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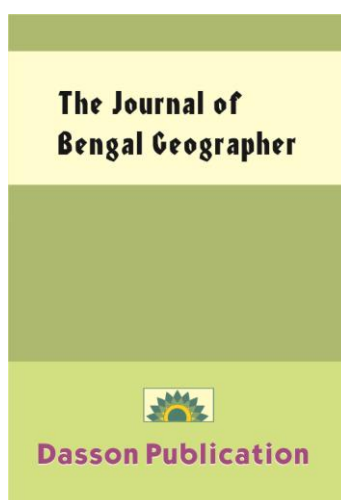
Evolution and Trend of Settlement Pattern Associate with General physiography in Bhagwanpur-I CD Block

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Abstract:

A settlement pattern is described in geographical area and refers to the way that buildings or houses are distributed in a rural settlement. Settlement patterns are settlements cluster in various shapes and sizes. The term "settlement pattern" refers to the" Characteristic groupings of population occupancy units together with the facilities in the form of house and street serve the inhabitants" it analysis the facilities developed in the process of occupancy of the land and grouping. Settlement pattern is a "The science of human settlements, including city or community planning and designing". Here is basically described that bhagwanpur-I CD block at how the trend and evolution of settlement pattern and relation to general physiography. I basically did the this study works, for my interest in this kind of work and as a result of the full cooperation from the guider, I also took up this work to get the work area too close to my college. Bhagwanpur-I CD block which is a part of Purba Medinipur District, West Bengal. This area is located 78 kilometers away from the nearest Digha sea coast. On the basic of object in this study area, to find out the evolution of settlement patterns or types in a perspective village pattern and also besides, how this evolution influences on physiography. Here has been there method mainly used the satellite image survey and Sampling survey. Which is basically a methodology of three steps, Here's the first step, knowledge gained from information related to my work and work and the information collected in the second phase has been used third, for information verification and analysis. Has been found in this research, is the settlement of the village has increased in low rates and the homesteads have improved. With rural settlement types has been seen to be more frequent. Rural settlement pattern has also increased towards attracting areas, which would later be indicated as a municipality. From this it can be said that the area will get more progress due to its own land use.

Key Word: 1.settlement pattern, 2.street serve, 3.community planning, 4.village pattern, 5.homesteads.

1.1. Introduction:

The term Settlement refers to the "Characteristic groupings of population occupancy units together with the facilities in the form of house and street serve the inhabitants" it analysis the facilities developed in the process of occupancy of the land and grouping. These facilities are designed and to serve specific purposes and hence carry functional meaning.

A human settlement is defined by geographers as a place inhabited more or less permanently by men and women. However, this definition is mainly confined to academic literature in geography study. To the common man a settlement or a place of dwelling is identified on a village or a town or a city. The discussion of settlement change pattern is closely related to the art and node of leaving and physical like water supply, relief, forests

and the nature of the site houses and streets, the chief elements of occupancies unit becomes the focal point of the study in social geography and determine the external and internal form of the habitation. The gradual modification in the external form of occupancy units indicates the change in the settlements. Settlement as on original of human beings consists of building in which they live or work and shuts over which people move. The functional inter-relationship among several settlements becomes increasingly complicated. This study covers the entire settlement change pattern situation in the span of 1991 to 2011, this study is not only related with the building grouped around the parameters form dwelling, but also with the temperature camp of the hunter or with settlement clusters or agglomerations running the scale from 1991 to 2011 settlement pattern change situations.

At though rural and urban settlements are two important wings of settlement geography, the problems and procedures of their analysis are distinct and separate. Both those branches have drawn the attention of geographers who have analysed various facts and elements and have developed distinct concepts. Urban geography has attracted more attention, while systematic and scientific analysis in case of rural settlements is still in the initial stage.

Urban and rural settlements are also concerned of economists, historians and sociologists but their leave approaches to the settlement features, such as building evaluation and their architecture style changes. The change structure of the society, become an important aspect of settlement geography. Changes in the technology of communication facilities have provided amenities for producing a different set of occupants units with different morphological structures. In such areas new settlement as well as settlement change patterns occupants units with different morphological structures. In such area new settlement have pattern treated and present a contrasting feature as a resent older settlement style are also influenced by the new settlement. At several places to the study area, new settlement have grown up on the ruined sites of the older settlement.

The functional structure of settlement closely related to social economic physical and political structure of the society. There aspects vitally, influence the shape, form and location of settlement. Each community has its distinctive religions, countries and educational institutions and these have a bearing on the development of the settlement.

In our country, the facility for the origin and development of settlement are different from those in the advanced nation of the world and require slight different approach for analogical from work and planning. Within the country its self that is great regional variation is the settlement. As a result I may self to apply district formula and analytical framework for different nuchals with varying problems and pattern of rural settlement growth.

Settlement studies appear as essential elements of research and understanding in many other branches of geography. It in closely related neighbouring fields and is obvious in literature cited throughout the project file. Even social scientists other than urban geographers such as sociologist's planners, economists have widely used and quoted urban literature in adjacent fields and have contributed every studies of values in urban geography. The house being the element of settlement geography forms a common link between many other branches of human geography and settlement geography. In is on expression of one of the three essential needs of the mankind as foods, cloning and shelter. It several not only for shelter or residence   but also as work-shed, business house, educational, building, administrative offices etc. The house become a permanent expression of culture landscape and chief elements of settlement.

Settlement patterns and its growth or change are also closely inter-related with the patterns and trends of agricultural land use that any attempt in insist on this study of these two phenomena in separate typical fields would be artificial. The settlement patterns in some area of the study region sees to determine the settlements patterns. In the Bhagwanpur-I

block. Where cultivation land was enough, due to shaped population growth and other suited caused, new day it becomes in interest view of observation.

1.2. Historical background:

Bhagwanpur is a historical place. A myth says it was 'sadar' of an old king, whose 'Rajprasad' was at 'Kajlagarh' (which is a tourist place because of this 'Rajprasad', 12 km away from Bhagwaban pur). Also Bhagwanpur led all major freedom movements at the time of independence. Many people joined the 1942 Quit India movement. This block is thickly populated and education is very high. Major two religious -Hindu and Muslims peoples reside there in harmony for long years. Peoples are mainly agricultural farmers producing-rice, jute, potato, vegetables, betel (sold in various parts of India). Many peoples struggled in Indian Freedom Movement and many of them killed by British forces. Gandhi visited bhagwanpur, Kakra, etc. villages during "Laban Satyagraha" (Salt) movement. Some Muslims are Urdu speaking. Bajkul Milani Mahavidyalaya is a Graduate College located at Bajkul in this Block.

1.3. Location of study area:

Bhagwanpur-I CD block which is a part of Purba Medinipur District, West Bengal. Here here absolute location is 22.094°N 87.759°E. The related distance between bhagwanpur-I to Digha 78 kilometer, Haldia 46 kilometer and Kolkata 130 kilometer. It has 1 panchayat samity, 10 gram panchayats, 167 gram sansads (village councils), 167 mouzas and 164 inhabited villages. The total area in Bhagwanpur-I is 18253.8 Hectare. Here Bhagwanpur-I areas East portion located Chandipur, SE portion located Bhagwanpur-II, west portion located Patashpur-I, NW portion located Paschim Medinipur and north portion located moyna. Bhagwanpur-I CD Block has 2 ferry services and 3 originating/ terminating bus routes. Deshapran is a station on the Tamluk-Digha line, constructed in 2003-04. SH 4 connecting Jhalda (in Purulia district) and Digha (in Purba Medinipur district) passes through this block.
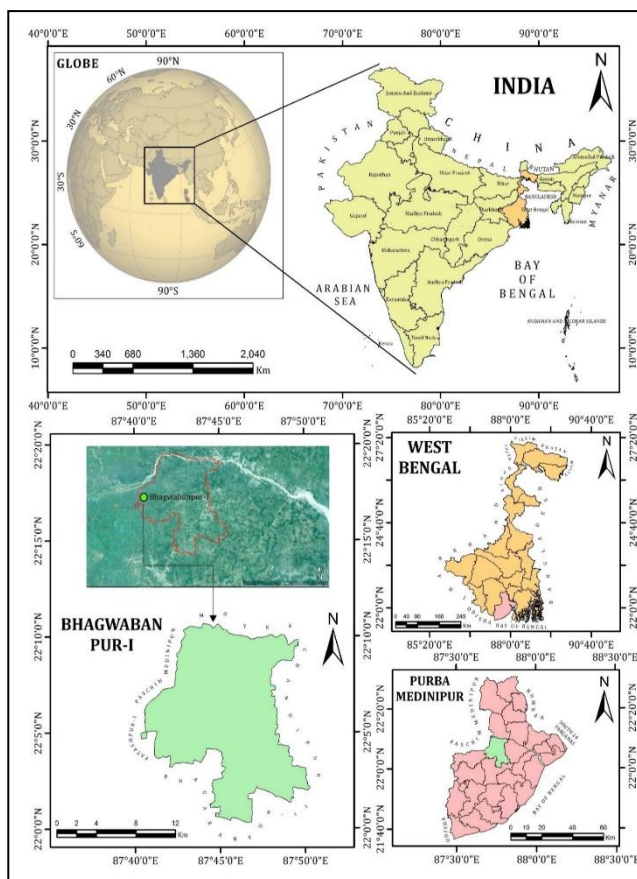
Fig. 1.1: Location of Study Are

1.4. Aim of research:

The primary aim of Geographical Research is to advance innovative and high-quality research. The aim of the research work, broad statements of desired outcomes or the general intentions of the research which 'paint a picture' in this research project.

As shown the aim of my research, Evolution and Trend of Settlement Pattern Associated with General physiography in Bhagwanpur-I CD Block. To find out the changing scenario of settlement areas and impact of selected area.

1.5. Objectives:

The main objective of geographical research is to underline that human activities are subject to adaptation and change. As for this research selected objectives, I mainly select three object:

1. To find out the relation between settlements with respect to physiography.
2. To find out the evolution of settlement patterns.
3. To find out the changing scenario of settlement areas and its impact of the selected study area.

1.6. Methodology:

For this study area, a systematic approach has been followed. The analysis of geographical condition has been made keeping in view their relation settlement and physiography.

The analysis of settlement change relation with dynamic land use has been used with the help of satellite image and intensive field survey. The visit study area, extensive

literature review and experiment documentary analysis are three key measure to prepare this field report.

The methodology of the field study is sub-divided into three categories-

I. <u>Pre field method</u>:
Pre field work mainly determine the processes of fieldwork, Revise essential pre-requisite knowledge and skills.
The methods of the entire work are divided into three phases. Pre field preparation includes.

- ➢ The selection of study area.
- ➢ Study of background in selected area.
- ➢ Visit site and show plan activities.
- ➢ Observation the problem, then I have done, select objectives.
- ➢ Collection of the satellite image.
- ➢ Information collection from different books, internet and research work in the process of literature review.
- ➢ Prepare the survey schedule for selected problems.

II. <u>Field method</u>:
It was mainly done by the satellite image survey and Sampling survey.
We identified different zones on the basis of observed features and land use pattern of the topographical map.

- ➢ Primary data collection method from the field-
    1. Sampling.
    2. Instrumental survey.
    3. Questionnaire survey.
- ➢ Photo documentation

III. <u>Post field method</u>:
- ➢ Data collected from field were tabulated, arranged and analysed for preparation of diagrams and subsequent analysis.
- ➢ Some maps and data are collect from google.
- ➢ Primary data from the survey do to compare by secondary data.
- ➢ Study area map is prepared and liked with grain size distribution.
- ➢ Preparation of tables, diagrams and writing of report were done subsequent.

1.7. Physical position and extent:

Bhagwanpur-I CD block which is a part of Purba Medinipur District, West Bengal. Here here absolute position is 22.094°N 87.759°E. The total area in Bhagwanpur-I is 18253.8 Hectare. Here Bhagwanpur-I areas East portion located Chandipur, SE portion located Bhagwanpur-II, west portion located Patashpur-I, NW portion located Paschim Medinipur and north portion located moyna.

Bhagwanpur-I CD Block extension 22°00′00″N to 22°12′00″N and 87°40′00″E to 87°50′22″E of at near.

1.8. Topography:

Purba Medinipur district is part of the lower Indo-Gangetic Plain and Eastern coastal plains. Topographically, the district can be divided into two parts – (a) almost entirely flat plains on the west, east and north, (b) the coastal plains on the south. The vast expanse of land is formed of alluvium and is composed of younger and coastal alluvial. Bhagwanpur-I

CD Block mainly included on the west, east and north by the Purba Medinipur district. As per there Minimum Elevation Value 7 metres and Maximum Elevation 18 meter above mean sea level.

We drawing two Cross Section Line, one 'N' to 'S' (X-Y) and another is 'W' to 'E' (A-B). North to South Cross Section Line length Total is 16.09 Kilometer, its Max Slope 1°45′18″ to 1°50′42″, Average Slope 0°24′18″ and Minimum Elevation Value 0.914 metres, Maximum Elevation Value 9.7536 metres. West to East Cross Section Line length Total is 12.15 Kilometer, its Max Slope 1°53′24″ to 1°56′6″, Average Slope 0°24′18″ to 0°27′0″ and Minimum Elevation Value 2.45 metres, Maximum Elevation Value 8.53 metres.

The purba medinipur district has an important block of Bhagwanpur-I. Floods are quite regular in Bhagwanpur-I CD Block (last floods years is 2005, 2007 and 2008). Normally floods occur in north part of CD Blocks. The major rivers are Keleghai, flowing in west to north or north-east direction. River water is an important source of irrigation. River activity important role plying in topography evolution.
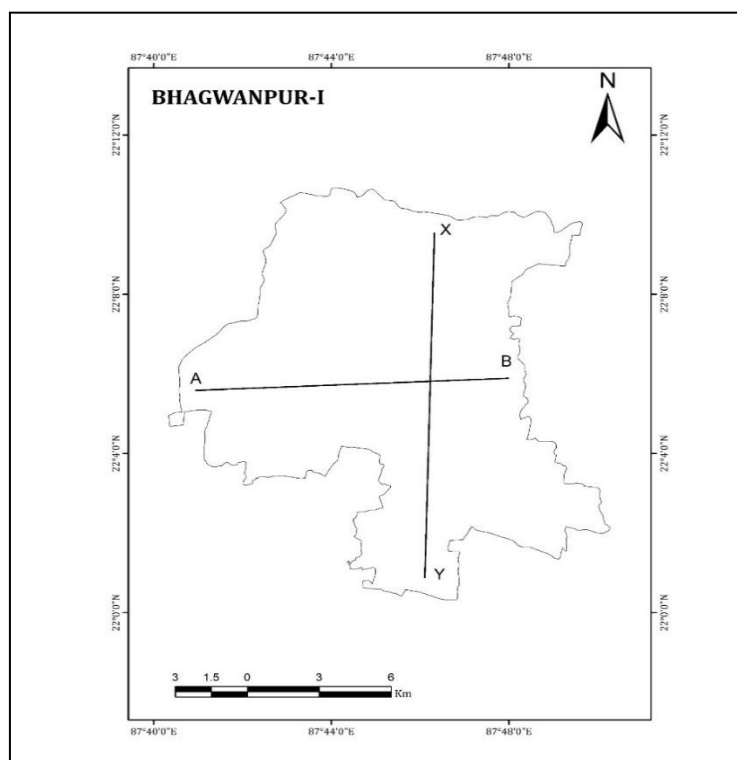

Fig. 1.2: Cross Section Map in the Study Area   *Source: Google Earth*

I collect the digital elevation value by a digital elevation map, here this DEM represent the lower elevation value is <3 metres and highest value is 18 meter. Most parts of the area are cover in a <3 metres value to 4.96 metres value and spread some part value is 4.96 metres to 18 metres. For this DE Map it is understood that, most of the par in west to east to south are belong in lower DEM value. Some middle part and northern portion are located on an upper DEM value. This study area Mean value 4.7 metres and Standard Deviation 2.9 metres. The study area average approximate slope <2 degree, so the land structure is a plane types mainly. Besides, the area is not friendly because the slope of land is low. As a result, the area of the contour line is very close to the area. As result, we can I say it is an ideal plane land exemplars in a west Bengal which is mainly associated with agricultural based and small

cottage industries. Here the contour value -6, 0, 6, 12 belong in the study area. Which is fully connected or depends to the DEM value/data. The contour map is represented topography more clearly in a study area. Contour map showing the matter in a Digital Elevation Map types. It General Topography is a more accessible, for the result, settlement are growing up very smoothly.

Though the whole block is under coastal plain land but there also have difference in elevation all over the area. After analyzing Digital Elevation map, found that the higher elevation structure form whole Northern side and south-west through middle to South-East, Where the elevation is in between 7 to 18 metres. And this elevated zones covered more or less 50% of the whole are.

In this whole CD Block, elevation data and Cross Section value are describe to do topography types. Which is related by contour value. The contour map is drawn by subject to digital elevation map. So in this case digital elevation map and contour map, represent the same feature of topography. At last, it can be said that over all CD Block under in (gangetic) plain land.
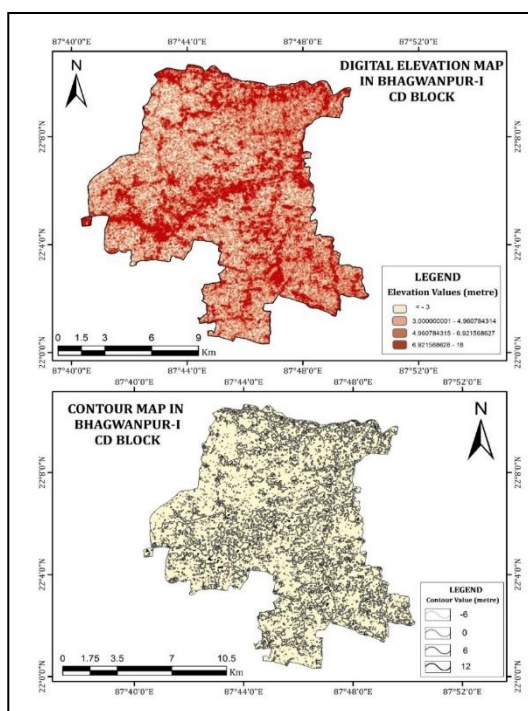

Fig. 1.3: DE & Contour Map in the Study Area
Source: Digital Elevation in GMTED2010

1.9. Drainage systems:

Drainage is the system or process by which water or other liquids are drained from a place. In the geomorphology, drainage systems also known as river systems. River system is the most important factor of physiography and which is keeping now important role of settlement growth. There is my study area only keleghai river. This river mainly going now west to east portion of the north side.

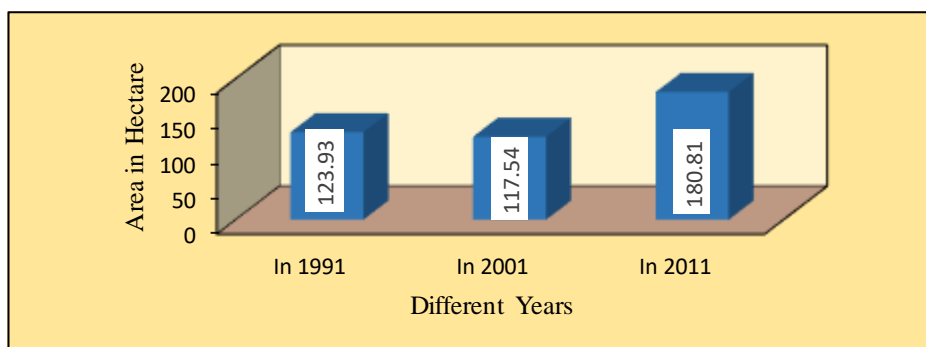| Table No. 1.1: Different Years of River Area in Bhagwanpur-I CD Block ||
Years	River Area in Hectare
In 1991	123.93
In 2001	117.54
In 2011	180.81
	Source: Landsat 4-5 TM Data

Fig. 1.4: Showing the Different Years of River Area

In my study area only Kelighai River is shown. Which flows mainly west to east portion of the north side. River keleghai had great influence on this region. Here we saw that in 1991 the area of river is 123.93 Hectare. But when time increase the river decreases its area is 117.54 Hectare, in 2001 due to dry period condition of this are. In this time period climate change is occurred and it's also shown in vegetation. So, the difference of river after 2001 floods are frequently occurred in this region and the area of river is increased up to 180.81 Hectare. By flood the volume of water increased and the river spread its spread its tributary and create a strong network system. The area of river increased by 62.27 Hector. It is a good indicator which influence the growing settlement pattern of Bhagwanpur-I CD Block.

| Table No. 1.2: Different Years of Other Water Body Area in Bhagwanpur-I CD Block ||
Year	Other Water body Area in Hectare
In 1991	188.19
In 2001	175.77
In 2011	260.46
	Source: Landsat 4-5 TM Data

Fig. 1.5: Showing the Different Years of Other Water Body Area
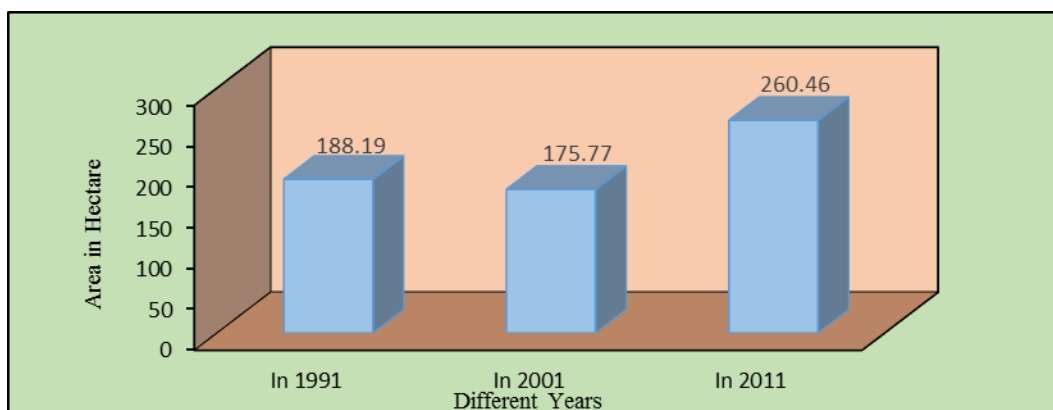
In this diagram we represent the year wise the increasing area of other water body of Bhagwanpur-I CD Block. River Kelaghai played an important role of this region. Beside it the other water body also create an important role for the development of this region. In 1991 the area of other water body is 188.19 Hectare. But in 2001 it decreases up to 175.77 Hectare, which is for less than natural increment due to changing climatic condition. But in 2011 the area of other body is increased 260.46 Hectare.

The other water body mainly created by human. Which are used agriculture, daily house work and other human activity. Is mainly source of water is river water and rainfall. But other water body, increasing and decreasing mainly depend on river water. As a result, in my study area deeply affected of socio economic sector. As a result, in my study area deeply affected of socio economic sector.
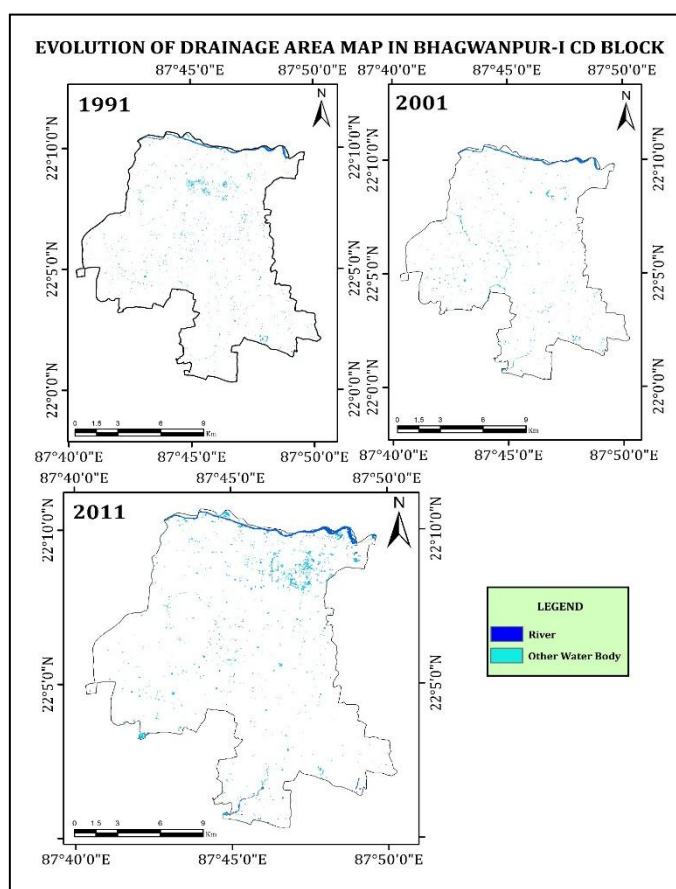

Fig. 1.6: Evolution of Drainage Map in the Study Area

That are control of settlement pattern and it is a positive sign to this region and had a great effect to increase settlement.
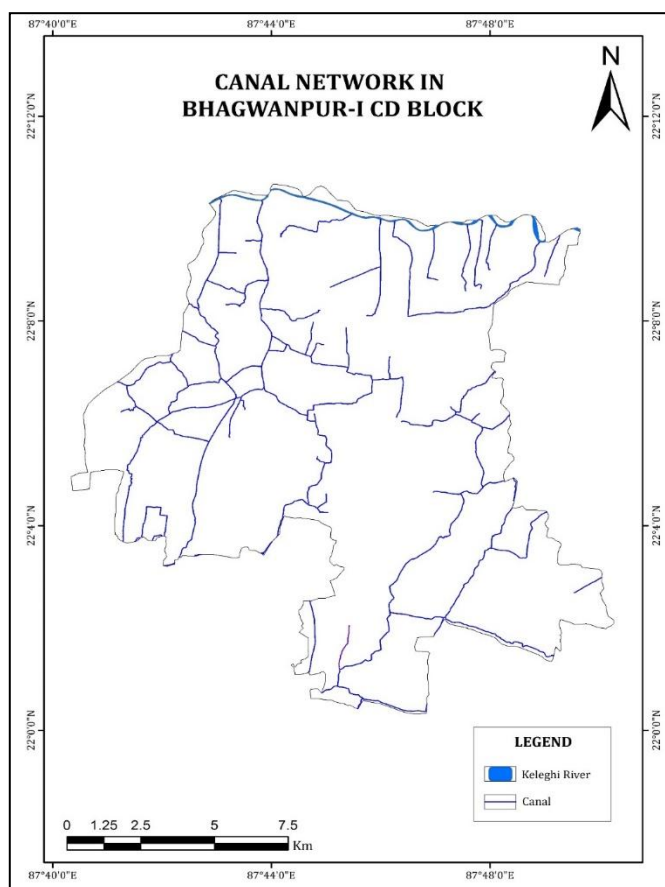
Fig. 1.7: Canal Network Map in the Study Area

Source: Landsat 4-5 TM Data & Google Earth

"A canal is also known as a navigation when it parallels a river and shares part of its waters and drainage basin, and leverages its resources by building dams and locks to increase and lengthen its stretches of slack water levels while staying in its valley". The Bhagwanpur-I CD Block as the canal network, is an ideal rural region in purba medinipur district. In this rural region canal are spreading up on the size of tree. Here most of the canal are free on Keleghi River which stay on northern side. These canals are mainly depend on tidal water.

In this region north-east, south-east and west portion most of the canal showings. This region canal system are flock of water distribution on whole area. In this case canals are dry sometime and sometime wet. Mainly water are not stay in river of winter and summer season. But if the tide is in the river, then there is the arrival of water in the canal.

1.10. Climatic condition:

The climate is an important indicator of physical setting. "Climate is the average weather in a given area over a longer period of time". It is measured by assessing the patterns of variation in temperature, humidity, atmospheric pressure, wind, precipitation, atmospheric particle count and other meteorological variables in a given region over long periods of time. Climate is directly impact on human and human activity, such as agriculture, animal husbandry, small rural industry, etc. It is directly and indirectly impact on settlement growth or evolution.

Bhagwanpur-I in Purba Medinipur district is a Community development block in the Indian state of West Bengal. It is the North-West block of Purba Medinipur. Bhagwanpur-I

climate is classified as tropical. The summers here have a good deal of rainfall, while the winters have very little.Rain is the lowest in December, with an average of 5 mm, Most of the Rain here falls in July, averaging 309 mm. The average annual rainfall is 1436 mm. Bhagwanpur-I summer highest day temperature is in between 30 °C to 36 °C .Average temperatures of January is 22 °C , February is 24 °C , March is 28 °C , April is 30 °C , May is 30 °C .

1.11. Soils:

Soil is a major source of nutrients needed by plants for growth. The three main nutrients are nitrogen, phosphorus and potassium. Depending on its location, a soil must contained some combination of san, silt clay and organic matter. The Purba Medinipur district has a vast expanse of younger alluvial soils. It is divided into three parts. First there is a strip of purely deltaic alluvial soils or entisols bordering the Rupnarayan River and the Highli River. The second division consists of costal alluvial soil. And the third part consists of narrow and elongated strip of saline and aridisois group, stretching from digha to the east of Haldi River. Considering the texture of soil in purba medinipur it is found that Bhagwanpur-I CD Block less than 30% of soil the percentage of organic carban of this study area is >0.75%. The lowest organic carbon (up to 0.5%) is also found in some pockets of Bhagwanpur-I Block. Available ph of this zone are vary from slightly acidic to highly acidic. So the soil is acidic in nature. The ph value vary from <4.4 to 6.0. The electrical conductivity of this zone is 0.5-1.0 mmhos/cm (dsm-1). The available phosphate of this zone is high above 90 kg/ha. The available potassium is high above 340 kg/ha.

1.12. Vegetation:

Bhagwanpur-I CD Block is one of the most important agricultural Block of purba medinipur. In this region 1991 in 3404.34 Hectare (over all 18.65003451%), 2001 in 1833.75 Hectare (over all 10.04585347%), 2011 in 4684.86 Hectare (over all 25.6651218%) area stay there's vegetation.

Table No. 1.3: Different Years Vegetation Area Bhagwanpur-I CD Block	
Years	Vegetation Area (Hectare)
In 1991	3404.34
In 2001	1833.75
In 2011	4684.86
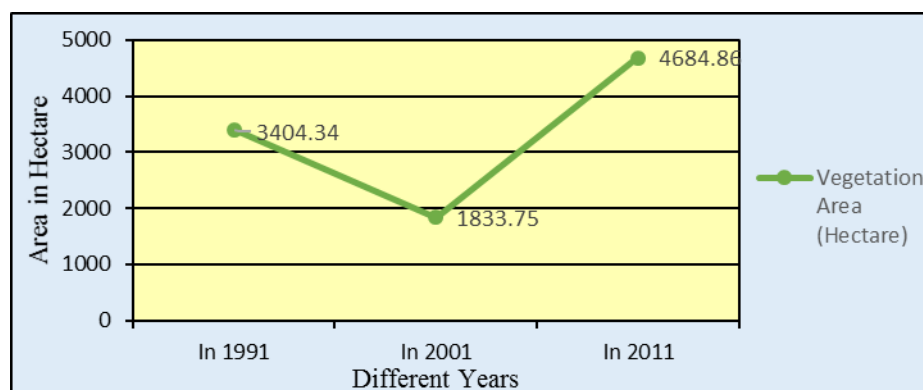
Source: Landsat 4-5 TM Data

Fig. 1.8: Showing the Different Years of Vegetation Area

In this diagram we show the year wise vegetation area of Bhagwanpur-I CD Block. In this year 1991 the area covered by vegetation is 3404.34 Hectare. This graph shows that the vegetation area had decreased up to 1570.59 Hectare in 2001. Which is not natural trend. But in 2001 the vegetation area extend with plantation of tress by Government, local people and agencies. As a result of this the vegetation area is highly located in my study area. The dominant species found eucalyptus, akashmoni, siris, jau, coconut, plam, bamboo, banana, mango, some cactus, neem, moringa, papayas, Tamarind, etc.
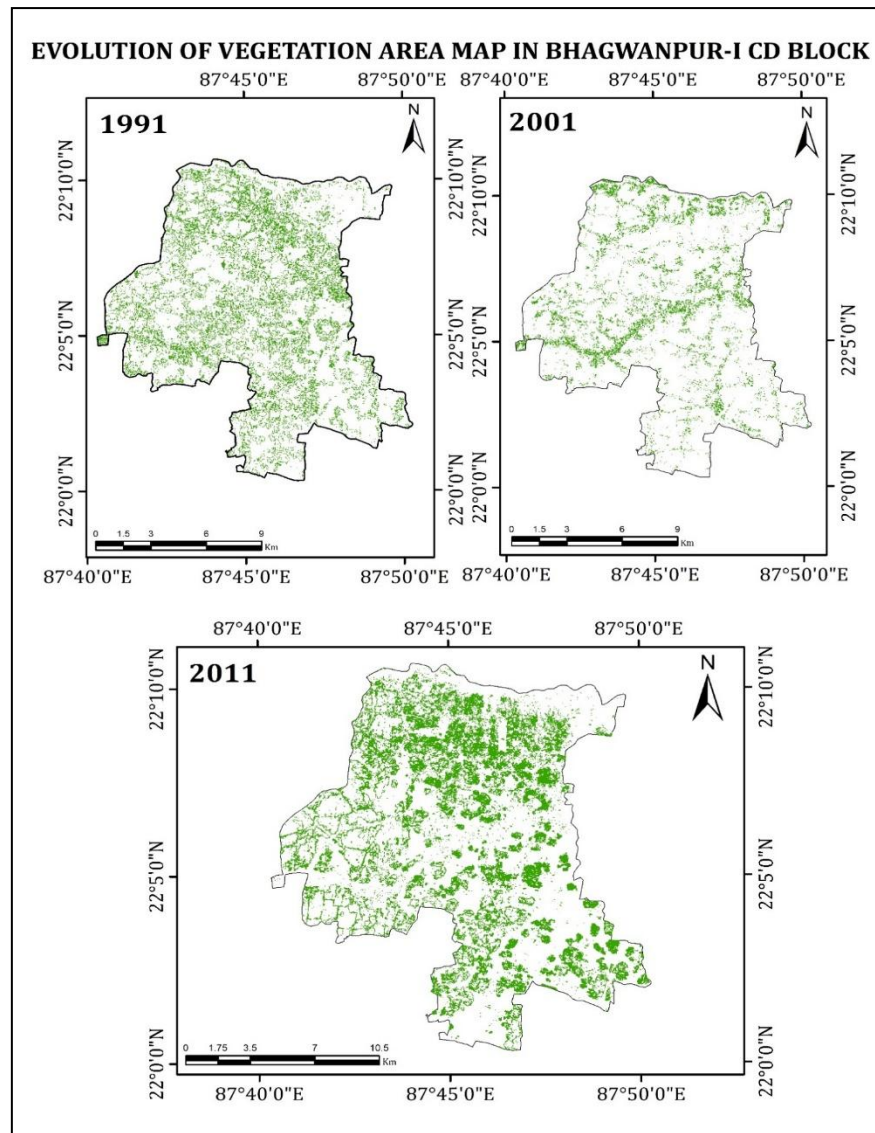

Fig. 1.9: Evolution of Vegetation Map in the Study Area
Source: Landsat 4-5 TM Data

Natural and planting vegetation show in my study area. Generally whole of my study area in 1991, vegetation is show dispersed types. As a time duration in 1991 to 2011, vegetation area are change most of them. Vegetation is an important factor for work in settlement growth, and vegetation mainly grown up subject to settlement pattern. In my study area most of the natural vegetation show in north side, and south-west, south-east portion vegetation show of small thickness in 2011. To effected of settlement pattern by the evolution of vegetation. Evolution of vegetation area map is show in next page.

1.13. Settlement pattern in study region:

My study area mainly represent rural features. In which Physical factors include configuration of the size, surface water, the nature of soil, cultivation, vegetation cover and shape of cultivated fields (Sinha, 1976) Among the Cultural factors, historical events, cultural traditions, caste system, pattern of roads, political situation also exert their influence. The rural path and gut form the skeleton of the internal layout of the village. The buildings located in the space within skeleton determines the shape and form of the village (Dickinson, 1924). In the studies area there are 54296 rural settlements. Study of each settlement pattern is quite difficult. So the study those rural settlements which are having more than 5,000 populations according to 2011 census. For the study, we used Google Earth images and Landsat 4-5 TM data.

The rural settlements are classified under following patterns: Rectangular, Linear, Circular, Semi-circu-lar, Star-like, Triangular, and Nebular Pattern.

I. Square Pattern: A square shaped village develops at the instruction of the road and cart tract as a settlement occurs simultaneously in all the four quadrants. Examples of such Gram Panchayat are Bhagwanpur, Kajllagarh, Simulia, benudia, Kotbar, etc. (Figure.1.10.)
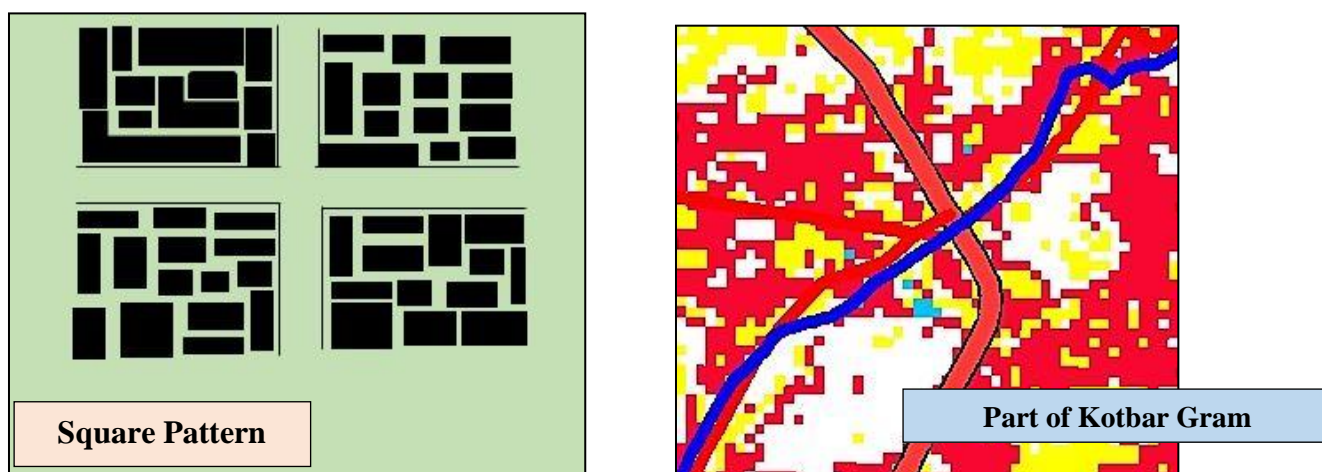

Square Pattern

Part of Kotbar Gram

Fig. 1.10: Square shape Settlement Pattern
Source: Landsat 4-5 TM Data in 2011 & Google Earth.

II. Rectangular Pattern: The aggregation of rectangular or square buildings in the plots of same shape results into rectangular plans of the village. The advantages of rectangular shape lie in agreeable maximum number of houses in several rows. Examples of such Gram Panchayat are Bhagwanpur, Kajllagarh, Simulia, benudia, Mahammadpur-I, Gargram,
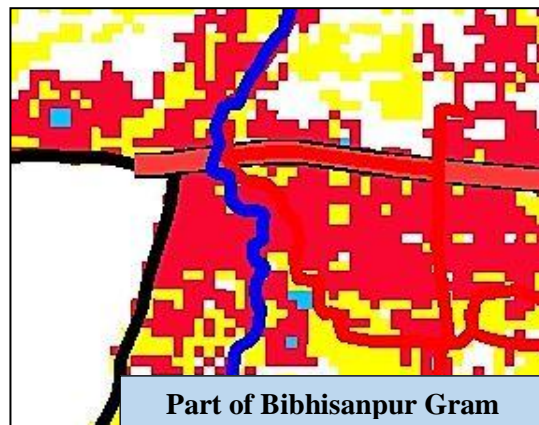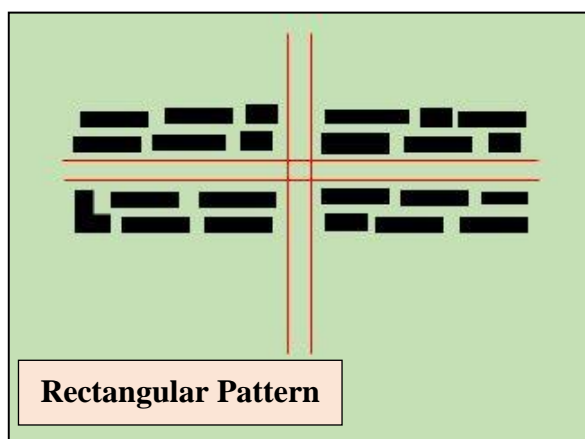
Bibhisanpur, etc. (Figure 1.11.)

Fig. 1.11: Rectangular shape Settlement Pattern
Source: Landsat 4-5 TM Data in 2011 & Google Earth.

III. Linear Pattern: This pattern is easily recognized with its simple arrangement of houses along a line like on road, river, and nalas. Examples of such Gram Panchayat are Kotbar, Kajllagarh, Simulia, Mahammadpur-I, Mahammadpur-II, Gargram etc. (Figure 1.12.)
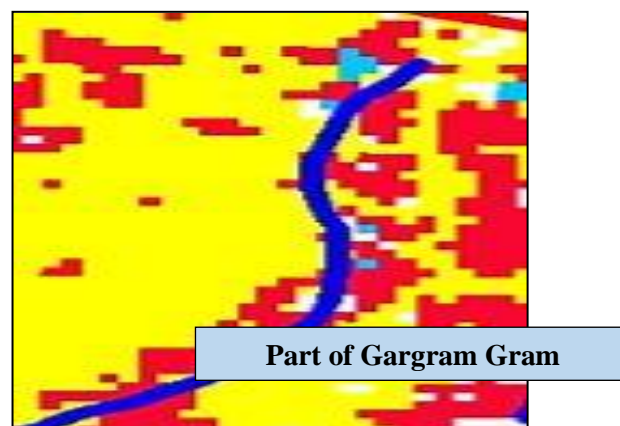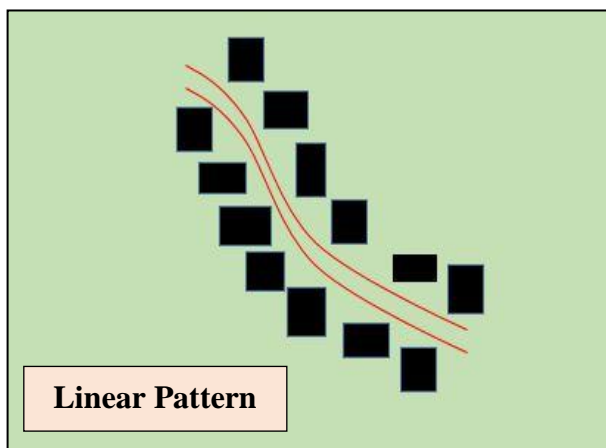

Fig. 1.12: Liner shape Settlement Pattern
Source: Landsat 4-5 TM Data in 2011 & Google Earth.

IV. L-Shape Pattern: Along the road or canal sometimes two rectangular blocks of houses meet at right angle, which form the L shape pattern. Examples of such Gram Panchayat are Kotbar, Kajllagarh, Simulia, Mahammadpur-I, Mahammadpur-II, Bibhisanpur, etc. (Figure 1.13.)
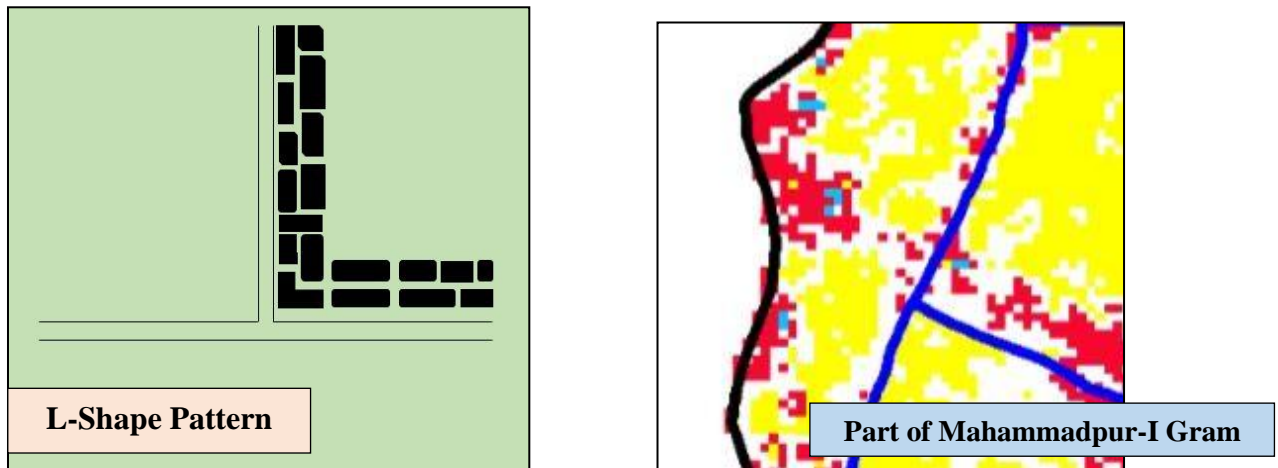
Fig. 1.13: L-Shape shape Settlement Pattern
Source: Landsat 4-5 TM Data in 2011 & Google Earth.

V. Triangular Pattern: Sometimes villages provide particular triangular shape, the main block forms the base and other gets extension towards the apex with road, rail or river. Example such Gram Panchayat are Kajllagarh, Mahammadpur-I, Gargram, Bibhisanpur, Bhagwanpur, etc. (Figure 1.14.)
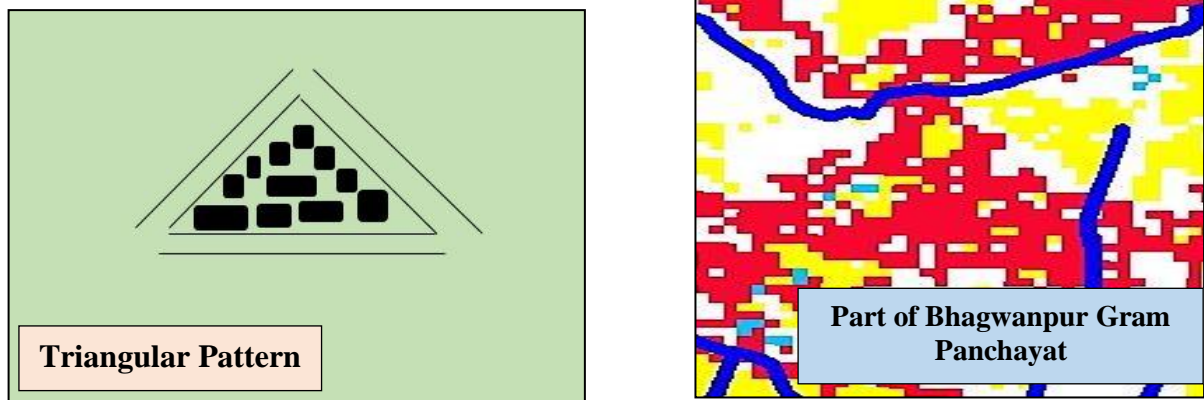

Fig. 1.14: Triangular shape Settlement Pattern
Source: Landsat 4-5 TM Data in 2011 & Google Earth.

VI. Semi-circular Pattern: These settlements look like crescent shape due to road river curvature or agriculture field. Examples of such Gram Panchayat are Mahammadpur-I, Mahammadpur-II, Gargram, Bibhisanpur, etc. (Figure 1.15.)
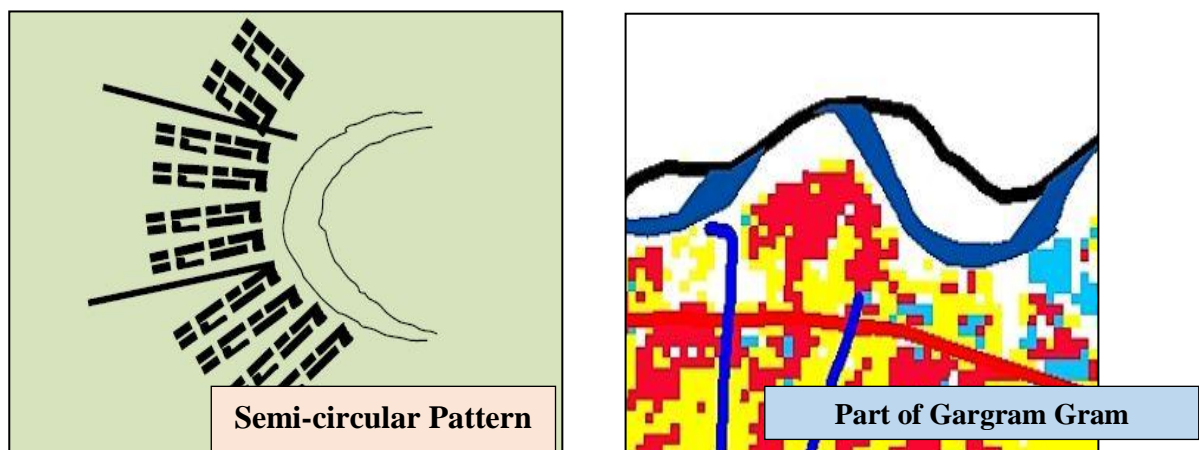
Fig. 1.15: Semi-circular shape Settlement Pattern
Source: Landsat 4-5 TM Data in 2011 & Google Earth.

VII. Circular Pattern: Along the curvature of river or road there is arrangement of the houses in somewhat circular manner then circular pattern get develop. Examples of such Gram Panchayat are Simulia, Bibhisanpur, Bhagwanpur, etc. (Figure 1.16.)
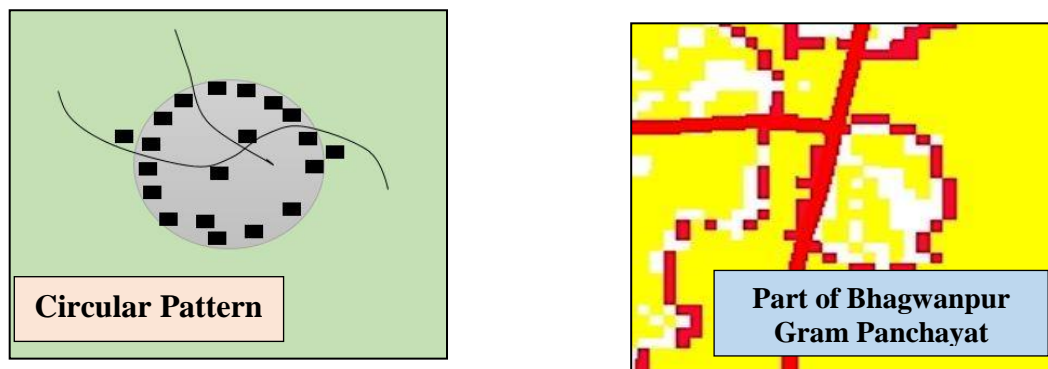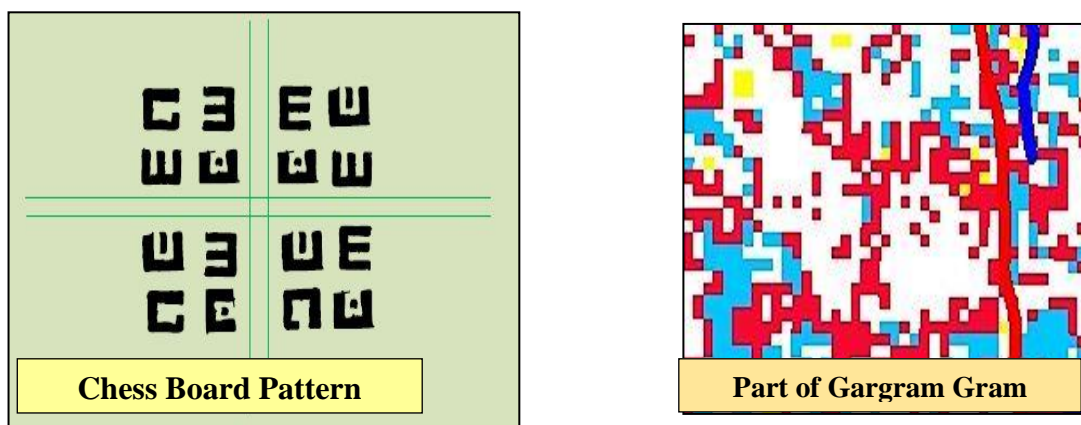

Fig. 1.16: Circular shape Settlement Pattern
Source: Landsat 4-5 TM Data in 2011 & Google Earth.

VIII. Chess Board Pattern: A rough grid plan is visible in some of the villages in the study region where main lanes divide each other. While in rugged land dispersed settlements are found. And other small lanes go to inside houses, similar to the old lanes. Examples of such Gram Panchayat are Mahammadpur-II, Gargram, Mahammadpur-I, Kajllagarh, etc.

(Figure 1.17.)

Fig. 1.17: Chess Board shape Settlement Pattern
Source: Landsat 4-5 TM Data in 2011 & Google Earth.

IX. Star Shape Pattern: The settlements, in which houses are constructed in a star shape is known as Star like Pattern. When many roads meet at the center, and along that road houses are build-up then star shape settlement gets form .For example Bibhisanpur, Benudia,

Star Shape Pattern

Part of Bhagwanpur Gram Panchayat
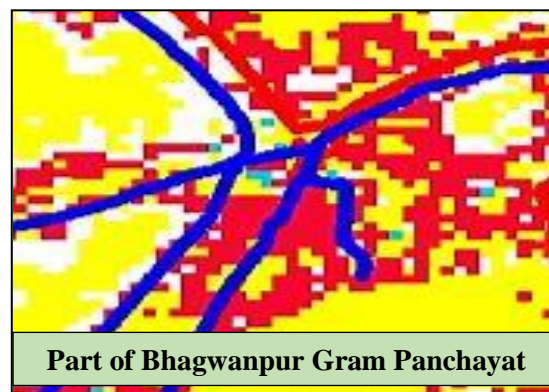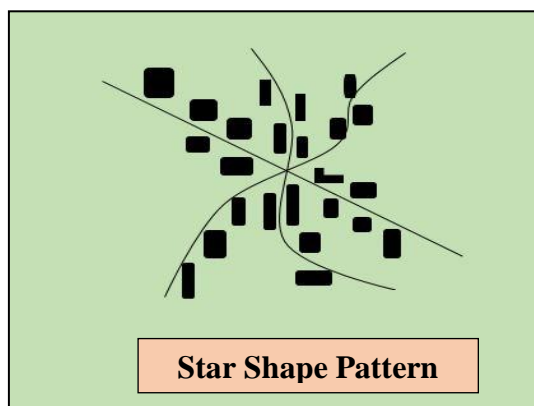
Bhagwanpur, Simulia, etc. Gram Panchayat gets found. (Figure 1.18.)

Fig. 1.18: Star shape Settlement Pattern
Source: Landsat 4-5 TM Data in 2011 & Google Earth.

X. Y Shape Pattern: The settlement in which houses are constructed along the straight going road, which further bifurcates into two roads (similar to Y shape) is known as Y-Shape pattern. Examples of such Gram Panchayat are Kotbar, Kajllagarh, Simulia, Mahammadpur-I, Mahammadpur-II, Bibhisanpur, Benudia, Kakra, etc. (Figure 1.19.)

Y Shape Pattern

Part of Kakra Gram
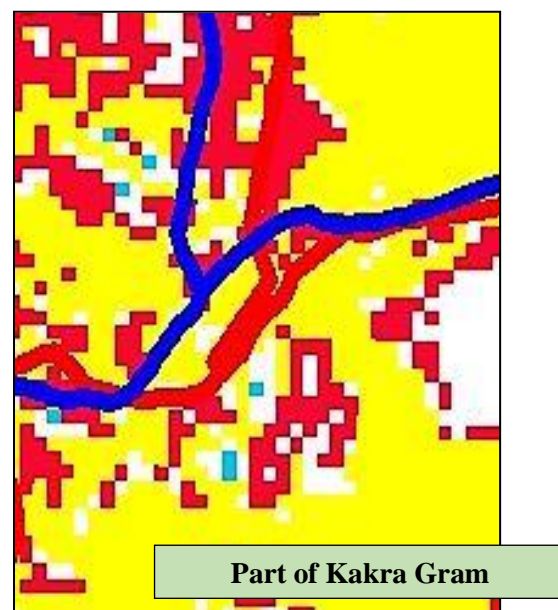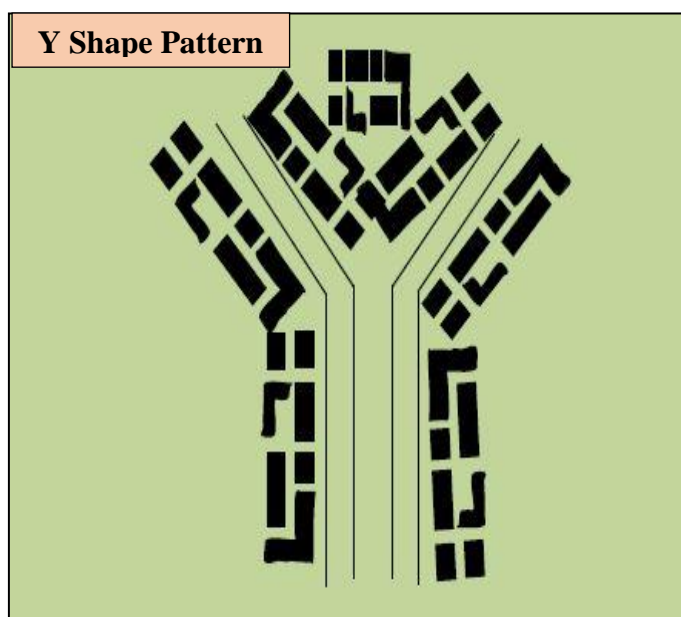
Fig. 1.19: Star shape Settlement Pattern
Source: Landsat 4-5 TM Data in 2011 & Google Earth.

It is observed that compact and composite types of rural settlements show variety of patterns with compared to disperse and fragmented type of rural settlement. Here site attributes along with the layout of the land, configuration of roads and streets play decisive role. It confirms well with the systems of house design, plugging pattern, field sizes and land measurement. It spite of physical factor, the ability of cast system, the pattern of land holding, irrigation and transport network also artistry an important role in shaping village patterns in the study region.

1.14. Evolution of rural pattern:

Evolution is the change in the characteristics of a kind over several generations and relies on the process of natural selection. The theory of evolution is based on the idea that all matter are related and gradually change over time.

Settlement refers to a place where people concentrate and settle down for living and production purpose. It can also be called residential settlement. According to their characteristics and sizes, settlements can be classified into two categories: urban settlements and rural settlements. This study area mainly a rural area. There Dispersed settlements are scattered throughout the rural landscape with farmers building homes directly on their farmland. Rural settlement patterns refer to the shape of the settlement boundaries, which often involve an interaction with the surrounding landscape features. This settlement area is evaluated in a perfect time periods. In this situation, we can explain settlement evolution trend of the ten year difference. So, we select the 1991, 2001 and 2011 census years.

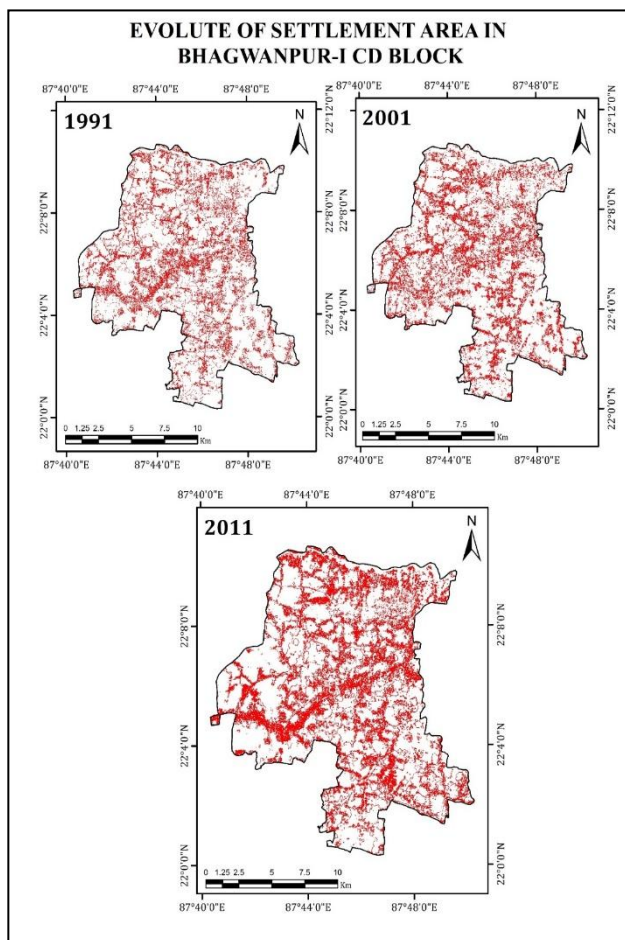**Fig. 1.20: Settlement Pattern Map for Physical Feature**
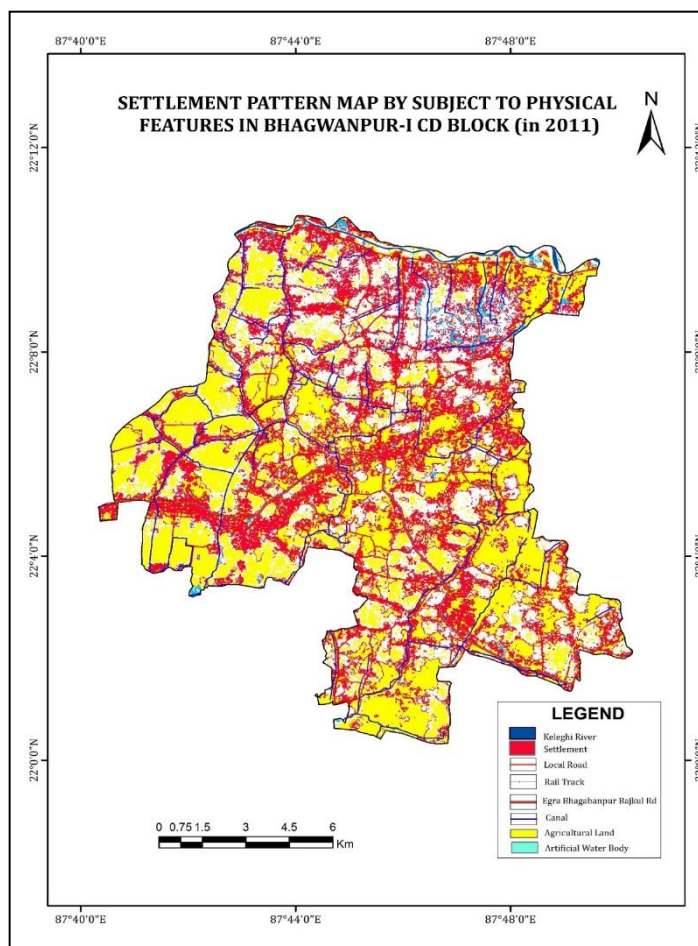
Fig.1.21: Evolution of Settlement Area Map

Source: Landsat 4-5 TM Data & Google Earth

We analyzing Landsat 4-5 TM Data then we see, here 1991 in census year, settlement area was there 3788.28 Hectare. This time settlement most of the part are stay was Semi-sprinkled settlements and Dispersed settlements. But some medial part and some northern part are represent compact types of settlement pattern in this region. That time in this region all settlement pattern are not clearly showing. But sum settlement pattern, such as Rectangular, Linear, Circular, and Semi-circu-lar, Star-like is showing.

The next census year is 2001, settlement area was there 4519.71 Hectare. This time settlement area is increasing from the before census year. And settlement pattern are huge evaluated, this time some settlement patterns are transfer to another settlement patterns, such as Linear convert to 'L' shape pattern, Square Pattern convert to Rectangular Pattern, Semi-circu-lar pattern convert to Circular pattern, etc.

The last census year is 2011, this time settlement area is increasing 5588.37 Hectare area. The trend of settlement area is increasing and the trend of settlement types is compact. And every settlement pattern is clearly showing. Over all village under the Bhagwanpur-I, CD Block, here almost showing the all settlement pattern. Yet south-east, west, south and some north portion mainly depend on agriculture. As a result this portion most of the settlement is Linear, Circular, Semi-circu-lar, Star-like, Triangular, and Nebular Pattern. The settlement pattern are evolute to Physical settings and Socio-Economic Setting. This settlement trend of

rural area is going now higher consented rural area or municipality. So this time, the conglomeration of the people is found in this region.

1.15. Rural house types:

Much can be learning about a culture by observing rural settlement patterns. Rural house type is significance of local culture. While building in urban areas follow technological and architectural trend and innovations, those in rural settlement express the basic relationship between human being and their physical and social environment. This relationship very slowly, if at all, and therefore rural houses retain their traditional forms for a long time. The architectures of urban building is worth studying as it reveals the history and aesthetics of human culture. But such study reveals little of either man-environment relationship or regional differentiation, the two core concept of geography. On the other hands, the study of rural house types, their plan, shape or construction materials use, brings out regional variations which are the expressions of different man-environment relationship.

1.15.1. House types according to building material: Human dwellings are governed by physical factor as well as tradition and cultural landscape. House as a geographic unit, includes the dwelling ranging from the small thatched hut to the most elaborate massive mansion and other human structure, where people agglomerate, used as store of material goods and where social and cultural needs are satisfied. Rural dwelling are adopted to environment of the region, which determine the nature of building material of roof and lay out of houses.

Rural dwelling are built of locally available material. The mud and sundried brick/ burned brick houses with thatched or tiled roof are the commonest in my study area. The quality of materials used depends on the economics condition of the owner. In some areas the government also provides building materials.
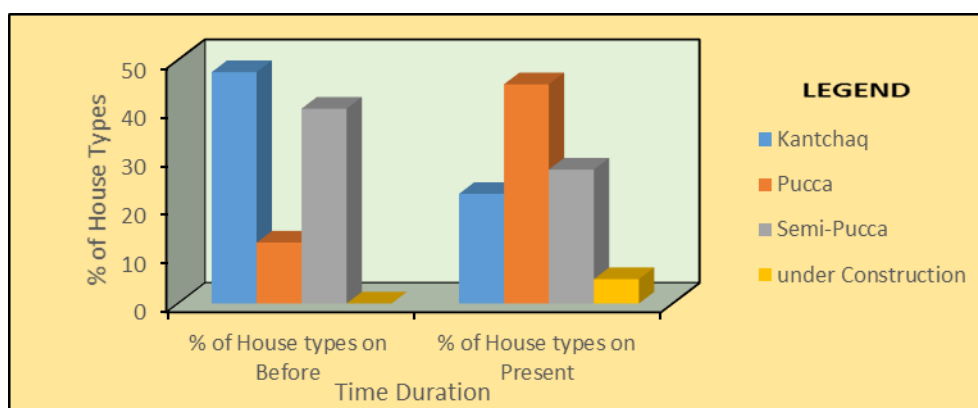
Table No. 1.4: Types of House in Bhagwabapur I CD Block				
Sl.No.	Types of House	Before 10 Years	% of House types on Before	present Situation	% of House types on Present
1	Kantchaq	19	47.5	9	22.5
2	Pucca	5	12.5	18	45
3	Semi-Pucca	16	40	11	27.5
4	under Construction	0	0	2	5
5	Total	40	100	40	100
					Source: Field survey

Fig. 1.22: Showing the House Types According to Building Material

From our house hold survey data we mode a comparative bar diagram to compare house types of Bhagwanpur-I CD Block. At first we tries to compare house types with house types of before 10 years. And here types with a highly increasing rate. Number of kantcha house becomes decline day by day whereas construction of pucca house is growing increasingly. From the present conditionof house types we can say most of the peoples are living in pucca houses and semi pucca houses.
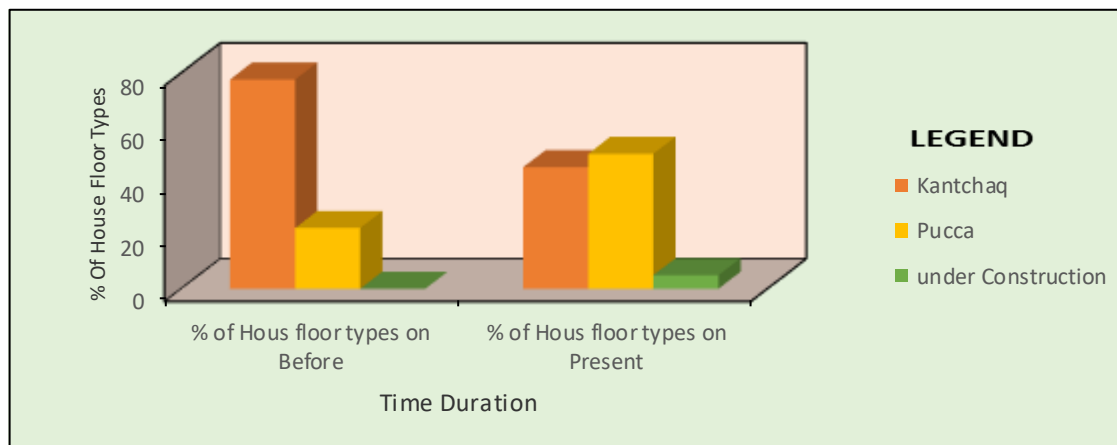
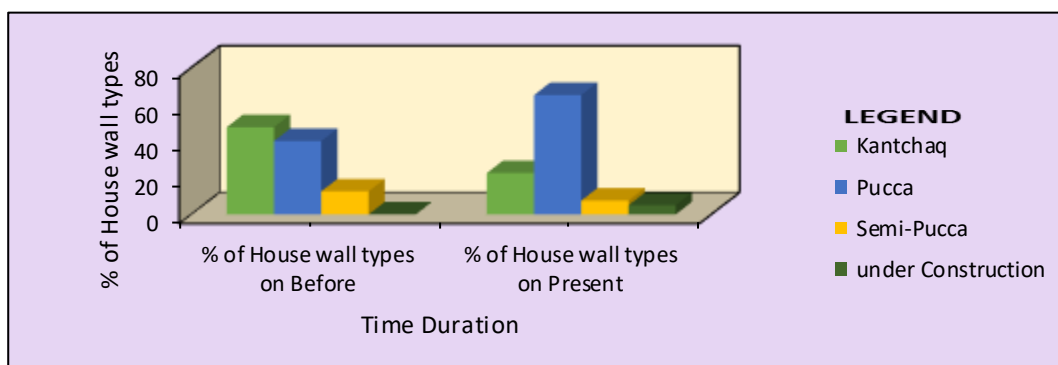| Sl.No.	Types of House Floor	Before 10 Years	% Of House Floor Types On Before	Present Situation	% Of House Floor Types On Present
	Table No. 1.5: Types of House Floor in Bhagwabapur I CD Block				
1	Kantchaq	31	77.5	18	45
2	Pucca	9	22.5	20	50
3	Under Construction	0	0	2	5
4	Total	40	100	40	100
					Source: Field survey

Fig. 1.23: Showing the House Floor According to Building Material

From the diagram we found that before 10 years from present mast of the house floors were made by sail which is kantcha types of house floor (77%). But at present condition we

can say that there those are transformed in to pucca houses and no. of pucca houses were increased.

Table No. 1.6: Types of House Wall in Bhagwabapur I CD Block				
Sl.No.	Types of House wall	Before 10 Years	% of House wall types on Before	present Situation	% of House wall types on Present
1	Kantchaq	19	47.5	9	22.5
2	Pucca	16	40	26	65
3	Semi-Pucca	5	12.5	3	7.5
4	under Construction	0	0	2	5
5	Total	40	100	40	100
					Source: Field survey

Fig. 1.24: Showing the House Wall According to Building Material

From the drawn diagram of house wall types we can conclude that most of house wall at present are pucca whereas before 10 years from present mast of the house wall were kantcha. There were a shape increase of house types as well as house well from kntcha to pucca in between there 10 year.

Table No. 1.7: Types of House Roof in Bhagwabapur I CD Block				
Sl.No.	Types of House roof	Before 10 Years	% of House roof types on Before	present Situation	% of House roof types on Present
1	Kantchaq	35	87.5	19	47.5
2	Pucca	5	12.5	18	45
3	under Construction	0	0	3	7.5
4	Total	40	100	40	100
					Source: Field survey
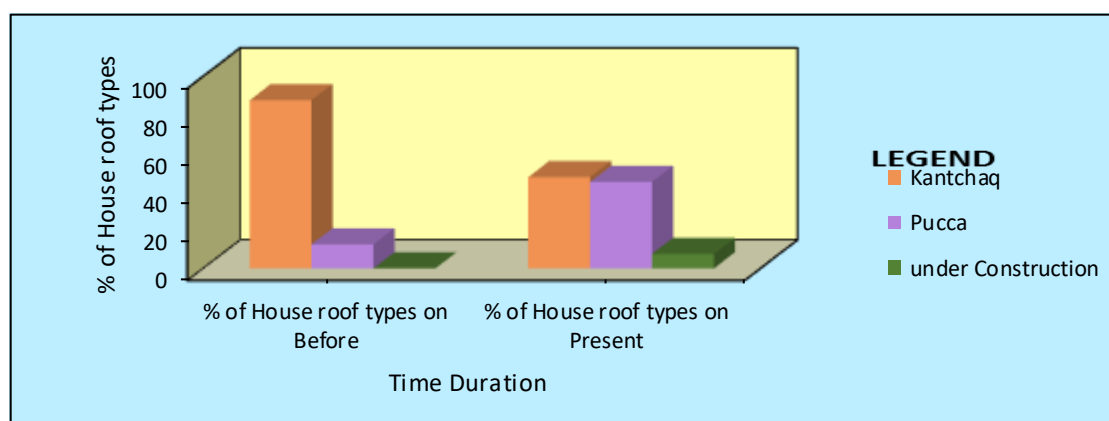
Fig. 1.25: Showing the Roof Wall According to Building Material

From the field survey data drawn comparative diagram shows that types of house roofs of Bhagwanpur-I CD Block. In this diagram we have found that before 10 years from present. Most of the house roofs were kantcha mainly mode by substances of frees or grasses. And 87% of house roofs were kantcha types of house roofs. But now at present condition pucca houses as well as pucca house roofs are then the kantcha house roofs. Now a days from the

field survey data kantcha house roofs are 45% whereas pucca house roofs are 48%. Mast of the kantcha house roofs are mode by or asbestos.

1.15.2. House classification according to their shape:

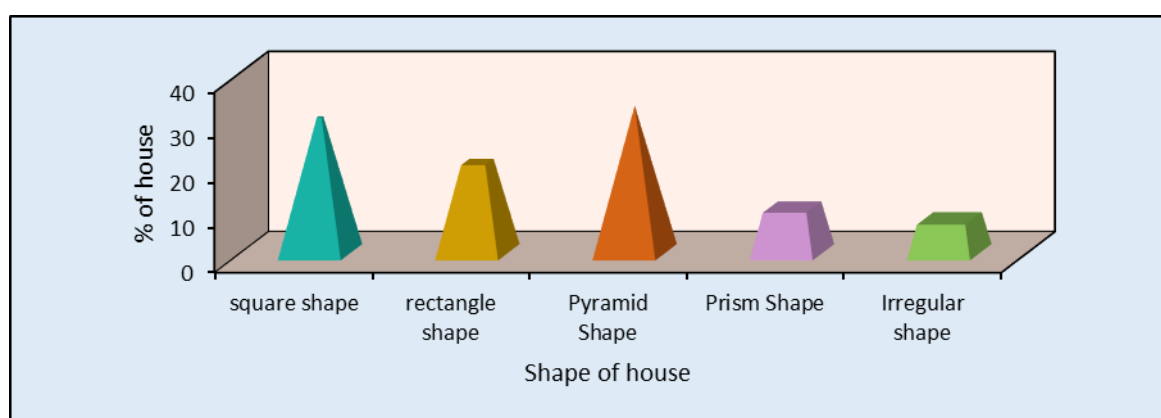| Sl.No.	shape of house	Number of house	% of house
— **Table No. 1.8: Shape of House in Bhagwabapur I CD Block**			
1	square shape	12	30
2	rectangle shape	8	20
3	Pyramid Shape	13	32.5
4	Prism Shape	4	10
5	Irregular shape	3	7.5
6	Total	40	100
			Source: Field survey

Fig. 1.26: Showing the Shape of House according to their shape

From the field survey data we have drawn a simple bar diagram to show various types of shape of houses of Bhagwanpur-I CD Block. There were find through our field survey. Among those five types of shape highest types are pyramid shape that s are 32.5% followed by square shape (30%) and rectangle shape that are 20%. The lowest types are found irregular shape (7.5%) and prism shape (10%).

Sl.No.	Quantity of Floor	Number of house	% of house floor
Table No. 1.9: Quantity of House floor in Bhagwabapur I CD Block			
1	Only 1	24	60
2	Only 2	14	35
3	Above 3	2	5
4	Total	40	100
			Source: Field survey

Fig. 1.27: Showing the Quantity of House Floor

To the field survey data we have drawn a simple bar diagram to show quantity of house floor of Bhagwanpur-I CD Block. From three categories of quantity of floor there were highest no. of houses that's contain one floor, Followed by only two floor (35%) and above three floor (5%).
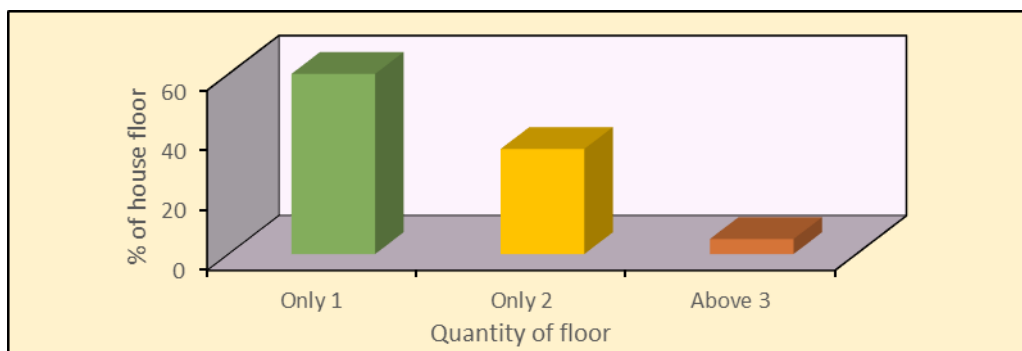
Table No. 1.10: Quantity of House Rooms in Bhagwabapur I CD Block			
Sl.No.	Quantity of Rooms	Number of house	% of house rooms
1	Only 1	12	30
2	2 to 3	18	45
3	Above 3	10	25
4	Total	40	100
			Source: Field survey

Fig. 1.28: Showing the Quantity of House Rooms
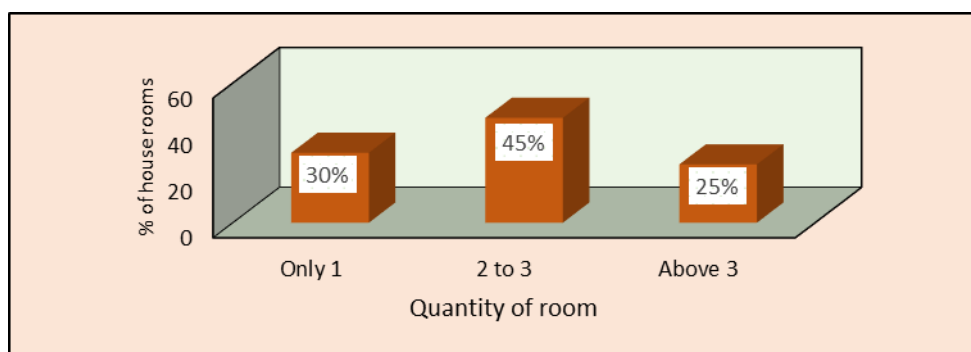
From the field survey data we have drawn a simple bar diagram to show quantity of house rooms of Bhagwanpur-I CD Block. From three categories of quantity of rooms there were highest no. of houses that's contain two or three rooms, followed by only one rooms(30%) and above three rooms(25%).

1.16. Factor affecting settlement pattern:

Settlement pattern are the expressions of space organization by a culture group and therefore reveal important facts about the structure and resource perception of the culture group. The culture and level of technology of a society determine how it perceptive the environment around it and how it will interact with it.

The two major restrictive factors are terrain and water source. Since rural settlement are associated with low technology levels, it is difficult for them to overcome the restrictions imposed by the slope of the land or ruggedness of the terrain. Buildings are generally found on the gentler slopes and exist individually or in small groups. It is therefore unusual for a village in a rugged terrain to be compact. In some places the houses are dispersed totally, that is, they occur individually or in very small groups only. Such villages are generally found in poorly developed areas, and they do not perform commercial functions or have large public buildings. With increasing commercial activity, the larger villages might develop into a cluster and hamlet pattern. The central unit of the village occupies the valley bottom or the ridge top, where the more important and affluent members of the community reside. Here one finds the concentration of whatever services the village may offer. This may range from the solitary tea shop, to a regular market, post office or the government bungalow. All round this central unit, individual or small groups of houses are found up or down slope located at convenient breaks in the slop face.

1.17. Findings:

➢ After analyzing the satellite imagery of three decades 1991, 2001, and 2011find the no. of settlement increased also the scenario of settlement patterns were changed from dispersed (1991) to tending towards cluster (2011).

➢ As settlement area increase the area under agricultural land decreases due to construction of settlement on agricultural land. Alternately the drainage system as well as drainage patterns also hampered due to unplanned construction and no. of increase of settlements.

➢ In the northern port of my study area river Kelaghai makes northern boundary of my study area and also plays an important role on drainage system as well as settlement patterns in northern part of the area.

➢ Generically there were inverse relation between altitude of topography and no. of settlement or settlement pattern. But as my study area is under coastal plain depict a positive relation between altitude and settlement, i.e. higher the altitude more compact and dense the settlement.

1.18. Conclusion:

Intensive survey and observations on settlement pattern and type associate with general topography in Bhagwanpur-I CD block revealed that the area is plains and being composed of compact, semi-compact, dispersed settlement type as well as Rectangular, Linear, Circular, Semi-circu-lar, Star-like, Triangular, and Nebular Pattern. Agricultural land are decreasing with time respect. After 2001 there is a sudden increase of vegetation. The present area shows there is a strong relationship between topography and settlement. So that this rural settlement are increased in a compressed manner.

1.19. Limitations:

Some limitations were encountered during the study period to complete research work according to the selected objectives. These limitations are described below:

➢ There was no sufficient secondary data to collect related physical of the study area.
➢ Climatic phenomena sometimes create a hazardous condition for collecting data in satellite image.
➢ Short time duration for dissertation work on the selected topic.
➢ Lack of secondary data and documents on the selected issue in this area of West Bengal.
➢ Lack of education quality can create a problem in field data collection.

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