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A STUDY OF  
NEW VILLAGE DEVELOPMENT IN BANGLADESH

by

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F. Gene Ernst  
Major Professor

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Dedicated to my parents

Late Mohammad Sadiq and Mrs. Khairunnessa Sadiq

**A STUDY OF  
NEW VILLAGE DEVELOPMENT  
IN BANGLADESH**

## PREFACE

At the time I started my higher studies at Kansas State University, I undertook an in-depth research study into the existing conditions of rural Bangladesh - its problems and needs. The final product was a report on background information and analysis titled 'Rural Bangladesh'. The findings of this study clearly reflected the picture of future rural Bangladesh conditions which indicated the problems that could result if no redevelopment were considered.

I decided to undertake the current study in light of the findings of the above-mentioned study. In this thesis, I attempted to conceive and develop plans and designs for the development of rural Bangladesh. It is hoped that the findings of this study will contribute to the limited research studies presently available on rural development in Bangladesh.

I acknowledge the valuable help and contributions I have received from the following persons during the stages of completing this thesis:

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## INTRODUCTION

The term 'rural development' applies to physical, technical, agricultural, economic and social programs that increase the well-being of villagers. One important aspect of rural development that has not been given enough consideration in the past is the need for modifications in the traditional village settlement pattern so that the benefits of development may serve the daily living needs of people. Historically, the patterns of human settlements played an important role in shaping the daily lives of people.

According to Dr. E. F. Schumacher of the Intermediate Technology Development Group of London, 'development' should mean first and foremost development for people; but development bypasses the great majority of people, particularly in

the third world countries.<sup>1</sup>

Because all human activities are interdependent, communities and their people's various physical, social and psychological needs should be the focus of development policies. Partial solutions should be avoided as much as possible. The major aim of this study, therefore, was to take into consideration all the interrelated factors of village life.

Prior to this study, a research study on the existing rural settlements in Bangladesh was undertaken and a background information and analysis report titled 'Rural Bangladesh' was prepared in May, 1976. The findings of this study were used as the primary

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<sup>1</sup>George McRobie, "Technology for Development", Paper presented at the Royal Society of Arts and Commerce, London, January, 1974.

source in undertaking this design proposal for a model village case study. The findings of the report suggest the need for new approaches to village planning, namely the need for renewal and rehabilitation of rural settlements. This design study deals with such development of villages in Bangladesh.

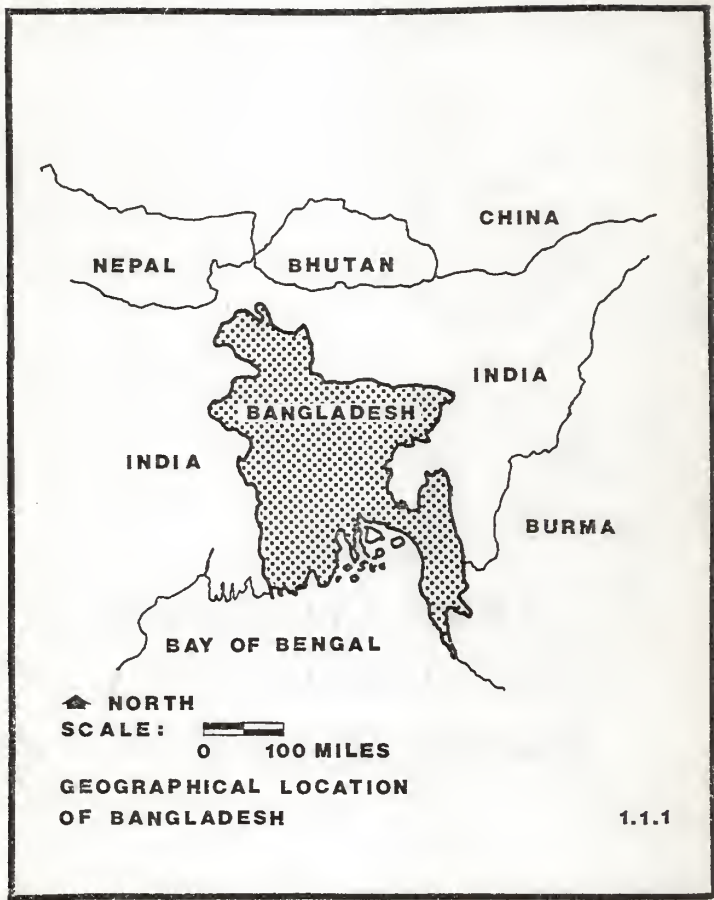
PART I

**A STUDY OF  
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## NATIONAL BACKGROUND AND THE SITE

Bangladesh, located in South Asia, is one of the newest third world nations. Figure 1.1.1 illustrates the location of Bangladesh in relation to the sub-continent of South Asia, which is surrounded by India on the west, Nepal, India and Bhutan on the north, Burma on the east and the Bay of Bengal on the south. Bangladesh became an independent nation in 1971 inheriting a composite of social, political and economic problems. Like most third world countries, it is rural, agrarian and over-populated.

The low-lying deltaic terrain of Bangladesh, approximately 55,000 square mile in total, is occupied by a population density of nearly 1,500 persons per square mile. According to the latest census, 90% of the total population lives in rural



▲ NORTH

SCALE: 

0 100 MILES

GEOGRAPHICAL LOCATION  
OF BANGLADESH

1.1.1

areas, 75% of the labor force is in the agricultural sector and 95% of the export earnings of the nation originate in rural areas.<sup>2</sup>

In Bangladesh, the present population growth rate of 3.3% annually has produced great pressures on the land. The growing population intensifies the demand for agricultural production from the land and also accelerates the need for more compact village clusters. Land is scarce and is the most important resource for Bangladesh. Because it is a nation with limited land resources, housing and food for an increasing population, a critical need exists on the part of the government of Bangladesh to establish priority policies for development.

The basis of selection of the site for planning a

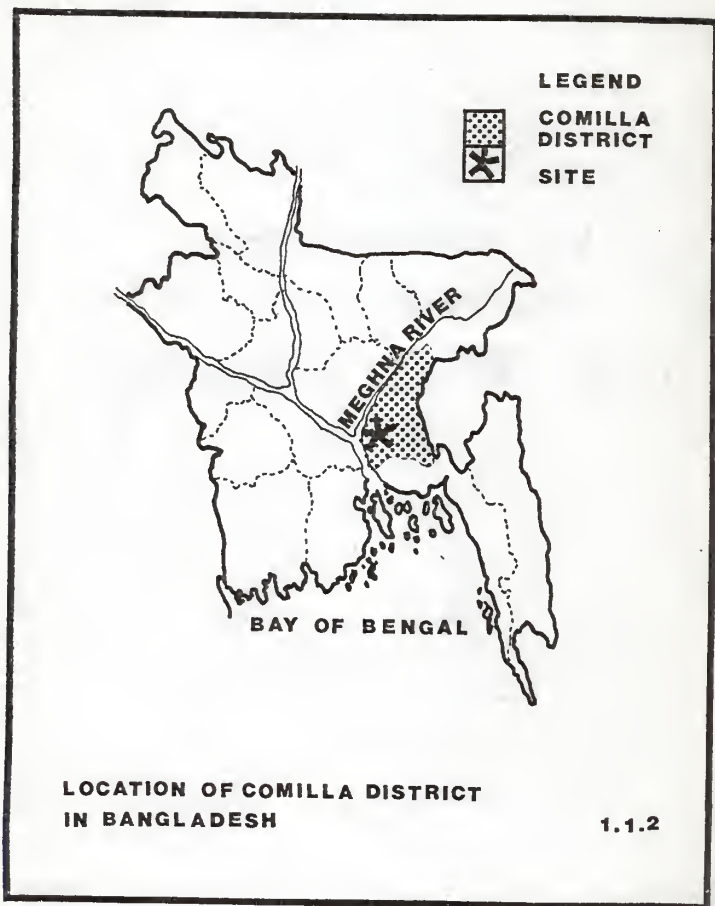
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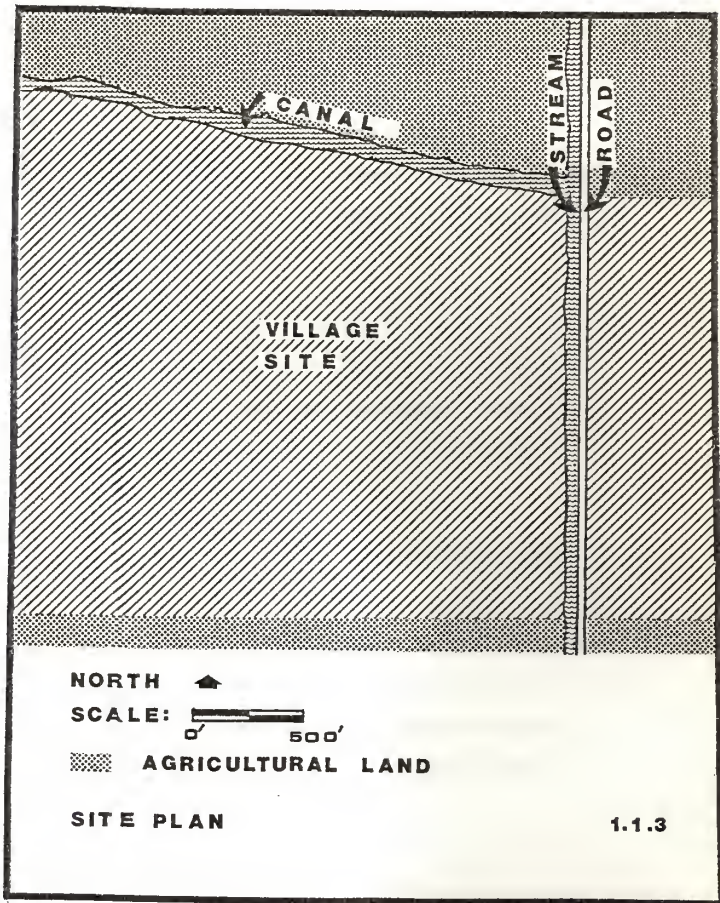
<sup>2</sup> John Woodard, "Public Policy in Reconstruction of Rural Bangladesh", Bangladesh Perspectives, (1972): p. 318



new model village in Bangladesh was conceptual. Hypothetically based, the site was chosen to consist of the typical characteristics of rural Bangladesh. Bangladesh is small and there is little variation in physiographic, climatic or other natural factors between the areas within it. This hypothetical site could easily be considered as typical of rural areas in Bangladesh because of this situation.

The site would be on vacant flat land in Comilla, the district where the Academy for Rural Development is located. Figure 1.1.2 and 1.1.3 illustrates the location of the district of Comilla in Bangladesh and the site map respectively. The site would be typically surrounded by agricultural land adjoined by a small stream which would flow south-ward into the Meghna River, the most important river in Bangladesh. Natural floods and site inundation





during the monsoon would result from this stream. An east-ward local road would connect the site with the nearest Thana.<sup>3</sup>

The features of the site are considered to reflect the typical characteristics of rural Bangladesh, as discussed in the previous report titled 'Rural Bangladesh'. Such characteristics are briefly summarized here.

Physiography: The deltaic region of Bangladesh is a fertile alluvial plain formed by rich silt deposited by the many rivers flowing through the area. The large and small rivers and canals form an extensive network over the delta, which is subject to frequent overflowing. The flat plain rises not

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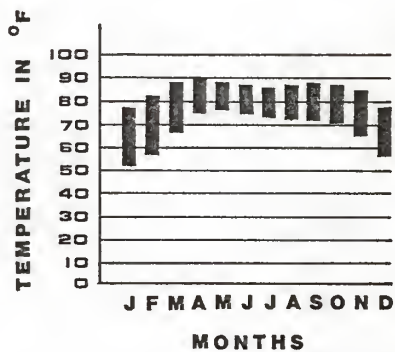
<sup>3</sup> Thana: A local police station. Each district is comprised of several local jurisdictions, represented by such Thanas.

not more than 30' above the sea level.

The river system of the region, dominated by five major rivers with hundreds of tributaries and distributaries branching out, is the most significant physiographic feature, which contributes to the large-scale flooding of the area.

Climate: The climatic features of the region are heavy rainfall, hot summer and high humidity. The relatively small annual temperature variation ranges from a mean minimum temperature of 55F degrees to a mean maximum temperature of 80F degrees. A seasonal chart of average minimum and maximum temperatures by month of the district of Comilla is given in Figure 1.1.4.

During monsoons seasons, standing water resulting from heavy rainfall contributes to an unpleasantly



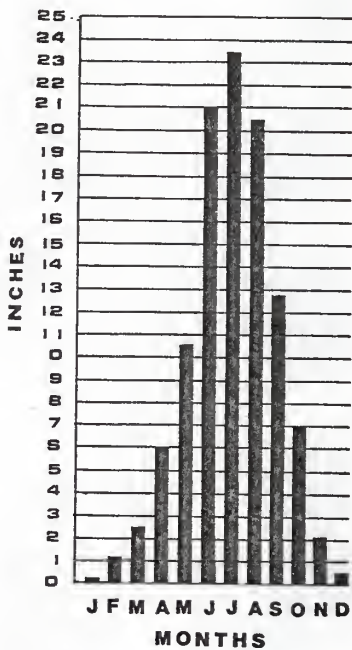
**ANNUAL TEMPERATURE  
FOR COMILLA**

**1.1.4**

humid atmosphere. The mean annual rainfall ranges from 80" to 100" as shown in Figure 1.1.5. Wind is moderate with the exceptions of occasional cyclones during September-October. More frequent natural hazards result from the 'nor-wester' during March-April. Figure 1.1.6 reflect the wind features.

Economy: The village economy is overwhelmingly dependent on agriculture. Under the prevailing land tenure system, the farmers, if they own land, owe 40% of their crops to money lenders. If they are tenants, they must give 50% of their crops to their land lords. The vast majority of the farming population in Bangladesh earn barely enough for their food and clothing only.

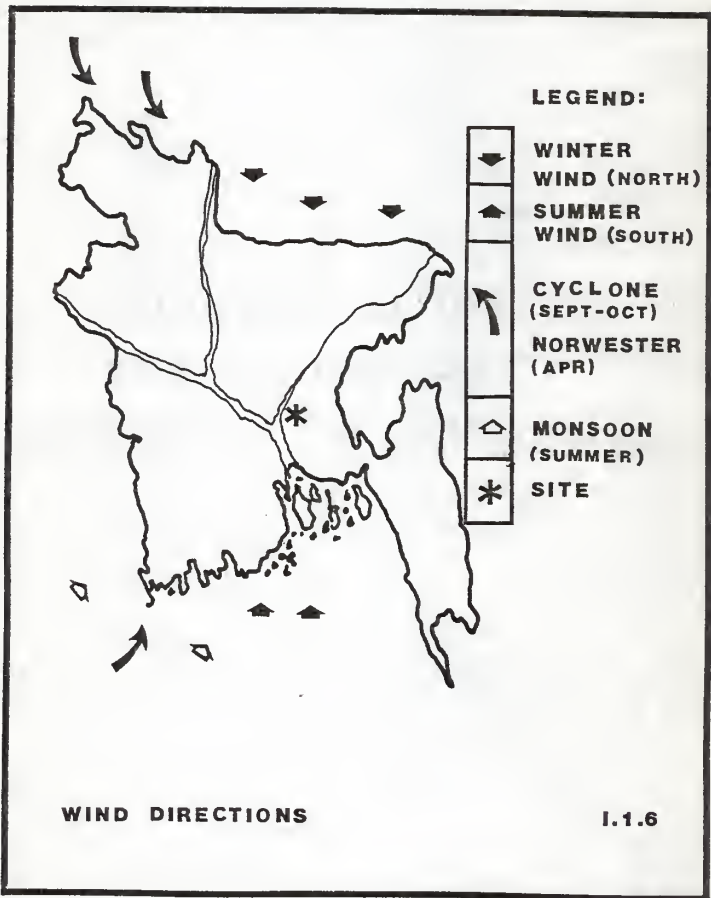
Transportation: The physiography of Bangladesh, in general, is unsuitable for roads and railroads, so that transportation is relatively difficult and



**ANNUAL RAINFALL  
FOR COMILLA**

**1.1.5**

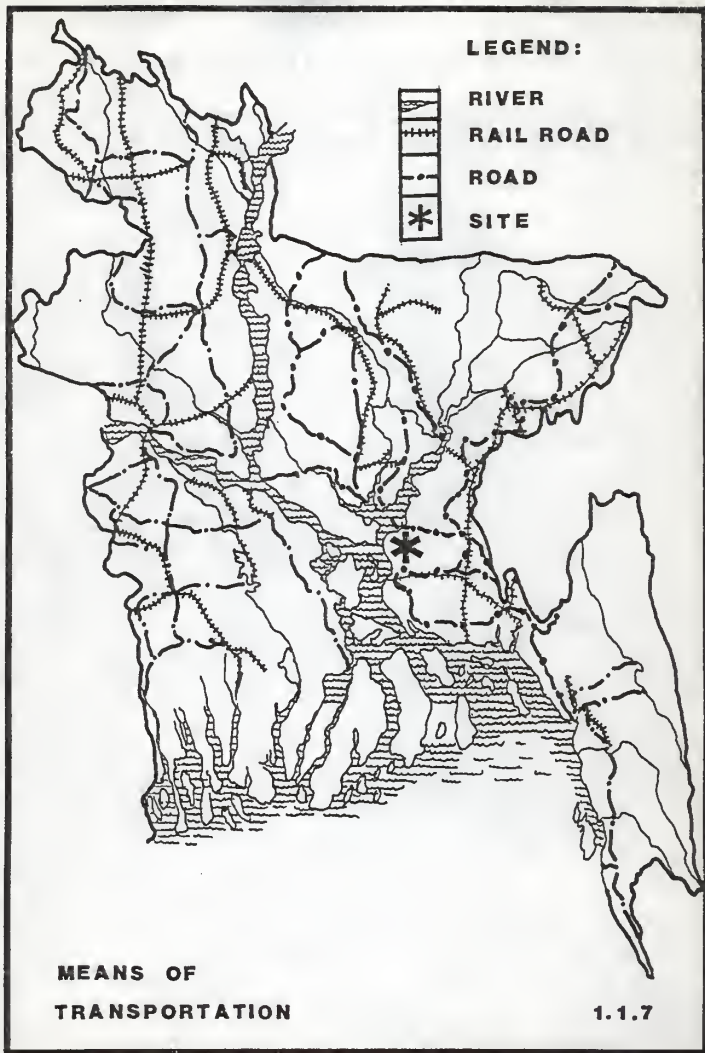




time-consuming in the rural areas. Roughly 75% of the villages are at least 5 miles away from a paved road, rail or steamer station; people walk the distance between the villages and station points for other modes of transportation.

Construction and maintenance of roads and railroads are expensive because of climatic features. Commercial transportation is commonly carried on waterways by motor-launches, barges and steamers. During the monsoon, mobility of the people is largely restricted by the impermeable nature of the soil. Figure 1.1.7 illustrates the existing transportation links of the district of Comilla with the rest of the country.

Dwelling Pattern: The houses are predominantly made of thin, mud-plastered, wooven bamboo walls, mud walls or brushed bamboo walls, with palm thatched roofs. The more stable houses have walls and roofs



of corrugated lime cement or iron sheets. Such materials are further discussed and compared in Section 2.2.

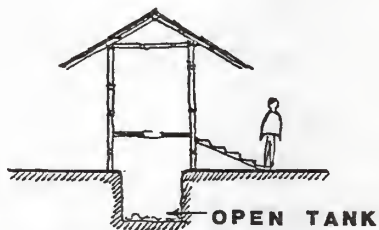
The basic landscape element in the homesteads scattered over the agricultural plain land are the raised grounds of the settlements which serve as protection against the floods. The dwelling units are fenced around by bushes and fruit plantations which provide both privacy and natural shade areas.

In general, the villages consist of 50 to 100 dwelling groups having their agricultural land around the settlement on a flat plain relatively lower than the settlement. Dwelling groups are formed by dwelling units located around a common courtyard, which is organized in two distinct parts. The main part, called the 'inner house', consists of the dwelling units organized around the courtyard which serves as the common family use area.

The second part, called the 'outer house', is used for social activities and is usually placed at the entrance of the courtyard. Section 2.2 compares the general organization of existing dwelling pattern with other alternatives.

Utilities: The majority of rural areas do not have electricity at the present; however, steps are under way to introduce electricity to these areas in the near future. For domestic fuel, people burn hay stock, wood chips, etc. For lighting, they use oil burners for both interior and exterior areas.

The drinking water-supply is from tube-wells and open-wells, while river and pond water are largely used for washing and bathing. Toilet systems consist of privies, latrines, etc. which are temporary constructions, as illustrated in Figure 1.1.8.



**TOILET-TEMPORARY TYPE  
(INEXPENSIVE-UNHYGIENIC)**



**TOILET-PERMANENT TYPE  
(EXPENSIVE-HYGIENIC)**

**TYPES OF TOILET SYSTEMS**

**1.1.8**

## REVIEW OF THE PROBLEM

Rural settlement patterns are influenced by the environment and by the manner in which the people earn their livelihood. In Bangladesh, people have settled in a scattered pattern, for about three centuries, in those areas which offered at least the minimum conditions essential to a permanent way of life. People built homes near their farming lands so that land ownership could be confirmed and at the same time work could be supervised conveniently.

In the scattered form of settlement there was a fair distribution of land ownership and available resources among the inhabitants. In small, scattered settlements, a group of 10-20 families would band together to live, supporting themselves from agriculture, hunting, fishing, etc.

Dispersed settlement patterns continued in the region while the cities were largely unlinked with their still undeveloped hinterlands. Governmental administration of the land was minimal. Private enterprise on private estates was a common practice. The private administration of land, known as the Zamindari system, was abolished in 1950 through the Permanent Settlement Act. But even then, the rural social and political structure was segmented. The dominant fact of village life seemed to be continued dispersal and diffusion.<sup>4</sup>

By the middle of the 20th century, it was realized by all concerned that rural development needed to be integrated with overall development of the

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<sup>4</sup>Robert D. Stevens et al., Rural Development in Bangladesh and Pakistan, (Honolulu: University Press of Hawaii, 1976), p. 30.



country. Disparity in resource distribution between cities and villages needed to be ended through the growth and development of rural settlements as well as increase in agricultural productivity. Centers for marketing, co-operative services, cottage industries, etc. needed to be strengthened, and for this reason, dispersed settlements needed to be brought together.

While the government needed control of land use and of land value to provide basic security of land tenure, the citizens needed the benefits of municipal and other services which would be easy to provide in an integrated village. An alternative system of settlements was needed to lessen pressure on villagers to migrate to cities.

The existing trend of scattered settlement patterns could be reversed by developing new villages of

the clustered type. Central village services are lacking in the traditional villages, particularly due to physical isolation. Much of the social as well as economic life of the village-dwellers is concentrated in and around nearby rural markets, which serve as the central meeting places; yet the services in the markets are inaccessible to major portions of the population, including women, elderly and handicapped. Separate schools and social facilities for women cannot be supported by small villages; yet women are not allowed to attend male schools because of social restrictions.

One major problem faced in the rural areas is large-scale flooding. The rivers and their distributaries, fed by heavy rainfall, are continually eroding their banks. On the average, annual floods are experienced by over half of the cultivated area of the country.

Solutions to flood problems are enormous tasks, and difficult to solve at village levels. Solutions of both temporary nature, such as, regular trenching of river beds, and of permanent nature, such as, construction of protective dams, etc. are part of continuous efforts at national level.

The primary concern in the preparation of a design proposal for a model village may be summarized by a recommendation from the United Nations;

".... the use and tenure of land should be subject to public control because of its limited supply .... as an essential basis for integrated rural development that will facilitate the transfer of economic resources to the agricultural sectors so as to improve the integration and organization of human settlements ...."<sup>5</sup>

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<sup>5</sup>Apostolos Doxiadis, Ekistics, (Athens Technological Organization: 1976), Vol. 42, No. 252, p. 265.

In other words, the local communities should manage and regulate the use of land in such a way that the growth of the rural areas are based on plans that will fulfill the local needs.

Finally, the problems of typical villages in Bangladesh indicate that plans for their future development should consider the need for the following;

- Upgrading the living conditions of the village-dwellers.
- Improving the physical conditions of the village environment.
- Preserving the cultural and social values and providing social facilities.
- Organizing land uses in an efficient manner to accomodate future growth.
- Providing physical amenities and services for

daily living.

- Protecting the village and its people from natural disasters and calamities.

## PURPOSE AND PROCEDURE

The purpose of this study was to develop a planning and design proposal for a model village in Bangladesh that would provide research information sought by the Academy for Rural Development of Bangladesh and that could be used by the Academy in their continued attempts to find solutions for the rural problems of Bangladesh. The Academy, located in Comilla, Bangladesh, is sponsored by the government to deal with the problems of rural development, and is primarily a research, education and development center.

The major rural development work programs undertaken by the Academy are; A) The Agricultural Cooperatives Federation, B) The Thana Training Development Center, C) The Thana Irrigation Program, D) The Rural Public Works Program, E) The Womens' Opportunities Program,

F) The Population Control and Education Program.<sup>5</sup>

The Academy was considered to be the client for this study; therefore the design proposal was developed incorporating within it the objectives set by the Academy.

Subsequent to the initial study on existing conditions of villages in Bangladesh, which culminated in the report 'Rural Bangladesh', this study was undertaken, in light of the problems reviewed in Section 1.2. This study was undertaken in two stages;

- 1) A background study of the problem including fact finding research of the needs and requirements of rural settlements, and
- 2) A design proposal development for a model village community based on the findings of the above study.

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<sup>5</sup> Ibid., p. 95.

During the process of the study and development of the proposal, the important issues taken into consideration are summarized here;

- Identification of functions and space allocations.
- Consideration of present and future land use and modes of transportation.
- Organization of the village site in relation to land use.
- Consideration of available building materials and their applications.
- Design of a Community Center Complex.
- Consideration of utility services.
- Design of prototype housing facilities.
- Choosing appropriate technology.
- Sequencing of the development phases.

The planning and design process involved a system of sequences through which the problem could be



analyzed on the basis of formulated goals and objectives, focused to suggest a solution in the form of design proposal which would synthesize the available information and organize it to meet specific problems.

## OBJECTIVES AND REQUIREMENTS

After a review of the policy statements of the Academy for Rural Development, the following set of goals were considered to be appropriate for the purpose of this study:

- 1) Physical: Create a village environment making optimum use of the rural land for both living and agricultural purposes; at the same time make functional provisions for human activities for the village-dwellers, such as, marketing, transportation, utilities, etc.
- 2) Cultural: Preserve cultural heritage and at the same time strengthen social bindings by increasing communication between people of different ages and occupational groups and emphasizing the sense of social responsibilities.
- 3) Economic: Develop a commercial and educational

base that will not only promote employment and economic opportunities, but also be within the financial means of the village - so that it can be implemented.

In order to fulfill the set of goals as stated, the following general objectives were established for their application during the process of development of the design proposal:

- A process should be considered that will help people build their own village environment.
- Land use planning should be determined with concern of land conservation principles.
- Adequate facilities should be provided to achieve the benefits of social, cultural and economic needs.
- People should be allowed to function with the least physiological and climatic obstructions.

- Development cost should be kept within the capacity of the community and dependence on governmental funds should be minimum.
- A Community Center Complex should be developed that will serve as central base for cultural as well as commercial activities.
- Handi-craft, light industry and employment activities should be promoted to strengthen the economic base of the community.
- Required spaces for housing accomodation and daily living needs should be provided.
- Means of transportation facility should be offered considering economy as well as accessibility to major activities.
- Village-dwellers should be served with hygienic facilities for water and waste treatment services.
- Provisions for shelters against natural disasters should be provided.

- Dwelling units should be flexible enough to suit the varied requirements of the users with opportunity for changes and modifications.
- The design for the model village should be of prototype and be applicable to typical sites.
- Availability of building materials and technology should be an important consideration.

A review of relevant literatures, as discussed in Appendix A, revealed that villages of less than 5000 people would be a desirable size because of the suitability in providing necessary services to such population size. Thus, the population size of 3500 to 4000 was chosen for the model village case study and subsequently their needs and demands were reviewed in order to establish a set of requirements, as listed here:

1. Aesthetic

- A. Contrast in height, volume, shape, etc. of the village structures should be avoided.
- B. Choice in color and type of material should conform to the natural environment.

2. Buildings

- A. A total of 456 dwelling units.
- B. Two schools (one primary and one secondary) for a total of 500 students.
- C. A Community Center Complex for health and social welfare services.
- D. Central trading, warehousing and shopping facilities.

3. Circulation

- A. The system of circulation should be basically pedestrian oriented.
- B. Vehicular traffic other than rickshaws and bi-cycles should be restricted to major roads.

C. Locally available land and water transportation means should be utilized.

4. Economy

A. Materials cost should be within the economic capacity of the people.

B. Benefits of village development should serve the daily living needs of people with low income.

5. Environment

A. Noise and air-pollution impacts resulting from village activities should be minimized.

6. Land Use

A. The area required under the various land use categories are listed below:

- residential (42.0 acres)
- community facilities (1.5 acres)
- shopping-marketing (4.5 acres)
- open spaces (6.0 acera)
- play grounds (5.0 acres)

- industrial (10.0 acres)

- schools (2.5 acres)

Total area = 71.5 acres (Density: 55 persons/acre)

7. Materials

A. Flexibility should be considered in the choice of materials for buildings.

B. Maximum use of locally available materials should be attempted.

C. Use of materials imported from other countries should be avoided.

8. Natural Elements

A. Cut and fill of natural site should be minimized.

B. Natural vegetation, water bodies, etc. should be utilized, not disrupted.

9. Space Use

A. The space requirements to be considered for the Community Center Complex are as follows:



- library (2,500 sft)
- multi-purpose hall (1,000 sft)
- club rooms (650 sft)
- health clinic (500 sft)
- offices (200 sft)
- rooms for rent for special event purposes (350 sft)
- food stalls (1,000 sft)
- mosque (1,200 sft)

B. The following space requirements should be considered for the dwelling units:

- living-sleeping (600 sft)
- cooking-dining-working (200 sft)
- washing-toilet (50 sft)
- storage-other (150 sft)

Total space = 1,000 sft (125 sft/person)

## 10. Social

A. Aspects of traditional living patterns of the rural communities should be considered in

the design.

B. Organization of dwelling unit spaces should respect the behaviour of the users.

#### 11. Technology

A. Construction should utilize local labor skills.

B. Development schemes should be flexible so that the construction could be completed in different phases.

C. While locally available technology should be applied, modest improvements of technology may be attempted.

#### 12. Utilities

A. Improvement of existing types and systems of utilities should be attempted.

B. Provision for future modification of utility system should be considered.

## ASSUMPTIONS AND LIMITATIONS

In order to work with a hypothetical problem of this type, it was necessary to make certain assumptions. Such assumptions are listed below:

- A. It was assumed that the method of development work, as discussed in Appendix B, which was devised by Dr. A. H. Khan, former director of the Academy for Rural Development, could be effectively utilized in building the proposed village.
- B. The residence of the model village would be the villagers who had previously responded to the Academy's pilot project and would be members of a cooperative society.
- C. The physical development of the model village could be implemented in phases with the support of the Academy and cooperative efforts of the

people.

- D. The community would be provided the facilities needed for a healthy life, using the available human resources and funds earned from the co-operative profits.
- E. The magnitude of the control of flood water problem for the agricultural land is too vast to be solved at the jurisdiction level of a rural village, and is usually handled at the national level. However, safeguard of structures of the model village from flood water would be considered.
- F. Other assumptions related to economy, agriculture and social needs would conform to national goals and efforts.

The preparation of the design proposal for a model village had the limitations which affected the design

development for it. The limitations may be summarized as follows:

- A. Funding: Availability of governmental funds or donations could not be anticipated at this stage; therefore the cost of the project will come from cooperative investments.
- B. Space/Land Availability: Horizontal expansion of the village would be limited because of the scarcity of the crop land; raising of the land would necessitated because of its initial low elevation.
- C. Building Materials: Scarce materials such as concrete or steel could not be used.
- D. Design Standards: A review of available reports and documents on housing in Bangladesh reveal that survey and research work in this area has been very inadequate. No standards of space requirements currently exist in Bangladesh, and

attempts to establish such standards are limited in private practice only. Because of this situation, the use of space requirements was influenced by the author's familiarity with the existing living patterns, as well as the availability of limited fund resources.

- E. Utilities: Extensive research is still under way by various agencies and institutions in Bangladesh; useful solutions to the utility system are still a long way to come. Only a temporary solution to the present utility system would be considered.

PART II

**A STUDY OF  
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IN BANGLADESH** \_\_\_\_\_

## CONCEPT OF DESIGN DEVELOPMENT

The master plan design of the proposed model village was conceived with the basic idea of achieving a largely self-sufficient community with maximum community services within the community itself. With this basic idea in mind, the overall design of the model village was developed on the concepts of, primarily, the following three aspects;

A. Physical: The existing pattern of scattered settlements is a waste of the limited land. On the other hand, the rural population is deprived of healthy living environment because of lack of planning initiatives for the development of villages. The design of the village was conceived to achieve land and resource conservation through clustered housing. Availability of both land and resources in Bangladesh is scarce and thus conservation has become a necessity.



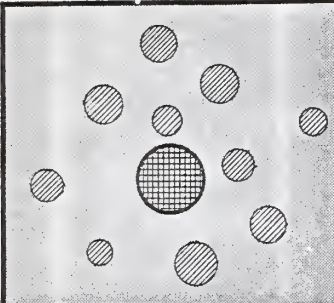
So, attempt was made in the proposed plan to achieve a nucleated settlement pattern. In addition to the land wastage problem of the existing settlement pattern, its disadvantages include difficulty in providing community services, social isolation due to travel distances, and costly utility provisions.

The benefits of clustering settlements are many. An integration of the site would result in clustering of the settlement pattern. The benefits of more intensive land use would be gained by decreasing the horizontal expansion of the settlement and also consolidating the social and commercial centers of the community.

Presently, a market place, usually located close to major transportation and governmental services, constitutes a trading center for the people of about a dozen villages encompassed within three to five

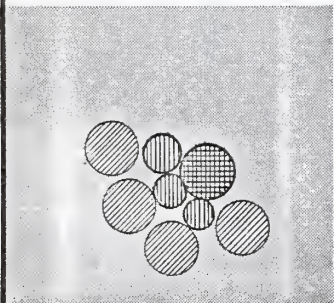
square miles of area. Considering the vital role of a market place in rural life, its location was utilized in creating a community focus point by consolidating the social activities around it. Thus, people's interest in responding to social responsibilities would result. Figure 2.2.1 illustrates a comparison of alternative settlement patterns.

B. Cultural: The present living pattern in rural areas is one of simplicity and freedom. Since a change in the settlement pattern itself may be difficult to accept for the dwellers, the design was conceived in an attempt to introduce minimum disruption in the traditional living patterns. The design was developed to be flexible enough to incorporate their old living patterns within the proposed new settlement patterns. Flexibility would be offered in the internal organization of spaces in the dwelling



SCATTERED SETTLEMENT PATTERN

WASTAGE OF LAND HIGH;  
COMMUNITY FEELING LACKING;  
TRAVELLING DISTANCES LONGER;  
UTILITY SERVICE PROVISIONS  
DIFFICULT.



NUCLEATED SETTLEMENT PATTERN

CONSERVATION OF LAND HIGH;  
COMMUNITY FEELING STRENGTHENED  
TRAVELLING DISTANCES SHORTER;  
UTILITY SERVICE PROVISIONS  
CONVENIENT.

## LEGEND:

-  AGRICULTURAL FIELD
-  DWELLING CLUSTER
-  MARKET
-  COMMUNITY SERVICE

## A COMPARISON OF SETTLEMENT PATTERN

A STUDY OF  
NEW VILLAGE DEVELOPMENT  
IN BANGLADESH

2.2.1

units. In the design development, concern of human needs and attitudes were considered important. Some needs are for the separation of dwelling unit from the rest of the village, the ability of females to perform their daily works in privacy, the seclusion of internal circulation, that is, provision to move around between rooms without any interference from the general circulation areas for the males.

The major part in the dwelling units need to provide space for multi-purpose uses, such as, living, study, sleeping, etc. The interior should be flexible enough to vary the spaces in accordance with the varying uses. Curtain or bamboo screens may serve very well in making the provision for space division. Because of the nature of work performed in and around the kitchen area, adequate separation of each from the sleeping area would be an important consideration.

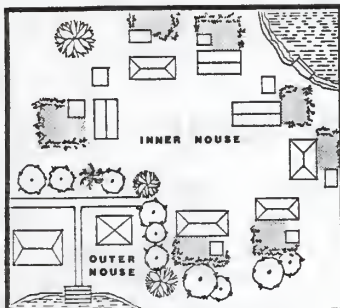
Essential provisions in the dwelling units are:

- a. A social-working area
- b. A living-sleeping area
- c. A cooking-storage area

Figure 2.2.2 illustrates a comparison of alternative dwelling patterns.

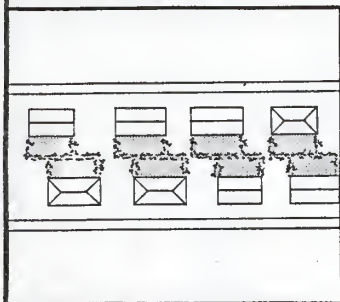
C. Economy: The design of the village was conceived to achieve minimum resource requirement through provisions for cheap construction and low maintenance needs. Types of transportation systems and building materials were important in the consideration of economy. Alternative modes of available transportation facilities include pedestrian, animal-drawn carts, rickshaws, boats, buses and trucks.

Of all the alternatives, the pedestrian mode was considered to be most suitable for intra-village travelling, while boats and rickshaws could be used



**TRADITIONAL DWELLING PATTERN**

ADAPTATION EASIER;  
 PRIVACY ADEQUATE;  
 SOCIAL CONTACT MORE;  
 SHARING OF WORK-SPACE  
 POSSIBLE.



**NON-TRADITIONAL DWELLING PATTERN**

ADAPTATION DIFFICULT;  
 PRIVACY LACKING;  
 SOCIAL ISOLATION MORE;  
 SHARING OF WORK-SPACE  
 DIFFICULT.

**A COMPARISON OF DWELLING PATTERNS**

**A STUDY OF  
 NEW VILLAGE DEVELOPMENT  
 IN BANGLADESH**

**2.2.2**

for inter-village. This reasoning was influenced by the following facts;

- a. Minimum space requirement
- b. Minimum construction cost
- c. Minimum pollution of environment
- d. Minimum disruption due to weather.

Thus, the proposed village design was conceived to have an easy and non-conflicting circulation system, achieved by organizing pedestrian precincts for internal circulation, the identity of the village growth being delineated by such precincts.

Entrances to dwelling units may be provided by narrow walkways without much distinct visual separation. Streets and walkways could be maintained by laying bricks and wood chips. Figure 2.2.3 illustrates a comparison of alternative transportation modes.

Alternative building materials considered were;



PEDESTRIAN



BOAT

INITIAL COST NONE;  
ROAD CONSTRUCTION MINIMUM;  
OPERATING RESOURCE NONE;  
ENVIRONMENTAL IMPACT NONE;  
INTRA-VILLAGE TRAVELLING  
SUITABLE ONLY.



RICKSHAW



ANIMAL DRAWN CART

INITIAL COST MINIMUM;  
ROAD CONSTRUCTION REQUIRED;  
OPERATING RESOURCE NONE;  
ENVIRONMENTAL IMPACT MINIMUM;  
INTER-VILLAGE TRAVELLING  
SUITABLE ONLY.



AUTOMOBILE

INITIAL COST PROHIBITIVE;  
ROAD CONSTRUCTION EXTENSIVE;  
OPERATING RESOURCE HIGH;  
ENVIRONMENTAL IMPACT POSSIBLE;  
INTER-DISTRICT TRAVELLING  
(PUBLIC TRANSPORTATION)  
SUITABLE ONLY.

#### A COMPARISON OF TRANSPORTATION MODES

### A STUDY OF NEW VILLAGE DEVELOPMENT IN BANGLADESH

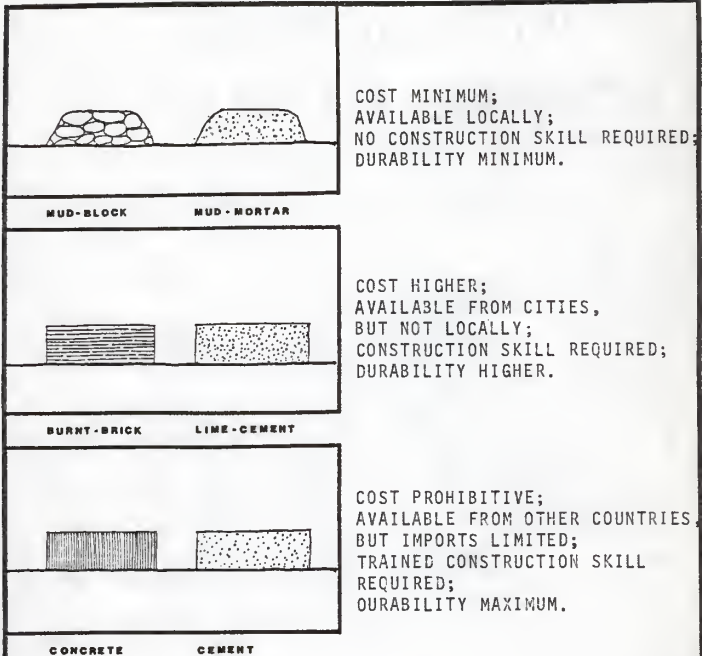
2.2.3



bamboo and hay, lime cement and iron sheets, mud blocks and burnt bricks, etc. Concrete and steel were not considered; they would be unavailable, or, because of their foreign production, too costly. While all of the above-mentioned materials would be available locally, use of bamboo wall, hay roof and mud foundation would involve little or no construction skill and may be used locally at a cheaper cost. However, such structures would not be protective from weather. On the other hand, use of brick foundation, iron sheet wall and corrugated cement roof may require hiring of skilled masons and labor resulting in additional costs, but would be more stable and weather protective. In this case, although the initial cost is higher, the long term cost may be lower because of less frequent replacement needs as compared to the other type of materials. However it was felt that

since bamboo, hay and mud are the types of materials presently used, a combination of them with brick, lime cement and iron sheet types of materials may be more desirable. Thus, it was conceived that flexibility would be offered in the choice of materials depending on the financial capability of the families.

Figure 2.2.4 and 2.2.5 illustrate a comparison of the various types of materials.



**A COMPARISON OF FOUNDATION/PLINTH/PLASTER MATERIALS**

**A STUDY OF  
 NEW VILLAGE DEVELOPMENT  
 IN BANGLADESH**

**2.2.4**



BAMBOO



HAY

COST MINIMUM;  
AVAILABLE LOCALLY;  
NO CONSTRUCTION SKILL REQUIRED  
DURABILITY MINIMUM.



IRON SHEET



CEMENT SHEET

COST HIGHER;  
AVAILABLE FROM CITIES,  
BUT NOT LOCALLY;  
CONSTRUCTION SKILL REQUIRED;  
DURABILITY HIGHER.



CONCRETE



WOOD

COST PROHIBITIVE;  
AVAILABLE FROM OTHER COUNTRIES  
BUT IMPORTS LIMITED;  
TRAINED CONSTRUCTION SKILL  
REQUIRED;  
DURABILITY MAXIMUM.

#### A COMPARISON OF DOOR/WALL/ROOF MATERIALS

A STUDY OF  
NEW VILLAGE DEVELOPMENT  
IN BANGLADESH

2.2.5

## FEATURES OF THE DESIGN

The characteristic features of the proposed design developed for the model village are described here, while elaborate discussion of such features are included in the next section. Figures 2.3.1 through 2.3.16 illustrate the proposed design, which consist of the following features;

1. The village plan would achieve an aesthetic quality in scale by the balanced use of open space for parks, ponds and walkways, and by the different levels and heights of the Community Center Complex and the market area.
2. The primary school building and the playground would be located near the residential area facing the park. The high school would be located beside the Community Center Complex so that it may use the library and recreation facilities

of this center.

3. The market place would be on a raised area supported by brick columns or timber posts. It would have a few permanent shops and warehouses. Open market on market days would enjoy direct access to and from the road which is on the same level as the market place. The open grounds near the market would be usable for the cattle market which would be on the same level as the canal and the surrounding fields.
4. Next to the market would be the Community Center Complex with common public facilities and amenities. Two distinct facilities - one educational and one recreational would encompass the mosque in the center.
5. The educational-public facilities arranged in the form of clusters of a library, clinic and post-office would be located on the south of

the complex to give direct access from the high school.

6. The recreational activities would be performed around a courtyard on the north of the complex. The multi-purpose hall together with its outside space, would serve the community's gathering need. It would meet daily needs as a gymnasium for physical education, a setting for cultural, marriage festivities and religious celebrations. It would also be used as a place for public showing of movies and theatrical performances.
7. The mosque would be located on the west side aligned to form an axis facing the market place. The space in front would be used for religious and political gatherings.
8. The dwelling units would be located with orientation towards north/south or diagonal towards north-east/south-west for natural ventilation

- of the units. Two dwelling units would share a common work and wash area to minimize land usage.
9. Economic activity in the village would be increased by accomodating cottage and light industries in the market place area.
  10. An environment for residential living quality would be retained. Noise or air-pollution problem would be avoided by restricting heavy industries and vehicular traffic.
  11. Outlet facilities into the canal would prevent the pond water from getting contaminated.
  12. The pattern of land use would achieve a conformity by separating the different uses and would meet the required land area as specified under the criteria.
  13. Provisions for 3500 to 4000 people would be grouped in six separate residential units. Each residential unit would consist of a number of



dwelling clusters placed around a central pond. Dwelling clusters would be formed by dwelling units for 50 to 100 people around an open courtyard, which would become the communal land for the cluster. The residential units comprised by the dwelling clusters would serve as neighborhoods for 600 to 650 people.

14. A small shopping facility for the women would be provided, which would carry the daily essentials; the facility would offer the needed privacy from other areas.
15. Areas for workshops and light industries would be located towards the housing areas having an intimate connection with the common area. The area would maintain linkage with the market place through walkways.
16. Bounded by the roads on the east, the canal on the north and the agricultural plots on the

west and south, the village would be confined to a growth size of 4000 people.

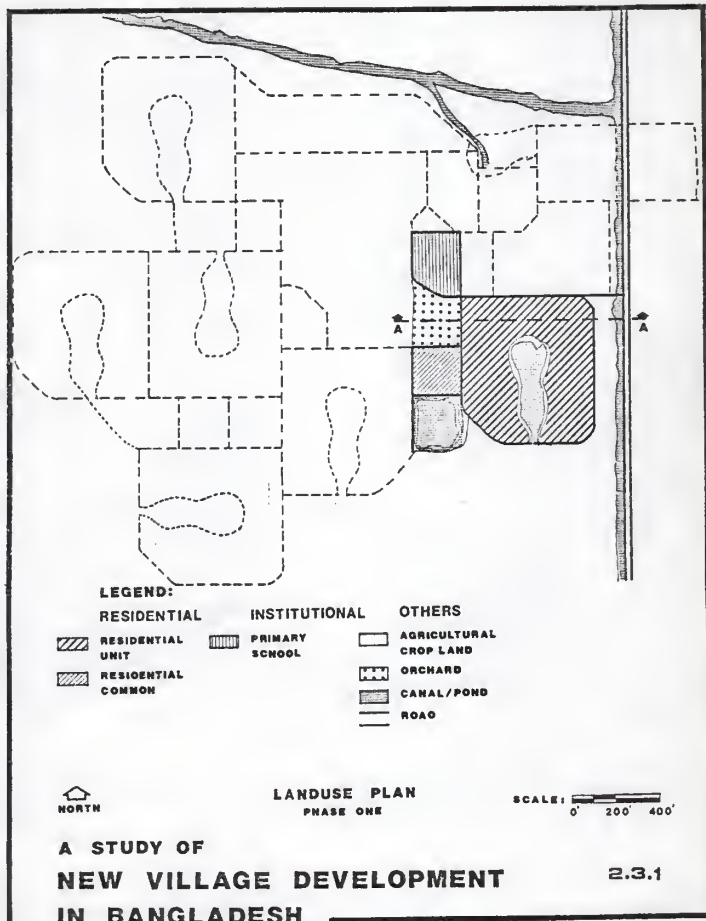
17. The village would be planned as a pedestrian precinct served by walkway systems. Streets within the pedestrian precincts would exclude other traffic which would use the major road only.
18. People in the residential units would have access to the road on the east and the canal on the north via the pedestrian walkways.
19. The dwelling units would provide a minimal initial space required for a family which may be progressively upgraded and enlarged through a series of development phases. Each dwelling unit would house two families of four persons each. Development of dwelling units may be phased with the growth of the family.
20. Individual families would be allowed to choose

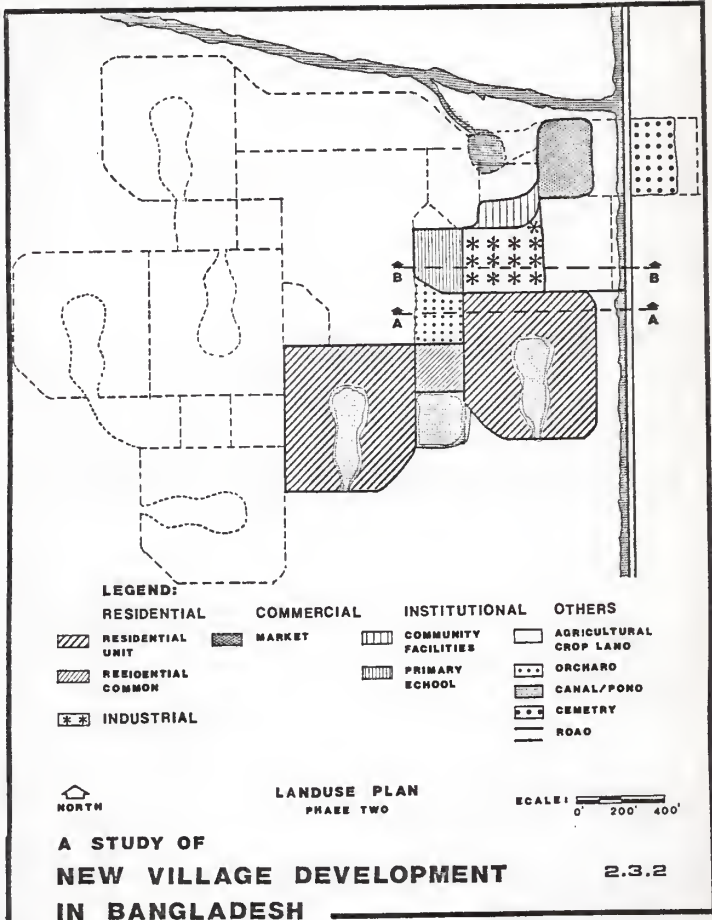
materials for their dwelling units from either the bamboo, hay and mud type or the brick, lime cement and iron sheet type or a combination of the two types, according to their own taste, need or capability. The design of the units would be a prototype with the flexibility of using either type of material.

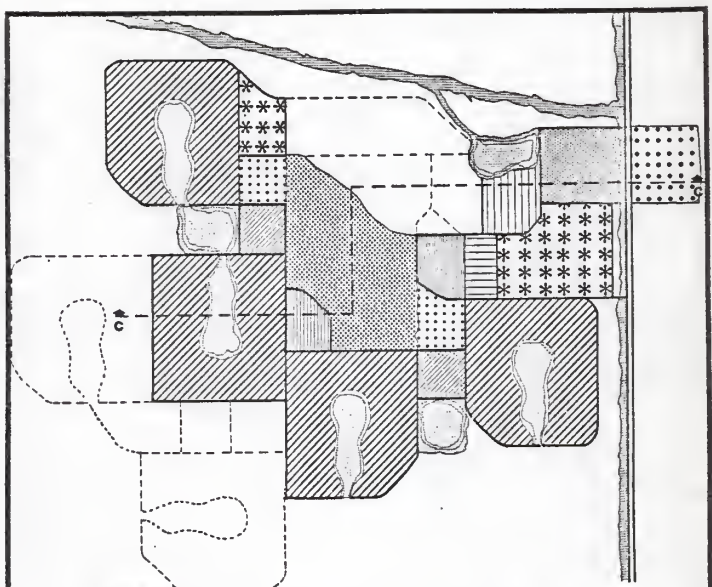
21. The village would be developed taking advantage of the road and water transportation running by the site.
22. The market would be located along the major arteries having access from the road and the canal. The market would provide for nearly all commercial activities.
23. In order to protect the dwelling units from heavy rainfalls, sloped roofs with extended overhangs were used.
24. For the Community Center Complex, materials

of brick, iron sheet and lime cement type were proposed for strong and stable structural frames, which could serve as storm shelters.

25. The site would be landscaped to allow drainage of rain water, and free flow of natural air.





**LEGEND:**

RESIDENTIAL	COMMERCIAL	INSTITUTIONAL	OTHERS
RESIDENTIAL UNIT	BUSINESS OFFICE	COMMUNITY FACILITIES	AGRICULTURAL CROP LAND
RESIDENTIAL COMMON	MARKET	HIGH SCHOOL	ORCHARD
INDUSTRIAL	PRIMARY SCHOOL	CEMETRY	CANAL/POND
			PARK
			ROAD

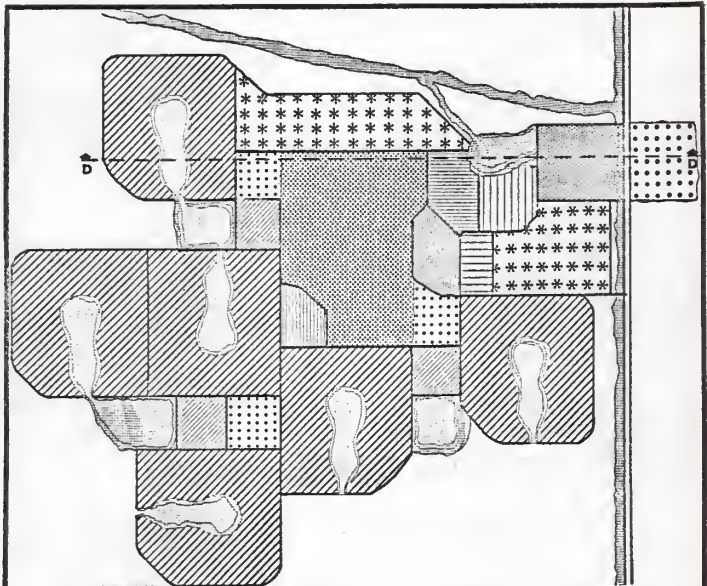


LANDUSE PLAN  
PHASE THREE

SCALE: 0 200 400

**A STUDY OF  
NEW VILLAGE DEVELOPMENT  
IN BANGLADESH**

2.3.3



**LEGEND:**

RESIDENTIAL		COMMERCIAL		INSTITUTIONAL		OTHERS	
	RESIDENTIAL UNIT		BUSINESS OFFICE		COMMUNITY FACILITIES		AGRICULTURAL CROP LAND
	RESIDENTIAL COMMON		MARKET		HIGH SCHOOL		ORCHARD
	INDUSTRIAL		SHOPPING		PRIMARY SCHOOL		CANAL/POND
							PARK
							ROAD



**LANDUSE PLAN**  
PHASE FOUR

SCALE: 0 200 400

**A STUDY OF  
NEW VILLAGE DEVELOPMENT  
IN BANGLADESH**

2.3.4





SECTION A-A, PHASE ONE



SECTION B-B, PHASE TWO



SECTION C-C, PHASE THREE



SECTION D-D, PHASE FOUR

**LEGEND:**

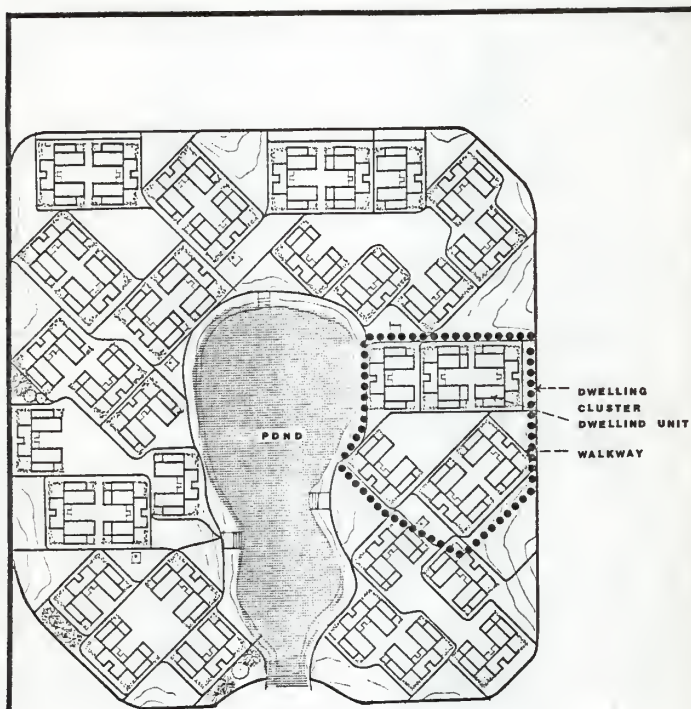
RESIDENTIAL	COMMERCIAL	INSTITUTIONAL	OTHERS
RESIDENTIAL UNIT	MARKET	COMMUNITY FACILITIES	AGRICULTURAL CROP LAND
INDUSTRIAL	SHOPPING	PRIMARY SCHOOL	ORCHARD
			CANAL/POND
			CEMETRY
			PARK
			ROAD

CROSS SECTION OF THE VILLAGE

**A STUDY OF  
NEW VILLAGE DEVELOPMENT  
IN BANGLADESH**

VERTICAL SCALE: 0 32'  
HORIZONTAL SCALE: 0 200'

2.3.5

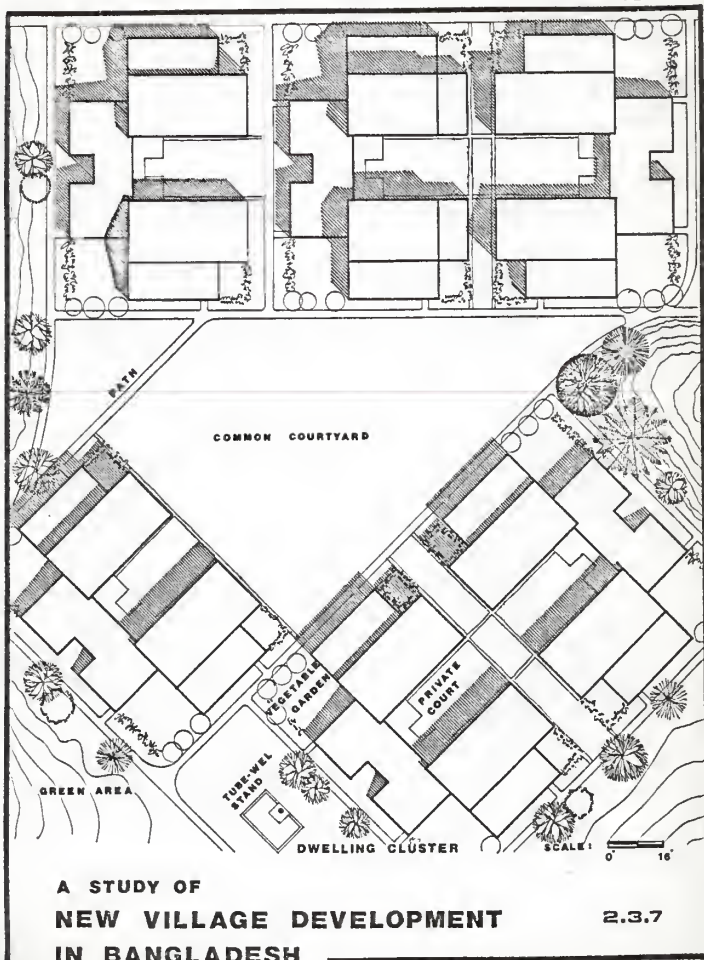


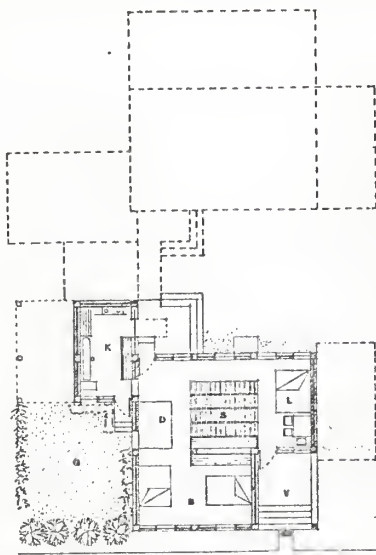
A TYPICAL RESIDENTIAL UNIT













SCALE:  64'

A STUDY OF  
NEW VILLAGE DEVELOPMENT  
IN BANGLADESH

2.3.6



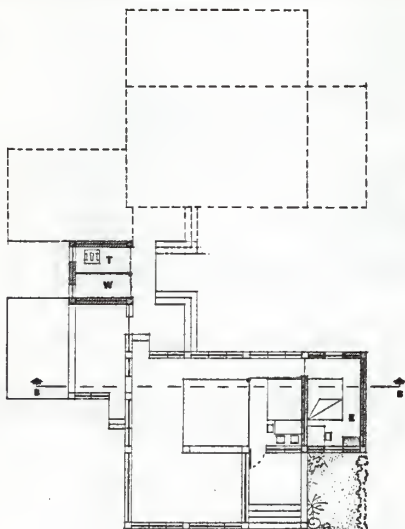


LEGEND:		GROUND FLOOR PLAN	
DAY ACTIVITY		NIGHT ACTIVITY	
	VERANDA		
	LIVING/STUDY		SLEEPING
	STORAGE		
	DINING		SLEEPING
	KITCHEN		
	BED ROOM		SLEEPING
	VEGETABLE GARDEN		DWELLING UNIT
	HOPTH		PHASE ONE

SCALE: 

**A STUDY OF  
NEW VILLAGE DEVELOPMENT  
IN BANGLADESH**

**2.3.8**



GROUND FLOOR PLAN

## LEGEND

 TOILET

 SLEEPING

 WASHING AREA

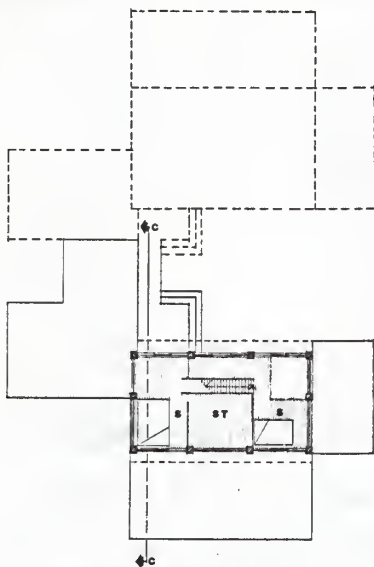
 NORTH

 DWELLING UNIT  
 PHASE TWO

 SCALE: 

A STUDY OF  
 NEW VILLAGE DEVELOPMENT  
 IN BANGLADESH

2.3.9



UPPER FLOOR PLAN

## LEGEND:

**S** SLEEPING AREA

**ST** STORAGE AREA

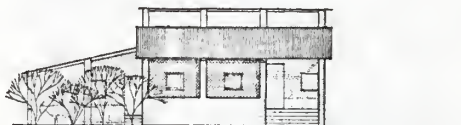


DWELLING UNIT  
PHASE THREE

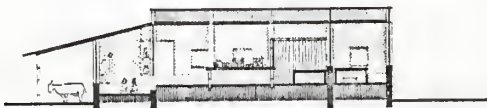
SCALE: 0 8

A STUDY OF  
NEW VILLAGE DEVELOPMENT  
IN BANGLADESH

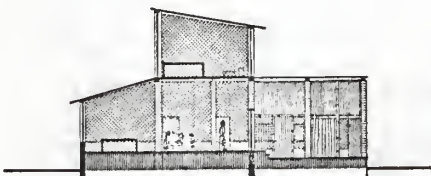
2.3.10



SOUTH ELEVATION PHASE ONE



SECTION E-E, PHASE TWO



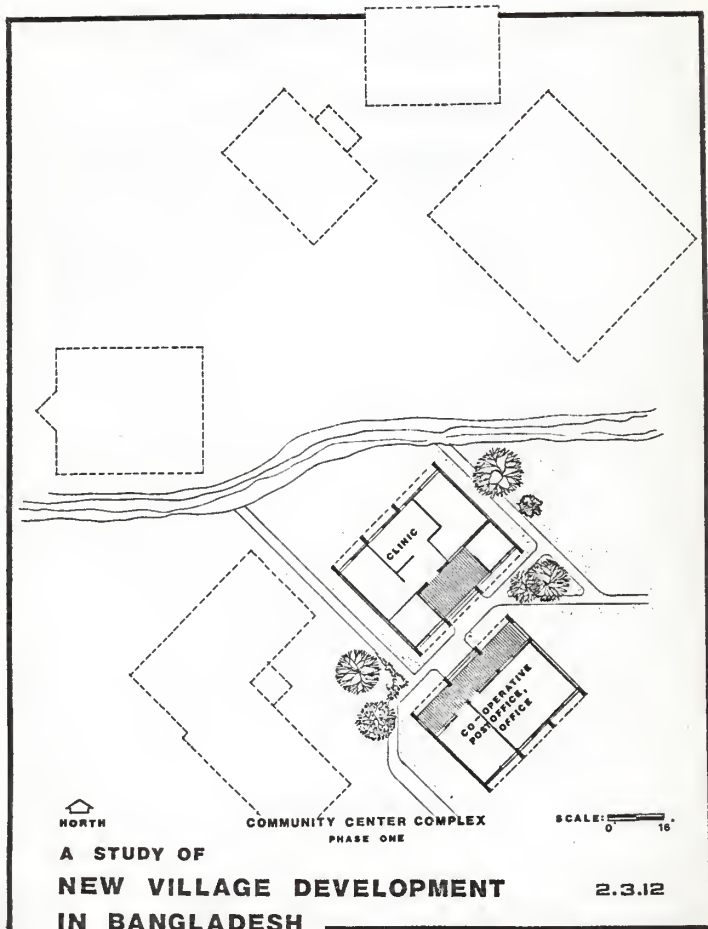
SECTION C-C, PHASE THREE

DWELLING UNIT

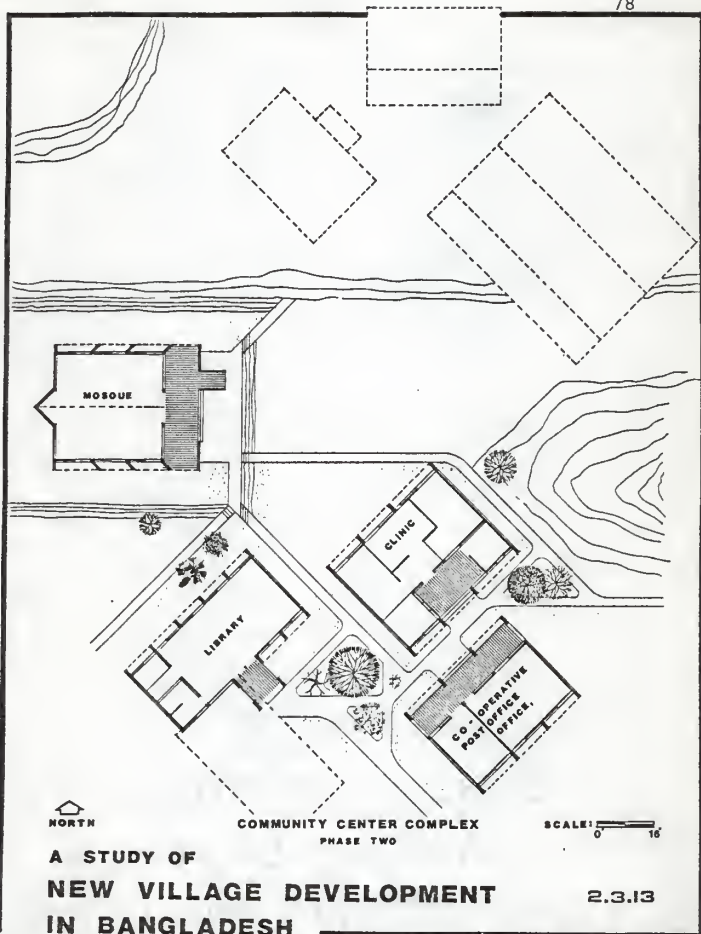
SCALE 

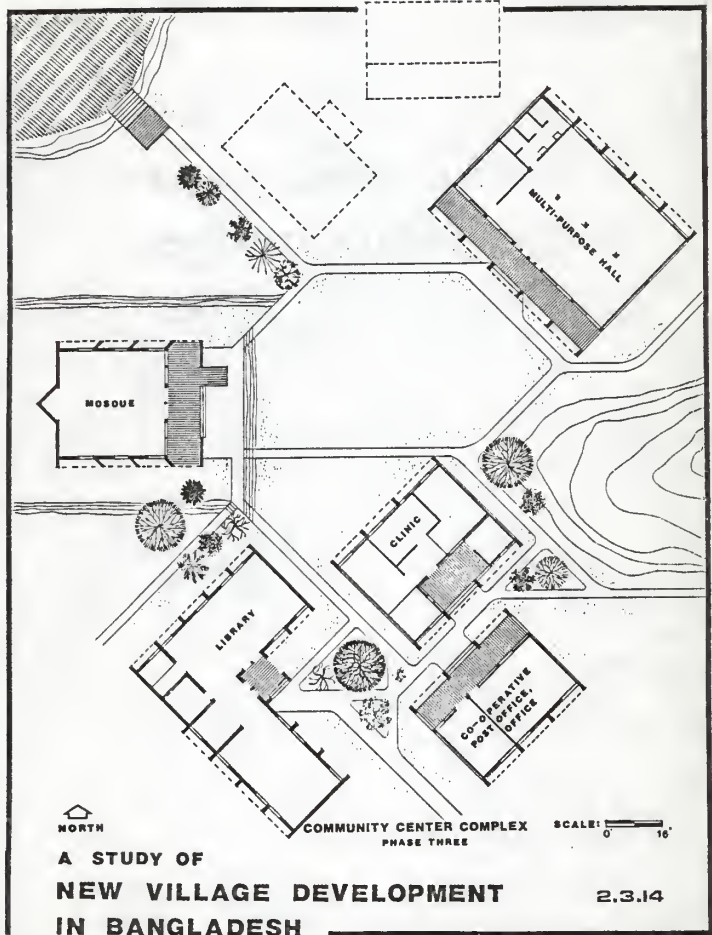
**A STUDY OF  
NEW VILLAGE DEVELOPMENT  
IN BANGLADESH**

2.3.11



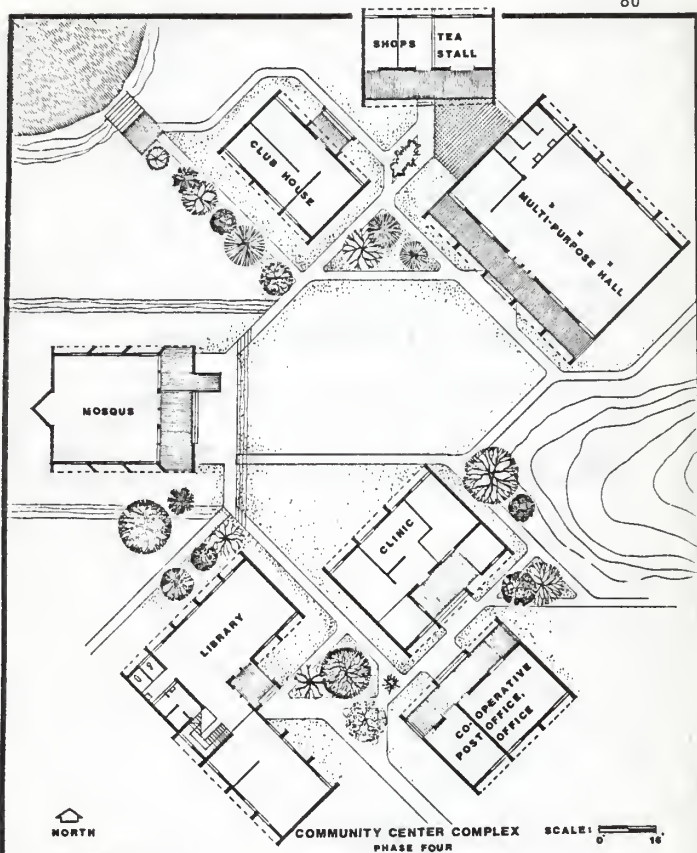






**A STUDY OF  
NEW VILLAGE DEVELOPMENT  
IN BANGLADESH**

2.3.14



**A STUDY OF  
NEW VILLAGE DEVELOPMENT  
IN BANGLADESH**

2.3.15



EAST ELEVATION, PHASE ONE



EAST ELEVATION, PHASE TWO




EAST ELEVATION, PHASE THREE



EAST ELEVATION, PHASE FOUR

COMMUNITY CENTER COMPLEX

SCALE:  0 10

A STUDY OF  
 NEW VILLAGE DEVELOPMENT  
 IN BANGLADESH

2.3.16

## DISCUSSION OF THE DESIGN

The proposed design solution was reviewed for its achievement of the design criteria and requirements. In the review, the validity and justification of the plan was studied with respect to its degree of criteria achievements. Before going into the details, it may be pointed out that this is limited to a discussion of the achievement of design criteria only and not an evaluation of its merits and demerits. Since the accepted methods of such evaluation requires comparison with other similar proposals, and because of the non-availability of alternative proposals from other research studies, undertaking of an evaluation of the design was considered beyond the scope of this study. The following is a discussion of the review;

The development of the village would take place slowly, without any time constraint for completion of the phases. The possibility for adaptation to the changes would also increase considerably as a result of the slow process. Individuals would have time to adjust to the change without a disruptive impact.

The village was developed with the common public facilities located in the center surrounded by residential areas to which they are easily accessible from all directions. The residential clusters were organized around a central pond. The courtyards, and the accessibility to the pond, would offer adequate privacy for the women to work and move around within the units. The cluster arrangement would provide a uniform distribution of population density, thus avoiding concentration of utility services.

The buildings were designed in basic rectangular form for the convenience and economy of construction with the use of locally available materials and labor. This would allow future additions and modifications in conformity with the buildings.

In addition to economizing the use of land, materials, resources, utilities and facilities, the cluster-type organization of dwelling units also would allow close contact among residents and provide variation in the grouping of dwelling units.

A population of 4000 for a village is a reasonable size to support a primary and a high school in the village. The Community Center Complex would consolidate local socio-cultural needs in a central location.

The residential area would be integrated by direct links with farmland and light industrial areas. Because of the minimum distance of the primary school

from homes, the children could walk the short distance to their homes.

Additional village would be created by elevating the village, particularly the Community Center area. This would also protect against floods and would provide opportunities to leave on the ground. Due to variations in elevation, the Community Center and the market area would be usable for emergency shelter from flooding and also would add variations in the surrounding landscape.

The open space in the middle of the village would offer design response separating the residential area from the public area providing privacy, and at the same time enabling free flow of air through the village. With the low elevation on the south, every part of the village would get fresh air.



The use of walkways to connect the village with the road as proposed would serve several purposes;

- A. Conserve land by limiting road building,
- B. Identify the area of development,
- C. Provide access from both land and water.

Because of the village's pedestrian character, sprawl and spreading of residential units would be reduced.

**A STUDY OF  
NEW VILLAGE DEVELOPMENT  
IN BANGLADESH**

## CONCLUSION

This study of the physical development for the model village stressed that a nucleated village can be achieved while maintaining the traditional, socio-cultural values. However, during the process of this study, it was observed that progress in the field of rural development will be more effective if living conditions, employment, entertainment, social services and other amenities are considered for development at a national level, rather than village level.

The Community Center Complex with its educational, cultural and social facilities will provide an opportunity and situation for demonstration of the importance of social responsibilities, while its success would depend greatly on the management of the facility by the community. Some research need

may be warranted to evolve effective methods of training community leaders at the initial stage, in the administration of the village.

In an existing situation of traditional scattered settlement pattern, implementation of a new concept such as this would be relatively eased by the nature of a cooperative society of the model village. Village dwellers of cooperative society have in the past, experienced changes in life-style. The process of implementing the development scheme for a non-cooperative society would require further study.

The effectiveness of a self-sufficient village would be increased if future research by the Academy could be undertaken in the following areas;

A. Improvement of the use of local materials in relation to labor and the potential of electricity in order to make structural components more weather resistant.

B. Although some vertical expansion has been attempted in this design, the possibility of further expansion to achieve a higher density of housing should be considered.

C. Possible ways to use human and animal wastes as a source of energy should be explored.

D. Development of appropriate construction technology that would be cheap and suited for little mechanization.

E. Development of sewerage collection, treatment and disposal systems. Consideration must be given to better environmental conditions. The systems should be simple and economical to build and operate, because there is serious shortage of available power resources.

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## APPENDICES

## Appendix A: Review of Demographic Features

In 1973, a survey of demographic features was conducted in a sample number of villages in the Jamalpur Thana within the district of Dacca. The following table represents the type of data that was collected.

Name of Village	Total Area (acres)	1961 Population	No. of Literate peoples	No. of House-holds
Burundi	391	1914	200	368
Badarpur	520	1786	175	346
Kazipara	266	1000	182	206
Alampur	28	89	4	16

The results of the above survey indicated that on an average, the population of the villages varies from 1000 to 1200. The villages consisted of residential groups of 50 to 100 families with five to seven members in each family. About three or four villages are served by one school.



It was noted that schools are perhaps the only service presently provided by the community. Thus, it would be proper to use a school as the unifying element in clustering the scattered villages. Thus, for a self-sufficient community to be served by one school, a total population of approximately 4000 would be desirable. This could be obtained by consolidating villages ( $1000 \times 4 = 4000$ ).

Ref: Aminul Islam. A Bangladesh Vilaage: Conflict and Cohesion. Massachussets: Schenkman Publishing Co., 1974.

Appendix B: Rural development program as devised by Dr. A. H. Khan, former director of the Academy for Rural Development of Bangladesh.

Recognizing the critical importance of the village as an economic and social entity, the first organizational step was the creation of the concept of a village cooperative group that would meet every week, make individual weekly savings, and choose its own 'Administrator' - to coordinate between the village group and the Academy. Once this undertaking is complete, the village development would take place, primarily, in two stages, as follows;

Stage 1:

- 1) The Administrator collects the savings and aggregates to the credit of its accounts.
- 2) The Administrator is given initial training and demonstration of the Academy's programs.

- 3) The Administrator transmits the instructions back to the villagers in weekly meetings.
- 4) The Administrator reports to the Academy the reaction of the villagers towards the program and receives subsequent advice.

Stage II:

- 1) Experimental use of mechanized agricultural tools to improve the village economy.
- 2) Training the villagers to replace the Academy's employees in the village operation.
- 3) Several village cooperatives are associated together to exchange experiences.
- 4) Women, elderly and children are involved in education, family planning, etc. programs.

Ref: Richard O. Niehoff, Technical Assistance in the In-service Training. East Lansing: Asian Studies Center, 1966.

A STUDY OF  
NEW VILLAGE DEVELOPMENT IN BANGLADESH

by

FATEMA A. AHSAN

B. Arch., Bangladesh University of Engineering, 1971

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AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree of

MASTER OF ARCHITECTURE

Department of Architecture

KANSAS STATE UNIVERSITY  
Manhattan, Kansas

1978

## ABSTRACT

Rural development programs are intended to increase the well-being of rural citizens in terms of their technical, agricultural, physical, economic and social needs. This study was undertaken in order to develop a model rural village with the year 2000 as the target date for the district of Comilla in Bangladesh.

High population density and deltaic flooding have resulted in a scattered settlement pattern. As a means of conserving land, reducing horizontal expansion and spreading of villages, higher density nucleated rural housing may become a necessity for Bangladesh. It is anticipated that this village plan will contribute to a higher net density for the country side.

The goals and objectives of this study are based on the established policies of the Academy for Rural Development of Bangladesh. The results of this study could be used by the Academy as part of their continued research.

The master plan for a model rural village for Bangladesh was developed with the idea of achieving a pedestrian-oriented, self-sufficient community. The design includes a nucleated settlement pattern of clustered housing to give adequate consideration for social and cultural values, and at the same time to improve physical conditions for healthy living.