# THE NATURE AND THE TREND OF GROWTH OF RURAL SETTLEMENT PATTERN: CASE STUDY OF SELECTED VILLAGES IN TANGAIL DISTRICT

MD. MASUDUZZAMAN



MASTER'S THESIS

Submitted to the Department of Urban and Regional Planning, Bangladesh University of Engineering and Technology, Dhaka in partial fulfilment of the requirements for the Degree of

MASTER OF URBAN AND REGIONAL PLANNING

DEPARTMENT OF URBAN AND REGIONAL PLANNING,
BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA.

APRIL, 1987.

THESIS

# THE NATURE AND THE TREND OF GROWTH OF RURAL SETTLEMENT PATTERN: CASE STUDY OF SELECTED VILLAGES IN TANGAIL DISTRICT.

BY

MD. MASUDUZZAMAN

Approved as to style and content by

Mahbubun Nabi. 20.5.87.
Chairman of the Committee

Mir Shahidul Islam
Head of the Department

Md. Shawkat Ali Khan 20.5.1987.
Member

Abdul Quium
Member

May 20, 1987

## ACKNOWLEDGEMENT

The author expresses his indebtedness and deep gratitude to Mr. A.S.M. Mahbub-Un-Nabi, Associate Professor, Department of Urban and Regional Planning, Bangladesh University of Engineering and Technology, Dhaka, under whose invaluable guidance and constant supervision this study has been completed.

The author gratefully expresses his sincere acknowledgement to Dr. Mir Shahidul Islam, Professor and Head of the Department of Urban and Regional Planning, who has kindly extended all the research facilities, given constant encouragement and offered valuable suggestions for completing this work.

The author would like to express his gratitude to all the teachers and fellow students who helped to carry out the research work fruitfully.

A number of persons in different agencies deserve thanks for their help and assistance during the study and field survey. The author is grateful to Mr. Md. Giash Uddin and Mr. Md. Abdul Wohab Lasker for typing the draft of the thesis and Mr. Md. Abdul Malek for typing the final thesis.

MD. MASUDUZZAMAN
APRIL, 1987.

CONTENTS

## LIST OF TABLES

# LIST OF MAPS AND FIGURES

MAP 1


SOURCE: SMALL AREA ATLAS OF BANGLADESH, B.B.S- 1986.

# CHAPTER-I

# INTRODUCTION

## 1.1 Statement of the Problem

Bangladesh with a geographical area of 1,44,000 square killo meter is a rural based agricultural country. Its population density of about 605 per square killo meter is one of the highest in the world. Population and land are the main resources to pull up the sicken economy of the country. Though the economy of Bangladesh is dependent on agriculture, the per capita arable land is less than 0.30 acre which is one of the lowest in the world. The population growth rate of the country is 2.37 percent per anum. So, the land-man ratio is shrinking day by day. The situation is being further aggravated by the haphazard, spontaneous and unplanned growth of homestead and rural settlement over our scarced arable land.

Such problem was also realised by Prof. James,John R. He refers,"the overwhelming fact about Bangladesh is the progressive imbalance that has been developing between its population and its land. No other country of any major importance suffers such an acute land hunger and in no country is there so great a need to utilize every acre to the fullest extent. Yet the conciousness of this fact does not seem to be reflected in the way the land is used for settlement purpose"[1].

---

1. Prof. James,John R., Some Aspect of town and country planning in Bangladesh, 1973, p-5.

In the second five year plan (1980-85), it was forecasted that "about 30% of the land area will be eaten up by such homesteads at the turn of the century thereby reducing further the already scarce land area of the country. Unless early efforts are made to forestall such tendency to proliferate rural homesteads, it may pose a great threat to social stability."1

In the third five year plan (1985-90) it is reiterated that "per capita availability of land is the lowest in Bangladesh in the South-East Asia region and it is declining even faster because of demand for land for other uses such as for homestead, industries and roads. The loss of arable land has been partly compensated by encroachment of forest land and partly by movement of population to the frontier islands in the Bay of Bengal to their peril. Encroachment on forest land has reduced the forest area to a critical level (8% of area) to threaten the whole environment. Scarcity of arable land will grow further".2

The policy of our Government is for overall development of the rural areas. Where rural development is associated with the improvement of rural settlement, the planning for the rural settlement in case of our rural people is not yet getting much importance.

---

1. The second five year plan, GOB, 1980-85, Chapt-XIX.
2. The third five year plan, GOB, 1985-90, Chapt-IX.

As a result these people still remain in deprivation. Formidable land scarcity should also be considered to undertake any settlement facilities in the rural area. Therefore it is necessary to formulate a policy guideline for introduction of settlement facilities by using minimum land resources.

So the aim of the present study is to investigate into the land utilization pattern of rural settlements and its trend of growth and the consequent decrease of agricultural land over the years since 1960.

## 1.2 Review of Relevant Literature

Few studies have so far been conducted in our country regarding the changing pattern of rural settlements. These studies are mainly focused on the type of problems that would arise due to horizontal expansion of rural homestead and other settlement related component. But none of them has measured the physical and dimensional changing rate of the homestead, agricultural and other type of land uses over the past few decades.

Among the various earlier affort, an extensive study in seven thanas were undertaken in 1981 by the Government of Bangladesh under the guidance of FAO/UNDP. The study found that "the increase in population during the study period (1952-74) was accommodated mainly within the existing homestead areas. For the seven thanas the overall population density increased by 58 percent and the population density within the settlements

increased by 55 percent. Housing density within settlement increased considerably over the period of study. Density increased mostly in deeply flooded areas, whereas in some cases, less than 5 percent of the total homestead area remained available in 1974 for further expansion of housing within the existing settlements. This implies that the future increase in population in such areas must eventually be accommodated by the expansion of the existing settlements. Also the area under road, canals, brickyards and factories increased slightly from 0.5 to 0.9 percent of the total area"[1]. The study also suggested that "in view of the conflict between the demand for increasing agricultural production so as to achieve national self-sufficiency in food production and the need for increased land to house the increasing population and to provide necessary roads, canals, factory sites etc., ways must be found to minimize the loss of agricultural land to non-agricultural use"[2].

The study concluded that "because of Bangladesh's high population density and its predominantly agriculture-based economy, the minimum possible amount of land should be taken out of productive agricultural use for non-agricultural purposes".[3] From the same study the rate of expansion of the homestead size was tried to be measured, based on a comparison of aerial

---

1. FAO/UNDP land use policy project, A reconnaissance study of changes in settlement and related non-agricultural land use in Bangladesh 1952-74(BGD/78/014) Dhaka, 1981, p-iii.
2. Ibid, p-iii.
3. Ibid, p-53.

photographs of 1952 and 1974 (Serno, 1981). The conclusion was reached that, "in the seven rural thanas studied, the homestead area had increased from 8.3 to 8.5 percent and tanks from 1.4 to 1.6 percent. That is, there had been net expansion of 0.4 percent during the 20 years".[1]

"The report on special studies of selected industries in Bangladesh (Aliff International, 1981) calculated the homestead complex to be 11 percent of the total farm area".[2] The Agricultural Census of Bangladesh 1977 (1981) gives a figure of "11.3 percent for the uncultivated area as a proportion of the total farm area. Compared with the 1960 census the uncultivated area had decreased by 1 lakh acres".[3] From the two sources mentioned, it appears that the figure for the uncultivated area is about 11 percent.

From the source of Bangladesh Bureau of Statistics, "the uncultivated area has decreased by 4.2 percent from 25.8 lakh acres to 24.8 lakh acres. Out of the uncultivated area 10.8 percent (2.69 lakh acres) is cultivable waste and the balance 89.2 percent (22.11 lakh acres) is occupied by homestead, pond, ditches, roads and bamboo forests etc. The cultivable waste has significantly decreased by 42.9 percent from 4.71 lakh acre in 1960 to 2.69 lakh acre in 1977"[4].

---

1. FAO/UNDP Agricultural Development Adviser Project (BGD/81/035) A study of village land made derelict by non-agricultural activities, Dhaka, 1982, p-1.
2. Ibid, p-1.
3. Agricultural Census of Bangladesh 1977 (National Vol.) BBS, June 1981, p-25.
4. Ibid, p-25.

The situation of the decreasing trend of the percapita agricultural land has also been observed by the Bangladesh Bureau of Statistics. It was found that, "in the rural area of Bangladesh per capita cultivated land was 0.25 acre in the year of 1981 and 0.26 acre in 1977. While in 1960 per capita cultivated land was 0.37 acre. As compared to 1960 per capita cultivated land had decreased by 32.43 percent".[1]

The decreasing nature of agricultural land with the growing demand of rural population was tried to be identified by Hafiz, Kazi Golam in his study of Rural Habitat of Mouza Pathalia at Savar Upazila. According to his most conservative estimate, he conclude that "within the span of 25 years there will be 289 new houses units and a total of 58 acres excluding the approach roads will be required for these new units. These will be situated on purely agricultural land. There is no scope of increasing the agricultural lands by reclamation. On the other hand they are loosing 48 acres highly productive agricultural land within 25 years. This will dangerously add to the already defecit food production of the study area. So something should be done to arrest such a huge loss of agricultural lands".[2] He also added that the pressure on land in his study area was not acute even thirty years ago. But later in 1978 the whole of the study area was nearly covered by the homestead and associated non-agricultural infrastructures.

---

1. Bangladesh Bureau of Statistics, 1986, the Bangladesh Census of Agriculture and Live Stock 1983-84, Vol.1, p-46.
2. Hafiz, Kazi Golam, Rural Habitat of Mouza Pathalia, Savar Upazila, an unpublished MURP Thesis, BUET, Dhaka, 1978.

Another study by Mohit, M.A, focuses the expanding nature of settlement in Upazila Sherpur. He identified that, "percentage of land under homesteads, roads and cultivation has increased whereas there has been a significant decrease in the amount of land not available for cultivation and a slight decrease in the land under water bodies and a very negligible reduction in the land area being used for drains over the period of past fifty two years".[1] He also explained the main reasons of reduction in the amount of lands under water bodies, drains and uncultivable waste as for reclamation of low-lying land and a growing awarness of extensive cultivation. In his study, he also conclude that "if existing system of homestead land use (residential densities) continues over the next twenty years, then the proportion of land to be taken for settlement, will increase in a linear rate averaging the impact of socio-economic groups but reducing cultivable land respectively".[2]

From the above review, it appears that most of the settlement related studies focused attention on the socio-economic aspects of the rural settlement growth. Very few attempts have been made to estimate the rate of change of physical dimension of the components of rural settlements, e.g. homestead, road, land for community use, agricultural area and land for other type of uses. For the planning of rural settlement it is required to determine the growth rate of settlement and identification of the socio-economic determinants. Such an

---

1. Mohit, M.A., Spatial and Socio-Economic Aspect in the Land Use Planning of Sherpur Thana, an Unpublished MURP Thesis, BUET, Dhaka, 1979, p-60.
2. Ibid, p.89.

analysis is deemed important in providing policy guidelines for future rural settlement improvement. With this end in view, the present study attempts at examining the existing land utilization pattern, their expanding trend and the socio-economic factors affecting rural settlement pattern of Zila Tangail.

## 1.3 Objective

In general sense the rural settlement consists of several components. These components of settlement may be classified according to the type of land use. In this study rural land use is divided into three main classes e.g. land for settlement purpose, Agricultural land and land used for other purposes. Again land for settlements are subdivided into, land for homestead, road and community land use. Where land for other type of use includes such land that are fallow land, forest area, water bodies etc. The land used for homestead may be classified as, houses and shelter; courtyards and open spaces; vegetable garden; fruit garden, orchard and bushes; water bodies, ponds and ditches; and homestead fallow land.

The main objective of the study is to investigate into the land utilization pattern of rural settlements and its trend of growth in order to determine the consequent effect on agricultural land.

This study has been undertaken in the nine villages of three upazilas in the district of Tangail (Map 1). The specific objectives of the present study can be summarised as follows:

(1) To study the land utilization pattern of homesteads and rural settlements in the selected villages.

(2) To determine the progressive growth of rural settlements and the consequent decrease of agricultural land over the years.

(3) To identify the socio-economic factors (like population growth rate, demographic pattern, education, employment and household income etc.), which affect the settlement pattern.

(4) To provide a guide line policy for future development of rural settlements in Bangladesh.

## 1.4 Criteria to Select the Study Area

The criteria to chose the study area as Tangail district was the physiography of the area. Seasonally flooded flat terrain has great importance for determining settlement patterns and the extent and depth of flooding depend on the physiography of the area. Seasonally flooded flat lands of Tangail district physiographically represent the vast areas of the country. Soil map on a scale of 1:500000 are available for all the agricultural areas of the country, and these provide the

required information on the location and extent of the major physiographic units.

In order to be able to correlate the information with local statistical data, it was decided to conduct the study on Upazila basis. Nine villages in three upazilas were selected for study, representing the country's most extensive physiographic units, viz -

| | |
|---|---|
| Tangail Sadar | Jamuna alluvium mainly unstable charland and Grey, finely mottled brown seasonally flooded soil with seasonally acid top soil. |
| Ghatail | Old Bramaputra Karalaya Bangali (part) and old Meghna estuarine floodplains, Grass land, Gazaria forest etc. |
| Gopalpur | Jamuna alluvium mainly unstable char land. |

Additional selection criteria for this district was accessibility and influence of major urban development. Moreover, the entire area of the district may be classified into flat land and char area. Therefore, it is expected that, information regarding settlement of this district would represent the information of the similar different districts of the country.

## 1.5 Methodology

Methodology in this study is based on two things, firstly, field survey which state the way how to collect data (both

physical and socio-economic characteristics) and how to take the observation and secondly, analysis and tabulation of field data, interpretation of maps related to physical characteristics of land and existing land uses both for settlement and cultivation.

To achieve the objectives of the present study intensive field work was undertaken to collect the data directly from primary sources i.e. the study areas, as there were no other sources to supply them. The following procedures were adopted in collecting different information of the study areas:

### 1.5.1 Information from questionnaire survey

Questionnaire survey has been conducted to receive the information of study areas regarding its land use pattern with socio-economic and cultural behaviour of the rural mass.

The questionnaire used in this study have included the necessary questions to get the information of rural people about their family type, religion, household size, age, sex, education, services, and their yearly income. Family members in different period, migratory trend of the family members, periodical variation of literate persons of each individual household have been incorporated in the questionnaire. Agricultural and non-agricultural land occupied by the household owners in different years, land use type of the component of homestead of individual household owner, and earth cutting

and filling to build up homestead with personal contact with the respondent have also been included in the questionnaire.

To get these information, we have divided the questionnaire into two major parts. First part of the questionnaire was used for household survey and second part for community land use measurement in different years.

### 1.5.2 Collection of base maps

Cadestral maps of different mouzas (study areas) were collected for use as base maps which were on a scale of 16 inches to a mile. These maps were available in the Dhaka Settlement Office. These maps were selected for the present study for two main purposes: firstly, to demarcate the mouza boundaries, secondly, to identify the homesteads, etc. as the preliminary step for subsequent surveys.

### 1.5.3 Household survey

Household survey was carried out in nine representative villages. These nine villages are situated in three Upazilas. For each of the upazila we choose at least one village nearest to the upazila headquarter and another one at the outer periphery of the upazila boundary. Individual homesteads were considered as primary sampling unit. Homesteads were selected from each sample village using random sampling technique. Household was thus the ultimate sampling unit for interview.

### 1.5.4 Village selection for household survey

Nine villages were selected from three upazilas. In selecting those villages, physiographic character of the area was given priority. In all respect it was tried to select the villages in such a manner that they represented the major settlement pattern of the Tangail district.

In upazila Gopalpur two study villages were chosen within one mile radius of upazila headquarter and three villages were chosen three miles away from it. The three villages chosen at a distance of 3 miles from Upazila Centre were found to be a clustered settlement. Out of these three villages one is regularly affected by flood, second one is irregularly flooded and the third one is above the average flood level and only affected by high flood. Moreover, they are far from upazila urban influences. The other two study villages of this upazila area very close to the upazila centre and are under the influence of upazila urbanization; one of them is frequently affected by monsoon flood.

The same criteria was followed to select the two study villages in Ghatail upazila. The village nearer to upazila centre is not frequently affected by flood, but the other village at about 3 miles away from upazila centre is regularly flooded.

The two study villages belong to Tangail Sadar Upazila were selected following the same criteria. One village was

selected from within one mile of the district headquarter and it was not usually affected by flood. Other one situated at about two miles from district headquarter and it was frequently affected by flood.

### 1.5.5 Selection procedure of sample household

Random sampling technique has been adopted to select 25 percent of rural homestead (cluster of a number of households) from each of the study villages. By listing up of all the homesteads of the study villages, 25 percent of those homesteads were selected randomly.

### 1.5.6 Physical investigation and studies

To study the physical components of the study areas and their land use pattern, reconnaissance to every individual community facilities were done. The thumb rule method (walking distance of 44 steps equal to 100 feet) was applied to measure the areas of various community functions and different infrastructures. At the same time information regarding the past situation of the land use pattern was extracted through the discussion with the local Union Parishad employees, U.P. members, revenue officers, local aged and literate persons and other concerned people.

## CHAPTER-II

## GENERAL FEATURES OF STUDY AREA

The nine villages selected for the study are located in the district of Tangail. It is envisaged that the general characteristics of the study areas is likely to be similar to that of the district. Hence, before going to discuss the general feature of the study area at first we have discussed the general features of the district.

### 2.1 General Features of Tangail District

Tangail was previously one of the subdivisions of Mymensingh district, emerged as a full-fledged district on the first day of December, 1969[1]. The total area of the Tangail district comprising 10 police stations is 1309 sq. miles[2] (including the rivers). Recently the police stations are increased to 11 and all of them are converted to upazilas.

### Physiographic characteristics

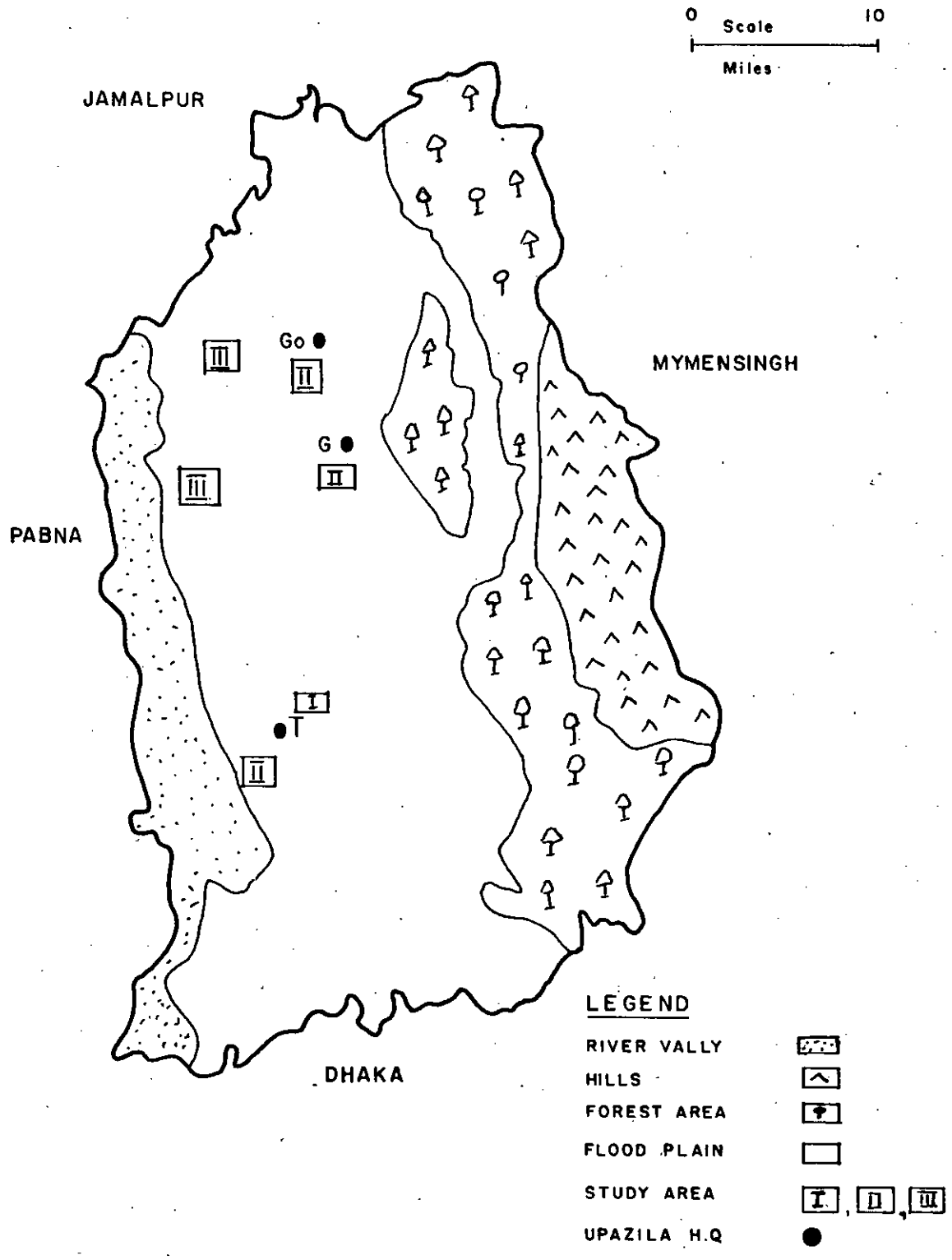
Regarding geomorphic features entire district may be divided into 4 categories (Map-2 of District topography), i.e., "about 60% is flood plain, 20% forest area, 12% river vallys and 8% hill areas".[3] River Jamuna have been flowing through the western part of the district, and a number of branch rivers from Jamuna flowing through the district. The terrace here has a

---

1. Notification No. GAI-242/68-1598, dated Dhaka,the First October, 1969.
2. Bangladesh population Census- 1974, Vol.2, P-36.
3. Bangladesh Census of Agriculture and Livestock, Op,Cit-P-2.

MAP 2

## TOPOGRAPHY OF THE DISTRICT TANGAIL




Source: The Bangladesh Censas of Agriculture & Livestock 1983-84

general westward slope. Western part of the terrace has been badly eroded by various rivers. There are different small rivers and channels passing through this district, and also there are a number of marshy areas called beels.

Flood and draught

Like all other districts of Bangladesh, Tangail also suffers from ravages of floods and associated calamities in the wake. Tangail also facilitate the flow of the heavy precipitation and heavy downpour of Bhutan Himalaya area. The flush floods from the Garo Hills certainly brings sudden disturbance in the low tracts of the districts.

"Tangail district is not affected by draughts which is one of the dominant factors behind farming. Though there may be retardation in sowings due to late or delayed cloud burst of the regular advent of the monsoons. Draughts never were of such a degree in this district as to requiping the Government to render relief operations".[1]

Population characteristics

The density of population in this district was 1136, 1587 and 1860 per sq. mile during 1961, 1974 and 1981 respectively, while the country's population density was 914, 1286 and 1567 per square mile in the year 1961, 1974 and 1981 respectively.

---

1. Tangail District Gazetteers 1983, Cap-I, P-17.

It represents that density of population in this district was always higher than that of Bangladesh since 1961. The situation of population growth rate was also similar with the situation of population density of this district. During the period of 1961-74, population increase was 39.78 percent, which was slightly below the national figure (40.6%). During the period 1974-1981, the population increase was 17.60 percent compared to that of 21.79 percent in Bangladesh. The trend of population growth is represented in Table below:

Average yearly growth of population of Tangail district

| Year | 1951 | 1961 | 1974 | 1981 | Average yearly growth of population | | |
|---|---|---|---|---|---|---|---|
| | | | | | 1951-61 | 1961-74 | 1974-81 |
| Tangail | 1226806 | 1486588 | 2077674 | 2443992 | 1.91 | 2.61 | 2.35 |

Source: Population census 1951, 1961, 1974, 1981, B.B.S.

It is evident from the table that the population in Tangail increased at a rate of 1.91% per year during the period of 1951 to 1961. But this rate was increased to 2.61% per year in the period of 1961-74. In 1974-81, the rate again declined to 2.35 percent which is below the national average of 2.5 percent.

Migration

According to the population census in 1981, total population of this district was 24,43,992. It was 2.81 percent of the

total population of Bangladesh. The net migrational characteristics of the people of this district was out migrational in nature. During the period of 1961-74 total 4.66 percent[1] of population was decreased due to migration. This trend was also visible in the period of 1974-81 and was found 3.61 percent[2] decrease in that time.

Level of urbanization

According to the percentage of population living in urban areas Tangail falls in second lowest position since 1961. In that period only 0.9 percent[3] of the total urban population of the country lived in the urban areas of this district, which was slightly higher than that of the district Patuakhali but lower than all other districts in Bangladesh . Nearly similar situation was observed in 1974 and 1981 censuses. It was found that 1.7 and 1.4 percent[4] of total urban population of the country lived in the urban areas of this district during 1974 and 1981 respectively .

Such abrupt increase of the level of urbanization in respect of the growth of urban population during 1974 was due to the stream of migrants from rural to urban areas in Bangladesh which was not an important event upto 1961. But it gained momentum during the period 1961-74. The urban

---

1. Analytical Findings and National Tables, BBS, 1981.
2. Ibid.
3. Ibid.
4. Ibid.

population of Bangladesh increased by 137.6% during 1961-74 and a significant population (37.61%) of this increase was due to the shift of population from rural to urban area".[1]

Though the level of urbanization suddenly increased in this district in 1961-74 but it was very insignificant in comparison with the national level increase.

Economy

Tangail has mainly an agriculture-based rural oriented economy. Agriculture is the primary sector - the main sources of income and employment of the people of all upazilas in the district.

Farm size

Due to the high rate of increase of population and absence of shifting of occupation from agriculture to other sources, the majority of labour forces depend mainly on agriculture for employment and means of livelihood. This heavy pressue of population on land over the years, coupled with the operation of muslim law of inheritance, has made agricultural holding subdivided and fragmented.

In the district of Tangail 77.53 percent of total households are farm households and this significantly higher (72.70%) than that for Bangladesh. The percentage of small, medium

1. Habitat, United Nations Conference of Human Settlement Regional Conference, Theran, June 14-19, 1975.

and large farm households were 72.31, 24.43 and 3.26 respectively in 1983-84 (The Bangladesh Census of Agriculture and Livestock) which was slightly below than the national range of such farm households i.e. 70.34, 24.72 and 4.94 percent respectively.

Level of landlessness

In this district, 9.8 percent of households had no land at all for homestead or cultivation and are recognised as landless of category I and this is slightly above the national figure of 8.7 percent. On the other hand households with only homestead land but no cultivated land were found 13.9 percent in comparison to 19.6 percent of the country and they were specified as landless of category II. The percentage of landless in category III were 29.9 percent which was slightly higher than the percentages of national level (28.2%). The landless of cateogory III were those households with homestead land and cultivated area of upto 0.50 acre. Households with homestead land and cultivated land 0.51 to 1.00 acre were considered as landless of group IV and they were found 13.7 percent in this district compared to 12.3 percent in Bangladesh.

Main crop

Like most of the other districts "rice and jute are the principal crops grown in this district. It may be mentioned here that the

Note: Households operating 0.05 acre or more cultivated area are farm households. Small farms medium farms and large farms are those households operating upto 2.49 acres, 2.50 to 7.50 acres, or more operated area respectively.

jute grown in this district is one of the best varieties in the world".[1]

Cropping pattern

The gross cropped area in the district is 12,41,356 acres where net cropped area is 6,12,655 acres. The total land under crops is 75% of the total area of the district and intensity of cropping in the district is about 200% against 165% for Bangladesh. The total irrigated land is about 23% of total land under crops of the district.

About 29,34 and 11 percent of the district's area were used to grow the single, double and triple crops respectively in 1983-84. During this year, the percentage of the total area of the country used for single, double and triple crop production were 32.6, 23.6 and 4.28 percent respectively. Therefore, the percentage of double and triple crop areas are significantly higher than that of total figure of the country. Per acre production of Aus, Aman and Boro were 9.14, 11.10 and 31.3 maunds respectively. The sugarcane, wheat, oil seed and jute are grown at the rate of 340.0, 21.8, 7.6 and 2.8 maunds per acre respectively in this district. The per acre production of such crops are much higher than that of the country. So the agricultural land of this district is undoubtedly very fertile.

---

1. Tangail District Gazeetter, Op, Cit Page-84.

Forestry

"About 14% of the total physical area of the district is under reserved forest against 15% in the whole of Bangladesh"[1]. The forest area is situated within the four Upazilas, namely, Ghatail, Madhupur, Mirzapur and Shakhipur. Among the Upazilas, Shakhipur has the highest forest area while Mirzapur has the lowest. The contribution of forestry to gross district income is 2.4% against 2.5% for Bangladesh.

Fishery

"The position of Tangail district is fairly well in respect of fishery resources. About 5% of beels and haors, 1.65% of ponds and tanks and 1.35% of rivers and canals of Bangladesh are situated in the district. The contribution of fishery sub-sector to gross district income is 2.85% against 3% of Bangladesh"[2].

## 2.2 Location of Study Areas

Out of nine study villages, two of them are situated in Tangail Sadar Upazila. Village Asekpur is situated at about 3/4th mile north-east from district headquarter and Aloabhabani is located at about 2¼ miles south-west from the same head-quarter. Villages Jaujani and Dasanibaksia are located in the Ghatail Upazila, which is at a distance of 32 Km (20 miles)

---

1. Tangail District Gazetteers 1983 Op,Cit, P-VI
2. Ibid,P-VI.

MAP 3

# TANGAIL DISTRICT

0 5 10 Miles

JAMALPUR

MADHUPUR

GOPALPUR

BHUAPUR

GHATAIL

MYMENSINGH

KALIHATI

PABNA

SAKHIPUR

TANGAIL

BASAIL

DELDUAR

MIRZAPUR

NAGARPUR

DHAKA

BANGLADESH

50 200 KMS

50 100 Miles

LEGEND

DISTRICT BOUNDARY

UPAZILA BOUNDARY

UNION BOUNDARY

STUDY AREA

UPAZILA H.Q

Source: Small area Atlas of Bangladesh, B.B.S – 1986

from the district headquarter. Villages Balata, Hijlipara, Bholarpara, Kamarpara and Uddampur are located at the Upazila Gopalpur at a distance of 48 Km (30 miles) from the district headquarter. Geographic location of all the study villages are shown in Map-3.

Out of nine study villages, one is situated nearest to the district headquarter, four villages are nearer to urban areas and remaining five are located in remote areas. Therefore, we may categorise all the study villages into three groups on the basis of their location and distance from urban centres which are presented in Table-2.1 as follows:

Table-2.1 Location of Study Mouzas

| Name of the Villages | Location criteria of study villages | Category of villages |
|---|---|---|
| 1. Asekpur | Within 1 mile radius from district headquarter | I |
| 2. Aloabhabani | Within 3 miles from district H.Q | II |
| 3. Jaujani | Within 1 mile from upazila H.Q. | |
| 4. Balata | Within 1 mile from upazila H.Q. | |
| 5. Hijlipara | Within 1 mile from upazila H.Q. | |
| 6. Dasani Baksia | At least 3 miles from nearest upazila headquarter | III |
| 7. Bholarpara | At least 3 miles from nearest upazila headquarter | |
| 8. Khamarpara | At least 3 miles from nearest upazila headeuarter | |
| 9. Uddampur | At least 3 miles from upazila headquarter | |

## 2.3 Geomorphic Features

In general, the geomorphic features of nine study villages are characterised by:

a) Flood plain

b) Back slope

c) River

d) Channel scare

e) Natural levee

Table-2.2 shows the distribution of different geomorphic features over three categories of villages.

Table-2.2 Geomorphic Feature of Study Area

| Geomorphic Characteristic | Percent of total land in village category I | Percent of total land in village category II | Percent of total land in village category III |
|---|---|---|---|
| Flood plain | 62.29 | 73.67 | 76.30 |
| Back slope | 21.26 | 14.37 | 13.56 |
| River | - | 3.63 | 2.89 |
| Channel scare | 4.45 | 6.21 | 7.25 |
| Natural levee | 12.00 | 2.12 | - |

Source: Field Survey 1986.

Floodplain predominate the study villages. About 76 percent area of village category-III, 74% area of village category-II and 62 percent area of village category-I fall under flood

plain. Such lands are suitable for agricultural purpose. Floodibility is infrequent and occupy about 76 percent of floodplain areas in high flood time only. Back slope occupy about 21.0, 14.0 and 13.5 percent of areas of village category I, II and III respectively with gentle slope and regular floodibility. The area is intensively cultivated with Irri and Boro crop. Channel scare is poor land of the area and remain almost all the time under water. It is about 4, 6 and 7 percent of total lands in village category-I, II and III respectively. Natural levee is found to be insignificant percent (2.12%) in the villages of category-II, and not found in villages of category-III.

## 2.4 Soil Characteristics

The soil of about two-thirds of the Tangail District are developed in recent and subrecent river alluvium. The soils in the eastern third of the area are developed in an older unconsolidated sediment: the Madhupur clay[1]. The percentage distribution of soil materials of the district Tangail are shown in Map-4.

Twenty five soil series and two miscellaneous land types have been recognised in this district. Ten series in the Jamuna and Old Brahmaputra flood plains, and fifteen in Madhupur Jungle tract.

---

1. Name in accordance with the Geological map of Bangladesh (former East Pakistan).

MAP 4

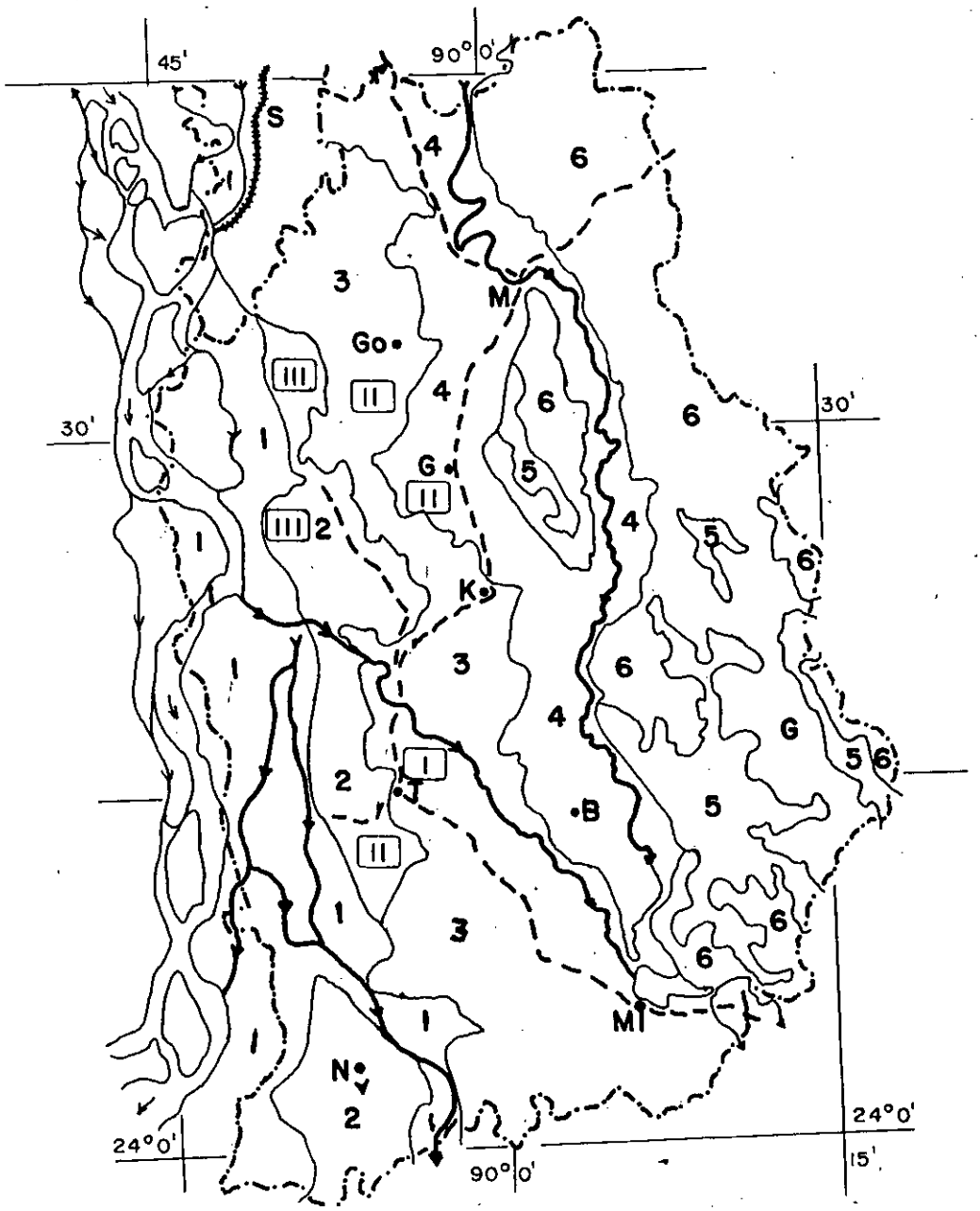
Map of soil parent material unit

## TANGAIL DISTRICT

SCALE 1:500,000

0 10

Miles




**LEGEND**

1. Active jamuna floodplain
2. Young jamuna meander floodplain
3. Older jamuna meander floodplain
4. Old Brahmapütra floodplain
5. Shallowly weathered Madhupur clay
6. Deeply weathered Madhupur clay

**CONVENTIONAL SINGS**

- District boundary
- Mapping unit boundary
- Narrow river
- Wide river
- Railroad
- Main road
- Upazila H. Q
- Study Village I II III

Source: Directorate of Soil Survey, Bangladesh

In the Jamuna meander flood plain, almost all of the soils are poorly drained and seasonally flooded. Both chemically and physically, the soils of the Jamuna floodplain appear to be among the best in the country. In spite of the severe dry season, dry-land crops grow well and the soil is moist for months without rain.

Old Brahmaputra floodplain have dark or very dark grey topsoils and subsoil. Generally, the soils are deeper (4 to more than 5 feet) than in the Jamuna floodplain. Almost all the soils are poorly drained and seasonally flooded. They appear to have a level of natural fertility similar to the Jamuna floodplain.

There are three kinds of soil material in the Madhupur Jungle tract: deeply weathered Madhupur clay, shallow weather Madhupur clay, and local alluvium and colluvium. The deeply weathered Madhupur clay is poorly drained, seasonally or intermittently flooded depressions. Most of the land is cultivated: part of the better drained soils is under forest.

The shallow weathered Madhupur clay is strongly acidic to moderately alkaline. Most of this land is under poor forest or scrub.

"Out of total 1301 square miles area of this district, 844 sq. miles are under floodplain, 438 sq. miles are Madhupur tract,

and remaining 19 sq. miles are under water"[1]. The soil type, units and their characteristics in study upazilas are given in Table-2.3.

Table-2.3 Soil Characteristics of Study Upazilas

| Name of Upazila | Type of soil | Characteristics of soil with suitable crops |
|---|---|---|
| Tangail Sadar | Non calcarious alluvium | Jamuna alluvium mainly unstable char land suitable for early aus and jute, deep water aman,chena, mustard, pulses etc. |
| | Grey floodplain soil | Grey, finely motlled brown seasonly flooded soils with seasonly acid top-soil and near natural subsoils. It is suitable for Aus, jute and transplanted aman locally followed by robi crops. |
| Ghatail | Non-calcarious dark grey flood plain soils | Old Brahmaputra karaloya Bengali (part) and old Meghna estuarine floodplains. Suitable for Broadeast aman deep water transplanted aman and boro. |
| Gopalpur | Non-calcarious alluvium | Jamuna alluvium mainly unstable char land. Suitable crops are early aus and jute, deep water aman, chena, mustard, pulses and other robi crops. |

Source: Report on Soil Survey of District Mymensingh (former Subdivision Tangail), 1966, p-12.

1. Statistical Year Book of 1983/84, Published by Bangladesh Bureau of Statistics, Ministry of Planning, Government of the People Republic of Bangladesh, pp-13-17.

The soil characteristics of nine study villages have been shown in the following table:

| Name of Upazila | Name of study villages | Soil characteristics |
|---|---|---|
| Tangail Sadar | Asekpur<br>Aloabhabani | Grey floodplain soil |
| Ghatail | Jaujani<br>Dasanibaiksa | Non-calcarious dark grey floodplain soil |
| Gopalpur | Balata<br>Hijlipara<br>Bholarpara<br>Khamarpara<br>Uddampur | Non-calcarious alluvium soil |

## 2.5 Land Level, Floodability and Drainage

The geomorphic variations within the region have led to the development of a number of land levels in study mauzas. By level we mean comparative height or elevation of different plots of land. Three such levels have been identified in study villages. They are commonly named by the local people as vity, chala, nal or nama. Where vity is the flood-free high level land, chala is the medium level land and infrequently flooded and nal or nama is the low level land. Table 2.4 represents them according to the category of villages.

Table 2.4 shows that vity land are in greater percent (29.15) in village of category-I and 19.66 percent and 13.72 percent in village of category-II and III. Infrequently flooded areas

Table-2.4 Distribution of Land Level and Floodability of Study Mouzas

| Category of of villages | Total area in acre | Vity or not flooded area | | Chala or infrequently flooded area | | Nama or regularly flooded area | |
|---|---|---|---|---|---|---|---|
| | | Area in acre | % | Area in acre | % | Area in acre | % |
| I | 207 | 60.34 | 29.15 | 71.08 | 34.34 | 75.58 | 36.51 |
| II | 1038 | 204.07 | 19.66 | 302.78 | 29.17 | 531.15 | 51.17 |
| III | 1676 | 230.0 | 13.72 | 369.72 | 22.06 | 1076.3 | 64.22 |

Source:Field Survey 1986

are also in greater percent (34.34) in village of category I compared to that existing in villages of category-II and III. But regularly flooded areas are in highest amount (64.22%) in villages of category-III. Relatively smaller amount of land are found infrequently flooded in villages of category-I, 51.17 percent of areas of villages category-II are regularly flooded. The general feature of vity, chala, nama etc. have been given below:

Vity:

Vity is the high level land found in study mauzas and occupy mostly along roads, hallots etc. and distributed throughout the mouza. The land tracts have been artificially developed

and are less fertile and moisture retaining capacity is low. Soil is relatively poor and crops can be grown through intensive irrigation. It is usually free from floods and is used for settlements, planting orchards, grazing animals and growing vegetables. It covers about 29.0, 20.0 and 14 percent of the total areas of the villages of category - I, II and III respectively.

Chala

Chala is the medium level land and infrequently flooded. Chala lands are most intensively cultivated and have higher cropping intensity. Often they are occupied by grazing animals. The price of chala land is higher than vity land. Such lands have been found 34.34%, 29.17% and 22.06% of total areas of villages category-I, II and III respectively.

Nama

Nal or nama land is the low level land. They are prone to flooding and the flood water remains for a long time from May to November. Boro and Irri are the most suitable crop for cultivation on such lands. This category of land occupy about 37%, 51% and 64% of the villages of category-I, II and III respectively. Due to higher fertility of such land, price per bigha is highest than other lands of respective villages.

Drainage system

No artificial drainage system is available in nine study villages. But there is only natural drainage system where water runs from relatively higher surface area to lower areas.

Well drained areas are the vity lands which are not flooded. Moderately drained areas are chala lands which are medium level lands and infrequently flooded. Poorly drained areas are the Nama lands of low level that are regularly flooded.

## 2.6 Percentage of Cropped Area

From Table-2.5 it is found that single cropped areas are about 9 to 14 percent of total arable land, compared to 39 percent for district and 53.9 percent for Bangladesh. Double cropped areas are found to be about 66 to 69 percent as against 45.5 percent for the district and 39.0 percent for Bangladesh. Therefore, the double cropped areas are considerably more than the national average. Triple cropped areas vary from 17-24 percent as against 15.4% and 7.1% for the district and Bangladesh respectively.

Table-2.5 Distribution of Single, Double and Triple Cropped Area in Three Types of Villages

| Cropping nature | Category of Villages | | |
|---|---|---|---|
| | I | II | III |
| | Percent of total arable area | Percent of total arable area | Percent of total arable area |
| Single crop | 9.7 | 8.9 | 14.4 |
| Double crop | 56.8 | 66.7 | 68.9 |
| Triple crop | 24.5 | 24.4 | 16.7 |

Source: Field survey 1986.

## 2.7 Per Acre Yield

From Table-2.6, the per acre yield of IRRI and Boro are found to be about 29, 34 and 40 maunds in villages of category-I, II and III respectively, as against 31.4 maunds[1] per acre for district Tangail. Production of Aman is found to be from 14-15 maunds per acre against 11.1 maunds[2] for the district. Wheat are produced by about 14-22 maunds per acre as against 21.8 maunds[3] in the district. Jute are produced by about 11 to 13 maunds per acre as against 2.86 maunds[4] in the district.

1. BBS, Op, Cit-p-258.
2. Ibid
3. Ibid
4. Ibid

Table-2.6 Yield of Major Crop in Three Type of Villages

| Category of villages | Yield per acre (maund per acre) of crop | | | |
|---|---|---|---|---|
| | Irri/Boro | Aman | Wheat | Jute |
| I | 29.27 | 13.8 | 17.6 | 12.2 |
| II | 33.6 | 15.4 | 14.2 | 13.5 |
| III | 40.2 | 14.0 | 22.6 | 10.8 |

Source: Field Survey - 1986.

## 2.8 Area and Population of Study Villages

Total area and population of the study villages have been shown in Table-2.7 and the density of population is shown in Table 2.8. Of all the villages Bholarpara is the largest village (660 acres) and Khamarpara is the smallest village (175 acres). Table-2.7 also shows the growth rate of population in the study villages during the period 1961-74 and 1974-81. It is found that the population growth rate is highest (5.4% per annum) in Sutibalata village within Gopalpur upazila. Two villages have negative rate of population growth during the period 1974-81. These are Jaujani village (-0.14% per annum) and Khamarpara village (-0.06% per annum). The negative growth rate is due to outmigration of population from those villages. The density of population in all the study villages for the years 1961, 1974 and 1981 are also shown in Table-2.8.

It is found that the density of population in all the study villages are much higher than that of the national figure (1567 per sq mile)and with some exception the density is also higher than that of the district (1860 per sq.mile)

Table-2.7 Distribution of Population in Study Villages in Three Census Year 1961,1974 & 1981 and Their Growth Rate

| Name of Village | Area in acre | Population in | | | Population Growth rate per year | |
|---|---|---|---|---|---|---|
| | | 1961 | 1974 | 1981 | 1961-74 | 1974-81 |
| Asekpur | 207 | 698 | 1140 | 1418 | +3.84 | +3.17 |
| Aloabhabany | 364 | 1355 | 1900 | 2289 | +2.63 | +2.70 |
| Jaujany | 250 | 637 | 801 | 793 | +1.77 | -0.14 |
| Sutibalata | 221 | 447 | 560 | 809 | +1.75 | +5.40 |
| Hijlipara | 203 | 318 | 612 | 707 | +3.71 | +2.08 |
| Bholarpara | 660 | 1687 | 2101 | 2510 | +1.70 | +2.57 |
| Uddampur | 458 | 1175 | 1531 | 1737 | +2.05 | +1.82 |
| Khamarpara | 175 | 522 | 687 | 684 | +2.13 | -0.06 |
| Dasanibaiksa | 383 | 1500 | 1180 | 1283 | -1.86 | +1.20 |

Source: Population Census Report, 1961, 1974, and 1981 of Bangladesh Bureau of Statistics, Government of People Republic of Bangladesh.

Table-2.8 Distribution of Population Density of Study Areas by Their Administrative Status in Year 1961, 1974 and 1981

| Administrative status | Name of Study Area | Density of population in per sq. mile | | |
|---|---|---|---|---|
| | | 1961 | 1974 | 1981 |
| Upazila | Tangail Sadar | 1537 | 2191 | 2809 |
| Village | Asekpur | 2181 | 3562 | 4431 |
| Village | Aloabhabany | 2336 | 3275 | 3946 |
| Upazila | Ghatail | 908 | 1321 | 1590 |
| Village | Jaujany | 1592 | 2002 | 1982 |
| Village | Dasanibaiksa | 2542 | 1966 | 2138 |
| Upazila | Gopalpur | 1270 | 1671 | 2576 |
| Village | Sutibalata | 1277 | 1600 | 2311 |
| Village | Hijlipara | 993 | 1912 | 2209 |
| Village | Bholarpara | 1637 | 2039 | 2437 |
| Village | Khamarpara | 1740 | 2290 | 2280 |
| Village | Uddampur | 1631 | 2126 | 2412 |
| District | Tangail | 1136 | 1587 | 1860 |
| Country | Bangladesh | 914 | 1286 | 1567 |

Source: Report on the Agricultural Census of Bangladesh 1977 (National Volume) B.B.S. June 1981, Page-25 and Bangladesh Population Census 1981, Community Table of all Thana of Tangail District July - 1985.

# CHAPTER-III

# SOCIO-ECONOMIC PROFILE

Total population in nine study villages are 12230 as ennumerated in 1981. These population developed many socio-cultural and economic traits which need analysis and examination in the light of utilization of rural physical and other resources.

## 3.1 Demographic Characteristics of Study Villages

The growth rates of population in three categories of villages have been presented in Table-3.1. The table shows that the population growth rate during the period 1961-74 for village category-I is 3.84 which is above the national rate of 2.6 percent, in category-II it is 2.65 percent and which is similar to national level, but in category-III the rate is as low as 0.92 percent only. Obviously this category of villages has experienced heavy outmigration due to massive affect of flood during the decade 1961-70, whereas in category-I, inmigration caused abnormal rise in population growth rate.

It is also apparent from the table that population growth has resulted in a significant change in population densities in different category of villages.

It is also observed from the same table that the growth rates of number of households during the period 1961-74 are 2.15,

Table-3.1 Population and Household Growth in Three Type of Village

| Village Category | Population | | | Households | | | Average increase of population per year | | Average yearly increase of H/H | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1961 | 1974 | 1981 | 1961 | 1974 | 1981 | 61-74 | 74-81 | 61-74 | 74-81 |
| I | 698 | 1140 | 1418 | 116 | 153 | 238 | 3.84 | 3.16 | 2.15 | 6.51 |
| II | 2757 | 3873 | 4598 | 479 | 591 | 669 | 2.65 | 2.48 | 1.63 | 1.78 |
| III | 4884 | 5499 | 6214 | 780 | 864 | 1005 | 0.92 | 1.76 | 0.79 | 2.18 |
| Total | 8339 | 10512 | 12230 | 1375 | 1608 | 1912 | | | | |

Source: Census Report 1961, 1974, 1981, B.B.S.

1.63 and 0.79 percent in villages category-I, II and III respectively. The growth rates of number of households is lower than the growth rate of population during 1961-74. This suggest that the increase of population is accompanied by increase in family sizes in the three categories of villages. During the period of 1974-81 the population increased at the rates of 3.16, 2.48 and 1.76 percent while the number of households increased by 6.51, 1.78 and 2.18 percent in villages of category-I, II and III respectively. The main findings of the table suggest the proposition that "the population increases are always accompanied by increase in size of families and residential densities but in good quality land areas the increases are relatively higher than in less good quality land areas".[1]

1. Mohit, M.A., Op, Cit. P-45.

## Age and sex distribution

Sample household surveys were conducted to study the age and sex composition. In all,399 sample households and 2335 members were surveyed for this purpose. The distribution of those population by age and sex has been presented in Table-3.2 and Fig. 1.2 and 3.

Table-3.2 Distribution of Sample Population by Age and Sex

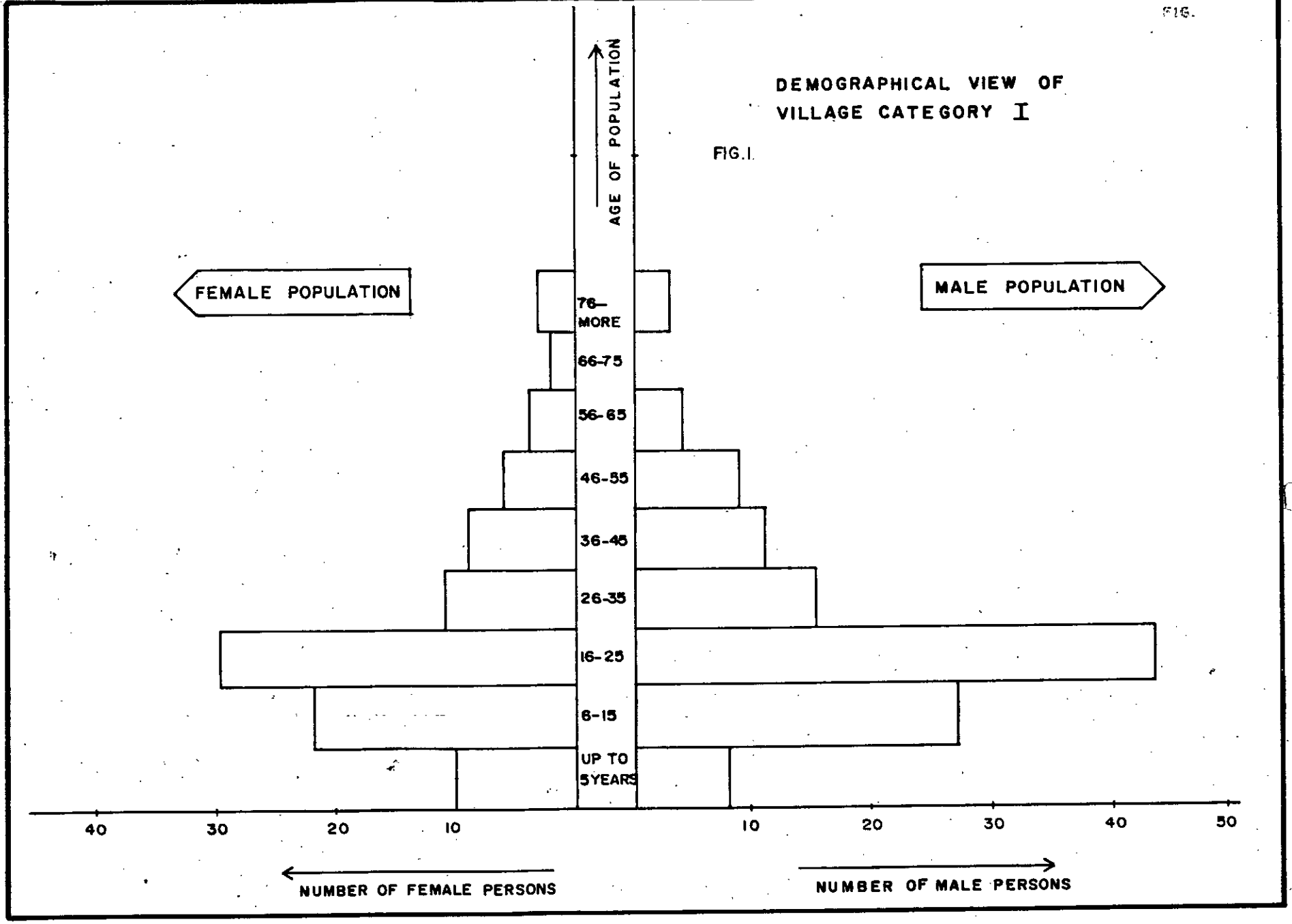
| Age Group (in year) | Village Category-I | | | Village Cateory-II | | | Village Category-III | | |
|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Total | Male | Female | Total | Male | Female | Total |
| Upto 5 | 8 | 10 | 18 | 88 | 84 | 172 | 90 | 110 | 200 |
| 6-15 | 27 | 22 | 49 | 155 | 113 | 268 | 173 | 152 | 325 |
| 16-25 | 43 | 30 | 74 | 106 | 78 | 184 | 118 | 110 | 228 |
| 26-35 | 15 | 11 | 26 | 85 | 55 | 140 | 84 | 60 | 144 |
| 36-45 | 11 | 9 | 20 | 51 | 37 | 88 | 63 | 48 | 111 |
| 46-55 | 9 | 6 | 15 | 34 | 28 | 62 | 39 | 26 | 65 |
| 66-75 | - | 2 | 2 | 7 | 14 | 21 | 7 | 10 | 17 |
| 76+ | 3 | 3 | 6 | 3 | 10 | 13 | 2 | 4 | 6 |
| Total | 120 | 97 | 217 | 547 | 436 | 983 | 595 | 540 | 1135 |

Source: Field Survey 1986.

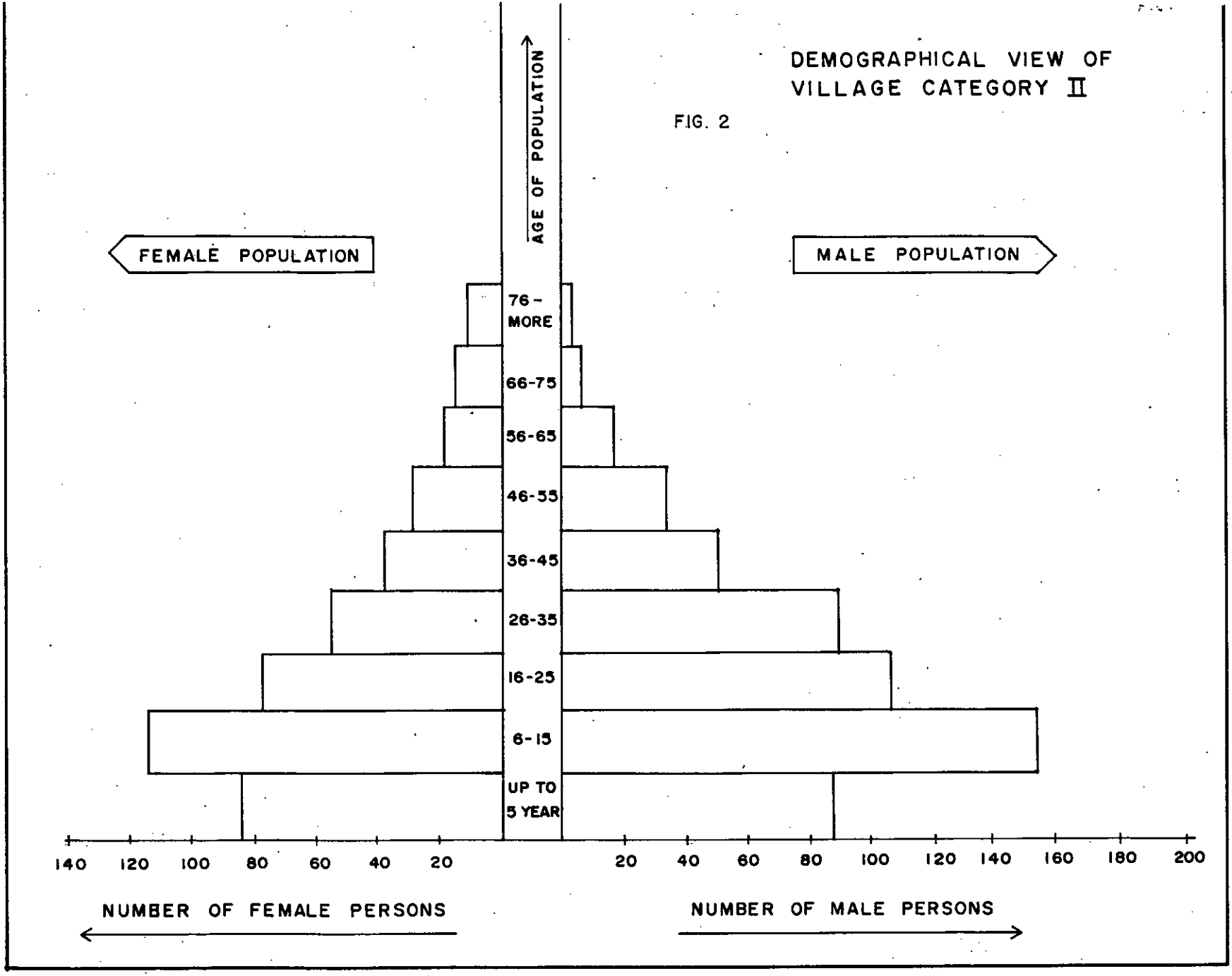
Table-3.2 presents that the young age group (below 15 years) constitutes about 30 percent of population in village category-I and about 40 percent in village of category-II and III. Therefore, 30 to 40 percent of population in study area are young. The working age group (above 15 years) is about 65,52 and 53 percent in villages of category-I, II and III respectively. The dependence

DEMOGRAPHICAL VIEW OF VILLAGE CATEGORY I

FIG.I.



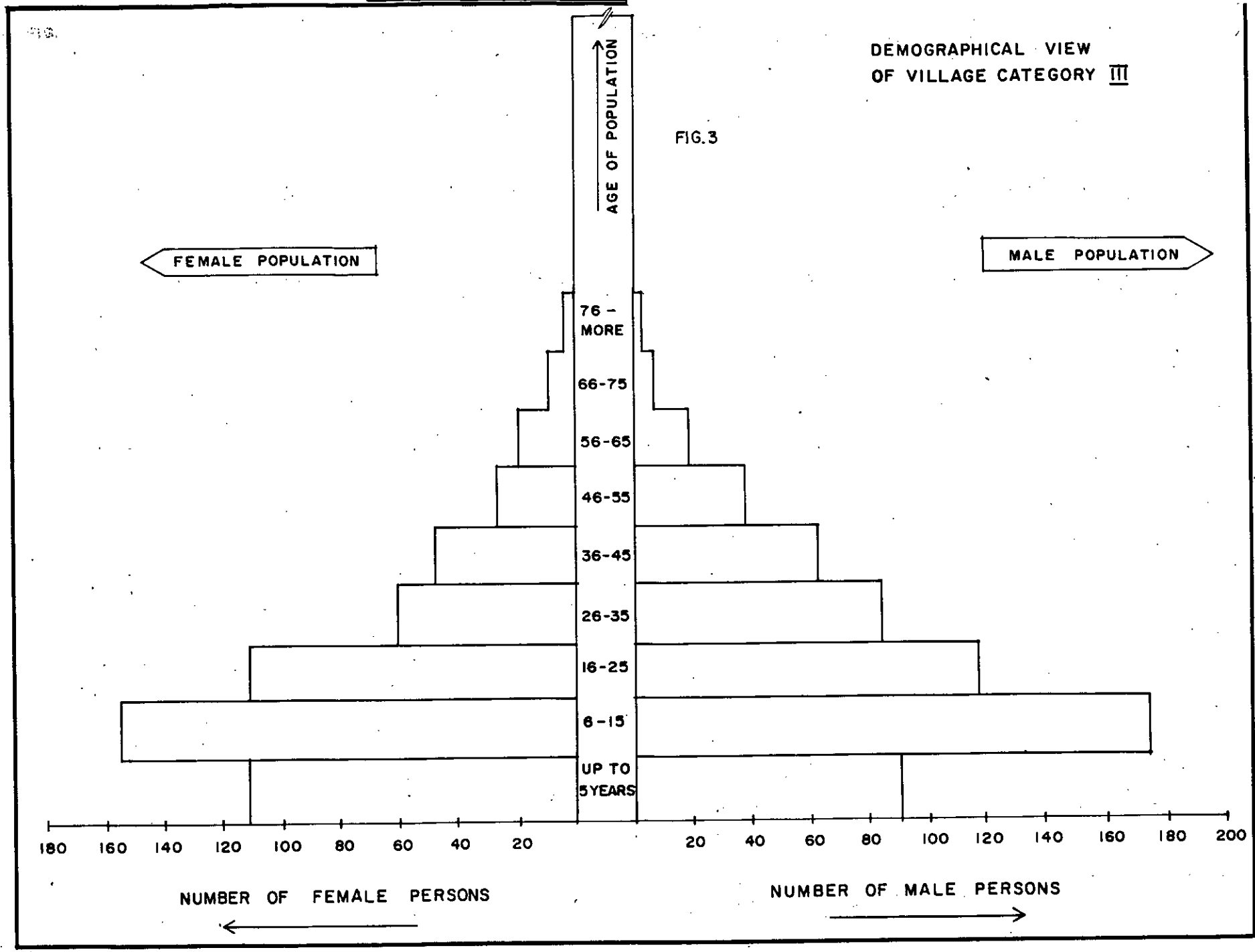

Source: Field-Survey 1986.




Source: Field Survey 1986.

DEMOGRAPHICAL VIEW
OF VILLAGE CATEGORY III

FIG.3




Source: Field Survey 1986.

ratios are similar (2.35) both for village category-II and III. But it is less for village category-I (1.65)[1]. The average size of households are 5.4, 5.3 and 6.5 in village category-I, II and III respectively. Therefore, household sizes vary from 5.3 to 6.5 in study areas compared to 5.9 for District and 5.7 for National level.

## 3.2 Family Structure

Family structure of nine mauzas may be categorized into three groups, viz. (a) nuclear, (b) semi-nuclear and (c) joint families. A nuclear family consists of married couple and their unmarried children. Semi-nuclear family consists of a married couple and unmarried brother or sister or one of the parents. Joint family consists of a married couple living with married children or married brother. The distribution of village households by each category of family composition is given in Table 3.3.

Table-3.3 Distribution of Family Structures of Households in Villages of Three Categories

| Family composition | Type of Villages | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Category-I | | | Category-II | | | Category-III | | |
| | No.of H/H | % of H/H | Cumulative % | No.of H/H | % of H/H | Cumulative % | No.of H/H | % of H/H | Cumulative % |
| Nuclear | 13 | 32.5 | 32.5 | 57 | 30.9 | 30.9 | 49 | 28.0 | 28.0 |
| Semi-nuclear | 16 | 40.0 | 72.5 | 71 | 38.6 | 69.5 | 60 | 34.2 | 62.2 |
| Joint | 11 | 27.5 | 100.0 | 56 | 30.5 | 100.0 | 66 | 37.8 | 100.0 |
| Total | 40 | | | 184 | | | 175 | | |

Source: Field Survey 1986.

1. Dependency ratio is equal to total population minus working male population divided by working male population.

This table shows that the nuclear family types are largest in numbers in the villages very near to major urban areas, and the percentage of nuclear families gradually decreases with the distance of the villages from urban areas. About 33 percent of total household are nuclear type in village of category-I, whereas about 31 percent are found in village category-II and 28 percent in village category-III. The semi-nuclear type of families are highest in village of category-I (40 percent), and this proportion gradually decreases with the increase in the distances of villages from urban areas. Joint type families are found significantly higher (37.8 percent) in the villages of category-III whereas 30.5 and 27.5 percent of the families are joint type in villages of category-II and-I respectively. Although the number of joint families are still significant, the traditional joint character has been decreasing in faster rate in the areas nearer to urban places and such rate is slower in the areas remote from towns like district and upazila headquarters etc. Such declining tendency of joint families is due to "socio-economic hardship of living and which inflicts changes in the value system of family structure"[1]. As a result, the transmission of urban influence in rural areas contributes to the changes in socio-economic condition of its people and community.

---

1. Hafiz, Kazi. Golam, Op, Cit. P-6.

## 3.3 Trend of Population Migration in Study Areas

The trend of migration of population in Tangail district has been discussed in Chapter-2. In absence of any data regarding migrational trend in the study area, household questionnaire survey was conducted to observe the migrational trend of the population during the period 1980-85 which is given in Table-3.4. It is found from the table that in all categories of villages there is a net increase in population due to migration during the period 1980-85. This seems to be unusual in case of rural areas where outmigration should have predominated. But the reason for this may be sought in the fact that the village category-I has urbanization trend and hence inmigration may be a usual phenomenon; but in other two categories of villages the reason for greater inmigration may be due to the river eroded flood affected people from the nearby villages.

Table-3.4 Trend of Population Migration by Category of Villages (for 5 years from 1980 to 1985)

| Type of Migration | Category-I | | Category-II | | Category-III | |
|---|---|---|---|---|---|---|
| | No. | % of population | No. | % of population | No. | % of population |
| In migration (increase) | 15 | 6.91% | 36 | 3.66% | 51 | 4.49% |
| Outmigration (decrease) | -3 | -1.38% | -5 | -0.51% | -18 | -1.58% |
| Net migration (increase/decrease) | 12 | 5.53% | 31 | 3.15% | 33 | 2.91% |

Source: Field Survey, 1986.

## 3.4 Literacy Rate in Study Area, 1981

Education is one of the important indicators of progress and development of an area. The literacy rate of the population of study areas are given in Table-3.4.

Table-3.5 Literacy Rate in Three Types of Villages, 1981

| Type of area (Category) | Total population | Literacy rate in % | | |
|---|---|---|---|---|
| | | Total population | Male population | Female population |
| I | 1418 | 25.04 | 31.47 | 18.43 |
| II | 4598 | 17.53 | 23.65 | 15.36 |
| III | 6214 | 17.50 | 22.83 | 11.91 |
| District | - | 20.2 | 26.8 | 13.5 |

Source: Bangladesh Population Census 1981: Published on July-1986.

Table-3.4 shows that the literacy rate of the villages of category-I, II and III are 25.04, 17.53 and 17.50 percent respectively. The literacy rate is comparatively higher (25.04) in the village of category I and this rate is also higher than the district rate (20.2) as well as the national figure (23.80). In other two types of villages the literacy rates are similar, but below the level of district and national rate. Similar situation is also found in case of male literacy rate. It is also observed that the male literacy rate is much higher than that of the females in all the three categories of villages.

## 3.5 Occupational Pattern

In Bangladesh about 80 percent of the rural population is engaged in agriculture (second five year plan - 1980). "This generalisation is probably based on farming as the main occupation. But in the poor country like Bangladesh where majority (83%) of farms are operated below 5.00 acre (Alamgir 1975: 268), which barely provides subsistence level income, people are rather compelled to accept subsidiary occupations"[1].

From Table-3.6 it appears that farming is the main occupation of rural people with some spatial variations. In villages of category-I, about 11.52, percent of population are engaged in

Table-3.6 Distribution of Sample Population by Occupation, 1986

| Category of village | Type of Occupation in % of Population(age 10+yrs.) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Not working | House-hold | Cultivation | Agri. non-crop | Manufacture | Business | Others | Total |
| I | 20.10 | 20.38 | 11.52 | - | 0.5 | 2.69 | 9.95 | 65.14 |
| II | 15.91 | 17.05 | 11.00 | 0.19 | 0.12 | 2.14 | 7.42 | 53.83 |
| III | 18.04 | 26.97 | 14.94 | 0.09 | - | 1.67 | 5.81 | 67.52 |

Source: Field Survey, 1986.

cultivation as main occupation, 9.95 percent are engaged in other profession and 2.69 percent in business. Table-3.6 indicates that there is some spatial variation in the occupationa

1. Mohit, M.A. Op, Cit. P-56.

pattern; "these variations emanate from other factors like proximity to market, access to other areas, transportation etc. Yet diversification of household to undertake different subsidiary job shows spatial variation"[1]. In village category-I, high population pressure and its moderate quality of land resulted a lower dependence on farming (11.52 percent). In village of category-II and III, where land quality is good and population pressure is moderate, caused a higher dependence on farming (14.94 percent).

## 3.6 Land Ownership by Size of Owned Land

Land ownership pattern of rural households on the basis of owned agricultural land has been given in Table-3.7. It is found from the table that about 15.0, 16.8, and 13.1 percent of households in villages of category-I, II and III respectively have no land for cultivation, as against "23.7 percent

Table-3.7 Distribution of Household Agricultural Land on Three Types of Villages

| Land in acre | Cateory-I | Category-II | Category-III |
|---|---|---|---|
| | % of total household | % of total household | % of total household |
| No land | 15.00 | 16.8 | 13.1 |
| Upto 0.50 | 12.50 | 23.3 | 18.3 |
| 0.51-1.00 | 22.50 | 14.9 | 17.0 |
| 1.00-2.49 | 32.5 | 20.6 | 23.8 |
| 2.50-7.49 | 12.5 | 18.5 | 19.5 |
| 7.50+ | 5.0 | 5.9 | 8.3 |
| | 100.0 | 100.0 | 100.0 |

Source: Field Survey, 1986

1. Mohit, M.A., Op, Cit-Page-56.

for district Tangail and 28.3 percent for Bangladesh"[1]. Households having agricultural land upto 2.5 acre are found to be 67.5, 58.8 and 59.1 percent in villages of category-I, II and III respectively against "72.3% for Tangail and 70.3% for Bangladesh"[2]. Medium farm households (2.5 to 7.49 acre) comprises 12.5%, 18.5% and 19.5% for total households in village category-I, II and III respectively as against "24.4% for Tangail and 24.7% for Bangladesh"[3] respectively. The large farm households are found to be from 5 to 8 percent in all the three categories of villages as against "3.25% for Tangail and 4.94% for Bangladesh"[4] respectively.

## 3.7 Correlation of Household Income and Homestead Size

Out of several socio-economic factors affecting rural settlement pattern, household income would be one of them. Table-3.8 shows the relationship of household income and the corresponding size of homesteads. It is found from the table that the maximum size of homestead in the study villages is 30.5 decimal (0.31 acre) and those belong to 5.3 percent of total household. Yearly income of these household is between Tk. 40001 to Tk. 50,000/- per anum. It is also found that average size of the homesteads increase with the increase of household income up to the size of 30.6 decimal (0.31 acre). Homestead sizes again decrease from this range with the increase of household income as shown in Fig.4.

---

1. Bangladesh Census of Agriculture and Livestock, 1983, 84; BBS, Op. Cit, P-49.
2. Ibid.
3. Ibid.
4. Ibid.

FIG - 4

GRAPH OF HOUSE HOLD
HOMESTEAD SIZE VS
HOUSEHOLD YEARLY INCOME

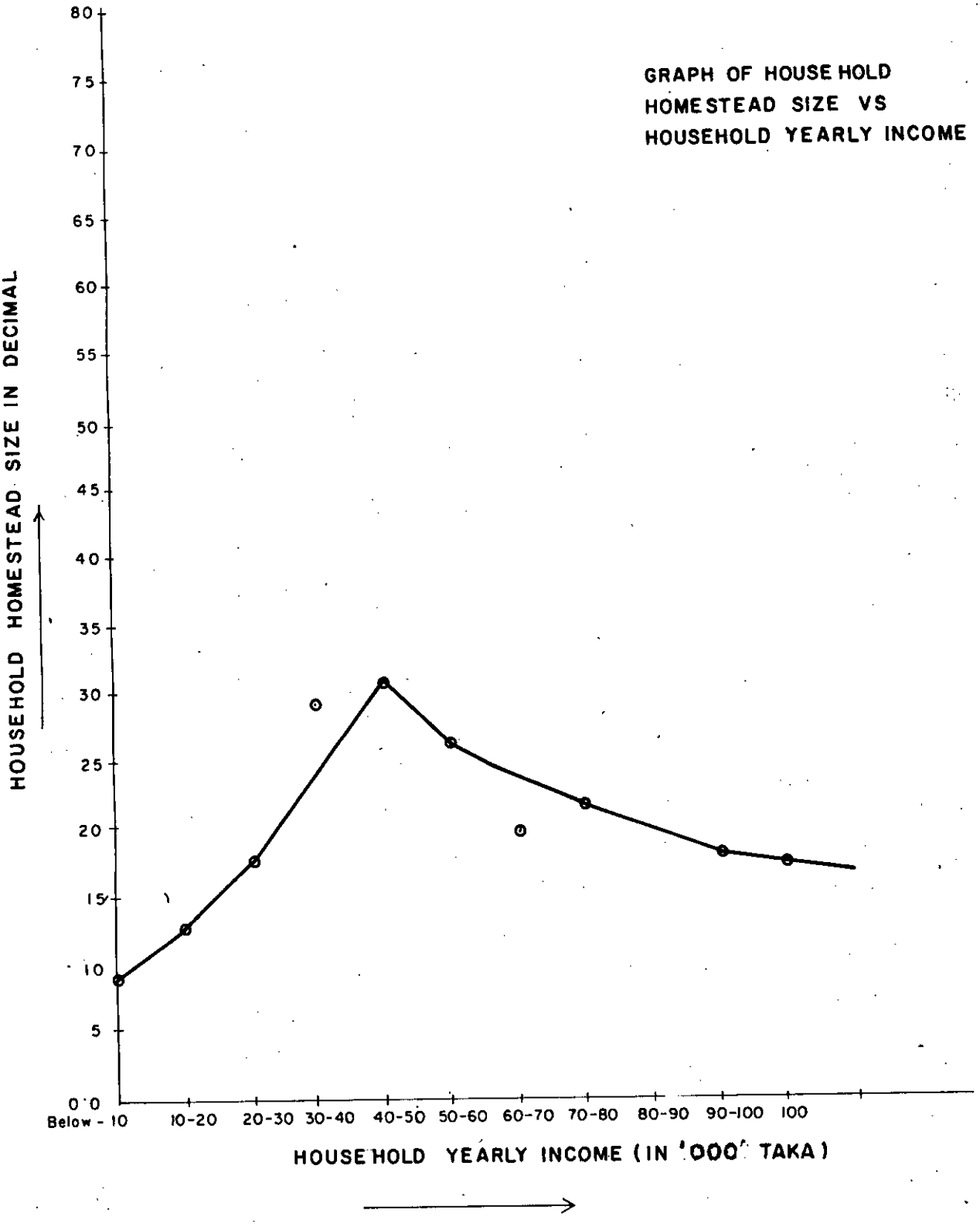


Table-3.8 Income Distribution by Sample Homestead Owners

| Household Yearly Income (Tk.) | Frequency of Household | Percent of Total household of nine villages | Average size of household homestead (in decimal) |
|---|---|---|---|
| below 10,000/- | 144 | 36.1 | 8.5 |
| 10001 - 20,000/- | 102 | 25.6 | 12.5 |
| 20001 - 30,000/- | 64 | 16.1 | 17.8 |
| 30001 - 40,000/- | 35 | 8.8 | 29.4 |
| 40001 - 50,000/- | 21 | 5.3 | 30.6 |
| 50001 - 60,000/- | 16 | 4.0 | 26.2 |
| 60001 - 70,000/- | 5 | 1.2 | 19.5 |
| 70001 - 80,000/- | 5 | 1.2 | 21.9 |
| 80001 - 90,000/- | - | - | - |
| 90001 - 100,000/- | 2 | 0.2 | 18.0 |
| 100001- above | 5 | 1.5 | 17.2 |
| Total | 399 | 100.00 | 20.15 |

Source: Field Survey 1986

## 3.8 Per Acre Yield from Homestead Land and Agricultural Land

Rural homesteads and the agricultural land have important role in rural as well as in national economy. With the gradual increase of population homestead areas are expanding by taking out more and more land from agricultural use and hence, agricultural land is decreasing. This may adversely affect our national economy. So, it has become important to make an analysis on the relative income from agricultural land and homestead land. Out of the total of 399 homesteads of individual

households surveyed in the nine study villages, it was found that small size (upto 10 decimal) homesteads were 53.9%, medium size homesteads (11-25 decimal) were 31.1% and the large size homesteads (over 25 decimal) were 15.0% (Table-3.9).

Table-3.9 Distribution of Homestead Sizes and the Productivity of Agricultural and Homestead Land

| Items | Homesteads of individual households | | | |
|---|---|---|---|---|
| | Small size (upto 10 decimal) | Medium size (11-25 dec) | Large size (over 25dec) | Total |
| No. of Homesteads/ Households | 215 | 124 | 60 | 399 |
| Percent of homesteads | 53.9% | 31.1% | 15.0% | 100% |
| Percent of Farm Homesteads | 32.9% | 26.7% | 9.3% | 68.9% |
| Total Farm Land (acre) | 409.0 | 1080.1 | 733.4 | 2222.5 |
| Total Farm Land (in percent) | 18.4% | 48.6% | 33.0% | 100% |
| Average size of farm land per household in acre | 1.8 | 8.3 | 17.5 | - |
| Yearly yield from per acre Farm Land (Tk./acre) | Tk.11740/- | Tk.9437/- | Tk.5800/- | Tk.10000/- |
| Average size of homesteads (decimal) | 5.46 | 16.87 | 38.61 | - |
| Percent of homesteads producing vegetables and fruits | 35.9% | 26.2% | 9.0% | 71.1% |
| Yearly yield from per acre homestead land (Tk./acre) | Tk.10840/- | Tk.2387/- | Tk.2,300/- | Tk.5,400/- |

Source: Field Survey, 1986.

It was also found that the total number of farm homesteads were 68.9% of which 32.9% were small homesteads 26.7% were medium homesteads and 9.3% were large homesteads.

Out of the total agricultural land, about 18.4% was in small homesteads, 48.6% was in medium size homesteads and 33.0% was in large size homesteads. From Table-3.9 it is observed that for the total homesteads the average per acre yield of agricultural land was worth Tk. 10000/- and the average per acre yield (fruits and vegetables) from homestead area was worth Tk. 5400/- per year. The Table also shows that per acre yield (fruits and vegetables) from homesteads and agricultural land owned by the smaller homestead owners was relatively higher than that of larger size homestead owners. For the owners of small size homesteads, average per acre yield of homestead land was worth Tk. 10,840/- and the average per acre yield of agricultural land was worth Tk. 11,740/-. Though the productivity of homestead land and agricultural land was higher for small homestead owners, but the average sizes of homestead and farm land were much smaller than that of the larger homestead owners. The average size of homestead was only 5.46 decimal and the average size of farm land was 1.80 acre for small homestead owners.

For medium size homestead owners, average per acre yield of homestead land was worth Tk. 2387/- and the average per acre yield of agricultural land was worth Tk. 9,437/- ; average size

of homestead was 16.87 decimal and the average size of farm land was 8.3 acres for medium size homestead owners.

For large size homestead owners, average per acre yield of homestead land was worth Tk. 2300/- and the average per acre yield of agricultural land was worth Tk. 5800/-. The average size of homestead was 38.61 decimal and the average size of farm land was 17.5 acres for the owners of large homesteads.

Therefore, it appears that small homestead owners utilize their homestead area and agricultural land relatively in greater intensity than the owners of large size homesteads. But this fact is not true for the very small homestead owners (i.e. size up to 3 decimal). Because, more than 30 percent of such homestead owners had no considerable space for vegetable garden and fruit trees to get any return as like other classes of homesteads. Moreover, modern agricultural incentives were beyond their financial capability.

# CHAPTER-IV

# EXISTING LAND USE SITUATION

## 4.1 Type of Rural Land Use

For the purpose of this study, the land uses in the rural areas have been broadly classified under three categories. These are (a) settlement area (b) agricultural land and (c) land for other purposes. Again the settlement areas are further classified into homesteads, roads, and community land uses. Land for other purposes includes land for water bodies, channel, river and fallow land. The existing land use situation have been discussed with reference to Table-4.1. Also Figure-5 & Maps 5,6, & 7 have shown the present land use pattern of the villages under category I, II and III respectively.

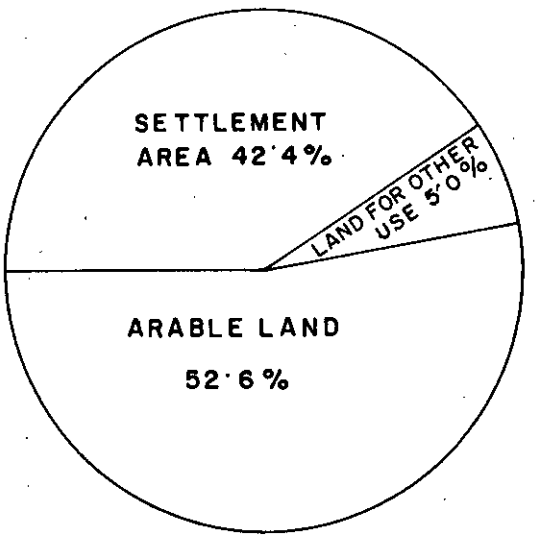
Table-4.1 Existing Land Use Condition of Study Villages(1986)

| Type of Land Use | Village of category-I | | Village of category-II | | Village of category-III | |
|---|---|---|---|---|---|---|
| | Total area (acre) | % of total area | Total area (acre) | % of total area | Total area (acre) | % of total area |
| 1. Settlement purpose | 87.77 | 42.40 | 211.05 | 20.34 | 267.19 | 15.94 |
| i) Homestead | 56.03 | 27.08 | 134.24 | 12.93 | 186.87 | 11.15 |
| ii) Roads and embankments | 26.70 | 12.89 | 66.05 | 6.36 | 70.70 | 4.22 |
| iii) Community land use | 5.04 | 2.43 | 10.76 | 1.05 | 9.62 | 0.57 |
| 2. Agricultural land | 108.83 | 52.57 | 762.15 | 73.42 | 1351.53 | 80.64 |
| 3. Land for other purpose | 10.40 | 5.03 | 64.80 | 6.24 | 57.28 | 3.42 |
| Total | 207.0 | 100% | 1038.0 | 100% | 1676.0 | 100% |

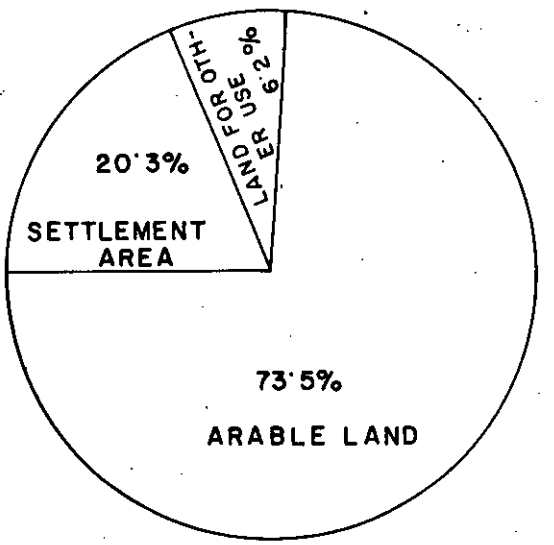
Source: Field Survey, 1986.

FIG.5

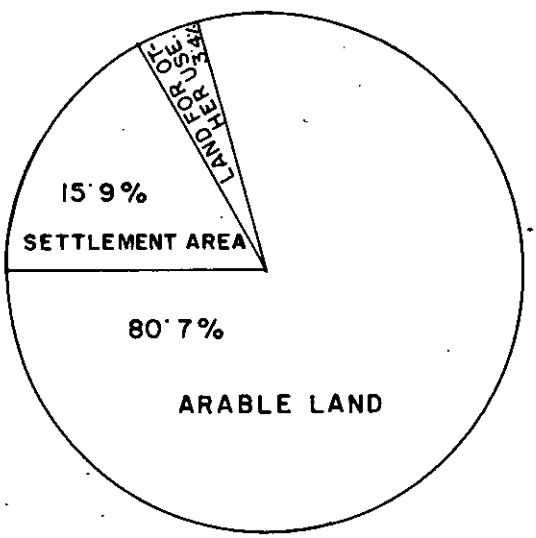
EXISTING LAND USE PROPORTION OF THREE CATEGORIES OF VILLAGES (IN 1985)




VILLAGE OF CATEGORY I




VILLAGE OF CATEGORY II

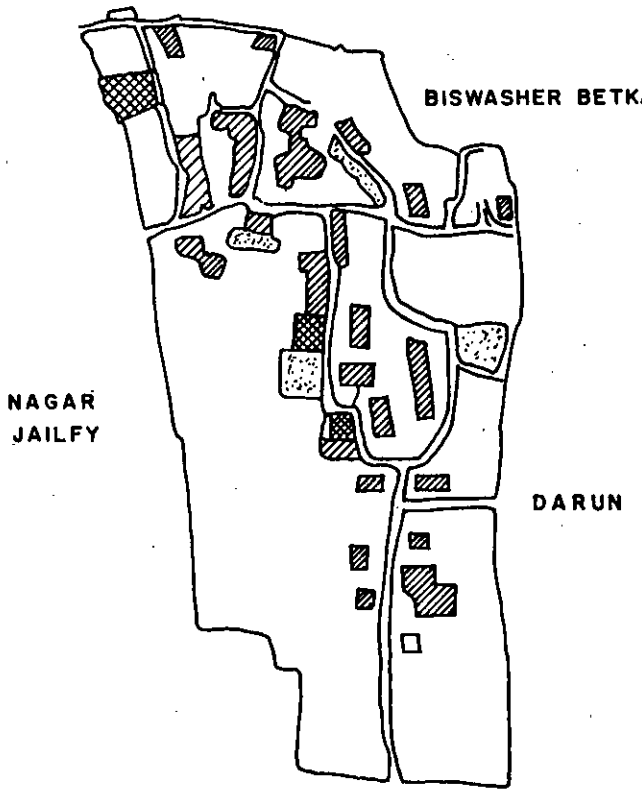



VILLAGE OF CATEGORY III

Source: Field Survey 1986

MAP 5

EXISTING LAND USE SITUATION 1985
VILLAGE OF CATEGEORY I
MOUZA ASEKPUR
Scale: 4·8" = 1mile



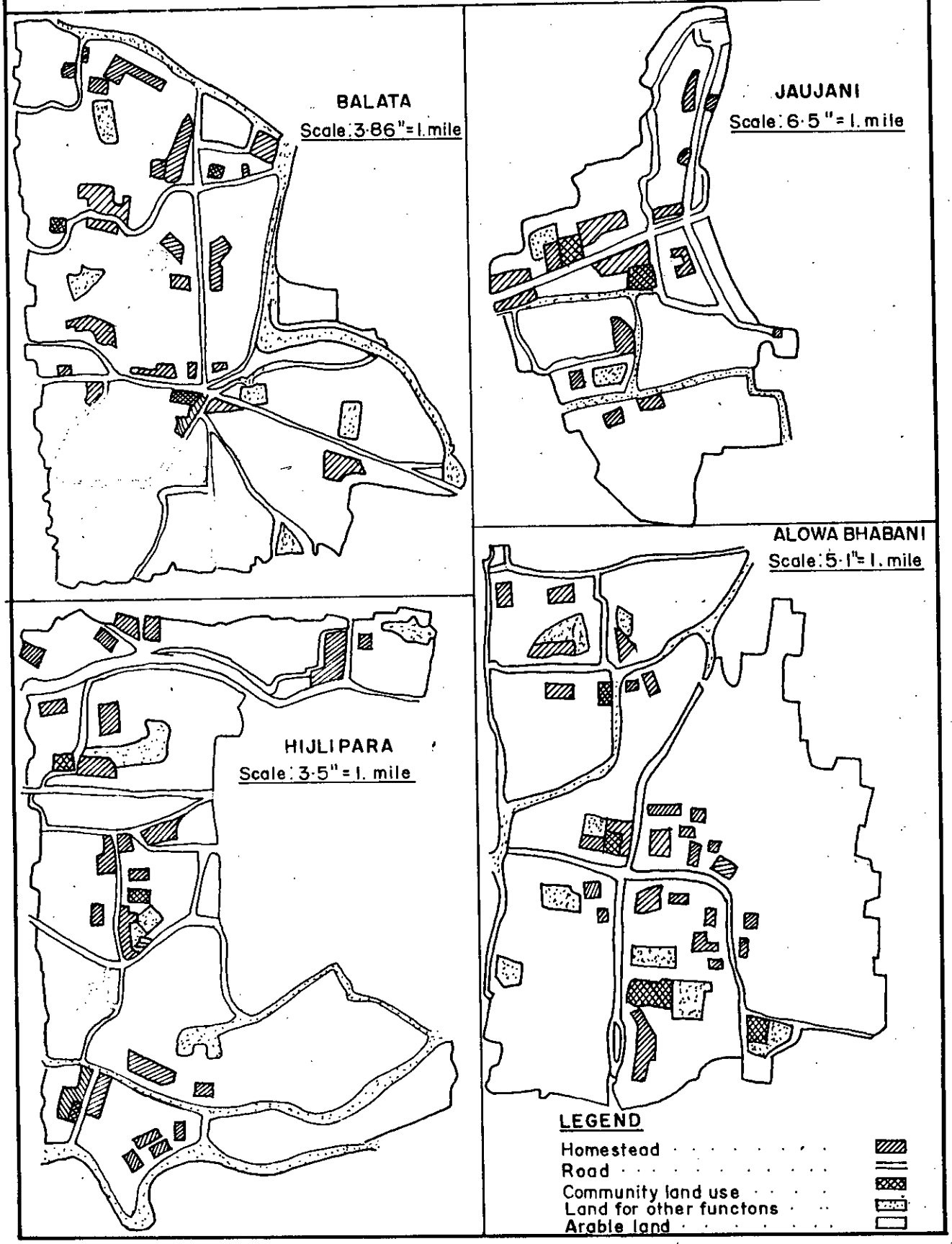

**LEGEND**

- Homested
- Road
- Community land use
- Land for other function
- Arable land

Source: Field Survey 1986.

EXISTING LAND USE SITUATION 1985
VILLAGE OF CATEGORY II

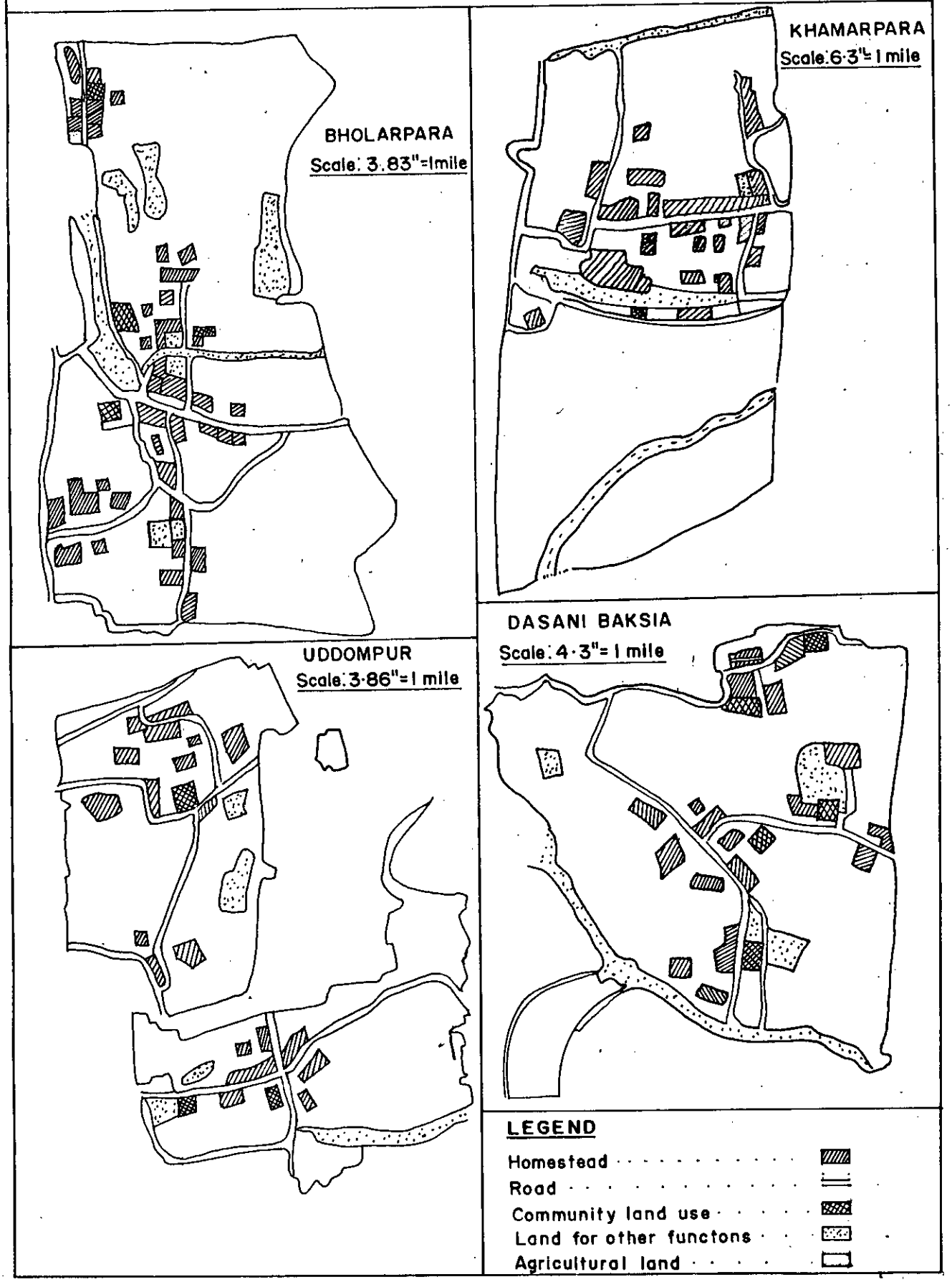
MAP 6




Source: Field Survey 1986.

EXISTING LAND USE SITUATION 1985
VILLAGE OF CATEGORY III

MAP 7




Source: Field Survey 1986.

### 4.1.1 Land use for settlement

Land use for settlements have been classified into land for homestead area, roads and embankments, and land for community function. The different land use components of the settlement areas have been given in Table-4.1. It is found from the table that the villages of category-I, II and III occupy about 42.40, 20.34 and 15.94 percent of areas respectively for settlement purpose (Table-4.1).

The different components of the settlement areas have been discussed briefly in the following paragraphs:

#### Homesteads

The first and prime component of rural settlement is its homesteads. Homesteads are locally called 'bari'. In each homestead generally a number of households live together in different shelters built at different location. Residential, social and cultural activities are performed in homestead areas. Normally, homestead areas consist of dwelling houses, shelters for cattles, storage for farm products, vegetable gardens, orchards and ponds. The homestead areas are built on vity or high lands and are free from flooding. In the study villages most of the settlements are dispersed into several clusters, but homesteads are nucleated on vity lands. Usually the homesteads are surrounded by trees which ensure privacy, provide shade from sun and protect houses from storms and heavy winds. Presently, homestead areas cover 27.08, 12.93

and 11.15 percent of areas of the villages of category-I, II and III respectively (Table-4.1).

Roads and Embankments

Rural roads play an important role for the movement of the people. During dry season all of the roads are used for rural communications. During rainy season specially high flood results submergence of a major portion of those roads. In the past most of the rural roads used to go under water during rainy seasons. For the last few years, various programmes (FWP) were undertaken by various foreign and local agencies like CARE, IRDP and local union Council authorities to improve the existing roads and to construct new roads. To build up new roads more rural land have gone under such functions since early of this decade.

Rural earth roads may be classified into major road, branch road and hallot. Major roads are those roads passing through the villages and connecting the villages with market and bazar etc. Width of these type of roads varies from area to area. Branch roads are rural roads generally lead toward the cluster of homesteads or para and comes from major earth roads. Such roads are not very long. The access roads lead towards homesteads and are locally called 'hallots'. Generally hallots connect branch roads and lead to each individual homestead. In some cases channel and river banks have also been used as hallot.

Flood control embankment is also an important component in some of the settlements. In many areas, flood control embankments are used as major earth road. The length and width of such embankments are generally higher than major rural roads. The width and length of flood control embankments are directly related with the elevation of the area from mean sea level, distance of the area from nearby major rivers and frequency of high flood. Road and flood control embankments occupy 12.89, 6.36 and 4.22 percent of the areas of village category-I, II and III respectively.



Land for community functions and open space

Rural community functions generally consist of market areas, educational and religious institutions. Play fields, dispensaries, offices and Eidgahs are also included within such categories of land. Land for community function occupy, 2.43, 1.05 and 0.57 percent of the area of village category I, II and III respectively (Table-4.1).

Settlement density

The population density in the settlement areas of the study villages is given in the following table.

Table of Settlement Density in the Study Area

| Villages | Population 1981 | Settlement area (in acre) | Settlement density (popl./acre) |
|---|---|---|---|
| Category-I | 1418 | 87.77 | 16.2 |
| Category-II | 4598 | 211.05 | 21.8 |
| Category-III | 6214 | 267.19 | 23.3 |
| Total(all vills.) | 12230 | 566.01 | 21.6 |

From the table it is found that the average density of population in the settlement areas of the study villages is 21.6 persons per acre. According to the category of villages, the population density is highest (23.3 persons/acre)in village category-III and the density is lowest (16.2 persons/ acre) in village category-I.

4.1.2 Agricultural land

The agricultural land includes all such lands those are under the plough or cultivation. In the study villages, 52.57, 73.42 and 80.64 percent of the area of village category-I, II and III respectively are agricultural land (Table-4.1). Per-capita agricultural land in the study villages is given in Table-4.2. It is found from the table that the average percapita

Table-4.2 Percapita Agricultural Land in Three Categories of Villages

| Villages | Population (1981) | Agricultural land(acres) | Percapita agricultural land (decimal) |
|---|---|---|---|
| Category-I | 1418 | 108.83 | 7.7 |
| Category-II | 4598 | 762.15 | 16.6 |
| Category-III | 6214 | 1351.53 | 21.7 |
| Total(all villages) | 12230 | 2222.51 | 18.2 |

land in the study villages is only 18.2 decimal while it is lowest in the villages of category-I (7.7 decimal) and maximum in the villages of category-III (21.7 decimal).

### 4.1.3 Land use for other functions

Rural land used for various purposes rather than settlement and agricultural use are classified as land for other functions. In the study villages, such areas are, rivers, water bodies and fallow land, and those land cover 5.03, 6.24 and 3.42 percent of the area of village category-I, II and III respectively.

## 4.2 Homestead Areas

"Homesteads play an important role in rural economy as well as national economy"[1]. Rural homesteads are not only used for shelter but also are used for several economic functions such as - processing of agricultural product, poultry farming, cattle farming, drying of grains, cooking, cottage industries, and for socio-cultural activities.

### 4.2.1 Size of homesteads per household

Homesteads may be classified according to their sizes. In the study area, homesteads are classified into three groups according to their sizes; these are identified as small, medium and large. Small size homesteads occupy areas less than 10 decimal. Homesteads occupying 11 to 25 decimals area are recognised as medium size and those occupying 26 decimals or above are considered as large size homestead.

---

1. Hafiz, Kazi, Golam, Op. Cit. P-63.

From Table 4.3 small homesteads are found to be 55.8%, 60.3% and 58.3% in villages category-I, II, and III respectively. Medium size homesteads are 33.0%, 29.5% and 28.6% and large homesteads are 12.2%, 10.2% and 13.1% in villages category-I, II and III respectively. These statistical distribution of

Table-4.3 Distribution of the Size of Homesteads per Household in Three Categories of Villages

| Type of villages | No. of homesteads as % of total homestead in each category | | | Total |
|---|---|---|---|---|
| | Small size (less than 10 decimal) | Medium (11-25 decimal) | Large (26 deci. and over) | |
| Category I | 55.8% | 33.0% | 12.2% | 100% |
| Category II | 60.3% | 29.5% | 10.2% | 100% |
| Category III | 58.3% | 28.6% | 13.1% | 100% |

Source: Field Survey, 1986.

three different sizes of homesteads in three categories of villages would help to realise the similarities of three category of villages regarding the percentages of three types of homesteads.

In order to have a better understanding about the size distribution of homesteads in all the study villages Table-4.4 is presented. It is found from the table that 30.3 percent of the homesteads in all the study villages have sizes below 5 decimals, 26.5 percent of the homesteads have sizes between

Table-4.4 Distribution of Homestead Size per Household in all the Study Villages

| Range of homestead size(decimal) | Percentage of total homestead | Cumulative percentage |
|---|---|---|
| Below 5 | 30.3 | 30.3 |
| 6 - 10 | 26.5 | 56.8 |
| 11 - 15 | 18.7 | 75.5 |
| 16 - 20 | 6.0 | 81.5 |
| 21 - 25 | 8.0 | 89.5 |
| 26 - 30 | 4.2 | 93.7 |
| 31 and above | 6.3 | 100.0 |

Source: Field Survey, 1986.

6 to 10 decimals, 18.7 percent have sizes between 11 to 15 decimals, 6 percent have sizes between 16 to 20 decimals, 8 percent have sizes between 21 to 25 decimals, 4.2 percent have sizes between 26 to 30 decimals and 6.3 percent have sizes 31 decimals and above. It is also found that the frequency of smaller size homesteads are greater, when 56.8 percent homesteads have sizes less than 10 decimals and 89.5 percent homesteads have sizes less than 25 decimals.

## 4.3 Component of Rural Homesteads

Main categories of land within rural homesteads may be classified as follows:

1. Homses and shelters
2. Courtyard and open areas
3. Vegetable garden area

4. Fruit garden, orchard and bushes

5. Water bodies, pond and ditches.

Table-4.5 represents the existing land use type in three categories of homesteads.

Table-4.5 Distribution of Land Categories in Three Different Type of Homesteads

| Type of homestead land use | Average area covered (in decm )on homestead | | | Percent of homestead occupy | | |
|---|---|---|---|---|---|---|
| | Small (less than 10 decm ) | Medium (11-25) | Large (25+) | Small 215 No. | Medium 124 No. | Large 60 No. |
| Houses & shelter | 0.91 | 1.45 | 1.68 | 100 | 100 | 100 |
| Courtyard and open area | 1.16 | 4.23 | 12.08 | 96.28 | 97.58 | 98.33 |
| Vegetable garden | 0.48 | 0.88 | 2.21 | 31.00 | 59.87 | 54.83 |
| Fruit garden, orchard & bushes | 0.25 | 0.19 | 0.48 | 73.02 | 76.61 | 71.66 |
| Water bodies ponds and ditches | 1.10 | 6.40 | 11.55 | 36.28 | 67.74 | 63.33 |
| Other uses | 1.56 | 3.72 | 10.61 | 37.67 | 89.52 | 100.00 |
| Total (average) | 5.46 | 16.87 | 38.61 | | | |

Source: Field Survey, 1986.

4.3.1 Landuse for houses and shelters

Houses and shelters specify those structures where household owner lives together with other members of his family. In this study houses and shelters also include those structures that are used for kitchen, cattle shelter, crop store, guest house etc.

Therefore, in this study we have measured total land area covered by one or several houses owned by a household.

Rural houses are of various sizes. Their sizes vary due to numerous factors. In the study area sizes of houses vary according to economic capability of household owner, size of household and size of homesteads etc. Table-4.5 represents the average areas covered by houses and shelters in the study villages.

It is found from the table that the average size of homestead for each household is 5.46 decimal in small homestead, 16.87 decimal in medium housestead and 38.61 decimal in large homestead. It is also found that the average area covered by houses and shelters for each household is 0.91 decimal in small homestead, 1.45 decimal in medium homestead and 1.68 decimal in large homestead.

### 4.3.2 Courtyard and open area

Courtyard and open areas include those areas like, interior courtyard, exterior courtyard and crop processing place. Courtyard and open areas are a major part of individual homestead. Sizes of such areas vary from house to house and vary from few square yards to several hundred square yeards. Almost all farm households use such areas to dry their crops and grains and for processing of their crop.

Courtyard and open areas occupy on an average 1.16, 4.23 and 12.08 decimals of homestead areas in small, medium and large size homesteads respectively (Table-4.5).

### 4.3.3 Vegetable garden area

Vegetable garden is also an important component in rural homestead. Villagers usually grow vegetables on such land. Vegetable gardens are generally found in both farm and non-farm homesteads. A significant percent of rural homestead owners earn a reasonable income by selling the product from their vegetable garden. So it plays an important economic role for the rural poor. In the study villages it is found that small homesteads have vegetable garden adjacent to kitchen. Medium and large homesteads have vegetable garden nearer to courtyards and open areas.

Sizes of vegetable gardens vary from homestead to homestead. Variation in their sizes depend upon the size of homesteads, soil characteristics, economic condition of household and personal interest of family members.

From Table-4.5 it is found that average sizes of vegetable gardens are 0.48, 0.88 and 2.21 decimal in small, medium and large size homesteads respectively, and about 31, 59 and 54 percent of small, medium and large homesteads have such gardens.

The main reason of such variation in the number of gardens in different classes of homesteads is dependent on different factors such as "social habit, varying incidence of hard manual work by day, and even economic status were probably involved"[1].

Therefore, it appears that space is not a factor for the provision of vegetable gardens in the rural homesteads, because only 54 percent of large homesteads (i.e av: size 38.61 decimal) have vegetable gardens whereas 59 percent of medium size homesteads have vegetable garden in their premises.

4.3.4 Fruit garden, orchard and bushes

Fruit garden and orchard areas consist of cluster of fruit or non-fruit trees. Bushes are generally of bamboos canes and others. We cannot think a village house without orchard and bushes. These places are generally located at the exterior part of the homesteads, such as behind the kitchen, latrine and cattle feeding areas etc. Existence of those at the front areas of homesteads are uncommon.

Average size of land areas occupied by garden, orchard and bushes are presented in Table-4.5. Combinedly these occupy on an average 0.25, 0.19 and 0.48 decimals of land areas in small, medium and large homesteads respectively. About 71 to 76 percent of the homesteads have garden, orchard and bushes. The

1. Keeble Lewis, "Principles and Practice of Town and Country Planning", 1969-Apt. 18.3.

remaining 25 to 30 percent of homesteads have no considerable fruit garden, orchard and bushes, which is not desirable for the country like Bangladesh. Because, such type of trees have great importance for the homestead owner as well as for national benefit and ecological balance. "According to an estimate homestead forest produce about 65-70 percent of sawlogs and about 90 percent of fuelwood and bamboos consumed in Bangladesh"[1].

Density of population may be one of the several factors to reduce the number of trees in rural homestead. Obviously the densities of the small homesteads are higher. So "very few of these smaller plots (below 5 decimals) produced fruit, firewood"[2]. Another important factor may be "to meet the ever increasing demand for fuelwood, at present an over-cutting of trees from homestead forests is going on"[3].

4.3.5 Water bodies, ponds and ditches

In the villages, water bodies, ponds and ditches are normally developed by excavating earth from them. In rural areas, these have multifarious uses. The excavated earth is used for building vity or flood-free high land for the homestead. The water is used for bathing, washing, cooking and drinking. They are also used for fish production and pisciculture. The

---

1. Byron Neil, "People's Forestry: A Noval Perspective of Forestry in Bangladesh" ADAB News, Vol. XI, No.2, March-April, 1984. p. 28.
2. Mundal Hakim, Op. Cit. P-162.
3. Khaleque Kibriaul, 'The importance and prospects of homestead forests in Bangladesh, March-April 1986, ADAB News, P.12.

ditches are generally used to dispose human waste, cowdung and for rottening the jute fibre during rainy season. Some ditches are used as seed-beds for paddy during dry season. Some ditches may remain derelict. Water bodies are generally shared among a number of households in the homesteads.

Sizes of water bodies, ponds and ditches vary from homestead to homestead. From the field survey it is found that average sizes of water bodies for each household are 1.10, 6.40 and 11.55 decimals in small, medium and large sizes of homesteads respectively (Table-4.5). It is also found that about 63 percent of large homesteads, 67 percent of medium size homesteads and only 36 percent of small homesteads have ponds and ditches.

Table-4.6 shows the nature of utilization of the water bodies in the study villages.

Table-4.6 Nature of Utilization of Homestead Waterbodies

| Type of Use | Number of water bodies in % of total | | |
|---|---|---|---|
| | Small homestead | Medium homestead | Large homestead |
| Derelict | 58.31 | 41.06 | 36.50 |
| Garbage | 21.64 | 27.19 | 19.00 |
| Seed plantation and raw jute process | 10.12 | 21.42 | 26.18 |
| Fish farming | 2.61 | 6.17 | 14.76 |
| Others | 7.32 | 4.16 | 3.56 |

Source: Field Survey, 1986.

From-Table 4.6 it is found that, about 58 percent of water bodies and ditches remain in derelict condition in small homesteads whereas about 41-37 percent of waterbodies in medium and large homesteads remain derelict. About 19-27 percent of the waterbodies are used for disposal of garbage, human faces and cowdung.

About 26 percent of the water bodies in large homesteads, about 21 percent in medium homesteads and about 10 percent in small homesteads are used as seed-beds for paddy and for rottening of raw jute. Only 14.76 percent of the waterbodies in large homesteads, 6.17 percent in medium homesteads and 2.61 percent in small homesteads are used for pisciculture. Small waterbodies,(ponds and ditches) become completely dried up during dry season and are, therefore, not suitable for pisciculture.

Table-4.7 shows the distribution of water bodies according to their sizes and their uses for fish cultivation. It is found from the table that small waterbodies (size upto 9 decimal) are 133 nos. (78.7%), medium size waterbodies ( 9 to 36 decimals) are 21 nos. (12.4%) and large waterbodies (over 36 decimals) are 15 nos. (8.9%). Out of the total of 169 waterbodies surveyed in this study only 21 waterbodies are used for pisciculture, 36 waterbodies supply fishes without cultivation and 221 waterbodies do not supply any considerable amount of fishes. Most of the small waterbodies do not supply

fishes, 43% of the medium size waterbodies and all of the large size waterbodies supply fishes.

Table-4.7 Percentage of Homestead Waterbodies Supplying Fishes According to Their Sizes

| Type of Uses | Sizes of Waterbodies;Pond/Ditches (Acre) | | | | | | | | Total number |
|---|---|---|---|---|---|---|---|---|---|
| | Upto 0.05 | | 0.05-0.09 | | 0.09-0.36 | | 0.36+ | | |
| | No. | % | No. | % | No. | % | No. | % | |
| Supply fish by cultivation | - | - | 1 | 3% | 3 | 14.3% | 8 | 53.3% | 12 |
| Supply fish without cultivation | 16 | 16% | 7 | 21.2% | 6 | 28.5 | 7 | 46.7% | 36 |
| Supply no fishes | 84 | 84% | 25 | 75.8% | 12 | 57.2% | - | - | 121 |
| Total | 100 | | 33 | | 21 | | 15 | | 169 |

Source: Field Survey, 1986.

In a recent study it is revealed that "about 80 percent of the pond and ditches in the district of Tangail remain derelict"[1]. This situation is also reflected in the study villages. The reason for this may be sought in the fact that most of the ditches and small waterbodies are very shallow in their depth and become dry during the dry season. This condition is not suitable for fish cultivation. Moreover, the villagers are not aware of the modern practices in fish cultivation.

1. FAO/UNDP Agricultural Development Adviser Project (BDG/81/035) Dhaka 1982, Op. Cit. P-32.

### 4.3.6 Other uses in the homestead land

Besides the uses which have been discussed before, there are also some other uses in the homestead areas. These include graveyard, pathways, fallow land etc., but the proportion of such land areas are very small. Table-4.5 shows that other uses comprise only 1.56, 3.72 and 10.61 decimal in small, medium and large homesteads respectively.

# CHAPTER-V

# RURAL LAND USE TREND

The different types of land uses in the study Areas have been discussed in Chapter-IV. The quantum of these land uses are changing over the years due to population increase and other related factors. The nature of uses of land areas are mainly influenced by the expanding demand of the growing population. This chapter is intended to establish the co-relationship of rural land use trend with the increase of population in the last 25 years starting from 1961. The analysis has been made for 10 year intervals i.e for 1961-70, 1971-80 and 1981-85 periods.

## 5.1 Trend of Population Growth in the Study Villages

Table-5.1 represents the yearly growth rate of population in study areas. From this table it is found that the population growth rates and the trend of growth rates are different in three types of villages. Population growth rate is highest in village of category-I, mild in village category-II and low in village category-III. By considering individual category of the villages it is observed that villages under category-I shows a gradual descending growth rate of population. In village category-II also the population growth rate show the descending trend but the growth rates are lower than that of village category-I. In village category-III the population growth rate

has an ascending trend from 1961-70 to 1971-80, but after that it has got descending growth rate. In the nine study villages combinedly it shows ascending growth rate of 1.78% during 1961-70 to 2.08% during 1971-80, but after that it has got the descending growth rate of 1.39% during 1981-85.

Table-5.1 Population Growth Rate in Different Decades

| Category of villages | Year | Total population | Increase of population | Per year growth rate |
|---|---|---|---|---|
| I | 1961 | 698 | - | - |
| | 1971 | 1016 | 318 | 3.83 |
| | 1981 | 1418 | 402 | 3.39 |
| | 1985 | 1615 | 197 | 3.30 |
| II | 1961 | 2757 | - | - |
| | 1971 | 3581 | 824 | 2.65 |
| | 1981 | 4598 | 1017 | 2.53 |
| | 1985 | 4834 | 236 | 1.26 |
| III | 1961 | 4884 | - | - |
| | 1971 | 5352 | 468 | 0.92 |
| | 1981 | 6214 | 889 | 1.50 |
| | 1985 | 6477 | 236 | 1.04 |
| Total for nine villages | 1961 | 8339 | - | - |
| | 1971 | 9949 | 1610 | 1.78 |
| | 1981 | 12230 | 2281 | 2.08 |
| | 1985 | 12926 | 696 | 1.39 |

Source: Population census 1961, 74 and 81.

Growth rates of population in different periods are relatively lower than the national figures in the nine study villages and also in village category-II and III. But, in village category-I, the population growth rates are higher than the national figures because of its urban influence.

## 5.2 Variation of Land Areas with the Increase of Population

It has already been discussed in Chapter-IV that the broad categories of land uses in the study villages are the settlement areas, agricultural land and the land for other purposes. During the last 25 years, from 1961 to 1985, considerable variation in the amount of land has taken place in all the categories of such land uses. Growth of population is the major factor in influencing the variation of land uses in the study areas. Table-5.2 shows the number of population and the consequent change in land uses for settlement, agriculture and for other purposes in every consequtive decades starting from the year 1961. It is observed from the Table-5.2 that, with the increase of population the settlement areas have increased, but the agricultural land and land for other purposes have decreased. The increase in population in different decades and the consequent amount of change(increase or decrease) of land uses in the three categories of villages have been shown in Table-5.3. The quantitative variation of

such land areas with the growth of population is discussed in the subsequent paragraphs.

Table-5.2 Distribution of the Land Use Size and Population in Different Years

| Category of villages | Total Area (in acre) | Year | Total population | Type of Land Use in Acre | | |
|---|---|---|---|---|---|---|
| | | | | Settlement purpose | Agricultural land | Land use for other purpose |
| I | 207 | 1961 | 698 | 51.82 | 121.58 | 33.60 |
| | | 1971 | 1016 | 53.24 | 124.51 | 29.25 |
| | | 1981 | 1418 | 72.00 | 113.50 | 21.50 |
| | | 1985 | 1615 | 87.77 | 108.83 | 10.40 |
| II | 1038 | 1961 | 2757 | 133.10 | 810.47 | 94.43 |
| | | 1971 | 3581 | 150.02 | 798.55 | 88.43 |
| | | 1981 | 4598 | 180.10 | 785.43 | 72.47 |
| | | 1985 | 4834 | 211.05 | 762.15 | 64.80 |
| III | 1676 | 1961 | 4884 | 196.93 | 1372.73 | 106.34 |
| | | 1971 | 5352 | 217.72 | 1374.31 | 83.97 |
| | | 1981 | 6241 | 247.56 | 1359.08 | 69.36 |
| | | 1985 | 6477 | 267.19 | 1351.53 | 57.28 |
| Total for nine villages | 2921 | 1961 | 8339 | 381.85 | 2304.78 | 234.37 |
| | | 1971 | 9949 | 420.98 | 2297.37 | 201.65 |
| | | 1981 | 12230 | 499.66 | 2258.01 | 163.33 |
| | | 1985 | 12926 | 566.01 | 2222.51 | 132.48 |

Source: Population census of 1961, 1974, 1981 and Field survey 1986.

Note: Population of 1971 is interpolated from census figures.

Table-5.3 Change in Population and Land Uses in Different Periods

| Category of village | Total area (in acre) | Period (year) | Increase in population | Increase/decrease of land uses (in acre) | | |
|---|---|---|---|---|---|---|
| | | | | Settlement area | Agriculture land | Land use for other purposes |
| I | 207 | 1961-70 | 318 | +1.42 | +2.93 | -4.35 |
| | | 1971-80 | 402 | +18.76 | -11.01 | -7.75 |
| | | 1981-85 | 197 | +15.77 | -4.67 | -11.10 |
| II | 1038 | 1961-70 | 824 | +16.92 | -11.92 | -6.00 |
| | | 1971-80 | 1017 | +30.08 | -13.12 | -15.96 |
| | | 1981-85 | 236 | +30.95 | -23.28 | - 7.67 |
| III | 1676 | 1961-70 | 468 | +20.79 | + 1.58 | -22.37 |
| | | 1971-80 | 862 | +29.84 | -15.23 | -14.61 |
| | | 1981-85 | 263 | +19.63 | - 7.55 | -12.08 |
| Total for nine villages | 2921 | 1961-70 | 1610 | +39.13 | - 7.41 | -32.72 |
| | | 1971-80 | 2281 | +78.68 | -39.36 | -38.32 |
| | | 1981-85 | 696 | +66.35 | -35.50 | -30.85 |

Source: Computed from Table-5.1 and 5.2.

5.2.1 Percentage variation of different types of land uses

The percentage variation of different types of land uses in different years has been shown in Table-5.4. It is found from the table that the proportion of settlement areas in all categories of villages have increased while the proportion of agricultural and other land areas have decreased. Figure 6,7& 8 have also represented decadewise land use variation of three categories of villages starting from 1961.

Table-5.4 Percentage Variation of Different Types of Land Uses

| Category of villages | Total area (in acre) | Year | Total population | Percentage variation of land uses | | |
|---|---|---|---|---|---|---|
| | | | | Settlement area(%) | Agricultural land(%) | Land for other purposes(%) |
| I | 207 | 1961 | 698 | 25.0 | 58.7 | 16.2 |
| | | 1971 | 1016 | 25.7 | 60.1 | 14.1 |
| | | 1981 | 1418 | 34.8 | 54.8 | 10.4 |
| | | 1985 | 1615 | 42.4 | 52.6 | 5.0 |
| II | 1038 | 1961 | 2757 | 12.8 | 78.1 | 9.1 |
| | | 1971 | 3581 | 14.5 | 76.9 | 8.6 |
| | | 1981 | 4598 | 17.4 | 75.7 | 6.9 |
| | | 1985 | 4834 | 20.3 | 73.4 | 6.3 |
| III | 1676 | 1961 | 4884 | 11.8 | 81.9 | 6.3 |
| | | 1971 | 5352 | 13.0 | 82.0 | 5.0 |
| | | 1981 | 6241 | 14.8 | 81.1 | 4.1 |
| | | 1985 | 6477 | 15.9 | 80.6 | 3.5 |
| Total for nine villages | 2921 | 1961 | 8339 | 13.1 | 78.9 | 8.0 |
| | | 1971 | 9949 | 14.4 | 78.7 | 6.9 |
| | | 1981 | 12230 | 17.1 | 77.3 | 5.6 |
| | | 1985 | 12926 | 19.4 | 76.1 | 4.5 |

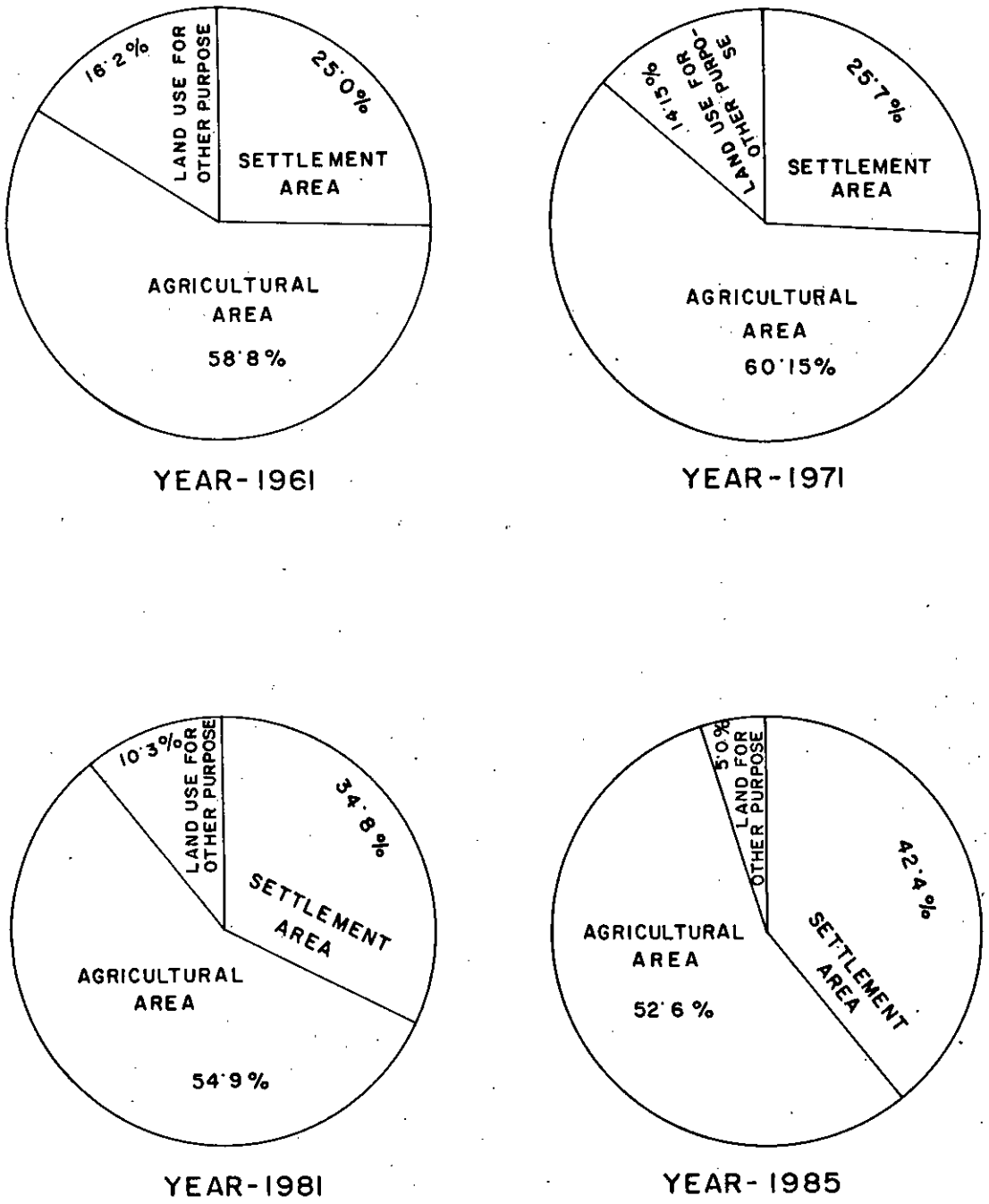
Source: Computed from Table-5.2

The total settlement area in the nine study villages was 13.1% in 1961 which has increased to 19.4% in 1985 (i.e. in 25 years). The settlement area in village category-I was 25.0% in 1961 and it has increased to 42.4% in 1985. The settlement

FIG.6

CHANGE OF LAND USE PATTERN OF VILLAGE

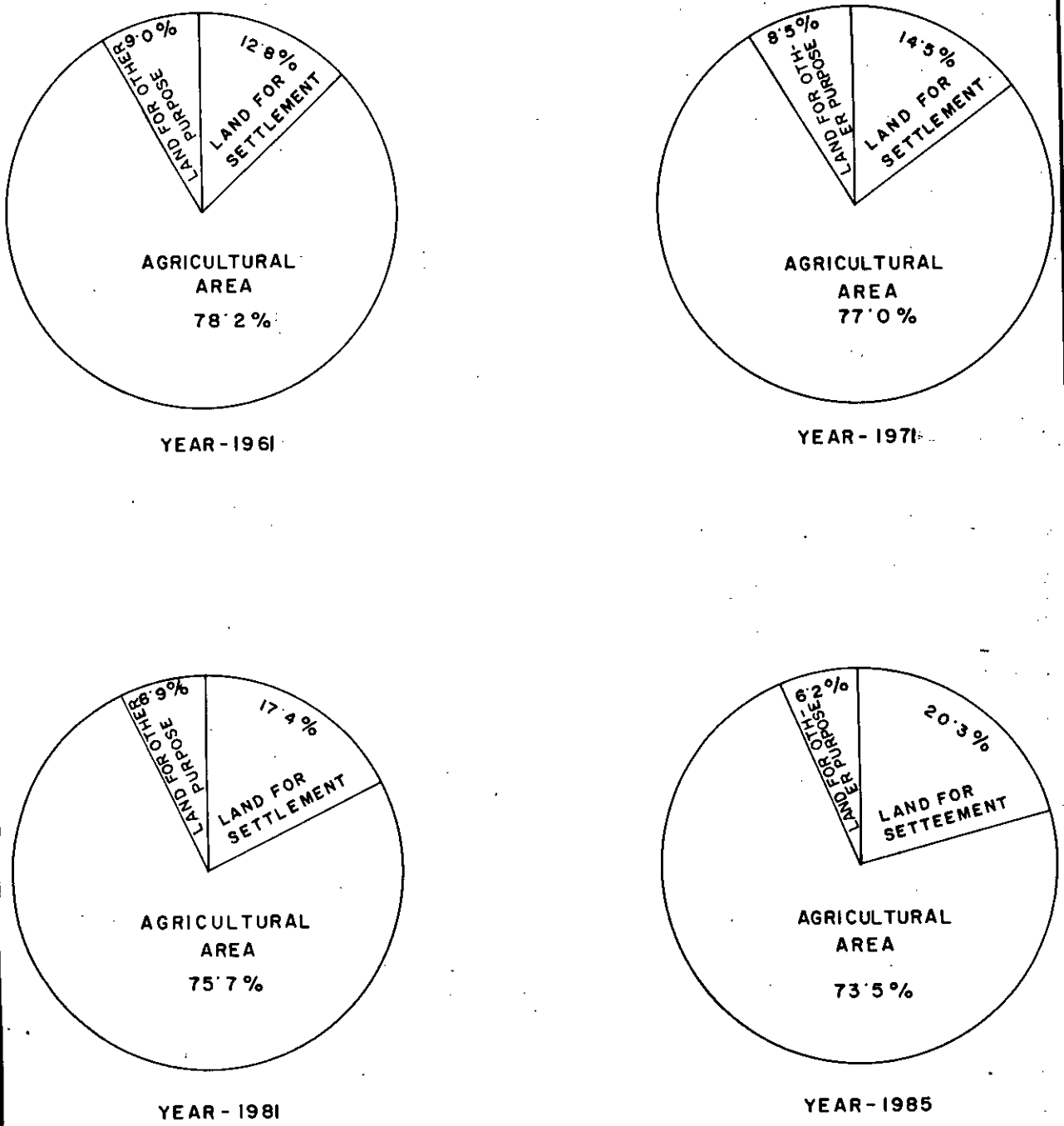
CATEGORY-I




Source: Field Survey 1986.

CHANGE OF LAND USE PATTERN OF VILLAGE CATEGORY II

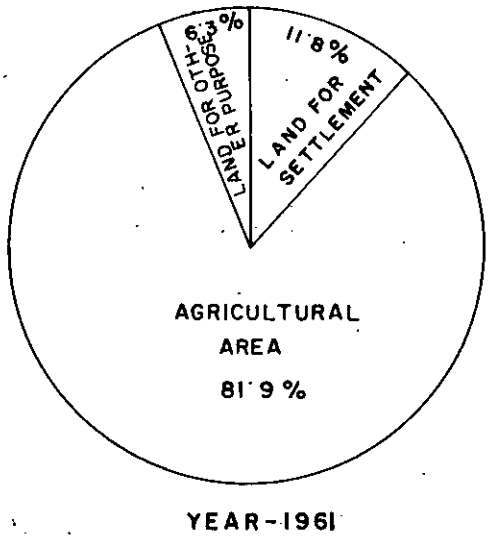
FIG.7



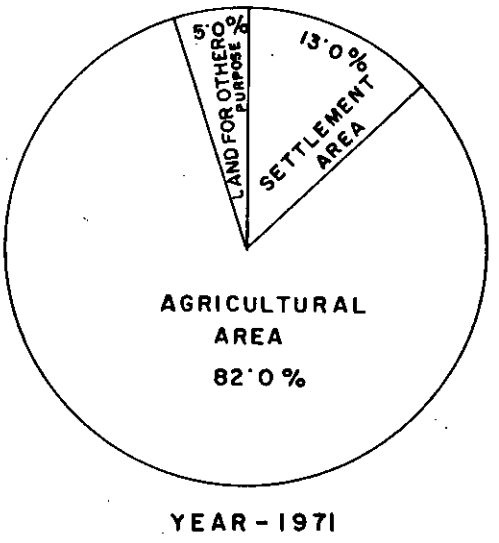

Source : Field Survey 1986.

FIG. 8

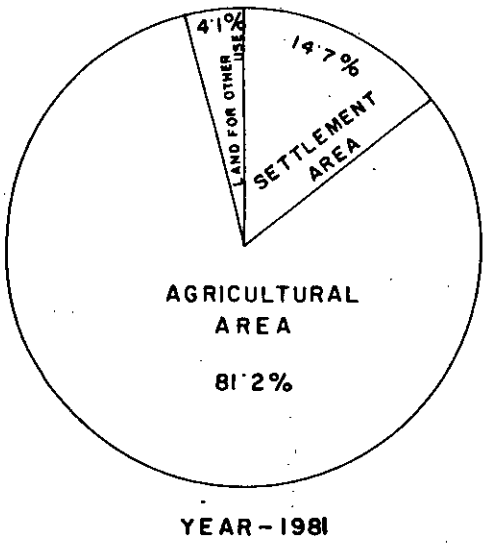
## CHANGE OF LANDUSE PATTERN OF VILLAGE CATEGORY III



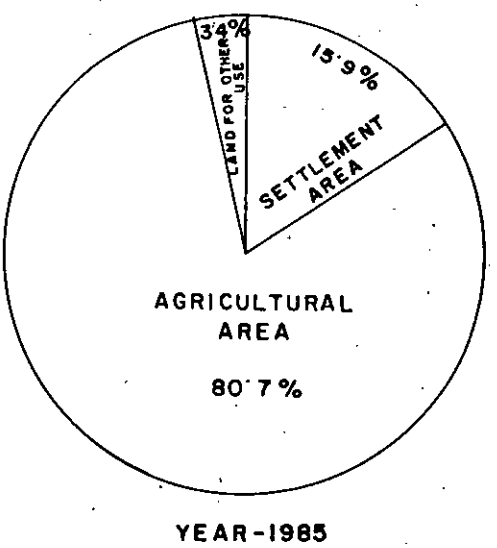

YEAR-1961




YEAR-1971




YEAR-1981




YEAR-1985

Source: Field Survey 1986.

area in village category-II was 12.8% in 1961 and it has increased to 20.3% in 1985, and the settlement area in village category-III was 11.8% in 1961 which has increased to 15.9% in 1985. It is also found that the rates of increases of settlement areas are higher in recent years. The grater proportion of settlement area in village category-I is due to its urban influence which has been discussed earlier.

The total agricultural land in the nine study villages was 78.9% in 1961 which has decreased to 76.1% in 1985 (i.e in 25 years). In village category-I the agricultural land was 58.7% in 1961 which has decreased to 52.6% in 1985; in village category-II it was 78.1% in 1961 which has decreased to 73.4% in 1985 and in village category-III it was 81.9% in 1961 which has decreased to 80.6% in 1985.

The total land for other purposes in the study villages was 8.0% in 1961 which is reduced to 4.5%in 1985. The land for other uses in village category-I was 16.2% in 1961 which has decreased to 5.0% in 1985; in village category-II it was 9.1% in 1961 which has decreased to 6.3% in 1985 and in village category-III it was 6.3% in 1961 which has decreased to 3.5% in 1985. The land for other purposes, which include natural waterbodies, derelict land and fallow land, has reached to such a minimum proportion in all categories of villages that the possibility of further reduction of such land thereby to increase the agricultural land seem to be very difficult.

5.2.2 Rate of change of population and land uses

The rate of change of population and the corresponding change in the land uses of different categories in the study villages have been shown in Table-5.5. It is found from the table that

Table-5.5 Rate of Change of Population and Land Uses

| Category of village | Total area (in acre) | Period (years) | Population growth rate ( in % ) | Change(increase/decrease) of land uses in percent per year | | |
|---|---|---|---|---|---|---|
| | | | | Settlement area | Agricultural land | Land use for other purposes |
| I | 207 | 1961-70 | 3.83 | +0.069 | +0.142 | -0.211 |
| | | 1971-80 | 3.39 | +0.906 | -0.532 | -0.374 |
| | | 1981-85 | 3.30 | +1.524 | -0.451 | -1.073 |
| II | 1038 | 1961-70 | 2.65 | +0.163 | -0.115 | -0.058 |
| | | 1971-80 | 2.53 | +0.290 | -0.126 | -0.154 |
| | | 1981-85 | 1.26 | +0.596 | -0.449 | -0.147 |
| III | 1676 | 1961-70 | 0.92 | +0.124 | +0.009 | -0.133 |
| | | 1971-80 | 1.50 | +0.178 | -0.091 | -0.087 |
| | | 1981-85 | 1.04 | +0.234 | -0.090 | -0.144 |
| Total for nine villages | 2921 | 1961-70 | 1.78 | +0.134 | -0.022 | -0.112 |
| | | 1971-80 | 2.08 | +0.270 | -0.136 | -0.134 |
| | | 1981-85 | 1.39 | +0.454 | -0.243 | -0.211 |

Source: Computed from Table-5.1 and-5.2.

the rate of increase of population in all the study villages during the periods 1961-70, 1971-80 and 1981-85 are 1.78%, 2.08% and 1.39% per year respectively. Corresponding to the rates of increases in population, the rates of increases in settlement areas are 0.134%, 0.270% and 0.454% per year, the corresponding rates of decreases in agricultural areas are 0.022%, 0.136% and 0.243% per year and the rates of decreases in other land uses are 0.112%, 0.134% and 0.211% per year during the periods 1961-70, 1971-80 and 1981-85 respectively. Similar trend is observed in all categories of villages but certain minor exceptions are also found. In villages of category-I, the rates of increases in settlement areas and the rates of decreases in agricultural and other land uses are higher compared to other categories of villages. This is perhaps because of the urban influence in the village category-I. It is also found that during the period 1961-70, the agricultural lands in villages of category-I and category-III have slightly increased and after that it started decreasing. This may be due to the fact that during the period 1961-70 much of the derelict and fallow lands were brought under agricultural use and also the loss of agricultural land due to settlement expansion was very small.

Table-5.5 also shows that the increase in population has got a descending rate of growth while the corresponding increase in settlement areas and the decrease in agricultural land have an ascending rate of change. The reason may be due to the fact

that during the period 1961-70 though the rate of growth of population was higher, but the increased population could be absorbed within the existing settlement areas without much expansion of the same. But, after that period, it became increasingly difficult to absorb further population without considerable expansion of settlement areas and the consequent decrease in agricultural land.

### 5.2.3 Variation of land uses with increase of every 100 population

The change (increase or decrease) of different types of land uses with respect to the increase of every hundred population in different decades in all the categories of villages have also been studied and is presented in Table-5.6. It is found from the table that during the period 1961-70 and 1971-80 the increase of settlement areas with respect to the increase of every hundred population was between the range of 0.45 acres to 4.67 acres. But, in the period 1981-85, the settlement areas have started to expand at an accelerated rate of growth in all categories of villages. At that period (1981-85) the minimum increase of settlement area with respect to the increase of every hundred population was 8.00 acres in the village category-I and the maximum increase was 13.10 acres in village category-II, and the average increase of settlement areas for all the nine villages was 9.53 acres per hundred population increase. The analysis shows that the capacity to

absorb the increased population within existing settlement areas have been greatly reduced in recent years (1981-85) and the agricultural land is threatened with a greater loss due to the expansion of new settlement areas to accommodate the increased population.

Table-5.6 Variation of Land Uses with Respect to the Increase of Every 100 Population ( in acres)

| Category of village | Period (years) | Population increase (No.) | Change (increase/decrease) of land use with increase of every 100 population (in acres) | | |
|---|---|---|---|---|---|
| | | | Settlement area | Agricultural land | Land use for other purpose |
| I | 1961-70 | 318 | +0.45 | +0.92 | -1.37 |
| | 1971-80 | 402 | +4.67 | -2.74 | -1.93 |
| | 1981-85 | 197 | +8.00 | -2.37 | -5.63 |
| II | 1961-70 | 824 | +2.05 | -1.45 | -0.73 |
| | 1971-80 | 1017 | +2.96 | -1.29 | -1.57 |
| | 1981-85 | 236 | +13.10 | -9.86 | -3.25 |
| III | 1961-70 | 468 | +4.44 | +0.34 | -4.78 |
| | 1971-80 | 889 | +3.36 | -1.71 | -1.65 |
| | 1981-85 | 236 | +8.32 | -3.20 | -5.12 |
| Total for nine villages | 1961-70 | 1610 | +2.43 | -0.46 | -2.03 |
| | 1971-80 | 2281 | +3.45 | -1.73 | -1.68 |
| | 1981-85 | 696 | +9.53 | -5.10 | -4.43 |

Source: Computed from Table-5.2.

The average loss of agricultural land for the increase of every hundred population in the nine villages was 0.46 acres in the period 1961-70, 1.73 acres in 1971-80 and 5.10 acres in 1981-85. This shows that the loss of agricultural land is being caused at an increasing rate and the loss is greater in recent years (1981-85).

### 5.2.4 Per capita land in different years

Per capita land in the study areas during last twenty five years have been studied in this article. Per capita settlement areas, agricultural land and other land uses in different years are presented in Table-5.7.

#### Per capita change of total land area

Total area of the villages is fixed but with the increase of population per capita distribution of areas have been decreasing gradually from year to year. It is found from the table that the average per capita total land in the nine study villages were 35.57, 30.5, 25.2 and 22.6 decimals in the years 1961, 1971, 1981 and 1985 respectively. This shows a gradual decrease of per capita total land but the amount of decreases are not the same for all categories of villages. Since the growth rates of population are higher in the villages of category-I, so the decreases of per capita total lands are also higher, which are found to be 30.09 decimal in 1961, 21.12 decimal in 1971, 14.96 decimal in 1981 and 11.91 decm.

Table-5.7 Per Capita Distribution of Rural Land in Different Years

| Category of villages | Year | Per capita land use in decimal | | | |
|---|---|---|---|---|---|
| | | Settlement purpose | Agricultural land | Other uses | Total |
| I | 1961 | 7.0 | 18.09 | 5.00 | 30.09 |
| | 1971 | 5.4 | 12.72 | 3.00 | 21.12 |
| | 1981 | 5.2 | 8.21 | 1.55 | 14.96 |
| | 1985 | 5.1 | 6.74 | 0.07 | 11.91 |
| II | 1961 | 4.95 | 30.12 | 3.51 | 38.58 |
| | 1971 | 4.44 | 23.62 | 2.62 | 30.68 |
| | 1981 | 4.22 | 18.42 | 1.70 | 24.34 |
| | 1985 | 4.36 | 15.76 | 1.34 | 21.46 |
| III | 1961 | 4.06 | 28.32 | 2.20 | 34.58 |
| | 1971 | 4.17 | 26.33 | 1.61 | 32.11 |
| | 1981 | 4.16 | 22.85 | 1.17 | 28.18 |
| | 1985 | 4.12 | 20.87 | 0.89 | 25.88 |
| Total for nine village | 1961 | 4.65 | 28.07 | 2.85 | 35.57 |
| | 1971 | 4.40 | 23.98 | 2.10 | 30.50 |
| | 1981 | 4.31 | 19.47 | 1.41 | 25.20 |
| | 1985 | 4.37 | 17.20 | 1.03 | 22.60 |

Source: Computed from Table-5.1 and-5.2.

in 1985. But in the villages of category-II, decreases are from 35.58 decimal to 21.46 decimal and in the villages of category-III, the decreases are from 34.58 decimal to 25.88 decimal during the last 25 years i.e. from 1961 to 1985. It is

also found that the amount of decreases are not similar for different types of land uses which are discussed in the following paragraphs.

Per capita settlement area

Per capita settlement area decreased very slowly as is evident from Table-5.7. It is found that in different years i.e. in 1961, 1971, 1981 and 1985 the per capita settlement areas are 7.0, 5.4, 5.2 &5.1dec.respectively in villages of category-I; 4.95, 4.44, 4.22 and 4.36 decimals respectively in villages category-II; 4.06, 4.17, 4.16 and 4.12 decimals respectively in villages of category-III and the average amount of per capita settlement area in the nine study villages are 4.65, 4.40, 4.31 and 4.37 decimals respectively. It is also found that per capita settlement area sharply decreased between the period 1961-70 and after that the decreases are very small, and also the per capita settlement area does not fall below 4.00 decimal even with the increase of population. This signifies that there is a minimum limit for per capita settlement area and hence a maximum limit for density of population in settlement areas beyond which, under the present pattern of development, the settlement areas may be over populated.

Per capita agricultural land

It is found from Table-5.7 that during the last 25 years (i.e 1961-85) per capita agricultural land decreased rapidly

in all the three categories of villages. Per capita agricultural land in village category-I is very small since it is under urban influence. During the last 25 years i.e from 1961 to 1981, per capita agricultural land decreased from 18.09 decimal to 6.74 decimal in village category-I, from 30.12 decimal to 15.76 decimal in village category-II and from 28.32 decimal to 20.87 decimal in village category-III. During the same period (1961-85), the average per capita agricultural land for all the nine villages decreased from 28.07 decimal to 17.20 decimal.

Per capita land for other uses

Per capita land for other uses also decreased very sharply. During the last 25 years (1961-85) per capita land of other uses decreased from 5.00 decimal to 0.07 decimal in village category-I, from 3.51 decimal to 1.34 decimal in village category-II and it decreased from 2.20 decimal to 0.89 decimal in village category-III. The average amount of per capita land for other uses in all the nine study villages decreased from 2.85 decimal to 1.03 decimal during the same period.

### 5.2.5 Variation of population density in settlement areas in different years

During the last 25 years (1961-85) the population density in the settlement areas gradually increased with the increase

of population and this variation in density is shown in Table-5.8. The average population density in the settlement areas of the nine study villages increased from 21.8 persons

Table-5.8 Population Density in Settlement Areas

| Category of village | Year | Total population (No.) | Total settlement area (acres) | Population density in settlement area (No./acre) |
|---|---|---|---|---|
| I | 1961 | 698 | 51.82 | 13.5 |
| | 1971 | 1016 | 53.24 | 19.1 |
| | 1981 | 1418 | 72.00 | 19.7 |
| | 1985 | 1615 | 87.77 | 18.4 |
| II | 1961 | 2757 | 133.10 | 20.7 |
| | 1971 | 3581 | 150.02 | 23.9 |
| | 1981 | 4598 | 180.10 | 25.5 |
| | 1985 | 4834 | 211.05 | 22.9 |
| III | 1961 | 4884 | 196.93 | 24.8 |
| | 1971 | 5352 | 217.72 | 24.6 |
| | 1981 | 6241 | 247.56 | 25.2 |
| | 1985 | 6477 | 267.19 | 24.2 |
| Total for nine villages | 1961 | 8339 | 381.85 | 21.8 |
| | 1971 | 9949 | 420.98 | 23.6 |
| | 1981 | 12230 | 499.66 | 24.5 |
| | 1985 | 12926 | 566.01 | 22.8 |

Source: Computed from Table-5.1 and 5.2.

per acre in 1961 to 24.5 persons per acre in 1981 and after that the population density is decreased to 22.8 persons per

acre in 1985. Similar tendency is also observed in the villages of all categories with the exception that the density level in village of category-I is much lower than other categories. The reason for this was not explored and hence, cannot be easily explained. However, the trend of variation of population density in the settlement areas shows that there is an optimum density, beyond which, with the present pattern of development, the settlement areas can not afford to accommodate increased population without its physical expansion, and this density may be around 20 to 25 persons per acre of settlement areas. But, this is not a conclusive suggestion, rather further research should be conducted in order to recommend an optimum density for the settlement areas.

## 5.3 Trend of Change of Component Land Uses of Settlement Areas

The trend of change of total settlement areas in different categories of villages has been discussed in the previous articles. But the settlement areas in the villages consists of different component land uses viz. (i) Homestead area, (ii) Roads and embankments and (iii) community land uses. These component land uses of the settlement areas have different trend of change with respect to the growth of population in different periods i.e. 1961-70, 1971-80 and 1981-85.

Table-5.9 Variation of Component Land Uses of Settlement Areas

| Category of village | Year | Total population | Total area for settlement (in acre) | Area of homestead, roads and community uses in acre | | |
|---|---|---|---|---|---|---|
| | | | | Homestead | Road & embankments | Community land use |
| I | 1961 | 698 | 51.82 | 31.32 | 11.80 | 8.70 |
| | 1971 | 1016 | 53.24 | 32.94 | 21.94 | 6.00 |
| | 1981 | 1418 | 72.00 | 44.16 | 21.94 | 5.90 |
| | 1985 | 1615 | 87.77 | 56.03 | 26.70 | 5.04 |
| II | 1961 | 2757 | 133.10 | 65.53 | 40.51 | 27.06 |
| | 1971 | 3581 | 150.02 | 87.74 | 41.14 | 21.14 |
| | 1981 | 45.98 | 180.10 | 119.19 | 43.10 | 17.81 |
| | 1985 | 4834 | 211.05 | 134.24 | 66.05 | 10.76 |
| III | 1961 | 4884 | 196.93 | 134.91 | 37.32 | 24.70 |
| | 1971 | 5352 | 217.72 | 146.65 | 46.37 | 24.70 |
| | 1981 | 6214 | 247.56 | 182.20 | 53.13 | 12.23 |
| | 1985 | 6477 | 267.19 | 186.87 | 70.70 | 9.62 |
| Total for nine village | 1961 | 8339 | 381.85 | 231.76 | 89.63 | 60.46 |
| | 1971 | 9949 | 420.98 | 267.33 | 101.81 | 51.84 |
| | 1981 | 12230 | 499.66 | 345.55 | 118.17 | 35.94 |
| | 1985 | 12926 | 566.01 | 377.14 | 163.45 | 25.42 |

Source: Field survey 1986.

Table-5.10 Change in Population and Component Land Uses of Settlement Areas in Different Periods

| Category of village | Period (years) | Increase in population | Increase/decrease of land uses (in acre) | | |
|---|---|---|---|---|---|
| | | | Homestead | Roads & embankments | Community land uses |
| I | 1961-70 | 318 | +1.62 | + 2.50 | - 2.70 |
| | 1971-80 | 402 | +11.22 | + 7.64 | - 0.10 |
| | 1981-85 | 197 | +11.87 | + 4.76 | - 0.86 |
| II | 1961-70 | 824 | +22.21 | +0.63 | - 5.92 |
| | 1971-80 | 1017 | +31.45 | +1.96 | - 3.33 |
| | 1981-85 | 236 | +15.05 | +22.95 | - 7.05 |
| III | 1961-70 | 468 | +11.74 | +9.05 | - |
| | 1971-80 | 862 | +35.55 | +6.76 | -12.47 |
| | 1981-85 | 263 | +4.67 | +17.57 | - 2.61 |
| Total for nine village | 1961-70 | 1610 | +35.57 | +12.18 | - 8.62 |
| | 1971-80 | 2281 | +78.22 | +16.36 | -15.90 |
| | 1981-85 | 696 | +31.59 | +45.28 | -10.52 |

Source: Computed from Table 5.9.

Table - 5.11 Percentage Variation of Population and the Component Land Uses

| Category of village | Period (years) | Increase in population ( in % ) | Increase/decrease of component land uses ( in percent) | | |
|---|---|---|---|---|---|
| | | | Homestead | Roads & embankments | Community land use |
| I | 1961-70 | 45.5 | 5.2 | 21.2 | -31.0 |
| | 1971-80 | 39.6 | 34.1 | 53.4 | -1.7 |
| | 1981-85 | 13.9 | 26.9 | 21.7 | -14.6 |
| II | 1961-70 | 29.9 | 33.9 | 1.6 | -21.9 |
| | 1971-80 | 28.4 | 35.8 | 4.8 | -15.6 |
| | 1981-85 | 5.1 | 12.6 | 53.2 | -41.0 |
| III | 1961-70 | 9.6 | 8.7 | 24.2 | - |
| | 1971-80 | 16.1 | 24.2 | 14.6 | -50.5 |
| | 1981-85 | 4.2 | 2.6 | 33.1 | -21.3 |
| Total for nine village | 1961-70 | 19.3 | 9.3 | 13.6 | -14.3 |
| | 1971-80 | 22.9 | 18.6 | 16.1 | -30.7 |
| | 1981-85 | 5.7 | 6.3 | 38.3 | -29.3 |

Source: Computed from Table 5.9.

Table-5.9 shows the number of population and the consequent changes in the component land uses of the settlement areas in every consecutive decades starting from the year 1961. It is observed from the table that with the increase of population the homestead areas and the land for roads and embankments have increased, but the community land use has decreased. The amount of increases in population and the amount of changes in the component land uses in different periods have been shown in Table-5.10; and also the percentage growth of population along with the percentage variation (increase/decrease) of component land uses have been shown in Table-5.11. It is found from the Table-5.11 that in the nine study villages during the periods 1961-70, 1971-80 and 1981-85 the total population have increased by 19.3%, 22.9% and 5.7% respectively and the corresponding increases in the homestead areas were 9.3%, 18.6% and 6.3% respectively and the increases in land use for roads and embankments were 13.6%, 16.1% and 38.3% respectively; but during the same periods the community land uses have decreased by 14.3%, 30.7% and 29.3% respectively.

### 5.3.1 Proportion of component land uses in different years

The proportions of different component land uses of the settlement areas in different years have been shown in Table-5.12. The table shows that in the nine study villages the proportion of (i) homestead area, (ii) land for roads

and embankments and (iii) community land uses were 60.7%, 23.5% and 15.8% respectively in the year 1961; 63.5%, 24.2% and 12.3% in the year 1971; 69.2%, 23.7% and 7.2% in the year 1981; and 66.6%, 28.7% and 4.5% in the year 1985. The

Table-5.12 Percentages of Different Component Land Uses in Different Years

| Category of village | Year | Total population | Total settlement area ( in %) | Percentage of different components of settlement area | | |
|---|---|---|---|---|---|---|
| | | | | Homestead (%) | Roads & embankment (%) | Community land use (%) |
| I | 1961 | 698 | 100 | 60.4 | 22.8 | 16.8 |
| | 1971 | 1016 | 100 | 61.9 | 26.9 | 11.2 |
| | 1981 | 1418 | 100 | 61.3 | 30.5 | 8.2 |
| | 1985 | 1615 | 100 | 63.8 | 30.4 | 5.7 |
| II | 1961 | 2757 | 100 | 49.2 | 30.4 | 20.3 |
| | 1971 | 3581 | 100 | 58.5 | 27.4 | 14.1 |
| | 1981 | 4598 | 100 | 66.2 | 23.9 | 9.9 |
| | 1985 | 4834 | 100 | 63.6 | 31.3 | 5.1 |
| III | 1961 | 4884 | 100 | 68.5 | 19.0 | 12.5 |
| | 1971 | 5352 | 100 | 67.4 | 21.3 | 11.3 |
| | 1981 | 6214 | 100 | 73.6 | 21.5 | 4.9 |
| | 1985 | 6477 | 100 | 69.9 | 26.5 | 3.6 |
| Total for nine villages | 1961 | 8339 | 100 | 60.7 | 23.5 | 15.8 |
| | 1971 | 9949 | 100 | 63.5 | 24.2 | 12.3 |
| | 1981 | 12230 | 100 | 69.2 | 23.7 | 7.2 |
| | 1985 | 12926 | 100 | 66.6 | 28.7 | 4.5 |

Source: Computation from Table 5.9.

figures clearly shows that during the last 25 years (from 1961 to 1985) the proportion of homestead area slowly increased from 60.7% to 66.6% and the proportion of land for roads and embankments considerably increased from 23.5% to 28.7%, but the proportion of community land uses sharply decreased from 15.8% to 4.5%. Similar trend is observed in all categories of villages. This signifies that under the pressure of population growth the community land uses like play grounds, school fields and vacant open areas have been reduced to a very negligible proportion.

### 5.3.2 Homestead density and per capita homestead area

During the last 25 years (1961-85), the variation in population density in homestead areas and also the variation of per capita homestead land have been very small, and these variations are shown in Table-5.13. The average density of population in homestead areas of nine study villages ranges between 34.3 to 37.2 persons per acre and the per capita homestead land ranges between 2.7 decimal to 2.9 decimal. The population density and per capita homestead land in the village category-II & III are almost similar. But in village category-I, the homestead density ranges between 22.3 to 32.1 persons per acre which is considerably lower than that of other categories of villages and the per capita homestead land ranges between 3.1 decimal to 4.5 decimal which are considerably higher than that

of other categories of villages. This signifies that the average size of homestead per household in village category-I is larger than that of other categories of villages.

Table-5.13 Homestead Density and Per Capita Homestead Area

| Category of village | Year | Total population | Total homestead area (in acre) | Homestead density (popln./ acre) | Per capita homestead area (in decimal) |
|---|---|---|---|---|---|
| I | 1961 | 698 | 31.32 | 22.3 | 4.5 |
| | 1971 | 1016 | 32.94 | 30.8 | 3.2 |
| | 1981 | 1418 | 44.16 | 32.1 | 3.1 |
| | 1985 | 1615 | 56.03 | 28.8 | 3.5 |
| II | 1961 | 2757 | 65.53 | 52.1 | 2.4 |
| | 1971 | 3581 | 87.74 | 40.8 | 2.5 |
| | 1981 | 4598 | 119.19 | 38.6 | 2.6 |
| | 1985 | 4834 | 134.24 | 36.0 | 2.8 |
| III | 1961 | 4884 | 134.91 | 36.2 | 2.8 |
| | 1971 | 5352 | 146.65 | 36.5 | 2.7 |
| | 1981 | 6214 | 182.20 | 34.1 | 2.9 |
| | 1985 | 6477 | 186.87 | 34.7 | 2.9 |
| Total for nine village | 1961 | 8339 | 231.76 | 36.0 | 2.8 |
| | 1971 | 9949 | 267.33 | 37.2 | 2.7 |
| | 1981 | 12230 | 345.55 | 35.4 | 2.8 |
| | 1985 | 12926 | 377.14 | 34.3 | 2.9 |

Source: Computed from Table 5.9.

## 5.4 Pattern of Expansion of Homestead of Individual Household

With the increase of population the number of homestead for households also increased in three categories of villages. But the growth pattern of homestead was not similar in all categories of villages. Table-5.14 shows the number of increase in the total households and the pattern of expansion of homestead in order to accommodate the increased households. It was found in the survey that the increased new households were accommodated in three different ways e.g. (i) by living in the existing homestead, (ii) by the expansion of existing homestead, or (iii) by building new homestead isolated from existing one.

Table-5.14 shows that the increases in the total households of all the nine study villages were 9.6% during 1961-70, 9.9% during 1971-80 and 6.1% during 1981-85. Out of the increased households of 9.6% in 1961-70, about 6.4% lived in the existing homestead thereby increasing the population density in the homestead, about 2.2% made expansion in the existing homestead area and only 1.0% built new homestead isolated from the old vity. Out of the increased households of 9.9% in 1971-80 about 4.3% lived in existing homestead, about 2.3% made expansion in the existing homestead and about 3.2% built new homestead; and out of the new households of 6.1% in 1981-85, about 2.9% lived in existing homestead, about 1.3% made expansion in the existing homestead and 1.9% built new homestead. Almost similar trend is observed in all the three categories of villages, though the percentages are different.

Table-5.14 Pattern of Expansion of Homestead of Individual Household

| Category of village | Year of interval | No. of sample household | No. of household increased in % | Percent of increased household accommodated in homestead by | | |
|---|---|---|---|---|---|---|
| | | | | Living in Existing one | Expansion of existing homestead | Building new homestead isolated from existing one |
| I | 1961 | 26 | - | - | - | - |
| | 1971 | 28 | 7.7 | 3.9 | 3.8 | - |
| | 1981 | 35 | 25.0 | 10.8 | 7.1 | 7.1 |
| | 1985 | 40 | 14.3 | 5.7 | 2.9 | 5.7 |
| II | 1961 | 147 | - | - | - | - |
| | 1971 | 156 | 6.1 | 3.4 | 2.0 | 0.7 |
| | 1981 | 173 | 10.9 | 5.1 | 2.6 | 3.2 |
| | 1985 | 184 | 6.4 | 2.9 | 1.2 | 2.3 |
| III | 1961 | 139 | - | - | - | - |
| | 1971 | 158 | 13.7 | 10.1 | 2.2 | 1.4 |
| | 1981 | 168 | 6.3 | 2.5 | 1.3 | 2.5 |
| | 1985 | 175 | 4.2 | 2.4 | 1.2 | 0.6 |
| Total for nine village | 1961 | 312 | - | - | - | - |
| | 1971 | 342 | 9.6 | 6.4 | 2.2 | 1.0 |
| | 1981 | 376 | 9.9 | 4.3 | 2.3 | 3.2 |
| | 1985 | 399 | 6.1 | 2.9 | 1.3 | 1.9 |

Source: Field survey 1986.

From the previous discussion it is clear that, greater proportion of new households during 1961-70 lived in the existing homestead thereby raising the population density in the homestead areas. If this situation is allowed to continue further, an adverse situation in national economy may be arised. "Experience from other countries, especially the U.K., shows that crop grown in homesteads and garden, also make a valuable contribution to national food production. This was especially true in U.K. during the second world war, when gardens and allotments contributed at least 10% to national food production. Furthermore, studies have found that when residential building density is too high, there is not enough space to maintain a garden with fruit and vegetables, and beyond a certain density this homestead production ceases altogether"[1].

On the other hand, greater proportion of new households during 1971-85, built new homestead and made expansion of the existing homestead over fertile agricultural land. Therefore, a new problem is arising due to a decrease in the productive agricultural land with the increase in the dimension of homestead. This problem would be more acute if the present trend of building new homestead on agricultural land are allowed to proceed, because this will aggravate the situation of food deficit in the country and will further increase the misery of the people.

---

1. Gallagher, R.A, A collection of articles on rural and urban homestead: land use, food production and planning control. Dept. of Urban and Regional Planning, BUET, 1986.

## 5.5 Case Study of a Owner of Homestead

Md. Alauddin is a farmer living in Bholarpara village. He is about 46 years old, having two sons and three daughters. He got married in 1964. He was born in a joint family, consisting of five brothers and two sisters. Total area of their homestead was 0.30 acre and agricultural land was about 10.0 acre. His father was also a farmer. He is the second son of the family. His father died in 1978. Up to the year 1978, he was living in his paternal homestead but in separate shelter. All of his brothers were also living in the same homestead but in separate shelters. By this time they subdivided their plot of homestead and according to heritage every one owned only 6 decimal of land. During 1974 he purchased an agricultural plot near their homestead. In early 1981, he filled his agricultural plot by collecting earth from nearby marshy land and raised its surface. In the mid of the same year he completely shifted to the new homestead.

In replying to questions, why he built a new homestead in such isolated place, he argued that, the problems of space in the existing homestead was acute, specially during harvesting period. Because, a major portion of his old homestead was occupied by the shelters of the household members, livestocks, etc. Hence, during harvesting time, it was very difficult to process the crops in such small area. In that situation he thought that, in near future he would have to face more and

more difficulties, unless he expanded the area of his homestead. So he had taken a step to fill up his own agricultural land about 300 yards away from old homestead. Now the size of his new homestead is 14 decimal. His old homestead was sold to his younger brother who was comparatively more solvent than other three brothers.

This case study also reflect the situation that was described by S.A. Hasnat, "homesteads are scattered over the whole face of the courtyard. Each cultivator has selected a suitable spot for homestead of his own, dug a tank or made untidy, irregular excavations to obtain earth to raise site and build houses on it. The process goes on. When the family goes too big for the homestead, quarrels ensue one of the brothers will make a new homestead on a convenient part of the family land which has fallen into his share, a little isolated from the earlier homestead"[1].

Therefore "population growth has resulted in the absorption of land for settlement and wastage of land by fragmentation"[2], also promulgate the truth happening in zila Tangail.

---

1. Hasnat, S.A., Rural Housing in Bangladesh, A paper presented at the National seminar on Integrated Rural Development sponsored by the Institute of Engineers, Dhaka, December,1975.

2. Mohit, M.A. Op, Cit,Page-43.

# CHAPTER-VI

# SUMMARY AND CONCLUSIONS

## 6.1 Summary Findings

The main objective of this study has been to investigate the nature and trend of growth of rural settlement in relation to the different component land uses of the rural areas. It also examines the socio-economic factor associated with the change of rural settlement pattern and measures the decreasing rate of agricultural land and the growing demand for land for settlement purpose during the last twentifive years (1961-85).

In this regard, the study has been undertaken employing empirical method using the following techniques, e.g. map interpretation, reconnaissance survey, socio-economic survey, data collection from secondary sources, personal observations and quantitative analysis of relevant data.

The study has been conducted in nine villages within Tangail district. Study villages are classified into three groups according to their spatial distance from urban centres. Villages within one mile from major urban centre like district headquarter have been recognised as category-I village. Villages situated at a distance more than one mile from major urban centre but within one mile from upazila centres have been recognised as category-II villages; and the villages which are at least three miles away from the nearest

urban centre have been recognised as category-III villages.

About the geomorphic condition of the nine study villages it is found that flood plain predominate the study areas. About 62% area of village category-I, 74% area of village category-II and 76% area of village category-III fall under flood plain. The soils of the Jamuna flood plain appear to be among the best in the country, both chemically and physically. The soil characteristics of the study areas consist of grey flood plain soil, non-calcarious dark grey and non-calcarious alluvium soil. Regularly flooded areas (nama land) are found to be about 37% in village category-I, 51% in village category-II and 64% in village category-III. Infrequently flooded areas (chala land) are about 34%, 29% and 22% in villages of category-I, II and III respectively; and flood-free high land (vity land) occupy about 29% in village category-I, 20% in village category-II and 14% in village category-III. In the three categories of villages, single cropped areas are about 9 to 14 percent as against 39% in the district and 53.9% in Bangladesh; double cropped areas are about 66 to 69 percent as against 45.5% in the district and 39% in Bangladesh; and tripple cropped areas are about 17 to 24 percent as against 15.4% in the district and 7.1% in Bangladesh.

The total area of the nine study villages is 2921 acres. The area of village category-I is 207 acres, the area of

village category-II is 1038 acres and the area of village category-III is 1676 acres. According to the population census, the total population of the nine study villages were 8339 in the year 1961, 10512 in the year 1974 and 12230 in the year 1981. The populations of the village categories-I, II and III were 1418, 4598 and 6214 respectively in the year 1981. In the same year per square mile density of population in villages of category-I, II and III were 4384, 2834 and 2372 respectively. Average yearly growth rates of population in the villages category-I, II and III during the period 1961-74 were 3.84%, 2.65% and 0.92% respectively and during the interval of 1974-81, yearly growth rates were 3.16%, 2.48% and 1.76% respectively.

Family structure in the study villages are categorised as nuclear, semi-nuclear and joint family. In the three categories of villages, proportion of nuclear family is highest (32.5%) in village category-I, and lowest (28.0%) in village category-III. Semi-nuclear families are also more (40.0%) in village category-I and less (34.2%) in village category-III. But joint families are still more (37.8%) in village category-III and the proportion of such families in the village of category-I and-II are 27.5 and 30.5 percent respectively. Perhaps, it signifies that the traditional joint character of households are in decline in the villages of category-I and II, due to successive socio-economic hardship of living, which also changes value system of family structure.

The young age group of population (below 15 years of age) is found to be 30 percent of total in village category-I and about 40 percent of total in each of the categories of villages-II and-III. The working age group of population were, 65 percent, 52 percent and 53 percent in villages of category-I, II and-III respectively.

Agriculture is the main occupation of the population in the study area. In village category-I, about 11.52% of population are engaged in cultivation, as main occupation, where as 9.95% are engaged in other profession and 2.69% in business. About 11.00% and 14.94% of the population of villages category-II and-III respectively are engaged in cultivation as main occupation.

The literacy rates of the population of the villages of category-I, II and-III were 25.04, 17.53 and 17.53 percent respectively in 1981.

About 15.0% households in village category-I, about 16.8% households in village category-II and 13.1% households in village category-III had no land for cultivation. In the villages of categories-I, II and-III, small farmers (having land upto 2.5 acres) were 67.5%, 58.8% and 59.1% respectively; medium farmers (having land 2.5-7.5 acres) were 12.5%, 18.5% and 19.5% respectively; and big farmers (having land over 7.5 acres) were 5.0%, 5.9% and 8.3% respectively.

It is found that there exist a correlation between household income and the size of homestead in the study villages. With the increase of household income the average size of homesteads gradually increase upto a maximum average size of 30.6 decimal corresponding to the income range of Tk.40,000/- to Tk. 50,000/- per anum, and after that homestead sizes decrease with the increase of household income. This relationship shows that there is an optimum range of homestead size corresponding to the range of household income upto which the homestead owners have the tendency to expand their homestead areas and above which the homestead owners have the tendency to invest for luxury, comfort and status instead of expanding the homestead areas. This range of income, at which optimum size of homestead area occur, is found to be Tk. 40,000/- to Tk. 50,000/- in the study area.

The land uses in the study areas (nine villages) are broadly classified into three major categories. These are (a) settlement area, (b) agricultural land and (c) land for other purposes. It is found that the villages of categories-I,II and-III occupy 42.40%, 20.34% and 15.94% respectively for settlement purpose, 52.57%, 73.42% and 80.64% respectively for agricultural use, and 5.03%, 6.24% and 3.42% for other uses.

Again, the settlement areas have three component of land uses, viz. (i) homesteads, (ii) roads and embankments and

(iii) community land use. It is found in the villages of categories-I, II and III that, homesteads occupy 27.08%, 12.93% and 11.15%of village area respectively, roads and embankments occupy 12.89%,6.36% and 4.22% respectively and community land uses occupy 2.43%,1.05% and 0.57% of village area respectively.

Homestead areas play an important role in rural as well as in national economy. Rural homesteads are not only used for shelter but also are used for several economic functions such as, processing of agricultural product, drying of grains, poultry farming, cattle farming, cooking, cottage industries and for socio-cultural activities. In this study, homesteads are classified into three groups according to their sizes; these are identified as small, medium and large. Small homesteads are upto the size of 10 decimal. Medium homesteads occupy 11 to 25 decimal and large homesteads occupy 26 decimal or above. The average sizes of small, medium and large homesteads in the nine study villages are 5.46 decimal, 16.87 decimal and 38.61 decimal respectively. Distribution of three different sizes of homesteads such as large, medium and small, are nearly uniform and similar in three categories of villages. The proportions of small, medium and large homesteads are found to be 55.8, 33.0 and 12.2 percent respectively in village category-I, 60.3, 29.5 and 10.2 percent respectively in village category-II, and 58.3, 28.6 and 13.1 percent respectively in village category-III.

Again, the homestead areas have different component of land uses , such as, land for (i) houses and shelters (ii) courtyards and open areas (iii) vegetable garden area (iv) fruit garden, orchards and bushes (v) water bodies, pond and ditches. The average sizes of these component land uses vary according to the sizes of homestead areas.

The sizes and numbers of rural houses and shelters for individual households vary with the economic condition of household owner, size of household, size of homesteads etc. It is found that in different categories of homesteads i.e. in small medium and large size homesteads, houses and shelters occupy on an average 0.91 decimal, 1.45 decimal and 1.68 decimal respectively.

Almost all homesteads have courtyards. These are generally used for processing crops and for drying foodgrains,clothes etc. Average sizes of courtyards are 1.16, 4.23 and 12.08 decimals in small, medium and large size homesteads respectively.

Vegetable garden also occupy a significant part of homestead area. In the study villages vegetable garden occupy 0.48, 0.88 and 2.21 decimals in small, medium and large size homesteads respectively and about 31%, 60% and 55% of small, medium and large homesteads have vegetable gardens.

Fruit garden, orchard and bushes are very common in every homestead. The average sizes of such areas are found to be

0.25, 0.19 and 0.48 decimals in small, medium and large size homesteads respectively. About 72-76 percent of all types of homesteads have fruit trees and bushes.

Waterbodies, ponds, and ditches have multifarious uses in rural areas and they occupy a major portion of rural homesteads. It was found that they occupy 1.10, 6.40 and 11.55 decimals of the homestead areas in small, medium and large size homesteads respectively. All of the large size homesteads and about 90 percent of medium homesteads have such waterbodies. Only about 38 percent of small homesteads have ditches or ponds. Some waterbodies are used for fish cultivation. Some ditches are used for disposal of garbage, human feces and cowdung. Some waterbodies are used as seed-beds for paddy and for rottening of raw jute; Small waterbodies become completely dried up during dry season and are not suitable for pisciculture. Some waterbodies and ditches remain in derelict condition.

Rural homesteads and the agricultural land have important role in rural as well as in national economy. In the nine study villages it is found that average per acre yield from agricultural land is worth Tk. 10,000/- per year and average per acre yield from homestead land is worth Tk. 5400/- per year. The per acre yield from homestead land (Tk. 10,840/- yearly) and per acre yield from agricultural land (Tk.11,740/- yearly) owned by the small homestead owners are relatively

higher than that of larger size homestead owners (e.g. Tk. 5,800/- per acre of agricultural land per year and Tk. 2,300/- per acre of homestead land per year).

The quantum of different components of rural land uses are changing over the years due to population increase and other related factors. The expanding demand of the growing population greatly influence the trend of change of rural land uses. The study was intended to establish the co-relationship of rural land use trend with the increase of population during the last 25 years (1961-85) and the analysis has been made for 10 year intervals i.e. for 1961-70, 1971-80 and 1981-85 periods.

It is found that the population growth rates in the nine study villages were 1.78% per anum during the period 1961-70, 2.08% per anum during the period 1971-80 and 1.39% per anum during 1981-85. The population growth rates are different in the three categories of villages. The population growth rate is highest (3.3% to 3.83%) in village category-1, medium (1.26% to 2.65%) in village category-II and lowest (0.92% to 2.08%) in village category-III.

It is found that with the increase of population the total settlement areas have increased, but the agricultural land and the land for other purposes have decreased.

The total settlement area in the nine study villages was 13.1% in 1961, 14.4% in 1971, 17.1% in 1981 and 19.4% in 1985.

With the increase of every 100 population in the study villages, the settlement areas have increased 2.43 acres during 1961-70, 3.45 acres during 1971-80 and 9.53 acres during 1981-85. It is also found that with the increase of population during the last 25 years, per capita settlement areas have gradually decreased. In the nine study villages, per capita settlement area was 4.65 decimal in 1961, 4.40 decimal in 1971, 4.31 decimal in 1981 and 4.37 decimal in 1985. It is also observed that during the last 25 years the density of population in the settlement areas gradually increased with the increase of population. The average population density in the settlement areas of the nine study villages increased from 21.8 persons per acre in 1961 to 24.5 persons per acre in 1981 and after that the population density is decreased to 22.8 persons per acre in 1985. The trend of variation of population density shows that there is, with certain pattern of development, an optimum population density for settlement areas, and for the study areas this density may be around 20 to 25 persons per acre.

The total agricultural lands in the nine study villages have decreased gradually during the last 25 years. The proportion of total agricultural lands were 78.9% in 1961, 78.7% in 1971, 77.3% in 1981 and 76.1% in 1985. With the increase of every 100 population in the study villages, the agricultural lands have decreased 0.46 acres during 1961-70, 1.73 acres during

1971-80 and 5.10 acres during 1981-85. This shows that the loss of agricultural land is greater in recent years. During the last 25 years, per capita agricultural land decreased rapidly. In the nine study villages per capita agricultural land was 28.07 decimal in 1961, 23.98 decimal in 1971, 19.47 decimal in 1981 and 17.20 decimal in 1985.

The land for other purposes in the study villages have also decreased considerably during the last 25 years. The total land for other purposes was 8.0% in 1961 which was reduced to 4.5% in 1985. The land for other purposes, which include fallow land, natural waterbodies and derelict land, has reached to such a minimum proportion that the possibility of further reduction of such land thereby to increase the agricultural land seem to be very difficult.

Out of the three components of land uses in the settlement areas, it was found that land for homestead areas, and roads and embankments have increased while the land for community uses have decreased with the increase of population during last 25 years. The total homestead areas in the nine study villages were 231.76 acres in 1961, 267.33 acres in 1971, 345.55 acres in 1981 and 377.14 acres in 1985. Similarly, the total land for roads and embankments have increased from 89.63 acres in 1961 to 163.45 acres in 1985, but the community land uses have decreased from 60.46 acres in 1961 to 25.42 acres

in 1985. Within the total settlement area the proportion of homestead area was 60.7% in 1961, which has increased to 66.6% in 1985; similarly the proportion of land for roads and embankments was 23.5% in 1961 which has increased to 28.7% in 1985; but the proportion of community land uses have very sharply reduced from 15.8 acres in 1961 to 4.5 acres in 1985. This signifies that under the pressure of population growth the community land uses like play grounds, school fields and vacant open areas have been reduced to a very negligible proportion.

During the last 25 years (1961-85), the variation in population density in homestead areas and also the variation in per capita homestead land have been very small. The average density of population in homestead areas of nine study villages ranges between 34.3 to 37.2 persons per acre and the per capita homestead land ranges between 2.7 decimal to 2.9 decimal within the period from 1961 to 1985.

## 6.2 Recommendation

Bangladesh is an agricultural country. But the country is deficient in food production. So the loss of agricultural land due to the expansion of homestead areas is a serious threat to the economy of the country. But the expansion of settlement areas cannot be stopped easily because, it is deeply related with population growth rate and population

growth rate is related with different socio-economic factors and national level policy.

In the context of this situation some policy measures are suggested to compensate the loss of agricultural land due to settlement expansion so that the food deficiency of the country may be minimised. The policy measures are as follows:

- o Natural growth rate of population should be reduced with the help of effective family planning measures. Because, without the control of population other measures to minimise the loss of agricultural land will not be very fruitful.
- o Excavated ditches, pond and waterbodies should be utilized fully for fish cultivation with the help of local co-operative organisation.
- o If possible, scatterdly excavated ditches and small waterbodies should be brought under proper utilisation. Some of those may be filled in with earth to convert into agricultural land and the others may be excavated bigger and deeper so that they facilitate fish cultivation and other uses throughout the year.
- o The homestead areas should be properly planted with fruit trees and orchard, and cultivated for the production of vegetables in sufficient quantities, so that these can compensate for the loss of agricultural crop production.

- o Large scale investment over construction of rural road and other infrastructural facilities should be minimised and made more effective through proper planning of those. Plantation of fruit trees and cultivation of high quality grasses along side-slopes of every earth road may be practiced through the rural co-operatives.

- o Indiscriminate excavation of agricultural land for collecting earth to repair rural roads should be stopped, rather earth should be collected from deep ditches along the roads or from agricultural land in such a way that the depth of cutting is not so deep to cause any harmful effect on agricultural production.

## 6.3 Conclusions

The study has investigated the trend of change of rural land uses and also calculated the rate of change of those component land uses due to population increase during the last 25 years. Regarding the present pattern of development, the study has also calculated the amounts of different components of homesteads and settlement areas, and has made some generalised recommendations to compensate for the loss of agricultural land due to settlement expansion. But the researcher do not dare to pretend that the study is a comprehensive and conclusive one. The spatial arrangement and physical setting of

different component land uses in homesteads and settlement areas have got very important bearing on the efficiency of land utilisation. But the spatial arrangement and physical setting of component land uses have not been examined in this study. So, further research should be conducted regarding those aspects. Moreover, the study, has indicated that there is an optimum limit for per capita land in homesteads and settlement areas and also there is an optimum range of population densities in homesteads and settlement areas. But those are not specifically suggested in this study. So, further researches should be conducted to be able to make specific recommendations as to the optimum limit of per capita land and the optimum range of population densities in homesteads and settlement areas, so that the efficiency of rural land utilization is enhanced.

However, it should not be forgotten that present trend of rural landuse for settlement, if allowed to continue in the same manner, then a major portion of our rural areas would be required in future only to build homesteads, ponds, and other settlement related purposes.

Therefore, serious thought should be given to the utilization pattern of our rural land to build homesteads, roads, and for public utilities. A long term policy should be adopted

and be followed strictly by rural authority regarding the use our scare resource (land) for settlement purposes.

Finally, it would not be exaggerated to say that neither planners nor the scholars of other discipline have touched this side systematically. Though this is not a comprehensive study, I would like to present it with feeble hope and belief that it may grow interest among the planners and policy makers. It may also help to take steps in rural settlement development planning by various organisation and governmental bodies.

APPENDIX-I

## The Questionnaire

Thesis Title: The Natural And the Trend of Growth of Rural Settlement Pattern: Case Study of Selected Villages in Tangail District .

Name of Upazila: . . . . . .

Name of Union: . . . . . .

Name of Mouza: . . . . . .

Village Name: . . . . . .

J.L. No. . . . . Name of Para . . . . . .

Designation of Homestead . . . . . .

Name of Respondent . . . . . Date . . . . .

Name of Head of the Family . . . . . .

Occupation of the Head of family . . . . . .

Occupation of the respondent . . . . . .

Relationship between respondent and Head of the family

. . . . . .

### (A) - (Household Questionnaire)

1.0 Type of family and their religion: (Use ✓ mark)

(a) Joint family ☐

(b) Semi nuclear ☐

(c) Nuclear ☐

(a) Muslim ☐

(b) Hindu ☐

(c) Christain ☐

(d) Others ☐

2.0 Member of the family with age, sex, education and employment

| Sl. No. | Relationship with head of family | Age | Sex | Marital status | Qualification | Occupation | |
|---|---|---|---|---|---|---|---|
| | | | | | | Main | Subsidiary |
| 1. | | | | | | | |
| 2. | | | | | | | |
| 3. | | | | | | | |
| 4. | | | | | | | |
| 5. | | | | | | | |
| 6. | | | | | | | |

3.0 Source of income:

| Sl. No. | Relationship with the head of family | Type of occupation | Annual production of following crops in Maund. | Income other than cultivation | Yearly expnediture | |
|---|---|---|---|---|---|---|
| | | | | | Crop (Maund) | Cash Tk. |
| 1. | | | a. Rice<br>b. Jute<br>c. Robi | | a. Rice<br>b. Jute<br>3. Robi | |
| 2. | | | a. Rice<br>b. Jute<br>c. Robi | | a. Rice<br>b. Jute<br>c. Robi | |
| 3. | | | a. Rice<br>b. Jute<br>c. Robi | | a. Rice<br>b. Jute<br>c. Robi | |

4.0 Number of family members

| Sl. No. | Family members and their relationship with head of family | Number of them in different years | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1960 | 1965 | 1970 | 1975 | 1980 | 1985 |
| 1. | Head of Household | | | | | | |
| 2. | Wife | | | | | | |
| 3. | Son | | | | | | |
| 4. | Daughter | | | | | | |
| 5. | Mother | | | | | | |
| 6. | Father | | | | | | |
| 7. | Brother | | | | | | |
| 8. | Sister | | | | | | |
| 9. | Others | | | | | | |

5.0 When you build your homestead ? Please mention the year of establishment of homestead in this village. [ ]

6.0 Did you come from other areas ? [ Yes ] [ No ]

If yes; please mention the name of location of area

(Use ✓ mark)

a. From outside the village [ ]

b. From outside the Upazila [ ]

c. From other district [ ]

7.0 Information regarding inmigrant and out migrant from the family:

| Sl. No. | Relationship of household owner with inmigrated persons. | Relationship of household owner with out migrated persons | Number of them in different years | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1960 | 1965 | 1970 | 1975 | 1980 | 1985 |
| 1. | | | | | | | | |
| 2. | | | | | | | | |
| 3. | | | | | | | | |
| 4. | | | | | | | | |
| 5. | | | | | | | | |

8.0 Informations regarding household education

| Sl. No. | Family members | Education status (level of education) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1960 | 1965 | 1970 | 1975 | 1980 | 1985 |
| 1. | Head of the household | | | | | | |
| 2. | His wife | | | | | | |
| 3. | " | | | | | | |
| 4. | " | | | | | | |
| 5. | | | | | | | |
| 6. | Sons | | | | | | |
| | i) | | | | | | |
| | ii) | | | | | | |
| | iii) | | | | | | |
| 7. | Dauther | | | | | | |
| | i) | | | | | | |
| | ii) | | | | | | |
| 8. | Others | | | | | | |
| | i) | | | | | | |
| | ii) | | | | | | |

9.0 Type of land utilization of owned land only

| Type of land use | Area in different years (in acre) | | | | | |
|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1985 |
| Non-Agricultural Land | | | | | | |
| Homestead | | | | | | |
| Pond | | | | | | |
| Ditches | | | | | | |
| Fruit & tree garden | | | | | | |
| Vegetable garden | | | | | | |
| Total fallow | | | | | | |
| Palan (farmyard) | | | | | | |
| Others | | | | | | |
| Agricultural Area | | | | | | |
| Single crop | | | | | | |
| Double crop | | | | | | |
| Triple crop | | | | | | |
| - Paddy cultivation | | | | | | |
| - Jute cultivation | | | | | | |
| - Wheat cultivation | | | | | | |
| - Oil seed cultivation | | | | | | |
| - Sugarcane cultivation | | | | | | |
| - Potato cultivation | | | | | | |
| - Others cultivation. | | | | | | |

10.0 Information about land for cultivation and settlement

| Type of land | Only owned property in different years | | | | | |
|---|---|---|---|---|---|---|
| | 1960 | 1965 | 1970 | 1975 | 1980 | 1985 |
| Agricultural land | | | | | | |
| Settlement area | | | | | | |
| Fallow land | | | | | | |

11.0 Information regarding ownership of land

| Type of land | Year | Inheri-tage | Purch-ase by own (dec.) | Sell (dec.) | Take rent | Given rent | Dona-ted (dec.) | Total (dec.) |
|---|---|---|---|---|---|---|---|---|
| Agricultural | 1960 | | | | | | | |
| | 1965 | | | | | | | |
| | 1970 | | | | | | | |
| | 1975 | | | | | | | |
| | 1980 | | | | | | | |
| | 1985 | | | | | | | |
| Homestead | 1960 | | | | | | | |
| | 1965 | | | | | | | |
| | 1970 | | | | | | | |
| | 1975 | | | | | | | |
| | 1980 | | | | | | | |
| | 1985 | | | | | | | |
| Fellow area | 1960 | | | | | | | |
| | 1965 | | | | | | | |
| | 1970 | | | | | | | |
| | 1975 | | | | | | | |
| | 1980 | | | | | | | |
| | 1985 | | | | | | | |
| | | | | | | | | |

12. Type of land use in homestead area

| Type of land | | Area in sq. hand | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1960 | 1965 | 1970 | 1975 | 1980 | 1985 |
| 1. | Shelter to live in | | | | | | |
| 2. | Crop store | | | | | | |
| 3. | Cattle shelter | | | | | | |
| 4. | Food store for cattle shelter | | | | | | |
| 5. | Crop processing place | | | | | | |
| 6. | Fuel store | | | | | | |
| 7. | Courtyard (interior) | | | | | | |
| 8. | Exterior courtyard | | | | | | |
| 9. | Guest house | | | | | | |
| 10. | Shelter for labour | | | | | | |
| 11. | Kitchen | | | | | | |
| 12. | Latrine (if any) | | | | | | |
| 13. | Bathing place | | | | | | |
| 14. | Well and D. water | | | | | | |
| 15. | Paultry shelter | | | | | | |
| 16. | Vegetable garden | | | | | | |
| 17. | Ditch | | | | | | |
| 18. | Pond | | | | | | |
| 19. | Bamboo Jangle | | | | | | |
| 20. | Tree garden | | | | | | |
| 21. | Others. | | | | | | |

13. Earth cutting and filling to build/expand the homestead:

a) Amount of land required to build up the platform of the homestead (in cft) . . . . . .

b) Where from that earth was collected ? . . . . . .

c) When earth was collected (in year) ? . . . . . .

d) How much land were filled to make platform ? . . . . . .

e) At which purpose the land was used before make platform ? . . . . . .

f) Area of the land was use to excavation (in decimal) . . . . . .

g) At what purpose this land was used before cutting earth ? . . . . . .

h) For which purpose this land is using and how long after the excavation . . . . . .

i) What was the yearly income from the land over which platform has builded (before filled by earth) in Tk. ? . . . . . .

j) What was the yearly income from the land before excavation (in Tk.) ? . . . . . .

k) For which purpose, the land is using now after excavation and yearly income from it ? . . . . . .

## (B) - (Community Questionnaire)

14.0 Questionnaire on land use for community purpose

| Sl. No. | Type of land use | Amount of land in (feet x feet) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1960 | 1965 | 1970 | 1975 | 1980 | 1985 |
| 1. | Main earth road | | | | | | |
| 2. | Branch road | | | | | | |
| 3. | Hallot | | | | | | |
| 4. | Channel | | | | | | |
| 5. | Irrigation drain | | | | | | |
| 6. | Flood control embankment | | | | | | |
| 7. | Only drain | | | | | | |
| 8. | Road side ditches | | | | | | |
| 9. | Primary school | | | | | | |
| 10. | High School | | | | | | |
| 11. | Bazar | | | | | | |
| 12. | Mardrsha | | | | | | |
| 13. | Mosque | | | | | | |
| 14. | Weekly hat | | | | | | |
| 15. | Weekly bazar | | | | | | |
| 15a. | Play ground | | | | | | |
| 16. | Graveyard | | | | | | |
| 17. | Mazar | | | | | | |
| 18. | Beel | | | | | | |
| 19. | Pond | | | | | | |
| 20. | Co-oper tive office | | | | | | |
| 21. | Shopes | | | | | | |
| 22. | Fallow land | | | | | | |
| 23. | Flood affected area | | | | | | |
| 24. | Irrigated area | | | | | | |
| 25. | Area for Jute cultivation. | | | | | | |
| | | | | | | | |

Appendix-II

## BIBLIOGRAPHY

### Published Materials

Ahmad, Nafis, An Economic Geography of East Pakistan; London Oxford University Press 1968.

Bandapadhya, Rakhal Das. Banglar Itihas. Calcutta: Nabobharati Publishers, 1971.

Chisholm, M.D. Rural Settlement and Landuse. London: Hutchinsons University Library, 1961.

Chorley, R.J. and Hogget, P. Socio-Economic Models in Geography. London: Methune, 1967.

Choudhury, Sirajul Islam. Arthanitik Bhugal. Dhaka: Puthigar Ltd., 1979.

Demangeon, A. "The Origins and Causes of Rural Settlement Types". Readings in Cultural Geography. Edited by P.L. Wagner and M.W. Mikesell. Chicago: University of Chicago Press,1962.

English, P.W. and Mayfield, R.C. Man Space and Environment. London: Oxford University Press, 1972.

Everson, J.A., and Fitz Gerald. Settlement Patterns, London: Longman, 1969.

Islam, M. Aminul. Man-land Relationship in Bangladesh. Dhaka: Dhaka University, 1978.

Keeble, Lews, Principles and Practice of Town and Country Planning, Published in 1969.

Majumder, R.C. The History of Bengal. Dhaka; Dhaka University, 1948.

Mandal, R.B. Introduction to Rural Settlement. New Delhi: Concept Publishing Company, 1979.

Hunter, W.W. Statistical Account of Bengal: Dhaka, Faridpur and Mymensingh Districts. Vol. V, Trubner & Co., London, 1877.

Roy, Niharranjan. Bangaleer Itihas. Calcutta Book Emporium,1956.

Roy, Ajoy, Bangala O Bangalee, Dhaka: Bangla Academy, 1376.

Roy, Samaren. The Roots of Bangali Culture. Calcutta: Firma KLM Private Ltd., 1981.

Sudamore, C.N.J. Settlement of Problems. Oxford Pergamon Press, 1977.

Spate, O.H.K. Learmonth, A.T.A. and Farmer, B.H. Inida, Pakistan and Cylone: The Regions 3rd. eds. London: Methune and Co. Ltd. 1967.

Spate, O.H.K. and Learmonth, A.T.A. India and Pakistan: Land People and Economy. London: Methune and Co. Ltd. 1972.

Stamp, L. Dudley. Asia: A regional and Economy Geography. London: Methune, 1962.

Trewartha, G.T. "Types of Rural Settlements in Colonial America" Readings in Cultural Geography. Edited by P.L. Wagner and M.W. Mikesell. Chicago; University of Chicago Press,1962.

Unpublished Materials

Ahmad, Nafis, "The Pattern of Rural Settlement in East Pakistan" Geographical Review, Vol. XLVI, No. 3 (July 1956) p.p. 388-398.

Ali, Syed Murtaza. "The Origins of Place Name in Bangal" Oriental Geographers, Vol. 8, No. 2 (July, 1964) P.P. 117-129.

Bowman I. "The Scientific Study of Rural Settlements". Geographical Review, Vol. XVI No. 1 (Jan. 1926) P.P. 647-653.

Bandapadhya, Amia Kumar and Das, Sudhirranjan, eds. Nodia Zilar Purakirti, Calcutta: Department Archaeology, Govt. of West Bengal.

Bushman, K.H. "Settlements and Habitations in India". Geographical Review of India, Vol. XVI, No. 3 (Sept. 1956) P.P. 19-39.

Byron, Neil: People's Forestry; A Noval Perspective of Forestry in Bangladesh. ADAB News, Vol. XI, No. 2, March-April 1984.

Choudhuri, Sirajul Islam "Rural House Type of Bangladesh". Paper Read in the Third National Geographical Conference, Organised by Bangladesh National Geographical Association Dhaka, 19-21 Dec. 1981.

Dickinson, R.E. "Rural Settlements in the German Lands" Annals of the Association of American Geographers, Vol. XXXIX, No. 4 (December, 1949) P.P. 239.

Etherton, David. & Lewis, Christopher. A: A Report on Squatter Resettlement at Mirpur, Dhaka, January 1978.

Haq, Lutful. Reorganisation of Rural Settlement in Bangladesh. Dhaka: Asiatic Society of Bangladesh, 1977.

Hudson, J.C. "A Location Theory for Rural Settlement". Annals of the Association of American Geographers, Vol. 59, No. 2 June, 1969. P.P. 365-81.

Hafiz, K.G. Rural Habitat of Mouza Pathalia, Unpublished MRUP Thesis Bangladesh University of Engineering and Technology, Dhaka, 1977.

Islam, M. Aminul. Man-Land Relationship in Bangladesh. Dhaka: Dhaka University, 1978.

James, John. R. Some Aspects of Town and Country Planning in Bangladesh. Dhaka, 1973.

Gallaghr, R.A. A Collection of Articles on Rural and Urban Homestead; Land Use, Food Production and Planning Control. Department of Urban and Regional Planning,BUET,Dhaka,1986.

Khan, Shafiul Bashar. The Form Nature and Spacing of Rural Settlements, (A Case Study of the District of Kushtia), Unpublished Master of Urban and Regional Planning Thesis, BUET,Dhaka.

Khaleque, Kibriaul: The Importance and Prospects of Homestead Forests in Bangladesh. (ADAB News) March-April,1986.

Mundal, Hakim; Jaipurhat: A Study of the Growth of a Potential Mining Town, Unpublished Thesis of Master of Urban and Regional Planning, BUET,Dhaka.

Mohit, M.A. Spatial and Socio-Economic Aspects in the Land Use Planning of Sherpur Thana, Unpublished Thesis of Master of Urban and Regional Planning, BUET, Dhaka,1979.

Mukerjee, Radhakamal. The Changing Face of Bengal: A Study of Riverine Economy. Culcutta: Calcutta University 1938.

Rahman, G. Village Planning in East Pakistan, Unpublished Master of City and Regional Planning Thesis, University of Oklahoma, USA, 1965.

Rasheed, K.B. Sajjadur. Size and Spacing of Rural Settlements in Bangladesh. Dhaka: Department of Geography, Dhaka University 1978.

Tarafdar, M.R. Hossain Shahi Bengal: A Socio-Political Study. Dhaka: Asiatic Society of Pakistan 1965.

Yonekura, Jiro. "Comparative Study of East Asian and Indian Villages". Geographical Review of India. Vol. XXIII, No. 3 (September, 1961) P.P. 6-15.

Govt. Report, Journal & Publications

A reconnaissance study of changes in settlement and related land use in Bangladesh 1952-74, Conducted by FAO/UNDP policy Project, on behalf of the Government of Bangladesh Dhaka,1981.

A Study of village land made derelict by non-agricultural activities. Conducted by FAO/UNDP Agricultural Development Adviser Project, on behalf of the Government of Bangladesh, Dhaka, 1982.

Bengali Language Report: Published by Dhaka Improvement Trust (D.I.T) Dhaka, 1981.

Govt. of Bangladesh, Ministry of Planning. District Census Report Tangail 1974, Bangladesh Bureau of Statistics, 1979.

Govt. of Bangladesh, Ministry of Public Works and Urban Development. National Reports on Human Settlements Bangladesh, Dhaka, P.W.D and U.D.D. 1976.

Govt. of Bangladesh, Ministry of Planning, Report on the Agricultural Census of Bangladesh. National Volume, Bangladesh Bureau of Statistics, 1977.

Govt. of Bangladesh. The Bangladesh Census of Agriculture and Livestock: 1983: 1983-84, Vol.1 Structure of Agricultural Holdings & Livestock Population, BBS (May 1986).

Govt. of Bangladesh, Statistical Division, Ministry of Finance and Planning, Statistical Year Book of Bangladesh 1984-85, Dhaka, BBS, 1986.

Govt. of Bangladesh, Ministry of Planning. The Second Five Year Plan, 1980-85, Dhaka.

Govt. of Bangladesh, Ministry of Planning, The Third Five Year Plan. 1985-90, Dhaka.

Govt. of Bangladesh, Small Area Atlas of Tangail District, BBS, 1986.

Govt. of Bangladesh, Analytical Findings and National Tables BBS, 1981.

Habitat: Paper Presented at United National Conference of Human Settlement, Regional Conference, Theran, June; 14-19; 1975.

Rural Housing in Bangladesh, "A field survey and study of the Existing Conditions by Housing and Environmental Research Cell, BUET, and Housing and Building Research Institute, Government of Bangladesh, Dhaka, 1976.

---