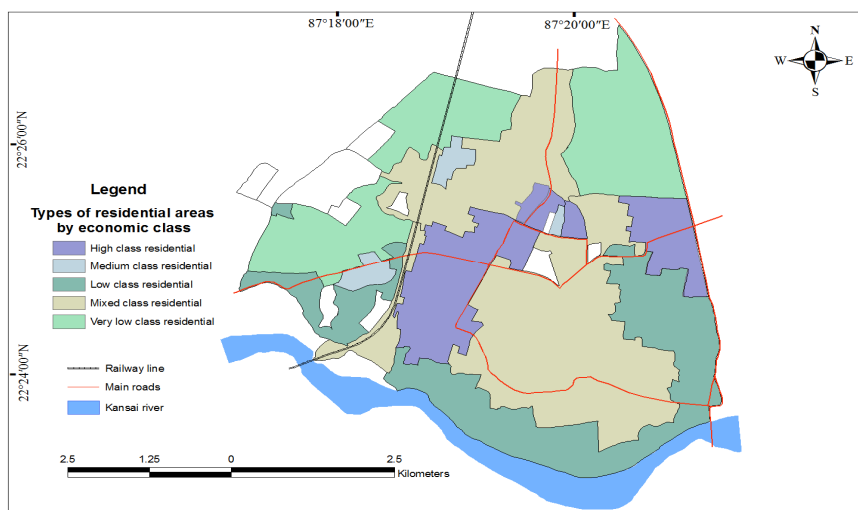


Figure-2
 Characterization of residential areas by economic class

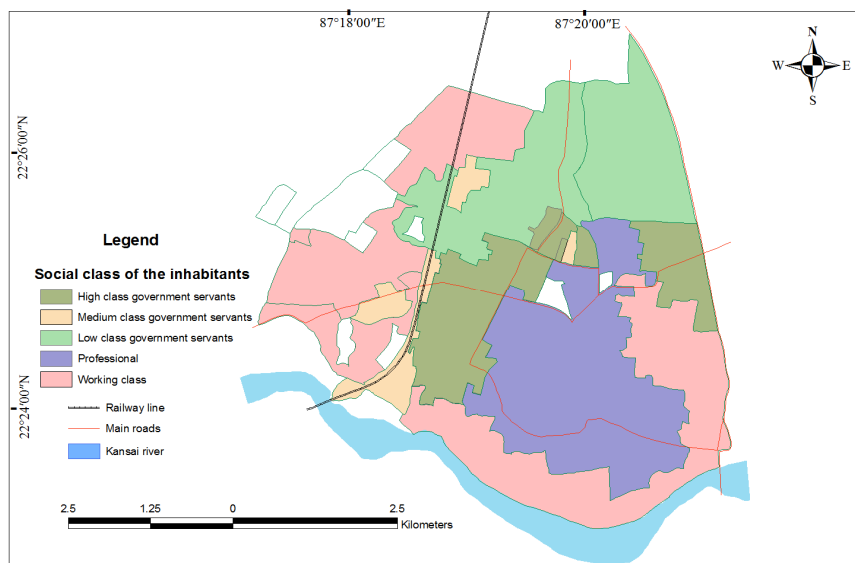


Figure-3
 Characterization of residential areas by social class

Morphological pattern of the residential areas according to average height of the buildings: For morphological analysis of Midnapore urban centre, the urban centre has been classified on the basis of average height of the buildings —Ground floor, 1st floor, 2nd floor (Figure-4).

From the floor map Midnapore urban centre, it has been cleared that second floor are generally concentrated in the city centre (commercial area) like Barabazar, Chotobazar, Schoolbazar etc. and first floor are concentrated mainly in the residential hearth of Midnapore urban centre like Bidhannagar, Rabindranagar, Mitra compound, Joudge court para etc. The outer margin of the urban centre has been comprised with ground floor but muds made houses are rarely seen in the periphery region. As Dharma is in the outer side of Midnapore urban centre, first floor buildings have been found because it is newly developed area of the urban centre for the people belong to high economic class.

Length, spacing and organization of the building blocks: Size and spacing of buildings are important concern of urban morphology. As the land price is high enough in the city centre and adjacent zones, the urban centre is used for commercial purpose, but beside this administrative and high class residential and squatter type settlement are also found (Figure-5).

As the land price is high enough, so the entire urban land is used with fully cover and spacing between or among buildings are near about 1m or <1m. But the essential spacing between the

two buildings is 16 metre for absolute scattering of solar radiation from the surface of the ground after the critical stage of absorption. In case of every urban centre due to hike land price, the entire urban area is used closely, for this reason the radiation or scattering from the earth surface is not satisfactorily done and for this reason “Urban Heat Island” come into being.

In Midnapore urban centre, the entire urban areas are not spacing plan fully. The main commercial areas of Midnapore urban centre are Barabazar, Chotobazar, Schoolbazar etc. The average spacing between the buildings is less than 1m.. But in the residential hearth of Midnapore urban centre like Bidhannagar, Rabindranagar, Mitra compound, the spacing between the buildings are is greater than 1m and from the city centre outwards region towards Dharma the average spacing between and among the buildings increases rapidly. The amount is >1.5m. The outer margins of Midnapore urban center excluding Dharma are totally unplanned in nature.

Morphological pattern of the building blocks according to dominant architectural design: As Midnapore is a historical urban centre, so history plays an important role over the architectural design of Midnapore urban centre¹⁵. The city centre has been comprised with Square shaped architecture along with different historical architecture. One of the popular attraction is the Jagannath temple at Natun bazaar was built in 1851 and was supposedly at the request of a descendant of the Ganga dynasty of Orissa (Orissa architecture with deul style) (Figure-6).

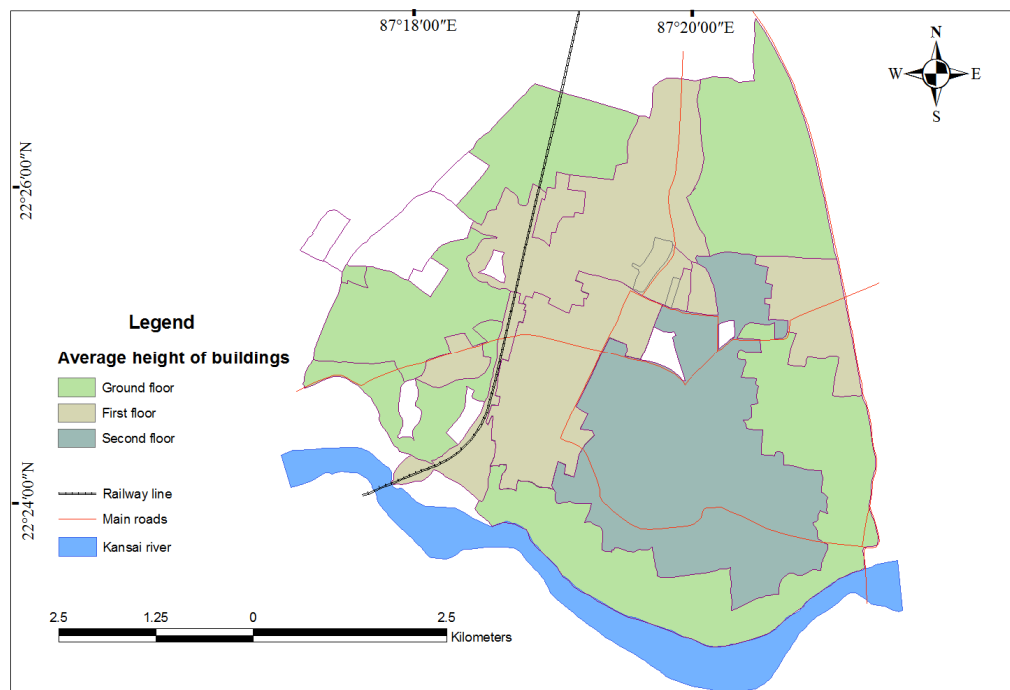


Figure-4
Average height of the building block

Deul is a style of temple architecture of northern India and Bengal that arose between the 6th and the 10th centuries and was received in between 16th to 19th century. The later representative styles were generally smaller and included features influenced by Islamic architecture (Dome and curving works). Ek-ratna (one tower or arch with terracotta sculptures) temple is sophisticated in pancharatna (five rises) and navaratna (nine rises) chics. Pancharatna kali temple at Natun bazar and Navaratna Radhakanta Jiu temple at Shib bazaar are the examples. These temples are ornamented with elaborate

terracotta decorations and has triple arched entry (arched and curving works). Sitala temple (Arched) at Barabazar, Jor Bangla (arched with curving works) at Barabazar, Jor Bangla temple (arched with curving works) ('Jor Bangla' means two curved segments that meet at a curved ridge) at Mirza Bazar, Devi durga temple (arched) at Bibiganj, Atchala style mahaprabhu temple (Square and curving works) at Patna Bazar and Saptarath temple (Arched) at Khaprel bazaar are the others architectural interests.

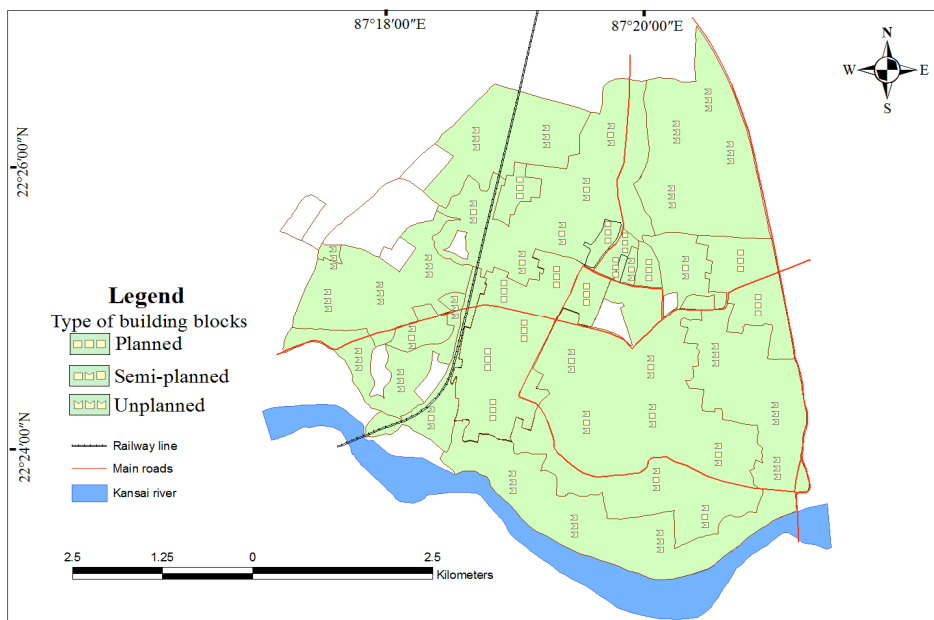


Figure-5
 Length, spacing and organization of the building block

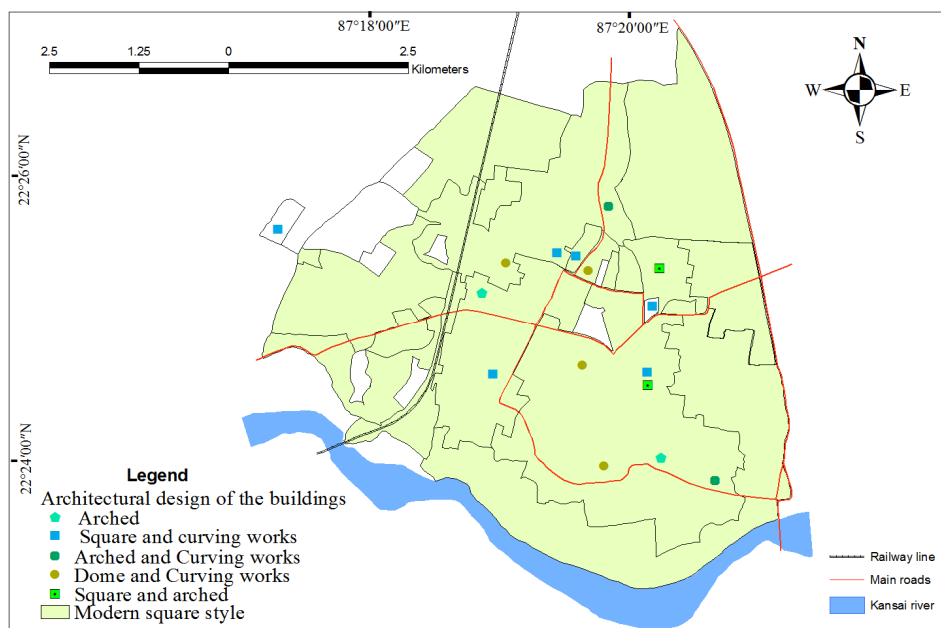


Figure-6
 Dominant architectural design

The Jora Masjid, literally mean the twin mosque, as these are two mosques built side by side. One of the most popular destinations in Midnapore, the Masjid is built with ancient Islamic architectural style (Dome and curving works). Fakir Kua (Near Midnapore central bus stand), Mosque at Natun bazar pally built around 16th century A.D., are the examples of dome and curving architectural style.

Apart from Hindu and Muslim religious, there are many places of religious importance of Christians as well, like St. John church (Arched) at Seikhpura, is one of the most popular churches in the entire district. The ancient looking small church has a graveyard next to it. Roman Catholic church of Keranitola (Square and arched) is another place architectural curiosity.

All types of architecture like square, arch, dome and curving works have been found in the city centre which proves that the urban centre have a historical back ground, but the modern building blocks are generally in square shaped. Due to rapid urbanization and to settle down the spillover or extra population,

there are needs of buildings in the periphery region which are mostly square shaped, ground floor to two floors.

Commercial Areas: Commercial areas in an urban centre are the areas, primarily composed of commercial buildings. Commercial buildings include fashion mall, shopping mall, super store in one hand and in the other hand it also consist of the shops or informal sectors in the both side of urban arterial road or new urban ribbon. Commercial activities within the city include the retail and wholesaling buying and selling of goods and services (Figure-7).

Table-2
Bases for the classification of commercial building blocks

Classification of commercial areas
Nature and type of commercial activities
Hierarchic position of the commercial centres

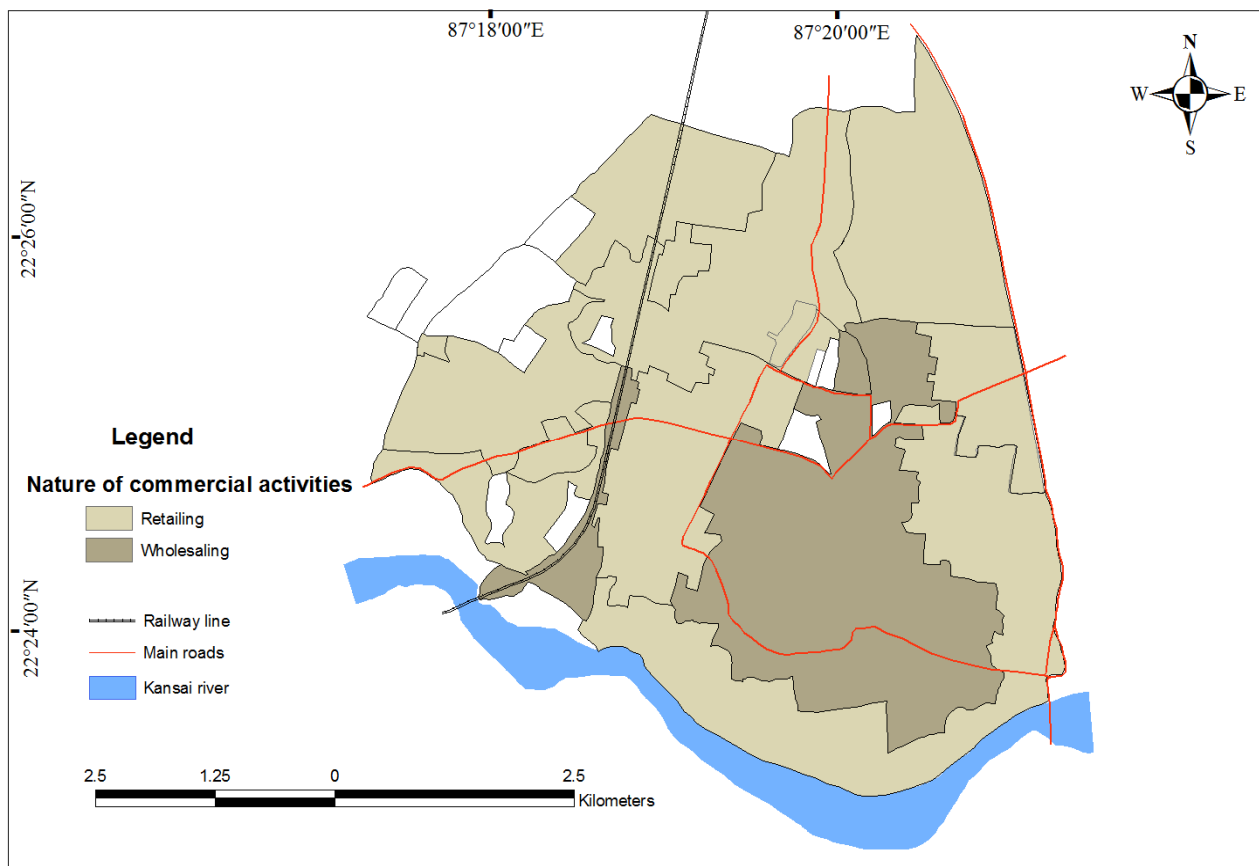


Figure-7
Nature and type of commercial areas

Nature and types of commercial activities: Midnapore urban centre has been divided into mainly two types of commercial areas. These are Wholesaling areas and Retailing areas (Figure-8).

Whole selling areas: Wholesaling (sale without transformation) is the sale of goods mainly cloths, metals, grocery articles etc in large quantities, as for resale by a retailer. Wholesaling commercial area means from where any trading material sale with large amount and large capital. Nature of wholesaling activities is large scale like large capital, large selling material, huge labour etc. Wholesaling activities are found mainly in Barabazar, Chhotobazar, School Bazar, Sahavaran Bazar, Natun Bazar, Mallik Chak etc of Midnapore the urban center. Wholesaling or big market area is mainly dominated by high class society area.

Retailing areas: Retailing is a set of activities that sells goods or services to the consumer for their household use. Nature of retailing type of commercial activity is small scale type. Retailing areas are mainly two types on the basis of the shape of market - stripwise and centrewise. Retailing areas mainly

dominated by mixed settlement area and low medium social type area. Different daily using material sales from retail centre.

Patterns of retailing centers: The pattern of retailing centres is basically two types – stripwise and centrewise.

Stripwise retailing centers: This type of retailing areas have been developed in Midnapore urban centre mainly along the urban arterial road and new urban ribbon road oriented. Types of articles of retailing centre are basically fruits, vegetables, flowers, clothes, books, motor vehicle parts etc. Strip wise retailing areas of Midnapore urban centre have been built up in unplanned manner except the some newly developed periphery area.

Centre wise retailing centers: When the retailing centres are located in junction of communication or transport, then the retailing centres are developed in a concentric manner. It is termed as centre wise retailing areas. The types of articles of this centre are basically two types- I. Special production like- clothes etc. II. Retail cluster like-fruit, cloths, vegetable, fish etc.

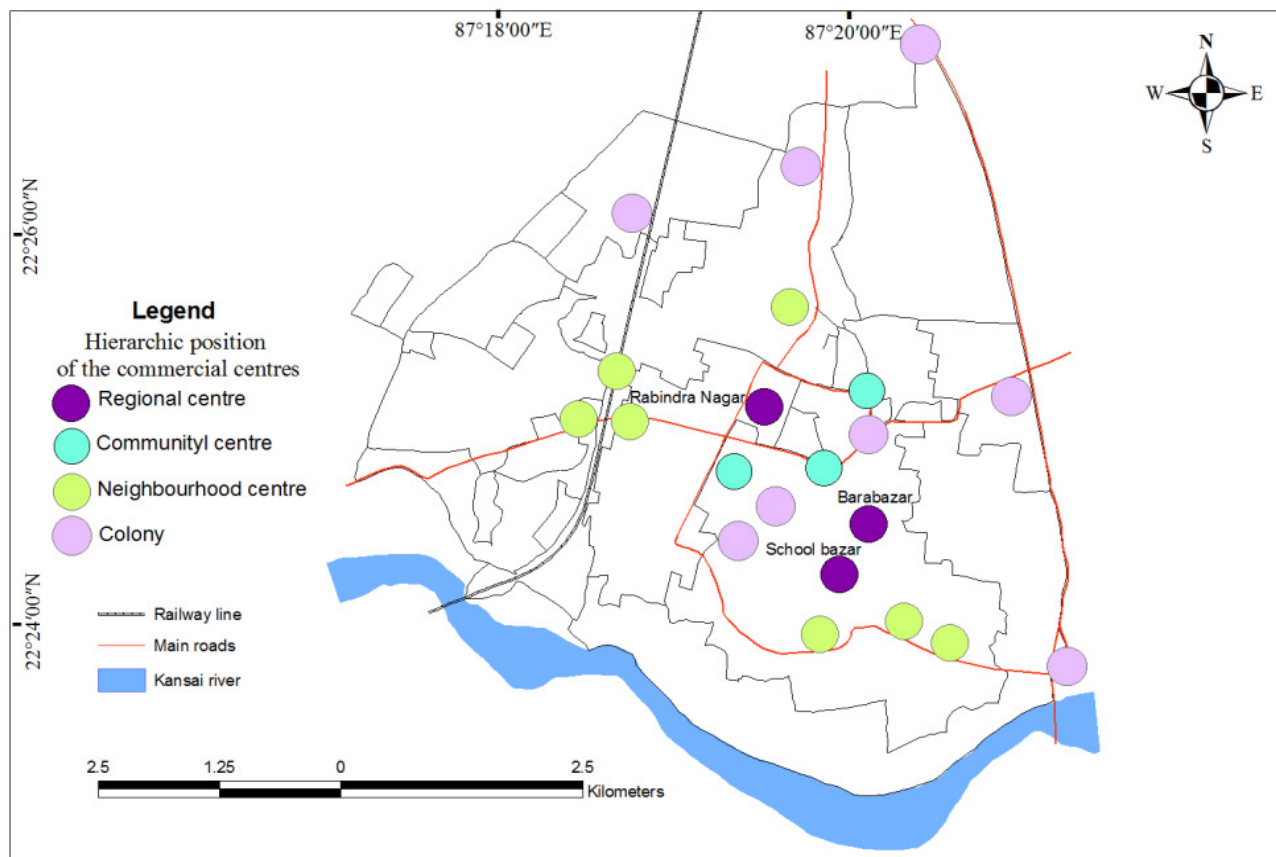


Figure-8
Hierarchic position of the commercial centres

Table-3
Zonation of the commercial areas

Name of the commercial Zones	Nature of commercial activities	Name of the commercial Zones	Nature of commercial activities
Tantigeria	Retailing	Rabindranagar	Wholesaling and retailing
Ashoknagar	Retailing	Keranitola	Wholesaling and retailing
Station bazar	Wholesaling and Retailing	Judge court	Wholesaling and retailing
Bus stand bazar	Retailing	Mirza bazar	Wholesaling and retailing
Khudiram more	Wholesaling and retailing	Bat tala	Wholesaling and retailing
Sepoi bazar	Wholesaling and retailing	Bara bazar	Wholesaling and retailing
Kote bazar	Wholesaling and retailing	School bazaar and Chotta bazar	Wholesaling and retailing
Raja bazar	Wholesaling and retailing	Patna bazar	Wholesaling and retailing
Dharma	Wholesaling and retailing	Boxi bazar	Wholesaling and retailing
Golkua	Wholesaling and retailing	Natun bazar	Wholesaling and retailing
Zilaparisad	Wholesaling and retailing	Amtala	Retailing

Hierarchic position of the commercial centres: The pattern of existing commercial centres within the Midnapore urban centre in the context of a commercial hierarchy as shown in the Table-4.

Commercial activity in the Midnapore urban centre is essentially concentrated in four centres: the regional centre (Bara Bazar, Chotta Bazar and School Bazar), the community centre (Raja Bazar, Keranitola), neighbourhood centre (Natun Bazar, Station Bazar) and colony centre (Amtala Bazar, Dharma Bazar).

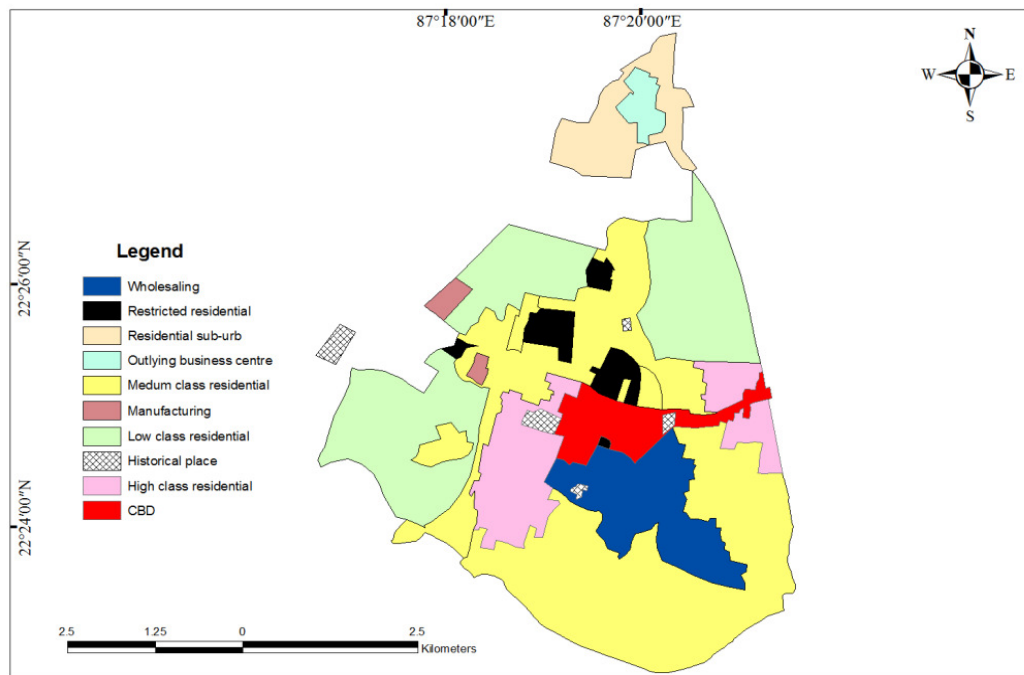


Figure-9
Application of Harris and Ullman's model in case of Midnapore urban centre

Table-4
Existing hierarchy of commercial centres in Midnapore urban area

Centres Hierarchy	Key Functions of	Centre	Average area of Influence	Centre(s)
	Floor Space	Population Served		
Regional Centre	Generally seen to comprise 4000 m ²	Services population more than 1,00,000	80 Kilometre	Bara Bazar, School Bazar
Community Centre	Generally seen to comprise 1000 - 4000 m ²	Services population between 50,000 - 1,00,000	20 Kilometre	Raja Bazar, Keranitola
Neighbourhood Centre	Generally seen to comprise 500 - 1000 m ²	Services population between 5,000 - 50,000	5 Kilometre	Natun Bazar, Station Bazar
Colony Center	Generally seen to comprise 100 - 500 m ²	Services population less than 5,000	2 Kilometre (generally no more than a cluster of 20 shops)	Amtala Bazar, Dharma Bazar

Conclusion

The information collected as above can be superimposed to identify the morphological zones of Midnapore urban centre. The resultant pattern grossly corresponds to the ‘Multiple Nuclei Model’ developed by Chauncy Harris and Edward Ullman (1945)¹⁶ with an exception that two new morphological components have been found in case of Midnapore, namely historical heritage areas¹⁷ and restricted residential areas. Moreover, the C.B.D. has largely shifted from Barabazar towards Dharma in empower socio-economic dynamics of this age old city.

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