



Factors Affecting Location and Siting of Settlements

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Abstract

Location of a settlement means the place where a settlement is situated i.e. with relation to geographical location and ecological conditions. A site is correlated with precise characteristics of the landscape on which the settlement began and over which it spread. The site is taken as an important criterion for the classification of rural settlements. Bengal Delta is the largest delta in the world on which the major part of Bangladesh lies. The purpose of this study is to find out the factors that affect the location and siting of the settlement of the Bengal Delta. The study was taken place through the phenomenological observation of twenty-two case study settlements in different locations and zones of the coastal region of Bangladesh. Key informants' interview (KII) was considered as the major data collection tool. Studies show that there are three sets of factors that affect the sites and location of rural settlements. They are- physical factors, socio-cultural factors and economic factors. In this article, these factors are discussed with case study references which is a vital part of settlement studies.

Keywords: Human settlement, Bengal Delta, siting of settlement, settlement formation.

I. Introduction

Location, site and context are three important aspects in the study of human settlement. Location of a settlement indicates the place where an object or settlement is situated viz. with reference to latitude, longitude, distance, direction and ecological conditions. A site, on the other hand, indicates the land on which the houses and other structures of the settlement are built with relation to surroundings (Rashid, 2017). In other words, a site associated with precise features of terrain on which the settlement began and over which it spread. There is a close relationship between the site and the physical environment of the area. Selection of settlement site is always governed by attractive and restrictive forces of physical setting i. e. geology, relief, drainage, soil, climate and available materials. The situation is related to physical and cultural conditions over a much wider area (Mandal, 1989). Chisholm (1962) indicates the importance of arable land, grazing land, water, building material and fuel as site determining factors. Preston E. James (1969) expresses it "as we identify things geographically because they deal with location". For Paul Vidal de-la Blache (1926) the whole of geography lay in the idea of 'Place' and geographically, the first

question of all is 'where'? Dickinson (1949), Brunhes (1952) and Peter Haggett (1965) also discussed the location and siting of settlements.

Chisholm (1962), suggested the classification of settlements and the description of the relationship between man and his physical environment. The study of rural settlement systems established in relation to the localization of resources is often important (Rashid and Khan, 2021). Rural settlement systems can be seen as adjustments to a combination of physical, biological and cultural parameters so that it can be anticipated that a shift in one or more inputs can lead to a system re-adjustment (Barker, 1969).

Physical, economic and cultural factors influence the location and siting of settlements (Rashid, 2020). Sometimes combined effect of all these factors or sometimes one or two factors assist in determining a settlement's location. The classification of settlements according to the suitability of site/location assists in highlighting the various kinds of geographical advantages which lead to the origin and growth of settlements (Cain, 1963). Physical features and landscape play an important role. Arable land, grazing land, a perennial source of water, adequate transportation

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and communication link, building material and fuel are site determining factors. Water is the most important factor in determining the site. Riverbank, river confluence, stream, river island, coastal and well settlements are significant sites related to hydrographic features.

II. Bengal Delta: The Study Area

Deltas are the unique result of the interaction of rivers and tidal processes resulting in the sedimentary deposits on the world's continental shelf (Rashid, 2020). Although comprising only 5% of the world land area, deltas have up to 10 times higher than the average population and agricultural production due to land fertility (Ericson et al, 2005). The major part of Bangladesh lies in the Ganges-Brahmaputra-Meghna Delta (GBM Delta), which in this paper is called Bengal Delta. It is the world's largest and the most populated delta (Ericson et al, 2005) and encompasses approximately 100,000 km² of Bangladesh and West Bengal, India. Most of the delta population depend on water-based livelihood for their survival. 156 million people live in Bengal Delta, despite the tropical cyclones, tidal surges, floods caused by heavy monsoons.

Tropical coastal areas of the deltas present one of the most challenging settings given their diverse character and location at the land–water interface. These areas are home to large populated centers and are significant centers of agricultural production and development (Rashid, 2018). Coastal areas of the tropical deltas also contain critical and sensitive ecosystems such as mangroves and a rich collection of flora and fauna induced cultural resources.

III. Methodology

The objective of this study is to identify the factors that affect the selection of the location of the settlement formation and evaluation in Bengal Delta. In this study, the author used the phenomenological approach to find the basic logic beneath the selection of location and evaluation of settlement. Among other approaches), this approach is most closely aligned with the study's objective.

Phenomenological methods are epistemologically based on a paradigm of subjective knowledge and subjectivity and emphasize the value of personal perspective and logical reinterpretation challenging the existing (Eagleton, 1983; Kruger, 1988; Moustakas, 1994; Creswell, 2013). As such, they are powerful in interpreting subjective experience, gaining insights into the motives and actions of people, and cutting through the clutter of stereotypes and traditional wisdom taken for granted (Husserl, 1970).

The study is conducted in some areas from the coastal region of Bangladesh from eight (8) coastal districts (adjacent to the Bay of Bengal) which represent different zones, stages and characteristics of the Bengal Delta, and which are still active and in a formative stage. The study area is distributed into three geographical zones (Table 1, Figure 1). These areas are assumed to represent the scenario of the Bengal Delta thousands of years back.

Table 1: Zoning for the study area.

Zone	Districts	Basin	Delta
Zone-A	Borguna Patuakhali Bhola	[Western Zone] at Ganga- Padma Basin	Old Delta
Zone-B	Lakshmipur Noakhali Feni	[Central Zone] at Surma- Kushiyara Basin	New Delta
Zone-C	Chattogram Cox's Bazar	[Eastern Zone] Basin of Chittagong Region	Foot Hills

The field survey is conducted in a total of twenty-two generic settlements (10 from Zone A and 6 from the other two zones) with physical and ethnographic observation, key informant interviews, questionnaire survey and mapping.

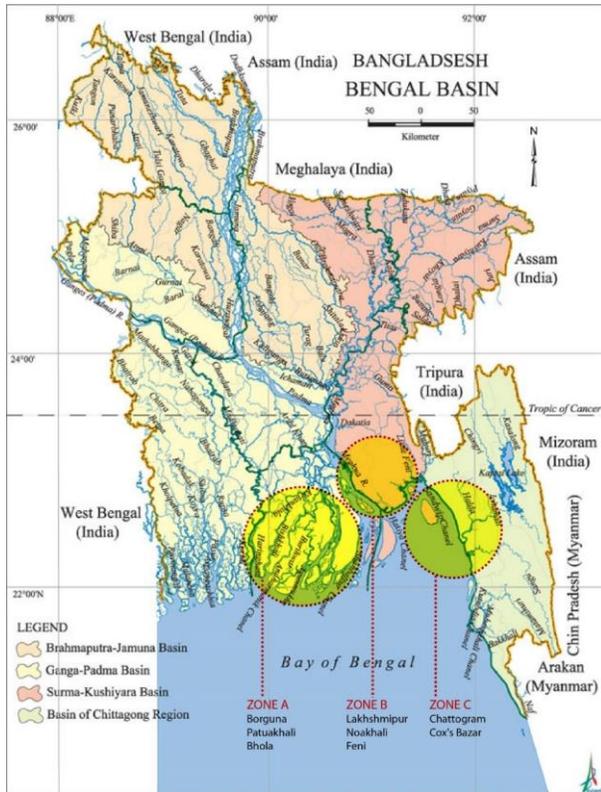


Figure 1: Zoning for the study area.

To conduct the phenomenological study Key Informant Interviews (KII) was conducted. KIIs include interviews with individuals who have especially knowledgeable viewpoints on an aspect of the event being evaluated. They are loosely structured, depending on a set of issues to be addressed. Interviewers spontaneously frame questions, scan for information and take notes that are further expanded (USAID, 1996). KIIs are qualitative and in-depth. In the present study, key informants are chosen from those who are expected to have specialized information on particular topics. A total of 22 Key Informant Interviews (KII) (i.e. one from each settlement) have been conducted with the old knowledgeable person or local community head.

IV. Factors Affecting Location and Siting of Settlements

The site and form of settlements are interwoven in a very complex manner and sometimes the site is taken as an important criterion for the classification of rural settlements. There are three sets of factors that affect the sites

and location of rural settlements. These factors are:

- 1) Physical factors
- 2) Socio-cultural factors
- 3) Economic factors

The relative importance of one or the combined effect of various factors decides the location of a settlement. Several physical, socio-cultural and economic factors are important in the settling process. The locational sites of villages in the study area have been identified after a careful study of the village's sites from the field survey.

IV.A. Physical Factors for Selection of Settlement Location

It is observed that the physical influence plays an important role in the location and site of rural settlements. Physical factors that attract humans to select a site for settlement include water bodies (for transportation routes, water for drinking and farming), flat land (for easy to build houses), fertile soil (for crops), forests (for timber and housing) etc.

In a broad line, the physical factors can be distributed into two categories:

- a) Sites related to Hydrographic features
- b) Sites related to Physiographic features

19 settlements of the three case study zones are found sited based on the physical factors among them 8 are related to hydrographic and 11 are related to physiographic features.

IV.A.1. Sites related to hydrographic features

Hydrographic features are the most important determinants for the selection of the location of a settlement in Bangladesh (Khan, 1996). There are 8 case study settlements are built near the water bodies, hence most of the settlements have a site related to water bodies. Water is a very important resource that attracts settlement. It is used for domestic/irrigation purposes, pastoral operations and in some situations, for transport purposes where the river is navigable.

Considering different types of hydrographic features, the surveyed settlements may have categorized into three different types. They are:

- i. River side settlement
- ii. Confluence side settlement
- iii. Canal side settlement

In flood-affected areas and marshy lands, settlements are not found near the river side or in the marshy areas. In such situations, the settlements are situated at a drier point. In river valleys, high terrace plains are selected for the location of settlements, while in marshy areas the parts which are raised over the sea level and remain dry for most period of the year are favored for the location of settlements. One the relatively higher terrain dig-elevate-dwell process of settlement starts.

River side settlement: River side attracts human agglomeration, likewise, several settlements in the study region are located on the river bank. Kumira Jele Para of Zone-C was developed adjacent to the Coast and river towards to coast. As the village is for fishermen this location is suitable for this settlement. Char Duani of Zone-A is situated alongside the Haringhata river of Patharghata Upazila of Barguna district. Clusters dot along the river.

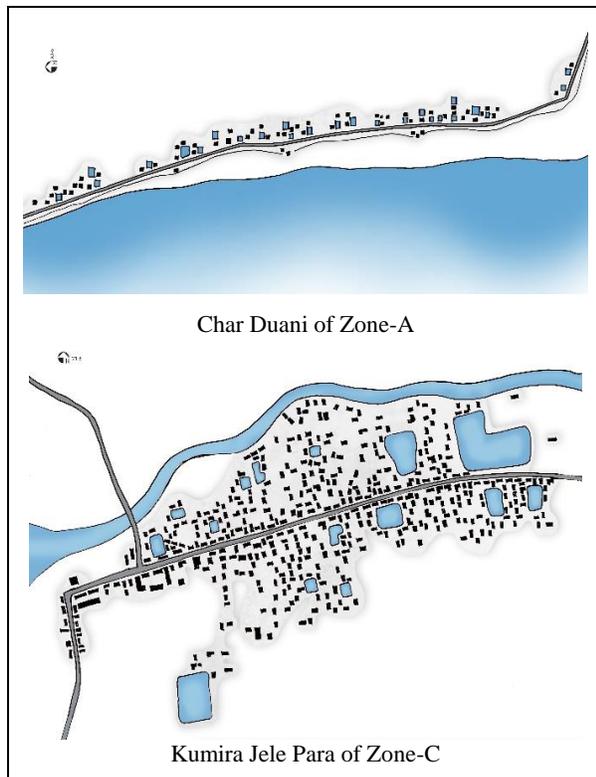


Figure 2: River side settlement.

Confluence side settlement: The river confluence sides have been attracting people since historical times as good navigation junctions. Jinntola and Padma Char of Zone is an example of such settlement.

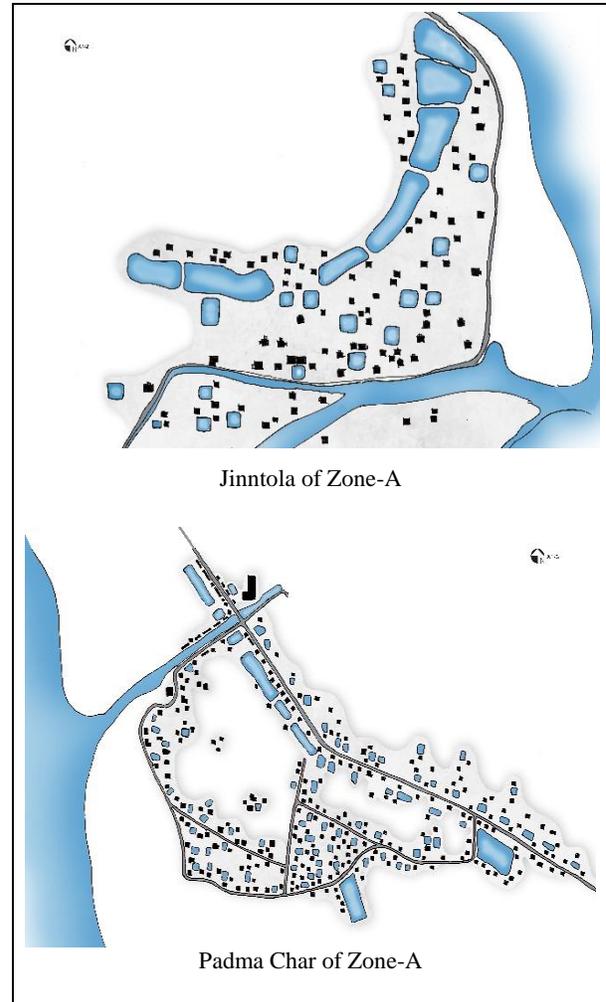


Figure 3: Confluence side settlement.

Canal side settlement: A canal provides a permanent source of water for agriculture and drinking. Naturally, the people who have their lands near the canal side prefer to stay at the canal side. Five settlements have developed in three zones of the study area along the canal. Canal side settlements are the modern time development and attract people due to water and transportation facilities. Canals are developed for irrigation purpose and to develop a road/embankment. Since the canals are not much developed in the study region, the canal side settlements are fewer in the study region.

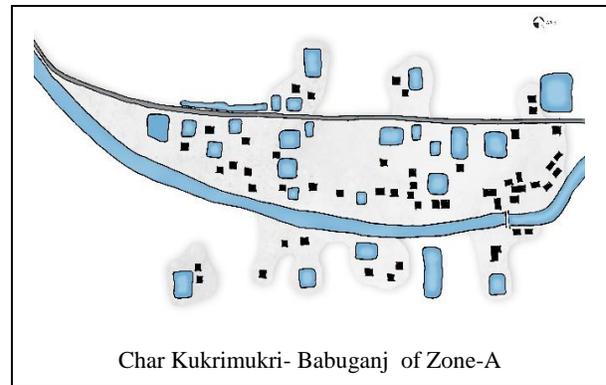
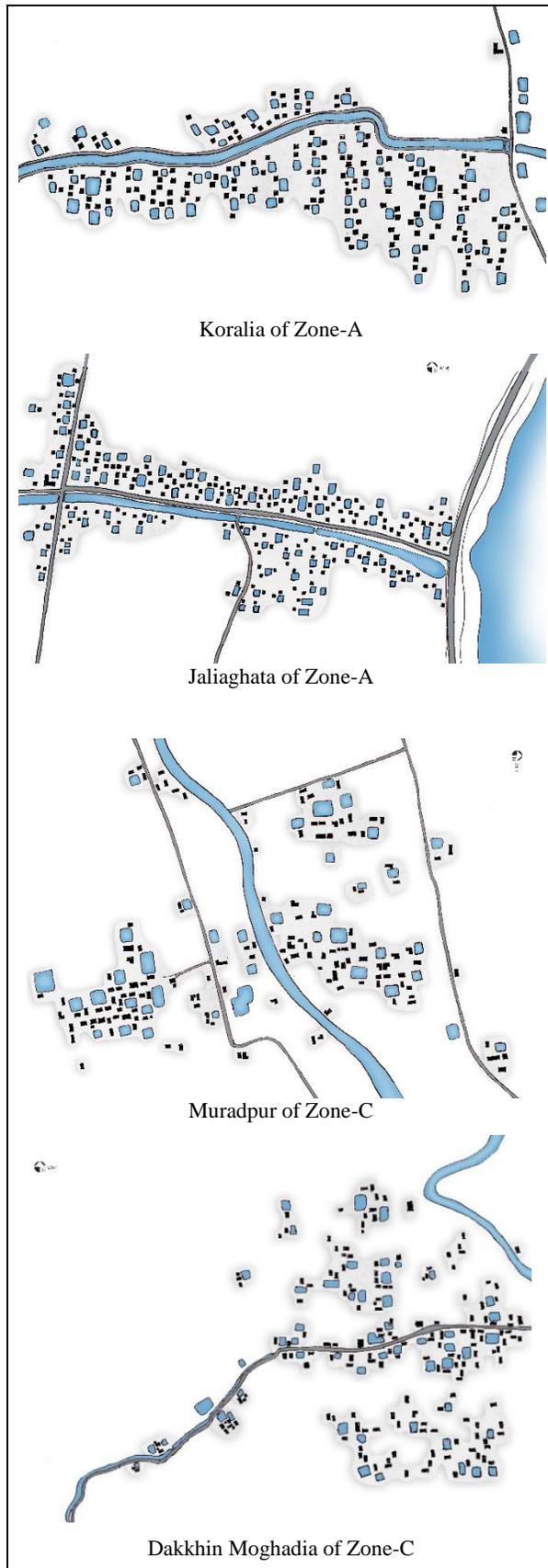


Figure 4: Canal side settlement.

IV.A.2. Sites related to physiographic features

After discussing the various rural settlement sites related to water bodies, it is appropriate to understand the definitive role of the physical features in siting the settlements. Among the physical factors determining or controlling the sites of settlements are the suitability of available land for occupancy and cultivation besides easy accessibility.

In deciding the site and location of rural settlements, the physiography of the region plays a significant role. In the spatial distribution of rural settlements, some settlements are found to be centrally located and often visited by the people of surrounding villages. Such central sites of the villages make them the villages of centrally importance, market villages and central places develop at such points. The centrality helps them grow into hat/bazar/ganj and a township.

Followings are the consideration of physiographic features that determine the location of settlements.

- i. Easy communication site
- ii. Fertile land site
- iii. Flood protected site

Easy communication site: Physical communication is important for the evolving of a settlement. The proximity of the transportation route (road/canal/river) is an important element that attracts the location of the settlement. A significant aspect that affects settlement patterns is the need to connect with other places for trade and transport purposes. Sometimes, villages are situated along transport routes and lines of

communication. Four settlements in the study area can be classified as 'Road side' settlements. Roads are the contemporary form of historic deltaic water channels.

Fertile land site: Agriculture is identified as a sole and predominant factor influencing various nomadic groups to settle permanently in a place across the world (Abrams, 1964). Where the soil is fertile, land available for cultivation is sufficient, water is enough for irrigation, all these factors have encouraged the growth of settlements in a location. As agriculture is the major mean of living, people always give preference to locate their settlement where fertile land is available, obviously along with the same water source.

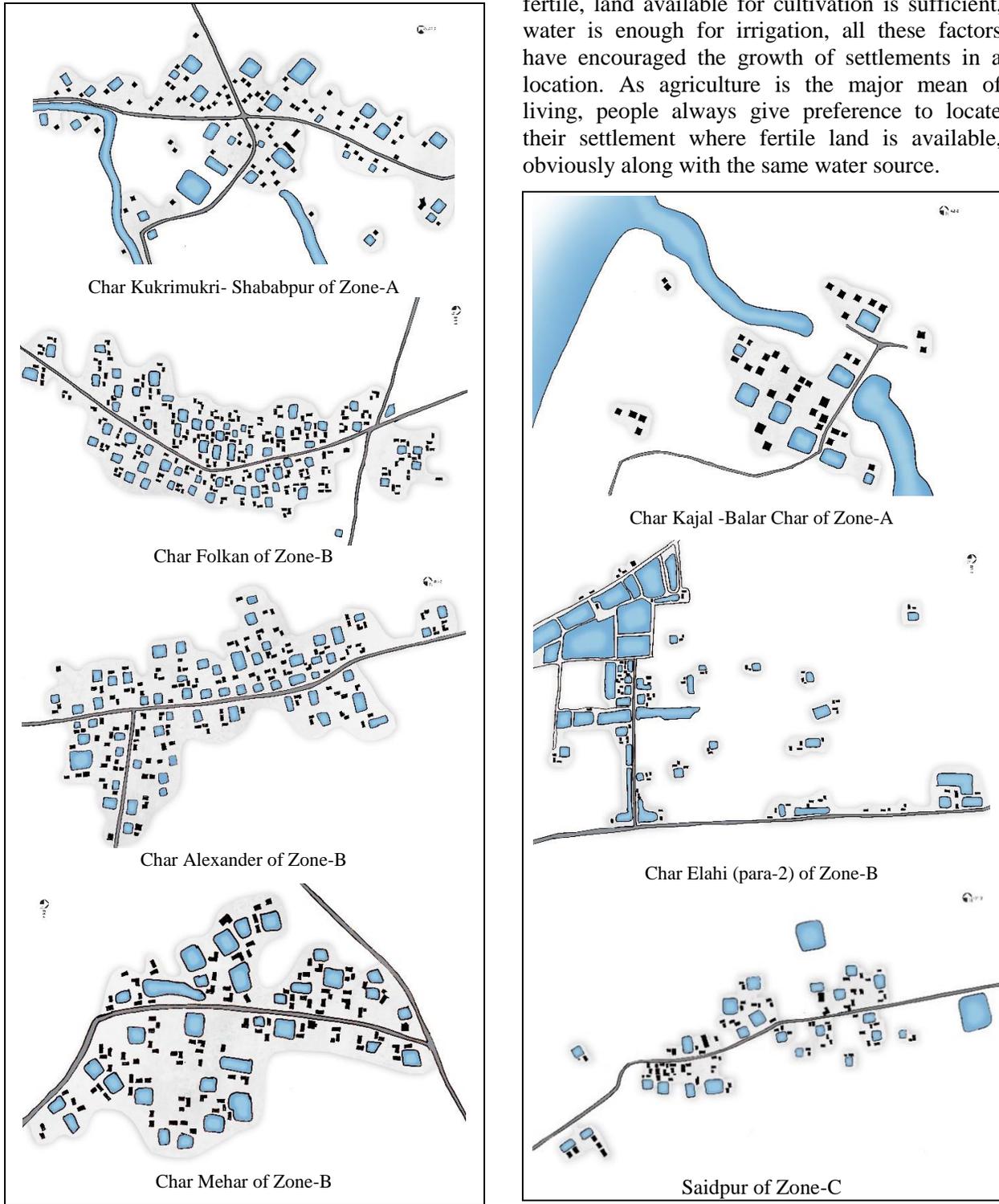


Figure 5: Easy communication site Settlement.

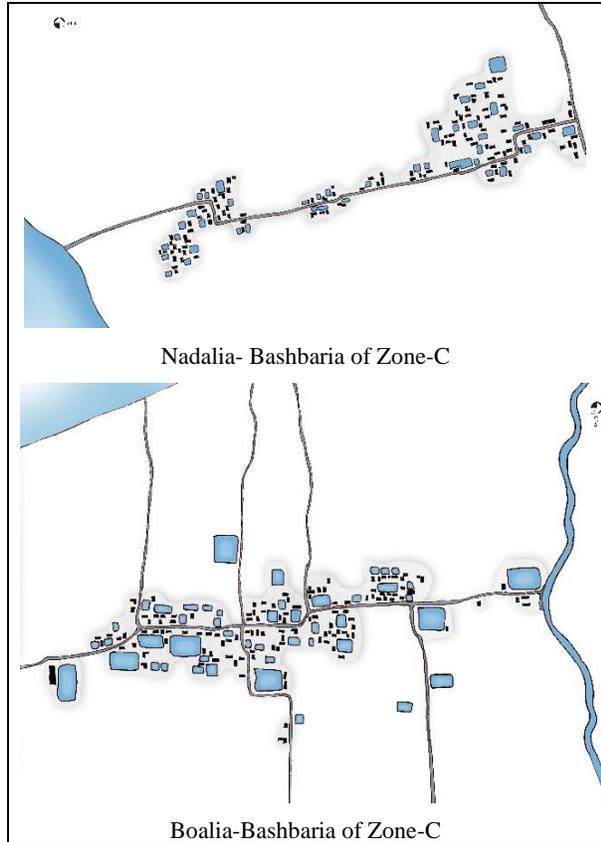


Figure 6: Fertile land site Settlement.

Flood protected site: In Bengal Delta, people try to select a site that is protected from the flood. In the field survey, it is found that the government makes embankment to protect the land from floods and tidal surges. People then are attracted to such protected land for their settlement. Char Montaj and Char Duani of Zone-A are examples of such locations. Settlements of Zone-B have also come up inside the embankment alongside the coast.

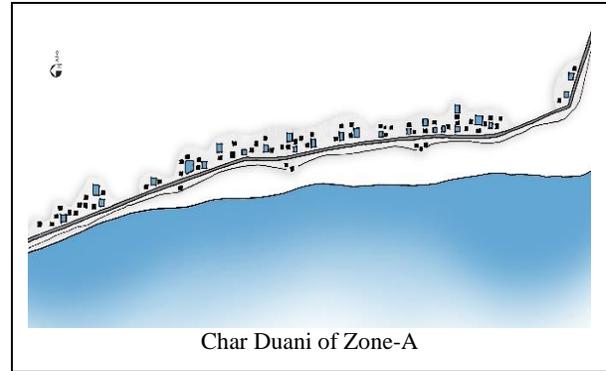
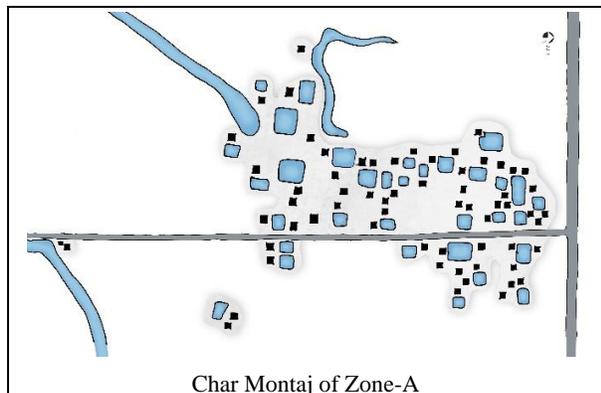


Figure 7: Flood protected site settlement.

IV.B. Socio-cultural Factors for Selection of Settlement Location

Cultural and social factors have always played an important role in giving locational importance to certain points. Sometimes a site of an ancient temple or a tomb of a historical man or historical monument attracts people and villages are established. As a social species, human always tends to live in society. They have their own belongingness to society and community (Rashid, 2013). When some river eroded people shift their homestead to a new location, other people from the same community try to build their houses in the same location. They follow because of their kinship. People feel comfortable in the previous community though the location is completely new (Rashid, 2015). Balar Char of Char Kajal and Char Jogobondhu are examples of this type of settlement. People came to settle their homestead in a new location in a group in these villages.

In Bengal, the rural classification was based on the agricultural arrangement. Earlier the total land ownership was united for which there was no personal ownership. According to tradition, all lands were of the society and according to necessity, the lands were redistributed. Though the family-oriented private property was recognized but still for many years, the relationships among the families were present due to their sense of responsibility and co-operation but this relationship gradually lost its essence when this kind of ownership was converted into private ownership. The situation was described by Baden-Powel (1892) is as follows- “though one-third of the land was under group ownership but still two-third of the ownership was personal.” Land ownership plays a role in the selection of

settlement locations. When people need to start building their homestead, they feel secure to have their own land. By this study, it is found that people may earn ownership of land by two means.

- i) By purchase
- ii) By succession
 - a. By patriarchal succession
 - b. By matriarchal succession

Getting land by purchase and by patriarchal succession and start building their homestead is very common for rural settlement in this delta. But building a house on land that is owed by matriarchal succession is uncommon here. Such a case is found in Boyatibari of Char Kukrimukri. The settlement started its beginning more than 60 years ago by some river eroded people from the mainland of Bhola district. These people came here as some of them owned land from their matriarchal heir. They prefer to use this land rather than purchase another. Thus they shifted their settlement in this isolated island and created some new generic villages.

Kumira Jele Para is another example of the socio-cultural impact on the location for settlement. They are considered low-cast in Hindu societies. Though the settlement is in a very dense situation and very congested, for the sake of the community the inhabitants do not move their house from the location.

IV.C. Economic Factors for Selection of Settlement Location

Various economic factors also determine the location and siting of settlements. Economically valuable sites are preferable by people. On the other hand, when the question of purchase comes, cost becomes an important consideration. Land adjacent to homestead or viti land has a higher price than the agricultural land. Roadside land is expansive than the land which has no connection with the formal road. The price of the old landmass is higher than the newly raised char. This is why people relocate their house and start building their new settlement in a far distant newly raised char. Padma Char is an example of this kind of settlement. In the year 1985, 38 families start living on this newly raised landmass at the western point of Patharghata Upazila of Barguna district. As the soil was not suitable for cultivation, people

got the chance to buy the land at a cheap price. That cheap price attracted people to select the location for their settlement. Char Elahi (para-1) of Zone-B is another example of a similar factor.

Again, land near the eroding riverbank has a relatively low price as they are in vulnerable condition but affordable. Many people have land to cultivate besides the river or in their old village which is erosion affected or in the char. They have to keep those under surveillance to harvest a maximum crop. So, they prefer those lands for their settlement. Char Jogbondhu is an example of a location with these factors. It is situated beside the river Meghna at Ramgati Upazila of Lakshmipur district. This is an old landmass but eroding at a high rate day by day. The village is only 500 meters far from the river edge at present.

Affordability plays a very significant role to select the location for settlement. The Kumira Jele Para settlement, which is hundreds of years old, is very compact in nature and receives more compactness day by day due to land scarcity. But the inhabitants do not have the affordability to purchasing land near the present settlement. Due to this, they are occupying the open spaces inside the settlements.

V. Conclusion

It is observed during the field survey that the settlers are attracted by the sites which provide them sufficient safety, connectivity, affordability and land for cultivation. Location and sites of settlements are influenced by environmental factors, water supply, drainage, soil availability of agricultural land.

Since the region is dominated by agricultural landscape more than one-third of the settlements of the study region are attracted by hydrographic features such as river bank and canal. 50% of settlements are sited based on different physiographic features. Besides this, some important nodal points/roadside settlements and miscellaneous religious sites are also observed in the study region. In whatever manner the site is selected for settlement or wherever the settlement starts, it begins with the dig-elevate-dwell process with basic shelter, courtyard and pond which gradually expands and densifies (Table 2).

Table 2: Factors for selection of settlement with examples from the field survey.

Physical factors for selection of settlement location	Sites related to Hydrographic features	River Side Settlement	Char Duani, Kumira Jele Para
		Confluence Side Settlement	Jinntola
		Canal Side Settlement	Koralia, Jaliaghata, Char Kukrimukri -Babuganj, Dakkhin Moghadia, Muradpur
	Sites related to Physiographic features	Easy communication site	Char Kukrimukri – Shababpur, Char Folkan, Char Alexander, Char Mehar
		Fertile land site	Char Kajal -Balar Char Char Elahi (para-2), Saidpur, Nadalia- Bashbaria, Boalia-Bashbaria,
		Flood protected site	Char Montaj, Char Duani
Socio-cultural factors for selection of settlement location	Land ownership factors	Char Kukrimukri - Boyatibari	
	Community factors	Kumira Jele Para Char Jogbondhu Char Kajal -Balar Char	
Economic factors for selection of settlement location		Char Jogbondhu Padma Char Char Elahi (para-1) Kumira Jele para	

Most rural settlements in Bangladesh may be characterized as ‘natural’ or organic growth in response to the context. In contrast, ‘planned’ settlements are transplantations. Rural settlements have developed without any formal professional planning input. This implies that in most cases settlements have evolved here responding to the possibilities offered and constraints imposed by the local topography, climate, natural features, and availability of local resources.

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