GEO-HISTORICAL ANALYSIS OF SOCIO-ECONOMIC TRANSFORMATIONS IN THREE EARLY URBAN CENTRES OF SOUTH BENGAL, EASTERN INDIA

Thesis submitted to Vidyasagar University for the degree of
Doctor of Philosophy in Geography (Science)

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DEDICATION

This thesis is dedicated to my beloved Father. His support and drive is what has made me who I am.

DECLARATION

The thesis entitled "GEO-HISTORICAL ANALYSIS OF SOCIO-ECONOMIC TRANSFORMATIONS IN THREE EARLY URBAN CENTRES OF SOUTH BENGAL, EASTERN INDIA" deals with the research work done by me under the supervision of Dr. Nilanjana Das Chatterjee, Department of Geography and Environment Management, Vidyasagar University, Midnapore, West Bengal, India. This is being submitted for the fulfillment of the requirement for the award of the degree of Doctor of Philosophy (Science) examination in Geography, 2017 of Vidyasagar University. I hereby declare that this thesis is my own research work and has not been submitted in any form for another degree at any university or other institution. Information derived from the published and unpublished work of others has been appropriately acknowledged in the text and a list of references is given.

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This is to certify that **Koushik Mandal**, M.A. in Geography, has completed his thesis entitled **"GEO-HISTORICAL ANALYSIS OF SOCIO-ECONOMIC TRANSFORMATIONS IN THREE EARLY URBAN CENTRES OF SOUTH BENGAL, EASTERN INDIA"** under my guidance and is now submitting it for Ph. D. (Science) Examination in Geography, 2017. This is an original piece of research work carried out by the candidate himself and findings of this research have not been used for any other thesis submitted in any other university. This is further certified Koushik Mandal has followed the Ph. D. regulations laid down by Vidyasagar University.

Nilanjana Das Chatterjee

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ABBREVIATIONS

GIS	: Geographic Information System
CBD	: Central Business District
CFs	: Composite Functional Score
DM	: District Magistrate
IDBI	: The Industrial Development Bank of India
ISUF	: International Seminar of Urban Form
IT	: Information Technology
mT	: Mean Population Threshold
PCFs	: Proportional Composite Functional Score
RSP	: Revised Settlement Policy
SBI	: State Bank of India
SI	: Sphere of Influence
SOI	: Survey of India
UBI	: United Bank of India
WF	: Weightage of Facility

Chapter 1: Introduction

1.1 Introduction

Geography concerns with the understanding of the dynamics of physical landscapes, environment, cultures, societies and economies and puts this understanding of physical and social processes within the context of places and regions recognizing the great differences in landscapes, environments, cultures and economics across the world, and the links between them. Historiography is the study of the history and a methodology of the discipline of history. Historiography denotes a body of historical works on a specialized topic. Scholars discuss historiography topically like 'the historiography of Bejing, an early urban centre of China'. It is the written record of what is known of human lives and societies in the past and how historians have attempted to understand them. Without history and historiography, people would be blindly venturing into the future without considering past mistakes or successes, having not studied how and why events occur. This can only be done through the preservation and review of historical records written by historians devoted to providing the public with reliable and factual information.

Geo-history is the study of geographies of past times, involving the reconstruction of a wide range of phenomena and processes central to geographical understanding of the dynamism of physical and human affairs, such as transformation in socio-economic components (Knight, 1950). Most recently Baker (2003) attempted to define the position and research orientation of geo-history with the formulation of fundamental principles for the discipline. 1) He places emphasis on geo-history's research focus from the past. 2) He emphasizes the significance of dialogue on developing the discipline. 3) He accentuates that geo-history deal with research of geographic (physical and socio-economic) changes in time. 4) Geo-history is a central discipline in a holistic comprehension of geography. 5) Geo-history deals primarily with the

geographic synthesis of place and not with the spatial analysis and is focused on 'period and place' rather than on 'time and space', 6) and emphasizes the peculiarity and distinctiveness of geographical phenomena and processes identified in geographically and historically specific and unique places.

1.2 History of geography, geography of history, historical geography and geo-history

Richard Evans, in his powerful 'defense' of history in opposition to its attack by postmodernism, declares that the 1960s saw 'the invasion of the social sciences into history in Britain' and that in the post-war years in France the Annals historians expected to make history far more objective and scientific than ever before by 'incorporating the methods of economics, sociology and especially geography into their approach to the past' (Evans, 1997). The writing of regional histories and of histories which addressed geographical concerns became such a distinctive characteristic of the Annals school that some observers claimed that its historians had 'annexed' geography (Harsgor, 1978; Huppert, 1978). A geographer, Etienne Juillard (1956), had written earlier of the 'frontiers' between history and geography. It is needful to engage with the relations of geography and history in a more sustained fashion. History of geography, geography of history, historical geography and geo-history has a shared experience over a wide range of matters (Mitchell, 1954). They address very similar, and often the same, problems and sources; they employ very similar, and often the same, research and presentational techniques; they straddle, not always without difficulty and sometimes with great discomfort, knowledge and understandings from both the natural sciences and the social sciences while they themselves are part of the broad spectrum of

humanities or historical sciences. To consider the trilogy – subject matter, geography and history, history of geography may be viewed as being concerned with the historical dimension in geography and geography of history with the geographical dimension in history. Historical geography is, simply stated, a geographical study of any period in the past for which a more or less ordered and dated sequence is established in human affairs. Historical geography is the geography of the past, but the historical geographer is always a geographer and never a historian. A historian can write a history of India without becoming a geographer and a geographer can write geography of India in the pre-historic or the historic period remains a geographer (Holdsworth, 2003).

A related key concept outlined by Braudel was that of 'geo-history' (ge´ohistoire). A sustained discussion and elaboration of geo-history as a concept was provided by Charles Higounet (1961), who saw it both as an approach which emphasized the importance of locating historical events. Geo-history in this limited sense, as 'the cartographic method in history', has come to be widely adopted in practice if not in name. But Braudel had given the term much broader meaning, embracing both the spatial and environmental contexts of human activities. Therefore, geo-history is geography, a geographical science. As such, it should not be merely topography. This, naturally, assumes that it will seek regularities (Guelke, 1997). Even though it is sometimes very difficult to distinguish geo-history from other geographical disciplines, its uncontested contribution lies in the fact that it deals primarily with the reconstruction of phenomena that no longer exist and, in so doing, contributes to understand the current state of the landscape. Much the same as historiography, it becomes, in this way, a sort of 'bridge' between our past and present. In order for geo-history to be distinguishable from historiography, it should place a greater

emphasis on space than on time as well as on the contemporaneity of the expressions being studied (Norton, 1980). Geo-history is primarily a science on the geographical organization of the landscape sphere in the chosen time period, and not a science dealing with the chronological description of the development of a certain phenomena. Geographers can agree that while historiography, with its emphasis on linear development in time and chronology, is more a 'time-space science' and that geo-history is more a 'space-time science'. Nomothetically oriented geo-history should study the status and development, causes and mechanisms of landscape variation or their various components in a certain time period in the past in a geographical manner. And, in doing so, contribute to seeking and verifying general regularities. If certain regularity is to be considered generally valid, it must apply not only in the present as geographers perceive it, but also in the past.

1.3 Literature review

1.3.1 Advancement of geo-historical analysis in the field of geography

Geo-history is an interdisciplinary branch that combines space with time and social with natural sciences, (Semotanova, 2002) there is clearly no doubt that geo-history must, by its very nature, be an interdisciplinary branch. Geo-history should not merely be a synthesis of geography and historiography. It should be something special, something more. It may seem that this problem could be resolved by designating geo-history as the 'geography of the past' (Butlin, 1992). However, even by doing so, it would not resolve the independent problem of whether geo-history is a geographical or a historical discipline. The fundamental problem of self definition of geo-history does not lie in comprehending the meaning of 'history' in the

two word title, but rather in the fact that it remains unclear, what is mean by ‘geo’. The historicalness of geo-history seems to be emphasized too often, while its relation to geography remains completely unnoticed.

However, dividing geography into so-called ‘geography of the present’ and ‘geo-history’ seems to be a very artificial treatment that does not correspond with reality. The world around is continually changing and continuously moves from the past into the future through present (Pred, 1984). Moreover, due to its nature, geography must and does deal with the changes and development of certain expressions in time (Pred, 1984; Sauer, 1941; Pumain, 2000). And, of course, in terms of the above mentioned claim, it also pays significant attention to the past and deals with the study of the development of the geographical environment in the past in relation to the present, then all geographical topics are geo-historical (Butlin, 1993). The connection of space and time is not what makes geo-history unique. Space and time are connected in geography as well as historiography (Naylor, 2005). Implementation of a different way of understanding the present, referred to as ‘embedded time’ could represent a certain methodological point of departure in resolving this dilemma. ‘Embedded time’ suggests that there is no clock sharp present common to everything. Instead the full life-time or the whole time of existence for each corpuscle stands out as its present. The past is what happened before the point of birth and the future is what will happen after death or destruction (Thrift, 1977).

Baker places emphasis primarily on the concept of geo-history as an idiographic science concerned with the singularities and peculiarities of specific places during certain periods. In so doing, He resigns the possibility to generalize the research findings, whereas he reduces geo-historical research to the mere creation of case studies emphasizing the uniqueness of a

place and a time period. The results of such studies, however, are very difficult to apply in the practical ways. Moreover, geo-history cannot simplify its extent to the mere geo-historical research of spatial phenomena without losing its competitiveness and its distinctiveness from other better established scientific branches such as historiography and archaeology. If geo-history is to attempt to clarify its current status (Semotanova, 2002) and to practically apply knowledge arising from its own research (Cloke et al., 1991), it must be, to a certain degree, nomothetic. That is, it must attempt to seek regularities in the development of the geographical organization of the past, in which case studies are perceived only as one of the possible methods in the given research context (Johnston et al., 1994). In other words, it must be, by definition, geographical and it must integrate both idiographic and nomothetic approaches. The former, idiographic, focus attention on the specificity of this world and life on earth and remind human beings that their life is not only composed of generally valid rules and laws. When making decisions, people should always be aware that they are making a decision in a specific context and the decision will never be completely ideal. The latter, nomothetic, lead to the knowledge that it is possible, at a certain level of abstractness and generality, to attain a degree of consensus, agreement, regularity, and in so doing to live, to some degree, in symbiosis with the surrounding world. They help society to find some direction in the world around mankind. Each place is, naturally, specific, but all are not so unique, as to not have something in common.

1.3.2 Geo-historical analysis of early urban centres in World

One key idea was that historical changes proceed at different rates. In his study on the Mediterranean, Braudel distinguished three such rates, devoting to each a separate section of his book. Before considering the short time-spans of individuals and events (histoire e´ve´nementielle) and the slow but perceptible rhythms (histoire conjoncturelle) of economies and societies over periods of, say, ten to fifty years, Braudel initially considered long-term, hardly perceptible changes in the physical environment and in the relations between people and their environment. This third category of change was described by Braudel in his book both as 'geographical time' and as 'structural history' (histoire structurelle), and the idea of slow but fundamental change, whether in the physical (geographical) or the cultural (social) domains, he elaborated later into that of 'la longue dure´e', a concept which has itself left an enduring impression upon the study of history as practiced by the Annalists. For example, recognizing the role of multiple time-scales within societies, Jean-Luc Piveteau in his book 'Temps du territoire' (1995) portrays the social organization of space at a moment in time as a horizontal cut made through the vertical arrow of time within which are embedded processes operating in short-term, medium-term and long term time-scales. But for Braudel, historical processes operated not only at different time-scales but also at different spatial scales. It was this emphasis in Braudel's work, together with his recognition of the roles of the physical environment and of distance and location in the making of regional histories, which led Yves Lacoste (1986) to refer to Braudel as a 'geographer' after Pierre Chaunu had referred to Braudel more transitionally as 'the master of historical geography' (Chaunu, 1969). For Braudel, geography was the study of society in space and in his monograph on the Mediterranean world during the sixteenth century he

described what for him would be a project in geo-history. It would seek a historical understanding of the spatial and environmental contexts of human activities and would, if at all possible, involve mapping them. Therefore, geo-history was explicitly a way of making historians more geographically aware and geographers more historically sensitive (Braudel, 1949; 1966). Geo-history has become embedded within the practice of French history as a concept, as a term it has not been much used by historians, perhaps because some thought it a 'barbarous' connotation, possibly because some confusion arose when it was employed to refer to the history of geography and of geology (Dunbar, 1980) and when it was used interchangeably with 'historical geography' by the historian Pierre Chaunu (1969). Charles Higounet (1961) cited two examples from his own geo-historical work: first, his mapping of 'new towns' in south-western France suggested the existence there in the thirteenth century of frontier zones between differently administered or owned territories; and secondly, his comparison of a map of the distribution of Romanesque churches in the Gironde region in the twelfth and thirteenth centuries with one of medieval woodland clearance enabled Higounet to suggest that the church building movement was probably associated with the growth of the viticulture economy of the Bordeaux region. A book entitled 'Lieux d'histoire: essaide ge´ohistoire syste´matique' is written by Christian Grataloup (1996), addresses the spatial organization of societies on a global scale through time. Examining spatial relations and the roles of location and distance in the changing fortunes of empires, continents, countries and cities from the Neolithic to the Industrial Revolution, Grataloup sees space as a significant 'actor' in world geo-history. Peter Taylor's (1999a, 1999b) 'geo-historical interpretation' of the modern world's development since the sixteenth century is an approach which 'focuses

on the embeddedness of social practices within specific space-time locations' and which interprets 'the concrete face of modernity as a single inter-connected story and map'.

1.3.3 Geo-historical analysis of early urban centres in India

Geo-history of urban centres in India, within the framework of geographical disciplines, is just over ten decades old. Interest in towns and cities as initially stimulated among Indian geographers and town planners by Patrick Geddes in the University of Bombay in 1915, and the study of urban problems was taken up by geographers to some extent in the 1920s. The more purposeful intellectual attempts to understand the geo-history of urban centres in India were based mainly on the literary evidences and archaeological excavations. This move was initiated by scholars like A. Ghosh (1973), Vijayakumar Thakur (1981), and Dilip K. Chakrabarti (1988). Attaching to this category of studies on ancient Indian cities, Kameshwar Prasad published his work entitled 'Cities, Crafts and Commerce under the Kushans' in 1984. In 1986, M. Lal tried to examine the role of iron and the growth of cities in the Gangetic valley. In 1987, R.S. Sharma in his 'Urban Decay in India' tried to argue that the early historic cities of India declined along with the decline of trade economy which reached its water-mark during the Kushan period. In the next year, Dilip K. Chakrabarti added some comments on the 'Phenomenon of urbanization' in his book 'Theoretical Issues in Indian Archaeology' (1988). A few other scholars like Hameeda Khatoon Naqvi, Gavin Hambly, S.C. Misra and I.P. Gupta, have published interesting studies on the urban geo-history of medieval India. J.S. Grewal and Indu Banga also belong to this category.

India's urban geo-history has attracted the attention of many scholars including Max Weber, Arnold Toynbee, Milton Singer, Robert Redfield, Gideon Sjoberg and Percival Spear. Max Weber has offered a comparative historical account of the cities with special attention to the institution of caste in the context of Indian cities. A book entitled 'A Study of History' is written by Arnold Toynbee and his goal was to trace the development and the decay of nineteen world civilizations in the historical records, applying his model to each of these civilizations, details the stages through which they all pass: genesis, growth, time of troubles, universal state, and disintegration. Anthony D. King's case-study of colonial urban development discusses the transformation of Delhi between the early nineteenth and the mid-twentieth century's. It was an attempt to construct a detailed geo-history of the socio-cultural and physical-spatial development of the capital city of Delhi, distinguishing implicitly between factors of 'modernization' and 'westernization'. R.I. Crane's work provides an insight into the growth of cities during the pre-British period while he discusses on the growth of cities during British rule. Ghurye (1962) compared urban growth in the colonial setting with urban growth since independence. In his study of Ahmadabad, Kenneth Gillon (1968) analyzed the colonial situation under the British as it prevailed on the West coast. Christine Dobbins (1972), in her study of Bombay in mid-nineteenth century, brought to light the speed and variability with which different local communities which were generally receptive to the new ideas introduced by the British took advantage of the new opportunities. This had been done by identifying the merging elites in Bombay in the mid-nineteenth century. Prof. Bayly (1975) referred to the emergence of the urban elite in the city of Allahabad. According to him, the new elite gave the much needed leadership to the nascent nationalist sentiments and their members were instrumental in shaping the early policies of

the Congress Party. Pradip Sinha (1978) traced the growth of the metropolitan city of Calcutta from a cluster of villages during the times of Job Charnock to the period when it assumed the status of the capital city in India.

There are three recent works dealing with geo-history of Indian cities and the process of urbanization on Bombay published by the Oxford University Press in a series. Covering almost 200 years of the city's history, the series follows Mumbai from the early 1800s when it was a second-tier East India Company trading post to its current manifestation as a deindustrializing global mega city. The treatises cover such themes as developments, socio-economic and cultural transformations, labour struggles, urban planning, and competing and co-existing local identities. Thus the work is relevant to both scholars of ancient Indian cities and those interested in geo-history of urban centres in general. Two other important works which cannot be omitted while discussing geo-history of urban centres in India are Sandip Hazareesingh's work (2007) based on the twentieth century Bombay city titled 'The Colonial City and the Challenge of Modernity: Urban Hegemonies and Civic Contestations in Bombay (1900-1925)' and Janaki Nair's (2005) 'Bangalore's Twentieth Century: The Promise of the Metropolis'. Hazareesingh's work offers fresh and stimulating insights into the multi-layered relationships between modernity, colonialism, and the production of urban space. It examines a crucial period of change in both urban forms and political conditions in Bombay city generated by the colonial context of modernity. Janaki Nair's 'Bangalore's Twentieth Century: The Promise of the Metropolis', a thematically presented book running to four hundred and fifty four pages discusses in great detail Bangalore city's evolution in spatial, social, religious, economic, the colonial rule and its impact on town planning, architecture,

local economy, consumption patterns and habits, post independence public sector impetus and finally its metamorphosis into the IT hub.

1.3.4 Early urban centres in South Bengal with special reference to Tamluk, Contai and Midnapore

The most important port cum urban centre in ancient Bengal was undoubtedly Tamralipta. The modern town of Tamluk, which roughly represents the old site, is on the right bank of river Rupnarayan, about twelve miles from its junction with the Hoogly (Majumdar, 1971). The course of these rivers has shifted frequently, and in early times the port of Tamralipta was not unlikely situated on the Saraswati or another branch of Ganges (Hunter, 1876). It appears from the account of Chinese pilgrims- Fa-hien, Hiuen Tsang, I-tsing and Dandin's 'Dasakumara-charita', that it was the place for embarkation for Ceylon, Java and China (in the east), and the land of the Yavanas (in the west). The 'Kathasaritsagara', a later work, also refers to people embarking on ships at Tamralipta for going to Kataha in Malaya Peninsula. Its existence in the second century A.D. is proved by reference in Ptolemy's Geography (Basham, 1975). The port on the Ganges referred to in the 'Periplus' has been identified with Tamralipta by Schoff who observes: "By the town of Ganges is probably meant Tamralipta, the modern Tamluk, which gave its name to the Tamraparni River in the Pandya kingdom and to the island of Ceylon". This was the sea port Bengal in post-Vedic and Buddhist periods, being frequently mentioned in the great epics. It was the port of the 'Bangalis, who trusted in their ships', who were conquered by the hero of Kalidasa's 'Raghuvamsa' (Majumdar, 1971). Malabathrum which was exported from this port, Schoff remarks that this was brought from the eastern Himalaya, the greatest source of its supply, according to

'Periplus' (Basham, 1975). The oversea trade from Tamralipta followed different courses. The first was a voyage along the eastern coast of the Bay of Bengal right up to Malaya Peninsula, and then through the Malaya straits, or across the narrow isthmus of Kra, to the south east Asia as far as China. The second was a coastal voyage to Paloura near Chicacole (presently Srikakulam) and then right across the Bay of Bengal to the opposite course. The third was a voyage along the eastern coast of India to Ceylon, and then turning north along the western coast to the mouth of the Indus, or across the Arabian Sea from some points in south India to the ports in Arabia and eastern Africa (Majumdar, 1971). Therefore, rural economic system of eastern India had always been dependent on agriculture and the economics of urban centres fundamentally ran on trade and trade based activities. Tamluk, Contai and Midnapore urban centres of Eastern India were not exception to this. Tamluk came into existence sometimes in-between 1500 to 2000 B.C. and became a renowned port by 700 B.C. Eastern India maintained trading of copper and horse with South-east Asian countries, Europe, Singhal and West Africa through Tamluk (erstwhile Tamralipta) port up to 8th century A.D. During early of the early medieval period (from 7th to 8th century A.D.) silk, cotton fabrics exported to Arab and Europe from Midnapore urban centres through the port of Tamralipta. After 8th century A.D., Tamralipta port got a huge set back due to siltation on river Rupnarayan and emergence of Hijili port on the coast of Bay of Bengal. During colonial period, European trade appears to have flourished around Contai. Contai was a part of Hijili kingdom and was famous for rice, salt, piece goods and cloths but during post-colonial period, overseas trade of these articles were on the decline as the European merchants became vulnerable to the Indian freedom movements. Simultaneously, salt, piece

goods and cloths manufacturing industries failed to retain its economic viability as before, but some imprints of those mega scale activities are still alive over the cultural landscape.

1.3.5 Significance of geo-historical analysis for Tamluk, Contai and Midnapore urban centre

Geo-historical analysis is essential in order to analyze the evolutionary data, information and to facilitate the decision process at all levels (Golledge, 1969). The present study is a humble attempt to analyze the historical evolution of Tamluk, Contai and Midnapore urban areas (Purba and Paschim Medinipur Districts, W.B.) from geo-historical point of view. Geographical history of these three urban areas is different from one another (Paul, 2002) and they also differ in their modes of origin and evolution (O'Malley, 1911). Tamluk, Contai and Midnapore urban areas are historical urban areas in undivided Medinipur District of South Bengal (Bosu, 1921). A number of dynasties (Maurayan, Kalinga, Gupta, Afgan, Mughal, British etc.) ruled these urban areas in different times in history (Das, 2001; Bosu, 1921) and left their distinct imprints on different aspects of society, culture and economy (Ghosh, 2008). The unique interaction among all cultural, political, social, economic activities etc. together makes these urban areas identical in nature among all historical urban areas in South Bengal as well as in Eastern India (Ghosh, 2008; Majumdar, 1971).

1.3.6 Tamluk, Contai and Midnapore urban centres: In geo-historical context

1.3.6.1 Geo-history of Tamluk urban centre

Tamluk is headquarter of Tamluk sub-division (O'Malley, 1911), situated on the north bank of river Rupnarayan (Paul, 2002). Tamluk was formed 1500 to 2000 years B.P. and that time it was characterized by marshy land topography, halophytic plants and salt marshes (Paul, 2002). Due to depositional work of river Hoogly and Rupnarayan, Tamluk urban area emerged 638 years B.P. (Paul, 2002) and human settlements were first grow in copper age (261 years B.C.) (Paul, 2002). Tamluk was occupied by Maurayan rule and Ashoka himself formed a 'Stupa' (Basham, 1975). Each 'Stupa' came to be metaphysically identified as 'the axis of the world' and ornamented with elaborated carvings which for all their cosmic and sometimes dynastic symbolism retained a fundamental humanity of scale (Renfrew, 1983). After that Buddhist formed monasteries and then Jain, Brahamana also left their cultural signature in every aspects of Tamluk urban area (Santra, 1998; Basham, 1975). Tamluk first emerged as port during colonial period and in which merchants and others landed and embarked for Ceylon, java, China etc. (O'Malley, 1911). So, the economic bases during colonial period were trade and trade related activities (Roy, 2006; Das, 2001). In medieval period also Tamralipta was an important port of sea mouth and the same economic bases of colonial period were survived (Sharma, 2009). From the time of Mughal, downfall of port Tamluk was started and in colonial time Tamralipta continued a Portuguese settlement and appears to have a slave market (Majumdar, 1971; O'Malley, 1911). In post-colonial time, the urban area is still a place of considerable importance as a centre of boat traffic on Rupnarayan River and the principal manufacturing is of bell-metal articles (Roy, 2005). Therefore the economic bases were changed at different points of time in history. Different cultural traits left their cultural signature like Bargabhima temple (Buddhist architecture),

Sakti temple (Oriya type architecture) etc. in every aspects of Tamluk urban area (Basham, 1975).

1.3.6.2 Geo-history of Contai urban centre

Contai town is headquarter of sub-division Contai and situated on the sandy ridges, 12 miles away from the Bay of Bengal. After the formation of shoreline, beach ridges due to wave deposition, longshore current deposition and sand deposition of windblown activities, the settlement of Contai urban areas like Majna, Kandi etc were formed 6000 years ago. After shoreline declination, Contai urban area emerged as a dune based settlement town (Goswami, 1997). Due to downfall of port Tamralipta, Tamralipta had lost its importance (Sharma, 1999; O'Malley, 1911) and Hijili had become a great trade centre (O'Malley, 1911). So, European trade appears to have flourished during colonial period (Roy, 2006; O'Malley, 1911). It lay on the road from Balasore to Pipli to Hijili (O'Malley, 1911). These three were the important ports in the west of the Bay of Bengal and share their export trades (Majumdar, 1971). These three ports played an important role for the expansion of trade in Kendua (Roy, 2006) and under the name of Kendua, the influence area were spread out up to Balasore, Pipli and Hijili (Majumdar, 1971; Roy, 2006). Dutch appear to have a station at Kendua for the trade of rice and other articles (Majumdar, 1971; O'Malley, 1911). So, the economic base of Kendua was trade i.e. trade of rice and other articles in colonial period and in the year 1781 the East India Company established a salt department, deprived the Zamindars of the power of manufacturing salt on their estates. In return for the loss of profits, the Zamindars received a certain fixed allowance (malikana) and a further allowance (mushahara) upon condition of

their rendering aid of manufacturing of salt. In 1852 it was estimated that ¾ of the cultivators in Hijili stood in the double capacity of salt makers and cultivators (Hunter, 1876). During post-colonial period, the economic base of Contai was changed into manufacturing of salt (Roy, 2005) i.e. Kendua was shown at the end of the small streams in colonial period but it was disappeared in post-colonial era owing to sand drifts (Paul, 2002). So, the foreign export trade gradually decline and manufacturing of salt increased (Roy, 2005) and Contai became headquarter of Hijili sub-division of salt agency (O'Malley, 1911; Roy, 2005).

1.3.6.3 Geo-history of Midnapore urban centre

Midnapore town is the headquarter of the district Paschim Medinipur, situated in the intersecting place of 22°25′N latitude and 87°19′E longitude (O'Malley, 1911). It was formed from 84000 B.P., due to sea level fall, isostatically Midnapore was uplifted and after that laterization process worked on and Midnapore was formed as a lateritic upland (Niyogi, 1972; Mallick, 1972). The town was declared to be the sadar station on 22nd September, 1783A.D. (O'Malley, 1911). A century later from Oriya rule, Chodaganga Deba defeated the king on Mandar and the kingdom Radha was included in the Medinipur district (Bosu, 1921; O'Malley, 1911). At the time of Afgan rule, Medinipur appears to have fared no better under the Afgan (Majumdar, 1971). During Mughal rule Medinipur continued to Subha Orissa (Majumdar, 1971). The name of the town was recorded as an important port of Sarkar Jaleswar in 'Ain-e-Akbori' and Medinipur was established and named after Medinikar (1200 to 1431 A.D.), the famous author of the lexicon 'Medinikosh' (Hunter, 1876). Agriculture was the predominant economic base on the Midnapore town in historical era and the

economic system of Midnapore urban areas was based on land tenure (Majumdar, 1971; Sharma, 2009). It would appear that silk, linen and cotton fabrics had all attained high degree of excellence i.e. Midnapore maintained her reputation for textile industry throughout the medieval period (Ray and Chattopadhaya, 1992). Cultivation of silk worm, cotton fabrics manufacturing and exporting of cotton to Arab, were the major economic bases of pre-colonial era (Majumdar, 1971; Roy, 2005). During British and French trade, they had different small and large scale industries near Sarkar Jaleswar (Roy, 2005; Das, 2001). So, trade was the major economic base during colonial period but the major portion of the profit drained away to Europe, France etc. as the factories were established by British (piece goods), French (white cloths) (Roy, 2005; Roy, 2006). Midnapore was changed to residential cum commercial areas (Roy, 2006). Only the people of the Midnapore urban areas were incorporated themselves into those factories as labourer and earned money to carry out their livelihood pattern not to aspire their livelihood pattern better (Majumdar, 1971; Biswas, 2003). These types of industries were the economic bases for the development of urban centres during colonial period (Roy, 2005; Majumdar, 1971) and urban industries played a role for the prosperity of their surrounding areas means the prosperity of their social life (Plekhanov, 2005). In post-colonial era Midnapore urban area was mainly developed on the basis of administrative cum commercial activities along with agricultural activities, industrial activities and different types of informal activities (O'Malley, 1911). Informal activities refer here the home industrial activities, microenterprise related activities, constructional work related activities etc. (Pacione, 2004).

1.4 Origin of research problems

Tamluk, Contai and Midnapore, the three selected early urban centres of Eastern India for the present study, are located in three distinctly different geographical zones and originated as urban centres at different points of time in history. Origin of those urban centres can be attributed to different bases which are economically, socially, politically related to the evolutionary history of the landscape as a whole. Functionally all these three towns had operated as a centre of opulence and thus assumed great significance at the time of their culmination. These three selected urban centres lost their economic significance due to geophysical changes of the landscape. In spite of the fact that the urban centres have lost their past glory but they still exist as three important urban centres of South Bengal as well as Eastern India. All the above interesting facts require explanation in geo-historical perspectives. Such reconstructions of the urban geo-history of the three urban centres may lead to arrive into planning decision that may be important in promoting urbanization of these three early urban centres for overall regional development.

1.5 Objectives of the present study

Objectives of the present study are-

1. To explore the varying history of geographical evolution of the landscapes over which the selected urban areas originated.

2. To study the economic history that formed the foundations for the establishment of the urban centres under consideration.

3. To assess the present morphological structure of the urban centres and their historical significance.

4. To delineate the sphere of urban influence of these three early urban centres of Eastern India.

5. To assess the future potentiality of each of these urban centres in the context of regional development.

Chapter 2: Materials and methodology

2.1 Study areas

2.1.1 Tamluk urban centre

Tamluk municipality covering an area of 17.86 sq. km., is one of the most populous urban centres in south Bengal, and Tamluk urban centre includes twenty municipal wards and surrounding areas. It is the headquarters of Purba Medinipur district, about 20 km. from Mecheda, 30 km. from Haldia and 25 km. from Panskura urban centre. It became an eminent port in historical past and now it lost its importance but different dynasties left their imprints over the different aspects of Tamluk urban centre like Tamluk rajbari of Mayuradha dynasty (Peacock dynasty). Presently, the Tamluk urban area exists as the centre of operations of district Purba Medinipur and has a strong control over the regional economy as a commercial cum administrative centre (Ghosh, 2008).

2.1.2 Contai urban centre

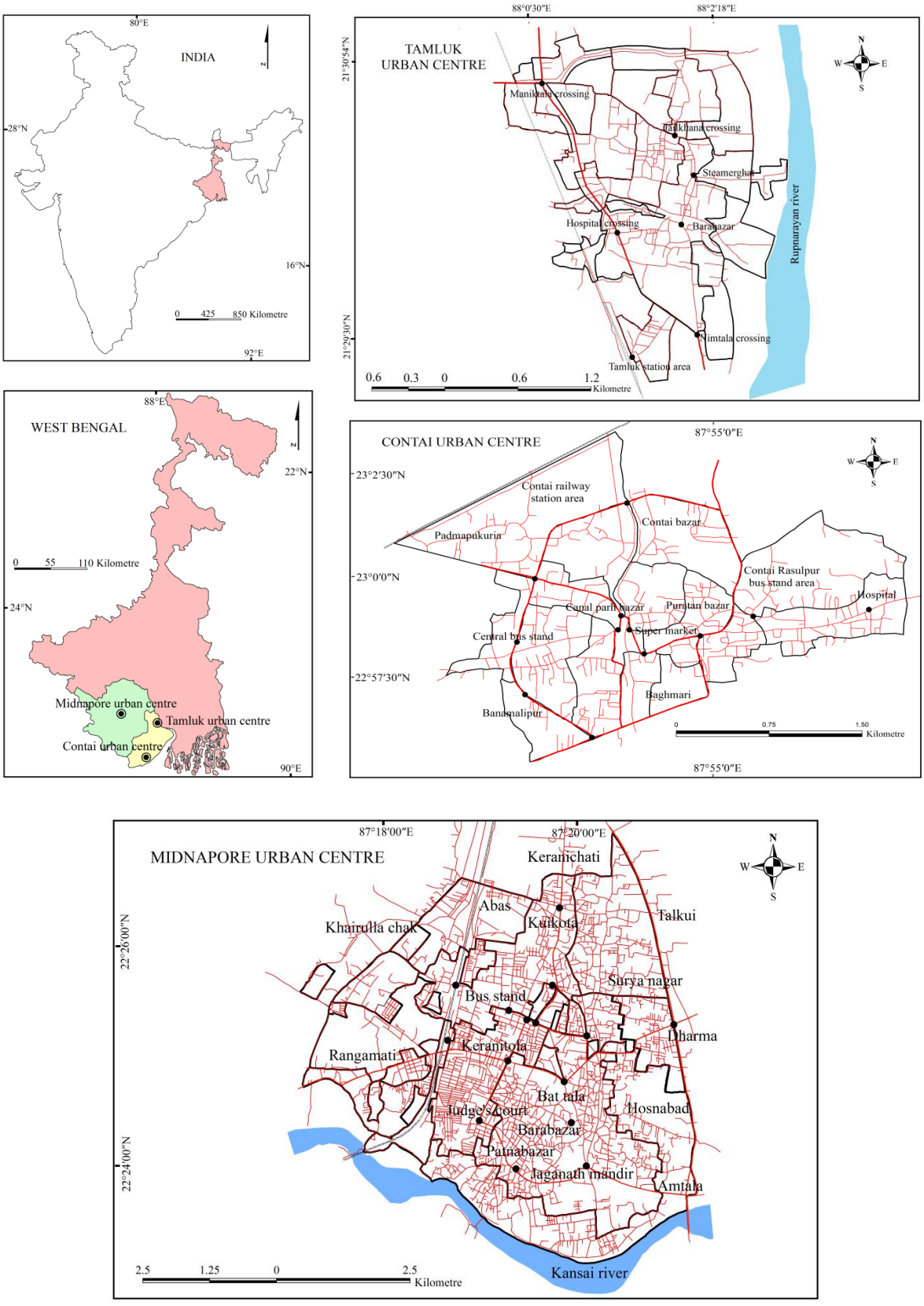
Contai municipality covering an area of 17.25 sq. km., is the administrative headquarters of Contai sub-division, and Contai urban centre includes twenty municipal wards and surrounding areas. It is about 35 km. from the famous beach town Digha, 25 km. from Egra urban centre and 70 km. from Haldia urban centre. Contai emerged as an historical urban centre when Hijili port became a great important trade centre on the coast of Bay of Bengal. Now it lost its importance but different cultural traits left distinct imprints upon the landscapes. Some of which are still exists e.g. Nimak Mahal office, Hijili mosque etc. Presently, Contai urban centre is famous for cashew nut, salt processing, and bell metal articles and also for mat and doormat production. And it exists as the centre of operation of

Contai sub-division and has a strong control over the regional economy as commercial cum administrative centre.

2.1.3 Midnapore urban centre

Midnapore municipality covering an area of 18.65 sq. km., is the administrative headquarters of Paschim Medinipur district, and Midnapore urban centre includes twenty four wards and surrounding areas. It is about 130 km. from Kolkata Metropolitan urban centre. Midnapore is a an ancient urban centre and the name of the urban centre 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' (Hunter, 1876). Today, it lost its historical behavior but different cultural signatures from different dynasties exist upon the different aspects of Midnapore urban centre like Jagannath temple of Ganga dynasty, Chol Shah mosque of Mughal dynasty etc. 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 (O'Malley, 1911). And it is famous for Sal-plate from Sal leaf.

Fig. No. 2.1 Location map of the study areas



2.2 Components of geo-historical analysis for Tamluk, Contai and Midnapore urban centres

Geo-history should be, first and foremost, an open platform for interdisciplinary discussion and cooperation. The aim of geo-history is not to describe and explain in details the development of selected landscape elements in the time through a retrospective method. Its aim is to understand the complexity and the functioning of the past landscapes and landscapes spheres. Only this type of geo-history can become of true geography of the past. It could contribute, among other things, to expand the reputation of historiography as well as geography and, in so doing, help their popularization. Or, in other words, lay the foundation for development of interdisciplinary cooperation of geographers with specialist from other branches (Holdsworth, 2003; Renfrew, 1983).

Integrative geo-historical analysis of these three urban centres of south Bengal as well as eastern India has five key components.

2.2.1 Geographical evolution of the landscape

Exploration of varying history of geographical evolution of the landscape over which a particular urban centre originated is an important element of geo-history.

2.2.2 Economic history

Studying the economic history that formed the foundation for the establishment of an urban centre under consideration is another element of geo-history.

Eastern India was noteworthy for its economic, political and cultural positions from the historical periods, but it has experienced diversified historical events. Tamluk, Contai and Midnapore, the three early urban centres of eastern India, experienced a number of reigns who ruled in different times in history and influenced the economic base of that period. The present work is an important attempt to analyze the economic history of these three historical urban centres from geographical point of view by geo-historical method.

2.2.3 Morphological analysis

Historic urban centres are the expression of the diversity of societies throughout history that embody the values of traditional urban cultures.

In urban geography, the study of the present pattern and morphology of buildings in urban centres concerted with landuse 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 study is a humble attempt to analyze the morphological components of Tamluk, Contai and Midnapore urban centres in south Bengal, eastern India from geo-historical point of view. It seeks to explain these urban landscapes of historical importance as a post modern space where built heritage and innovation design of have become the competitive facets of these urban centres 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. and a model of urban morphology has been formulated.

2.2.4 Delineating sphere of urban influence

Historical changes in opulence and delineation of present sphere of urban influence is an element of geo-historical analysis.

Urbanization and regional development are intimately allied. Higher and lower order facilities and specialization of activities influence the urban growth which diffuses its benefit to the surrounding countryside. Subsequently, socio-economic development of the region comes into being. Optimum level of growth of an urban centre depends on the capacity to provide required facilities to the people. Hierarchical growth of urban centre in association with the location of civic amenities induced regional development in hierarchical dimension. In case of eastern India, few of the urban centres are having large number of facilities while others are lacking in correspondence to their population size. Formulation of pragmatic planning model is the rescue of wiping out such problems. The present treatise is a different effort to analyze the hierarchical growth and influence of these three early urban centres. It seeks to explain from geo-historical perspectives how the urban centres of historical importance have evolved and continues to evolve in a hierarchical framework of functional Weightage and how the geography of their spheres of influence are changing in relation to the transformation of economic and political regimes since their origin through the dynasties like Maurya, Kalinga, Gupta, Afagan, Mughal, Portuguese, Dutch, French, British etc. Besides, it looks at the adequacy and inadequacy of facilities in the urban centres and put forward planning recommendations, so that a balanced regional development would be achieved.

2.2.5 Future growth trend

Urban expansion has become a popular word nowadays. For sustainable development strategy and efficient urban management, the growth pattern analysis of urban centre is a prerequisite. Urban expansion is a dynamic process and it is a difficult task to create a uniform growth pattern model. At the same time for developing new strategies it is necessary to sort out the present landuse state and also figure out some locations for future expansion. But for this a huge scale of data is required with efficient maintenance system. Present study is a significant attempt to study the future growth trend and potential residential areas identification of Tamluk, Contai and Midnapore, three early ports based urban centres of south Bengal, eastern India.

2.3 Survey design

The design of any research study begins with an idea for the study and selection of a methodological paradigm. A paradigm is essentially a world view, a whole framework of beliefs, values, and methods with in which research will take place. In case of present study the survey design is classified in two. These are qualitative research design and quantitative research design.

2.3.1 Survey design for qualitative research

Qualitative research places emphasis on understanding through survey of concerning literatures and maps, looking closely at people's words, actions and interactions, oral histories and historical tracing, and traces or records created by people.

2.3.1.1 Survey of concerning literatures and maps

Data and Information are mainly obtained from concerning literatures and maps about geographical evolution, architectural design of buildings, intensity of agricultural activities, volume of agricultural production, major agricultural produces, trade relation of the three urban centres through Tamralipta and Hijili port, volume of trade and trade articles. 'A Cultural History of India' (Basham, 1975); 'History of Ancient Bengal' (Majumdar, 1971); 'Adi O Madhayajuger Bharatiya Samaj' (Sharma, 2003); 'The Economic History of India 1857 – 1947' (Roy, 2006) etc. and maps of Van Den Brook, Rennel, Thnillier, D.R.Nandi, and Valentine etc. have been considered.

2.3.1.2 Survey of people's words, actions and interactions

The words of Rakhaldas Bandhopadhaya, Haraprasad Sastri, Fa-Hien, Hieu-En-Sung, Durga Das Lahiri, Ramesh Chandra Dutta, Warren Hastings etc. have been examined to note the major historical events which help understanding the changes in geographical settings, changes in economic bases, changes in sphere of influence and morphological structure of buildings. The data and information have been derived from Patachitra (Scroll painting) with

mythical stories and contemporary events, manuscripts in palm leaf and handmade paper, a number of antiquities mainly terracotta plaques and figuries (Terracotta Buddha Head, Mishiraian Harpoon, Roman Amphora, Toy Cart), coins and beads of precious and semi-precious stones.

2.3.1.3 Oral histories and historical tracing

Oral histories are literally the stories and eyewitness descriptions of individuals who have personal life experiences with certain events, phenomena, settings, and so forth. Although the ideal way to learn about this information is by listening to an oral historian, many researchers have recorded and/or transcribed the words of oral historians and created more permanent records of these oral histories. Giving the growing accessibility of oral history archives on the internet, a kind of revitalization of this orientation has begun to occur in the social sciences during the past ten years. It is now possible to locate and actually listen to via internet. But in case of present study the local people were interviewed for their experiences and ancestor's lives.

2.3.2 Survey design for quantitative research

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 the open source. Information for each of such building blocks was collected and recorded using pre-designed field manual and questionnaires.

2.4 Data and information

Primary data and information are derived from the sources such as oral historians, or their transcribed statements, or written testimonials of other types of eyewitnesses. These tend to original artifacts, documents, and items related to some direct event, or outcome of an event, or some experience of an individual. Data regarding economic class, social class, average height of buildings, dominant architectural design, length, spacing and organization of building blocks, nature and types of commercial centres, hierarchy of the commercial centres, types and number of shops in the urban centre and average distance covered by the customers, location of newly developed residential and commercial areas and growth trend are collected from the questionnaire survey.

Secondary data are sources that include oral or written statements from people who may not have been immediately present during the event or phenomena being described, but they convey information provided by others who were present or have knowledge about some specific research interest or subject.

2.5 Analysis method

All the collected data and information for the present study has been analyzed by geo-historical method. Geo-history would seek a historical understanding of the spatial and environmental contexts of human activities and would, if at all possible, involve mapping them. It is a method which prioritized mapping historical data as a way of exploring problems. Therefore, Geo-history is a cartographic method in history. Geo-historical interpretation of the modern world's development since the sixteenth century is a method

which focuses on the embeddedness of social practices within specific space-time locations and which interprets the concrete face of modernity as a single inter-connected story and map.

Chapter 3: Geographical evolution of the landscape

3.1 Introduction

A single definition does not apply to all the manifestations of an urban centre (Existence, functions, performance etc.) and no single description will cover all its transformations, from the embryonic physical and social nucleus to the complex form of its maturity and the corporeal disintegration of its old age (Mumford, 1989). The origin of the city are obscure, a large part of its past effaced beyond recovery, and its further prospects are difficult to weigh (Mumford, 1989; Geikie, 1879). Will the city disappear or will the whole planet turn into a vast urban hive? –which would be another mode of disappearance (Mumford, 1989).

It is a well known fact that some of 'Purana' give a brief account of the ancient geographical evolution of South Bengal along with ancient ruling dynasties, but they are hardly more than mere list of kings and dynasties (Das Gupta, 1914). So far as ancient South Bengal is concerned, there is no such book even of this type, not to speak of any regular geographical history (Das, 2013). The extent of our ignorance regarding the geographical history of ancient South Bengal may be judged from the first attempt to write one by Mrityunjay Sharma, a Pandit of Fort William college, Calcutta. His book 'Raja-taranga' or, 'Rajavali' published in 1808 (Majumdar, 1971), is nothing but a string of fables woven round a number of historical, mythical and imaginary names, and it will suffice to indicate its nature when it is stated that Ballalasena is described as sitting on the throne of Delhi. With the progress of knowledge in nineteenth century regarding the geographical history of ancient Bengal, the idea of writing a proper geographical history of South Bengal, and, separately, of the various geographical and linguistics units comprised in it, dawned upon the mind of scholars, both Indian and European (Majumdar, 1971). The early successful attempts in this direction were made by R. C. Dutt (A History of Civilization in Ancient India, 1889) and R. G. Bhandarkar

(Early History of Deccan, 1895). The twentieth century, which opened with the publication V. A. Smith's 'Early History of India', gave a great impetus to the geographical evolution of ancient India, as a whole, or, of its various religions like South Bengal. The first idea of writing a geographical history of ancient Bengal on modern scientific lines may be traced back to 1912, when Lord Carmichael, the first governor of the newly created Presidency of Bengal, took the initiatives in the matter, and invited Haraprasad Sastri to prepare a scheme; but nothing came out of it (Majumdar, 1971). A similar attempt was made a few years later at the instance of Raja Prafulla Nath Tagore of Calcutta. He under took to bear the entire financial burden of the project and requested R. D. Banerji, R. C. Majumdar and others to undertake it. But this attempt also proved equally abortive. The failure of these two successive attempts was not, however, without some fruitful results. Almost immediately after the first, Ramprasad Chanda published 'Gaudarajamala' in 1913, and shortly after the second, R. D. Banerji published his 'Banglar Itihas' Part I in 1915 A.D. (Majumdar, 1971). But these two individual works, highly valuable though they were, did not remove, and rather accentuated, the needs of a comprehensive political and cultural history of ancient Bengal written by the joint efforts of specialists in different branches of the subject. For, it may be noted that the two books mentioned above dealt only with the political theory. The first successful attempt in the direction of geographical history was made by the University of Dacca (Majumdar, 1971). In 1935, it sanctioned the plan to publish a history of Bengal in two volumes, covering, respectively, the geographical, political and cultural history during the Hindu, Muslim and British periods. Ramesh Chandra Majundar was appointed as the editor of the first volume and Jadunath Sarkar, of the second. The first volume has been dealt with geographical, political and cultural history and published in 1943. But the second

volume has been deal with only the political history, published few months later from the publication of the first volume.

South Bengal was noteworthy for its economic, political and cultural positions from the historical periods, but it has experienced diversified historical events (Ganguly, 2007). Tamluk, Contai and Midnapore, the three early urban centres of South Bengal, experienced a number of reigns who ruled in different times in history (Jana, 2001). Sometimes, these urban centres had a prosperous influence over the World due to their emergence as a river or sea port and geographical location and after that, got huge set back due to river siltation, coastline regression etc. (Bosu, 1921). The present study is modest attempt to describe the varying history of geographical evolution of the landscape over which the three selected urban centres (Tamluk, Contai and Midnapore) of South Bengal originated.

3.2 Early evidences on geographical evolution of the landscape

Ancient South Bengal suffers from paucity of historical literatures. All the printed library and archaeological evidences throw a flood of light on the geographical history of the region. One gropes in the dark while searching for statistical data regarding the geographical evolution of the region. The value of literary and archaeological evidences for geo-historical research is, however, enhanced if the derived knowledge is supplemented by socio-anthropological researches. In the pre-historic period, printed literatures like 'Sritipuranadi' (cited in Majumdar, 1971), 'Bouddha Dharmagrantha' (cited in Basham, 1975) supplies little information about the geographical settings of that period. In the historic period, printed and translated literary works like Tarikh-I Firuz Shahi (14th century A.D.) by Shams-i-Siraj Afif,

Ain-i-Akbari of Abul Fazl and Bengal in Sixteenth Century, A.D. by Yogendra Nath Das Gupta (16th century A.D.) or other minor works like Riyazus Salatin of Maulavi Abd-us-Salam supply valuable information on the political history of the period and throw hints at the geographical history of the region. But these accounts were coloured by religious fanaticism of the rulers punctuated by the Muslim victor-complex. As such they ignored the prevalent geographical settings shaping historical developments. The contemporary foreign accounts are valuable assets to understand the geographical condition of that period. The accounts of the foreign travelers like those of Fa-Hien, Hiuen Tsang and I-tsing as well as printed records edited by Foster, though fragmentary and lacking in statistical data, help scholars to make general observations on the geographical evolution of that period. The British civilian writers like O'Malley and W. W. Hunter, mainly on the basis of their access to Midnapore Collectorate records as well as Revenue and Judicial records of the State Archives, some of which were published by W. K. Firminger, have drawn a very dismal picture of the geographical history, but this picture in that period spread light not only on the struggle between the local elements and the early conquistadors in this formative phase of British rule in South Bengal as well as on the geographical history and general physical aspects. The author of the District Gazetteers and some Indian writers like Joges Chandra Basu, Trailokyanath Rakshit etc. have described the physical aspects of Proto-historic period.

3.3 Analysis of the literary information and maps to explore history of geography

Much of the information has been derived from historical sources i.e. from literatures related to position of the urban centres and rivers at particular times and the dimensions, shapes,

orientations and characteristics of these features. Maps of various kinds, historical records and literatures and SOI's topographical maps has been used to derive the geographical evolution of these urban centres in South Bengal from pre-historic period and to detect the geographical changes in the last three centuries of South Bengal with special reference to Tamluk, Contai and Midnapore urban centres. Early maps are reliable sources for studying the intricate channels, estuaries, the alignments of well-defined shores, the configuration of swamps and coasts. Archaeological evidences have been widely used to investigate the geographical changes as well as the historical changes of the sea level and shoreline.

Intensive survey has been conducted in the three urban centres of South Bengal for understanding the present geographical settings. All the collected data and information for the present study have been analysed by geo-historical method.

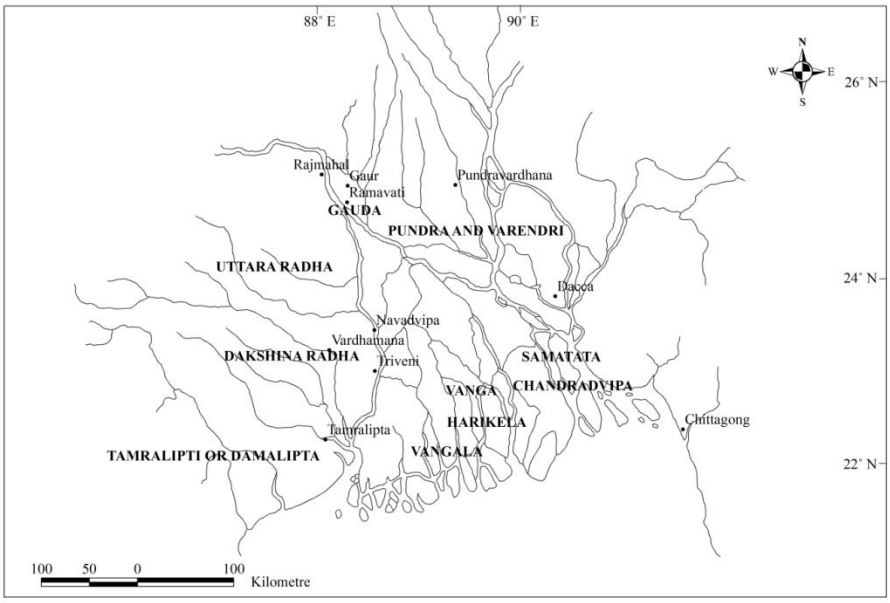
3.4 The trace of South Bengal

The first problem that one faces in writing the geographical history of South Bengal is to define the territory comprised within its geographical name. The difficulty arises from the following facts. First, the province in British India, called Bengal, was not known by this name before the Muslim conquest of this territory (Majumdar, 1971). Second, in pre-Muslim period there was no common name for the whole province, though Gauda, which originally formed only a part of it, and was sometimes used to denote the whole or a considerable portion of it (Majumdar, 1971). Even in the nineteenth century a Bengali poet referred to his native land as Gauda. Third, Vanga was originally the name of the south-eastern part of the provinces, but its boundaries were not well-defined, and other geographical names such as Samatata, Harikela, Vangala, were used for different parts, if not the whole, of it at different

times during the pre-Muslim period (Majumdar, 1971). Fourth, the English name, Bengal, and its Portuguese form, Bengala, were both derived, not from Vanga, as is generally supposed, but from Vangala which the Muslim rulers adopted as the name of the province (Majumdar, 1971).

The precise location for the ancient city of Gauda as well as the kingdom which bore this name is not known. A city of Gaudapura is mentioned by Panini, and Gauda, as the name of a country, occurs in the Arthasastra of Kautilya (Majumdar, 1971). It is stated in a stone inscription of the middle of the sixth century A.D. that the Maukhari King Isanavarman forced the Gauds to seek refuge in the sea (Hunter, 1876). This gives the impression to specify that Gauda probably extended up to the sea coast. 'Brihat Samhita' by Varahamihira stated that the Gauda territory is distinguished from Paundra (North Bengal) and Tamraliptika (Midnapore District) as well as also from Vanga and Samatata (South-east Bengal).

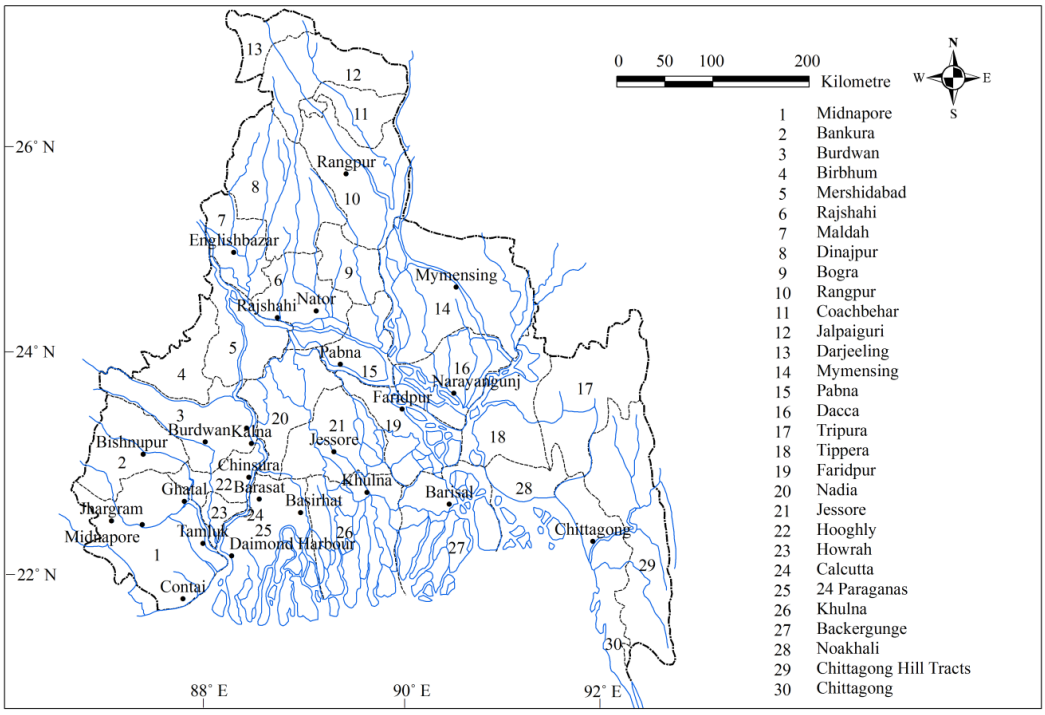
Fig. No. 3.1 Ancient Bengal (6th Century A.D. to 1600 A.D.)



Source:

Majumdar, 1971

Fig. No. 3.2 Bengal before 1947



Source: Majumdar, 1971

Tamralipta (-lipti) or Damalipta is referred to in the 'Mahabharata'. In the 'Digvijaya' section of the 'Sabhaparva' it is distinguished not only from territories known to have situated in Northern, Eastern and Central Bengal, but also from Suhma. The core of the territory lay in the undivided Medinipur district and its capital has been identified as Tamalities of Ptolemy, the modern Tamluk. In the day of Hiuen Tsang it lay over about 150 miles from Samatata. The land was low and moist, forming a bay where land and water met (Ghosh, 1996).

3.5 Changes in river courses

The river system of Purba and Paschim Medinipur districts consist of Hoogly, of its tidal tributaries, the Rupnarayan, Haldi and Rasulpur, and their sub-tributaries. During the period

i.e. from the ancient time till the end of the 12th century A.D., the river system, which forms the most characteristic physical feature of South Bengal, must have been very different, at different times, from what it is now, and these changes had a considerable effect upon the geographical setting of Tamluk, Contai and Midnapore. Though there have no definite knowledge of exact courses of the rivers during the period, but from the great changes that took place in subsequent times, in the courses of Principal River, idea of river courses has been formed.

3.5.1 Bhagirathi, Hoogly and Saraswati river

The present courses of Ganges, after it has swept in a curve round the spurs and slopes of the Rajmahal hills, is very different from what it was before the 16th century (Das Gupta, 1914). In those days it flowed further north and east and the city of Gauda was probably on its right bank (Das Gupta, 1914). There has been more than one shifting towards the south and west before the Ganges reached its present course, and the dry beds of some of its old channels can still be traced. About twenty five miles to the south of ancient Gauda the Ganges divides itself into two branches, the Bhagirathi, of which the lower portion is called the Hoogly, running almost due south, and the Padma flowing in a south easterly direction. Today the enormous volume of the water of the Ganges is carried mainly by the Padma, while the upper part of the Bhagirathi has shrunk to a very shallow stream. But formally the Bhagirathi was in all possibility the more important channel of the Ganges (Majumdar, 1971). It is difficult to determine when the great change took place, but there is hardly any doubt that by the beginnings of the 16th century A.D. the Padma already ranked as the main stream of the

Ganges (Majumdar, 1971). Evidence adduced in favour of the view that the Bhagirathi was the Principal stream of the Ganges in ancient times, a great sanctity is attached to it by the Hindus. The mighty Padma causes havoc and creates terror, but is not looked upon with great veneration, nor does it claim any traditional religious sanctity. The earlier courses of the lower Ganges, as it rushed down the channel of the Bhagirathi, was somewhat different from what it is today. Small rivulets from the west like the Bansloi, the Mor, and the Ajay fell into it after it had broken off from the parent river, as now, but at Triveni (near Hoogly) it branched off into three streams. These were the Saraswati flowing south west past Satgaon (Saptagram), the Yamuna (Jumuna) running its course south east down its present bed, and the Bhagirathi proper, the middle off-shoot, gliding south down the present Hoogly channel upto Calcutta and then through the Adi Ganga (Tolly's Nulla) past Kalighat, Baruipur, and Magra to the sea (Paul, 2002). There are reasons to believe that the Saraswati flowed into an estuary near modern Tamluk and received not only the water of Rupnarayan and the Damodar but those of many smaller streams issuing from the hills of Santal Paraganas. Some times after 8th century A.D. the port Tamluk lost its importance on account of the silting up of the mouth of the river Saraswati and the consequent shifting of its course (Chatterjee, 2011). Its place was eventually taken up by Saptagram or Satgaon, higher up the river, which figures as the Muslim capital of South –western Bengal in the 14th century A.D (Das Gupta, 1914). In the 16th century the main water of the Bhagirathi began to flow through the Hoogly channel (Nandi et al., 1983). Satgaon was ruined, and the first Hoogly, then Calcutta took its place. The upper Saraswati today is a dead river, but the Bhagirathi or the Hoogly has deserted the old Adi Ganga channel and flows through the lower courses of the Saraswati below Sankrail.

Fig. No. 3.3 Map of Bengal drawn by Ven Den Broucke showing river Saraswati in 1660 A.D.

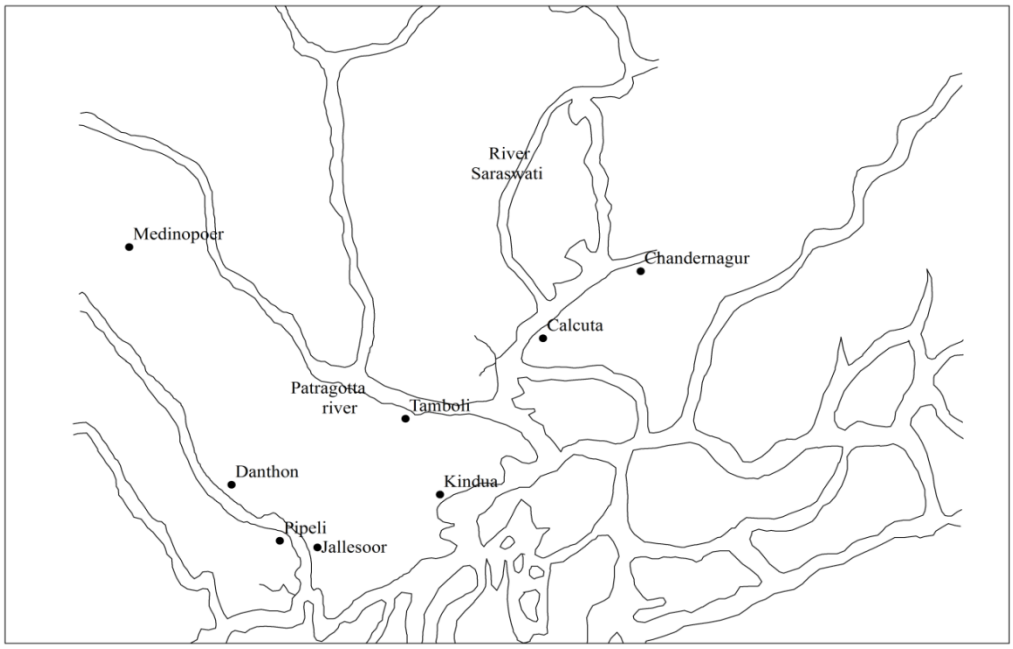
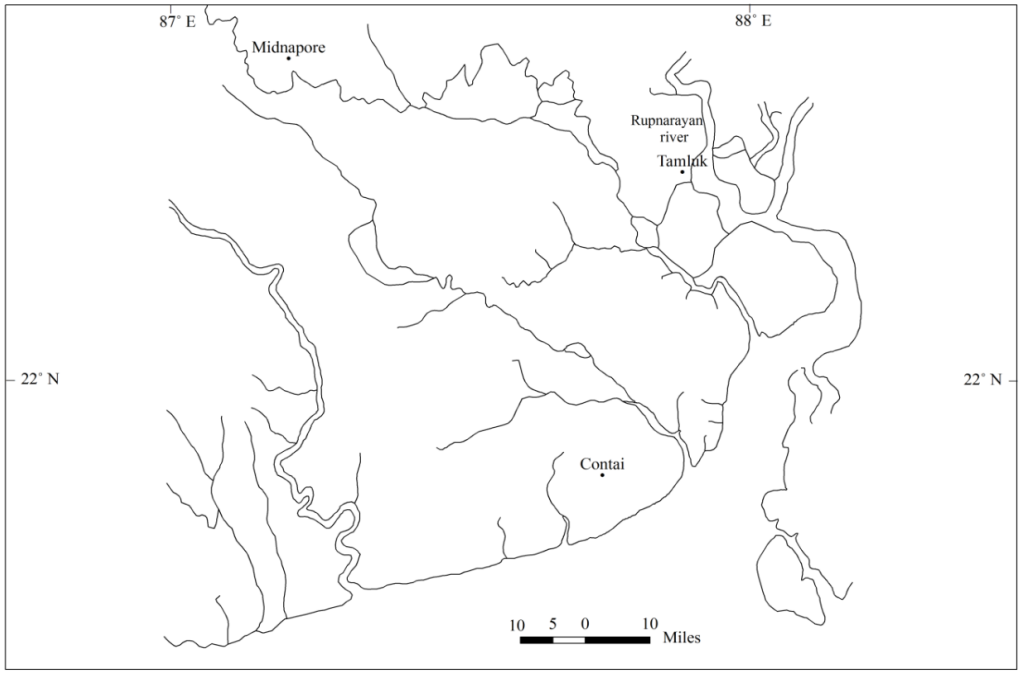


Fig. No. 3.4 Absence of river Saraswati in the map of Lower Bengal (Rennel's Atlas, 1777 A.D.)



3.5.2 Rupnarayan river

The joint flows of river Dwarkeswar and Silai at Bandar in Ghatal gave birth to Rupnarayan river which is extended south and south-eastward upto Geonkhali before reaching Hoogly. At present, the total course of wider channel is flashed by tides which give rise to a complex estuarine channel linked with Hoogly estuary. Historically, the river was very active and navigable, and was used by the foreign traders at different times. In the last few centuries, the river suffered from changing courses. The river was named as Ganga between 1553 to 1613 A.D. in the map of Gestald and D. Barrose (1561), Guenga in 1650 A.D. in the map of Blayeve, Tamili in 1687 A.D. in the map of Baori, and Patragotta in 1660 A.D. in the map of Van Den Broucke and in 1670 A.D. in the map of Valentine. Finally, the river was named as Rupnarayan in the map of Rennell in 1777 A.D. The river was also connected Damodar main flows through the trading ships used to enter the Rupnarayan from Bhagirathi. It was named as Ganga because of the connecting links between Bhagirathi and Hoogly through this channel (Rupnarayan) in the past (Nandi et. al., 1983). Tamralipta was described as a coastal sea port in the accounts of Ptolemy (150 A.D.), Fa-Hien (405-411 A.D.), and Hiuen Tsang (640 A.D.). Gradually the port lost its past glory with the rapid siltation problems.

Fig. No. 3.5 Patragotta river (Rupnarayan river) in the map of Ven Den Broucke (1660 A.D.)

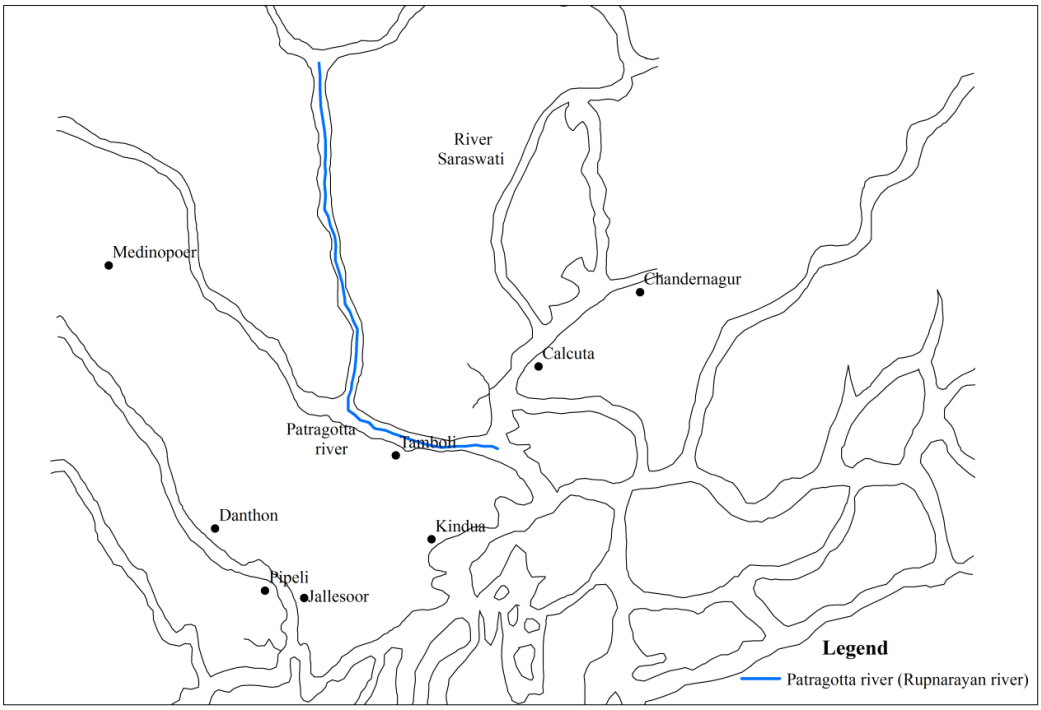


Fig. No. 3.6 Rupnarayan river in the map of Rennel (1777 A.D.)

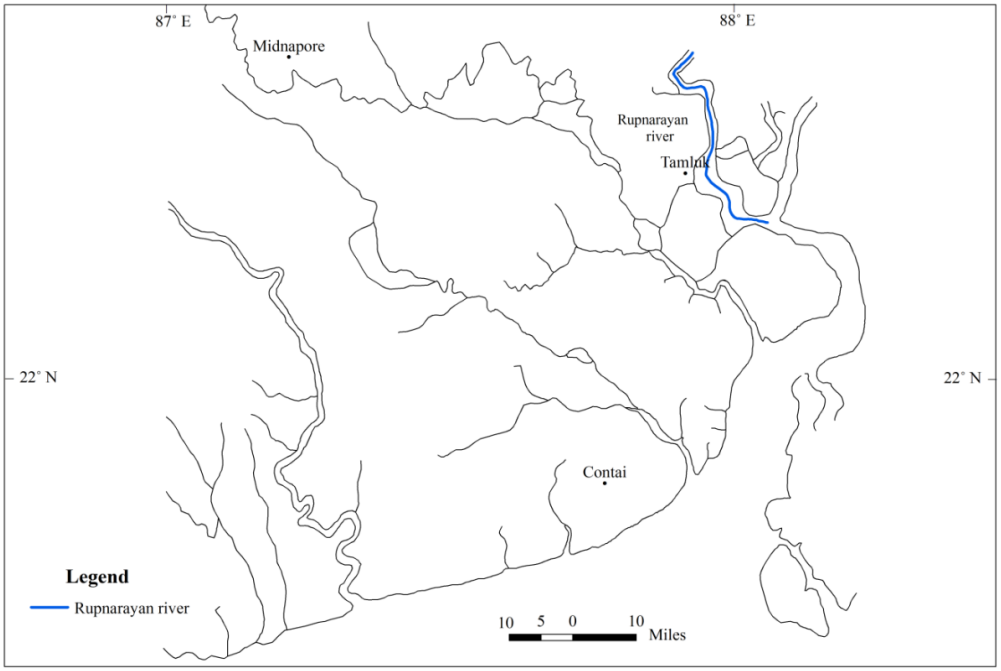


Fig. No. 3.7 Rupnarayan river in the map of M. L. Thuillier (1874 A.D.)

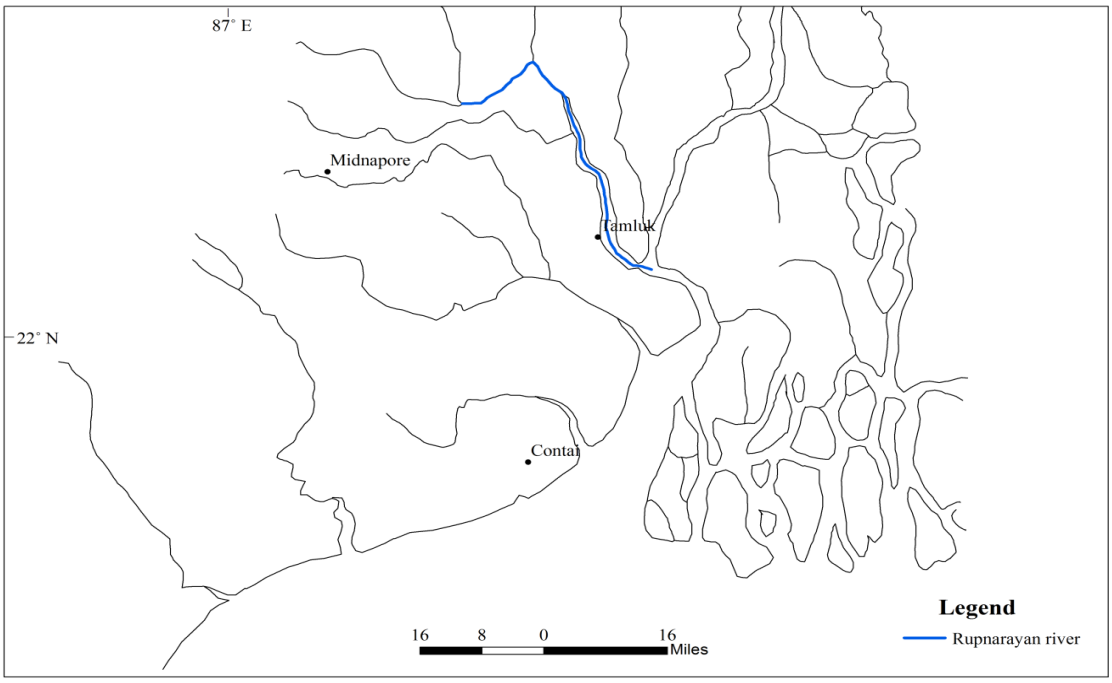
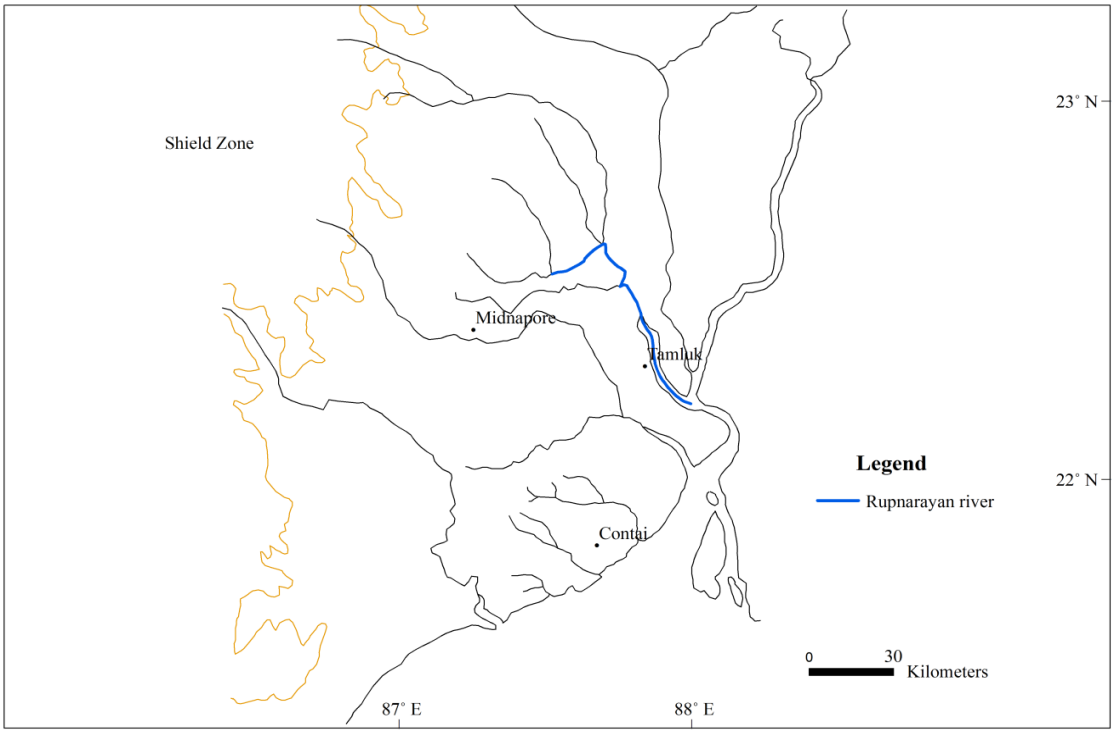


Fig. No. 3.8 Rupnarayan river in the map of D. R. Nandi (2001 A.D.)



3.5.3 Rasulpur river, Kaukhali and Kunjapur canal

Historical changes of the depositional surface of Khejuri and Hijili are also significant in the north-eastern margin of Kanthi coastal plain (Banerjee, 1998). Initially, Khejuri and Hijili were two islands along the seashore isolated from the main land by Rasulpur river, Kaukhali and Kujapur channel. These islands were traced from the maps of D. Barrose (1561 A.D.) and Blayeve (1650 A.D.). The islands were also found in the map of Valentine (1670 A.D.) and Baori (1687 A.D.). Hijili island was occupied by Job Charnock in 1687 A.D (Hunter, 1997). when the Britishers declared war against Sayesta Khan, Nawab of Bengal at that time. It was naturally a shelter place for the Britishers, isolated from the main land by channels. Both the islands were absent in the map of Rennell (1777 A.D.), but historical records indicate that they maintained their separate existence with the inter-connecting channels until 1770 A.D. Now they are the part of Purba Medinipur main land on the western bank of the present Hoogly estuary.

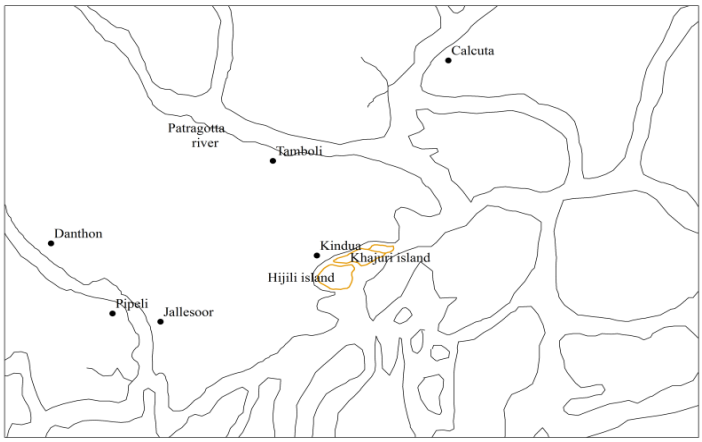


Fig. No. 3.9 Presence of Khejuri and Hijili Island in the map of Ven Den Broucke (1660 A.D.)

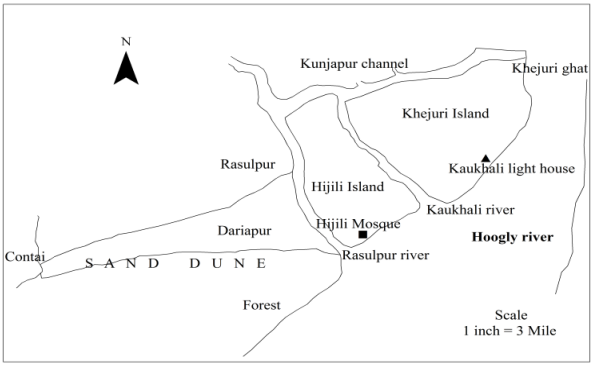


Fig. No. 3.10 Presence of Khejuri and Hjili Island in the map of Hijili Battle Field in 1657 A.D. (cited in William's book 'Vange-Engraj')

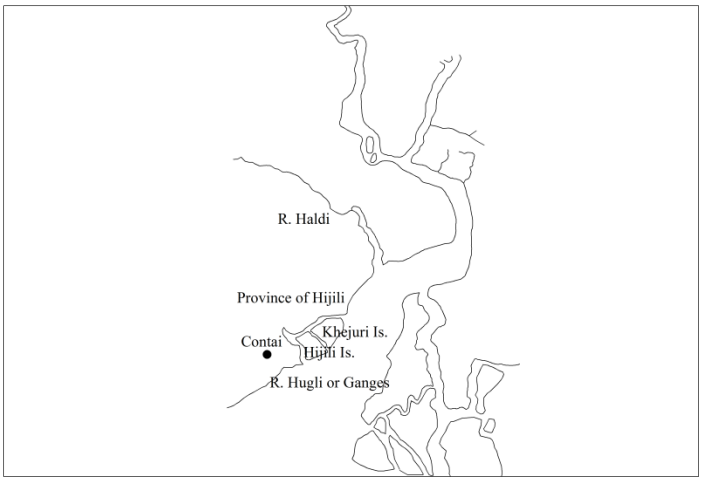
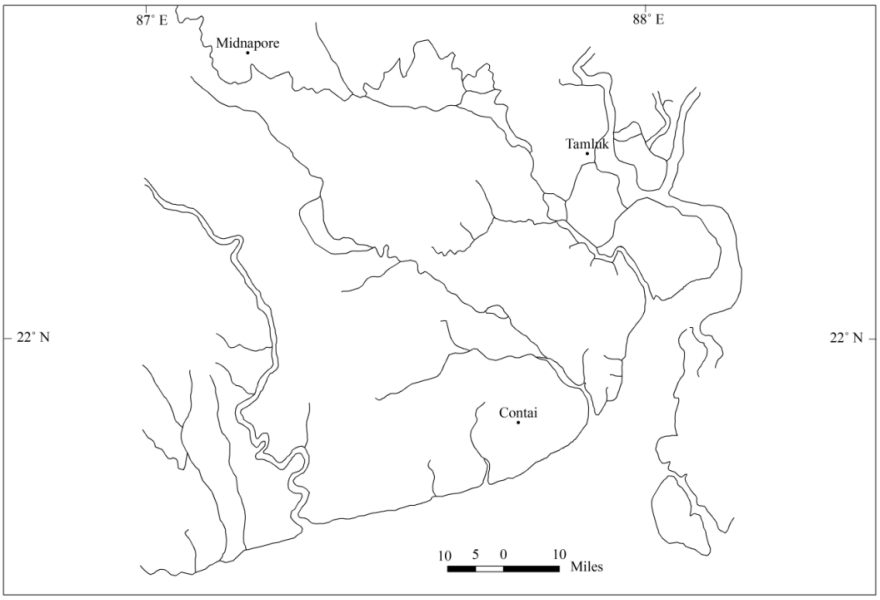


Fig. No. 3.11 Presence of Khejuri and Hijili Island in the map of Baori (1687 A.D.)

Fig. No. 3.12 Absence of Khejuri and Hijili Island in the map of Rennel (1777 A.D.)



3.5.4 Kansai river

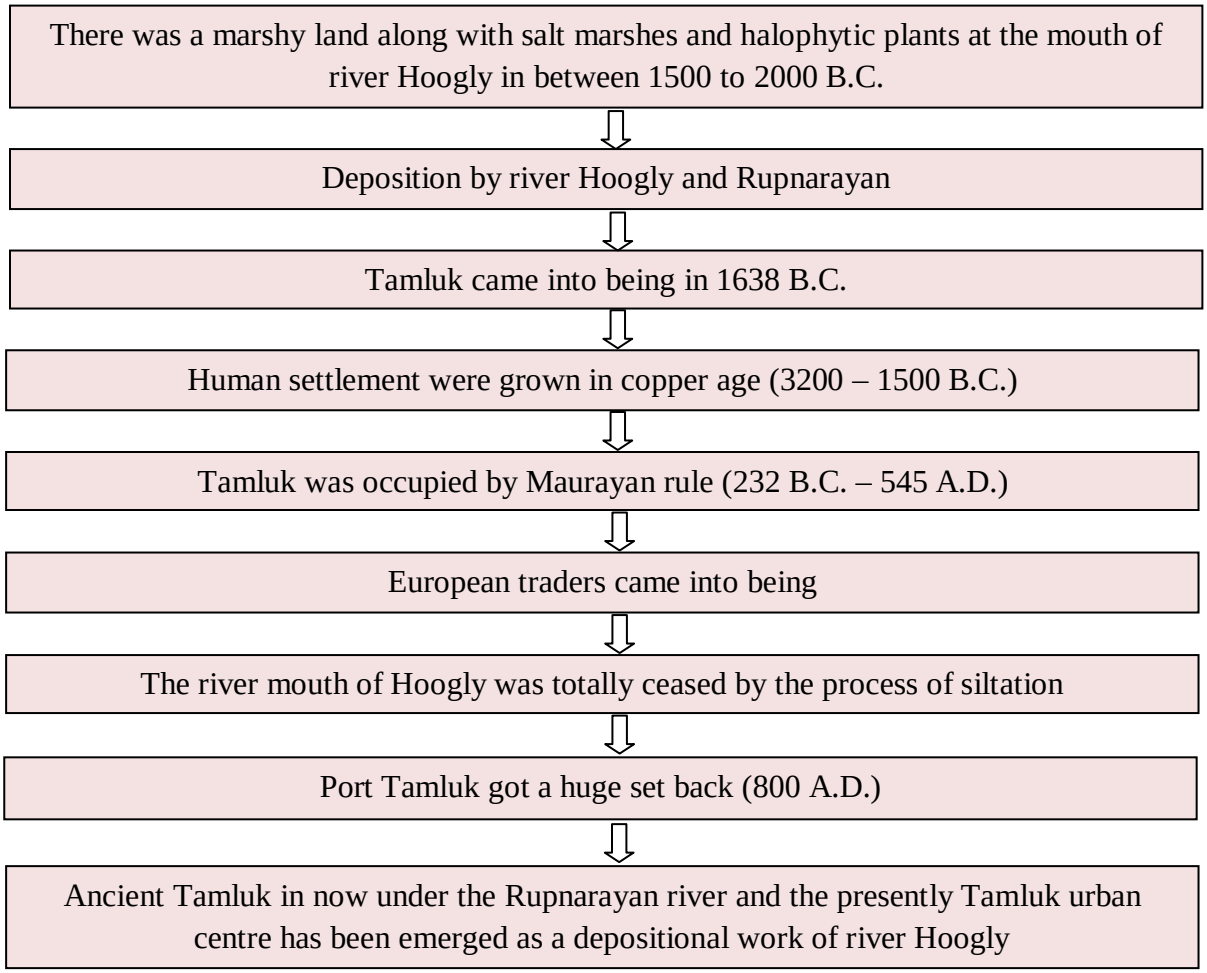
Kansai is a major tributary channel of Haldi river which drained over the east and southeast ward regional slopes of Medinipur plain, Rupnarayan plain and Kanthi coastal plain. It is said that more than hundred years ago the Kansai was diverted from an old channel a little above Panskura and carried southwards to the present channel, by which it makes its way into the Haldi (O'Malley, 1911; Paul, 1997). Kansai follows an exceptionally tortuous course, running first south and south-west and then eastward past the town of Midnapore, which is situated in the on its north bank. Below Midnapore the channel contracts rapidly, in Kapastikri it bifurcates, one small branch going north and eventually falling into the

Rupnarayan. The main channel runs south-east till it falls into the Haldi river. It is embanked throughout the lower part of its course; as a result of embanking, combined with the action of the tide and a large amount of silt it carries, the bed of the river is silting up, chiefly at the point up to which the tide flows (O'Malley, 1911).

3.6 Geographical evolution of Tamluk urban centre

Tamluk was formed 1500 to 2000 B.C. and at that time it was characterized by marshy land topography, halophytic plants and salt marshes (Paul, 2002). The low lying marshy area was

Fig. No. 3.13 Geographical evolution of Tamluk urban centre



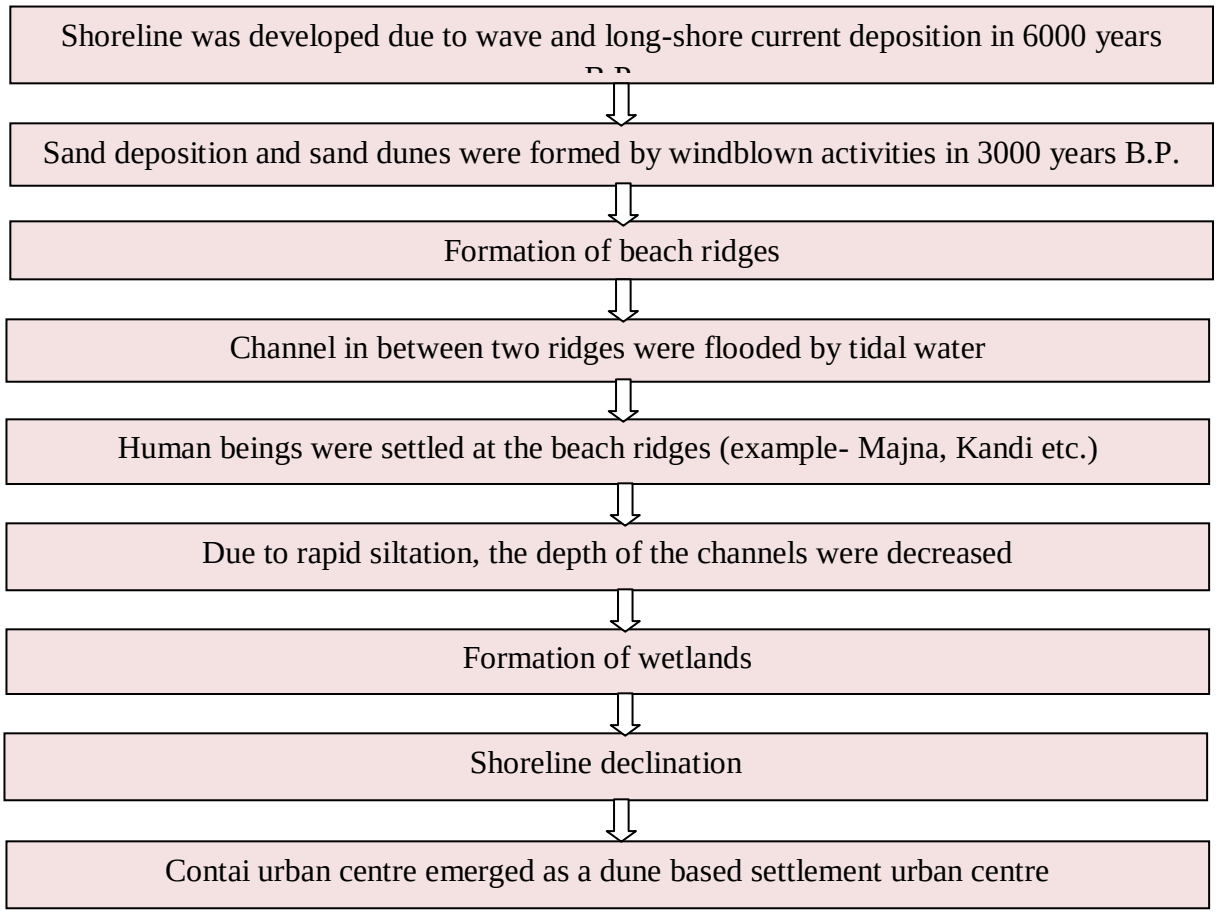
filled up by depositional reworking of river Hoogly and Rupnarayan (Das et al., 1985). Thus the area came into existence as an elevated land surface where port activities began to be carried out in 1638 B.C. Human settlement were first grown in copper age (3200 – 1500 B.C.) (Paul, 1997). By 700 B.C., Tamluk became a renowned port (Basu, 1921). Tamluk was occupied by Maurayan rule (232 B.C. – 545 A.D.) and Ashoka himself formed a 'Stupa' (Basham, 1975). After that Buddhist formed monasteries and then Jaina, Brahamana also left their cultural signature in every aspect of Tamluk urban area. The Buddhist legends mention that it was the port where travellers landed and went aboard for Ceylon (O'Malley, 1911). Ptolemy (150 A.D.) noticed Tamluk in his geography, calling Tamalities and placing it on the river Ganges as a port (Bagchi, 1945). Fa-Hien (405 – 411 A.D.) described it as a port on the sea mouth. Tamluk emerged as a port during colonial period and in which merchants and others landed and embarked for Ceylon, Java, China etc. (O'Malley, 1911). During early medieval period (7^{th} to 8^{th} Century A.D.) agricultural products (silk and cotton fabrics) exported to Europe through Tamluk port. In medieval period, Tamluk was an important port at the sea mouth (Sharma, 2009). Hiuen Tsang (700 A.D.) said that it lay near an inlet of the sea and was 10 li (about two miles) in circuit; closed by 'Stupa' erected by Ashoka (Majumdar, 1971). I-tsing landed have from China at the close of the same Century and Huri-Lun, the Corean, remarked that Tamralipta was the place for embarking to China from east India and close to the sea. In the story of Mitragupta in the Dasa-Kumara-Chharita (story of the ten princes), Tamralipta was described as close to the sea and not far from the Ganges. It was a centre of trade, inhabitated by many merchants. It is clear from the other references in Sanskrit e.g., Dudhpani rock inscription of Udayanama, which is not later than the eight or nine Century A.D. In 8th Century A.D., the river mouth of Hoogly was totally ceased due to

rapid siltation and after 8th century A.D., Tamluk port got a massive hindrance due to siltation on river Rupnarayan, Hijili port on the coast of Bay of Bengal emerged as a new port with trading potentialities (Paul, 2002; Majumdar, 1971). Tamluk existed as a Portuguese settlement and appeared to have a slave market. Upto middle of the 16th Century (Das Gupta, 1914), Tamluk maintained low level porting activities because Rupnarayan river survived and is shown in the earliest European maps of Gastaldi and De Barros. From these maps the present police stations of Mahisadal and Sutahata appear to have formed an island, the main channel of Rupnarayan flowing to their west and then south-west into the Haldi river. After the middle of the 16th Century, Tamluk gradually lost its importance totally as a port due to silting up of channels that formally connected it with the sea, which was once large enough for sea going vessels to sail up (Das Gupta, 1914). Little is now left to mark the past glory of Tamluk Urban centre. The royal palace and grounds are said to have covered an area of eight square miles, fortified by strong walls and deep ditches (Majumdar, 1971). No trace of ancient palace is now discernible, except some ruins to the west of the palace of the Kaibartta Rajas, which is built on the side of the river Rupnarayan, surrounded by ditches. A number of old silver and copper coins bearing the Buddhist symbols were discovered thirty years ago in the midst of the debris from the crumbling bank of the Rupnarayan. The old urban centre lies under the river silt and even the great temple of Tamluk (Bargabhima) is now partly underground.

3.7 Geographical evolution of Contai urban centre

After the formation of shoreline (6000 years B.P.) due to wave deposition and long shore current deposition, sand dunes were formed by sand deposition of windblown activities in 3000 years B.P. (Banerjee, 1998). Beach ridges were formed. Channel in-between two ridges were covered by salt-tolerant mangrove forests (Paul, 1996). As the channels in between two ridges were flooded by tidal water, the settlement of Contai urban areas like Majna, Kandi etc. were formed

Fig. No. 3.14 Geographical evolution of Contai urban centre



2800 years ago at the top of the beach ridges (Paul, 2002). The depth of the channels was decreased due to rapid siltation (Paul, 2002). Wetlands were formed (Paul, 2002). After

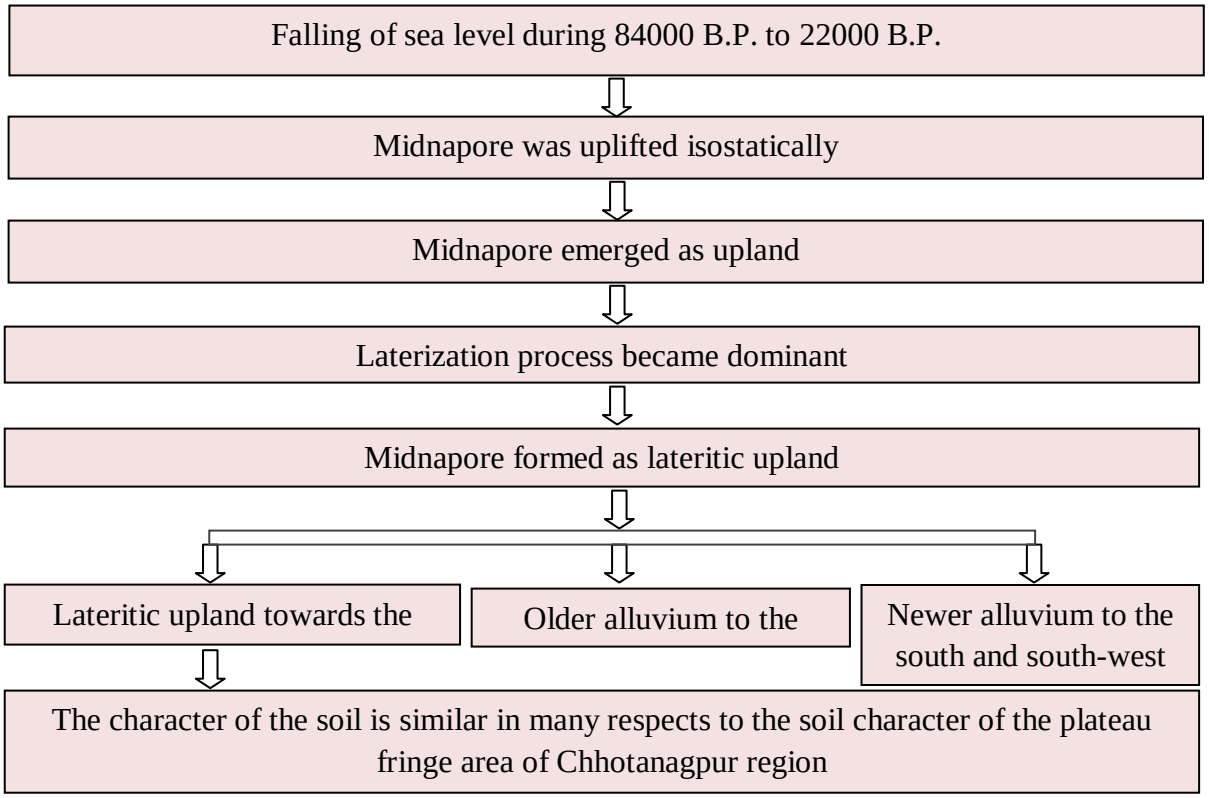
shoreline declination, Contai urban area emerged as a dune based settlement town. Due to downfall of port Tamluk after 800 A.D., Tamluk had lost its importance and Hijili port had became a great trade centre (Majumdar, 1971). Contai first became of importance in the days when the European ships began to visit the ports in the neighbourhood. It lays on the road from Balasore and Pilpli to Hijili, the three chief ports on the west of the Bay of Bengal. In the 15th Century, during the visit of Fa-Hien, Contai was uninhabited. In Valentine's travelogue (1670 A.D.), a harbour Kendua by name, was mentioned. This harbour was on the bank of the river, a short distance from Rasulpur estuary (O'Malley, 1911). In Valentine's map, Kindua (presently Contai) is shown at the end of a small stream which has now disappeared owing to sand drifts. From Valentine's memories, the Dutch appeared to have a station at 'Kendua' for the trade of rice and other articles and have to subsequently abandon it. Later, the harbour was shifted to the present site of Contai urban centre. However, it is said, the name of the port was retained for its new location. As the foreign trade gradually declined, manufacturing of salt increased and Contai became a salt agency, situated on a sandy ridge twelve miles away from Bay of Bengal (Ghosh, 1996). In the early part of the 19th century (before 1822), the temporary settlements were chiefly confined to the salt tracts in the Hijili division along the sea coast (Das, 2013). In the middle part of 19th Century (1822 - 1850), the temporary settlements were also confined in the western bank of the estuary of the Hoogly (Das, 2013). Salt agents of the region used the land to extract salts particularly from the tidal flood plains of Contai during 1850s (Sharma, 2009). After 1855, the whole tract of Hijili division from Rupnarayan river mouth to Subarnarekha delta along the coastal plain was dominated by swamps and salt flats with numerous tidally influenced water courses, and also by sand dunes in some areas (Paul, 1996). The extensive sandy plain

and associated rows of sand dunes in Contai town were covered by various indigenous plant species in the past (1867) (Paul, 1996). Tidal channels extended over the surface depressions between the successive dunes rows of Contai coastal plain. Much of the lowland was under the water in rainy season. During 1970s only a few fisher men, salt makers, smugglers and pirates were living in the island of coastal mangroves (Ghosh, 1996)). The entire wetlands were not used for permanent settlement in this period. Settlements expanded in this coastal tract under revised settlement policy (RSP). Land usually exploited by the people for salt extraction. Land reclamation and settlement, agricultural expansion along with mangrove felling and other form of resource extraction have changed the wild landscape from the interior parts towards the shoreline in the rich alluvial soil of the coastal plain in the past century. Tidal wetlands of the entire coastal belt continue to change under the pressure of human settlement and other forms of activities in the recent years. Wetlands of Contai areas are largely depleted because of reconstruction of landuse changes with extensive built up areas (residential, commercial, recreational, industrial land, areas covered by roads and other transport systems as well as technical infrastructures). Existing wetlands behind the shoreline dunes barrier and along the channel banks influenced by tidal flood flows of the entire region are converted into fish ponds, slat pans, dumping sites of city wastes, industrial wastes and other wastes, as well as pasture land and cropland. In the early 20th century, lands are cultivated by the people and swamps are reclaimed for settlements. In the present time, Contai urban area (30 Km interior from the beach town Digha) is now intensively cultivated and inhabited by dense settlement.

3.8 Geographical evolution of Midnapore urban centre

Midnapore was formed from 84000 years B.P., due to sea level fall (Clayton, 1995; Paul, 2002). Sea level fall and consequent isostatic adjustment led this area to rise as an upland over which laterization became dominant process to shape its geomorphology (Sengupta, 1966; Paul, 2002). Midnapore was formed as a lateritic upland. The settlement was grown over the uplifted land in 22000 years B.P. (Hunter, 1997).Presently, the entire Midnapore urban area has been classified into three areas based on the characteristics of soil. These are lateritic upland towards the west, older alluvium to the north and newer alluvium to the south and south-west. The characteristics of the soil in the west are similar in many aspects to the soil character of the plateau fringe area of Chhotanagpur region. Settlement shifted towards

Fig. No. 3.15 Geographical evolution of Midnapore urban centre



south and south-west due plain land and fertile newer alluvium soil. The area is generally flat with mild slopes towards the eastern and southern fringe. The major drainage system consists of Kansai river and Dwaribandh canal.

3.9 Present geographical settings

It would appear from what has been stated above that great changes have taken place in the courses of some of the important rivers in South Bengal during the last four or five hundred years. Though positive evidence is lacking, but it must presume the possibility of similar changes in the remoter past. It is to be regretted that there have no knowledge of their nature and extent. But the courses of the rivers in South Bengal were probably somewhat different not only from those of the present time, but even from those in the recent past of which there have more definite knowledge. This is essential in discussing geographical history of South Bengal on the basis of the position of the rivers. The frequent changes in the courses of rivers have been responsible for the ruins of many old places, at the times by washing them off and more often by making them unhealthy and inaccessible. Reference has already been made to Tamralipti, Hijili, Khejuri, Contai and Midnapore. Much of the areas of the deltaic coasts were occupied by distinctive wetland swamp and forest areas in the 18th century. Such broad flat low-lying areas with wide inter tidal zone and large tidal range were the ideal ground for tropical wetland swamps. Silt carried by rivers was deposited along the river channels, at the mouth of the deltas, and on the channel banks or into the floodplain areas. Tidal sediments carried into the river mouth and tidal inlets were deposited along the channel beds, channel banks and also in the large intertidal areas. The shifting of the beds of the Rupnarayan river

contributed to the ruin of the port Tamralipta and left Tamralipta as an early urban centre. Bridge ridges deposits of Contai, lying few metres above the present day sea level reveals radio-carbon dates back between 5760 and 6000 years before present and another set between 2900 and 3000 years before present (Paul, 2002). Thus, the civilization over younger surface of unconsolidated sediments deposits was prone to hazards, like subsidence, development of river meanders etc. Civilization of Chalcolithic period (5000 to 6000 years before present) flourished along the river banks or shorelines and encouraged by the trade. Natural lavees along the river banks and beach ridges along the shoreline were the ideal seats for civilization. Other areas dominated by tidal flood plains, lowlands, and wetlands, not suitable for the development of civilization. Such significant historical changes in the physical environment were responsible for the base level change and relative sea level change. At present, the entire areas of the coastal alluvial plain are protected by embankments. Regressive phase of the sea is documented from the Pliocene and older Pleistocene formations which are physically very distinct units in the South Bengal basin. The entire lateritic tract or the depositional areas of ferralitic materials over Midnapore urban centre represents the boundary between the shallow marine and terrestrial environment of the older Pleistocene period. The crescent shaped depositional units of lateritic tract traverse the whole of South Bengal extending from western fringe of Paschim Midnapore where Midnapore urban centre is located.

Physical environment of the coastal plain has been changed even in the last few centuries due to excessive land reclamation, construction of damps or barrages across the rivers and human activities. A large portion of the tidal wet lands has been reduced in the vast littoral tracts of Purba and Paschim Medinipur districts due to land reclamation. Thus, the vertical accretion

of sediments under tidal inundation and riverine flood flows have been diminished gradually on the delta surface due to protective flood banks. The heavily silt laden tidal influx is concentrated within the channels and is gradually raising the beds of the creeks. The creeks beds are rapidly rising above the adjoining land surface which was formerly drained. There is an absolute necessity of the embankments for the protection of the lands in the interior, which slope away from the rivers, and for avoiding the submersion of lowlands by the rivers overflowing their banks in the lower part of the deltas. Thus, a great portion of the area is rendered inhabitable by the sea dykes or the embankments that run along the tidal estuaries, tidal creeks and shorelines.

Chapter 4: Economic history

4.1 Introduction

Urban history is a field of history that examines the historical nature of urban centres (Huff et al., 1995; Paul, 1985). The approach is often multidisciplinary as it crosses the boundary of history and encroaches into the sub-fields of geography like urban sociology, urbanization, economic geography and archaeology (the popular themes of geography in the 20th century). This standpoint of studying urban centres is often tied to an implicit model of modernization (Pacion, 2004; Ling, 2008). Writing urban history was an act of local piety and an expression of identity, while local orthodoxy was an important consideration (Krugman, 1991). There was also a widespread recognition that urban centres were crucial agents of historical change (Paul, 1988). Urban centres were the points from which civilization emerged (Roy, 2006); they were the centres of economic change and conflict (Verma, 2008); the loci of modernity (Pacion, 2004). Urban histories those were being written till early 20th century generally focussed upon experiences with respect to the concerned urban centres. It reinforced sense of local difference and civic identity (Paul, 1989). In broader narratives of economic change, urban area featured as autonomous agent and the rapid rate of urban growth in the 19th century stimulated interest in the city as the object of historical enquiry (Wang, 2001). Since 1960s, geographical review of historical data and information began to be recognized as an important tool to facilitate the decision making process at all geographical scales (Golledge, 1969; Barno, 1991). One of the most cited publications in geography, 'Geographical Review' has, since 1969; presented significant advances in geographical theory, model building and quantitative methods to geographers and scholars in wide spectrum of related fields (Eaton et al., 1982). The approaches of studying a historical urban centre are based on scale (capital cities, metropolitan cities and administrative units), function (ports, railway centres, tourist

centres and industrial activities), categories (new towns and imperial cities) and ideology (capitalism and communism) and on power and social relation (Israd, 1956; Mills, 1987; Rao, 1964; Glasson, 1978). The known economic history of India begins with the Indus valley civilization (O'Malley, 1911). The Indus Valley Civilization was an ancient civilization located in what is Pakistan and northwest India today, on the fertile flood plain of the Indus River and its vicinity. Indus valley civilization, the first known permanent and predominantly urban system that flourished from 3500 B.C. to 1800 B.C., boasted of an advanced and thriving economic system (O'Malley, 1911). By 2600 B.C., several towns and cities had been established, and during the period from 2500 to 2000 B.C. the Indus Valley Civilization was at its peak. Two cities, in particular, have been excavated at the sites of Mohenjo-Daro on the lower Indus, and at Harappa, further upstream. The Indus Civilization had a writing system about cities which today still remains a mystery. All attempts to interpret, it has failed. This is one of the reasons why the Indus Valley Civilization is one of the least known of the important early civilizations of antiquity. Examples of this writing system have been found in pottery, amulets, engraved stamp seals, and even in weights and copper tablets. These evidences suggest they had a highly developed city life; many houses had wells and bathrooms as well as an elaborate underground drainage system. The economic conditions of the citizens were comparable to those in Sumerian and superior to the contemporary Babylonians and Egyptians. These cities display a well-planned urbanization system. Commercial, religious, and artistic connections have been recorded in Sumerian documents. Its citizens practiced agriculture, domesticated animals, made sharp tools and weapons from copper, bronze and tin (Majumdar, 1971). The Indus civilization's economy appears to have been dependent significantly on trade, which

was facilitated by advances in transport and communication. There are evidences from the description of Ptolemy, Fa-Hien, Hu-en-Sung, Sir Mortimer Wheeler, and Jonathan Mark Kenoyer, of some trade-based links between the Indus Valley Civilization and the Near East. Both Harappa and Mahenjo-daro shared approximately the same architectural lay out, and were generally not heavily fortified. The description depicts that there was some kind of economic and administrative centrality, but the extent and functioning of economic activities remain unclear. It has been stressed from the description of above historians and visitors that, Bengal's geography and physical features endowed the region with considerable facilities of communications- overland, riverine and maritime, from the period of Indus valley Civilization. When, for instance, the northern and north-western part of the subcontinent experienced mature urbanisation during the period from 2500 to 1750 B.C., there was no such similar development in Eastern India (Majumdar, 1971). Similarly, Bengal was outside the scope of urban development and emergence of '*mahajanapada*s' (territorial polities) in and around the Sixth Century B.C. (O'Malley, 1911). Around 600 B.C., the Mahajapadas minted punch-marked silver coins and this period was marked by intensive trade activity and urban development (Majumdar, 1971). By 300 B.C., the Mauraya Empire united most of the Indian subcontinent. The political unity allowed for a common economic system and enhanced trade and commerce, with increased agricultural productivity. For the next 1500 years, India produced its classical civilization and during this period India is estimated to have had the largest economy of the ancient and medieval world from 1st to 17th century A.D., controlling between 1/3rd and ¼th of the world's wealth. This opulence of India continued until the time of Maratha, from whence it rapidly declined during European rule (Hunter, 1876). Major urban centres in early Bengal like Pundranagara, Kotivarsa,

Mangalkot, Karnasuvarna, Ramavati, Vikrampura, Tamralipta, Hijili and Midnapore appear to have combined functions of politico-administrative and commercial centres (Majumdar, 1971). These seem to have occupied the apical position in the hierarchy of market places in early Bengal. Closely connected to the markets, urban centres were the ports at principal. The foremost ports of Bengal from the late 2nd Centuries B.C. to the 8th Century AD were certainly Tamralipti and then Hijili, the major outlets for the landlocked Ganga valley. Tamralipti was undoubtedly the port par excellence in ancient Bengal, and the Gange or Chandraketugarh likely to have played the role of an important feeder port to Tamralipti. It appears that the last known definite epigraphic reference to Tamralipti does not go beyond the 8th Century AD, after which the port seems to have declined mainly because of the siltation in the Rupnarayan river. The gradual fading away of this premier port may have adversely affected the commercial activities of these early historic urban areas in Eastern India. All the studies about the economic history of early urban centres throw a flood of light on the political history of the region but one gropes in the dark while searching for data and information regarding the general economic condition of the region. That means scholars were concerned simply to trace the economic events that took place in any particular early urban centre. But it is essential not to be too concerned simply in tracing the economic events, but rather to locate the urban centre's economic history into wider systems of communication, power and social relation along with the agricultural and manufacturing boom these urban centres experienced. Not only with the consolidation of Mughal or British power in these province but also with the growth in overland and maritime trade in different dynasties that linked Bengal even more closely to the Eastern India and world economy (Ghosh, 2008). The present chapter is a humble attempt to analyze the economic history of

three early urban centres (Tamluk, Contai and Midnapore) in Eastern India from geo-historical point of view. Geographical history of each of these three urban areas is different from another (Sharma, 2003) and they also differ in their modes of origin and evolutionary history of urban functions (O'Malley, 1911). Tamluk, Contai and Midnapore had been three historical urban areas of Eastern India (Bosu, 1921). Maurayana, Kalinga, Gupta, Afgan, Mughal, British etc. ruled these urban areas (Bosu, 1921) and left some signatures on society, culture and economy (Ghosh, 2008). The unique interactions among all cultural, political, social and economic processes have rendered some special characters to these ancient towns that have made significant difference between themselves and other historical urban centres of West Bengal in regard to urban features (Ghosh, 2008; Majumdar, 1971). Therefore the present study seeks to examine the economic history of Tamluk, Contai and Midnapore (three early urban centres of Eastern India) urban centres of historical importance where built heritage and innovation design of space have been competitive facets of urban centres in terms of metamorphosis of urban systems under the influence of processes like urban economic functioning, urban redevelopment etc (Verma, 2008).

4.2 Early evidences on varying economic base

A perusal of trade in the three early urban centres in Bengal as well as in Eastern India has to be placed in the broader context of commerce in the subcontinent (Majumdar, 1971). In India, as in early Bengal, the mainstay of economic life must have been agriculture (Majumdar, 1971). In the Brahmanical theoretical treatises, for instance the *Arthashastra*, however, *vartta* (the science related to occupations or *vrtti*), includes *krsi* (agriculture) and *vanijya* (trade) as well. The Pali canonical literature in fact clearly underlines the greater

economic advantages in trade than in agricultural pursuits (*Majjhima Nikaya*); there is also the clear recognition in the *Anguttara Nikaya* that out of trade could be derived enormous profit. It is no wonder that the great grammarian Panini (5th century B.C.) was aware of *kraya-vikraya* (purchase and sale) as the principal aspect of *vyavahara* or trade. The principal sources of our information regarding trade in early Bengal are indigenous literature (both normative and creative), impressions of foreigners (Classical, Chinese, Arabic, Persian and European), inscriptions, coins and field archaeological evidence from explored and excavated sites. These sources, though diverse, rarely throw any light on transactional activities in Bengal. The evidence is scattered and far from adequate, providing virtually no statistical data and offering what is termed as 'qualitative data'.

4.3 Analysis of literary information, maps, antiquities, coins and beads of stones

Data and Information are mainly obtained from concerning literatures and maps about intensity of agricultural activities, volume of agricultural production, major agricultural produces, trade relation of the three urban centres through Tamralipta and Hijili port, volume of trade and trade articles. 'A Cultural History of India' (Basham 1975); 'History of Ancient Bengal' (Majumdar 1971); 'Adi O Madhayajuger Bharatiya Samaj' (Sharma 2003); 'The Economic History of India 1857 – 1947' (Roy 2006) etc. Literatures and maps of Van Den Brook, Rennel, Thnillier, D.R.Nandi, and Valentine etc. have been considered. Other data and information sources include People's words, actions and interactions. The words of Rakhaldas Bandhopadhaya, Haraprasad Sastri, Fa-Hien, Hieu-En-Sung, Durga Das Lahiri, Ramesh Chandra Dutta, Warren Hastings etc. have been examined to note the major economic events which help understanding the changes in economic bases. The data and

information have been derived from Patachitra (Scroll painting) with mythical stories and contemporary events, manuscripts in palm leaf and handmade paper, a number of antiquities mainly terracotta plaques and figures (Terracotta Buddha Head, Egyptian Harpoon, Roman Amphora, Toy Cart), coins (Roy Choudhury, 1962; Smith, 1906; Rakshit, 1902) and beads of precious and semi-precious stones. The local people were interviewed for their experiences and ancestor's economic lives. Intensive survey has been conducted taking homogeneous commercial block as the basic unit of study. Commercial blocks separated by arterial roads were identified from the high resolution satellite images downloaded from the open source. Information for each of such commercial blocks was collected and recorded using pre-designed field manual and questionnaires. All the collected data and information for the present study has been analysed by geo-historical method.

4.4 Trade relations, import and export and evidences of trade relations during Pre-historic (400000 B.C. to 200000 B.C.), Historic (1400 B.C. to 1757 A.D. or 1800 A.D.) and Proto-historic period (1800 A.D. to Present time)

4.4.1 Pre-historic Period

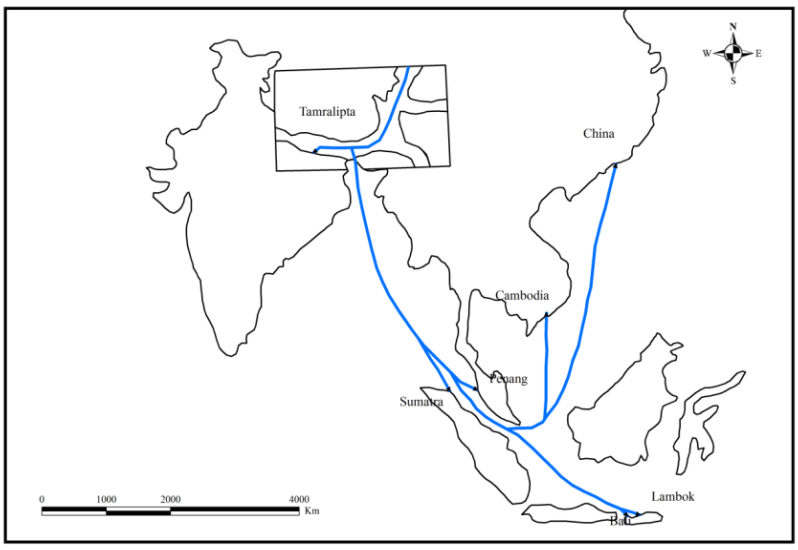


Fig. No. 4.1 Trade relations of Tamluk in Pre-historic period

Tab. No. 4.1 Import and export from Tamluk

Import	Gold and Silver
Export	Copper

Evidences of trade relations

- "Tamralipta was the important port on the western bank of river Rupnarayan."

  Sritipuranadi (Cited in Majumdar, 1971)

- "Tamralipta was the important port of Eastern India wherefrom trading with Penang, Java, Lambok, Cambodia etc used to be carried out."

  Bouddha Dharmagrantha (Cited in Basham, 1975)

- "The Hindu and Buddhist architecture of Bali, Lambok, java, Enam, Cambodia prove that there was a trade relation with India via Tamralipta port."

  Oral histories of *Panchakari Bandhopadhaya* (Cited in Sharma, 2003)

4.4.2 Historic period

4.4.2.1 Trade relations of Tamluk in Historic period (1400 B.C. to 600 B.C.)

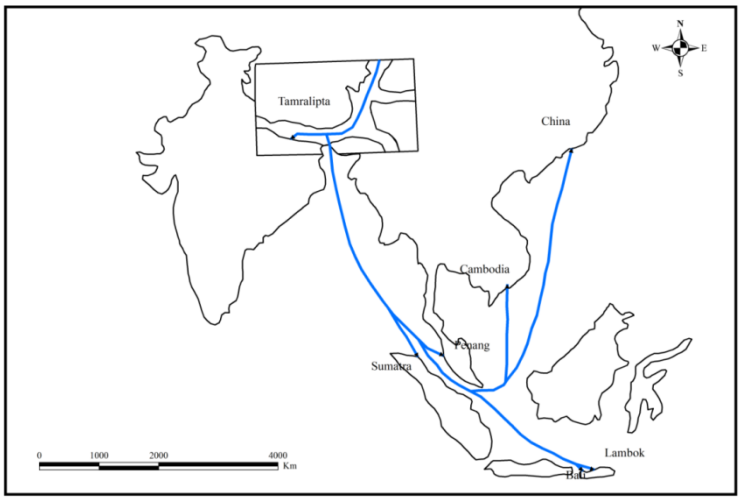


Fig. No. 4.2 Trade relations of Tamluk in Historic period (1400 B.C. to 600 B.C.)

Tab. No. 4.2 Import and export from Tamluk

Import	Gold and Silver
Export	Copper

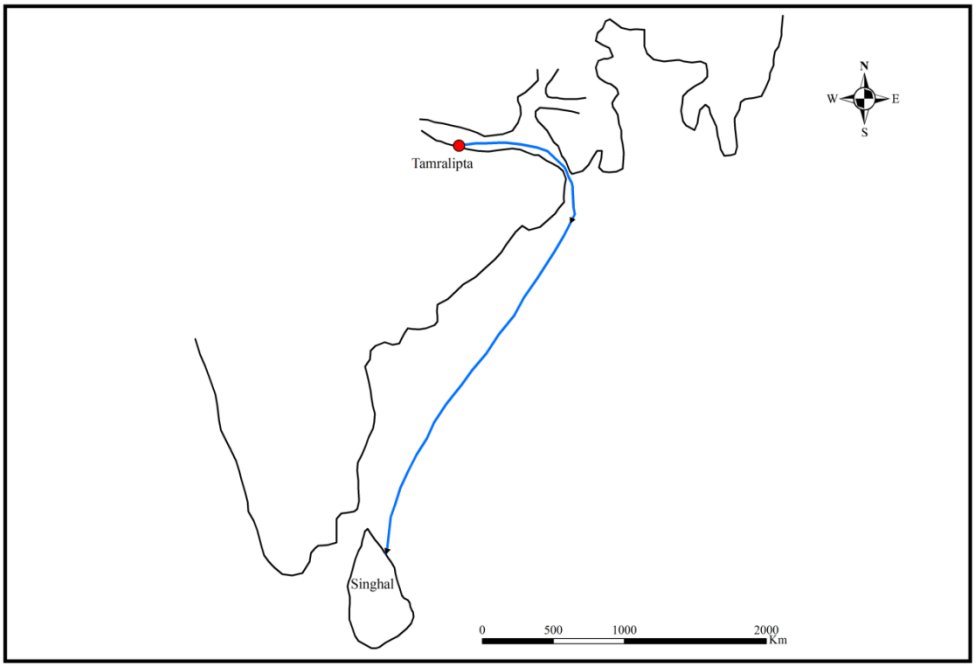
Evidence of trade relations

- "Tamralipta was the important port in Eastern India. Copper collected from Santal paragana, Singhbhum and Ghatsila used to be exported to South-east Asia from Tamralipta."

Mahabansha and Deepbansha (Cited in Bosu, 1921)

4.4.2.2 Trade relation of Tamluk in historic period (500 B.C.)

Fig. No. 4.3 Trade relation of Tamluk in historic period (500 B.C.)



Tab. No. 4.3 Import and export from Tamluk

Import	Information not available
Export	Copper

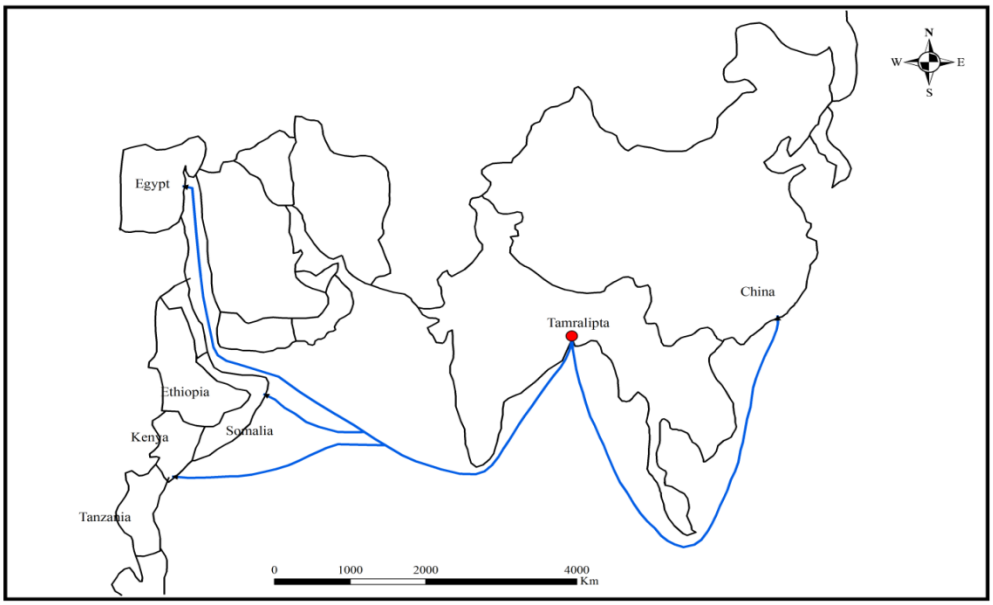
Evidence of trade relation

- "There was a trade relation between Tamralipta and Singhal."

Singhapali (Cited in Majumdar, 1971)

4.4.2.3 Trade relations of Tamluk in Historic period (400 B.C.)

Fig. No. 4.4 Trade relations of Tamluk in Historic period (400 B.C.)



Tab. No. 4.4 Import and export from Tamluk

Import	Rice, Gold, Silver, Perfume Material, pearls, precious stones etc
Export	Steel, Silk, Ivory, Vermilion etc

Evidence of trade relations

Egyptian Harpoons are excavated from Tamluk and these are preserved in the Archaeological museum in Tamluk. These are the evidences of trade relation with Egypt.

Pla. No. 4.1 Egyptian Harpoons

Source: Archaeological Museum, Tamluk

4.4.2.4 Trade relations of Tamluk in Historic period (300 B.C.)

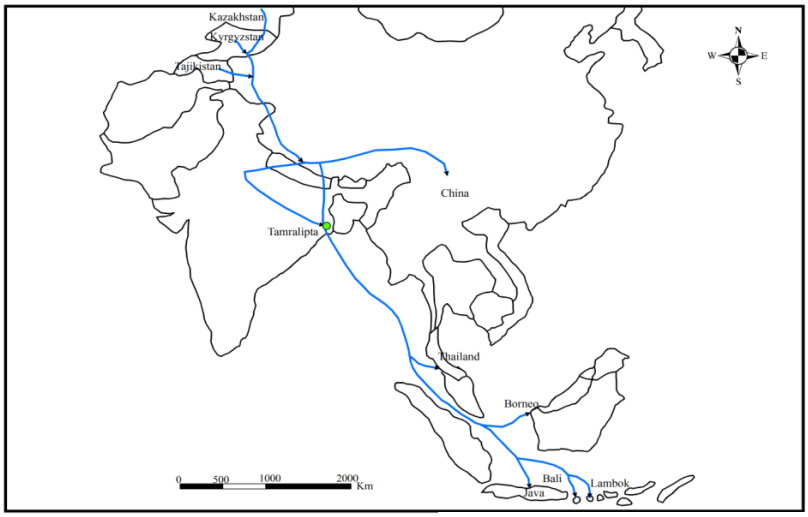
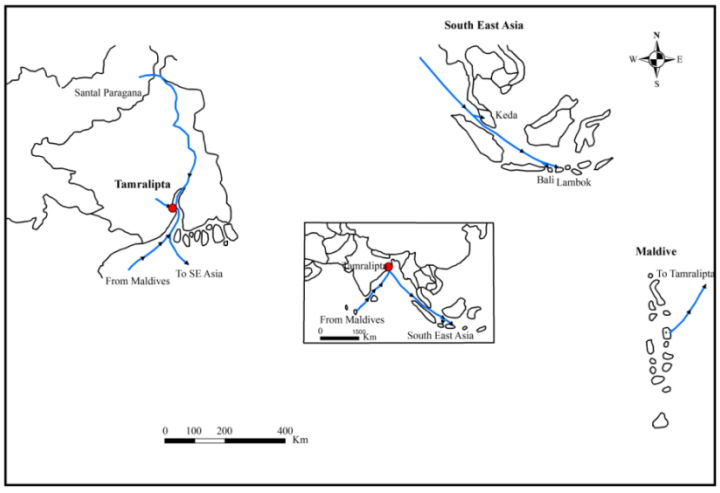


Fig. No. 4.5 Trade relations of Tamluk in Historic period (300 B.C.)



Tab. No. 4.5 Import and export from Tamluk

Import	Horse, Gold, Silver, Stiver (Kawrie) etc
Export	Horse, Glass, Cloth, Rice, Perfumed oil, Cassia leaf, Honey, Resin etc

Evidence of trade relations

- "India could maintain relations with Central Asia and South-east Asia through Tamralipta port. The main trading matter was horse of Central Asia."

  Chi-n-han-shu and Periplus of Erithrian Sea (Cited in Rakshit, 1902)

4.4.2.5 Trade relations of Tamluk in Historic period (200 B.C. to 100 B.C.)

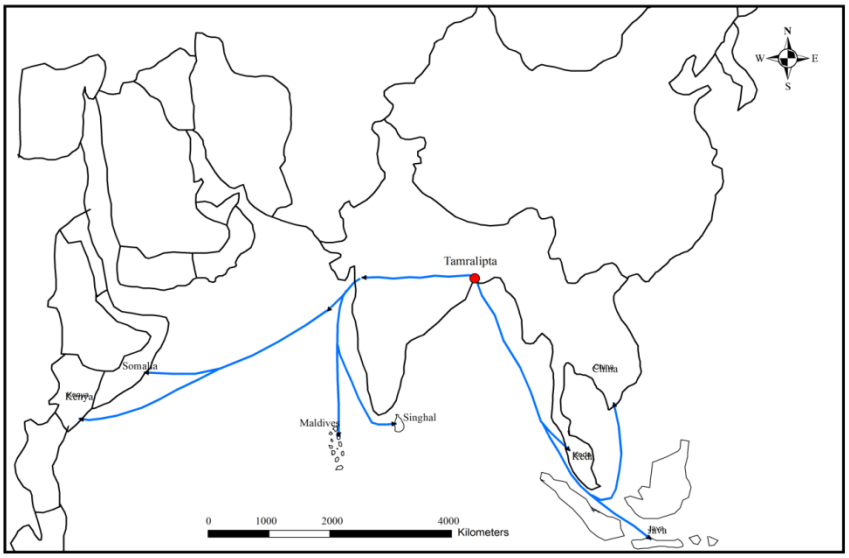


Fig. No. 4.6 Trade relations of Tamluk in Historic period (200 B.C. to 100 B.C.)

Tab. No. 4.6 Import and export from Tamluk

Import	Gold, Silver, Paisa (kawrie) etc
Export	Cloth, Rice, Perfumed oil, Honey etc

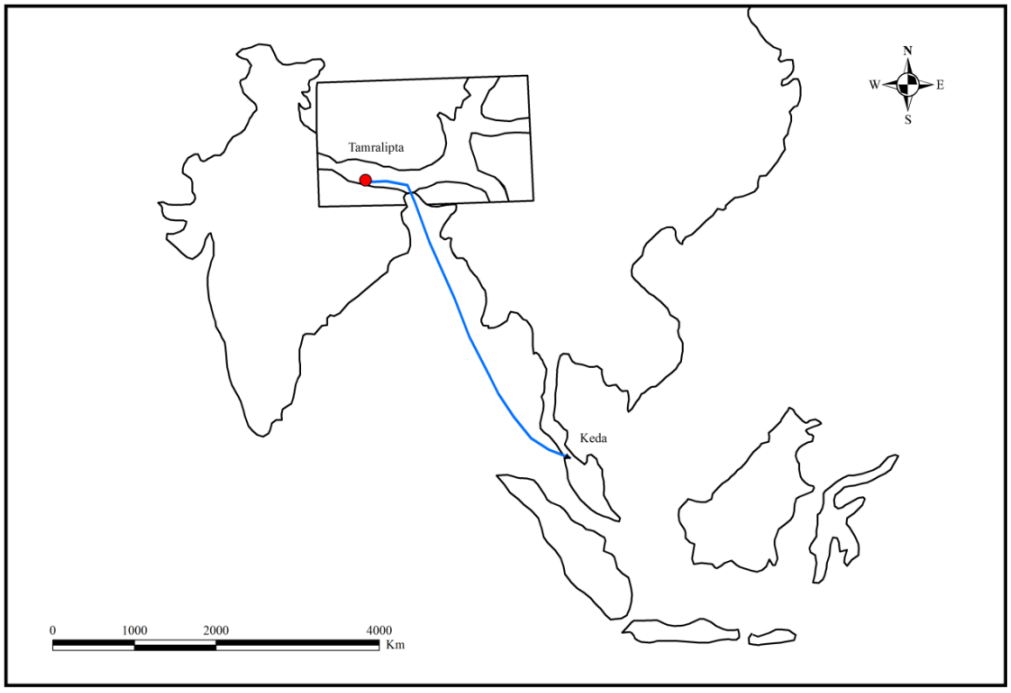
Evidence of trade relations

- "The overseas trade from Tamralipta followed different courses. – 1.Tamralipta to Malaya, Sumatra and Java, 2.Tamralipta to Singhal and 3. Tamralipta to Africa."

(Majumdar, 1971)

4.4.2.6 Trade relation of Tamluk in Historic period (400 A.D. to 500 A.D.)

Fig. No. 4.7 Trade relation of Tamluk in Historic period (400 A.D. to 500 A.D.)



Tab. No. 4.7 Import and export from Tamluk

Import	Horse from Kazakhstan, Kyrgyzstan etc.
Export	Horse to Keda

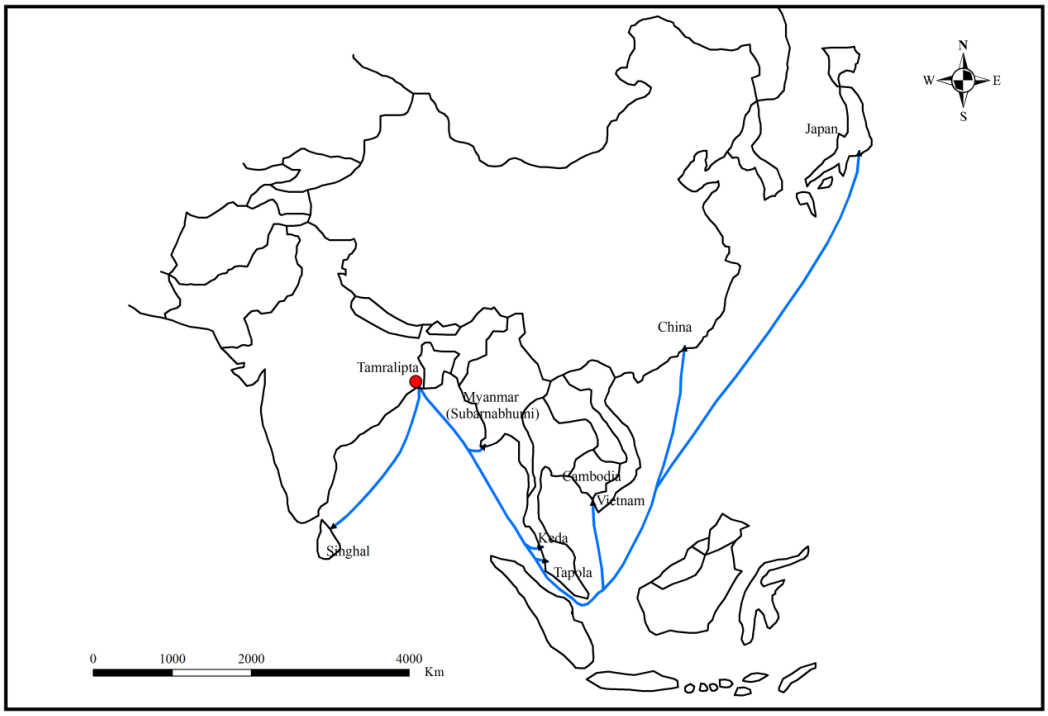
Evidence of trade relation

- "Tamralipta was an eminent port and there was a trade relation with keda."

Oral histories of Fa-Hien in 411 AD (Cited in Basham, 1975)

4.4.2.7 Trade relations of Tamluk in Historic period (500 A.D. to 700 A.D.)

Fig. No. 4.8 Trade relations. of Tamluk in Historic period (500 A.D. to 700 A.D.)



Tab. No. 4.8 Import and export from Tamluk

Import	Horse, Aromatic oil, cassia leaf etc
Export	Horse, Rice, Essence, cassia leaf etc

Evidences of trade relations

- "In 7th century A.D., Tamralipta had a trade relation with Malaya, Keda, Subarnabhumi, Tapola etc."

Kathasarit Sagar (Cited in O'Malley, 1911)

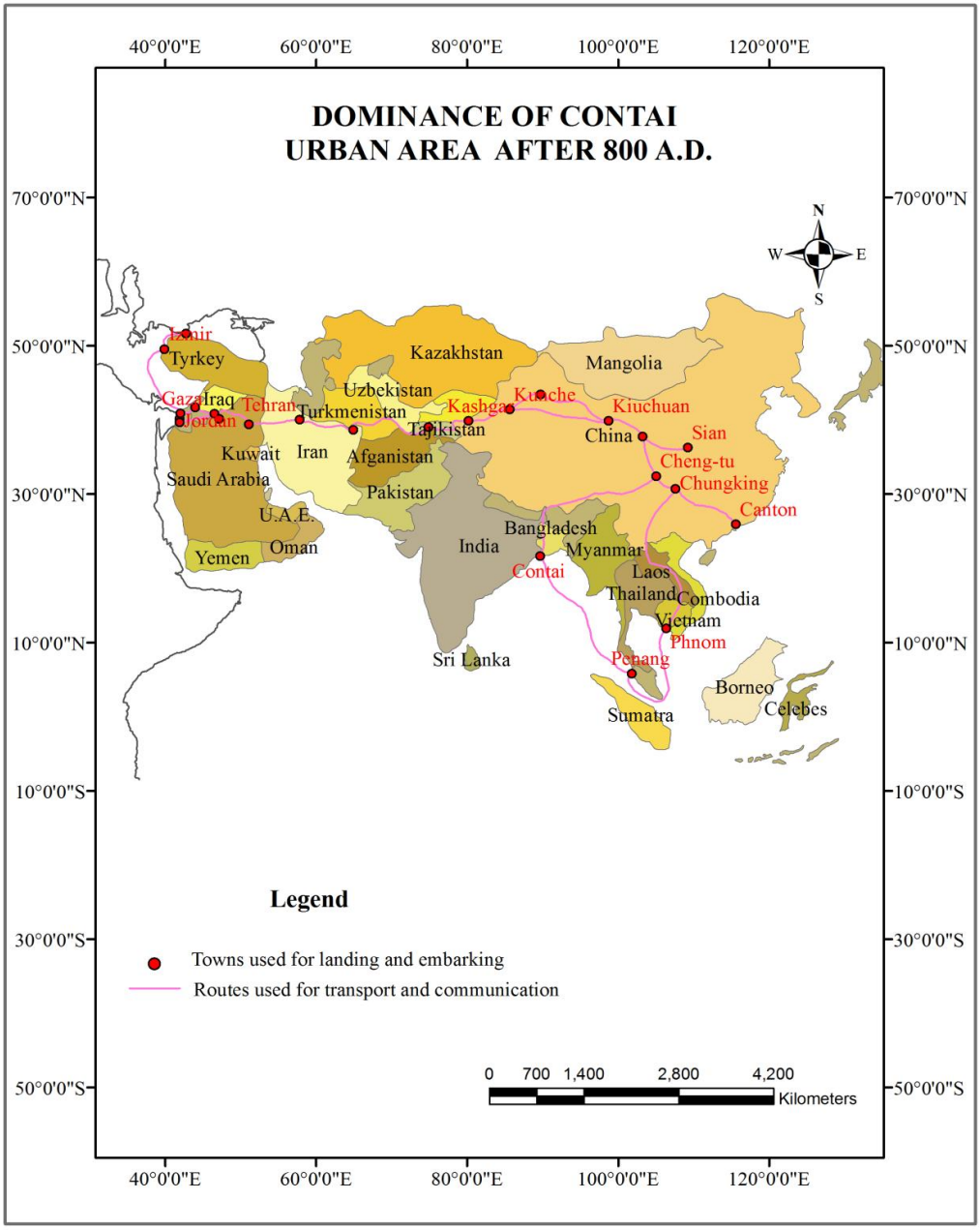
- "In 7th century A.D., India could extend trade relation to Singhal through the ancient port."

Oral histories of *I-tsing* (673 AD) (Cited in Basham, 1975)

4.4.2.8 Trade relations of Hijili (After 800 A.D.)

Due to downfall of port Tamluk, trade not appears to have flourished. Tamralipta contained a Portuguese settlement and appears to have a slave market. These slaves were transported to Midnapore urban area as labour in piece goods industry (established by British), white cloths industry (established by French) etc and then these produced goods, rice and other articles were exported to the European country through Hijili port (Presently Contai urban centre).

Fig. No. 4.9 Trade relations of Contai in Historic period (After 800 A.D.)



Tab. No. 4.9 Import and export from Contai

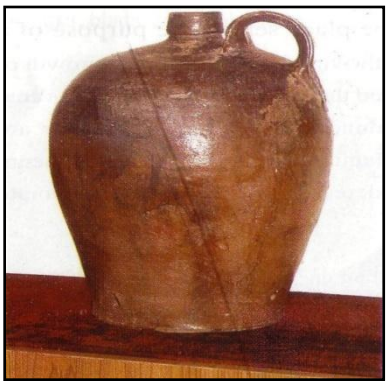
Import	Malabathrum, Silk, Bamboo, Agaru (Agar Chandan Plant) etc
Export	Textiles, Sandals, food grains, Piece goods etc

Evidences of trade relations

- "It was by this route that the commodities of Assam like textiles, sandals and agaru were carried through Hijili to other part of India."

Kathasaritsagara (Cited in Majumdar, 1971)

- Roman Amphora is excavated from Tamluk and these are preserved in the Archaeological museum in Tamluk. This is the evidence of trade relation with Rome.

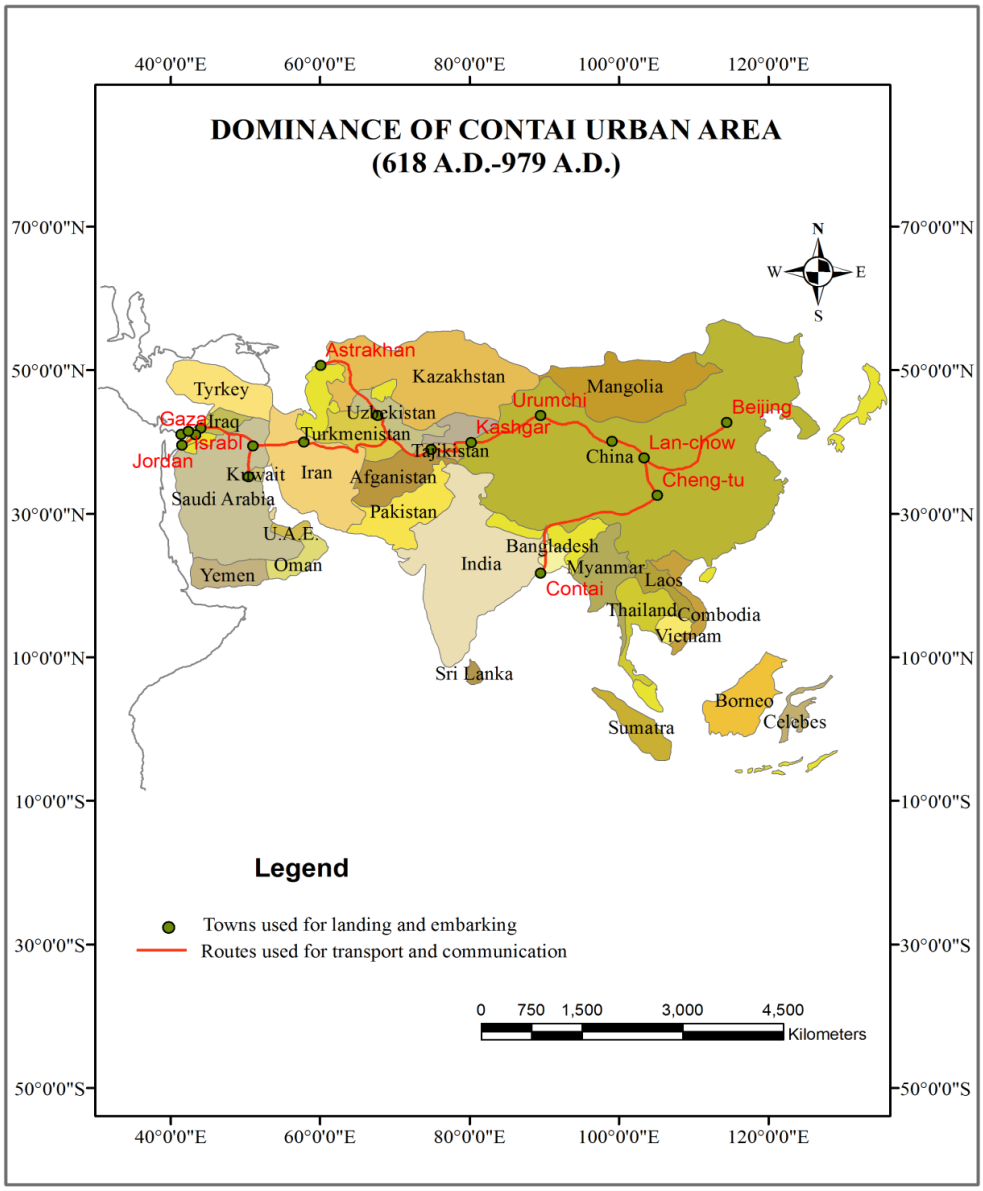


Pla. No. 4.2 Roman Amphora

Source: Archaeological Museum, Tamluk

4.4.2.9 Trade relations of Contai in Historic period (618 A.D. to 979 A.D.)

Fig. No. 4.10 Trade relations of Contai in Historic period (618 A.D. to 979 A.D.)



Tab. No. 4.10 Import and export from Contai

Import	Horse
Export	-

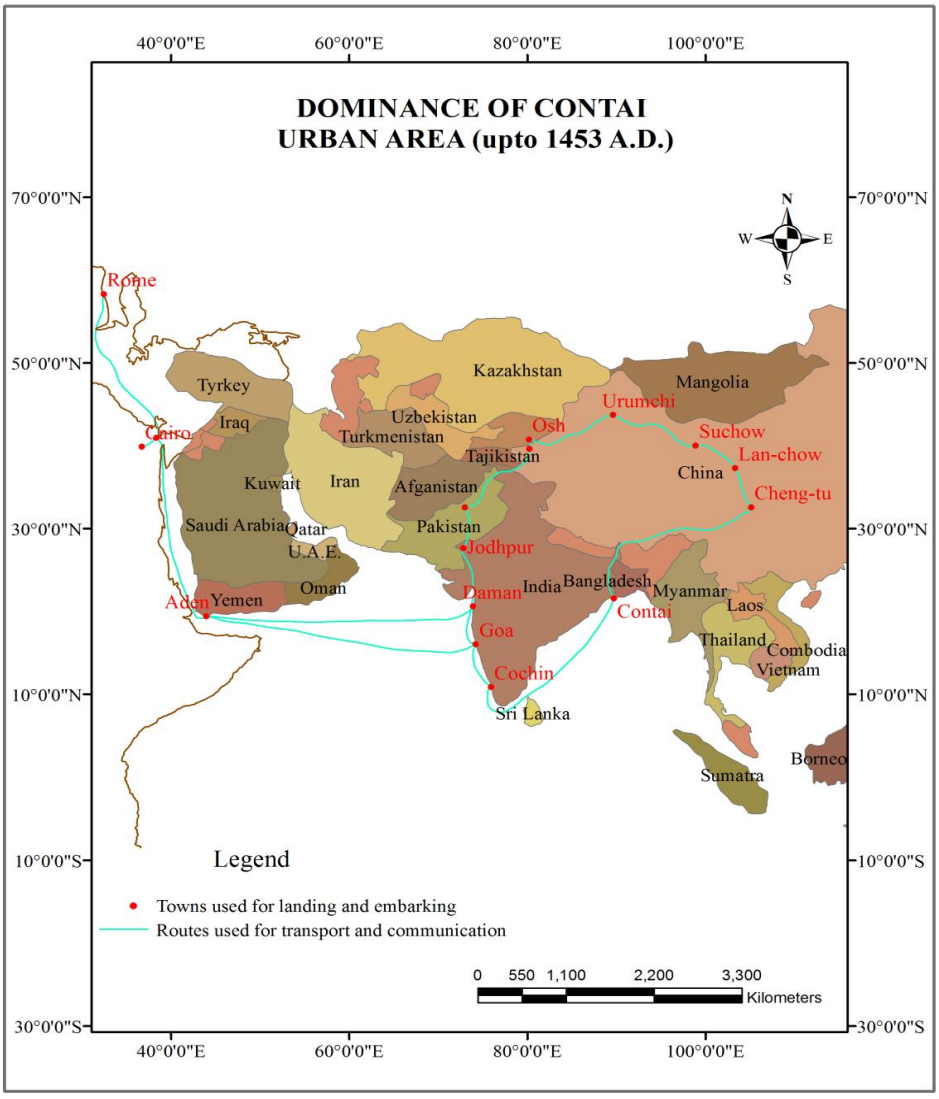
Evidence of trade relations

- "Every morning in the market of the city, about fifteen hundred horses are sold."

Tabaqat-i-Nasiri (Cited in Majumdar, 1971)

4.4.2.10 Trade relations of Contai in Historic period (Upto 1453 A.D.)

Fig. No. 4.11 Trade relations of Contai in Historic period (Upto 1453 A.D.)



Tab. No. 4.11 Import and export from Contai Evidence of trade relations

Import	Horse
Export	Cloth, Piece goods

Evidence of trade relations

- Toy cart of Greek is an evident of trade relation with Europe.

Pla. No. 4.3 Toy cart of Greek

Source: Archaeological Museum, Tamluk

4.4.2.11 Trade relations of Contai in Historic period (660 A.D. to 1516 A.D.)

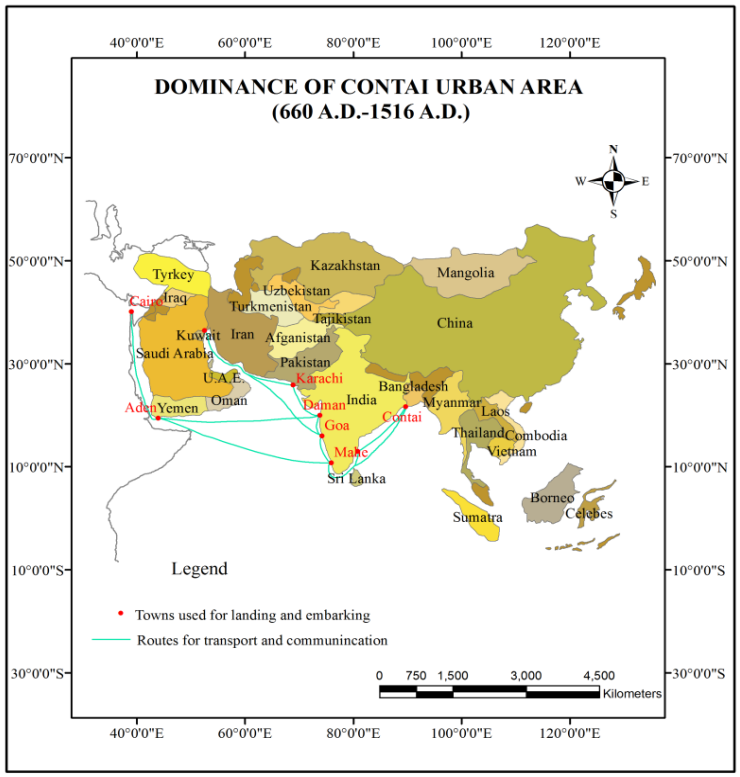


Fig. No. 4.12 Trade relations of Contai in Historic period (660 A.D. to 1516 A.D.)

Tab. No. 4.12 Import and export from Contai

Import	Silver, Gold
Export	Rice, Essence

Evidence of the trade relations

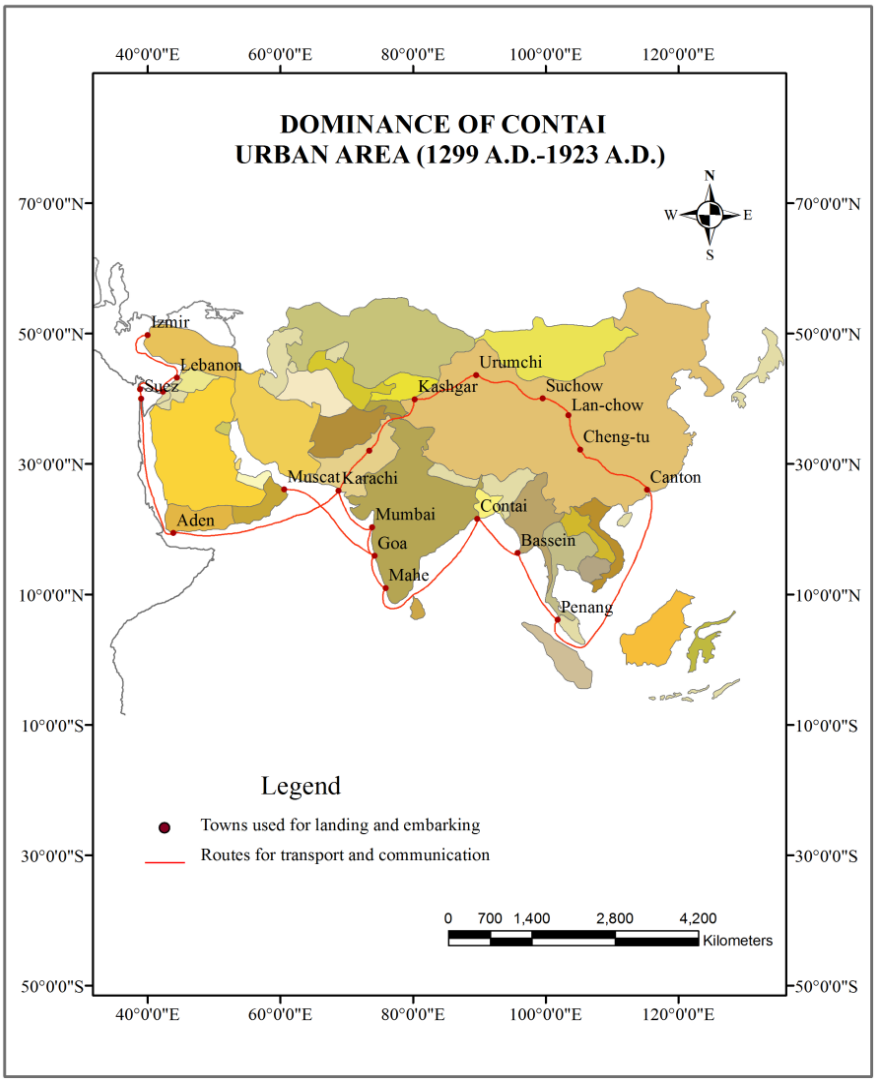
- "The chief articles exported from Hijili port are paddy, rice, essence; the principal imports being gold and silver of Arab."

Majumdar, 1971

4.4.3 Proto-historic Period

4.4.3.1 Trade relations of Contai in Proto-historic period (1299 A.D. to 1923 A.D.)

Fig. No. 4.13 Trade relations of Contai in Proto-historic period (1299 A.D. to 1923 A.D.)



Tab. No. 4.13 Import and Export

Import	Rice, Cloth, Wool, Sugar, Peeper etc.
Export	Copper, Gold, Silver, Salt, Sugar, handkerchief, indigo etc.

Evidences of the trade relations

- "To this haven of Angeli came every year many ships out of India, Sumatra, Malacca and divers other places, and lade from thence great store of rice and much cloth of cotton, wool, and sugar and long peeper, great store of butter, and other victuals."

  Oral histories of *Ralph Fitch* (1586) (Cited in O'Malley, 1911)

- "Chandrakona and Radhanagar was famous for manufacturing sugar and cotton cloth and silk romaals or handkerchiefs."

  Oral histories of *Alexander Hamilton* in 1720 (Cited in O'Malley, 1911)

- "Hingeli was formerly one of our (Dutch) chief settlements, and the Portuguese also had their quarters and a church."

  Oral histories of *Valentine* in 1724 (Cited in O'Malley, 1911)

4.4.3.2 Economic base of Tamluk, Contai and Midnapore urban centres in Proto-historic period (After 1947)

In the middle of 19th century, patriotic movement started in Midnapore district under the leadership of Surendranath Banerjee. Indian Association was formed in 29 branches. These branches were set up Midnapore sadar, Contai, Tamluk and other places (Batra, 2009). Through different movement, finally, on 15th August, 1947, Midnapore district liberated from the British rule. During colonial period, European trade appears to have flourished around Contai. Contai was a part of Hijili kingdom and was famous for rice, salt, piece goods and cloths but during post-colonial period, overseas trade of these articles were on the decline as the European merchants became vulnerable to the Indian freedom movements.

Simultaneously, salt, piece goods and cloths manufacturing industries failed to retain its economic viability as before, but some imprints of those mega scale activities are still alive over the cultural landscape. Presently, along with their administrative functions, these three urban centres exist as local commercial centres.

4.5 Economic History of Tamluk Urban Centre

Tamluk came into being sometimes between 1500 to 2000 years B.P. when it was comprised of marshy lands topography, halophytic plants and salt marshes (Bosu, 1921). The low lying marshy area was filled up by depositional reworking of the rivers Hoogly and Rupnarayan. Thus, the area came into existence as an elevated land surface where port activities began to be carried out. By 700 B.C., Tamluk became a renowned port (Majumdar, 1971). In the seventh century B.C., India could extend trade relation outside India through Tamralipta port. Copper collected from Santal Paragana, Singhbhum and Ghatsila used to be exported to South-east Asian countries like Bali, Lambok, Sumatra, Enam, China and to Europe from Tamralipta, a port in the coast in the Bay of Bengal (Sharma, 2003). The Buddhists and then Jains constructed monasteries during 600 to 468 B.C. Brahmanas also left distinctive signatures on the cultural landscape of the area. In the fifth century B.C., there was a trade relation between Tamralipta and Singhal (Presently Srilanka) (Majumdar, 1971). Tamluk was under the Maurayan rule during 273 to 236 B.C. (Ghosh, 2008) and Ashoka himself constructed a ‘Stupa’ here. According to Buddhist philosophy, a ‘Stupa’ is metaphysically identified as ‘the axis of the world’ and ornamented with elaborated carvings with cosmic and sometimes dynastic symbolism (Basham, 1975). Human settlements were first grown in copper age (261 years B.C.) (Das, 2001). In the third century B.C., India could maintain the

trade relations with Singbhum, Singhal, Maldives, Central Asia and South-east Asia through Tamralipta port (Das, 2001). During second century B.C., there were three important trade routes from Tamralipta to Malaya, Sumatra; West Africa; and South-east Asia (Basham, 1975). Between first century A.D. and third century A.D., Tamralipta had a trade relation with South-east Asia (Majumdar, 1971). Between fifth to seventh century A.D., India could extend the trade relation to Singhal, Keda (South-east Asia), Burma, Malayasia, Sumatra through this ancient port (Bosu, 1921). But after the eighth century A.D., Tamralipta lost its importance due to downfall of the port (Basham, 1975). The river Sarasvati flowed into an estuary near Tamluk as a dominant river and received not only the waters of the Rupnarayan and the Damodar but those of many smaller streams issuing from the hills of Santal Paragana. Sometimes after the eighth century A.D., the port of Tamluk lost its importance on account of silting up at the mouth of Sarasvati and the consequent shifting of its course (Das, 2001). The place of Tamralipta as a port was eventually taken up by Saptagram or, Satgaon, located higher up the river. Satgaon figured as the muslim capital of South-western Bengal in the fourteenth century A.D. In the sixteenth century A.D., the major water of the Bhagirathi began to flow through the Hoogly channel and consequently Satgaon failed to continue its port activities. With the passage of time Hoogly, and then Calcutta emerged as new ports along river Hoogly (Majumdar, 1971). During colonial period, Tamluk continued to function as a port where merchants and others used to land and embark for Ceylon, java, China etc. (O'Malley, 1911). Hence, trade and trade related activities were the economic bases of Tamluk during colonial period (Das, 2001). With the emergence of the ports of Hijili and Calcutta during the late colonial period, Tamralipta failed to survive as a port town but existed as a Portuguese settlement and appeared as a slave market (Majumdar, 1971;

O'Malley, 1911). During post-colonial period, the urban area of Tamluk was still a place of considerable importance as a centre of boat traffic along the Rupnarayan River and was a principal centre of manufacturing of bell-metal articles (Roy and Chottapadhaya, 1992). Presently, the Tamluk urban area functions as the headquarters of the Purba Medinipur district and has a strong control over the regional economy as a trade centre (Das, 2001). Therefore, the economic background of Tamluk changed at different points of time in the history. Different cultural traits left their imprints over the physical space. Some of which are still existent e.g. Bargabhima temple (Buddhist architecture) and Sakti temple (Oriya type architecture) etc. (Basham, 1975).

4.6 Economic History of Contai Urban Centre

After eighth century, port Tamralipta lost its importance (Sharma, 2003; O'Malley, 1911) and Hijili became a great trade centre (O'Malley, 1911). European trade appears to have flourished during colonial period around Contai (Roy, 2006; O'Malley, 1911). The road was laid on to connect Balasore, Pipli and Hijili (O'Malley, 1911). These three were the important ports in Eastern India along the western coast of the Bay of Bengal (Majumdar, 1971). These three ports played an important role for the expansion of trade in Kendua (Roy, 2006) and its area of influence extended upto Balasore, Pipli and Hijili (Majumdar, 1971; Roy, 2006). In the 5th century A.D., during the visit of Fa-Hien, Contai was uninhabitated and was not known to the rest of the world as a trade centre (Ghosh, 2008). In Valentine's travelogue, a harbour Kendua by name had been mentioned. This harbour was on the bank of Rasulpur River, at a short distance from Rasulpur estuary (Roy and Chattopadhaya, 1992).

By 1605, Dutches hailed at Kendua for trading of rice and other articles (Majumdar, 1971; O'Malley, 1911). Before 1781 A.D., Contai was originally a part of Hijii kingdom that belong the state of Subha-orissa. The kingdom was being ruled by a hindu king, Gopinath Pattanayak (Sharma, 2003). He headed the system of manufacturing salt and had the responsibility to collect salt tax as royal revenue (Das, 2001). The Satbahana inscription and post Gupta epigraphs refer the king's supervisory authority over salt manufacturing (Das, 2001). In the year 1781 A.D., the East India Company set up a system of monitoring salt production in the area and thus deprived the local Zamindars by reducing their control over salt manufacturing in their own estates (Das, 2001). The Zamindars received a certain fixed allowances (malikana) and some additional allowances (mushahara) for rendering lands and other helps to british traders for manufacturing salt (Das, 2001). In 1852 A.D., it was estimated that ¾ of the working force in Hijili who were engaged in salt processing, increased salt production by two times of the amount that could produce before the British salt merchants took the charge of production (Hunter, 1876) and in this year, the East India company announced as a sub-division consisting of six police stations – Contai, Khejuri, Ramnagar, Egra, Bhagabanpur and Pataspur and the sub-divisional office was at Negua (Hunter, 1876). Bankim Chandra Chattopadhaya served as the deputy magistrate of Contai from January to November, 1860 (Sharma, 2003). In 1863 A.D., when Nimak Mahal (the salt factory and business centre) at Contai ceased functioning, the sub-divisional office was shited from Negua to the abandoned Nimak Mahal building at Contai (Das, 2001). During post-colonial period, overseas trade of salt became insignificant as the British salt merchants had to leave the country saltvmanufacturing continued for a long depending on local trade (Roy and Chattopadhaya, 1992). During the colonial period, Kendua existed as an island at

Rasulpur river mouth, but it disappeared afterward due to sand drifts (Das, 2001). As such, the foreign export trade of salt gradually decline though the production of salt increased largely (Roy, 2006). Hence, salt manufacturing could not retain its economic viability any more (Roy, 2006). In 2002, Medinipur district was divided into two – Purba and Paschim Medinipur for the sake of administrative efficiency. Purba Medinipur district consists of four sub-divisions – Contai, Tamluk, Egra and Haldia. Contai urban area is under Contai block and Contai block is under Contai sub-division. Presently, Contai urban area is about 30 kilometres away from the beach town Digha, a famous tourism centre of West Bengal as well as Eastern India. Now-a-days, Contai is famous for cashew nut industry, salt processing industry and also for bell metal, mat and door mat production.

4.7 Economic History of Midnapore Urban Centre

A century later after the Oriya rule (700 A.D.), Chodaganga Deba (750 A.D.) defeated the king of Mandar and the kingdom Radha was included in the Medinipur district (Bosu, 1921; O'Malley, 1911). Under the Afgan rule (1000 – 1526 A.D.), Medinipur did not have that much of prosperity (Majumdar, 1971). During Mughal rule Medinipur continued to belong to Subha Orissa (Majumdar, 1971). Agriculture constituted the economic base of the Midnapore town in historical era and the major economic function of Midnapore urban area was to collect revenue from land owners (Majumdar, 1971; Sharma, 2003). Medinipur could earn fame in textile industry during medieval period; good quality silk, linen and cotton fabrics were produced in and around Medinipur (Roy and Chattopadhaya, 1992). Cultivation of silk worm, cotton fabrics manufacturing and exporting of cotton to Arab, formed the major

economic bases during pre-colonial era (Majumdar, 1971; Roy, 2006). During colonial period, British and French traders developed different small and large scale industries near Sarkar Jaleswar (Roy, 2006; Das, 2001). The industries were of two types – piece goods industry (established by British) and white cloths industry (established by French) (Roy, 2006). So, trade became the major economic base of the area during colonial period but the major portion of the profit thus generated channelized away to European countries by the foreign traders (Roy, 2006). Afterwards Midnapore was changed into residential cum commercial area (Roy, 2006). Only the residents of the Midnapore urban area were involved in those factories as labourer and earned money to carry out their livelihood but not to aspire their livelihood pattern better (Majumdar, 1971). These types of industries served as economic bases for the development of urban centres during colonial period (Roy, 2006; Majumdar, 1971) and urban industries played a pivotal role for the prosperity of sorroundings areas (Paul, 1989). In post-colonial era Midnapore urban area was mainly developed as an administrative cum commercial centre along with agricultural activities, industrial activities and different types of informal activities. Informal activities refer to activities related to home industries, microenterprises, constructional works, street shops etc.

4.8 Economic bases of Tamluk, Contai and Midnapore urban centres in Recent Era

Tamluk is an early urban centre in India and it is the district headquarters of Purba Medinipur district of West Bengal. Currently, Tamluk is a place of affluent people for purba Medinipur district. It is one of the largest producers and exporters of paan (betel leaf) outside India.

Fishing is also an important occupation of local residents of Tamluk urban centre. The building of bus bodies is also an important business, as in transport.

Contai is the headquarters of Contai-subdivision in Purba medinipur district, West Bengal, Eastern India. Contai is famous for its tourism, cashew crop, fishing and processing industries. The land is highly fertile and therefore, agriculture is also a major driving force that sustains the middle-class economy of this urban centre. Contai is also famous for its salt industry. The urban centre is newly connected by a rail link to Howrah which is believed to have given a rise to the local economy.

Being a district headquarters, Midnapore urban centre functioned is an ancillary role for the rural Paschim Medinipur district as an administrative and judicial centre. Many businesses and services revolved around this role and Midnapore still fills this role and has more banks and administrative offices than any other urban centre in both Purba and Paschim medinipur district. But poorer segments of this semi-rural urban centre are involved in transportation, basic agriculture, small shops and manual labour for commercial work.

Therefore, the economy bases of these three urban centres in divided Medinipur district, according to 2011 census statistics has been classified into upper and lower circuit economy. Most simply, the upper circuit consists of integrated, non-integrated and mixed economic activities. Integrated economic activities are modern urban industry (oil mill, rice mill etc.), trade (cloths, shoes, jewellery, two and four wheeler trade etc.) and services (beauty parlour, traffic signal, maruti and taxi facility etc.) are integrated activities. Non-integrated economic

activities are export oriented industry and trade (cashew, ilish mach, betel-leaf etc.) and banking (SBI, Bank of India, UBI, IDBI etc.) are non-integrated activities. Mixed activities include wholesaling and transport is mixed activities, being linked to both upper and lower circuits of the urban economy. The lower circuit economic sector is heterogeneous with respect to both its activities and workforce, but the common characteristics are the small scale of activities. The lower circuit economic activities are also known as informal economy and there are multifaceted types of lower circuit economic activities are found in Tamluk, Contai and Midnapore urban area. The present day informal economic activities of these three urban centres are classified in the following manner.

Tab. No. 4.14 Informal activities in Tamluk, Contai and Midnapore urban centres

Economic Activities	Examples	Customary location	Person per operation
Home industry	**Tamluk:** betel leaf arranging, handicraft **Contai:** date and coconut processing, carpet and doormat preparing, matting, cashew processing **Midnapore:** sal-leaf arranging and sal-plate preparing	Own household	Mainly female, including unpaid family labour
Street economy	**Tamluk:** betel-leaf selling, rikshaw and toto driving **Contai:** cashew and green coconut selling, basket and ken-busket selling, trolley and toto-driving **Midnapore:** sal-leaf and fuel wood selling, rikshaw, auto-rikshaw and toto driving	Street ambulatory	Both men and women, including unpaid family labour
Domestic service	Maids, cooks, gardeners	Employer household, including live in arrangement for some staff	Both men and women
Microente -rprise	Tailoring, metal working, electrical and radio-tv reparing, car reparing	Rented space, but also operated out of own home	Mainly men plus several employees
Constructi -onal work	Daily labour, carpenters	On-site	Individually recruited for specific project

4.9 Major commercial areas with multiple activities and potential commercial zones in Tamluk, Contai and Midnapore urban centres

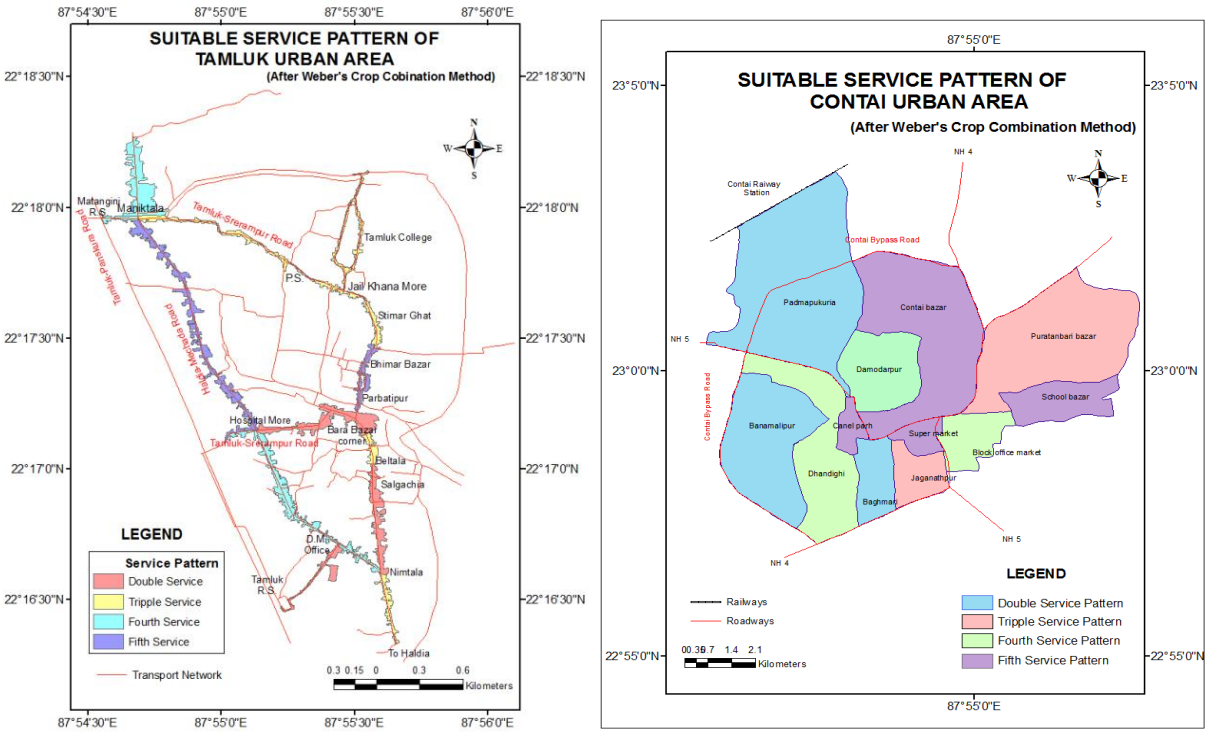
4.9.1 Major commercial areas with multiple activities

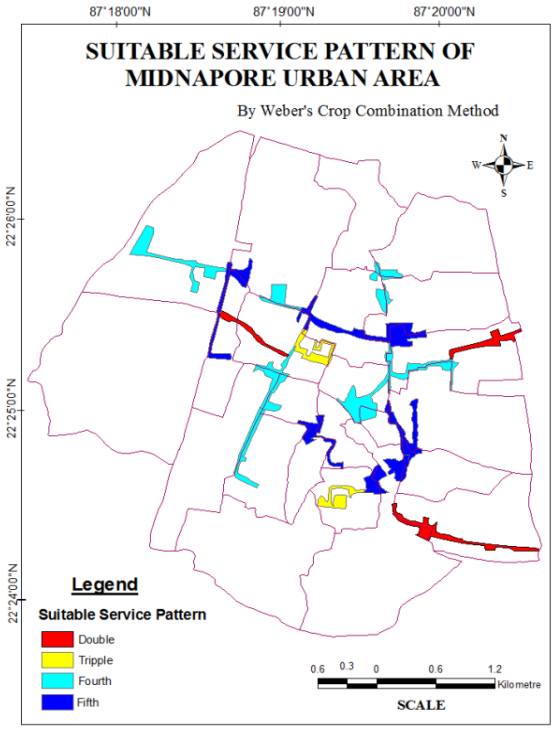
After discussing the economic history of the three ancient urban centres, current economy has been discussed. In the ancient times, the economy had to rely on internal and foreign trade, and now has emerged as the district and sub-divisional headquarters. Urban based human needs are similar to these of economic functions of the three early urban centres ever be the same, but the urban centre also has its individuality contrast between maintaining economic activities. The current economic activities are highlighted in two ways – suitable service pattern and commercial potential zones. The recent economic activities are classified in five categories – food and raw material related service, traditional activities, industrial activities, household activities and others activities. Weber's crop combination method has been adopted to analyze the suitable service pattern of these three urban centres. All types of economic activities have been concentrated in the core of the urban centres. But on the outside, two to three service patterns have been developed along the main and urban arterial roads. The central part of these urban centres, compared to the periphery areas have been developed previously. The descendants of the original inhabitants of these urban centres live in the central part of the urban centres. So almost all types of economic activities (fourth or fifth service pattern) have developed and are still there. For example, Parbatipur, Bhimar bazar, Hospital crossing, Maniktala etc. of Tamluk urban centre; Schoolbazar, Canalparh bazar, Super market, Contai bazaar etc. of Contai urban centre; and Bara bazaar, Chotta bazaar, Raja bazaar, Khudiram crossing, keranitola etc. of Midnapore urban centre are significant in respect to concentration of fourth of fifth service pattern economic activities.

People from the different parts of the district to the centre of the urban centre, there is a trend. As a result, the urban centres are growing along the road towards the outside shot and economic activities are developed. But there are five types of economic activities virtually non-existent; only two or three types of economic activities have been developed. Therefore, the people of the central and periphery areas of these urban centres have to rely on the central region for all types of economic activities.

Fig. No. 4.14 Suitable Service Pattern

Showing Major Commercial Areas with Multiple Activities (After Weber)

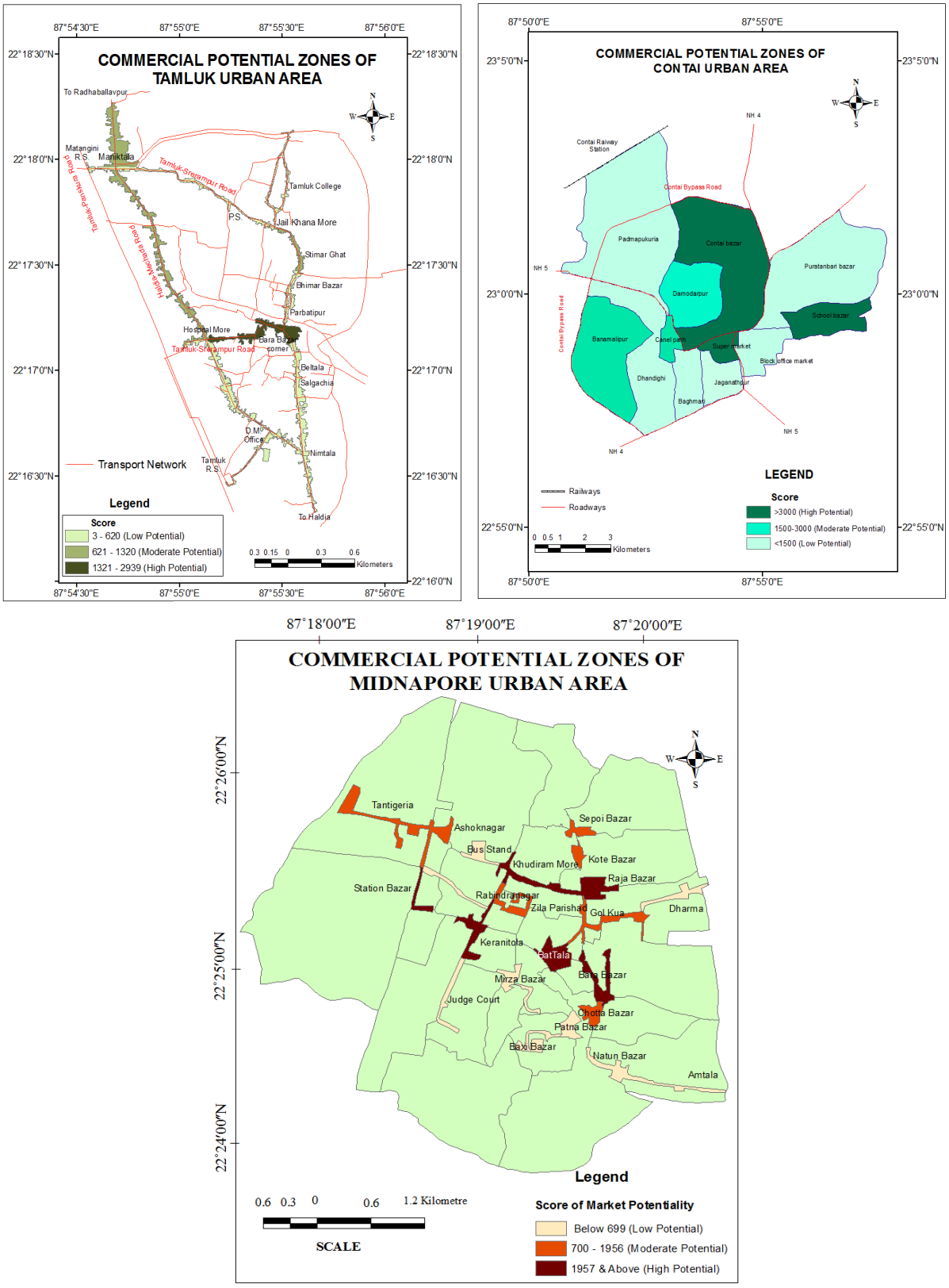




4.9.2 Commercial Potential Zones

In order to identify the commercial potential zones of these three historical urban centres of Eastern India; first, the number of economic activities has been counted and divided into five categories. Then the weightage has been given to the categorized economic activities on the basis of importance and the score has been calculated. Based on total score, commercially high, moderate and low potential zones have been identified. High commercial potential zones have been coincided with the core areas of these urban centres and low potential zones with periphery of these urban centres.

Fig. No. 4.15 Commercial Potential Zones



Tab. No. 4.15 Total Score of Economic Activities in Tamluk, Contai and Midnapore Urban Centres

Serial No.	Tamluk urban Centre		Contai Urban Centre		Midnapore Urban Centre	
	Name of the Zones	Total Score	Name of the Zones	Total Score	Name of the Zones	Total Score
1	Sahid matangini	277	Jaganathpur	601	Tantigeria	766
2	Maniktala	620	Baghmari	497	Ashoknagar	839
3	Jailkhana	229	Super market	3011	Station bazar	2013
4	Stimarghat	1044	Block office bazar	917	Bus stand bazar	659
5	Bhimar bazar	279	Canalparh bazar	2511	Khudiram crossing	1968
6	Parbatipur	464	School bazar	3167	Sepoi bazar	1621
7	Beltala	162	Banamalipur	1626	Kote bazar	1601
8	Salagechia	516	Dhandighi	849	Raja bazar	3306
9	Nimtala	131	Damodarpur	2932	Dharma	96
10	Hospital crossing	1602	Puratanbari bazar	67	Golkua	1152
11	Bara bazar	2939	Contai bazar	4612	Zilaparisad	1329
12	High road bazar	1320	Padapukuria	619	Rabindranagar	1107
13	Radhaballavpur	849			Keranitola	2562
14	Tamluk station	67			Judge court	536
15					Mirza bazar	632
16					Bat tala	2931
17					Bara bazar	4011
18					Chotta bazar	1860
19					Patna bazar	681
20					Boxi bazar	659
21					Natun bazar	541
22					Amtala	287

Chapter 5: Urban morphological analysis

5.1 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 (Larkham, 1987). Simply, it is the layout of an urban centre and in brief, it is the study of urban landuse (Glasson, 1978). It is the appearance, design and renovating processes, spatial arrangement and character of human settlements through an analysis of chronological development progressions (Conzen, 1981). 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 day (Davies, 1968; Arrais and Medeiros, 2015). 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 century (Whitehand, 1986). Buildings (residential and commercial), architectures, streets and place of worship are among the foremost essentials of urban morphological analysis (Larkham, 1987). 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 form (Moudon, 1997). In the present time, various approaches have come into view for urban morphological analysis. Some of them are ISUF (International Seminar of Urban Form,

2015)'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 historically (Moudon, 1997). 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 space (Conzen, 1960). Initial work in the field focused on analyzing the evolution and change in traditional urban space (Lane, 1991). 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) (Murphy, 1974). 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 three early urban centres 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 these three historical urban centres 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.

5.2 Methodology for urban morphological analysis

In arriving at the above objective, an intensive survey has been conducted taking homogeneous building blocks 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. The 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 to show spatial segregation and /or aggregation of residential and commercial functions across the area under study. This had led to the identification of morphological patterns of Tamluk, Contai and Midnapore, three historical urban landscapes in Eastern India in question. Each of the urban centres can be considered as an expression of urbanization process operative over a long period of time since pre-historic period.

5.3 Classification of 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 analysis (Davies, 1968). Residential land use is the largest sector of the urban spatial structure. Housing constitutes one of the most basic human needs and ranks second behind feeding

(Pacione, 2004). Housing and the housing environment have been defined variously by different scholars as encompassing the entire residential environment including the structural characteristics of the house occupied as well as the internal and external facilities that contribute towards a condition of living (Rao, 1964). Residential areas are classified on the basis of environmental characteristics and socio-economic characteristics. This study 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.

Tab. No. 5.1 Classification of residential areas

Bases for Classification of residential areas	Measured by	Types
Characterization of residential areas by economic class	Monthly income	a) High class residential b) Medium class residential c) Low class residential d) Very low class residential e) Mixed class residential
Characterization of residential areas by Social class	Occupation	a) High class government servants b) Medium class government servants c) Low class government servants d) Industrial workers e) Professional f) Working class
Morphological pattern of the residential areas	average height of the buildings	a) One story b) Two storied c) Three storied
Morphological pattern of the residential areas	Length, spacing and organization of the building blocks	a) Planned b) Semi-planned c) Unplanned
Morphological pattern of the building blocks	Dominant architectural design	a) Arched b) Square and curving works c) Arched and curving works d) Dome and curving works e) Square and arched f) Hindu, Buddhist and Oriya style g) Modern square style

Pla. No. 5.1 Arched

Pla. No. 5.2 Arched and curving works

Pla. No. 5.3 Dome and curving works

Pla. No. 5.4 Arched

5.3.1 Characterization of residential areas by economic class

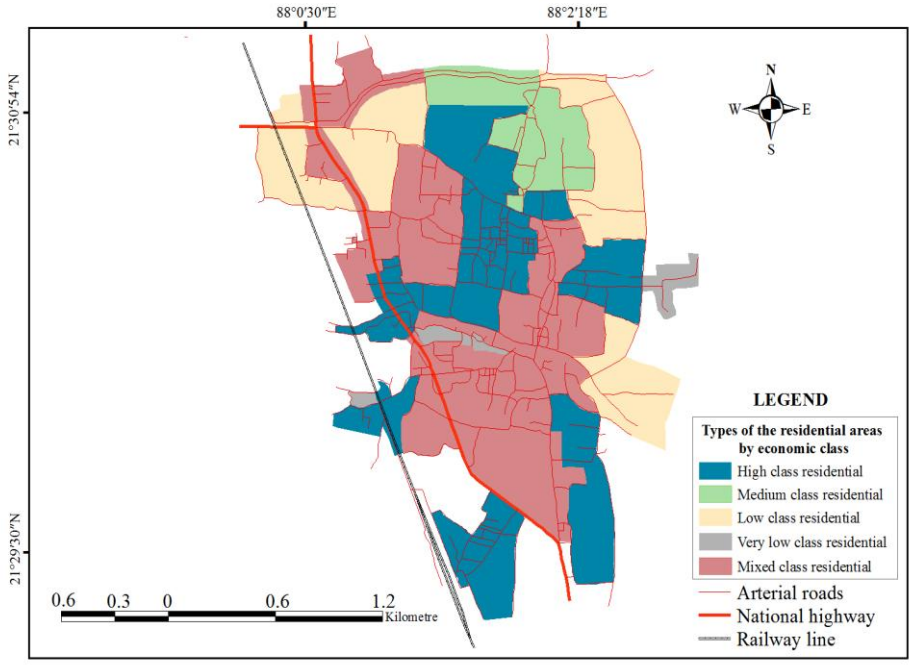
Residential segregation by income has increased during the past three decades across the developing countries (Roy, 2006). Usually, a household in a developing country utilizes its income to take care of the requirements of the family members. Housing is one of the important wishes for the family belonging to developing countries. 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 decide to own one, either by building or buying from the housing market (Roy, 2006). In case of present study, household incomes of these three urban areas have been classified into five classes, namely, high, medium, low, very low and mixed income class. Those in the very low income category have monthly

incomes less than Rs. 5000, while those earning between Rs. 10000 to 15000 are in low income group and those earning between Rs. 15000 and 25000 are in the medium income group. The high income group comprises those whose monthly incomes are in excess of Rs. 25000 per month.

Tamluk urban centre

The low income class building blocks constituting about 21 percent and very low constituting about 4 percent of the total Tamluk urban area and have been located along Rupnarayana river side areas of Steamerghat, Barabazar and Matangini railway station. On the other hand, medium income makes up 14 percent of the total urban area.

Fig. No. 5.1 Characterization of residential areas by economic class in Tamluk urban centre

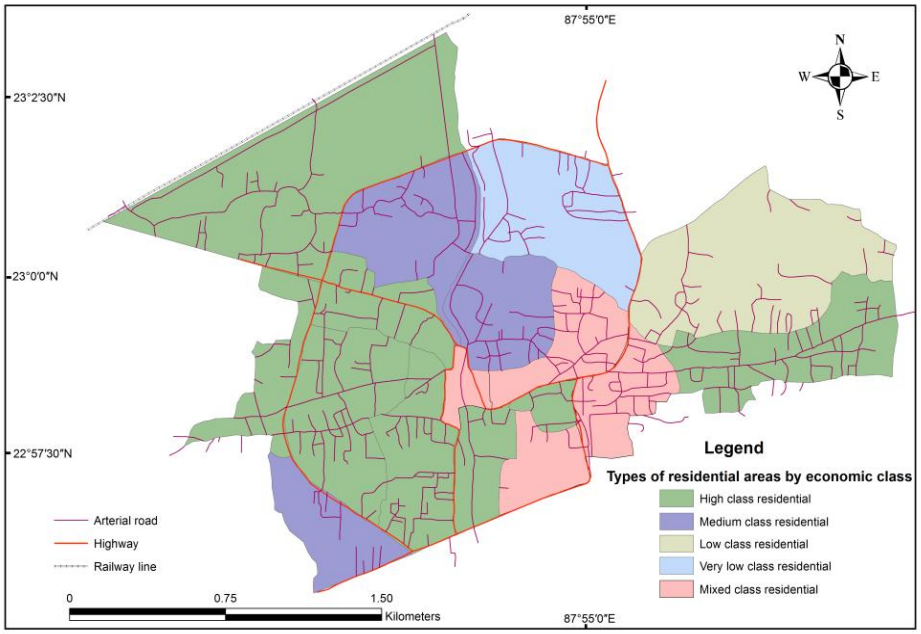


Building blocks with high concentrations of medium income earners include Jailkhana crossing and Tamluk college area. Those building blocks in the high income category constitute 27 percent of the total urban area and have been concentrated mainly in the Courtpara, Tamluk station para, Hospital crossing and Sankarara. But sometime along highway i.e. along Mecheda-Haldia road, Srirampur road mixed class residential areas have been found.

Contai urban centre

The low income class building blocks constituting about 13 percent and very low constituting about 10 percent of the total Contai urban area and have been located in Puratan Bari and eastern side of Canel Parh i.e. Contai bazar. On the other hand, medium income makes up 16 percent of the total urban area. Building blocks with high concentrations of medium income earners include Damodarpur, Canel Parh, Dhandighi, Padapukuria. Those building blocks in the high income category constitute 46 percent of the total urban area and have been concentrated mainly in Padapukuria (between Contai station and Contai bypass), Banamalipur and School bazar. But mixed class residential areas have been developed mainly in the core of the city (Block office market, Canal parh bazar) and it is mainly the commercial sector of Contai urban centre.

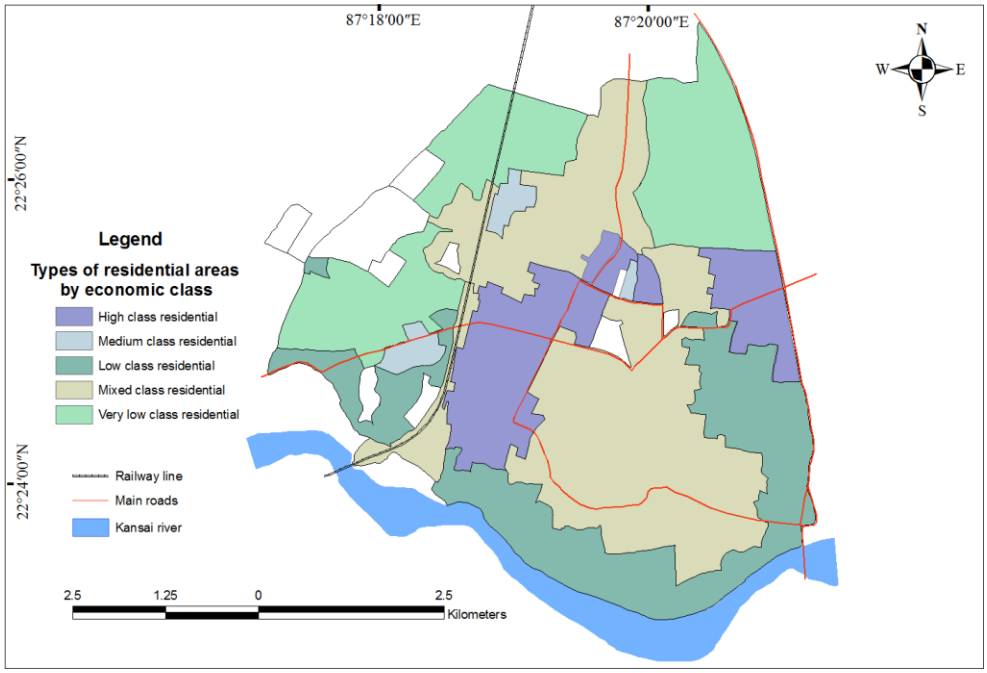
Fig. No. 5.2 Characterization of residential areas by economic class in Contai urban centre



Midnapore urban centre

The low income class building blocks constituting about 21 percent and have been located in Amtala, Gandhi ghat, Najarguanj etc.. Very low class building blocks constituting about 19 percent of the total Midnapore urban area and have been located in Talkui, Jamunabali Basantapur, Golapi chak etc.

Fig. No. 5.3 Characterization of residential areas by economic class in Midnapore urban centre



On the other hand, medium income makes up 13 percent of the total urban area. Building blocks with high concentrations of medium income earners include Rangamati, Ashoknagar and Michel Madhusudan nagar area. Those building blocks in the high income category constitute 26 percent of the total urban area and have been concentrated mainly 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.

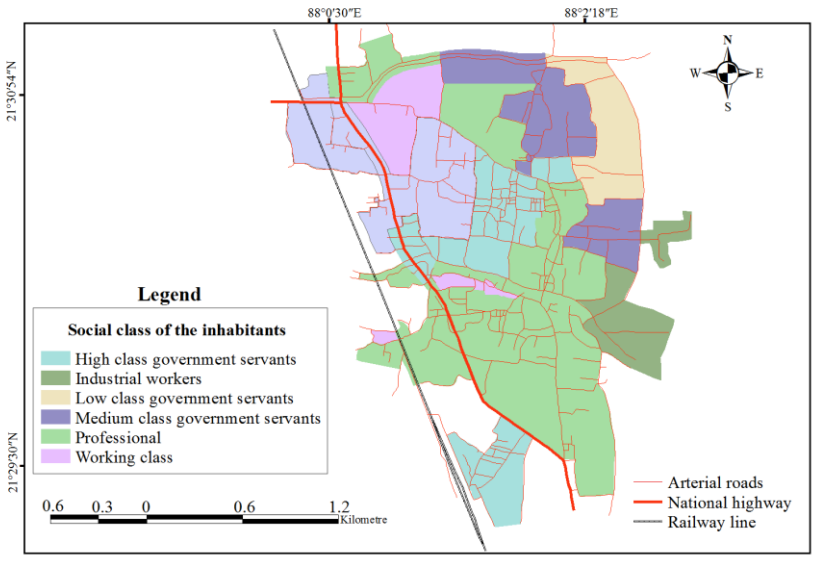
5.3.2 Characterization of residential areas by social class

Structural approaches of class analysis typically measure social class through indicators of socio-economic status such as income, occupation, and education. In case of present study,

the professional allocation of Tamluk, Contai and Midnapore urban centres 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 types social class have been found in each and every building block of these three early urban centres i.e. a mixed type of social status of the inhabitants has been highlighted. But most of the inhabitants belong to working class, professionals and low class govt. servants. High and medium class government servants are few. There have been some relationships between economic class and social class of these three urban centres. By superimposing the two maps of residential areas by economic class and social class, it is clear that the high class residential area and high class govt. servants or professional groups of workers coincide. It has been also applicable for the area of low class residents and working class or low class government servants.

Tamluk urban centre

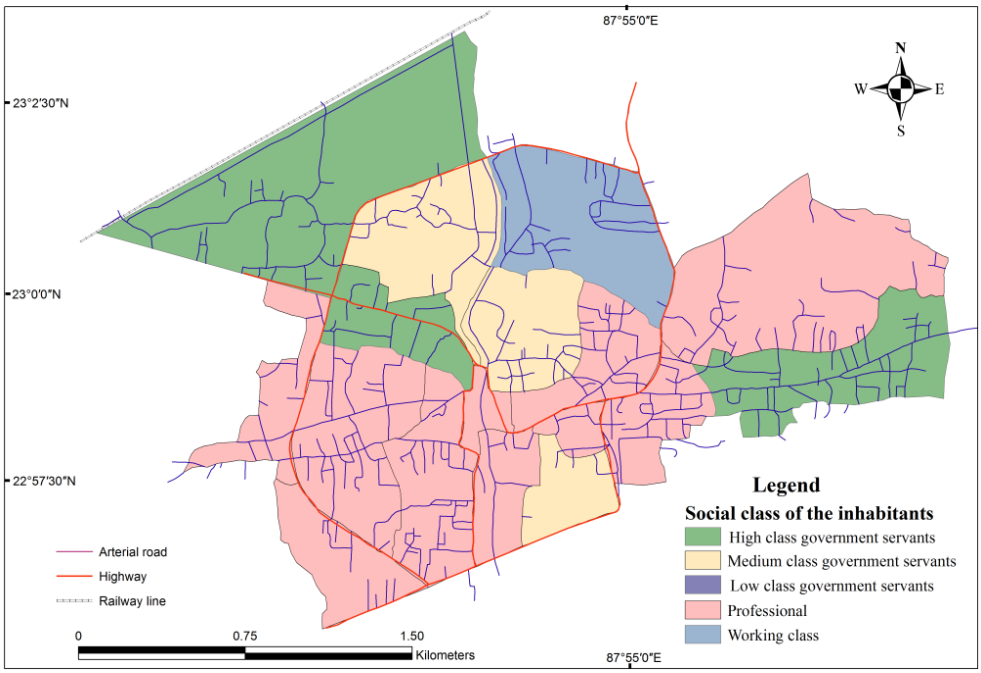
Fig. No. 5.4 Characterization of residential areas by social class in Tamluk urban centre



The core areas of Tamluk urban centre include Barabazar, Parbatipur, Bhimarbazar, Steamerghat and Salgachia. These areas and near about these areas have been used for the people living at the apex 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. There is no such building block which is fully composed with a particular type of social class.

Contai urban centre

Fig. No. 5.5 Characterization of residential areas by social class in Contai urban centre



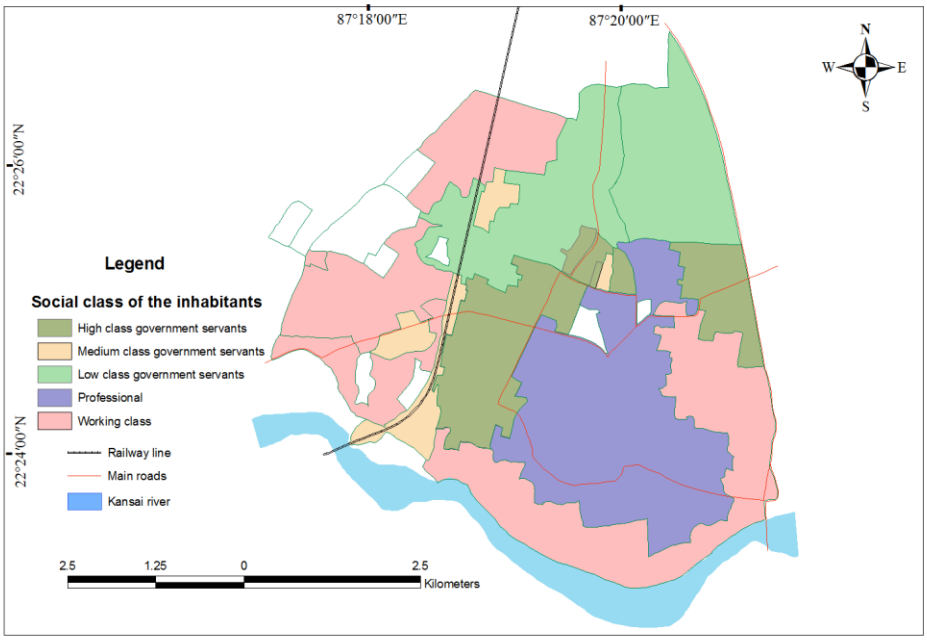
The hearth areas of Contai urban centre include Padapukuria (between Contai station and Contai bypass), Banamalipur, Puratanbari bazar and School bazaar. These areas and around these areas are occupied by the people of the apex social class, either belong to high class

govt. servants or managerial and professional services. Towards the eastern outer margin, low class govt. servants and working class has people are found due to bad transport facility but towards Bypass or Station or Digha road, just opposite situation exists because of good transport facility along with availability of other amenities.

Midnapore urban centre

The hearth areas of Midnapore urban centre include Bidhannagar, Mitra compound, Rabindranagar, Joudge's court and Barabazar. These areas and nearby these areas have been occupied by the people living at the apex 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 mainly towards Dharma.

Fig. No. 5.6 Characterization of residential areas by social class in Midnapore urban centre



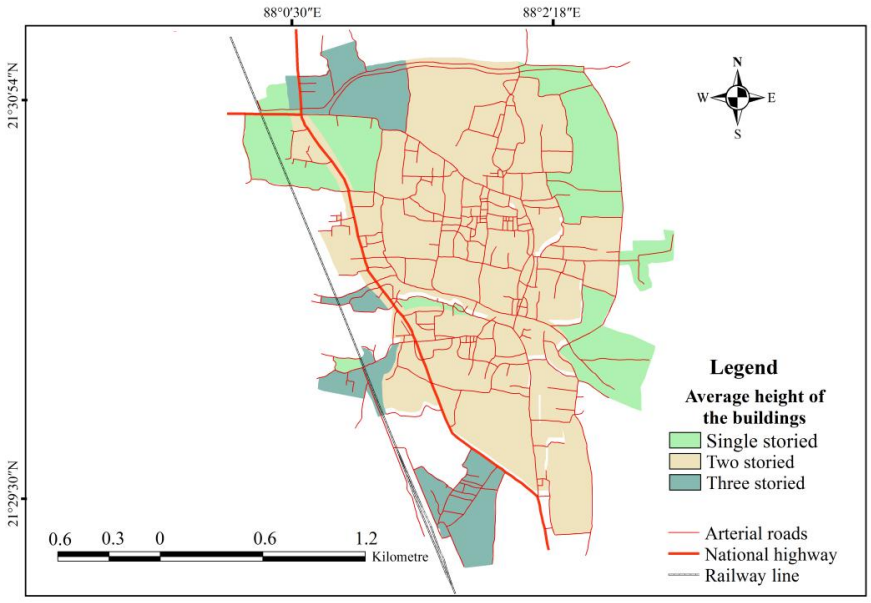
5.3.3 Morphological pattern of the residential areas according to average height of the buildings

For morphological analysis of Tamluk, Contai and Midnapore urban centres, the urban centres have been classified on the basis of average height of the buildings — one story, two storied and three storied.

Tamluk urban centre

One storied buildings has been seen in Jailkhana crossing, Panskura bus stand, Stimarghat, Bhimarbazar, Parbatipur, Nimatala, Hospital crossing, Salgachia etc. The outer margins of the urban centre are comprised with single floor but mud's houses are rarely seen in the peripheral areas. Two storied buildings have been found in the newly developed areas of the urban centre namely Tamluk station areas, from Hospital crossing towards Nimtouri, Sankarara and near Maniktala crossing area.

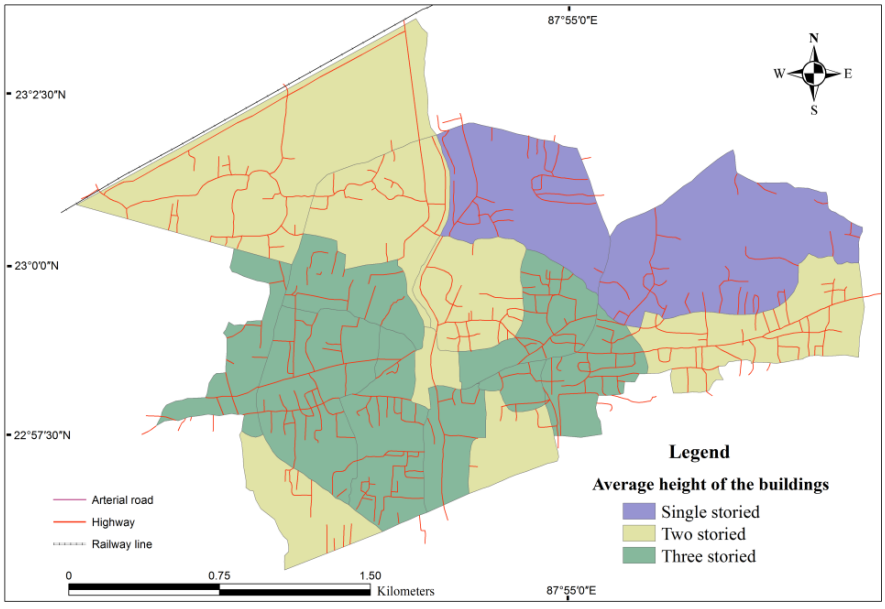
Fig. No. 5.7 Average height of the building block in Tamluk urban centre



Contai urban centre

The two storied housing units are generally concentrated in the westward margin of the urban centre (commercial areas) like Contai central bus stand bazaar, along station road (Padapukuria), along Digha road (Banamalipur) along with Block Development office market and Super market (core commercial areas) and two storied building blocks are concentrated mainly in the residential hearth of Contai urban centre like Contai station, along municipality road (Padapukuria), Damodarpur, School bazaar, Jaganathpur etc. The outer margin of the urban centre (mainly in the Puratanbari bazaar) is comprised of single storied houses but muds made houses are rarely seen in the peripheral areas. Except Puratanbari bazar area, the other marginal areas of Contai urban centre (part of Banamalipur, Contai station adjacent area etc.), one storied buildings are found because these are newly developed areas of the urban centre for the people belong to high economic class. They mainly came from outside for profession reasons.

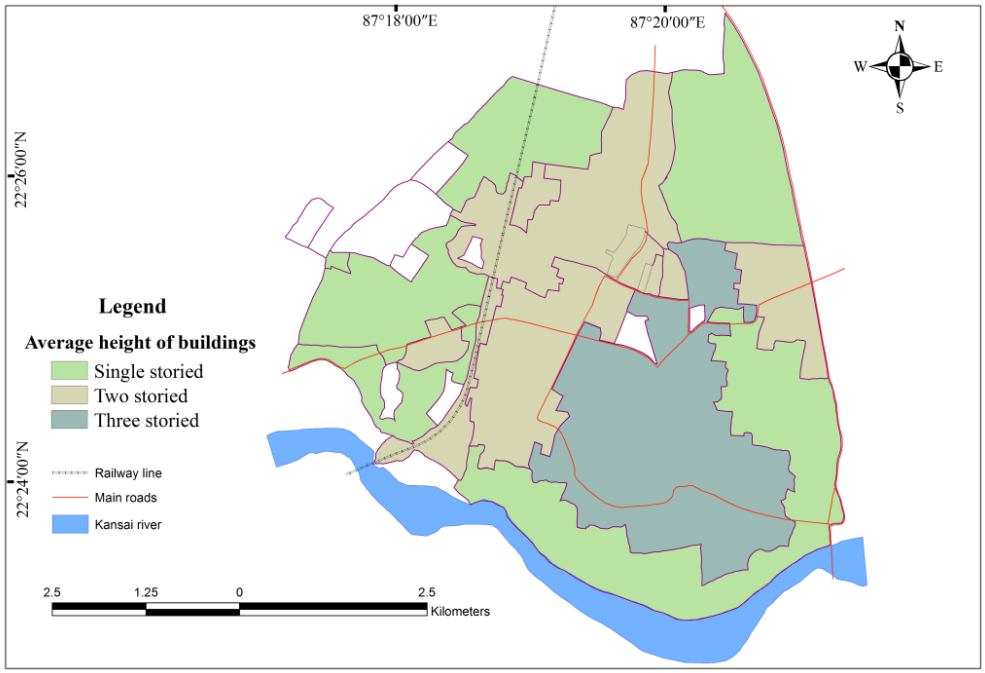
Fig. No. 5.8 Average height of the building block in Contai urban centre



Midnapore urban centre

The two storied buildings are generally concentrated in the city centre (commercial area) like Barabazar, Chotobazar, Schoolbazar etc. and single floor buildings are concentrated mainly in the residential hearth of Midnapore urban centre like Bidhannagar, Rabindranagar, Mitra compound, Joudge's court para etc. The marginal areas of the urban centre comprise ground floor but mud made houses are rarely seen. As Dharma is in the outer part of Midnapore urban centre, but single floor buildings have been found as it is a newly developed area of the urban centre for the people who belong to high economic class.

Fig. No. 5.9 Average height of the building block in Midnapore urban centre



From the building map of Tamluk, Contai and Midnapore urban centres, it is clear that single storied buildings are concentrated in the core of the Tamluk centre, but in case of Contai and Midnapore urban centre, the core areas are mainly dominated by two storied houses. The

outer margin of Tamluk and Contai urban centres are comprised of single storied and two storied buildings. Two storied buildings are found in the newly developed areas of the urban centre having good transport facility and other amenities. But the outer margin of Midnapore urban centre is comprised of one storied housing units except in Dharma area.

5.3.4 Characterization of residential areas by Length, spacing and organization of the building blocks

Size and spacing of buildings are important concerns of urban morphology (Pacione, 2004). As the land price is high enough in the city centre and adjacent zones, the central place is used for commercial purpose. But beside this, administrative areas, high class residential and squatter type settlements are also found. As the land price is high enough, so the entire urban land is densely used and spacing between buildings is about 2 m. According to Bureau of Indian Standards, New Delhi, the spacing between the two buildings depends on height of the building.

Tab. No. 5.2 Standard width of open spaces for different height of buildings

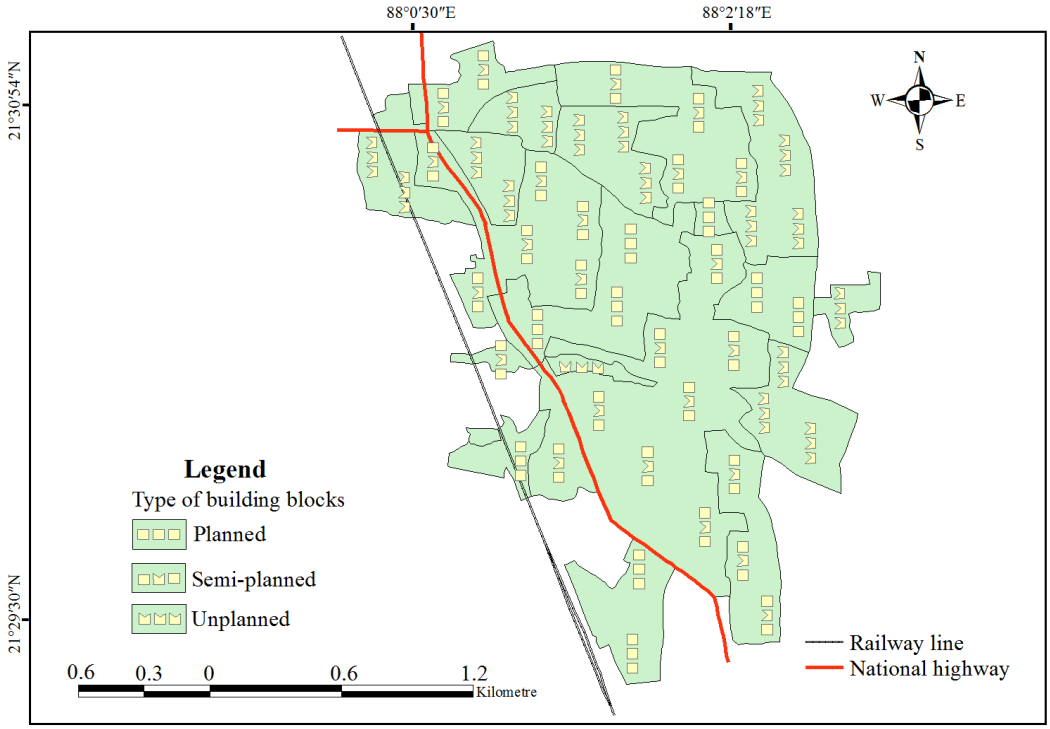
Height of buildings in metre	Width of open spaces to be left around building in metre	Distance between two building blocks in metre
3	1	1+1=2
6	2	2+2=4
10	3	3+3=6

Source: Bureau of Indian Standards, New Delhi, 2011 (Clause 5.3.3.1)

Tamluk urban centre

In Tamluk urban centre, the buildings are not spaced planfully. Near C.B.D. of the urban centre i.e. the Panskura bus stand, Steamerghat, Bhimarbazar, Salgachia and Nimatala the spacing between the buildings is 3 m but away from the city centre (Tamluk station area, Sankarara, Uttar Sankarara, Dharinda rail gate area etc.) spacing between buildings is 6 m.

Fig. No. 5.10 Length, spacing and organization of the building blocks in Tamluk urban centre

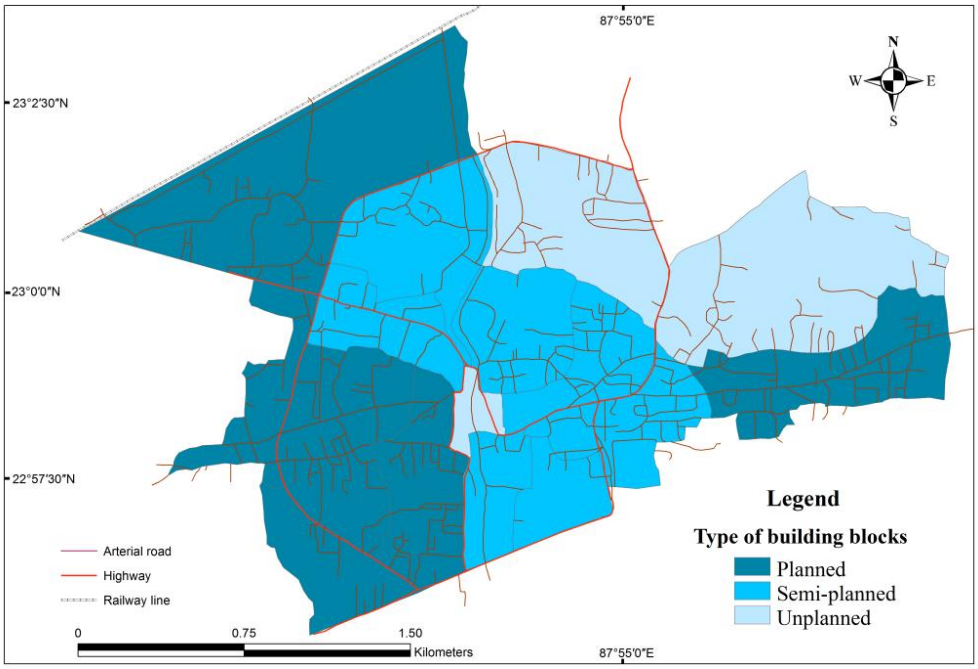


Contai urban centre

The main commercial areas of Contai urban centre are classified into two - interior commercial areas (Super market, Block office market, Canal Parh bazar etc.) and peripheral commercial areas (Contai bus stand bazaar, Contai station bazaar, Banamalipur bazaar,

Baghmari bazaar etc.). The average spacing between the buildings is 3 m for interior commercial areas and 6 m for peripheral commercial areas. The residential hearth of Contai urban centre like Canal parh, Puratanbari, Damodarpur etc., the spacing between buildings is 3 m and from the city centre towards Contai station, Banamalipur, Dhandighi and Baghmari the average spacing between the buildings increases rapidly. The space between buildings is more than 6 m.

Fig. No. 5.11 Length, spacing and organization of the building blocks in Contai urban centre

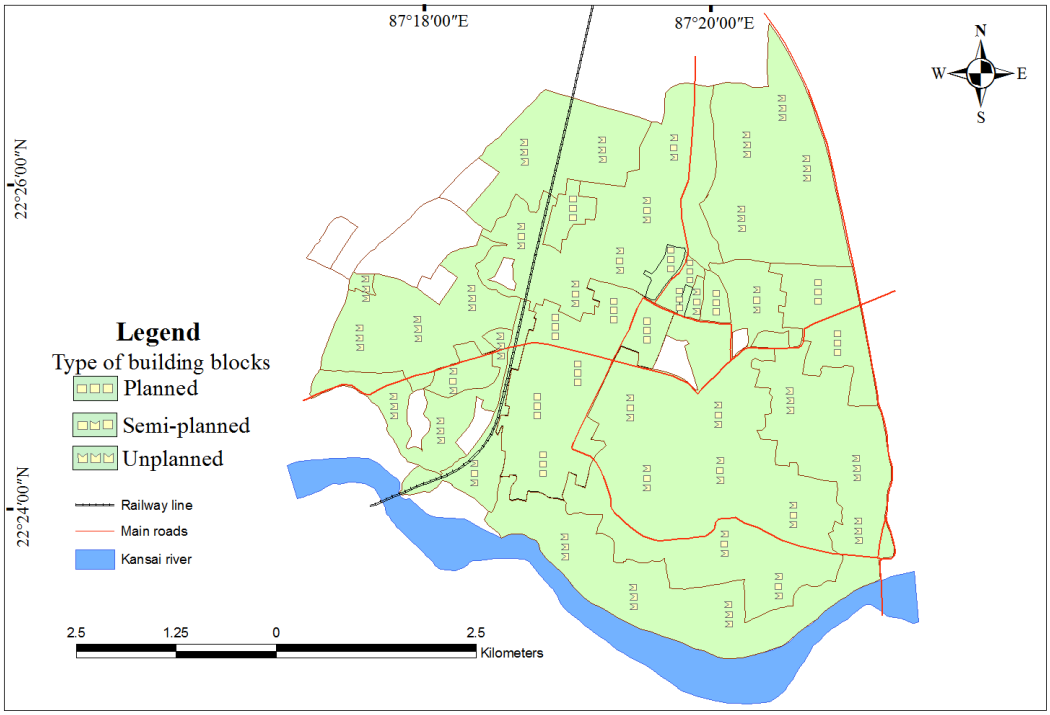


Midnapore urban centre

The main commercial areas of Midnapore urban centre are Barabazar, Chotobazar, Schoolbazar etc. The average spacing between the buildings is less than 3 m.. But in the residential hearth of Midnapore urban centre like Bidhannagar, Rabindranagar, Mitra compound, the spacing between the buildings is 6 m or more but the other residential

building blocks have not maintained 6 m spacing between buildings. From the city centre towards Dharma the average spacing between buildings are 6 m or more. But the outer margins of Midnapore urban centre excluding Dharma are completely unplanned in nature.

Fig. No. 5.12 Length, spacing and organization of the building blocks in Midnapore urban centre



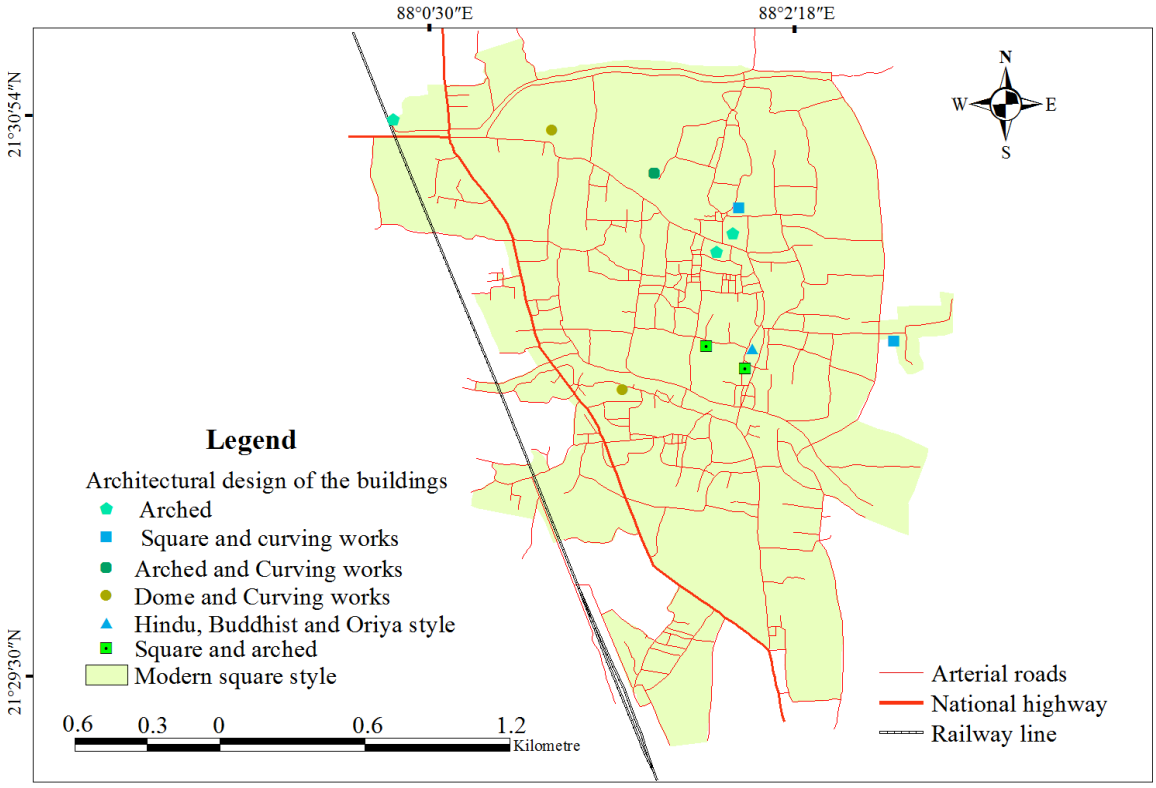
5.3.5 Morphological pattern of the building blocks according to dominant architectural design

Tamluk urban centre

As Tamluk is a historical urban centre, so history plays an important role over the architectural design of Tamluk urban centre. The city centre has been comprised of Square shaped architecture along with different historical architectural design. Arched and curving

works style architecture has been found in Tamluk Rajbari, dome and curving works style architectures are found in two old maszid, Arched shaped architectures are found for Tamluk court and Mahaprabhur mandir, Square and curving works style architectures are seen in Tamluk irrigation bungalow and in Matangini sahid smarak and Hindu, Buddhist and Oriya type architecture has been found in Bargabhima temple.

Fig. No. 5.13 Dominant architectural designs in Tamluk urban centre



All types of architecture like square, arch, dome and curving works have been found in the city centre which proves that the urban centre has a historical back ground, but the modern building blocks are generally in square shaped. Some of the above historical architectures are as under.

Tamluk Rajbari is one of the popular historic centres due to its cultural significance. History associated with the site dates back to 2500 years. The palace at the complex is believed to be established in 5th century B.C. by Mayuradha dynasty (Peacock dynasty). Besides, the site is also linked with the incident of swayamvar sabha of lady Droupadi that occurred in the epic Mahabharata. During colonial rule, freedom leaders like Mahatma Gandhi and Netaji Subhas Chandra Bose also visited the site that hosted the chief events for freedom struggle (Sharma, 2003).

In the beginning of 19th century Rakhit Bati was famous as a secret centre of revolutionary party 'Anusilan Samiti' and 'Gupta Samiti'. Famous historian late Trilakyanath Rakhit rebuilt this building at Bhimar bazaar (Das, 2001).

Nearly 1150 years old temple of Kali named as Devi Barghobhima. This temple is a part of 51 Sakti Peethas. Puranas says that the small finger of left feet of Sati Parvati fell here when Lord Vishnu cut the sacred body of Goddess Sati into several pieces to make Lord Shiva quite. It is located in Bhimar bazar (Basu, 1921).

Tamluk Hamilton High School was founded in Tamluk in 1852 by Robert Charles Hamilton, who was a salt merchant. The school is the oldest institution in the districts of both Purba and Paschim Medinipur and has great significance in the educational history of Bengal (Hunter, 1876).

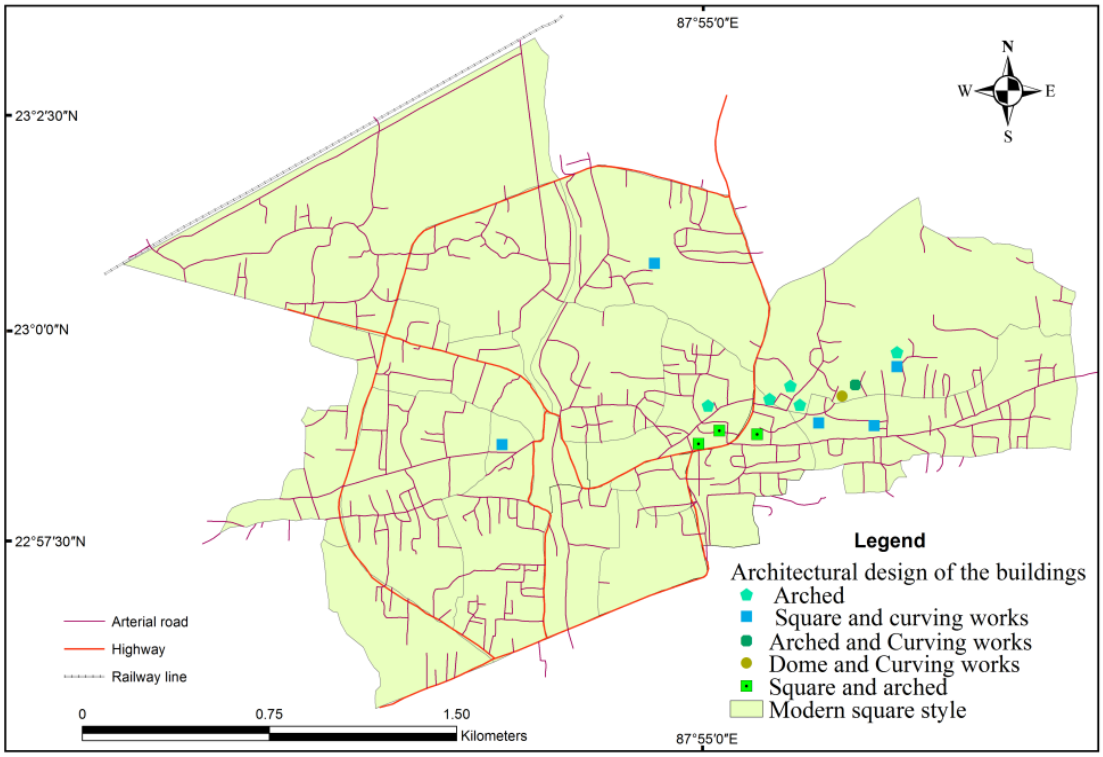
Matangini Sahid Smarak is at the side of a pond called Banpukur at Abasbari para near Tamluk court. During the 'Ahinsa movement' of 1942, while a crowd trying to capture Tamluk administrative building, British police opened fire in which Smt Matangini Hazra became 'sahid'. Later on Mahatma Gandhi appreciated her bravery and titled her as 'Birangana'. This monument is homage to her (Roy, 2006).

Contai urban centre

One of the popular attractions is Nimak Mahal office (Das, 2001). 'Nimak mahal' means 'Salt factory'. In 1863, when Nimak mahal at Contai ceased functioning, the office shifted from Negua to the abonded Nimak mahal building. The dilapidated arch shaped office is located near Contai Prabhat Kumar College.

Kapal Kundala Kali temple at Puratan bari (Dariapur) is an ancient temple based on which Bankim Chandra's novel was written (Das, 2001). It is an example of arch with Ek-ratna (one tower or arch with terracotta sculptures) style architecture.

Fig. No. 5.14 Dominant architectural designs in Contai urban centre



A Shiv temple arched style architecture with curving (Arched) is located at Uttar Darua was built around 16th century A.D. Square shaped architectural style temple with curving works

of Athilagori Sitala temple at Athilagori, Harisabha temple at Contai bazar, Maa Sarada Asharm at Puratanbari bazar; Mundamari Kali temple (Arched) at Damodarpur; Contai jail (Square and arched) at Puratanbari ; Contai High School (Square and arched) at School bazar are the others architectural interest.

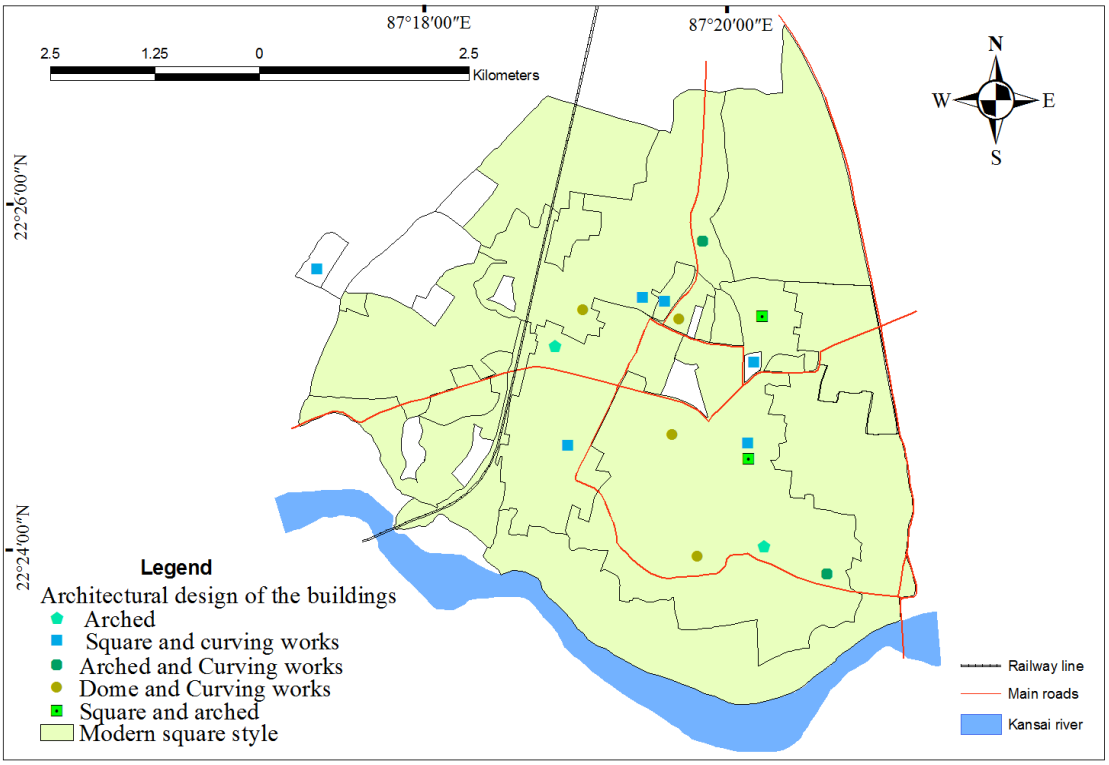
There are many places of Muslim religious importance as well, like North Darua James mosque (Dome with curving works) at North Darua, Hijili mosque (Dome with curving works) at Puratanbari are the most popular mosques in Contai sub-division.

Midnapore urban centre

One of the popular attractions is the Jagannath temple at Natun bazar built in 1851 and was supposedly at the request of a descendant of the Ganga dynasty of Orissa. It is an wonderful piece of Orissa architecture and Deul style. Deul is a style of temple architecture of northern India and Bengal that arose between the 6^{th} and the 10^{th} centuries and was revived in between 16^{th} to 19^{th} century (Das, 2001). 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), is style of temple architecture that arose in Bengal (Basham, 1975). The base structure is similar to the four sided "char-chala" temple style, but the roof is quite different, flat with a tower in the centre. Ek-ratna temple is elaborated in pancharatna (five towers) and navaratna (nine towers) styles. Pancharatna kali temple at Natun bazar and Navaratna style Radhakanta Jiu temple of Mallik family in Shib bazaar are the examples. These temples are decorated with intricate terracotta decorations and has triple arched gateway (arched and curving works). West facing Sitala temple of Sikhar Deul architecture style (Arched) in Barabazar built around 18th century A.D., Jor

Bangla architectural styled temple of Dharma thakur in Barabazar, Jor Bangla architectural type temple (two curved segments that meet at a curved ridge) in Mirza Bazar, Devi durga sikhar deul temple at Bibiganj, Atchala type mahaprabhu temple (Square and curving works) at Patna Bazar and Saptarath sikhar deul temple (Arched) at Khaprel bazaar are the others structures of architectural interests.

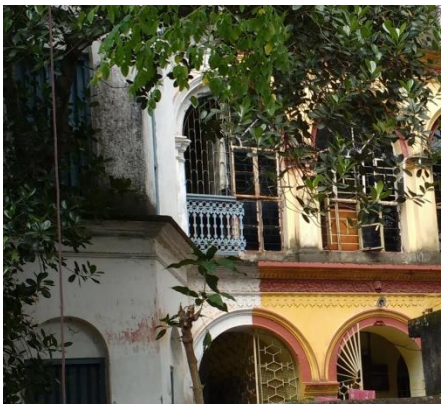
Fig. No. 5.15 Dominant architectural designs in Midnapore urban centre



The Jora Masjid, literally mean the twin mosque, as these are two mosques built side by side (Majumdar, 1971). One of the most popular destinations in Midnapore, the Masjid is built in ancient Islamic architectural style (Dome and curving works). Fakir Kua (Near Midnapore central bus stand), and Mosque at Natun bazar pally were built around 16th century A.D., Dewankhana mosque was built by Emperor Aurangazeb Dewan Kaifatullah in Aliganj area

and Chol Shah Mosque was built during the time of Emperor Shah Jahan at Sepoy bazaar are the examples of dome and curving style architectural design.

Apart from Hindu and Muslim, there are many places of religious importance for Christians as well, like St. John church (Arched) at Seikhpura, is one of the most popular churches in the district. The ancient looking small church has a graveyard next to it. Roman Catholic church of Keranitola (Square and arched) and American Baptist Mission church at Sepoy bazaar, now known as Midnapore Baptist Chruch (Arched), are the other examples.



Pla. No. 5.5 Old arched architecture is mirrored in new buildings

Pla. No. 5.6 Newly developed square shaped two storied over old one storied arched shape building

5.4 Classification of 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 (Pacione, 2004). Commercial activities within the city include the retail and wholesaling buying and selling of goods and services (Glasson, 1978).

Tab. No. 5.3 Classification of commercial building blocks

Bases for the classification of commercial building blocks	Measured by	Types
Classification of commercial blocks	Nature and type of commercial activities	a) Retailing b) Wholesaling
Classification of commercial centres	Hierarchic position of the commercial centres	a) Regional centre b) Community centre c) Neighbourhood centre d) Colony

5.4.1 Nature and types of commercial activities

The commercial areas of these three urban centres have been divided into two types. These are Wholesaling areas and Retailing areas.

5.4.1.1 Wholesaling 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. Nature of wholesaling activities is large scale like large capital, large selling material, huge labour etc.

5.4.1.2 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 in these three urban centres 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.

Stripwise retailing centre

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

Centre wise retailing centre

When the retailing centres are located in junctions 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 of two types- I. Special production like- clothes etc. II. Retail cluster like-fruit, cloths, vegetable, fish etc.

Fig. No. 5.16 Nature and type of commercial areas in Tamluk urban centre

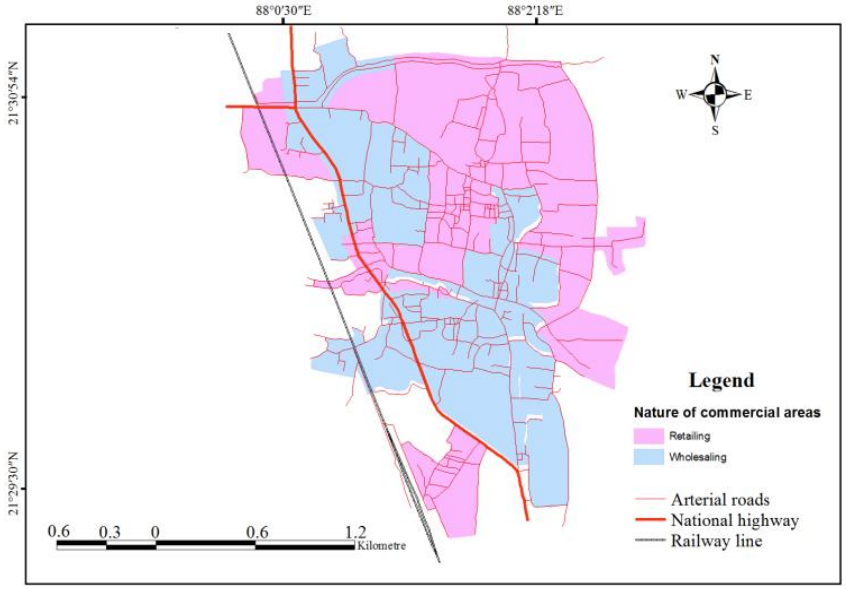


Fig. No. 5.17 Nature and type of commercial areas in Contai urban centre

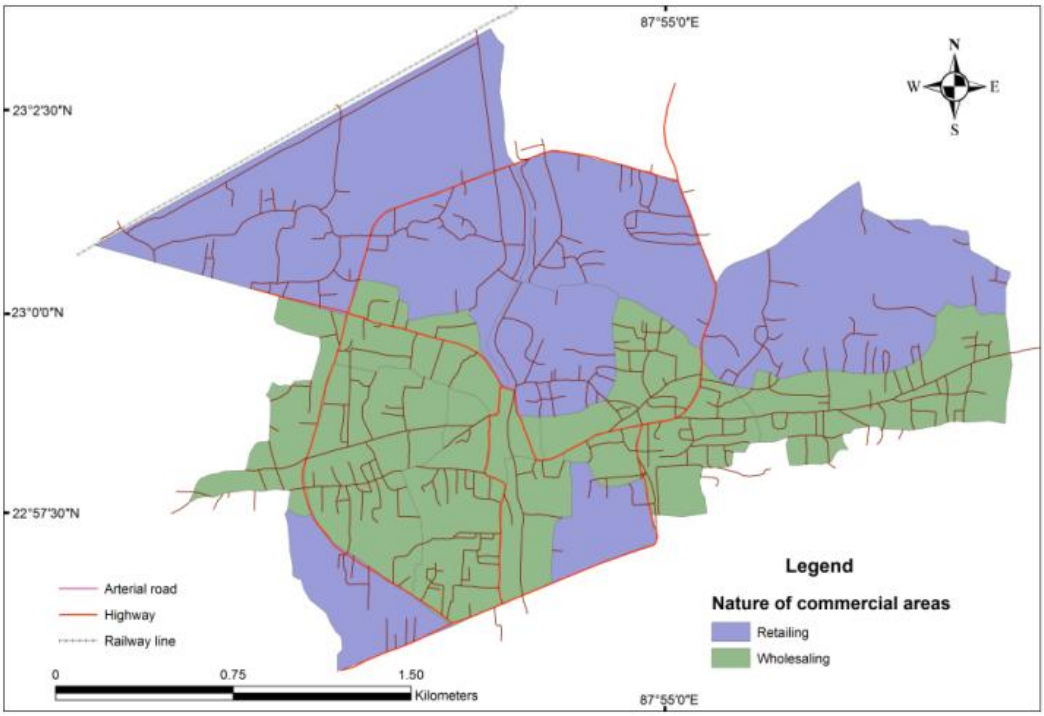
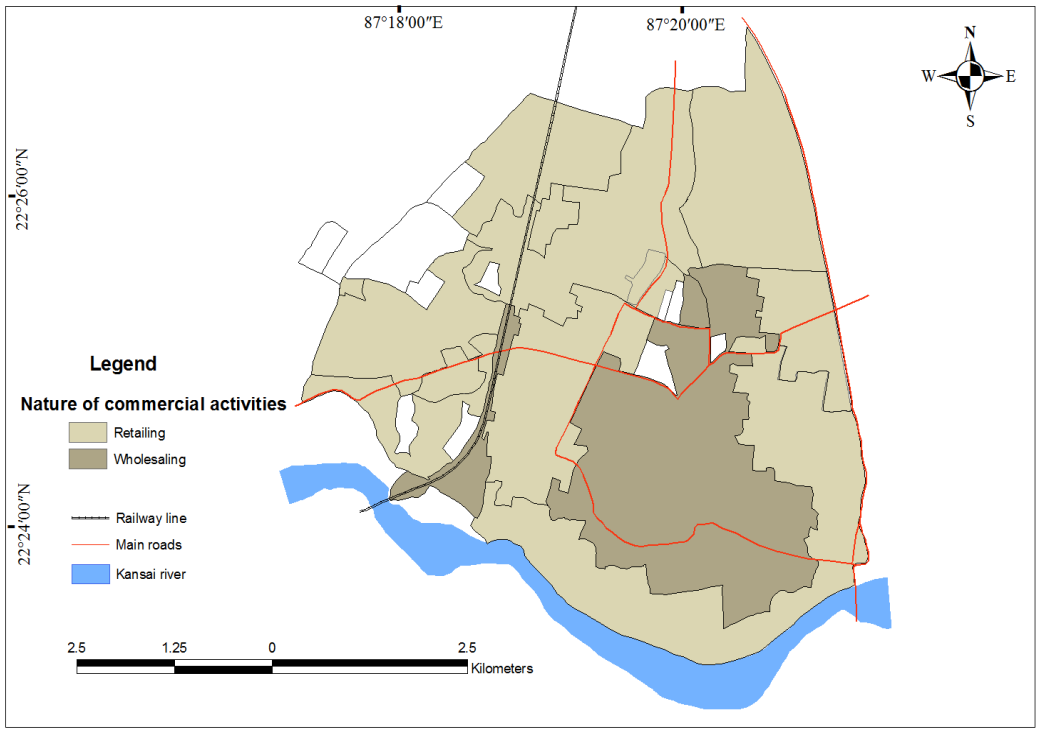


Fig. No. 5.18 Nature and types of commercial areas in Midnapore urban centre



5.4.2 Hierarchic position of the commercial centres

Commercial activities in these three urban centres are essentially concentrated in four centres. These are regional centre, community centre, neighbourhood centre and colony centre.

Tab. No. 5.4 Existing hierarchy of commercial centres in Tamluk, Contai and Midnapore urban areas

Centres Hierarchy	Key Functions of centre		Average area of Influence	Centre(s)
	Floor Space	Population Served		
Regiona-l Centre	Generally seen to comprise 4000 m²	Services population more than 1,00,000	80 Kilometre	Tamluk: Hospital crossing, Maniktala Contai: Cental Bus Stand, Canal Parh Midnapore: Bara Bazar, School Bazar
Commu-nity Centre	Generally seen to comprise 1000 - 4000 m²	Services population between 50,000 - 1,00,000	20 Kilometre	Tamluk: Nimtala, Bara Bazar Contai: Super Market, School Bazar Midnapore: Raja Bazar, Keranitola
Neighbo-urhood Centre	Generally seen to comprise 500 - 1000 m²	Services population between 5,000 - 50,000	5 Kilometre	Tamluk: Jailkhana crossing, Sankarara Contai: Banamalipur Baghmari Midnapore: Natun Bazar, Station Bazar
Colony Center	Generally seen to comprise 100 - 500 m²	Services population less than 5,000	2 Kilometre (generally no more than a cluster of 20 shops)	Tamluk: College crossing, Salgachia Contai: Contai Bazar, Puratanbari Bazar Midnapore: Amtala Bazar, Dharma Bazar

Fig. No. 19 Hierarchic position of the commercial centres in Tamluk urban area

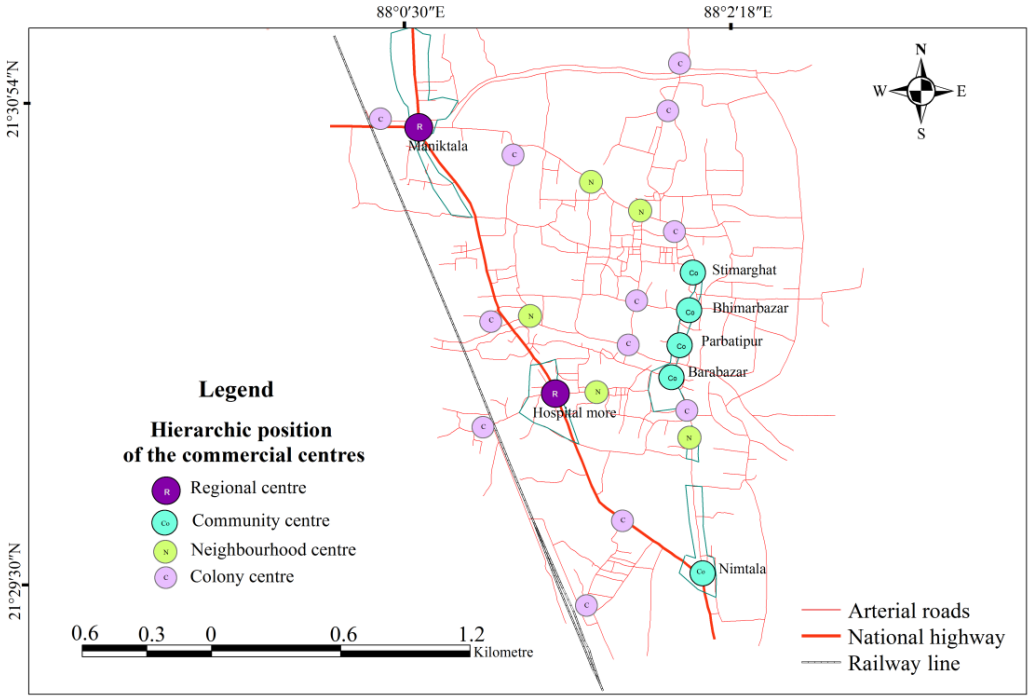


Fig. No. 5.20 Hierarchic position of the commercial centres in Contai urban area

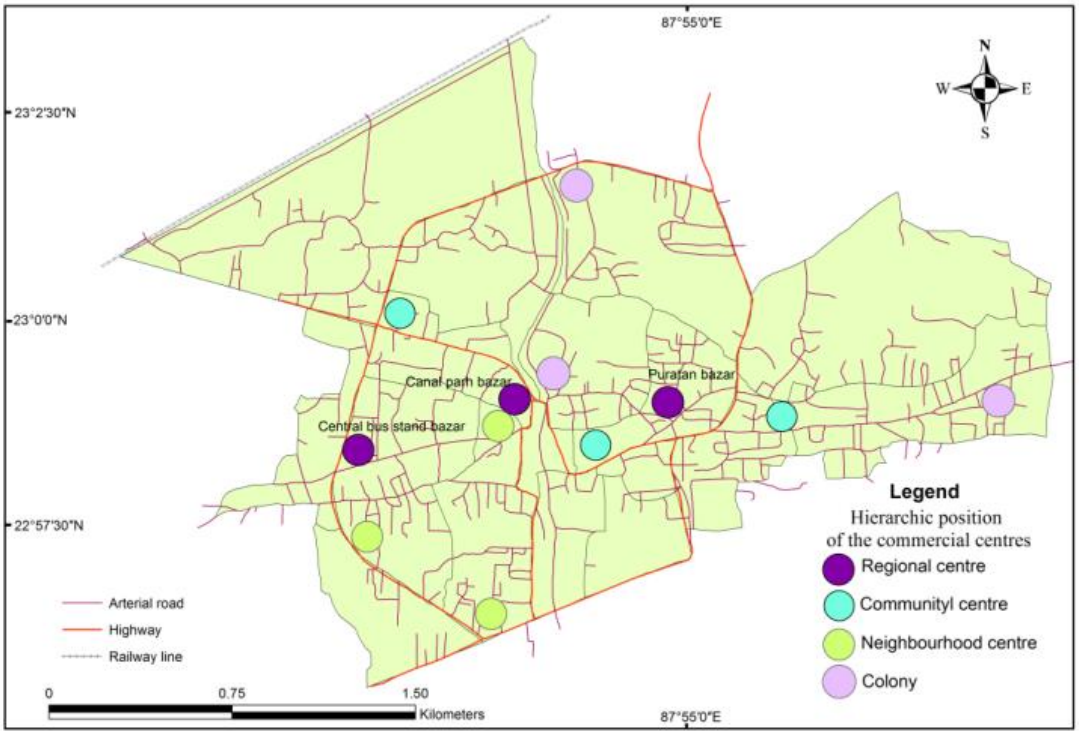
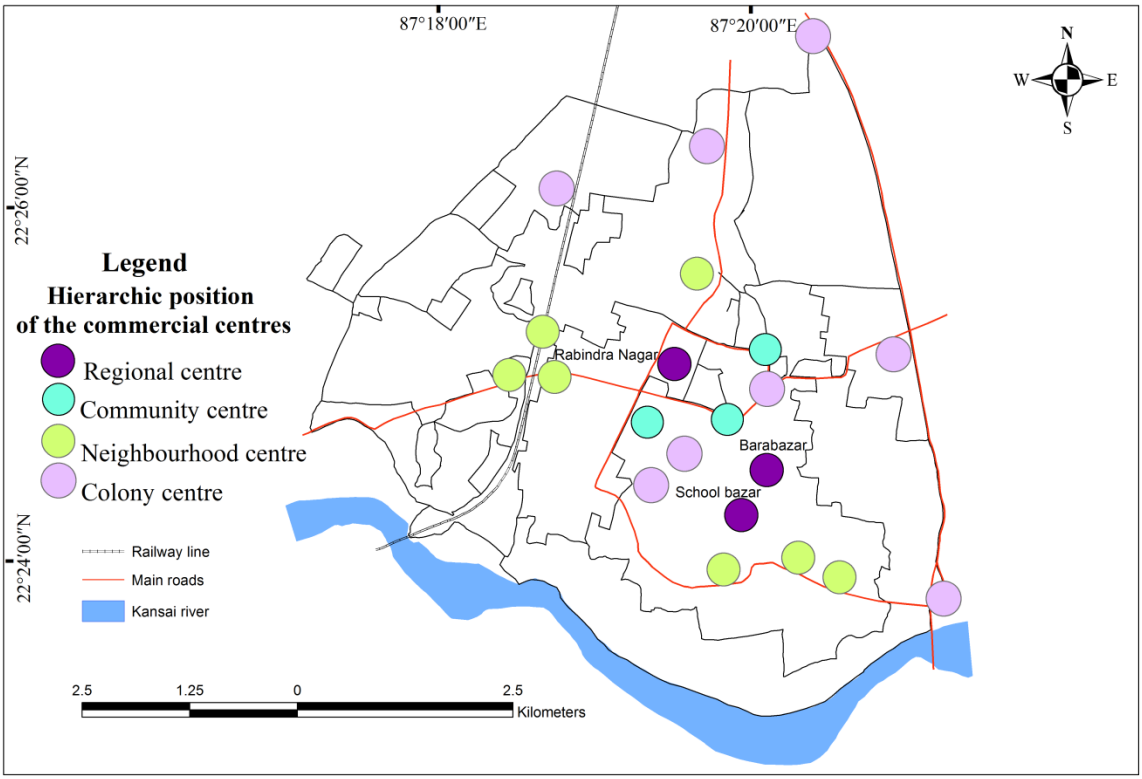


Fig. No. 5.21 Hierarchic position of the commercial centres in Midnapore urban area



5.5 Application of 'Multiple Nuclei Model'

The information collected as above can be superimposed to identify the morphological zones of these three urban centres. The resultant pattern grossly corresponds to the 'Multiple Nuclei Model' developed by Chauncy Harris and Edward Ullman (1945), (Verma, 2008) with an exception that two new morphological components have been found in case of these three urban centres, namely historical heritage areas and restricted residential areas. Moreover, the C.B.D. has largely shifted from Bara bazar towards Tamluk station (in case of Tamluk urban centre), Canal parh bazar through Central bus stand area towards Contai railway station (in

case of Contai urban centre) and from Barabazar towards Dharma (in case of Midnapore urban centre) in empowers socio-economic dynamics of this age old city.

Fig. No. 5.22 Application of 'Multiple Nuclei Model' for Tamluk urban centre

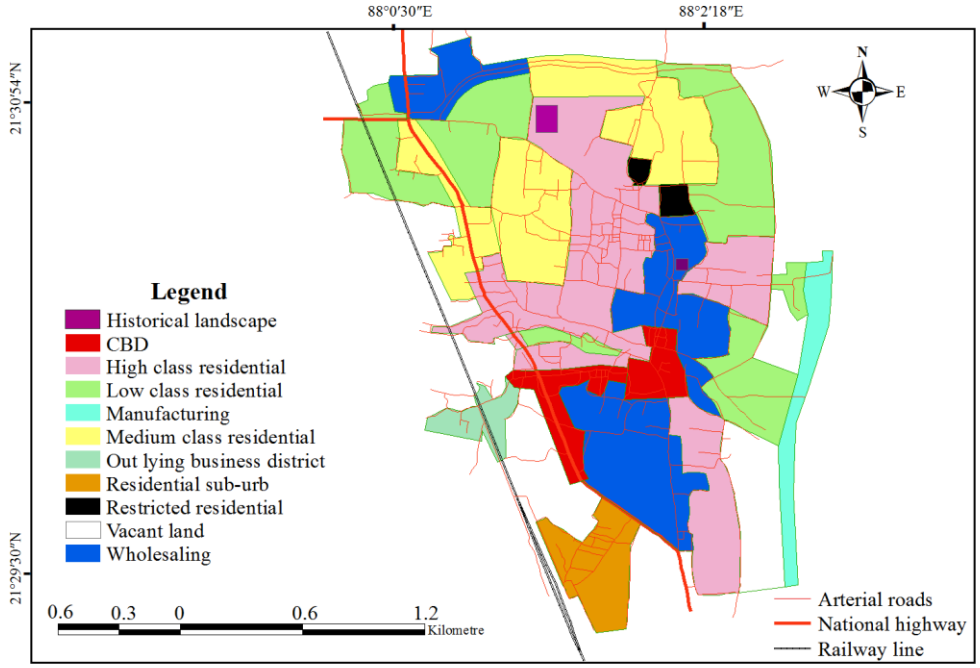


Fig. No. 5.23 Application of 'Multiple Nuclei Model' for Contai urban centre

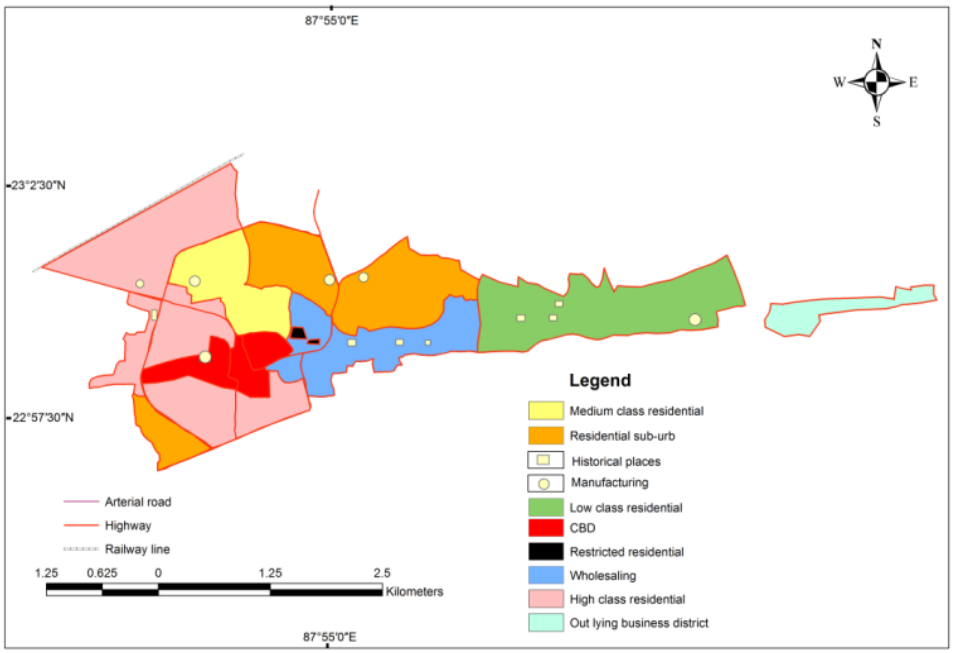
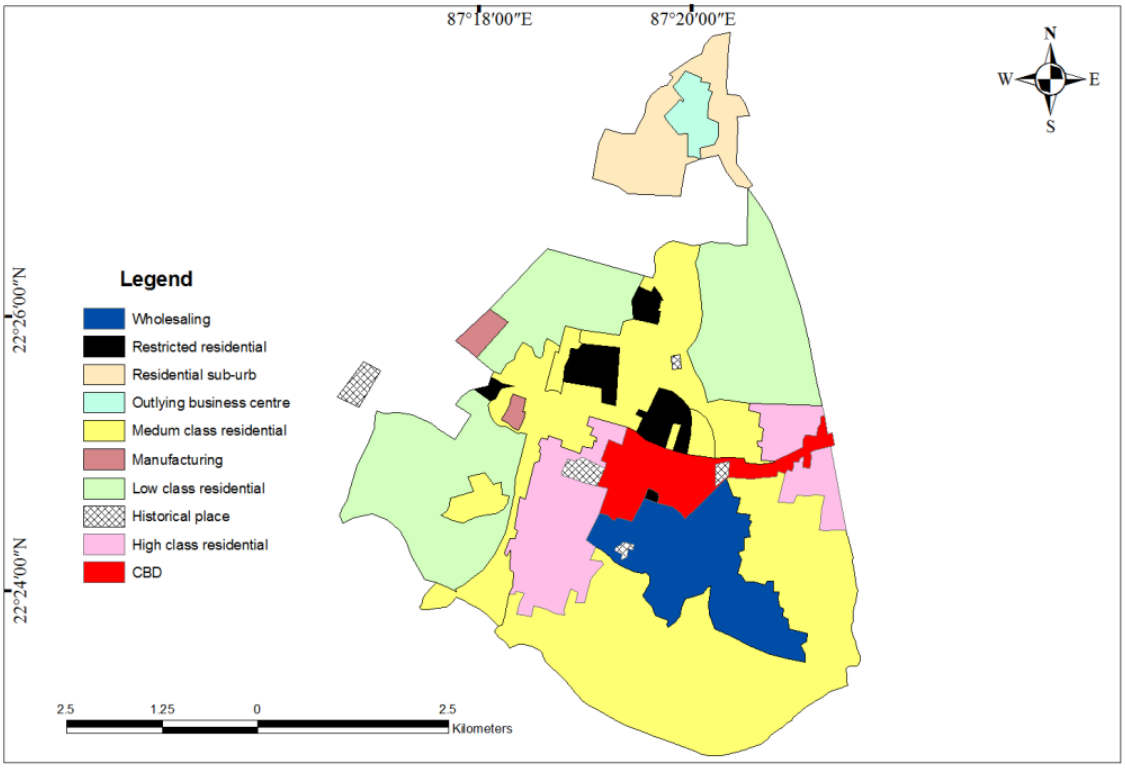


Fig. No. 5.24 Application of 'Multiple Nuclei Model' for Midnapore urban centre



Chapter 6: Delineating sphere of urban influence

6.1 Introduction

Urban spheres of influence reflect centre-to-hinterland relationship, compared with the non-central region, the centre assumes more complex economic functions, and provides more economic activities (Berry and Lamb, 2007). Famous theoretical contributions to this research field are the Central Place Theory (Christaller, 1933), the extension to the Central Place Theory (Losch, 1940), the modification to the Central Place Theory (Isard, 1956), and An Economic Theory of Central Places (Eaton et al., 1982). After verification and conceptual refinement of these classical literatures, it can be found that any study on delineating sphere of urban influence has been guided by either of two research approaches: the empirical research and model research. Empirical method determines sphere of urban influence according to data features and regional characteristics. As for example, sphere of urban influence in America is described in terms of the extent of the regional delivery system (Huff, 1973). Models are developed to capture the interaction between or spaces using theoretical understanding, the intensity and pattern of contact among cities, and thus those models help to determine the sphere of urban influence. In modeling, the sphere of urban influence, Huff (1973) and Lutz (1995) made a great contribution by using a model namely "Sphere of Urban Influence and Urban System" to delineate the urban sphere of influence of United States of America, Ireland and Ghana. Now-a-days in Western countries, the study of sphere urban of influence is diminishing in general. By virtue of their high degree of economic and social development, most of the developed countries have accessed post-industrial society, where node-to-node interactions have become, as compared to the node-to-hinterland relationships. But, for the developing countries, they are still pursuing industrial development and hence, develop the industries; the node-to-hinterland relationships are

distinctly dominant. Recently the studies of spheres urban of influence of industrial cities are assuming international academic interest (Wang, 2001; Liang, 2008). The present chapter is a modest attempt to analyze the socio-economic facilities by total population and composite functional score, and to delineate the sphere of urban influence for the present time.

6.2 Collection of data

Data are mainly obtained from the District Census Handbook 2001, 2011 (Office of the Director of Census Operation, W.B. IB-199, Sector-III, Salt Lake City, Kolkata-700106). Other data sources include District Statistical Handbook 2001, 2011 of Purba and Paschim Medinipur District (Bureau of Applied Economics and Statistics, Government of West Bengal), Economic Review 2001-02, 2011-12 (Department of Statistics and Programme Implementation, Government of West Bengal), Statistical Abstarct of Purba and Paschim Medinipur (Bureau of Applied Economics and Statistics, Government of West Bengal). During analysis synthesis of data is performed.

6.3 Methodology for the analysis of data

6.3.1 Projection for urban population

Annual growth rates of population in percentage have been estimated using following equation:

$$r = \frac{(P2 - P1)}{10}$$

Where, P1 and P2 are the population of urban area in two census enumerations at 10 years of interval and r = Growth

The annual growth rate of population for each urban centre is used in the following equation to derive projected population assuming Arithmetic growth:

$$PP = P1 + (r \times t)$$

Where, PP = projected population, P1 = population of base year and t = time interval between the base year and the year of which projected population would be estimated.

6.3.2 Delineating sphere of urban influence

The zone of urban influence is estimated through the following four steps.

Mean Population Threshold for a particular category of facility is the ratio between total population and number of facilities belonging to the category. (Haggett and Gunwardena, 1965) This can be expressed as:

$$mT = \frac{P}{NFi}$$

Where, mT = mean population threshold, P = total population, and NFi = total number of facilities under functional category 'i'.

Mean Population Threshold (mT) value for each facility type available in a geographical unit (district, urban centre etc.) is employed in the following equation to derive the Functional Weightage of the facility category (Bhatt, 1976):

$$WFi = \frac{mTi}{mTl}$$

Where, WFi = estimated weightage of facility 'i', mTi = mean population threshold of facility 'i', and mTl = lowest mean population threshold.

The WFi values for all facilities are summed up to derive Composite Functional Score of a geographical unit, which is given by:

$$CFs = \sum_{i=1}^{n} WFi$$

Where, CFs = Composite Functional score, n= number of facilities and i=1.

Thus Composite Functional Score for Purba and Paschim Medinipur as a combined district and for each of the urban centres under examination are computed.

Now the Proportional Composite Functional Score of an urban centre with respect to that of the district is multiplied by the area of the district to receive Sphere of Urban Influence for the urban centre in question (Rao, 1964):

$$S.I. = \frac{CFs\ Urban\ Centre}{CFs\ District} \times A\ District$$

Where, S.I. = Sphere of Urban Influence (sq. km.), CFs Urban centre = Composite Functional Score of Urban Centre, CFs District = Composite Functional Score of District and A District = Area of district.

6.4 Annual growth rate of urban population and area

Tab. No. 6.1 Annual Growth Rate of Urban Population and Area of Tamluk, Contai and Midnapore urban centres

Name of the Urban centres	Population		Annual Growth (%)	Area (sq.km.)		Annual Growth (%)
	2001	2011	2001-2011	2001	2011	2001-2011
Tamluk	45830	65306	4.25	10.36	17.86	7.24
Contai	77513	92226	1.90	14.25	17.25	2.11
Midnapore	149769	169264	1.30	14.78	18.65	2.62

Source: District Census Handbook, 2001 & 2011

Urban populations are increasing rapidly. In approximately 2027, for the first time in history, the global urban population will exceed the global rural population, and urban population has remained predominantly urban thereafter (United Nations, 2009). In coming decades, urban populations are expected to double in next 50 years, while rural population remain constant or decline (Rosser, 1980). In the US, urban populations are growing (not as rapid as the global rate) and the urban areas are expanding faster than the urban population size, leading to a decline in average urban population density. Whereas, in India, urban population are increasing (as rapid as the global rate) and the urban areas are expanding faster than the urban population size, leading to an incline in average urban population density. Urban population growth affects urban areas in many ways, from infrastructure requirements and their environmental impacts, to a new pattern of social interactions and changes in regional economy (Bettencourt et al., 2007; Rosser, 1980). But urban growth in terms of population and area is related with economic development, institutional and commercial activities, technological advancement, cultural growth and ecological settings. A single or autonomous

factor alone also accelerates the growth of an urban centre. It is found that Tamluk urban area of Purba Medinipur District has almost doubled in terms of area (Tab. No. 6.1) in one decade from year 2001 to 2011 i.e. from 10.36 sq.km to 17.86 sq.km. Tamluk has experienced a very high annual growth rate of population, 4.25% during 2001 to 2011 which is very high as compared to the growth rates experienced in the previous time periods and as compared to the growth rates of Contai (2.11%) and Midnapore urban area (1.30%). It is due to the fact that Tamluk has become the district headquarters of newly formed Purba Medinipur district in 2001. This change in status has attracted large amount of institutional and commercial activities to come up in Tamluk urban area in last one decade. Further, it is evident from the same table that all the three urban centres have been recorded to increase their urban population along with expansion of urban area. The annual growth of urban population (1.90%) and annual growth of urban area (2.11%) during 2001 to 2011 are near about identical for Contai urban centre, but for Tamluk and Midnapore urban centre the annual growth rate of urban population and urban area are not identical i.e. the annual growth rate of urban area (7.24% for Tamluk and 2.62% for Midnapore urban area) is near about double in relation to annual population growth rate(4.25% for Tamluk and 1.30% for Midnapore urban area).

6.5 Projection for urban population

Tab. No. 6.2 Projected populations for Tamluk, Contai and Midnapore urban areas

Urban centres	Population of the base year i.e. in 2001	Annual growth rate (%)	Projected year	Projected Population
Tamluk	45830	4.25	2025	104163
Contai	77513	1.90		116758
Midnapore	149769	1.30		200070

Source: District Census Handbook, 2001 & 2011

In today's increasingly global and interconnected world, one half of the World's Population lives in urban areas although there is still a substantial variability in the levels of urbanization across countries (UN World Population Prospects Report, 2014). The coming decades are expected to see changes in the size and spatial distribution of global population. The continuing urbanization and overall growth of World Population is projected to add 2.5 billion people to the global urban population by 2050, with nearly 90% of the increase concentrated in Asia and Africa. At the same time, the population of the World living in urban areas is expected to increase, reaching 66% by 2050. The urban population in 2014 accounted for 54% of the total global population, up from 34% in 1960, and continues to grow. The global urban population is expected to grow approximately by 1.84% per year between 2015 and 2020, 1.63% per year between 2020 and 2025, and 1.44% per year between 2025 and 2030 (United Nations, 2014). Population projection is a scientific attempt to peep into the future population scenario, under certain assumptions by using available data at present point of time. Being the fourth most populous state in India, the size and growth of West Bengal's population remained a matter of great interest not only to West Bengal but to India also. According to 2011 census, the total population of West Bengal was 9,13,47,736

(urban-6,22,13,676 and Rural-2,91,34,060) and the population of West Bengal is currently growing at the rate of 0.14 percent per year, whereas the growth rate for urban population per year is 1.13 percent. Tamluk, Contai and Midnapore, the three early urban centres of West Bengal as well as for eastern India, there has been a spurt in growth of urban population from 2001 to 2011 census at the rate of 4.25 %, 1.90 % and 1.30 %, respectively, which could be due to migration and natural increase, in general. The population of these three urban areas will continue to grow until at least 2050, with the estimated population (based on current growth trends), to reach 104163 for Tamluk, 116758 for Contai and 200070 for Midnapore in 2025, and in 2050 as high as 1 lakh 50 thousand for Tamluk and Contai and 2 lakh 50 thousand for Midnapore urban area.

6.6 Mean Population Threshold (mT)

Mean Population Threshold for a particular category of facility of a geographical unit is considered to be the best way to assess and determine the ratio between the total population and number of facilities of the category (Haggett and Gunwardana, 1965). Threshold Population (PT) is the minimum number of people required to support a given service. The concept is equivalent to the 'range' in Central Place Theory, which delineates the market area of the central place for a particular service, and is dependent on the spatial distribution of population and the willingness of the consumers to travel a given distance to purchase goods or to achieve services (Rao, 1964). Therefore, it states that there is a range of population size for each function, below the lower limit of which all settlements lack that functions, while above the upper limit all settlements possess it. A lower order facility (Primary School) may

require only 500 or so populations, whereas a higher order facility (Degree College) may need a threshold of 50000 to be sustainable, a University may need 350000 to be viable (Tiscali Encyclopedia, 2017). For example, a Primary school, a Degree college and a University may require threshold population in Aligarh District in UP are 1727, 33679 and 1868831 and in Kolkata district, West Bengal these threshold are 3112, 66927 and 749449, respectively. The present study, reveals that among the educational facilities, Primary school, Degree College and University for the combined Purba and Paschim Medinipur district, are having the MTP are higher than the required ratio i.e. 1389, 262799 and 11037538. Therefore, the Population Threshold propose that all the settlements having higher population than the threshold but not yet having the function should have it; and the settlements having lower population than the threshold and having the function should have it.

6.7 Functional Weightage of Facility (WF)

Anyone settlement in a region may not have all types of utility and amenity for fulfilling the social functions. But the functional importance of the settlement is judge on the basis of the concentration of available facilities. In an integrated area planning, population centres at the bottom of the hierarchy are planned to promote for the balanced growth of the region (Bhatt, 1976). The Functional Weitage of a choosen function/ facility is obviously related to the frequency of its occurrence. In case of Ballia district in UP, the functional importance of Primary schools, High schools and Degree colleges are 1.21, 2.99 and 5.04, respectively; and total number of Primary schools, High schools and Degree colleges are 4200, 2963 and 499, comparatively. Therefore, it is quite simple to understand that importance of a

University is much more than a secondary school which may occur in more numbers in a particular settlement (Bhatt, 1976). In the present analysis, to find out the relative functional importance/weightage, mean population threshold for non-formal educational institute (577 persons) has been taken as the unit measure i.e. weightage value of 1 has been assigned to a non-formal educational institute which has the lowest mean population threshold. In relation to this unit value, functional weightage of the other facilities have been estimated. Therefore, facilities occurring in higher frequency have functionally lower importance value and vice-versa. Thus, a university receives highest functional weightage (19139) followed by the government tourist lodge (2392.38), while the lowest functional weightage is obtained by the non-formal educational institute (1.00) after the facility of primary schools (2.41).

Tab. No. 6.3 Mean Population Threshold and Functional Weightage of urban facilities, Purba and Paschim Medinipur District

Category of Facilities	Name of the Facility	Number of Facility		NF	P	mT	WF
		Pur. Med.	Pas. Med.				
Educational Institute	Primary Schools	3253	4691	7944	11037538	1389	2.41
	Middle/Junior Schools	55	12	67	11037538	164739	285.66
	Secondary/Matriculation	317	440	757	11037538	14581	25.28
	Senior Secondary Schools	313	316	629	11037538	17548	30.43
	Degree Colleges	18	24	42	11037538	262799	455.69
	University	0	1	1	11037538	11037538	19139.0
	Centre of Open University	6	3	9	11037538	1226393	2126.56
	Technical Schools	20	22	42	11037538	262799	455.69
	Technical Colleges	22	15	37	11037538	298312	517.27
	Technical University	1	0	1	11037538	11037538	19139.00
	Mass Literacy Centre	3161	4198	7359	11037538	1500	2.60
	Non-formal	7597	11542	19139	11037538	577	1.00
Recreational Facility	Cinemas	76	24	100	11037538	110375	191.39
	Public Libraries	121	158	279	11037538	39561	68.60
	Reading Rooms	124	158	282	11037538	39140	67.87
	Govt. Tourist Lodge	7	1	8	11037538	1379692	2392.38
Health Facility	Hospitals	8	28	36	11037538	306598	531.64
	Sub-centres	706	858	1564	11037538	7057	12.24

	Family Welfare Centres	31	40	71	11037538	155458	269.56
	Primary Health Centres	51	82	133	11037538	82989	143.90
	Nursing Homes	152	124	276	11037538	39991	69.34
	Block Primary Health Centres	22	6	28	11037538	394198	683.54
Financial and Commercial Institute	Nationalized & Non-nationalized Banks	227	324	551	11037538	20032	34.74
	Agricultural Credit Societies	722	835	1557	11037538	7089	12.29
	Non- Agricultural Credit Societies	534	1084	1618	11037538	6822	11.83
	Non-Credit Societies	373	452	825	11037538	13379	23.20
Communication Facility	Post Offices	832	590	1422	11037538	7762	13.46
Administrative Facility	Police Stations	34	52	86	11037538	128343	222.55
Cold Storage Facility		23	81	104	11037538	106130	184.03

Pur.=Purba, Pas.=Paschim, Med.=Medinipur, NF=total number of facilities, P=total population, mT=mean population threshold, WF= Weightage of facility

Source: District Statistical Handbook, 2001 & 2011

6.8 Composite Functional Score (CFs) and Proportional Composite Functional Score (PCFs)

The analysis of spatio-temporal dynamism of phenomena is the main thrust of geographical research. Likewise diverse physical, cultural, social and economic aspects, the distribution of population and facilities is not uniform across the region. But over the earth's surface, the nature of distribution of both population and facilities happens together, as both are

interdependent to each other. People requires different facilities to sustain their socio-economic life as well as to fulfill needs and desires, while proper functioning of facilities depends on the size and purchasing power of patrons. Therefore, higher important facilities which are fewer in number available only in bigger size towns, while lower important facilities are available in both bigger as well as smaller size towns. Functional weightage values for all the facilities (based on mT) are summed up to derive the Composite Functional Score for a geographical unit. Composite Functional Score and Proportional Composite Functional Score analysis is a significant way to estimate the probability of extension of an urban centre in future. People flows towards the centre where there are ample opportunities of education, employment, and medical etc. as socio-economic pull factors. Urban centre having more functions but less population has more prospect of further growth. The present study reveals the distribution of three urban centres or towns in five categories according to their population size and also indicates the total urban population and composite functional score (total importance of all facilities in a town) in each size category. Midnapore is the biggest town in Medinipur district with its total population 169264 persons in 2011 (51.80 per cent of total urban population in the district) and Composite Functional Score (CFs) of 855.12 (45.30 per cent of total urban functional importance), comes under the category of Class I towns in India. However, Tamluk and Contai (65306 and 92226) are found in Class II town in the district having 16.59 per cent urban population and 38.11 per cent (CFs 313.14 and 719.42) urban functional importance. The present study reveals the Proportional Composite Functional Score (relative ratio of CFs of urban centre and CFs of district as a whole). Such an analysis is significant to estimate the probability of extension of a town in future. People flows towards the centre where there are ample opportunities of education,

employment, medical, etc. as socio-economic pull factors. Therefore, a town having more functions but lesser population has more prospect of further growth. In this view, it may be argued that a town with PCFs near about 01 is supposed to have more functional importance in proportion to its existing population size, subsequently has an advantage of further expansion by attracting and accommodating more people. In contrary, towns with ratio less nearer to zero have lesser probability to be expanded.

In the study area, Class I town i.e., Midnapore has scored the ratio of 0.01960, while Class II town i.e., Contai and Tamluk have scored highest ratio of 0.01512 and 0.00879 respectively. It may be inferred that Midnapore and Contai urban centre have greater probability of its further growth than Tamluk urban centre. However, Midnapore and Contai have better prospect of its further growth in terms of both population and area consequent upon in-migration of people from surrounding rural part.

Tab. No. 6.4 Number of facilities and Functional Weightage of urban facilities of Tamluk, Contai and Midnapore urban centres

Category of Facilities	Name of the Facility	Number of Facility			Functional Weightage		
		T	C	M	T	C	M
Educational Institute	Primary Schools	34	21	85	1.24	4.14	1.35
	Middle/Junior Schools/ Secondary	2	3	7	21.00	29.00	16.43
	Senior Secondary Schools	7	8	18	6.00	10.88	6.39
	Degree Colleges	1	1	3	42.00	87.01	38.33
	University	-	-	1	-	-	114.99
	Technical Schools/ College	11	12	15	3.82	7.25	7.67
	Mass Literacy Centre	29	18	24	1.45	4.83	4.79
	Non-formal	42	87	115	1.00	1.00	1.00
Recreational Facility	Cinemas	3	4	1	14.00	21.75	114.99
	Public Libraries	3	1	4	14.00	87.01	28.75
	Reading Rooms	5	2	4	8.40	43.50	28.75
Health Facility	Hospitals	1	1	1	42.00	87.01	114.99
	Family Welfare Centres	2	1	3	21.00	87.01	38.33
	Nursing Homes	32	19	20	1.31	4.58	5.75
Financial and Commercial Institute	Nationalized & Non-nationalized Banks	8	7	16	5.25	12.43	7.19
	Agricultural and Non-agricultural Credit Societies	9	6	11	4.67	14.50	10.45
Communication Facility	Post Offices	1	1	1	42.00	87.01	114.99
Administrative Facility	Police Stations	1	1	1	42.00	87.01	114.99
Cold Storage Facility		1	2	1	42.00	43.50	114.99
				CFs	313.14	719.42	855.12

T=Tamluk urban centre, C=Contai urban centre, M=Midnapore urban centre,
CFs=Composite Functional Score
Source: District Statistical Handbook, 2001 & 2011

Tab. No. 6.5 Composite and Proportional Composite Functional Score of urban centres, their Sphere and Radius of Influence

Urban Centres	Composite Functional Score (CFs)	Population (P)	Area (A) in Sq.Km.	Proportional Composite Functional Score (PCFs)	Sphere of Influence (SI) in Sq.Km.	Radius of Influence (R) in Km.
Tamluk	313.14	65306	17.86	0.00879	123.77199	11.12529
Contai	719.42	92226	17.25	0.01512	212.90472	14.59125
Midnapore	855.12	169264	18.65	0.01960	275.98760	16.61287
Kolkata	17383.83	4496694	185.00	0.15330	13605.40684	116.64222

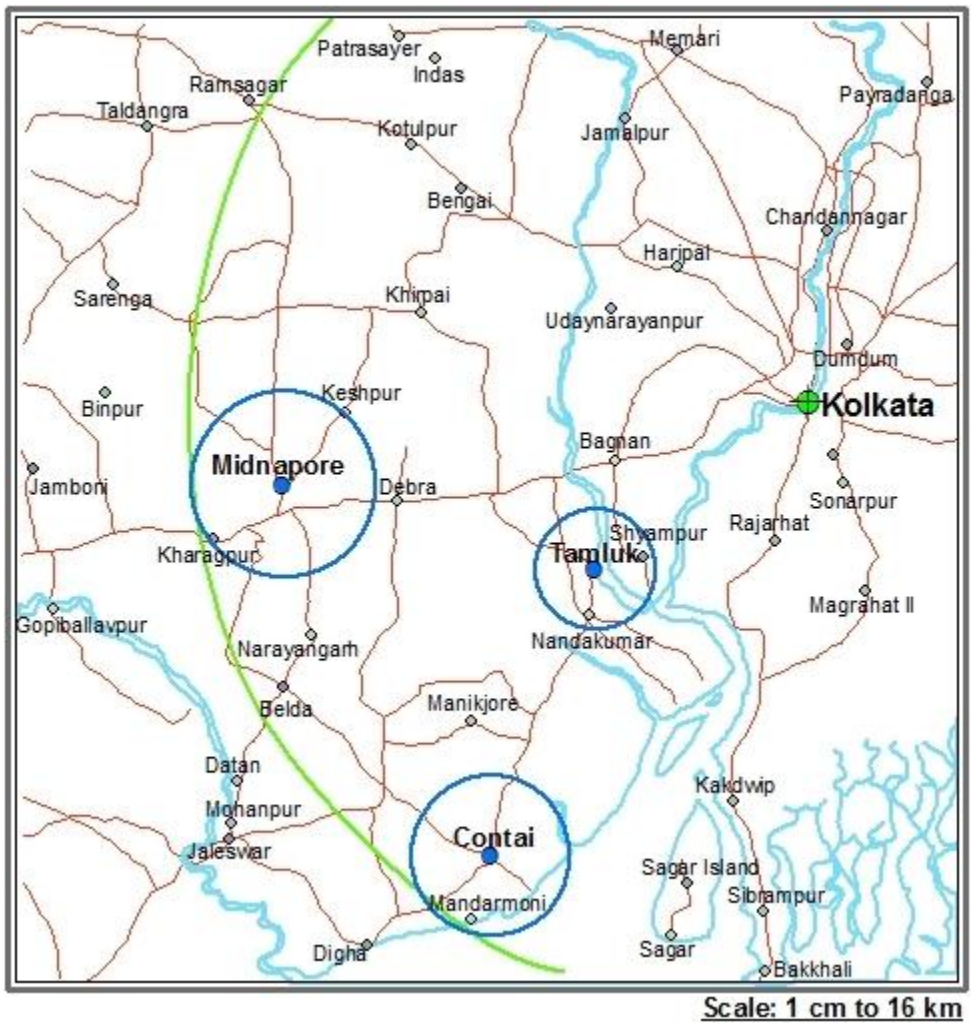
6.9 Adequacy and Inadequacy of urban facilities

Functional importance is the sum of all the pulling factors available in an urban centre. Therefore, higher functional importance having variety of both higher and lower order facilities exerts a greater pulling effect that attracts people towards an urban centre. Thus, a smaller urban centre turns into a bigger urban centre progressively. Functional importance is the qualitative identity of an urban centre, as it refers to the pulling gravity of later. Since the functional importance varies across urban centre, their size of population and area also vary positively. Higher order centres with higher functional importance encompasses larger influence area within which the influence area of lower order centres come under. Kolkata metropolitan urban centre being a largest urban centre in the state of West Bengal as well as in Eastern India radiates its influence up to the highest distance from the centre with radius of influence 116.6422 km and its population and CFs are 4496694 and 17383.83. In comparison to Kolkata metropolitan urban centre, the CFs of Midnapore, Tamluk and Contai urban centre should be 655.05168, 252.73422 and 356.91462 respectively. But it is revealed that

Midnapore urban area with functional importance 855.12 stood at the highest position accounting total population 169264 persons and 18.65 sq.km area. Midnapore urban area had enjoyed the position of headquarter of Medinipur district and now this urban area is getting pleasure from the status of headquarter of Paschim Medinipur district and have all the socio-economic facilities including a university, medical college. It is followed by Contai and Tamluk urban area of Purba Medinipur district with functional importance of 719.42 and 313.14. Among the three historical urban area of Purba and Paschim Medinipur district, Tamluk urban area having functional importance of 313.14 stood at the lowest position with population and area 65306 persons and 17.86 sq.km respectively. Therefore, in comparison to Kolkata metropolitan urban centre these three urban centres have the adequate facilities and make use of these facilities to the people of the urban centre.

6.10 Sphere of Influence of urban centres

Fig. No. 6.1 Sphere of Influence of Tamluk, Contai and Midnapore urban centres



Each city forms the centre of a larger area and dominates over certain area which is actually the city's sphere of influence (Murphy, 1974). Urban centres do not function in isolation; rather they provide goods and services to the area lying beyond the urban boundary. People from the surrounding area commute a town to avail the required facilities. But, people visit towns from a certain distance. The distance which patrons willing to travel, should be depends on the importance of facility so that it should be the economy of the distance (Pawar

and Lokhande, 2001; Yasenovskiy and Hodgson, 2007). Therefore, both importance of facility and the distance traveled by the patrons are positively related. Again, an urban centre having large number and higher order of facilities is being visited by patrons from longer distance. In other words, an urban centre with higher functional importance exerts an influence upon larger area of its surrounding (Pawar and Lokhande, 2001). Such, an area surrounding the urban centre reveals the complexity of interaction and interdependence between town and surrounding rural area that is popularly known as functional region (Glasson, 1978). It may be inferred that a town having higher functional importance covers larger zone of influence and vice-versa. In this analysis by adopting V.L.S.Prakash Rao's modified method, the sphere of influence of each urban centre has been delineated. Midnapore urban area exerts its influence up to 16.61287 km and covers the area of 275.98760 sq.km. It is followed by the Contai urban area with its radius of influence 14.59125 km. and sphere of influence is 212.90472 sq.km. However, Tamluk has been identified at the bottom position in its functional influence with radius of influence 11.12529 km. and sphere of influence is 123.77199 sq.km.

Chapter 7: Future growth trend

7.1 Introduction

The population of cities in developing country is expected to double in the next thirty years; from some 2 billion in 2011 to almost 4 billion in 2041 (Cohen, 2006). According to preliminary estimates of the Census of India, cities with populations in excess of 100,000 will contain 1.7 billion people in 2041 and their total built-up area will have an average density of some 8,000 persons per square kilometer (Cohen, 2006). In other words, by 2041 these cities can be expected to triple their land area, with every new resident converting, on average, some 160 square meters of non-urban to urban land during the coming years (Lutz et al., 2004). The pace, scale, and the form of South Bengal's urbanization will have long lasting effects on the region's social, economic, and the environmental future. Urbanization rapidly transforms the face of South Bengal and the lives of its citizens, Urban policy makers and planners have an important role to play in ensuring that urban expansion, and the economic growth it brings, is efficient, sustainable, and inclusive (Preston, 1979). Tamluk, Contai and Midnapore are three early urban centres of South Bengal. These three early urban centres of Eastern India experienced a number of reigns who ruled in different times in history and influenced the landuse of that period (Basham, 1975). Presently, along with their administrative functions, these three urban centres exist as local commercial centres with grossly reduced zone of influence (Mandal et al., 2015). The present discussion is a modest attempt to analyze the future growth trend along with the identification of potential residential areas of these three early urban centres of South Bengal, India.

7.2 Collection of data

Primary data are collected by field survey. Secondary data are mainly obtained from the District Census handbook of 1991, 2001 and 2011 (Office of the Director of Census Operation, West Bengal, IB-199, Sector-III, Salt Lake City, Kolkata-700106) and District Statistical Handbook of 1991, 2001 and 2011 (Bureau of Applied economics & Statistics, Govt. of West Bengal, 5th Floor, South Wing, Joint Administrative Building, HC-7, Sector-III, Bidhannagar, Kolkata-700106). Other data sources include municipal office, Block Development office, Local Government Engineering Department etc. When necessary, synthesis of data is performed.

7.3 Methodology for the analysis of data

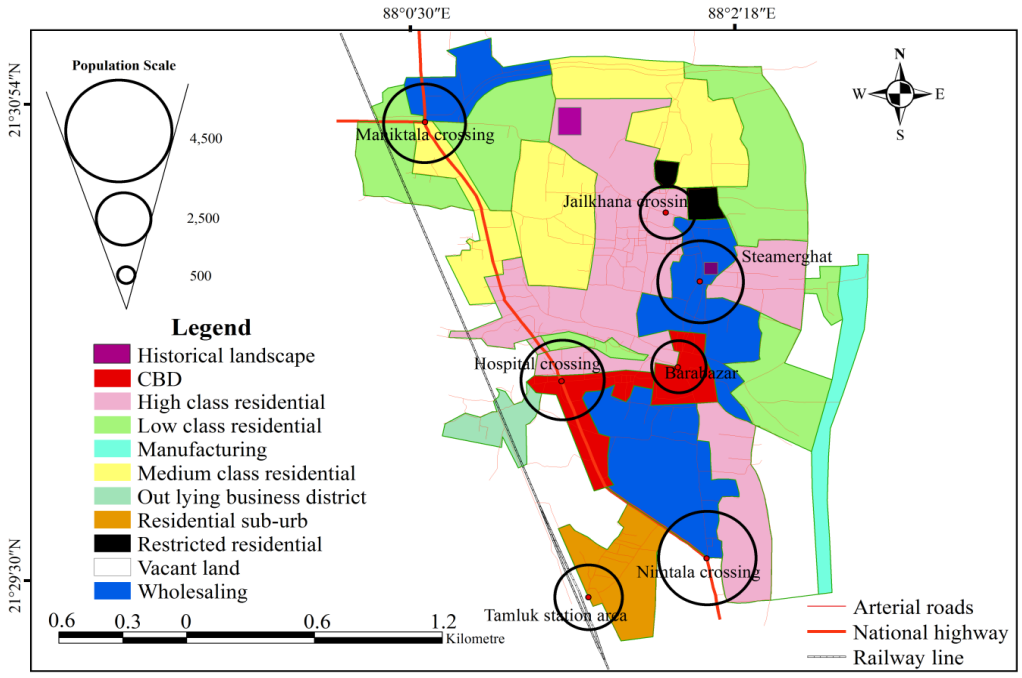
In determining the future trend, an intensive survey has been conducted taking homogeneous building block as the basic unit of study. Building blocks separated by arterial roads were identified with the help of high resolution satellite images downloaded from open source (wikimapia.org). Information for each of such building blocks were collected and recorded using predesigned field manual and questionnaires. Secondary data have been also used to achieve the goal. Thus, collected spatial information from both primary and secondary sources were organized and classified. All the categories of classified data and information were then employed in mapping by Arc GIS 9.3 software. For this, at first the growth centers of these urban centres are figured out, then by analyzing their future potential and present state the maps are prepared showing the overall growth trend of these urban centres. In the same way maps are prepared containing the present land use condition. This had led to future

growth trend analysis and potential residential areas identification of Tamluk, Contai and Midnapore, three historical urban landscapes 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.

7.4 Growth centres and its served population within urban centre

Urban growth centre may be defined as urban service centre which has a potential for further development (Buxton et al., 2000). It is a centre which provides goods and services to its own population as well as its surrounding population creating balanced socio-economic development of an urban area (Turksta, 1996). It is a powerful strategy for micro level planning for urban areas (Bunker, 1986). For developing countries like India, where nearly 30 percent of the total population lives in the urban areas and mostly it is seen that growth centres have a large number of facilities and amenities for the betterment of the people (Mohan, 1996). Therefore, there is a need to indentify the existing urban growth centres in urban areas where maximum population prefer to go to avail different socio-economic facilities for their livelihood.

Fig. No. 7.1 Growth centres of Tamluk urban area



The growth plan identifies seven urban growth centres across the Tamluk urban centres, eight urban growth centres across the Contai urban centre and sixteen urban growth centres across the Midnapore urban centre. Some urban growth centres have already met or exceeded the minimum target set by the growth plan, while others must substantially increase density and attract considerable new development to achieve the target. There is also a wide variation in the population served by each urban growth centre, which influences the amount of growth required to meet the target. For example, Barabazar is the largest urban growth centre and 9012 person has been depending on it for facilities and amenities. And Bus stand area is the smallest and 1160 person has been depending on, which is eight times low population served than the Barabazar area. Combined, the peripheral urban growth centres in these three early urban centres require new people to meet the target in relation to the largest urban growth centre.

Fig. No. 7.2 Growth centres of Contai urban area

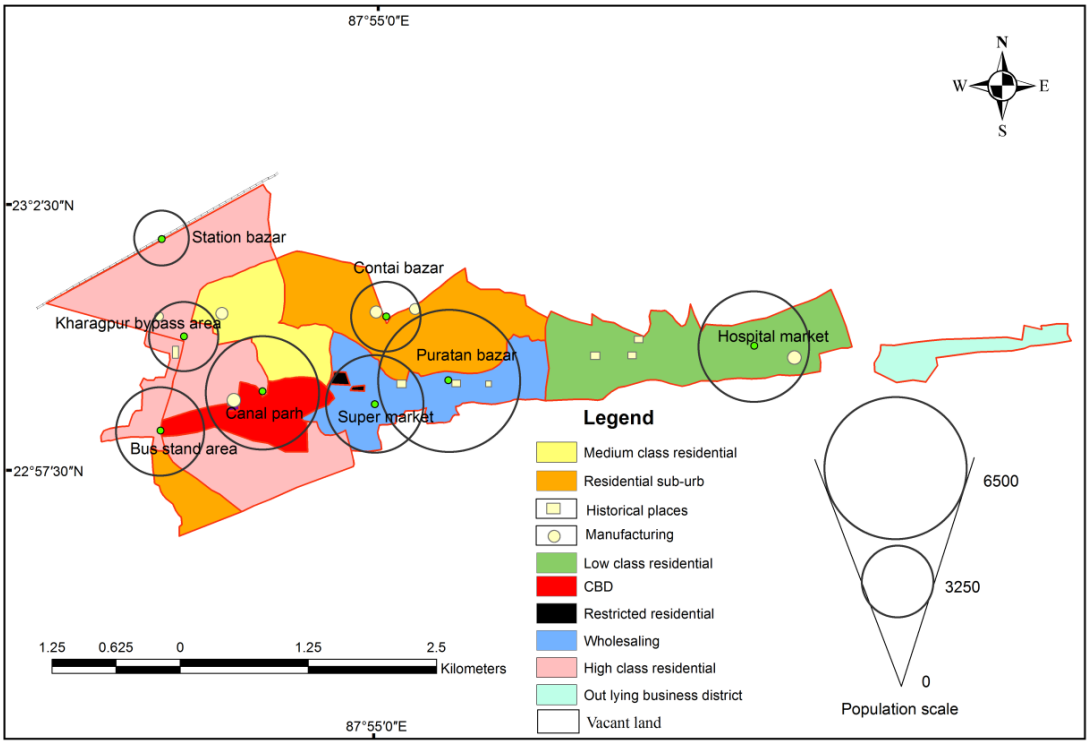


Fig. No. 7.3 Growth centres of Midnapore urban area

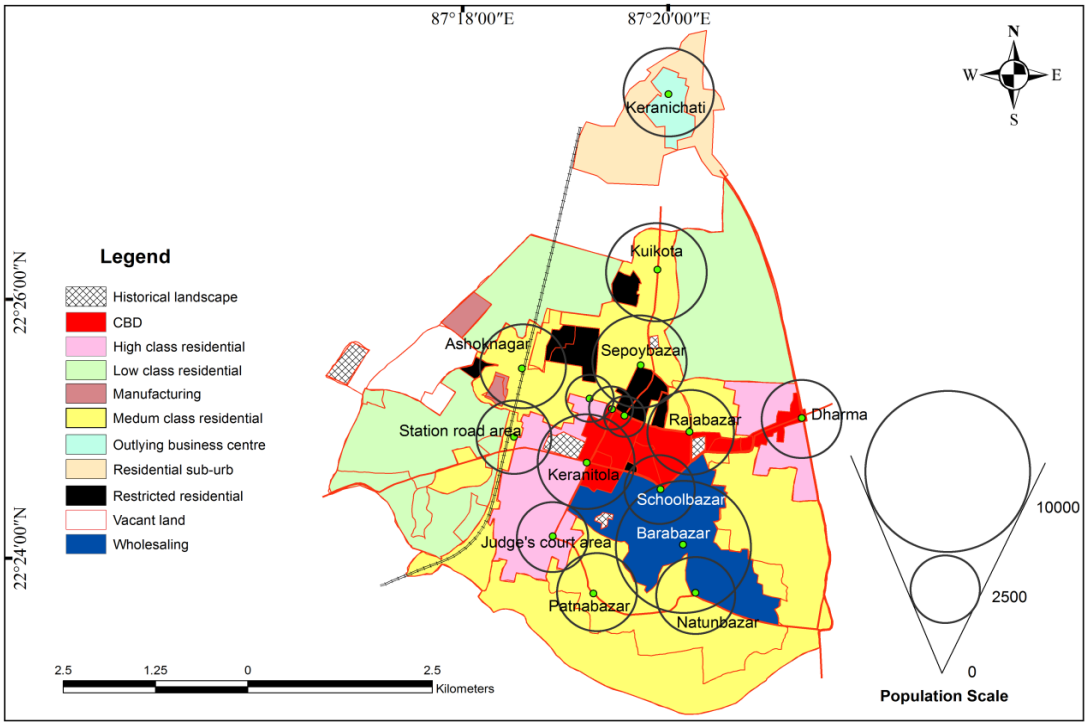
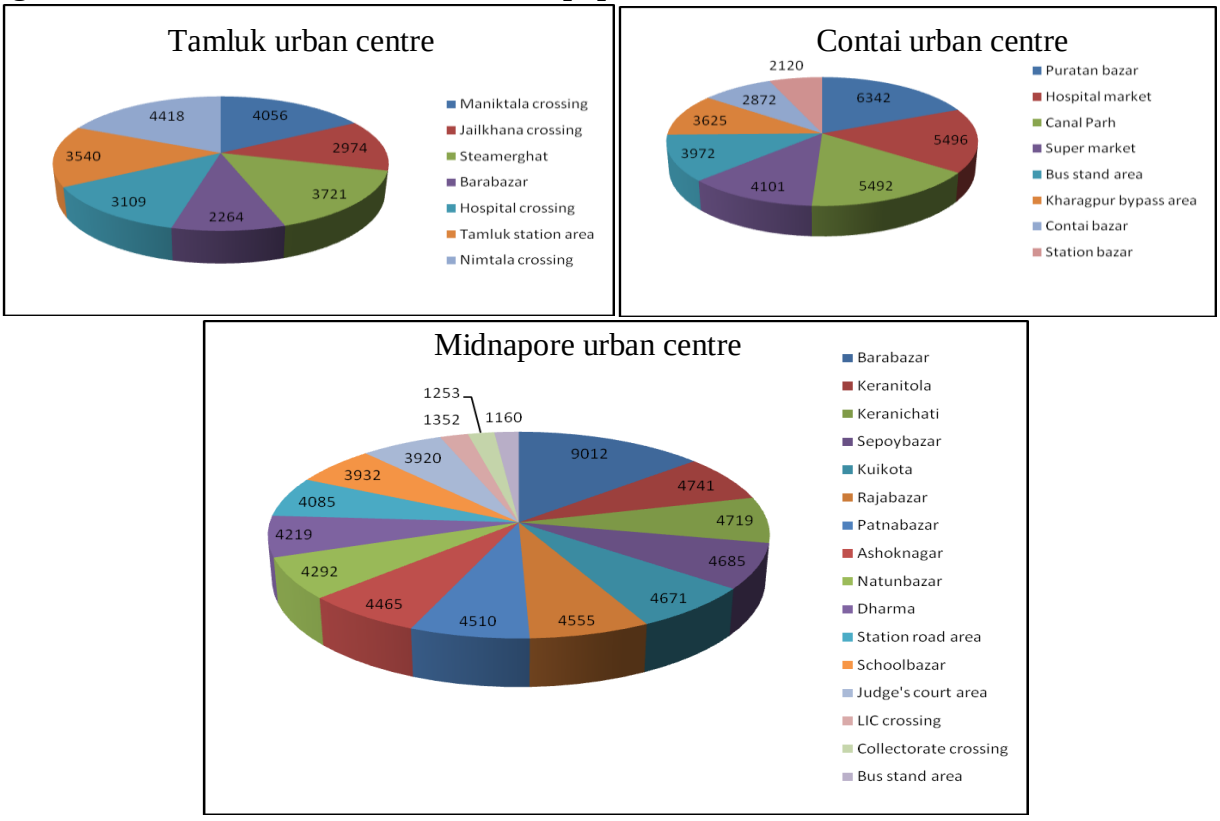


Fig. No. 7.4 Growth centres and its served population within urban centre



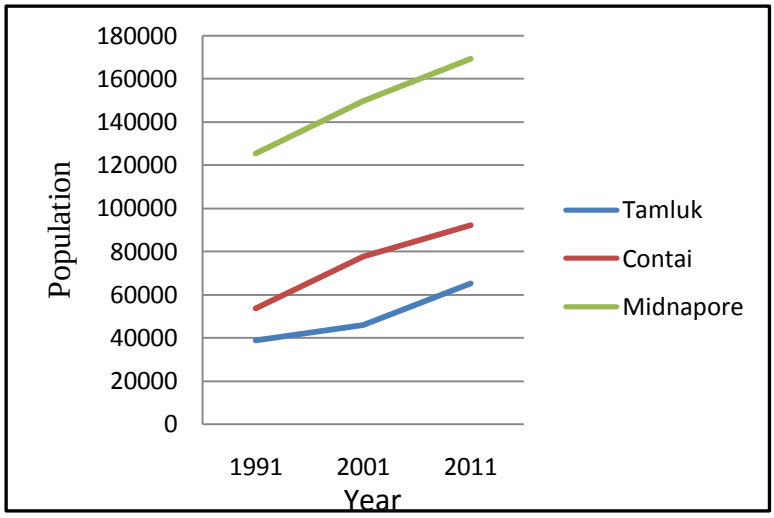
7.5 Population growth trend and landuse percentage

Tab. No. 7.1 Population of Tamluk, Contai and Midnapore urban centre from 1991 to 2011

Name of the urban centre	1991	2001	2011
Tamluk	38688	45830	65306
Contai	53484	77513	92226
Midnapore	125498	149769	169264

Source: District Census Handbook, 1991 - 2011

Fig. No. 7.5 Population growth of Tamluk, Contai and Midnapore urban centre from 1991 to 2011



High population growth rate is a common problem for most of the urban centres throughout the developing World (Permana et al., 2013). The figure 7.5 showing the population growth of Tamluk, Contai and Midnapore urban centres are available only since enumeration year 1991. Therefore it may be taken as a base for analysis of growth trend and decadal variation of the population of the urban centre. The table 7.1 represents the pattern of population growth and percentage of variations during different decades. From the perusal of the table 7.1, it is evident that the population of the Tamluk, Contai and Midnapore urban centres during the last twenty years (1991 – 2011) has grown phenomenally. It is increased from 38688, 53484 and 125498 persons for Tamluk, Contai and Midnapore urban centres in 1991 to 65306, 92226 and 169264 persons in 2011 indicating nearly one and half times increase with a net increase of 26618, 38742 and 43766 persons for Tamluk, Contai and Midnapore urban centres, respectively.

Tab. No. 7.2 Landuse percentage of Tamluk, Contai and Midnapore urban centre in 2001

Landuse type	Area (sq.km.)			Percentage		
	Tamluk	Contai	Midnapore	Tamluk	Contai	Midnapore
High class residential	2.98	5.16	2.39	28.76	36.21	16.17
Medium class residential	**1.96**	**1.13**	**4.76**	18.92	7.93	32.21
Low class residential	2.51	2.01	2.24	24.23	14.11	15.16
Commercial	1.60	1.76	1.26	**15.44**	**12.35**	**8.53**
Historical landscape	0.04	0.16	0.50	0.39	1.12	3.37
Restricted residential	0.06	0.05	1.36	0.58	0.35	9.20
Manufacturing	0.25	0.11	0.69	2.42	0.77	4.67
Residential sub-urb	**0.45**	**1.96**	**0.21**	4.34	13.75	1.42
Outlying business district	**0.10**	**0.87**	**0.83**	0.97	6.11	5.62
CBD	0.41	1.04	0.54	**3.95**	**7.30**	**3.65**
Total	10.36	14.25	14.78	100.00	100.00	100.00

Tab. No. 7.3 Landuse percentage of Tamluk, Contai and Midnapore urban centre in 2011

Landuse type	Area (sq.km.)			Percentage		
	Tamluk	Contai	Midnapore	Tamluk	Contai	Midnapore
High class residential	3.94	5.83	2.94	22.06	33.80	15.76
Medium class residential	**2.94**	**1.34**	**6.13**	16.46	7.77	32.87
Low class residential	2.93	2.13	2.52	16.41	12.35	13.51
Commercial	4.01	2.79	1.66	**22.45**	**16.17**	**8.90**
Historical landscape	0.04	0.16	0.5	0.22	0.93	2.68
Restricted residential	0.06	0.05	1.36	0.34	0.29	7.29
Manufacturing	0.25	0.11	0.69	1.40	0.64	3.70
Residential sub-urb	**1.96**	**2.21**	**0.3**	10.97	12.81	1.61
Outlying business district	**0.51**	**1.27**	**1.36**	2.86	7.36	7.29
CBD	1.22	1.36	1.19	**6.83**	**7.88**	**6.38**
Total	17.86	17.25	18.65	100.00	100.00	100.00

During past ten years (2001 – 2011) increasing population due to high natural growth rate and in migration from rural surroundings for better livelihood opportunities have paved way for rapid expansion of these urban centres. Table 7.2 and 7.3 shows the percentage of increase in landuse type along with the total area of the urban centre during last ten years. It is clear from the table that there has been a slow expansion for high class residential, low class residential and manufacturing areas but rapid expansion for the medium class residential, commercial, residential sub-urb, outlying business district and CBD also. The CBD has largely shifted from the core to the peripheral areas of the urban centre along main

road. Percentage area of commercial landuse has increased from 15.44 to 22.45 for Tamluk urban centre, 12.35 to 16.17 for Contai urban centre and 8.53 to 8.90 for Midnapore urban centre. Percentage area of CBD has increased from 3.95 to 6.83 for Tamluk urban centre, 7.30 to 7.88 for Contai urban centre and 3.65 to 6.38 for Midnapore urban centre.

7.6 Future urban growth trend

Urban growth consists of three basic forms: low density continuous growth, ribbon growth, and leapfrog growth. Low density continuous growth is highly consumptive use of land for urban purposes along the margin of the existing urban areas (Preston, 1979). Ribbon growth is the settlement development that follows the peripheral transport arteries outward from the urban cores. Leapfrog growth is a discontinuous pattern of growth with patches of developed land that are widely separated from each other and from the boundaries of recognized urban areas (Magri, 1994).

Fig. No. 7.6 Growth trend of Tamluk urban centre

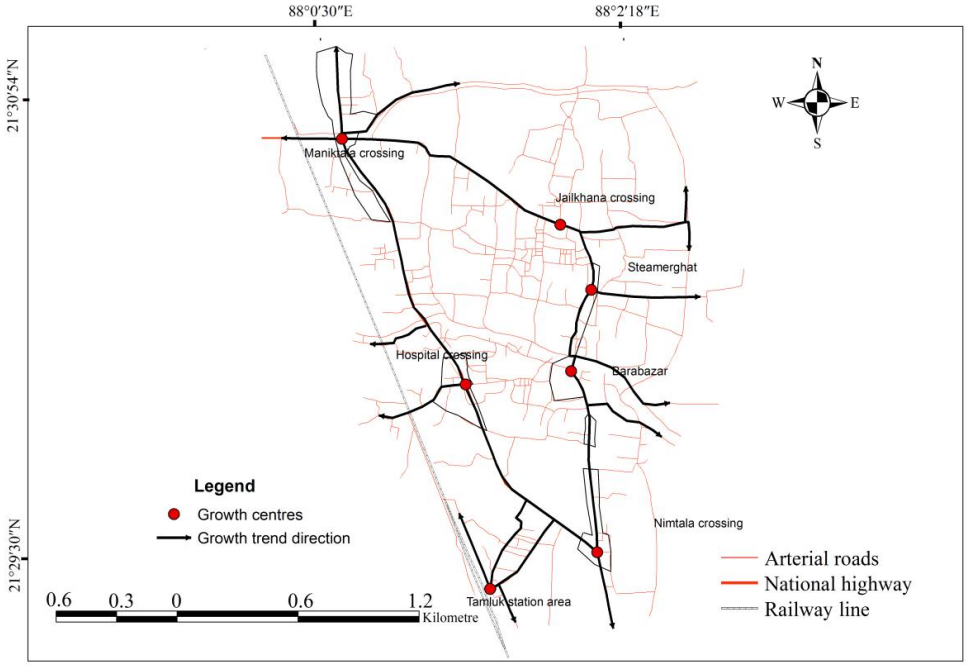


Fig. No. 7.7 Growth trend of Contai urban centre

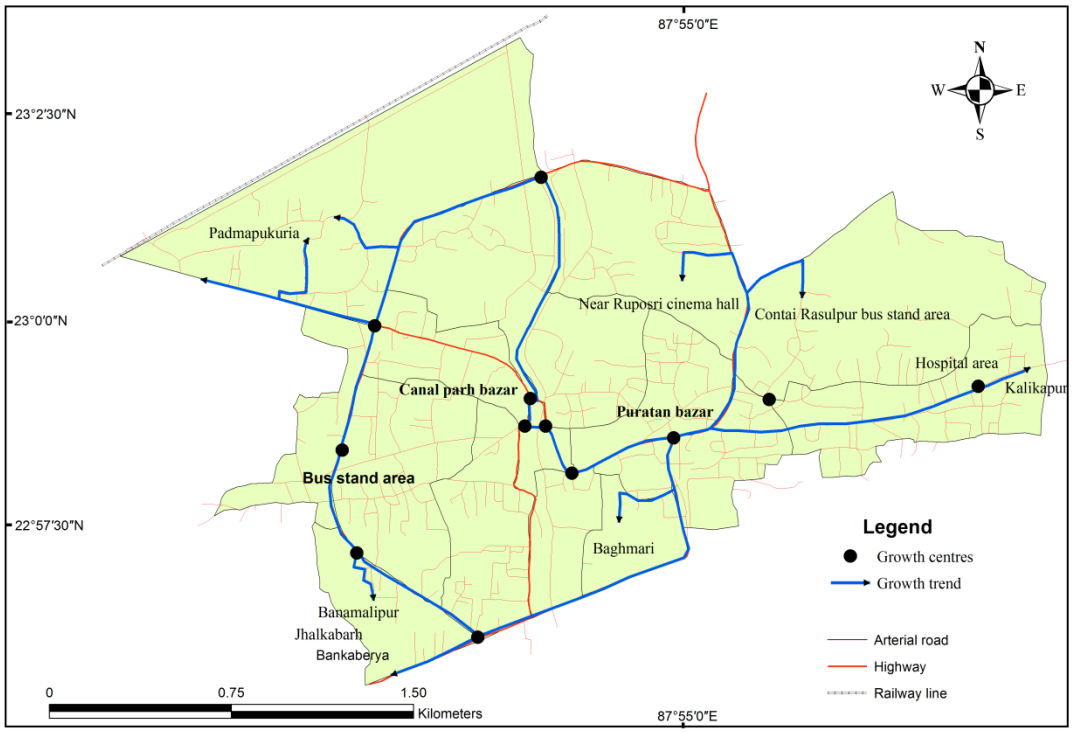


Fig. No. 7.8 Growth trend of Midnapore urban centre

As visualized in the figure 7.6 and 7.8, there has been no such growth trend of urban limits in the east due to the presence of the Rupnarayan river for Tamluk urban centre and in the south due to the presence of the Kansai river for Midnapore urban centre. This shows the control of natural boundary in shaping the spatial form of these urban centres. But the figure 7.7 shows that Contai urban centre has no such growth limits. The growth trend of Tamluk, Contai and Midnapore urban centres has taken place mainly either in the form of ribbon growth, in a linear direction along the highway and other important transport corridors of these urban centres or in the form of low density continuous growth, occupying along the right bank of Rupnarayan river in the margin of Tamluk urban centre, Kansai river front areas of Midnapore urban centre and Contai Rasulpur bus stand areas of Contai urban centre. It is found that Tamluk urban centre mainly expands towards west and south-west directions, Contai urban centre expands in all directions and Midnapore urban centre mainly expands

towards east, north-east and north-west directions. Such growths have taken place along main and arterial roads.

7.7 Potential residential areas

Asian countries have experienced rapid urbanization due to economic development, industrialization, massive migration as well as natural growth. This expansion took place particularly in an unplanned way and has impacted negatively on peripheral agricultural areas, forest area or water bodies (Permana et al., 2013). Thus, identification of potential residential sites for future urban development is an important issues in ensuring sustainable development (Braby, 1989).

Fig. No. 7.9 Landuse map along with potential residential areas of Tamluk urban centre

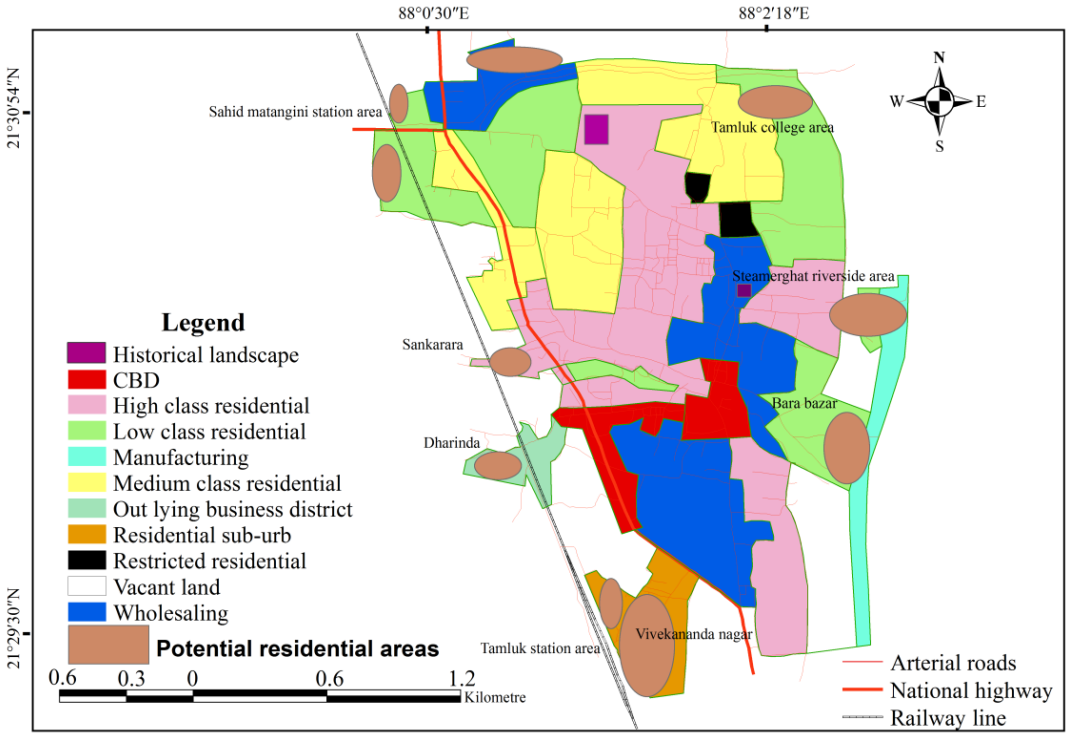


Fig. No. 7.10 Landuse map along with potential residential areas of Contai urban centre

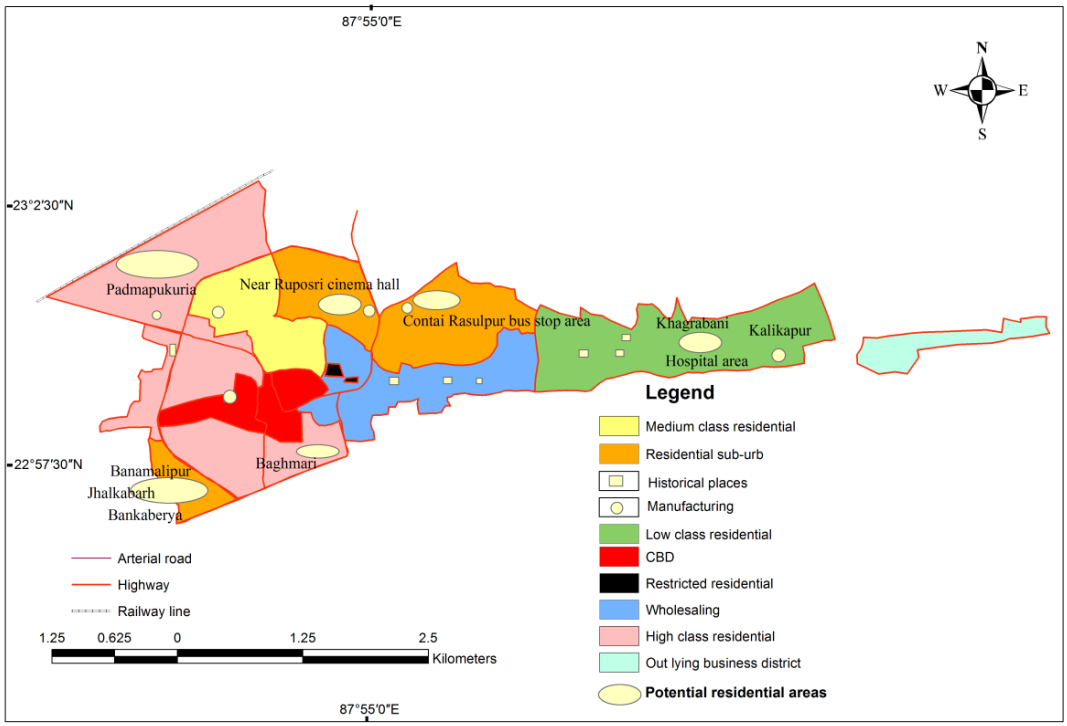
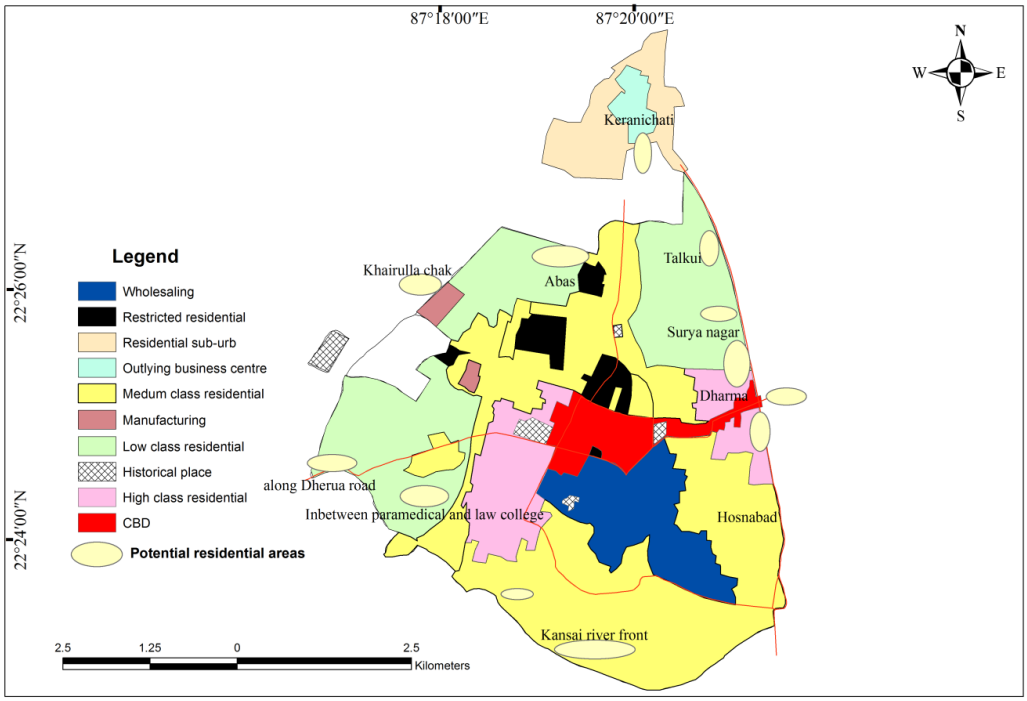


Fig. No. 7.11 Landuse map along with potential residential areas of Midnapore urban centre



The result indicated that the large portion of the peripheral areas has been converted to built-up areas. Urban areas increased from 10.36 sq. Km. in 2001 to 17.86 sq. Km. in 2011 for Tamluk urban centre, from 14.25 sq. Km. in 2001 to 17.25 sq. Km. in 2011 for Contai urban centre, and from 14.78 sq. Km. in 2001 to 18.65 sq. Km. in 2011 for Midnapore urban centre, to accomodate with the increasing population from 2001 to 2011.

From the table 7.3, it is quite evident that commercial, high class residential and medium class residential areas are the top three dominant among all the landuse types of the urban centre. A map containing the overall landuse and potential residential landuse areas is prepared (Fig. No. 7.9 for Tamluk urban centre, Fig. No. 7.10 for Contai urban centre and Fig. No. 7.11 for Midnapore urban centre). From the figure 7.9, 7.10 and 7.11, it is found that the overall residential development of these urban centres followed a concentric pattern. But now there is a lack of sufficient space for concentric growth. So the potential locations for development are found in the peripheral regions of these urban centres.

The analyses produce a map showing potential sites for residential development in future. The findings also indicate that built-up areas would continue to encroach into available peripheral flat lands which will be eradicate if no restriction imposed. Thus, the information obtained from this study is useful for the planners and decision makers in conserving peripheral agricultural fields or forests or water bodies and guiding new development plans.

7.8 Near future and preservation of historical landscapes

Tamluk urban centre has developed dominantly in the west and south-west directions. Among the growth centres Nimtala and Maniktala are the most important areas of

development. Commercial landuse is the prime use of land of this urban centre. Sahid matangini station area, Sankarara, Dharinda, Tamluk station area, Vivekananda nagar and Tamluk college area can be considered most important for future development especially for residential purpose. Among them Dharinda and Vivekananda nagar are the most promising for long term growth.

The growth of the Contai urban centre has taken place in almost the all directions. Among the growth centres Puratan bazar, and Canal parh are the most significant areas of development. Commercial landuse is the prime use of land of this urban centre. Padapukuria, Banamalipur, Jhalkabarh, Bankaberiya, Baghmari, Hospital, Kalikapur and Contai bazar area can be considered most potential areas for future residential development. Among them Padapukuria, Banamalipur and Hospital area are the most promising for development in near future.

Midnapore urban centre has developed dominantly in the east, north-east and north-west region. Among the growth centres Barabazar and Keranitola are the most important areas of development. Commercial landuse is the prime use of land of this urban centre. Dharma, Surya nagar, Talkui, Keranichati, Abas, Khairulla chak, along Dherua road and Hosnabad can be considered most important for future residential development. Among them Khairulla chak, Talkui and Keranichati are the most promising for development in near future.

For the economic stability and progress of an urban centre it is an urgent necessity to create a close connection with the CBD. That is why the adjacent areas of the urban centre start to develop and create pull factors which encourage convergence of marginal areas to the centre of the urban area. As a result converging development takes place. Again for the sustainable

development of the urban centre it is necessary to identify some locations for future development. The study aims to identify some potential areas for residential development. Thus, this study will help for developing future planning strategy.

The popular opinion is that it is more simple, beneficial and cheaper to build new buildings instead of preserving the old ones. But, there has been sufficient respect to the old architectures or historical landscapes in these three early urban centres. Preservation and restoration plays a cultural role. Historical landscapes enlighten us about the history, who lived in different times and different societies. Architectural monuments cultivate pride of past and heritage making us unique in the world. That is why the historical landscapes of these three urban centres are important for study.

Chapter 8: Discussion, major findings and conclusion

8.1 Introduction

The study was set out to explore the geographical evolution of the landscape, economic history, morphological analysis, sphere of influence and growth trends of Tamluk, Contai and Midnapore, three early urban centres of South Bengal in geo-historical point of view. The general theoretical literatures of this subject especially in the context of geo-history of Tamluk, Contai and Midnapore urban centres are inconclusive on several vital questions. Therefore, the study sought to answer five of these questions.

8.2 Discussion and major findings

The main empirical findings are chapter specific and were summarized within the respective empirical chapters. This section will synthesize the empirical findings to answer the study's five research objectives.

During the period of initiation, Tamluk was characterized by low lying marshy land and due to depositional reworking of river Hoogly and Rupnarayan it came into existence as an elevated land surface where port activities began to be carried out. After 8th Century A.D., the river mouth of Hoogly and Rupnarayan ceased functioning due to siltation and the port Tamluk got a huge set back. Hijili emerged as a new port in the coast of Bay of Bengal with trading potentialities. Based on Hijili port, Contai urban centre has emerged as a dune based urban centre after shoreline declination. Sea level fall and consequent isostatic adjustment led Midnapore urban centre to rise as an upland over which laterization process became dominant to shape its geomorphology.

Tamluk become a renowned port by 700 B.C. Eastern India maintained trading of copper and horse through Tamluk port upto 8th Century A.D. After that Tamluk port lost its importance and became a slave market. After 8th Century A.D., Hijili port emerged. Silk, linen and cotton fabrics were produced in Midnapore during medieval period and pre-colonial period. During colonial period, piece goods and white cloths from Midnapore and salt from Contai were main produced articles. European trade of these articles appears to have flourished around Contai but during post colonial period, overseas trade was on decline as European merchants became vulnerable to Indian freedom movement. Obviously, all the manufacturing industries failed to retain its viability as before. Till 2002, Midnapore was the headquarters of Midnapore district and after 2002 Midnapore district was divided into two and consequently Tamluk and Midnapore became the headquarters of Purba and Paschim Midnapore district. And Contai became the headquarters of Contai sub-division. Presently, along with their administrative functions these urban centres exist as local commercial centres with five types of economic activities. Four or five types of economic activities are in the core of these urban centres and two or three types are in the periphery.

The study shows that ten types of morphological components are found in these three early urban centres, with an exception of two new morphological components, namely historical landscape and restricted residential areas. As these three are historical urban centres, history is mirrored in the morphological features. These urban centres have been comprised of mainly square shaped architectures along with different historical architectural design like arched, arched with curving works, dome with curving works, square with curving works etc. Sometimes mixed special type of architectures has been also found like Bargabhima temple

(Hindu, Buddhist and Oriya type of architecture) in Tamluk urban centre. The core building blocks have historical architectures and it is mirrored in the new buildings associated or nearer to it. They sometime follow the old architectural designs. But the shadow is totally absent in case of the new building in the periphery building blocks of these urban centres.

These three urban centres maintained trade relations through Tamluk port upto 8th Century A.D. and through Hijili port after 8th Century A.D., with Singhal, Maldives, Bali, Lambok, Sumatra, Enam, China, Europe countries, African countries, Singhbhum etc. But the present sphere of influence is positively related to their functional weightage which leads to socio-economic development. Quantitatively, an urban centre with higher functional weightage exerts an influence upon the larger area of its surrounding. Functional Weightage of Tamluk, Contai and Midnapore urban centres are 313.14, 719.42 and 855.12. Presently, these three urban centres exists as local commercial centres with grossly reduced their zone of influence.

One direction has been towards Nimtouri through Hospital crossing and Dharinda. And another growth can be seen towards Tamluk station area through DM office area and Vivekananda nagar. In future, Tamluk and Nimtouri may be merged together and considerable growth in that direction has already taken place. The growth of Contai urban centre has been in the all directions i.e. towards Kalikapur through Hospital area, towards Contai railway station area through Padmapukuria, towards Kharagpur bypass through Canal parh and Contai bazaar and along Digha road through Banamalipur, Jhalkabarh and Bankaberiya. The growth of Midnapore urban centre has been towards Keranichati and Hosnabad through Golkua chak and Dharma in the east. Another growth can be seen towards

the Khairulla chak through Ashoknagar and Tantigeria. In future, Midnapore and Kharagpur may be merged together and considerable growth in that direction has already taken place.

8.3 Strengths of the study

The strengths of the present study are as under.

- The classification of residential and commercial areas was developed through intensive questionnaire survey in all the building blocks of these three urban centres. Through these classification, a complete picture of urban morphology emerged.

- Kolkata metropolitan urban centre being a historical and largest urban centre in eastern India radiates its influence about upto 120 Km. and in comparison these three urban centres have the adequate facilities. Through this comparison adequacy of urban facilities in these urban centres cleared.
- The growth centres and their dominance were identified by number of population served. Through this study future growth trend and potential areas for future expansion were identified which will help for future planning purpose.

8.4 Limitations of the study

The study has offered an geo-historical perspective of early urban centres on socio-economic transformations, and was conducted in three early urban centres of south Bengal as well as in eastern India through direct field survey and secondary data and information collection from literatures, coins, historical architectures, preserved historical item etc. As a direct consequence of this secondary data and information collection methodology, the study

encountered a number of limitations, which need to be considered. Unavailability of secondary data and information during some period of time is the major limitation during this study. Besides the available information were not always to easy to use in the study because of their structure and arrangement.

There are many western morphological models of morphological analysis which are often not applicable to Indian situation due to their differential urban landscape, characters of residential and commercial areas and system of urban management. Ofcourse these models are quite efficient in the context of western urban centres. Technically and statistically these models are of high order due to their achievable results in developed countries. But their relevance in Indian as well as in historical urban centres of south Bengal is questionable.

8.5 Future scope of research

Further research will be valuable on methods and measuring growth of these three early urban centres. Future research also is needed to examine the distribution pattern and evolution characteristics of urban sphere of influence. Furthermore, the urban hierarchy and relationship among urban agglomeration regions can be studied in future.

Application of morphological model from developed countries can be examined after testing its applicability and efficiency to early urban centres in developing countries. This research work will be helpful for further study in this direction.

8.6 Conclusion of the Conclusions

In spite of what is often analyzed about the geo-history of Tamluk, Contai and Midnapore urban centres, geo-history in practice has offered only solution of historical transformations of socio-economic elements which proceed not only different time scales but also at different spatial scales since pre-historic period. Without analyzing the past, it is ineffective to enter into the present and estimate the future. Therefore, the advantage of geo-historical analysis of Tamluk, Contai and Midnapore urban centres is that this analysis simulates the future of these urban centres by analyzing the Pre-historic, Historic and Proto-historic data and information with the present context.

Annexures

Annexure - A

Total score of Tamluk urban centre

Name of the zones	Food and Raw Material			Traditional Service			Handicraft Service			Industrial Products			Modern Service			Other Service			Total score
	f	w	s	f	w	s	f	w	s	f	w	s	f	w	s	f	w	s	
Sahid Matangini	11	5	55	12	4	48	1	2	2	25	6	150	7	3	21	1	1	1	277
Maniktala crossing	22	5	110	23	4	92	8	2	16	62	6	372	10	3	30	0	1	0	620
Jailkhana crossing	12	5	60	16	4	64	0	2	0	14	6	84	7	3	21	0	1	0	229
Steamerghat	80	5	400	32	4	128	12	2	24	75	6	450	14	3	42	0	1	0	1044
Bhimarbazar	10	5	50	8	4	32	7	2	14	24	6	144	13	3	39	0	1	0	279
Parbatipur	11	5	55	9	4	36	20	2	40	51	6	306	9	3	27	0	1	0	464
Beltala	0	5	0	11	4	44	5	2	10	18	6	108	0	3	0	0	1	0	162
Salagechia	7	5	35	24	4	96	5	2	10	59	6	354	7	3	21	0	1	0	516
Nimtala crossing	11	5	55	6	4	24	0	2	0	7	6	42	3	3	9	1	1	1	151
Hospital crossing	69	5	345	49	4	196	6	2	12	142	6	852	64	3	192	5	1	5	1602
Barabazar	228	5	1140	52	4	208	53	2	106	227	6	1362	41	3	123	0	1	0	2939
High road bazar	48	5	240	45	4	180	5	2	10	117	6	702	61	3	183	5	1	5	1320
Radhaballavpur	60	5	300	27	4	108	7	2	14	59	6	354	24	3	72	1	1	1	849
Tamluk station area	0	5	0	7	4	28	0	2	0	6	6	36	1	3	3	0	1	0	67

f = Frequency, w = Weightage, s = Score.

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Annexure - B

Suitable service pattern of Tamluk urban centre

Name of the commercial areas	Suitable service pattern	Value of suitable service	Services				
			F	T	H	I	M
Sahid Matangini	Fourth	14.3	✓	✓		✓	✓
Maniktala crossing	Triple	15.6	✓	✓		✓	
Jailkhana crossing	Triple	5.8	✓	✓		✓	
Steamerghat	Triple	10.9	✓	✓		✓	
Bhimarbazar	Fifth	10.9	✓	✓	✓	✓	✓
Parbatipur	Fifth	16.0	✓	✓		✓	✓
Beltala	Triple	15.6	✓	✓			
Salagechia	Double	19.5		✓		✓	
Nimtala crossing	Triple	9.1	✓	✓		✓	
Hospital crossing	Fourth	10.8	✓	✓		✓	✓
Barabazar	Double	15.2	✓			✓	
High road bazar	Fifth	8.8	✓	✓	✓	✓	✓
Radhaballavpur	Fourth	9.6	✓	✓		✓	✓
Tamluk station area	Double	5.0		✓		✓	

F = Food and raw material, T = Traditional, H = Handicraft, I = Industrial, M = Modern.

Annexure - C

Suitable service pattern of Contai urban centre

Name of the commercial areas	Suitable service pattern	Value of suitable service	Services				
			F	T	H	I	M
Jaganathpur	Triple	10.8	✓			✓	✓
Baghmari	Double	4.9	✓				✓
Super market	Fifth	13.8	✓	✓	✓	✓	✓
Block office market	Fourth	12.6	✓	✓		✓	✓
Canal parh bazar	Fifth	13.2	✓	✓	✓	✓	✓
School bazar	Fifth	9.5	✓	✓	✓	✓	✓
Banamalipur	Double	9.3	✓				✓
Dhandighi	Fourth	10.1	✓	✓		✓	✓
Damodarpur	Fourth	11.2	✓	✓		✓	✓
Puratan bazar	Triple	9.6	✓	✓	✓		
Contai bazaar	Fifth	12.3	✓	✓	✓	✓	✓
Padapukuria	Double	6.2	✓				✓

F = Food and raw material, T = Traditional, H = Handicraft, I = Industrial, M = Modern.

Annexure - D

Suitable service pattern of Midnapore urban centre

Name of the commercial areas	Suitable service pattern	Value of suitable service	Services				
			F	T	H	I	M
Tantigeria	Fourth	10.8	✓	✓		✓	✓
Ashoknagar	Fifth	10.7	✓	✓	✓	✓	✓
Station road area	Fifth	9.5	✓	✓	✓	✓	✓
Bus stand area	Fourth	10.1	✓	✓		✓	✓
LIC crossing	Fifth	9.6	✓	✓	✓	✓	✓
Sepoybazar	Fourth	11.9	✓	✓		✓	✓
Kote bazar	Fourth	10.2	✓	✓		✓	✓
Raja bazar	Fifth	13.5	✓	✓	✓	✓	✓
Dharma	Double	8.3	✓				✓
Golkua crossing	Fourth	8.6	✓	✓		✓	✓
Zilla parisad bazar	Fourth	9.1	✓	✓		✓	✓
Rabindranagar	Triple	9.2	✓			✓	✓
Keranitola	Fourth	10.4	✓	✓		✓	✓
Judge's court area	Fourth	9.3	✓	✓		✓	✓
Mirza bazar	Fifth	10.0	✓	✓	✓	✓	✓
Bat tala	Fourth	11.7	✓	✓		✓	✓
Barabazar	Fifth	14.9	✓	✓	✓	✓	✓
Chottabazar	Fourth	12.6	✓	✓	✓		✓
Patnabazar	Fifth	12.8	✓	✓	✓	✓	✓
Boxibazar	Triple	11.6	✓			✓	✓
Jaganathmandir and Natunbazar	Triple	13.2	✓	✓	✓		
Amtala	Double	8.6	✓				✓

F = Food and raw material, T = Traditional, H = Handicraft, I = Industrial, M = Modern.

Annexure - E

Nature of commercial areas of Tamluk urban centre

Name of the commercial areas	Nature of commercial areas	
	Wholesaling	Retailing
Sahid Matangini		✓
Maniktala crossing	✓	✓
Jailkhana crossing		✓
Steamerghat	✓	✓
Bhimarbazar	✓	✓
Parbatipur	✓	✓
Beltala	✓	✓
Salagechia	✓	✓
Nimtala crossing	✓	✓
Hospital crossing	✓	✓
Barabazar	✓	✓
High road bazar	✓	✓
Radhaballavpur		✓
Tamluk station area		✓

Annexure - F

Nature of commercial areas of Contai urban centre

Name of the commercial areas	Nature of commercial areas	
	Wholesaling	Retailing
Jaganathpur		✓
Baghmari	✓	✓
Super market	✓	✓
Block office market	✓	✓
Canal parh bazar	✓	✓
School bazar	✓	✓
Banamalipur	✓	✓
Dhandighi	✓	✓
Damodarpur		✓
Puratan bazar		✓
Contai bazaar		✓
Padapukuria		✓

Annexure - G

Nature of commercial areas of Midnapore urban centre

Name of the commercial areas	Nature of commercial areas	
	Wholesaling	Retailing
Tantigeria		✓
Ashoknagar		✓
Station road area	✓	✓
Bus stand area		✓
LIC crossing	✓	✓
Sepoybazar	✓	✓
Kote bazar	✓	✓
Raja bazar	✓	✓
Dharma	✓	✓
Golkua crossing	✓	✓
Zilla parisad bazar	✓	✓
Rabindranagar	✓	✓
Keranitola	✓	✓
Judge's court area	✓	✓
Mirza bazar	✓	✓
Bat tala	✓	✓
Barabazar	✓	✓
Chottabazar	✓	✓
Patnabazar	✓	✓
Boxibazar	✓	✓
Jaganathmandir and Natunbazar	✓	✓
Amtala		✓

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