

# CHAPTER-4

## CHAPTER:-4

### LAND USE, STRUCTURE , AND MORPHOLOGY

A cognisance of land use pattern as well as the structure and morphology of the town is an essentiality as our study deals with the pattern of Bogra's growth

The importance of the study of urban land use, structure and morphology is very well explained by many studies. Ratcliff (1949) confirms that "the land use pattern of any urban area is a reflection not only of the immediate and current space requirements of the community but rather of the cumulative needs over a period of years". Harris and Ullman (1945) suggest that "any effective plan for the improvement or rearrangement of the future city must take account of the present pattern of land use within the city, of the factors which have produced this pattern, and of the facilities required by activities localized within particular districts". Singh and Singh (1983) find that an understanding of the land use pattern of urban centres in relation to the locations of the various functional associations of land uses, makes it is easier to present general descriptive hypothesis on the pattern and process of urban growth. In view of the importance, land use, structure and morphology of Bogra town are examined.

#### 1. LAND USE IN BOGRA TOWN :

The land use in Bogra town is complicated like other towns of Bangladesh. The internal structure of the town is a

composite effect of different types of operations and functional areas. The extent and pattern of these functional diversities are based on geographical site and situation, historical legacy, and over and above human desire to utmost utilisation of the urban land for different developmental activities.

### Evolution of Land Use:

This study concerns with the trend and pattern of land use of Bogra Town. In this connection, Land use information is depicted in Table 4.1 and Figures 4.1, 4.2, 4.3 & 4.4 for three different periods: 1920, 1962 and 1988.

Land use information was collected from the Record Room of Bogra Collectorate, for the year 1920 (D.S) and 1962 (R.S. Kathian). Cadastral map (32" to 1 mile) was used for plotting land uses. Extensive survey was conducted for the study to get up to date land use information (1988) using cadastral map. For a perception of land use, period-wise the proposed study area is divided into two parts: Municipal limit of each period and the present extension area. This enables us to ascertain the spatio-temporal changes of land use.

### Residential Land Use:

In every town or city, residential use takes away the largest portion of land in comparison to other uses. Out of the total acres (3648 acres), the residential area within municipal limit occupied 46.52% land and outside 20%. in 1920. Due to the extension of municipal limit after 1951, the percentage of the

TABLE 4.1 Land Use In Bogra Town And Fringe Area (1920-1988)

Land use categories	1920 Municipal area (1)	1920 Outside municipal limit (2)	Total area (as in 1988) (1+2)	1982 Municipal area (1)	1982 Outside municipal limit (2)	Total area (as in 1988) (1+2)	1982 Municipal area (1)	1982 Outside municipal limit (2)	Total area (as in 1988) (1+2)
1. Residential	247 (46.32)	580 (20.00)	827 (23.00)	341 (38.88)	720 (25.98)	1061 (29.08)	500 (45.00)	1000 (39.55)	1500 (41.11)
2. Commercial	6 (1.13)	2 (0.06)	8 (0.22)	20 (2.28)	10 (0.36)	30 (0.82)	40 (3.57)	22 (0.88)	62 (1.70)
3. Industrial	-	* 45 (2.00)	45 (1.23)	50 (5.70)	75 (2.70)	125 (3.43)	100 (8.37)	170 (6.72)	270 (7.40)
4. Public Institutions	10 (1.88)	-	10 (0.27)	40 (4.56)	35 (1.26)	75 (2.06)	90 (8.76)	190 (7.52)	280 (7.89)
5. Health & Educational	11 (2.07)	-	11 (0.30)	17 (1.94)	50 (1.80)	67 (1.84)	21 (1.88)	90 (3.60)	111 (3.04)
6. Vegetation & Open Space	133 (25.05)	810 (26.00)	944 (26.00)	165 (18.81)	462 (16.67)	627 (17.19)	77 (6.68)	120 (4.74)	197 (5.40)
7. Agricultural	83 (15.63)	1604 (52.00)	1687 (46.00)	174 (19.64)	1314 (47.42)	1488 (40.70)	203 (18.14)	797 (31.51)	1000 (27.41)
8. Others	41 (8.00)	76 (2.44)	116 (3.00)	70 (7.98)	105 (3.79)	175 (4.80)	80 (7.15)	140 (5.54)	220 (5.75)
Total Areas	531	3117	3648	677	2771	3648	1119	2527	3646

Data Compiled

Source : Land Record Room, Bogra Collectorate; UDA Report (Under BNFFP, 1960) and Field work.

Note : - Figures in parenthesis show percentage

\* Sericulture and agricultural farm.

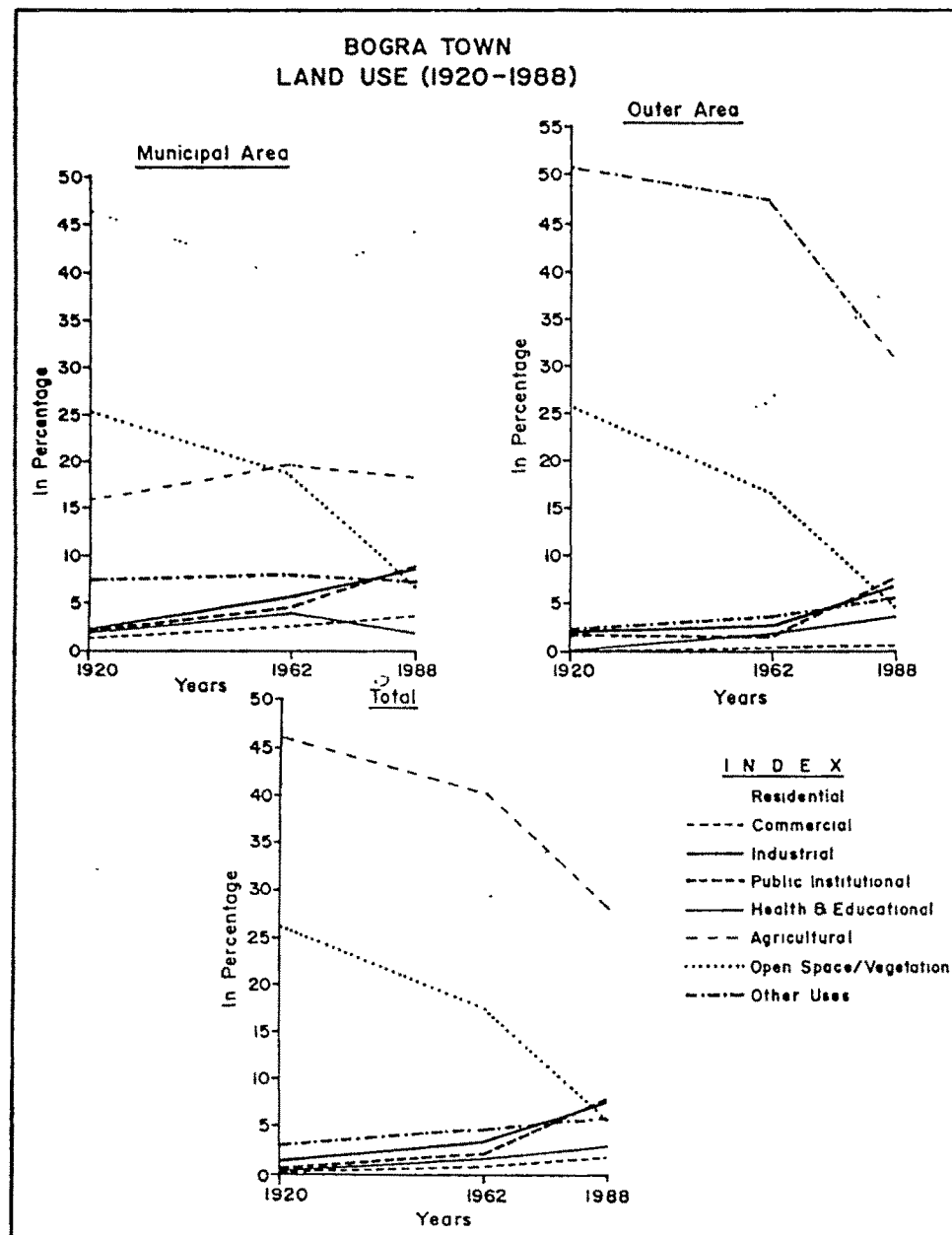


Fig. 4.1

# BOGRA TOWN-LAND USE (1920)

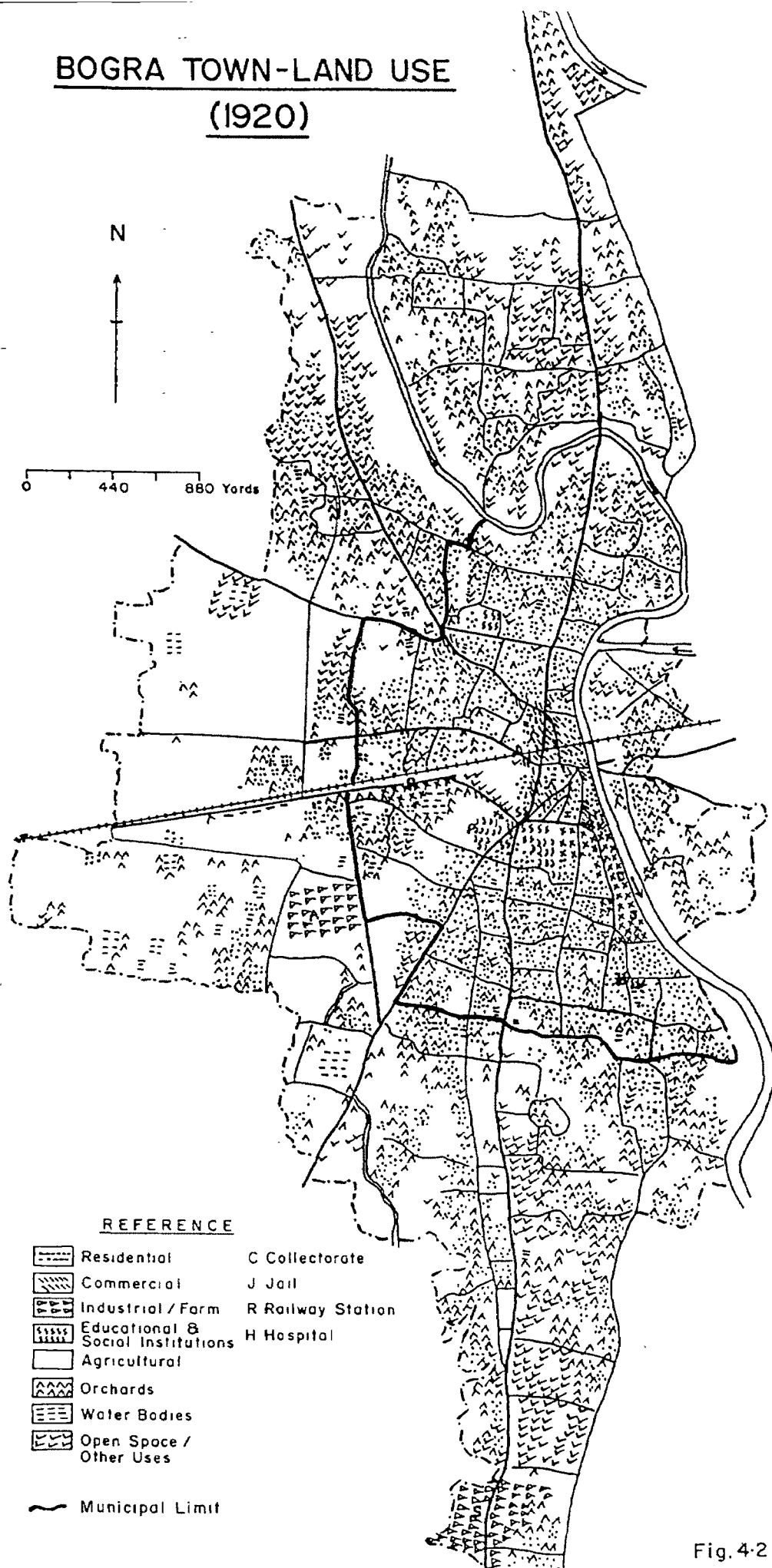


Fig. 4.2

# BOGRA TOWN-LAND USE (1962)

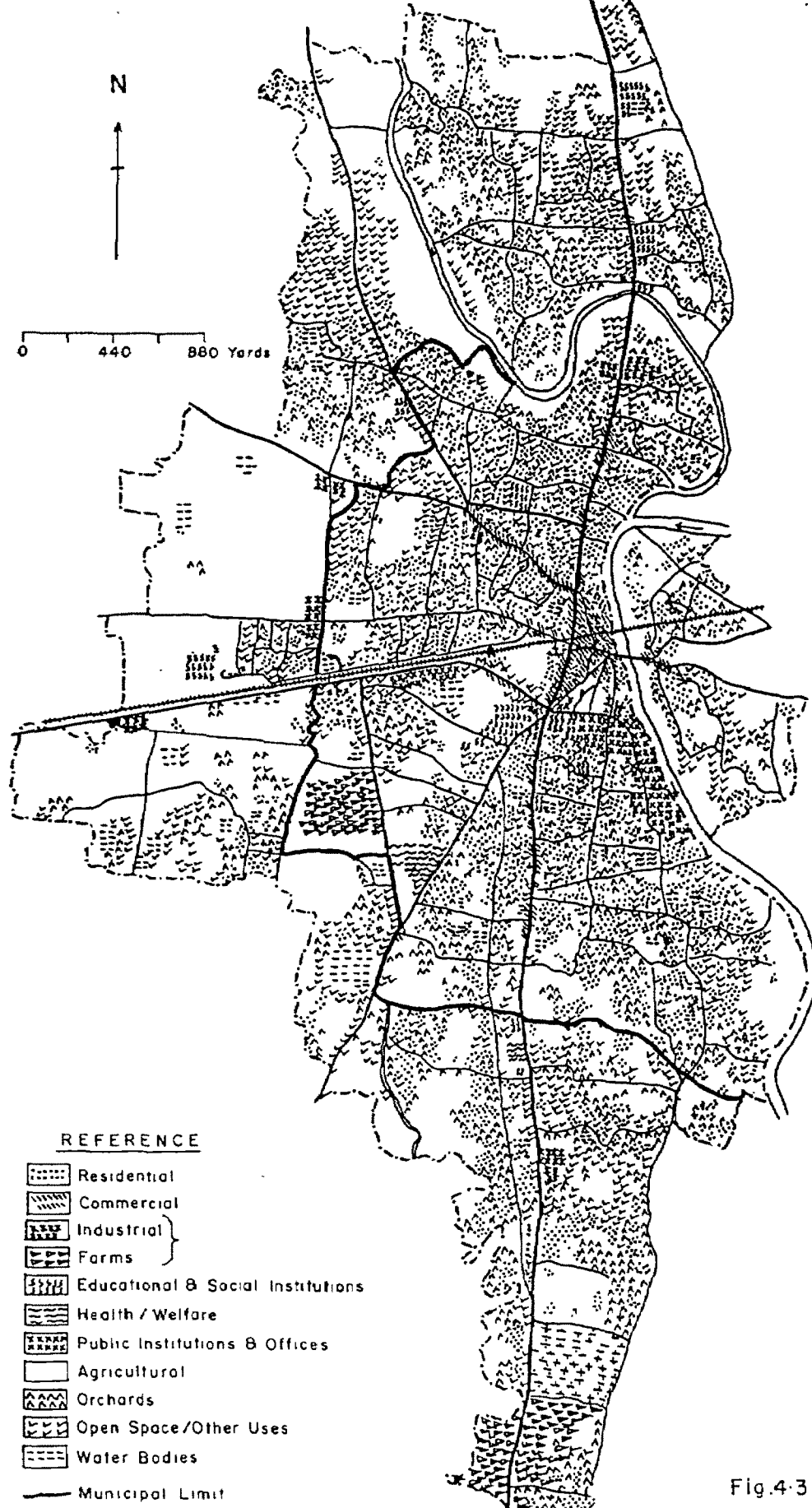


Fig.4-3

# BOGRA TOWN-LAND USE (1988)

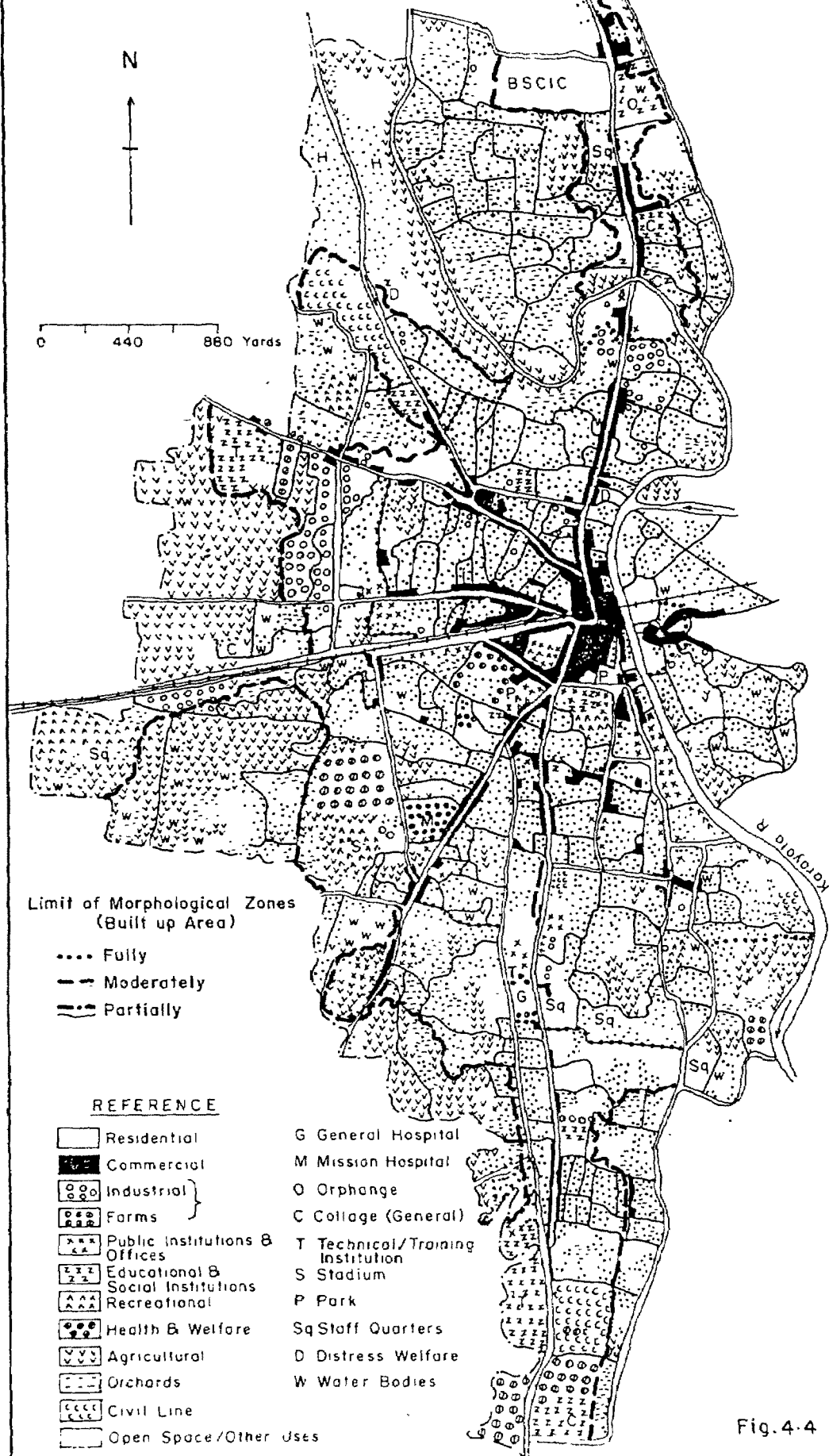


Fig. 4.4



residential land use in 1962 inside the town was 38.88% and outside 25.98%. In 1982, the proportion of land under residence, was 45% within the municipal limit and 39.55% outside. The extension of the urban limit corresponds to the growth of population in these periods. After 1982/83, the incorporation of large area belonging to different categories specially agriculture, indicates changes in the percentage under respective land uses.

#### Commercial Land Use:

It is evident from the Table 4.1, that the commercial area is mainly confined to the town. Further it shows that there is a gradual increase in the area under commercial activities denoting high intensity of land use. The area under this activity has grown from 6 acres in 1920, 20 acres in 1962, 40 acres in 1988. Out side the town jurisdiction it was 2 acres, 10 and 22 acres in the respective years.

#### Industrial Land Use:

Before Partition (1947), there was no industry in Bogra. Sericultural and agricultural farms were confined to the outer area (1920). After Partition land use for industrial activity increased to 50 acres (5.70%) in 1962 and 100 acres (8.37%) in 1988 within the town. Whereas the extension area had 75 acres (2.70%) and 170 acres (6.72%) of land respectively.

## Public Institutions/Educational And Social Institutions

The Table referred above shows that upto 1920 only 21 acres of land was under these categories in the main town, but it increased to a considerable extent in the periods 1962 and 1988 i.e. 57 and 119 acres respectively. As these institutions required vast land, they were established outside the town limit where open land was available.

In case of land under agriculture/vegetative cover or vacant land, it is observed that there is a gradual decline (Table 4.1., Fig.4.4) due to the developmental activities and growth of settlement. Others' which includes transport and storage, water bodies, graveyard show gradual increase except water bodies.

## 2. STRUCTURE AND MORPHOLOGY OF BOGRA TOWN :

Regarding the structure, Hudson (1985) focuses on town as the physical manifestation of interactions among people, activities, and structures. He observes that the relative success of certain places has variously attributed to entrepreneurship and promotion of town activities performed in them, or their structures. Structures, he argues, is the material design, including siting of place produced by people engaged in activities.

Therefore, spatial structure of a town is the result of several forces, namely:

1. Attraction and integration
2. Dispersion and disintegration
3. Spatial differentiation.

The first two forces lead to the horizontal and vertical expansion whereas the third one refers to segregation of buildings.

#### Major Determinants Of Structure and Morphology:

It is apparent from the map of Bogra town that it indicates a longitudinal development of the town structure. From the beginning, the growth was parallel to the river Karatoya and the National Highway i.e., Dhaka - Rangpur Road, which runs in north - south direction. Apart from this road, developmental activities take place also along other regional roads.

The layout of the present town may be attributed to several factors.

1. The river Karatoya forms the 'edge' of the town on the western side. 'Subil' effluent in the north restricts spatial growth to some extent;

2. Low lying flood plain area in the east of Karatoya river is unfavourable for urban expansion;

3. While low level agricultural land in different areas greatly discourage settlement growth, it attracts other functions like industry, public and private institutions etc;

4. Further, spatial expansion, towards the extreme south, is

obstructed by the presence of cantonment;

5. Major development takes place along the major roads;

6. Radial road pattern has a great control over the functional set up in many ways.

However, structurally the town is a complex association of human activities; and certain sections are predominantly characterised by commercial and industrial activities, administrative functions, social and educational services etc. To a considerable extent, regularity of spatial form predominates in Bogra town. Except CBA, mixed land uses is rarely observed throughout the town. Unlike many non-western cities, here 'shop-house' structure is not seen much. Broadly, each area has its own functional distinction. It is evident that there is no area or block without residents. Wide diversity of residential structures/housing patterns depending upon different income groups and social background are apparent in the main town. The extension area with its, predominantly rural character stands out distinctly from the main town. CBA, Peak - value intersections, street frontages etc. are the most sought after for establishing economic concerns.

#### MORPHOLOGICAL REGIONS OF BOGRA TOWN:

So far we were concerned with the complex historical, political, social and economic forces involved in the growth of Bogra. Based on these forces, we may differentiate the town into three morphological regions in the light of Dickinson's (1951:517) study of West European cities where he observes their common tendency to grow in concentric zones:

(1) The central, fully built up zone, which is the core of the modern city;

(2) The compact and fully built up middle zone that was erected mainly during the 19th century, and

(3) The Outer, partly built up (suburban) zone in which urban and rural areas are mixed, and to which urban areas have penetrated mainly during this century;

For Bogra, we have considered the following zones (Fig 5.3)

(1) The central fully built up zone,

(2) The moderately built up transitional zone with fully built up arteries.

(3) The outer partially built up zone (greater part of the extension area) in which urban and rural characteristics intermingle, but which predominance of rural culture.

The central fully built up zone refers to the major part of the town i.e., CBA and adjacent areas where process of urban growth is prevailing since long. It shows the greatest intensity of land use with little scope of further expansion.

The commercial, administrative functions and mainly population foster dynamism in this area. With few exception, the change in the landscape of the transitional zone is of recent origin. This zone is characterised by the rapid inflow of migrants. Of late developmental activities, have been taking place especially along the major routes (since 1950s) displaying a clear pattern of tentacle growth. This zone being merges into the next zone.

The major portion of the extension area belongs to the third classification which has a marked rural type of environment. Effects of urbanisation slowly transform the society. Here dynamic change in physical or social structure is negligible due to the presence of mainly lower income group, peasant class and low paid daily wage earners. It is vivid that the spatial growth of this area is quite uneven over space and time.

### 3 URBAN LAND VALUE

Urban land value, determines the urban land uses resulting in urban forms, structures and functions. The study of urban land value dates back to early days. Social scientists, economists, urban geographers, ecologists have been overwhelmingly inclined to this study. The study of Bogra town needs to examine different aspects of land value in the town which would help in understanding the internal structure of growth.

The study of land value can be grouped as:

- i) Descriptive models, and
- ii) Mathematical models

The present study is based on the first model which evaluates the value of land.

The idea of "Location" or accessibility which determines land value, is the contribution of early classical work of Ricardo (1817), Von Thunen (1842) on the principle of agricultural land use.

Hurd (1903) observes the value of land depends on economic rent, and rent on location, and location on convenience, and convenience on nearness, and concludes that the value depends on nearness. Thus quality of transportation will influence urban land value patterns. Apart from the location and accessibility or other alike factors, Islam (1972) advocates that other important factors in determining land values are the income level

of an area, its population density, rate of growth or decline of the community, government policies, and (more particularly for individual site values), the size, shape, corner vs. interior location and topography of the actual site where value is being considered. Considering social, economic or political atmosphere, Alam (1965:95) has observed in the study of Hyderabad - Secunderabad as the functional areas evolved out of a complex interaction of administrative decisions, or social reactions and of most influential economic competition. These functional areas are essentially dynamic and change their location and character with the change in socio-economic conditions. Thus, the resultant effects of the changes are reflected in land values.

#### BOGRA: URBAN LAND MARKET:

The demand for the land value increases hand in hand with the increasing rate of urbanisation at Bogra. Purchasing land is considered to be a profit yielding and secured business by many private parties. Speculation of the market value of the particular land decides the profit of this business, considerable amount of speculation and land held for various purposes or left vacant and priced high, form major constraints to the government and other agencies in acquiring the land, for the developmental purposes. Apart from these factors which govern the land values few other obstacles imposed by the public as well as private concerns in the land market include: encroachment or ownership conflicts, disparity in payment for acquiring land, holding of more land than required resulting in institutional hazard and selling or buying parcels of land.



### Land Value in Bogra (1960 - '87):

The land value in Bogra varies from place to place depending on the factors stated above, and with the passage of time it changes, and the rate of change is never similar to every area.<sup>Table 4.2</sup> This diversity in land value has given rise to the different types of land uses.

For this study, mauzawise information of land values for four different periods namely, 1960, 1970, 1980 and 1987, was collected from the District Registrar Office (Land). Analyses of the data on average value of land in each mauza show the prevalence and trend of land price (Fig 4.5).

From the Fig. 4.5, it is evident that land in the extension area has low value unlike the main town. But everywhere, it is observed that the change in land value is disproportionate according to the whims of the time. Like in other sectors of development there has been explosion in land value since 1970s. This may be attributed to the rapidly growing urban functions, open competition of land, land value speculation, absence of zoning laws, increasing migration, influx of remittance from Middle-East etc.

The urban core fetches the highest land price which is a common phenomenon. Similarly the areas closer to the core viz. Sutrapur, Rahmannagar, Malotinagar, Katnarpara, Shibbat, Thanthania. Command high value from the early days. The fully developed mauza Sutrapur shows high land value where central

business area, administrative offices, important schools, transport terminals, different types of residential area etc. are located. With the addition of underdeveloped Unak Sutrapur locality to the mauza of Sutrapur, average land value has fallen. Excepting Sutrapur, other mauzas stated above comprise more of mixed class, business establishments, dense population and closely spaced houses which have undergone a long history of growth.

Some mauzas like Malgram, parts of Nisindara and Malotinagar possessing vast agricultural land/low land have comparatively low land value. Fulbari, Chaklokman, Latipur, Chakbrindaban have moderate land value where development is taking place along the arteries.

The mauzas on the lowlying areas east of the river Karatoya were less attractive for developmental activities and settlements. Only a small mauza Chelopara which is closer to the core grew in importance from the early days and became the place of residence of business class and place of centre of business activities. Therefore it shows comparatively higher land value than Natai and other localities on the west. Two regional roads pass towards the east through these mauzas. Of late, land value has increased due to the inflow of people from flood affected areas. The non availability of land near the core area and the comparatively low price of land in these areas (East Bogra) have induced development here.

Bogra Town-Mauza Wise Land Value (1960-1987)

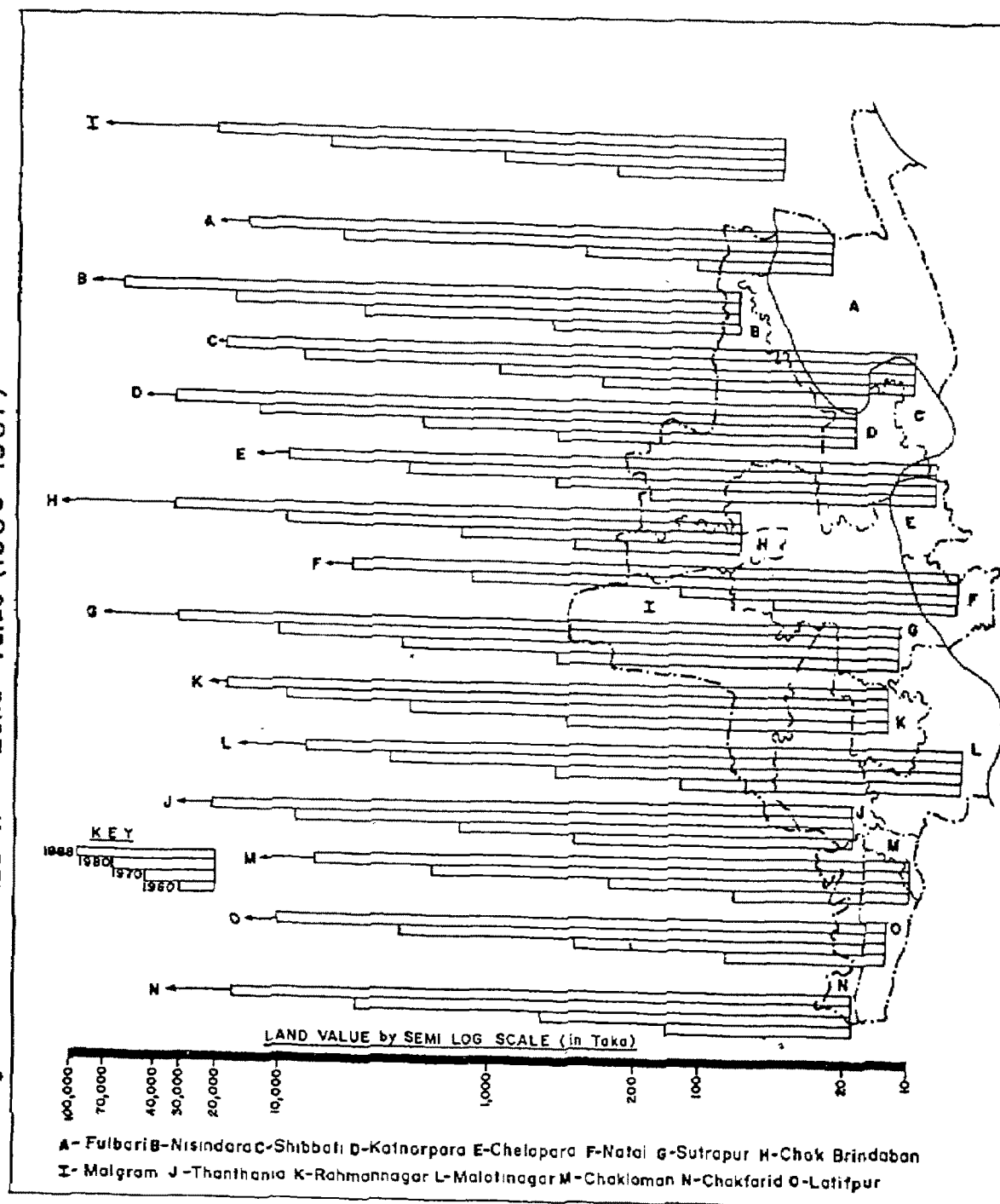


Fig. 4.5

(1960 - 1987)

Bogra Town : Table 4.2 Mauza-Wise Land Value		(Value in Taka/per Decimal*)			
Name of the Mauzas	1960	1970	1980	1987	
Sutrapur	350	2500	10012	31500	
Katnarpara	275	1200	7500	19200	
Malotinagar	225	930	5690	14000	
Rahmannagar	360	2000	8000	15000	
Nisindara	85	650	2697	9500	
Fulbari	45	150	2300	6500	
Shibbat	320	1023	7200	20100	
Malgram	659	225	1520	5500	
Chakbrindaban	105	450	3500	11000	
Chak farid	80	320	2500	10000	
Chak lokman	75	280	2000	7500	
Latifpur	60	320	2230	8500	
Thanthania	220	800	4900	12000	
Chelopara	235	680	3500	13100	
Natai	80	220	2100	8500	

Source : District Land Register Office, Bogra.

\* 1 decimal = 40.47 sq.m.

From the observation of the trend of land value in some of the peripheral localities, it can be mentioned that these areas are potential for developmental activities and settlement. Due to scarcity of vacant land and high price in the main town, there is a compulsive shift of activities to the periphery

### Patterns of Land Value Along The Roads in Bogra:

Fig 4.6 Portrays wave like distribution pattern of land value along the roads with wide oscillation or with gradual ups and downs depending upon the degree of importance of places and their accessibility. Land value along the main roads is determined by the functional importance and the developmental activities taking place. Peak land value is observed in and around the CBA and the value decreases outwards. In the core area, land value is more, by about one lakh taka per decimal than other areas. From the Fig 4.6 we find that there is a sudden rise of value at the intersection of important roads (eg. Khander bazar, Namajgarh) and market places (eg. Kalitole hat, Metidali hat). In this regard Charely and Haggett (1967:336) rightly point out :

(1) Land values reach a grand peak in the city centre and gradually decrease outward toward the periphery with different proportion,

(2) Land values are higher along the major traffic arteries than in the areas away from them, and

(3) Local peaks of higher value than the general level at a given distance from the city centre occur at the intersection of major traffic arteries.

According to the importance of roads, we find variations in land value starting from the centre of the town. All along the most important Dhaka - Rangapur road the highest value is observed. Greater part of the developmental activities

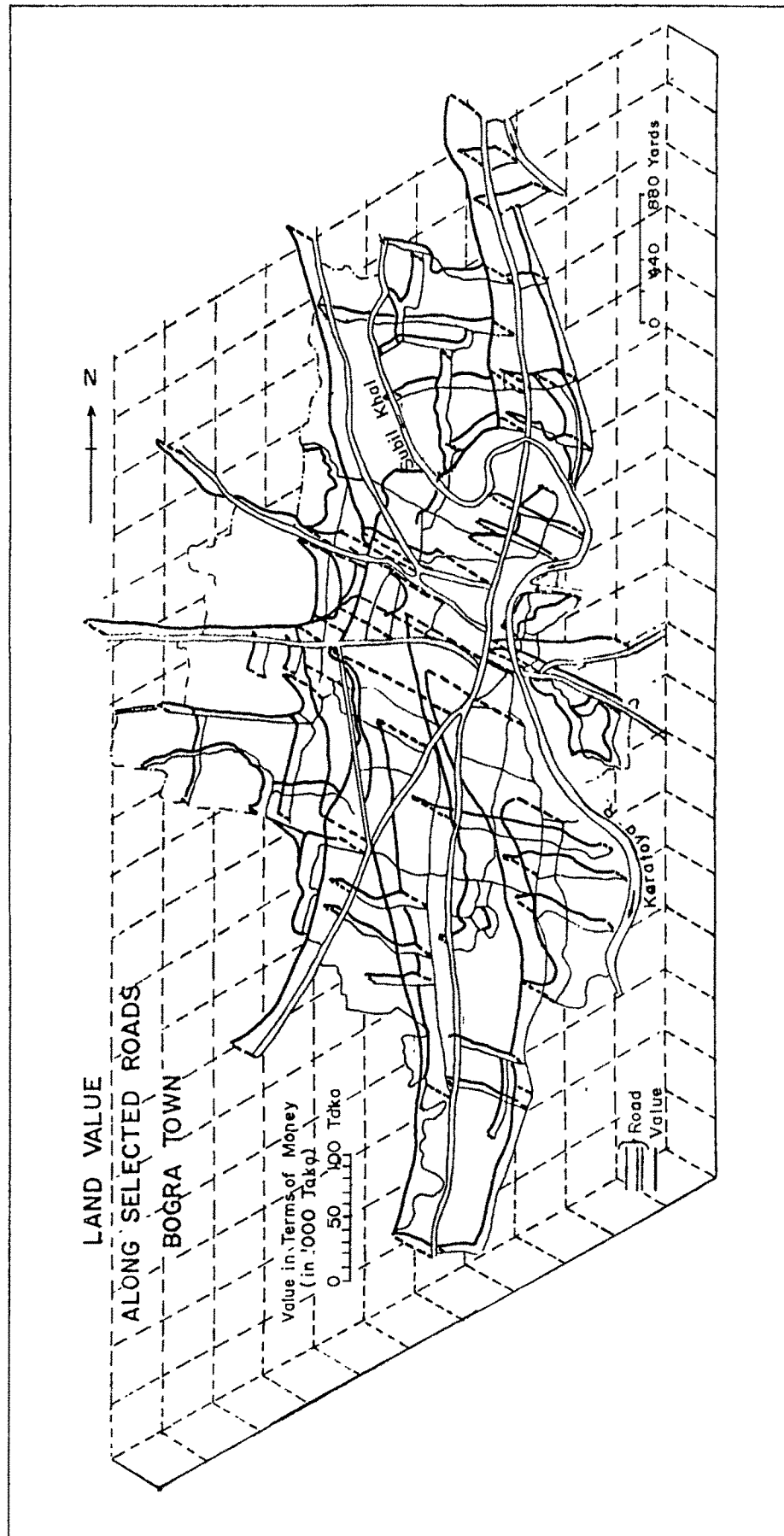


Fig. 4-6 140

take place along this road. Other business streets - Santahar road, Badortola road, Natore road, and also Chelopara - Sariakandi and Chelopara - Chandanbaisha roads quote higher land value upto a certain distance.

The neighbourhoods of upper class residential area of high land value through which important roads pass are known for convenient locations, accessibility and economic uses of land. The areas referred to are in proximity to Nalidari road, Jailkhana road, Madla road (Malotinagar), Bakshirnat - Ansar office road, Sejgarı road, Katnerpara coronation school road etc.

# **SCHEMATIC REPRESENTATION OF LAND VALUE:**

A number of scholars have presented land value models through empirical observations. Taking different aspects of land value they have constructed models. Some of the important works which are pertinent to our study may be mentioned below:

In the study of Topeka, Kansas, Kanos, (1962), has made series of mathematical models. Four generalisations have been obtained from his study:

- i) Urban land values vary inversely with the reciprocal of the distance from the centre of the CBD,
- ii) Urban land values vary inversely with the reciprocal of the distance from a business thoroughfare intersecting the centre (of Topeka),
- iii) Urban land values vary directly with the distribution of population potential within the city; and
- iv) Urban land values vary with sectors of growth within the city.

Brighan (1965) constructs a model of urban land values in relation to residential land. Different features identified are:

- i) Value of land of a particular urban area, site is functionally related to its accessibility to economic activities,
- ii) To its amenities, to its topography, and to its present and future uses, (industrial, commercial or residential) and to certain historical factors that affect its utilisation.

Yeates (1965) has done an important work on this



line, like He shows in his model that land values vary with sectors of the city, where some sectors show increase in value towards the periphery.

Based on the aforesaid discussion and three classical theories of urban growth Burgess (1923), Hoyt (1939), and Harris and Ullman (1945), Bogra town can roughly be classified into number of land value zones within the frame of zonal, sectoral and multiple nuclei theories. These are schematically represented in Fig 4.7b

By close examination of Bogra's spatial growth or land use patterns, we find a great correlation between land values and land use pattern.

concentration of commercial, financial, some light industries and some office establishments in the central area, result in peak land values. This is the zone where the land price is maximum. In the town forming almost a concentric zone.

With the lapse of time, segregation of social areas, convenient location and accessibility provided by radial road patterns having linkages with the surrounding region, and proximity to different urban amenities; the values of land began to differ spatially. From the analysis of land value, it is observed that the concentric zone develops into a sectoral pattern where there is variation in land price, for example, south east of Bogra, bounded by Dhaka road and the river. This area comprises part of Sutrapur, Malotinagar, Rahmannagar and inhabited by mainly higher income group. Different administrative

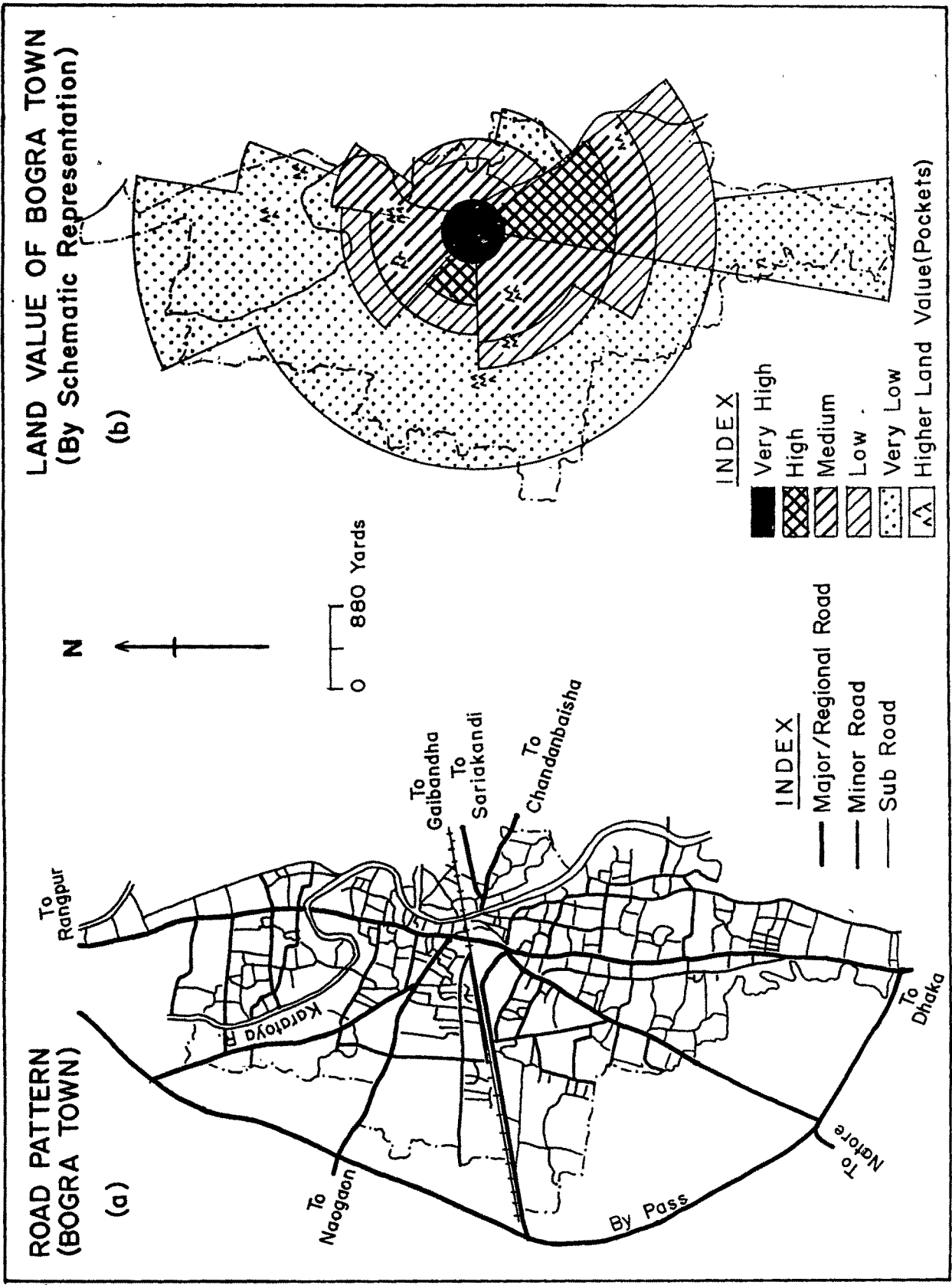


Fig. 4.7

offices and other public institutions, private enterprises, and socio-economic factors are responsible for the high land price.

Land values decline with distance from the centre. Roughly all the Sectors form high land value zones to a certain distance almost upto the municipal limit of 1982. Hence we may identify the zones between Dhaka road and Natore road, Natore road and station, Badortola road and Rangpur road (wide zone in most concentric form), and Rangpur road to the Karatoya river, Karatoya river and Chandanbaisha road (Chelopara & Natai) and finally Chandanbaisha road to the river (Natai) as Sectors with high land values.

The zones adjoining the town centre, has the third highest land value. Here the localities are Thantania, Sejgari, part of Chaksutrapur, Badortola, Namajgar, part of Katnarpara, Nisindara, and Kalitola area.

Again, within these zones, we find some pockets of different land that differ from the surrounding area. In these cases, local factors like good neighbourhood, transport facilities and in some cases business activities determine the Land value. These areas are Katnarpara Sejagari, Malotinagar near high school, Kalitolahat.

In the extension area pockets of high land price exist in places like Kamargari (near Govt. college) Fulbari, (Benina Wamena college) Khander bazar area due to the unique accessibility and arrival of comparatively higher class people

are including professional.

Now we may refer to the zone of the lowest land value which are mostly in the extension area (Fig. 4.7b) where predominantly rural character, extensive agricultural and vacant land, less population density, moderate to low accessibility and amenities etc. are the common features.

It may be summed up that the town of Bogra is a landscape of more or less mixed structures. Different income groups form continuous residential areas without much intermingling of other functions in the neighbourhoods. Schools, small business centres or business establishments, small scale industries fulfil the needs of the residents frontages or principal and Secondary roads are occupied by all sorts of urban functions, which do not disturb the residential environment.

The morphological structure and the land use pattern which are found in Bogra could serve as an example of many of the urban centers of Bangladesh.