

URBAN DEVELOPMENT DIRECTORATE
MINISTRY OF WORKS
GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH

LAND USE / MASTER PLAN
NANDIGRAM UPAZILA SHAHAR
BOGRA ZILA

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TECHNO SERVE INTERNATIONAL
620 SHAHEENBAG, OLD AIR-PORT, TEJGAON, DHAKA.

TO WHOM IT MAY CONCERN

The undersign has carefully reviewed and checked the Landuse/Master plan for Upazila Shohar prepared by M/S Techno serve International, 620 shaheenbag, old Airport, Dhaka and found it to be acceptable.

১৪/৮/৯০
উপজেলা নির্বাহী অফিসার,
নবীনগর বজা

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CHAPTER-1

1. INTRODUCTION

In the Government's recent policy of overall administrative re-organization, the upazila has been recognized as the most significant tier of administration. Each upazila centre will be the focal point of all upazila level administrative activities, Thus the development of upazila centre is the government's key strategy for social, economic and infrastructural upliftment of the upazila region.

The administrative re-organization has delegated more power to the upazila authority for planning, programming and controlling development activities within the upazila region. It is expected that with geared up administrative, social and economic activities the upazila headquarters can be relieved from the curse and ills of unplanned growth through the preparation and implementation of the land use/master plan.

The land use/master plan prepared for the headquarters will serve as a guideline for a planned and coordinated development of prospective headquarters' town upto year 2009. When successfully materialised, the land use/master plan will cause orderly growth of the town and its land uses. It will provide effecient transport network, promote development of commerce and industries, resulting in generation of employment and will indicate more rational use of land. The plan will reserve all provisions necessary for modern civic life.

It is a promise to the potential dwellers of the headquarters for a healthy, pleasant and functionally efficient living environment. Preparation of land use/master plan is the first step of the programme for bringing the whole of the upazila under planned development. It is expected that other important alternative settlements of the upazila based on hierarchy will be taken up soon for planning and development to render them healthy, pleasant and growth generating centres.

Planned development is the prime objective of the land use/ master plan. However, there is a common feeling that planning means a total development involving huge volume of fund. But such an idea is not fully correct. Planned development to a large extent, can be ensured through effective enforcement of development control regulations.

In the light of the above circumstances, it is felt that the upazila centre should grow up expeditiously and the preparation of land use/master plan for such centre is of utmost importance for better utilization of regions. land, people and natural resources. With this end in view, the government has planned to engage consultants for preparation of land use/master plan for every upazila shahars of Bangladesh.

CHAPTER-II

2. METHODOLOGY OF SURVEY AND ANALYSIS

The objectives and scope of services for preparation of the land Use/master plan for upazila shahar have been stated in section-2, and section-3 of the Term of Reference (TOR) respectively. To fulfil the requirements of objectives and scope of services it was needed to go through the following methodology for conducting existing land use and socio-economic survey.

2.1 Existing Land Use Survey

Mauza maps in the scale of 1 inch equal to 330 feet were collected from the D.L.R Office covering whole of the designated study area and traced out with plot boundaries and numbers to prepare field survey sheets. Plot to plot survey of current uses of land were marked on the survey sheets. The layout of the special features were drawn on the survey sheets. The survey for current uses of land were completed for the whole of the designated study area.

2.2 Preparation of Existing Land Use Map

The survey sheets were compiled in the laboratory and existing land use map were prepared in hatches. The land use map was examined and analysed and finally shahar area was delineated. From the survey sheets a base map of existing land use was prepared in graphics.

2.3 Existing Land Use Analysis

A table on existing land use was prepared from the base map. The quantity of land under different uses were calculated by grid method and consequently there might have some errors of calculations. The percentage of land under different uses were also calculated.

2.4 Socio-economic Survey and Data Analysis

A format of questionnaire containing 7 items and 95 variables was prepared and administered to collect the data on socio-economic condition of the people of the shahar area. Five percent of the total households were interviewed by field investigators on random basis. Data thus collected were tabulated and analysed to determine the socio-economic characteristics of the shahar area. The land use master plan would be prepared to meet the socio-economic needs of the people of the shahar area and catchment area.

2.5 Detailed Land use Survey

A detailed land use survey was conducted and completed by the survey team for 200 acres of core area (scale 1/1000). Layout of all man-made structures will be plotted to the correct scale. The level of land and flooded area were demarcated by physical varification. Contour maps will be collected from the BWAPDA and compared with the survey map and finally contours were interpreted on the survey map and it will be presented in the 3rd report.

2.6 Hierarchy of Settlements

The hierarchy of settlement was determined on mauza basis depending on population, economic activities, social infrastructure provisions, transport linkages and related other characteristics. In order to determine the hierarchy of settlements, necessary socio-economic indicators were selected and they were given assumed weightages. Data and information on selected indicators were collected during the field survey from the upazila headquarters. These data were tabulated and they were multiplied by assumed weightage to determine the gravity of each mauza of the concerned upazila. Accordingly relative gravitational circles were drawn on the geographical centres of each mauza which shows the importance of respective unions.

2.7 Catchment Area and Planning Area

To determine the catchment area, data on commuting distance and service area of the upazila shahar were collected during the field survey. The catchment area was determined and delineated through studies on commuting distance. Service area, Physical features, growth of settlements of the upazila headquarters and surroundings. The shahar area was determined on analysis of existing land use survey. Trend of development of settlement, availability of buildable lands and physical features of the centre and surroundings have been given due considerations.

DISTRICT BOGRA SHOWING UPAZILA

SCALE 1" = 4 Miles

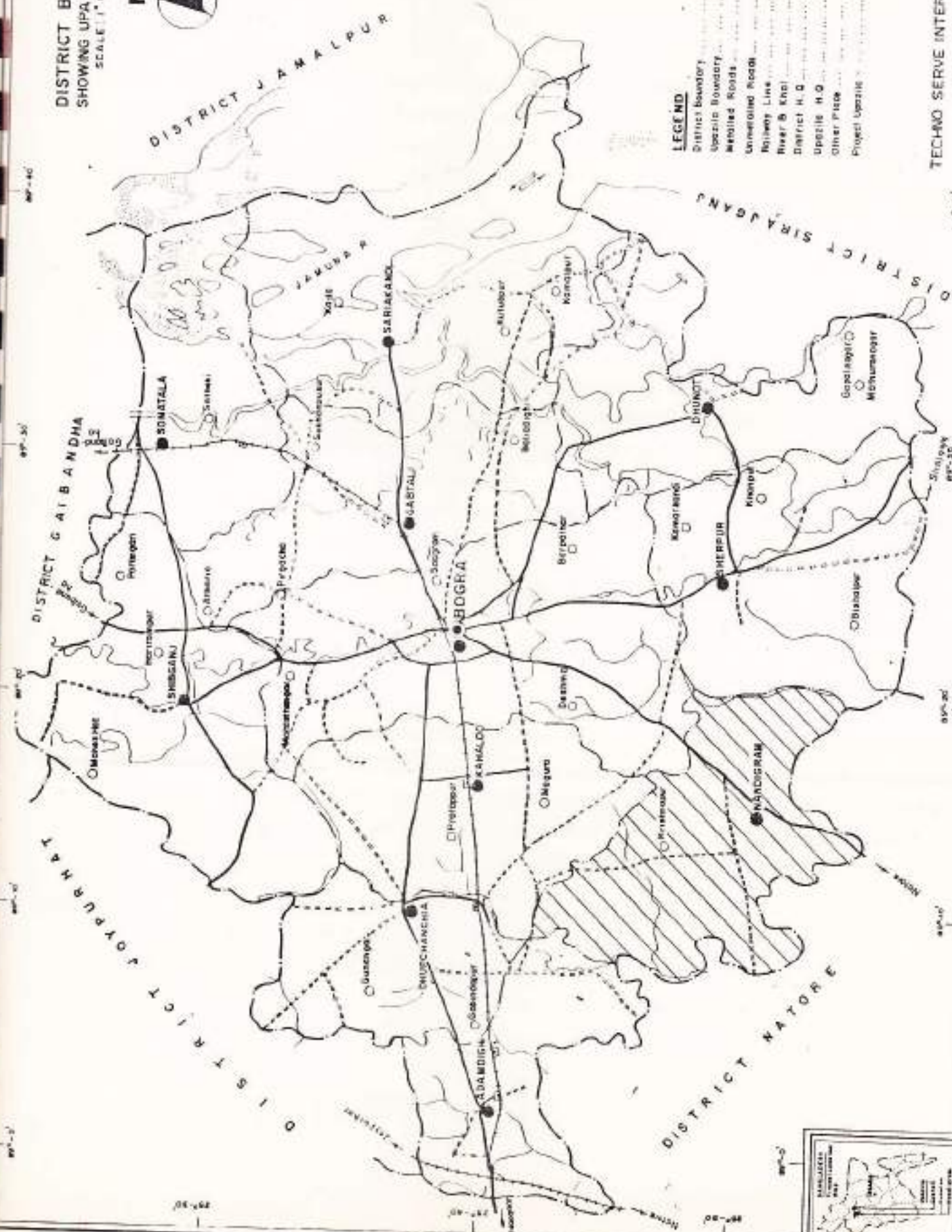


LEGEND

- District Boundary
- Upazila Boundary
- Metalled Roads
- Unmetalled Roads
- Railway Line
- River & Canal
- District H.Q.
- Upazila H.Q.
- Other Place
- Project Upazila

TECHNO SERVE INTERNATIONAL

90°-50'



CHAPTER-III

3. THE UPAZILLA IN IT'S DISTRICT CONTEXT

3.1 Brief History

The upazila came into existence in 1937. There is a legend that the father's house of the second queen of Raja Dashorat, the king Ojuddah, was situated at the present place of the Upazila. The name of the brother of queen was Nandini after whose name the place was named Nandigram. The Upazila assumed the same name at the time of its creation in the same place.

3.2 Location and physical characteristics

3.2.1 Location of Upazila and Upazila Shahar

Nandigram is one of the Upazila of Bogra district. It is located at a distance of 32 km (20 miles) from district headquarters. It lies between $24^{\circ}35'$ and $24^{\circ}43'$ north latitude and $89^{\circ}12'$ to $89^{\circ}19'$ east long. It is bounded in the north by Kahaloo and Bogra Sadar Upazilas, in the south by the singra upazila Natore district in the east by Kahaloo, Bogra sadar and sherpur Upazila and in the west by Adamdighi Upazila, Raninagor and singra Upazila of Natore district. It comprises a total area of 265.5 sq km (102.5 sq miles).

The soils of the Barind Tracts Lauta-gulta grey mixed brown clays series are prevailing in the Upazila. The Upazila shahar is situated roughly around the intersection of longitude $89^{\circ}13.5'$ to $89^{\circ}16.5'$ east and latitude $24^{\circ}37'$ to $24^{\circ}8.5'$ north. It is southernly located (Map-2).

3.2.2 Physiography

The general aspect of the district is that of a great plain unbroken through out its whole extent. Its landscape, being an absolute dead level, only by a slight slope, amounting in the whole length of the district to a few feet from the north-west towards the south and southwest.

The rivers Karatoya and phuljur divide it longitudinally into positions whose characteristics are very distinct. The eastern portion is small, containing some what less than two-fifths of the entire of the district, may be regarded as forming part of the flood plains of the Jamuna.

The western portion of the district presents a marked contrast to the eastern. It is well wooded scrub jungle being found in parts and is generally above flood level. Its soil is a hard compact clay and of raddish colour.

3.1.3. River System

There are quite a few rivers in the district of Bogra. Taking the Karatoya as the central dividing water channel the other rivers may be classified into the eastern and the western system. The eastern rivers are Monas, charkdaha and Khamati besides a few other smaller ones. Through the Khair tracts in the western parts the Nagar, the Tulshiganga and other minor streams. All western rivers are the tributaries of the Antrai which itself flows into the Jamuna (Map-1).

3.1.4. Soils.

A very good idea of the relative firmness of the two soils poli and Khair is afforded by the manner of digging wells in use in the two tracts. In poli land the well is lined with earthenware rings to prevent the earth falling in from above and choking up the well. In Khair land the well is dug straight down without any such artificial supports. Rice, Jute and Rabi crops are grown in the poli tracts but Khair is fit for the cultivation of paddy only.

3.1.5. Climate

The climate of Bogra is not much different from other north western districts of Bangladesh. The year is distinctly divided into a hot and dry summer, hot and wet monsoon, and dry winter. The hot weather commences in April and lasts the greater part of three months. Rain started from June to middle of October. The average temperature is between 68° - 69° F with extreme minimum and maximum ranging between 43° F and 87° F for that period. The average monthly rainfall is about 12.51" inches. Individual months during the monsoon season sometimes do have rainfall more than 33 inches.

3.1.6 Agriculture.

Rice is the staple crop of the district and one of the main sources of food supply. The principal crops are transplanted aman, Broadcast aman, Aus, Jute, Rape and Mustard Tobacco, Potatoes, and sugarcane.

Paddy is grown everywhere and accerents for more than 90% of the area under this crop. Paddy is extensively grown in the three allusion Upazilas of Gabtali, Dhunot, and Shariakandi. Boro paddy is rarely grown, save in the char areas.

3.2 Population and Settlement Distribution

3.2.1 Zila

According to the population census report of 1981, the population of Zila are 2108,622 persons. The total number of households is 379016, the total area of the zila is about 2922 sq.km. The density of population of the zila is 722 persons. The rate of growth of population of zila are 1.56 percent.

3.2.2 Upazila.

The total area of the Upazila is about 267 sq.km. The total number of households of the Upazila are 18885. The total population of the upazila in 1981, are 112424. The average density of total population are 421 persons per sq.km. The annual rate of growth of population of Upazila area is 1.91 percent.

TABLE-1
DISTRIBUTION OF POPULATION AND SETTLEMENTS

Locality	Area in Sq.km.	Population 1974	Population 1981	Density of Pop. 1981	Rate of Growth 1974-1981
Upazila	267	87802	112424	421	1.91
Zila	2922	1723262	2108622	722	1.56

Source : Bogra District Statistics - 1987

Table No.1.02 and 1.03

TABLE - 2

POPULATION AND LABOUR FORCE 1981

Locality	Population		Population (10 years)		Labour Force		Married Women (15-49 years)
	Total	Male	Total	Male	Total	Male	
Zila	2108616	1074383	1397723	719712	587664	560744	414550
Upazila	112428	56439	73318	37019	29290	28395	22197

Source : Upazila Statistics Vol. 1 - 1985
 Table No.2.02 Page 39
 Bangladesh Bureau of Statistics.

3.3 Economic Performance and Transport Linkages

3.3.1 Employment and Underemployment

Zila

The total population of Bogra Zila is 2108616 persons, out of which 1074233 persons are males and 1074383 persons are females. The total number of population in the age group of 10 years and above is 1397723 persons. The total number of labour force of the Zila is 587664 persons. The rest of the labour force are house-wives, student and underemployed. Amount the labour force the participation of males are 560744 persons and females are 26920 persons respectively. For details table no. 2 may be seen.

The total labour force of Zila is 587664 persons out of which 476801 persons are directly or indirectly engaged in agriculture. The remaining 111114 persons employed in non-agricultural sectors. For details Table No.2 and 3 may be seen.

TABLE-3: OCCUPATIONAL CLASSIFICATION OF POPULATION 1981.

Locality	Agriculture		Non-Agriculture		Others
	Cropping	Non-Cro- pping	Manufact- ture.	Business	
Zila	465575	11226	4417	55732	50965
Upazila	53412	205	171	4131	3067

Source : Upazila Statistics Vol. 1-1985
Table No.2.04. Page 69 Bangladesh
Bureau of Statistics.

Upazila

The total population of the Upazila is 112424 persons, out of which 56439 persons are males and 5585 persons are females. The total number of population in the age group 10 years and above is 73318 persons. The total number of labour force in the Upazila is 29,290 persons and the rest 22197 persons are housewives, students and underemployed situation of the Upazila is comparatively better than the Zila.

The total number of labour force employed is 29,290 persons, out of which 33617 persons are employed directly or indirectly in agriculture and the rest 7198 persons are engaged in non-agricultural sectors. For details Table No.2 and 3 may be seen.

3.3.2 Income and Expenditure.

The data on income and expenditure of the Zila or of the Upazila are not available for analysis. The data on income and expenditure of the study area have been collected through socio-economic survey and analysed in the section on 'socio-economic conditions' of the Upazila.

3.3.3 Transport Linkages.

Roads

There are only 203 miles metalled road in the Bogra Zila. The length of semi-metalled road is 80 miles. The non-metalled road is about 2415 miles. The main mode of communication is buses, autorickshaw, rickshaws and train services.

The total length of metalled road in the Upazila is 8 miles, Semi-metalled is 3 miles and non metalled road is 287 miles. The main mode of communication is bus and rickshaw. The distance between the Zila headquarters and the Upazila headquarters is 20 miles or 32 km. For details of transport linkages the table No.4 and the Zila map may be seen.

TABLE-4: ROAD MILEAGE BY TYPE, DISTANCE AND MODES OF COMMUNICATION 1981-1982

Locality	Road mile by type			Distance from district head Quater.	Modes
	Metalled	Semi-metalled	Non-Metalled		
Zila	203	80	2415	-	-
Upazila	8	3	287	20 miles/ 32 km.	Bus Tempoo

Source : Upazila Statistics, Vol.1, 1985
Table No.6.01
Page 198 Bangladesh Bureau of Statistics.

3.4 Social and Economic Infrastructures of the Upazila Region.

3.4.1 Market and Commerce.

Village markets play an important role in the country's economy. According to the data collected from the Upazila headquarters, there are 15 markets in the Upazila region of Nandigram. They meet once or twice in a week. One market serves 7495 persons.

3.4.2 Education.

There is one college in the Nandigram Upazila. The total number of high/Junior high schools is 18. There are 59 primary schools in the Upazila region. The teacher-student ratios in college, High/Junior high school, primary schools are 17, 21 and 53 respectively.

3.4.3 Health and Welfare.

There are one hospital and one dispensary with 10 beds, 13 doctors and 23 paramedics in this Upazila. This shows that there is one doctor, and one paramedic available for every 4648 and 4888 persons respectively.

3.4.4 Urban Services and Utilities.

There is water supply system in the Upazila headquarters area. Recently electricity and sanitary facilities are also available. Out of 236 villages of the Upazila, 1 village have so far been provided with electricity facilities. There are 8 post offices and one telegraph office in the Upazila.

3.5 List of current Development Projects :

The list of current development projects are taken by the Upazila parishad is given below, Table-5

TABLE-5

CURRENT DEVELOPMENT PROJECTS 1988-1989
UPAZILA NANDIGRAM, BOGRA.

Sl. No.	Name of Projects	Estimated cost(Tk)	Progress %
1.	Agriculture and Irrigation	1,98,000.00	100%
2.	Small and cottage Industries	19,800.00	100%
3.	Transportation and Communication	6,46,800.00	100%
4.	Housing and maintenance	2,41,400.00	100%
5.	Education development	99,000.00	100%
6.	Health and social Welfare	39,600.00	100%
7.	Sports and culture	66,000.00	100%
8.	U.P.Physical works	66,000.00	100%
9.	Miscellaneous	92,400.00	100%
Total :		14,69,000.00	100%

Source : Office of the Upazila Engineer, Nandigram -1989.

3.6 Synthesis : Identification of Hierarchy of Settlements in the Upazila.

In Bangladesh, socio-economic functions are not concentrated in one centre nor they are found completely dispersed. For this reason the hierarchy of settlements should not be determined on centre basis. Mauza-wise consideration of functions will have specific locations. Therefore, it would better to analyse the data for determination of hierarchy of settlements on mauza basis.

In determining the hierarchy of settlements 18 mainsocio-economic indicators have been selected (Table No.6). Data on these indicators on mauza have been collected from the Upazila headquarters. The distribution of socio-economic indicators on mauza basis has been shown in Table No.7.

The selected socio-economic indicators have been given assumed weightage for each (Table No.8). According to the given weights, the gravity of each function located in each mauza have been calculated (Table No.8). Finally, the total weight of each mauza have been found out. According to the weight ranking has been made. They are connected with shortest road linkages with Upazila shahar.

TABLE-6 : INDICATOR OF SETTLEMENT HIERARCHY AND WEIGHTS.

Sl no.	Infrastructures	Abbreviation	Weight
1.	Public Institution	pi	5-10
2.	Commerce	ch	1-5
3.	Industrial Establishment	In	1-5
4.	Police Station	Ps	1-5
5.	Health and Welfare	Hw	1-5
6.	College	Ec	5-10
7.	High School	Eh	3-6
8.	Primary School	Ep	1-2
9.	Post Office	Po	1-5
10.	Telegram and Telephone	Tt	1-5
11.	Electricity	Et	2-5
12.	Religious Institution	Ri	1-5
13.	Road Pucca	Rp	1-5
14.	Station (Rail, Water, Bus)	Ri	1-5
15.	Recreation (Park, Playing)	Re	1-5
16.	Bank	Bk	1-5
17.	Area 500 Acres	Ar	1-6
18.	Population 500 persons	Pn	1-6

TABLE 7

DETERMINATION OF HIERARCHY OF SETTLEMENT BY NIGHTJAG METHOD

Name of Mouzas	Pi	Ch	In	Ps	Hu	Ec	Sh	Bo	Po	Tt	St	Ri	Rp	St	Re	Idc	Ar	Pn	Total	Rank
Nardigram	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Thaltamelgram	5	4	4	4	5	10	4	2	5	5	4	5	5	5	5	5	5	5	88	1st
Bhatra	5	-	-	-	4	5	5	2	4	-	4	4	4	-	3	3	3	2	48	2nd
Bisrul	5	-	-	-	4	3	5	2	3	-	3	3	-	-	3	3	3	3	40	3rd
Mamuite	-	-	-	-	4	3	4	2	3	-	-	3	-	-	3	3	2	2	38	4th
Hat Karai	-	-	-	-	-	-	4	2	3	-	-	3	-	-	3	3	2	3	30	5th
							4	2	3	-	-	3	-	-	3	3	2	2	19	6th

TABLE B

LIST OF INDICATORS OF SETTLEMENT HIERARCHY

Name of Mouzas	P1	Ch	In	Ps	Hw	Ec	Sh	Do	Po	Tv	Bl	Rl	Rn	St	Re	Bk	Ar	Pn
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Nandigram	1	1	1	1	1	2	2	2	1	2	1	1	1	2	2	4	581	2557
Thaltamajeram	1	-	-	-	1	1	1	1	1	-	1	1	1	-	1	1	746	2431
Bhatra	1	-	-	-	1	1	2	1	1	-	1	1	-	-	1	2	249	512
Bisrul	1	-	-	-	1	1	2	1	1	-	1	1	-	-	1	1	619	2674
Nemute	-	-	-	-	1	1	2	1	1	-	-	1	-	-	1	1	886	1892
Hat koral	-	-	-	-	-	-	1	1	1	-	-	1	-	-	1	1	971	2330

4. SOCIO-ECONOMIC CONDITIONS OF THE STUDY AREA.

According to the instructions given in the scope of work 4.3 of the TOR, the socio-economic survey for the study area was conducted and completed for 125 households. The main objectives of the socio-economic survey were to find out the social and economic conditions of the study area. The results of analysis of socio-economic data may help locate adequate functions of government's services and facilities of basic needs in the upazila shahar which will bring some significant improvement in the quality of life of rural people. The data collected through socio-economic survey are analysed in the following paragraphs.

4.1 Population Characteristics.

According to socio-economic survey of 125 households contains 650 persons.

The distribution of population by age group has been shown in Table No.9. The highest number of population is found in the age group of 16 to 20 years accounting 12.31 percent of the total population. It indicates that the people of younger age group have been concentrated in the Upazila centre for jobs and education. It has also been noticed that beyond the age group of 35 years the number and percentage of population have gradually fallen.

TABLE-9: AGE AND SEX COMPOSITION OF POPULATION OF STUDY PLAN AREA

Age Group (Years)	Male	Female	Total	Percentage
0 - 5	24	22	46	7.08
6 -10	28	26	54	8.30
11-15	34	32	66	10.15
16-20	40	40	80	12.31
21-25	38	36	74	11.38
26-30	36	33	69	10.62
31-35	34	30	64	9.85
36-40	30	28	58	8.92
41-45	25	22	47	7.23
46-50	20	18	40	6.15
51-55	12	8	20	3.08
56-60	10	8	18	2.77
60+above	7	7	14	2.15
Total :	340	310	650	100.00

Source : Field Survey, 1989

There are 109 males for 100 females in the study area which character of urban population. Due to the upgradation of upazila, economic activities have already been started in the Upazila centre and people of younger generation have been concentrated in and around the Upazila centre for jobs.

4.2 Household Characteristics.

In the study area, 125 households containing 650 persons have been surveyed. The size of house-hold is 5.20 which is lower than the district average.

There are 50 pucca structures in the study area. There are 400 semi-pucca and 700 kutcha structures. In the study area 80 structures are unclassified. The structural conditions of the study area are poor, for detail Table No.10. May be seen.

TABLE-10 : HOUSEHOLD STRUCTURES OF THE STUDY AREA, 1989.

Household Structures	No. of Household	Percentage
Pucca	50	4.07
Semi-Pucca	400	32.52
Kutchha	700	56.91
Unclassified	80	6.50
Total :	1230	100.00

Source : Field Survey, 1989.

4.3 Economic Performance.

The total number of population of age group 10 years and above is 650 persons, out of which 200 persons or 30.77 percent are employed in different sectors of economic activities. The number of persons unemployed are 400 persons including housewives and students.

TABLE - 11 : EMPLOYMENT STRUCTURES, 1989.

Employment Structures	Persons	Percentage
Employed	200	30.77
Unemployed	400	61.54
Invalid	50	7.69
10+ Population	Total : 650	100.00

Out of Source : Field Survey, 1989.

Out of 200 persons, 120 persons or 60.00 percent are engaged in agriculture. The number of persons engaged in business is 30 or 15.00 percent. Only 30 persons are employed in service. The total of other professionals amounts 20 persons or 10.00 percent of the total population.

TABLE-12 : PROFESSIONS STRUCTURE OF POPULATION, 1989.

Professions	No.of Population	Percentage
Agriculture	120	60.00
Business	30	15.00
Service	30	15.00
Others	20	10.00
Employed :	Total : 200	100.00

Source :Field Survey, 1989.

The income and expenditure of 125 households are available. The annual income of 48 households are upto Taka 10,000.00 only, The annual income of 42 households lies between Taka 10,001 to 20,000.00. The annual income of 18 households lies between Taka 20,01.00 to 30,000.00. The expenditure of 20 households lies between this range. The expenditure of 5 households lies between Taka 30,001.00 to 40,000.00. The expenditure of 3 households lies between Taka 40,001.00 to 50,000.00 and expenditure of threhouseholds lies between Taka 40,001/-to50,000/-. The maximum expenditure of household about 55 nos. or 44% lies upto Tk.10,000.00 and about 40 household or 32% lies between Tk.10,001.00 to 20,000.00. (Table-13 and Table-14).

TABLE-13 : ANNUAL INCOME PATTERN OF THE HOUSE-HOLD IN THE STUDY AREA, 1989.

Range(Tk)	Income	Percentage
+10,000	48	38.40
10,001-20,000	42	33.60
20,001-30,000	18	14.40
30,001-40,000	8	6.40
40,001-50,000	4	3.20
50,001+ above	5	4.00
Total :	125	100.00

Source : Field Survey, 1989.

The main source of income of the people of the study area is agriculture and business. The main field of expenditure is food and clothing.

4.4 Small Scale and Cottage Industries.

There is one small scale and cottage industry complex in the shahar area which is funded by the upazila parishad.

4.5 Educational Institutions.

There are 2 primary schools in the study area of Nandigram Upazila shahar area. The total number of teachers in 2 schools are 10 persons. There is one high school for boys and one high school for girls. There is one college in the study area.

TABLE-14 : ANNUAL EXPENDITURE PATTERN OF THE HOUSE-HOLD IN THE STUDY AREA, 1989.

Range (Tk.)	Expenditure	Percentage
+10,000	55	44.00
10,001-20,000	40	32.00
20,001-30,000	20	16.00
30,001-40,000	5	4.00
40,001-50,000	3	2.40
50,001+ above	2	1.60
Total:	125	100.00

Source : Field Survey, 1989.

4.6 Administrative Institution.

Administrative institution includes both the government and semi-government offices. There are 20 administrative offices located in the upazila study area. The commuting distances of officials are 1 to 2 kilometers.

4.7 Financial Institutions.

There is only four bank branches in the upazila headquarters of shahar area of Nandigram.

4.8 Health and Welfare.

There is a charitable dispensary in the Upazila centre. There is only one family planning centre in the study area. The upazila health complex is located outside the shahar area.

4.9 Recreational Facilities.

There is no notable recreational facilities in the upazila centre. But there is two playgrounds in front of boys high school and college.

4.10 Distance of Important places from Home.

The distance of roads of 100 households is within 03 km. Only 50 households lie within one kilometre distance.

The working places of most of the households are within 1-2km. Approximately 82 percent of the households are located within 0.5 km.distance from the primary schools. About 10 percent of household are located within 0.5 km.radius of the high school. Rest of the households are located within 2 km.radius.

More than 75 percent of the households are located within 0.5 radius of the market. Rest of the households are within 2 km. distance.

4.11 Available Facilities.

According to the socio-economic survey, 65 percent of the people answered that there is no scope of employment in the upazila. Health facilities are not adequate. The facilities for recreation exists in the upazila. There is telephone service in the upazila headquarters. The upazila is devoid of social and economic facilities. Under this circumstances an upazila shahar can not be developed.

5. THE UPAZILA HEADQUARTERS.

5.1 Definition of sphere of Influences/Attractiveness: Functions located in space have dynamic influences on surrounding areas. It may be assumed that the zone of influence of any functional centre varies directly with the potentiality of the centre. Physical barriers and discontinuation of settlements are the main constraints of the zone of influence. But specialised functions have greater zone of influence. But specialised functions have greater zone of influences.

In the Upazila headquarters, major government services have their zone of influences over whole of the Upazila region. Social functions like hospital, colleges, sports, stadium etc. may have greater zone of influences even spreading beyond the territorial boundaries of the Upazila region.

The zone within the commuting distance of Upazila Headquarters may be called the catchment area of the Upazila headquarters. The information and data collected during socio-economic survey from the Upazila headquarters and surroundings have been analysed and described in the preceding chapter on socio-economic condition of the study area. Here, we shall throw some light on socio-economic analysis.

On verification of physical facilities and commuting distances the mauzas shown in the table have been included in the catchment area. For details of area, population of 1961, 1974 and 1981, the table No.15 may be seen.

5.2 Definition of Shahar Area.

To prepare the land use/master plan for Gabtali Upazila Shahar in order to serve as locational guidelines indicating places of work, residence and to facilitate public and private developments at the Upazila centre through physical planning approach, around the Upazila headquarters. The survey map was analysed very carefully and found that almost all the non-agricultural functions have been located around the Upazila headquarters. There are scattered settlements around the Upazila headquarters. For details of area and population have been shown in the table 16.

Table : 14

Catchment area and Population

Mauzas	Total Area		Involved Area		Population Involved		
	Acre	Hectore	Acre	Hectore	1961	1974	1981
Namuite	886	(358.83)	886	(358.83)	589	952	1196
Dhakair	374	(151.47)	374	(151.47)	331	525	707
Bhabanipur	369	(149.44)	369	(149.44)	214	396	408
Belgharia	128	(51.84)	128	(51.84)	180	271	354
Belgram	65	(26.32)	65	(26.32)	35	61	96
Dalgacha	215	(87.07)	215	(87.07)	292	446	587
Khorda Simla	196	(79.78)	196	(29.38)	298	410	508
Uttarkachagari	163	(66.01)	163	(66.01)	113	257	330
Pakuria	180	72.9)	180	(72.9)	109	-	889
DobaTeghara	64	(25.92)	64	(25.92)	109	180	231
Dighirpar	124	(50.22)	124	(50.22)	118	205	243
Badlashon	215	(87.07)	215	(87.07)	292	425	556
Khariapukur	95	(38.47)	95	(38.47)	-	-	-
Kamla	330	(133.65)	330	(133.65)	391	561	758
Chakran Adhkola	54	(21.87)	54	(21.87)	80	110	165
Bisha	431	(174.55)	431	(174.55)	556	798	967
Bhatgram	606	(245.43)	606	(245.43)	701	1031	1320
Nizamatkuri	69	(27.94)	69	(27.94)	118	200	299
Katham	1069	(432.94)	1069	(432.94)	886	996	1235
Dhamgra Doutat	390	(157.95)	390	(157.95)	359	672	956

Baziata Belgram	502	(203.31)	502	(203.31)	518	788	1000
Chhota Derahor	379	(153.49)	379	(153.49)	379	558	773
Derahar	374	(151.47)	374	(151.47)	201	391	707
Kadma	166	(67.23)	166	(67.23)	154	240	318
Omarpur	152	(61.56)	152	(61.56)	268	397	563
Isabpur	388	(157.14)	388	(157.14)	266	390	462
Bijayghat	155	(62.77)	155	(62.77)	120	246	306
Gandail	200	(81.00)	200	(81.00)	97	172	249
Hatua	189	(76.54)	189	(76.54)	114	237	292
Phukpal	576	(233.28)	76	(30.78)	25	44	87
Uttar Suknagar	66	(26.73)	66	(26.73)	39	62	80
Raidhal	535	(216.67)	535	(216.67)	550	826	857
Chak-Ramdebpur	103	(41.71)	103	(41.71)	69	188	210
Dohar (Johar)	402	(162.81)	402	(162.81)	404	617	744
Singrekhalas	55	(22.27)	55	(22.27)	80	114	131
Sidhail	221	(89.50)	221	(89.50)	340	541	682
Basamtabor	42	(17.01)	42	(17.01)	429	689	797
Dasgam	846	(342.63)	846	(342.63)	671	821	958
Paralia	64	(25.92)	64	(25.92)	40	71	51
Alalpur (Alaipur)	51	(20.65)	51	(20.65)	157	227	283
Bishnupur	75	(30.37)	75	(30.37)	53	85	97
Purb Kuchahuri	107	(43.33)	107	(43.33)	59	157	200
Bhadradighi	95	(38.47)	95	(38.47)	252	168	221
Kahali	396	(160.38)	396	(160.38)	318	898	621

Total : , 12162 (4925.61) 11662 (4723 .11) 11374 17423 22494

Source : Census report of 1961, 1974 and 1981 of Bogra District,
BBS, Govt. of Bangladesh.

TABLE-15
POPULATION OF THE STUDY AREA

Name of Mouza	Total Area		Area Involved		Total Population Involved		
	Acres	Hectares	Acres	Hectares	1961	1974	1981
Nandigram	581	261	581	261	846	1297	2557
Majhgram barendra	104	42	104	42	119	178	233
Kalikapur	265	107	265	107	135	227	259
Bhaturtapara	118	48	118	48	64	177	250
Phukpal	576	233	500	203	365	602	802
Total :	1644	666	1568	635.04	1529	2481	4101

Source : Population census report of Bogra District,
1961, 1974 & 1981, BBS, Government of Bangladesh.

5.3 Existing Land Use : Facilities and Utilisation Characteristics.

The land use survey reveals a that table-17 constitute about 1568.00 acres or 635.04 hectares of land showing different land use characteristics. The survey indicates that a large portion of the study area is under agricultural activity. The detail of land use categories have been described in table No.17 and the following sub-paragraph.

5.3.1 Commerce

There is a market centre in the Upazila shahar study area. It covers 3.50 acres of land. It is located in the mauza of Nandigram on the west side of Bogra Natore road. Many mills have been set up in an unplanned manner in the market centre of the upazila shahar area.

5.3.2 Industry .

There are 1 saw mill, 2 rice husking mills in the Upazila shahar area. It covers an area of about 3.00 acre of land.

5.3.3 Educational Institution.

There is one college, one high school, one girls high school, three Primary schools in the study plan area. It covers an area of about 16.00 acres of land (1.02%) of total land uses. It is situated at Nandigram mauza.

5.3.4 Health Facilities.

There is one Charitable dispensary which is situated at Nandigram mauza covers an area of about 1 acre of land (0.06%).

TABLE-16

EXISTING LAND USE PATTERNS IN THE STUDY AREA, 1989 (area in acres)

Functions	Name of mauzas in the study area					Total	Percent
	Nandigram	Kalikapur	Majhgram	Barandra	Bhaturtapara Phukpal		
Commerce	3.50	-	-	-	-	3.50	0.22
Industry	3.00	-	-	-	-	3.00	0.19
Health	1.00	-	-	-	-	1.00	0.06
Education	16.00	-	-	-	-	16.00	1.02
Recreation	4.00	-	-	-	-	4.00	0.26
Administration	20.00	-	-	-	-	20.00	1.28
Socio-culture	2.00	-	-	-	-	2.00	0.13
Urban Service	7.00	-	-	-	-	7.00	0.45
Residential	48.00	30.00	16.00	12.00	25.00	131.00	8.35
Roads	18.00	5.00	6.00	4.00	16.00	49.00	3.13
Water Bodies	20.00	5.00	10.00	5.00	16.00	56.00	3.57
Agriculture/ Forestry	378.50	215.00	72.00	97.00	413.00	1275.50	81.35
Grand Total	581.00	265.00	104.00	118.00	500.00	1568.00	100.00

Source : Field Survey - September, 1989.

5.3.5 Administration.

There is one Upazila complex, one police station, one Upazila Court in the Shahar area which constituted a total land of about 20.00 acres (1.28%).

5.3.6 Socio-Cultural.

One graveyard, three mosques and one club is situated in the shahar area with 2.00 acres of land (0.13%).

5.3.7 Recreation.

It covers about 4.00 acres of land about (0.26%). There is only one playground in the study plan area.

5.3.8 Urban Services.

There is one post Office in Nandigram mauza, one PDB Office and one T&T Office at Nandigram mauza which covers an area of about 8.7 acres or 3.52 hectares (0.46%) of the total land uses.

5.3.9 Roads

It covers about 49.00 acres of land (3.13%), there are 18.00 acres of land in the Nandigram, 5.00 acres at Kalikapur, 6.00 acres are at Majhgram Barendra, 4.00 acres at Bhatartapara, 16 acres at Phukpal mauza.

5.3.10 Water Bodies.

The water bodies cover an area of 56.00 acres (3.57%) of the total land, in this case only canals and tanks/ponds are counted.

5.3.11 Residential

Residential use of land covering about 131.00 acres. It constitutes about 8.35 percent land uses of the total uses. A large majority of this land contains traditional housing with concentric pattern of settlement. But in the Upazila shahar there are some modern designed house. There are 48.00 acres of land at Nandigram 30 acres at Kalikapur, 16.00 acres at Majhgram Barender, 12 acres at Bhaturtapms and 25.00 acres at phukpal mauza.

5.3.12 Agriculture/Forestry.

Major portion of the Upazila shahar study area is under Agricultural activity. It covers about 1275.50 acres of land of the total area. The area is potential for growth of rice. It is surplus rice productive area.

5.4 Physical Opportunities and Constraints.

5.4.1 Land Tenure.

The land tenure system in greater Bogra is similar to that of almost whole of Bangladesh. The land revenue system introduced by the British rulers was again reinforced after partition of India subcontinent in 1947. By a legislation known as the East Bengal Estate Acquisition and Tenancy Act, 1950 all proprietary rights of the middlemen that is the zamindars and other subleases were abolished and agricultural tenants were given permanent, heritable and transferable rights in their hands. They were entitled to use the land

in any way they liked. They were to pay rent direct to the government. Thus direct relation was established between government and the people. In the process, the tillers of the soil became its real proprietors.

Amendments have been made recently by the present government that land use for dwelling units are not transferable. The Govt. of Bangladesh has also distributed 3 acres of khas land to the landless cultivators.

5.5 Land Value

As per report of the field survey, the value of land in and around the Upazila headquarters has greatly increased due to the upgradation of Upazila.

At present, the value of an acre of residential land ranges from Tk. 8,00,000.00 to 10,00,000.00. The value of fertile agricultural lands varies between Tk. 1,15,000.00 to 1,50,000.00. The value of medium agricultural lands ranges from Tk. 50,000.00 to 80,000.00 only.

5.6 Land suitable for Building

Buildable land is rare in and around the Upazila headquarters. The land on the west side of the Bogra-Natore road is buildable and suitable for construction purposes.

5.7 Land to reserve for Agriculture and other specific uses.

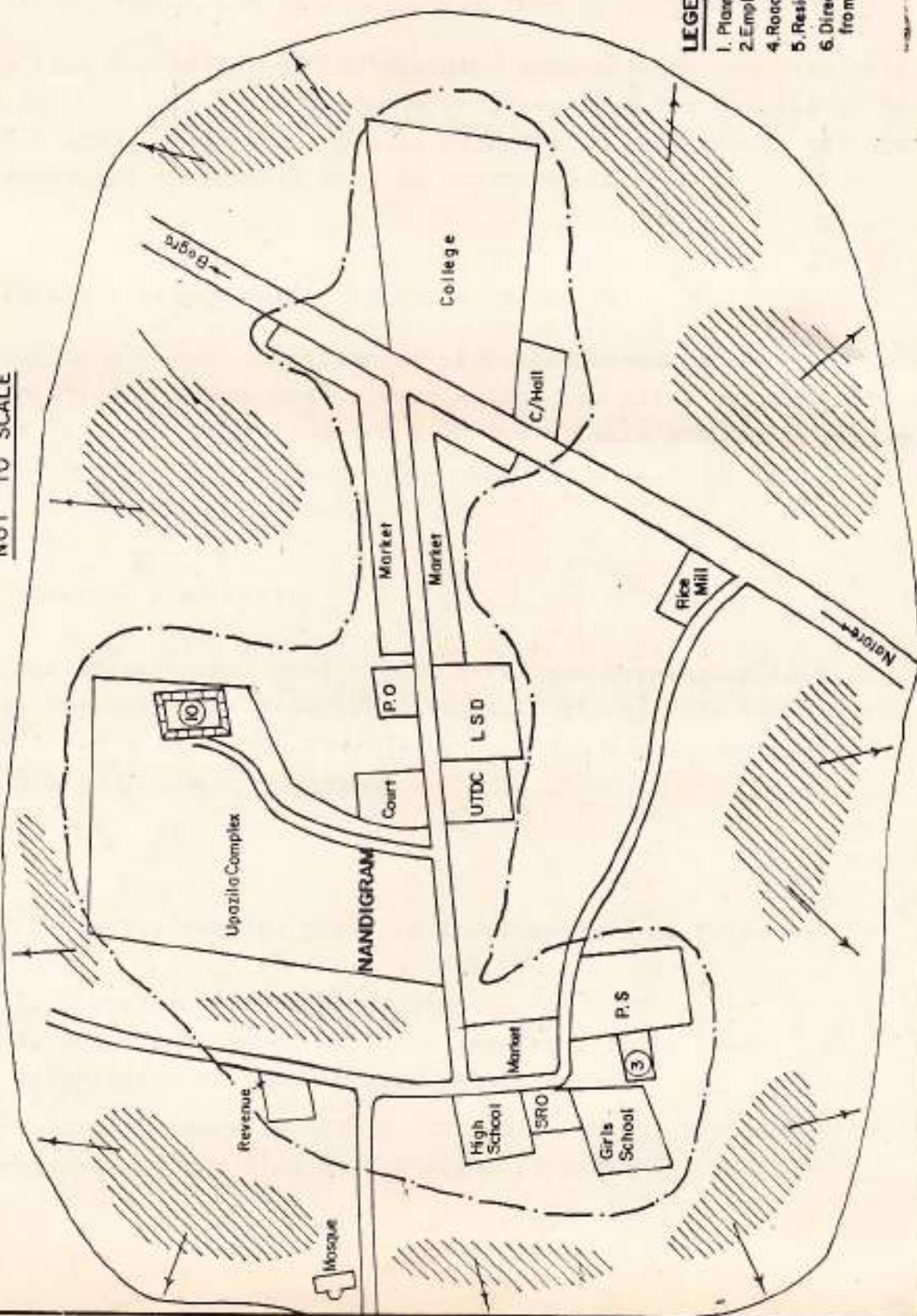
As stated in the preceding paragraph, the agricultural lands on the east and north east of the Upazila headquarters are fertile and they should be kept reserved for the current use. The land on the east of the Upazila headquarters is very low and not buildable in Majhgram barandra.

SCHEMATIC CONCEPT PLAN

NOT TO SCALE

NANDIGRAM UPAZILA SHAHAR

N



LEGEND

1. Planning area boundary...
2. Employment area...
4. Roads...
5. Residential area...
6. Direction of urban growth from the employment area...

D-1

5.4.5 A Schematic Concept Plan

The urban growth and its structure are dependent on the size of the design population and local socio-physical condition as follows:

A) Urban Growth and Size Resulting from Population Growth

The base population of the planning area in 1981 has been estimated to be 4101 only. The forecasts would suggest the Upazila to be a small urban area. This area is expected to grow around the upazila complex and the market area in Mouza Nandigram.

B) Physical Determination of Urban Expansion

There is a number of different sizes kutchha and brick soling road within the planning area. These kutchha and brick soling roads make the area well connected with the upazila shahar. The Bogra-Natore High way passes through the centre of Upazila which make the importance of Nandigram Upazila Shahar.

C) Internal Road System

So far the internal road system have been developing in such a way that the man-made drainage pattern is linked with the natural water courses. The Baligram - Nandigram, a brick soling and connected the Upazila with its rural areas.

The Schematic concept plan has three aspects as follows:

1. Direction of future growth
2. Concentration of employment/central/civic zone
3. Expansion of housing/community areas.

Considering these aspects a Schematic Concept plan has been prepared and attached as a Diagram (Diagram-I).

6.1 POPULATION, HOUSEHOLD STRUCTURE, DENSITY

6.1.1 Within Sphere of Influence/Catchment Area:

A. Population :

The sphere of influence/catchment area of Nandigram Upazila Shahar is identified and includes mauzas in full or part covering an area of 11662 acres (4723 hectares). Total population of the catchment area was 22492 persons in 1981. Table 18 shows high, medium and low population projection of the catchment area for the years 1985, 1990, 1995 and 2,000 A.D.

TABLE 18: HIGH, MEDIUM AND LOW POPULATION PROJECTION OF THE CATCHMENT AREA, 1985-2000

	Projections					
	High		Medium		Low	
	Pop.1974	Pop.1981	Pop.1961	Pop.1981	Pop. 1961	Pop. 1974
	Growth Rate= 3.72		Growth Rate= 3.47		Growth rate= 3.33	
1985	26030		25780		25641	
1990	31245		30574		30204	
1995	37506		36260		35579	
2000	45021		43003		41911	

Source : Figures for 1961, 1974, 1981 are quoted from 1961, 1974 and 1981 government census publication.

Note : Population of 1981 Census is considered as base year.

B. Population Density :

The density levels in the catchment area is considered to be number of persons per acre/hectare over the different plan periods. The level of population is shown in the following table (Table-19).

TABLE 19 : POPULATION DENSITY FORECASTS IN THE CATCHMENT AREA (MEDIUM PROJECTION)

Aspects	Year			
	1985	1990	1995	2000
Population	25780	30574	3620	43003
Density-Per Acre	2.21	2.62	3.11	3.69
Per Hectare	5.46	6.47	7.68	9.11

Note : Area is determined by field survey

C. Household Structure :

Household structures have been expressed in term of household size. The forecasted household sizes over the different plan periods are as follows :

TABLE- 20 HOUSEHOLD SIZE FORECASTS IN THE CATCHMENT AREA
(MEDIUM PROJECTION)

Aspects	Year			
	1985	1990	1995	2000
Projected Population	25780	30574	36260	43003
Household Size	5.0	4.8	4.2	4.0
Member of Household	1.94	1.57	1.16	0.90

Note : The base year of household size 5.0 as considered in 1981.

6.1.2 Within Shahar Area:

A. Population :

In Table-21 population of the Upazila Shahar on high, medium and low projection over different plan periods are presented.

TABLE-21 HIGH, MEDIUM AND LOW POPULATION PROJECTS
IN THE SHAHAR AREA.

Year	Projects					
	High		Medium		Low	
	Pop.1974	Pop.1981	Pop.1961	Pop.1981	Pop.1961	Pop.1974
	Growth rate= 7.44		Growth rate= 5.06		Growth rate= 5.79	
1981	4101		4101		4101	
1985	5465		4996		4759	
1990	7824		6395		5732	
1995	11201		8185		6904	
2000	16035		10476		8315	

Source : Figures of 1961, 1974 and 1981 are quoted from Census documents of 1961, 1974 and 1981.

Note : Population of 1981 is considered as base population.

B. Population Density :

The consequent levels of population in the Upazila Shahar Area will likely be as follows (Table-22):

TABLE- 22 : POPULATION DENSITY FORCASTS IN THE SHAHAR AREA
(MEDIUM PROJECTION).

	Year			
	1985	1990	1995	2000
Projected Population	4996	6395	8185	10476
Shahar Area				
- Acres	1568	1568	1568	1568
- Hectares	635	635	635	635
Density				
- Per Acre	3.19	4.08	5.22	6.68
- Per Hectare	7.87	10.07	12.89	16.50

Note : The area within the Upazila Shahar is determined by field survey.

C. Household Structure :

The forecasted household sizes and number of households are likely to be as shown in Table-23.

TABLE-23 : HOUSEHOLD STRUCTURE FORCASTS IN THE SHAHAR AREA

Aspects	Year			
	1985	1990	1995	2000
Projected Population	4996	6395	8185	10476
Households Size	5.1	4.8	4.2	4.0
Number of Households	1.02	7.51	5.13	3.64

6.1.3 Migration Aspects:

There is not enough statistical information on the migration aspects at the Upazila levels. However, the migration aspects have to be considered in terms of population growth in the Zila context, future economic development prospects in Zila and Upazila levels and population policy of the government. In view of absence of adequate information, elaboration of the aspects in this plan are not possible.

6.2 LABOUR FORCE AND EMPLOYMENT

It is described in the previous Chapter Two.

6.3 LAND REQUIREMENT PROVISION STANDARDS

Land requirements of the Upazila Shahar are determined on the basis of

- Population growth on Upazila Shahar as forcasted for Upazila Shahar Area and Catchment Area.
- Spatial consequences of government's administrative decentralization at Upazila level.
- Local natural features/conditions: Problem and opportunities.
- Availability of existing services and facilities.
- Circulation system of Upazila Shahar.

The standard provisions as noted in the TOR of Urban Development Directorate are generally followed in allocating land for different uses.

The estimated land requirements for different uses in the Upazila Shahar Area are presented in Table-24 :

TABLE-24: LAND REQUIREMENTS OF THE UPAZILA SHAHAR, 1985-2000.

Classification of uses	Provision standard	Existing land		Land requirement according to TOR		According to plan provision	
		Acre	Hectare	Acre	Hectare	Acre	Hectare
1	2	3	4	5	6	7	8
1. Commerce -Shops/Markets (Shahar popn + Catchment area)	1.5 acres/ 1,000 popn.	3.50	1.42	80.22	32.49	30.00	12.15
2. Industry (Shahar popn + Catchment area)	-Do-	3.00	1.22	80.22	32.49	25.00	10.12
3. Education :		16.00	6.48	49.30	19.97	26.00	10.53
-Primary Schools (Shahar popn).	2 acres/ 5000 Popn.	2.00	0.81	4.19	1.70	4.00	1.62
-Secondary Schools (Catchment Area + Shahar Propn).	5 acres/ 20,000 popn.	6.00	2.43	13.37	5.41	10.00	4.05
-College (Catchment + Shahar propn).	5 acres/ 20,000 popn.	6.00	2.43	13.37	5.41	8.00	3.24
-Vocational Centre	5-10 acres - per Upazila.	-	-	5.00	2.03	1.00	0.41
-Madrasa	5 acres/ 20,000 Popn.	2.00	.81	13.37	5.41	3.00	1.27
4. Health (Catchment + Shahar popn).		1.00	0.405	15.46	6.26	12.00	4.86
-Dispensary/ Maternity/ Childcare (Shahar popn).	1 acre/ 5,000 popn.	1.00	.405	2.09	0.85	2.00	0.81
-Health Complex/ Hospital	5 acres/ 20,000 Popn.	-	-	13.37	5.41	10.00	4.05
5. Administration/ Judiciary	12 acres/ Upazila Shahar	20.00	8.10	12.00	4.86	20.00	8.10
6. Recreation : (Catchment Area +Shahar popn.)		4.00	1.62	62.84	25.45	12.50	5.06
parks	1 acre/ 1,000 popn.	1.50	0.61	53.48	21.66	5.00	2.02
-Cinema	0.5 acre/ 20,000 popn.	1.00	0.405	1.34	0.54	1.50	0.61
-Stadium/ play field	3 acres/20,000 popn.	1.50	0.61	8.02	3.25	6.00	2.43

1	2	3	4	5	6	7	8
7.	Socio-Cultural : Catchment Area+ Shahar popn.)	2.00	.81	37.96	15.37	10.00	4.05
	-Community Centre (Shahar popn). 1 acre/ 20,000 popn.	-	-	0.52	0.21	0.50	0.20
	-Religious Facilities 0.5 acre/ 5,000 popn.	1.00	0.405	5.35	2.17	1.50	0.61
	-Public Library 0.5 acre/ 5,000 popn.	-	-	5.35	2.17	1.00	0.41
	-Cemetery/ Graveyard 5 acres 20,000 popn.	1.00	0.405	13.37	5.41	5.00	2.03
	-Edgah 5 acres/ 20,000 popn.	-	-	13.37	5.41	2.00	0.81
8.	Urban Services : (Catchment area + Shahar popn).	7.00	2.83	16.02	6.49	12.50	5.06
	- Post Office 0.5 acre/ 20,000 popn.	2.00	0.81	1.34	0.54	2.00	.81
	- Telephone Exchange 0.5 acre/ 20,000 popn.	2.50	1.01	1.34	0.54	2.50	1.01
	- Bus Terminal 1 acres/ 20,000 popn.	-	-	2.67	1.08	2.00	0.81
	- Fire Station "	-	-	2.67	1.08	1.00	0.41
	- Water supply "	2.50	1.01	2.67	1.08	2.00	0.81
	- Electricity supply "	-	-	2.67	1.81	2.00	0.81
	- Petrol Pump "	-	-	2.67	1.81	1.00	0.41
9.	Roads (including local roads) 8% of total proposed land	49.00	19.85	125.44	50.80	125.00	50.63
10.	Residential : (Shahar popn) 60 persons per acre	131.00	53.05	184.60	74.76	185.00	74.93
	- General	131.00	53.05	174.60	70.71	170.00	68.85
	- Housing Estate	-	-	10.00	4.05	15.00	6.08

1	2	3	4	5	6	7	8
11.	Urban Deferred 10% of built up area	-		30.00	12.15	30.00	12.15
12.	Cattle or poultry Farm	-	-	10.00	4.05	10.00	4.05
13.	Water Bodies (Reserve)	56.00	22.68	56.00	22.68	56.00	22.68
14.	Agriculture/ Forestry	1275.50	516.58	807.94	327.21	1012.00	409.86
TOTAL :		1568.00	635.04	1568.00	635.04	1568.00	635.04

CHAPTER VII : LAND USE PLAN

7.0 APPROACH, CONCEPT, PLANNING PRINCIPALES :

7.1 Approach :

The planning approach has been adopted in pursuance of government's decision to develop the Upazila Shahar. The present land use/Master plan would guide the Upazila Shahar Authority to prepare detailed plans and to control development. Recommendations have been made in accordance with legal and administrative matters.

7.2 Concept :

Before actually drawing up the plan, land requirements have been assumed on the basis of (a) design population and (b) overall urban service requirements for the population of Upazila Shahar and the population of the sphere of influence. The regional transportation network specially road networks, Shaharwise services like administration, other offices, market, etc. are located along the main road where land prices would be high.

7.3 Planning Principles :

The urban area is visualized in terms of central area, residential areas and recreation areas which have been integrated into a structure. Gird-iron pattern has been favoured with a mix of concentric overlay. For residential areas a maximum number of 5,000 population, who require at least one primary school, has been considered to be an urban neighbourhood. In order to ensure minimum cost, land acquisition except for road has been limited. Existing social facilities have been proposed to be augmented. Five year phased development of new facilities and upgradation of existing facilities are described in Table-25.

7.3.1 Land Use Criteria:

A total of 1568 acres of land has been identified for the township of Mandigram Upazila by the year 2000. According to the plan provision about 11.80 percent of land is proposed to be utilized for housing purpose. For commercial and industrial purposes a ratio of 0.77% and 0.64% land respectively has been earmarked. Educational institutions by 2000 will need about 2.74 percent land. In health sector, dispensary, maternity clinic, hospital and health

centre, etc. will be established and expanded and land requirement for these facilities will tend to be around 0.76 percent. With the expansion of township, more administrative set up will be required to be built up. For that adequate provision of 1.28% land has been kept. The small township of Nandigram of today will grow as a model one for which necessary provision of parks, cinema hall, stadium, open space, etc. has been made on 42.50 acres (2.71%). In a sprawling township socio-cultural side cannot be ignored and community centre, cemetery, religious facilities have to be created to meet the basic needs of the town dwellers. This will be taken care of with a provision of 2.07% of land. The other important sector is road for which considerable provision (7.97%) has been provided in the land use plan with the growth of township the question of its security personnel like Police, VDP, Ansar, Fire-men, etc. and land use plan/ Master plan has also allocated sufficient land for their housing as well as activities. The land use/master plan has practically visualised all the relevant activities of a modern town but still there might be more urgent need in future. To address this need about 10% of land has been kept as reserve/urban deferred. Each category of proposed land use is described below :

7.4 Plan Description.

A scenario of land use/master plan by 2000 at Nandigram Upazila Shahar has been summarised at Table-25. The land use plan as described in the earlier chapter is not proposed to be materialised without studying the pros and cons of such plan. A careful growth model has been used to arrive at this growth by 2000 the growth has been phased out at three distinct period. The first phase will run through 1985-90. The second phase will cover the period from July 1990 to June 2000. Among other considerations population growth model has been the prime influential factor for land use plan. There are three population projections. Medium projection has been considered to be most acceptable one and based on this projection our land use/master plan has finally been evolved. In our medium projection the population will increase from the existing to over 6395 by 1990 and another 1790 will be added by 1995 which will reach about 10476 by the year 2000. This trend in population growth has been the basis of our land use/master plan. Each category of proposed land use is described in brief, below :

TABLE-25 : LAND USES IN THE PLAN
(ACCORDING TO PLAN PROVISION)

Sl No.	Categories of land uses	Existing Area	Proposed Area		Percentage
			Acres	Hectares	
1.	Commerce	3.50	30.00	12.15	1.91
2.	Industry	3.00	25.00	10.12	1.59
3.	Education :	16.00	26.00	10.53	1.66
	- Primary	2.00	4.00	1.62	0.25
	- Secondary	6.00	10.00	4.05	0.64
	- College	6.00	8.00	3.24	0.51
	- Others	2.00	4.00	1.62	0.26
4.	Health	1.00	12.00	4.86	0.76
5.	Administration/ Judiciary	20.00	20.00	8.10	1.28
6.	Recreation	4.00	12.50	5.06	0.80
7.	Socio-cultural	2.00	10.00	4.05	0.64
8.	Urban Services	7.00	12.50	5.06	0.80
9.	Roads	49.00	125.00	50.63	7.97
10.	Residential	131.00	185.00	74.93	8.35
11.	Urban Deferred	-	30.00	12.15	1.91
12.	Water Bodies(Reserve)	56.00	56.00	22.68	3.57
13.	Agriculture/Poultry and Cattle Farm.	-	10.00	4.05	0.64
14.	Agriculture/Forestry	1275.50	1012.00	409.86	64.54
TOTAL :		1568.00	1568.00	635.04 "	100.00

1. Commerce:

With the increase of population commercial activities will increase and for this activities additional land requirement will be limited to 30.00 acres and that will also be met in phased mannner.

2. Industry:

With the increase of population industrial activities will increase. For this purpose an additional land requirement will be limited to 25.00 acres and that will also be met in phased manner.

3. Education:

Physical planning for establishment of educational institution has been viewed on the ground that within a limited space a considerable number of students will need to be accommodated and from an area of 16.00 acres it will increase to 26.00 acres by 2000 AD.

4. Health:

More clinic and dispensaries are expected to be established by 2000 and there will be a need for 12.00 acres land to create such facilities. The growth from existing to 1995 will be normal but from the next phase the growth will gain momentum in this sector.

5. Administration/Judiciary:

The total need of infrastuctural facilities will be fully met by 1990 and this will be maintained in 2nd and 3rd phases.

6. Recreational:

Among the recreational facilities park, open space, cinema hall, stadium get prominence. By 1990 all these facilities will be created on 10.00 acres. These facilities will, however, be expanded and modernised in subsequent period with an earmarked area of 12.50 acres by 2000. A fulfledged stadium/play ground on about 6.00 acres of land is proposed to be completed by 2000. The cinema hall will not need much space and an area of 1.50 acres has been set-aside to establish it including provision for expansion. With the growth of the Shahar necessity of adequate open space and park will be felt to facilitate breathing space for the dwellers and an area of 5.00 acres is proposed to be allocated at the rate of 1000 persons per

acre. Like other land use planning, all recreational facilities will be created in phases.

7. Socio-cultural:

Under socio-cultural facilities necessary provisions for community centre 0.50 acre, cemetery/graveyard 5.00 acres, public library 1.00 acres, other religious facilities 1.50 acres and an area of 2.00 acres of land has been kept for plan provision upto the year 2000 A.D. for eidgah.

8. Urban Services:

Nandigram Upazila Shahar will Continue to remain a small township in the foreseeable future. Like other big urban town it will not get all urban character even by 2000 A.D. So the proposed urban services will be limited to provide telephone exchange, post offices, etc. and for these services initially 4.50 acres of land will be necessary which will be increased to 12.50 acres by 2000. However, one thing can not be all together ruled out that with passages of time there may be need for more urban services. Adequate thought has been given to this aspect and under urban deferred necessary provision has been made to meet such situation.

9. Roads:

Road becomes an important aspect in any township. In a planned town every household should be linked with road connection. The land use/master plan has, therefore, made adequate provision for building roads and in order of priority it is being closely equated with housing sector. 11.80 per cent of land of the Shahar has been set aside for road against 7.97 per cent in case of housing accommodation. The town plan should basically start with road building and other activities should oscillate around the roads. Construction of roads should be completed within the first phase on 850 acres of land including existing and in subsequent phases these roads land should be maintained.

10. Housing/Residential:

As indicated earlier housing or residential purpose will consume lion share of the total land area of Nandigram Upazila Shahar. About two-third of the earmarked land for housing will be required by the end of first phase and in the remaining phases over 185.00

acres will be needed to give minimum housing facilities to the projected population of Shahar. The land use will not unnecessarily intend to block land from the very beginning of special planning rather it will go by phase so that the unutilized land may be gainfully utilized elsewhere.

11. Urban Deferred:

Over 1.91 per cent of the land of the proposed township area will be reserved for future requirement. Many unforeseen requirement may crop up in future dates and to meet such situation 1.91 per cent reserved land seems reasonable. But due care has been given so that no lopsided construction takes place on the deferred areas.

12. Water Bodies:

During the physical survey in the area it was found that an area of 56.00 acres remained under different water bodies namely, tanks, ponds, khals etc. which will continue to remain as water bodies even by the year 2000. These water bodies though not being utilized for physical infrastructure but accruing immense benefits to the town dwellers and it was, therefore, decided to keep the area unchanged.

13. Poultry or Cattle Farm :

About 10 acres of land have been proposed for poultry culture in Nandigram mouza.

14. Agriculture/Forestry:

Agriculture is a primary occupation and it is quite incompatible with township. Agriculture should be practised outside the town area. Since, Nandigram Upazila Shahar did not grow in a modern concept, agriculture existed side by side with urbanisation. Agriculture occupied more than 1275.50 acres of land in the Upazila Shahar area. The agricultural land will decline to about 1167.00 acres by 1990. This will further decrease to 1108.00 acres by 1995. By the terminal year, the size of agricultural land will be limited to 1012.00 acres. Demand for poultry and dairy products will continue to increase with increase of urbanisation. Hence, necessary provision has been made to establish poultry and dairy farming in the vicinity of Upazila Shahar.

The above mentioned land uses have been proposed on the basis of existing sites and areas and maximum lands in accordance with the increase of population. All services would grow in this proportion.

8.1 PRIORITY ACTIONS, COST IMPLICATIONS

The present land use plan has been thought out of the considerations of growth points within the newly recognized zila region. The thrust of development activities that are assumed to be occurring within the zila till the end of the present century, will determine the growth of the Upazila Shahar. The land use/master plan is a guideline for the orderly development of the Upazila Shahar depending on the size of design population and not obviously an instrument to bring about to the level of larger of places in the country till the end of the present century. The local Govt. Administrative Reorganisation Ordinance 1982 has brought about this thrust of development by implications. There are 17 functions enumerated in the second schedule. Some of these relate to generation of non-agricultural activities and employment at the Upazila Shahar. In the continuum of urban places, Nandigram Upazila Shahar is probably at the lower level. The level of township should be considered a potential place in the next 10 to 15 years considering urbanization as a mechanism to the improvement of the quality of life. The rice and rabi crops resources in this part, the Bangladesh will probably provide an impetus to the growth. The sectoral development priorities are assumed to be as follows consequent upon the discussion below :

- 8.1.1 Drainage channels within the Upazila Shahar are to be maintained and implementation of such activities should be given priority.
- 8.1.2 The low-lying areas within the shahar area are to be developed in such a way that there is a trade off between costs of development and income in the long run.
- 8.1.3 Investments for the Upazila Shahar should be made in such a way that achievements would generate associated developments. Such basic developments have been proposed in terms of commercial developments and small scale industries utilising resources of the Upazila. The design of physical and social infrastructure has been made cost effective on the basis of assumed growth of tax base with the increase of population.

8.2 PHASING, URBAN DEFERRED

The plan should be implemented in phased at an interval of 5 years upto 2000 A.D. which should be related to the national 5- year development plans. The following table shows the phasing of development activities according to the plan.

TABLE-26: PHASING OF INFRASTRUCTURE DEVELOPMENT 1985-2000 A.D.

Sector	1st phase		2nd Phase		3rd phase		Percentage (3rd ph- ase)
	1985-90		1990-95		1995-2000		
	Acres	Hectares	Acres	Hectares	Acres	Hectares	
1. Commerce	6.00	2.43	10.00	4.05	30.00	12.15	1.91
2. Industry	6.00	2.43	8.00	3.24	25.00	10.12	1.59
3. Education	18.00	7.29	22.00	8.91	26.00	10.53	1.66
4. Health	12.00	4.86	12.00	4.86	12.00	4.86	0.76
5. Admin/Judiciary	20.00	8.10	20.00	8.10	20.00	8.10	1.28
6. Recreation	10.00	4.05	11.00	4.46	12.50	5.06	0.80
7. Socio-cultural	8.00	3.24	9.00	3.65	10.00	4.05	0.64
8. Urban Services	10.00	4.05	12.00	4.86	12.50	5.06	0.80
9. Road	85.00	34.43	110.00	44.55	125.00	50.63	7.97
10. Housing/ Residential	130.00	52.56	150.00	60.75	185.00	74.93	11.80
11. Urban Deferred	30.00	12.15	30.00	12.15	30.00	12.15	1.91
12. Water Bodies (Reserve)	56.00	22.68	56.00	22.00	56.00	22.00	3.57
13. Agriculture/ poultry and Cattle Farm	10.00	4.05	10.00	4.05	10.00	4.05	0.64
14. Agriculture/ Forestry	1167.00	472.63	1108	448.74	1012.00	409.86	64.54
TOTAL	1568.00	635.04	1568.00	635.04	1568.00	635.04	100.00

8.3 DEVELOPMENT CONTROL

All development should be subject to planning control including all changes of use of existing buildings and the changes of use of land not involving the erection of buildings. It will be necessary to define the uses that will normally be permitted in the various zones. Building giving rise to special siting problems, such as petrol filling stations, cinema and hotels will require special condition.

Additional matters which should be subject to planning control, such as, height of buildings, site coverage, density of houses per acre, preservation of trees, realisation of fees and taxes etc. should be adequately setout in an appropriate planning regulation for Upazila Shahar area.

It is desirable that planning control, in accordance with the land use plan, should be exercised as soon as the draft plan has been prepared, delay in the exercise of control might result in some proposals being endangered.

But, at present there is no planning regulation to exercise the control on the development at the Upazila centre. The provision of the "Municipal Ordinance" is applicable only for the declared Municipalities and the "Town Improvement Act 1953" is applicable for Rajdhani Unnayan Kartipakha.

Hence, we suggest that an appropriate planning regulation for all urban centres and potential urban centres should be framed as soon as possible. In the meantime the provisions of the "Municipal Ordinance" may be extended temporarily for development control at the Upazila centre and the Upazila Engineer should act as the "Authorised Officer" as the provision of "Building Construction Act" for giving planning permission in the Upazila Shahar area.

8.4 MONITORING AND REVIEW

The present land use plan is a broad guide line for the development of Nandigram Upazila Shahar. The proposals of the plan are evolved on the basis of existing conditions, and the expected trend in growth and their future projections and estimates. Any significant change in any of the basic criteria may make it necessary to revise some of the proposals embedded in the plan. Hence the plan should be periodically reviewed.

It is suggested that the progress in the implementation of the proposals of the plan or any change or deviation from the plan should be monitored once in a year by the Upazila Parishad should also seek advice from urban development directorate in case of difficulty in the implementation of the plan.

On the basis of the monitoring of the progress. Urban Development Directorate should review the plan once in a year and make revisions incorporating the change and modifications in the plan. The revised plan should be sent to the Upazila Parishad office every year. But this process is likely to be cumbersome and the consuming, moreover, town planning is a profession in its own right, and hence, we recommend that a qualified Urban Planner should be appointed to take charge in each of the Upazilas to guide, control and implement the planning and development activities, to act as "Authorised Officer" and to monitor and review the land use Master plan of the Upazila Shahar area.