Government of the People's Republic of Bangladesh

Ministry of Irrigation, Water Development and Flood Control
Flood Plan Coordination Organization

BANGLADESH ACTION PLAN FOR FLOOD CONTROL

COMPARTMENTALIZATION PILOT PROJECT (FAP 20)

TANGAIL CPP INTERIM REPORT

ANNEX 1.1 : HOUSEHOLD SURVEY MAIN VOLUME

(DRAFT)

September 1992

Euroconsult/Lahmeyer International/Bangladesh Engineering & Technological Services/House of Consultants

under assignment to

DIRECTORAAT GENERAAL INTERNATIONALE SAMENWERKING
Government of the Netherlands

and

KREDITANSTALT FÜR WIEDERAUFBAU
Federal Republic of Germany

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TANGAIL CPP INTERIM REPORT

ANNEX 1.1: HOUSEHOLD SURVEY; MAIN VOLUME

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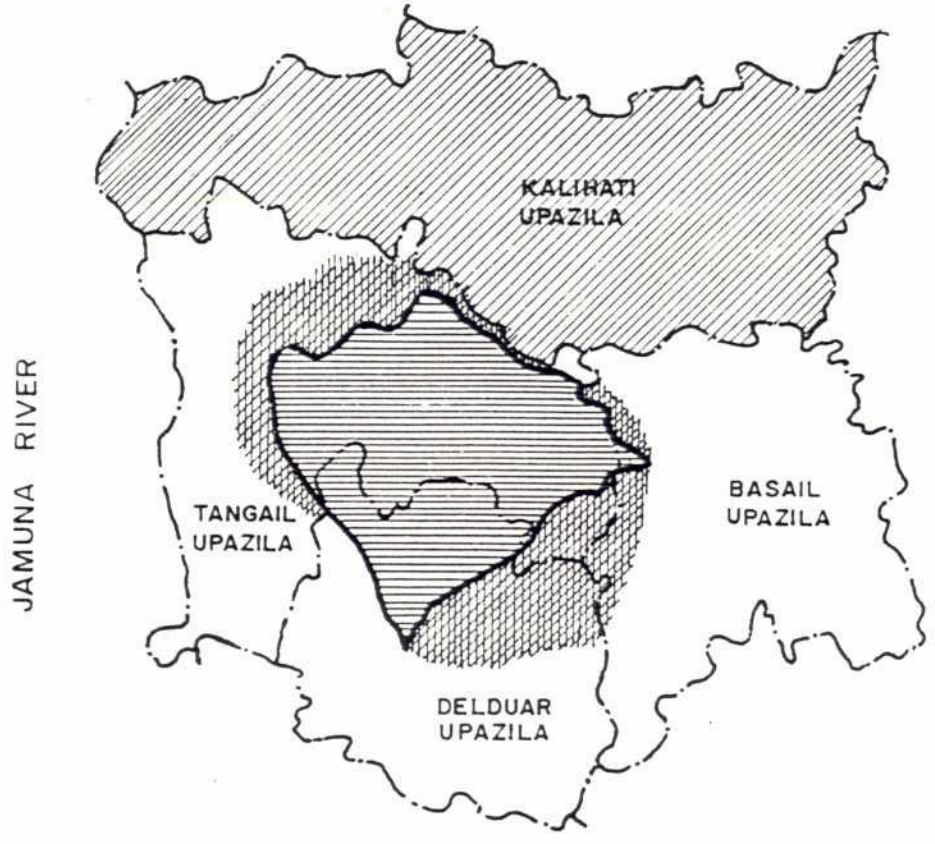
MAP OF THE AREAS SURVEYED

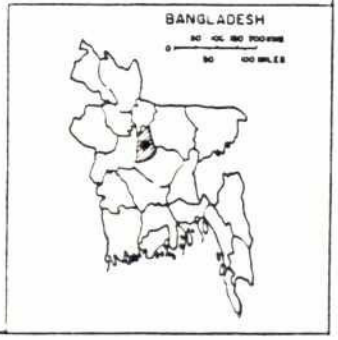


LEGEND :-

Tangail CPP Area

Adjacent

Control Area



1 INTRODUCTION

1.1 General

The pilot project nature of FAP 20 calls for an experimental type of approach to implementation. FAP 20 therefore needs both detailed and extensive information on the existing and, in due course, on the post-project situation. To gather this information FAP 20 will conduct a rather comprehensive baseline survey.

The TOR mentions the following about the main objective of the baseline survey:

> *"Provide and verify data on hydrological, engineering, agricultural, socio-economic and environmental aspects prior to, during and on completion of the pilot project."* [TOR, page 9].

One part of the baseline survey is a household survey (for the study framework see 2.4 below). The quality of this is vital to the final evaluation of the impact of compartmentalization at the end of the project life cycle. Furthermore it is important that the survey be replaceable, both geographically (Tangail and Sirajganj) and in time (1992-1995).

As the BWDB does not have a permanent survey team it has been decided to have the household baseline survey conducted by a specialized local firm, DEVELOPMENT, PLANNERS & CONSULTANTS (DPC).

This **draft** report on the household survey has been produced by DPC. Due to unavoidable circumstances the CPP Team has only had limited time to ckeck and edit this report. However, for two reasons it was decided to issue this report and its appendices as part of the TANGAIL CPP INTERIM REPORT. The first reason is that, even unedited, it provides useful background data. The second reason is that it may solicit useful comments from FAP and other proessionals which can then be taken into account when the final editing will be done.

1.2 Objectives of the report

Much data has been collected during the household survey. All information is stored and retreivable in a database system. It is expected that specialist will often refer back to this information as the project develops.

For easy reference the most obvious data have been processed and compiled in table form. This household survey main report combines the data from the three areas covered (see 2.6), where possible and relevant compares the data with national figures, analyses the data and draws conclusions that are relevant to compartmentalization.

1.3 Organization of the report

Following this introduction the projects background and the study areas are described. Chapter 3 deals with the methodology, 4 and 5 deal with demographic characteristics, employment and occupation, 6 - 8 agricultural matters, 9 with professional fishermen, 1o with the urban population, 11 with women, 12 with lifestock, poultry and kitchen gardening,

13 with open water fisheries, 14 with floods and finally chapters 15 - 17 with general matter.

Appendix 1.1 contains the bengali version of the questionnaires, Appendix 1.1.2 the english translation of those questionnaries, Appendix 1.1.3 the processed project area tables, Appendix 1.1.4 the tables from the adjacent area and Appendix 1.1.5 those of the control area.

2 PROJECT BACKGROUND AND STUDY AREAS

2.1 Project background

Following the disastrous floods of 1987 and 1988 several studies were undertaken to investigate how to protect the country better against the devastating effects of the floods. The results showed alternatives, with on the one side 'full protection' and on the other side 'living with the floods'.

Bangladesh adopted the outlines of an Action Plan for flood control and drainage in June 1989 and the Government of Bangladesh requested the World Bank to assist in preparing a Flood Action Plan (FAP). This request was endorsed at the G-7 meeting of industrialised countries in July 1989, which called for the international community to help find solutions to the flood problem in Bangladesh which are 'technically, financially, economically and environmentally sound.' The FAP was in turn endorsed at a special conference of the Government of Bangladesh and donor organisations in London in November 1989, and is presently being implemented.

The FAP comprises a number of studies and pilot projects which are expected to lead to water resource management and related projects, with an emphasis on flood control and drainage. In the first two years of the Plan, 1990-92, Regional Water Resource Development Planning Studies are being undertaken to identify alternative water resource management strategies for different regions of the country. These will be followed by feasibility studies for priority investment projects. A number of complementary socio-economic and environmental studies are being carried out in order to improve understanding of the impact of flooding and of Flood Control, Drainage and Irrigation (FDC/I) projects, and to recommend economic, social and environmental guidelines and criteria appropriate for use in planning and implementing such projects. While the emphasis of the Regional Studies is on flood control and drainage, other problems such as saline intrusion will also be addressed.

The main focus of the Flood Action Plan is defined by the Government of Bangladesh in the well-known Eleven Guiding Principles. Emphasis is given on 'controlled flooding' and 'controlled drainage'. Floods would be controlled in such a way that maximum profit can be achieved from the beneficial effects of river water flooding, while minimizing the disadvantages. The Action Plan comprises twenty-six components and supporting activities. The Compartmentalization Pilot Project - FAP 20 - is one of them.

2.2 The compartmentalization concept

The concept of compartmentalization is introduced in the GOB/UNDP study "Bangladesh Flood Policy Study" (May 1989). According to the Flood Action Plan, which resulted from this study, the areas at the right and left bank of the Brahmaputra would be subdivided into compartments.

The flood water will flow into the compartment and spread over the area in a semi-controlled way by means of regulating structures in the primary embankments along this river and the gated or ungated openings in the secondary embankments between the compartments. The structural and non-structural measures to achieve this can be called the macro (main) system.

The way the flood, as well as the drainage of excess rainfall, has to be controlled will be determined by the demands from inside the compartment. The required structural and non-

structural measures for water management within the compartments can be called the micro (minor) system.

The concept of compartmentalization is instrumental for the implementation of water management interventions.

The following definition will be used:

> A compartment is an area in which effective water management, particularly through semi-controlled flooding and controlled drainage, is made possible through structural and institutional arrangements. Compartmentalization is linked to area development with sound water management as the main agent. A compartment will be sub-divided into sub-compartments and operational water management units.

Sofar it is not clear yet what the "optimal" size of a compartment will be nor what factors should determine the boundaries of the compartment. The boundaries of the Tangail pilot area are formed by the existing embankment.

It is obvious that a compartment can be a large area and that hydrology, topography, existing infrastructure, landuse and administrative boundaries are important factors to consider. In analogy with an irrigation system, it is possible to make a distinction between the macro (main) system and the micro (minor) system. Clearly, to make the participation of the beneficiaries in Project planning, design, construction, operation, maintenance, monitoring and evaluation successful, it will be necessary to subdivide the compartment into rather small units.

2.3 Objectives of the Compartmentalization Pilot Project

The overall objective of FAP 20 is:

> "*....to establish appropriate watermanagement systems for the development of protected areas so that criteria and principles for design, implementation and operation can be made available for the Action Plan.*" [ToR, page 4].

Specifically this will entail the

> "*...testing of the compartmentalization concept in the field under real operating conditions, addressing all relevant socio-economic, institutional and environmental issues and trying out water control works and water management systems.* "[ToR, page 4].

FAP 20 has to produce not only the structural works and an institutional set-up for the compartments Tangail and Sirajganj, but also criteria, guidelines, manuals and a training and demonstration programme for the establishment of other compartments.

2.4 Baseline survey and study framework

The involvement of FAP 20 in a compartment starts with a **reconnaissance survey**. This survey is conducted by a few members of the CPP Team, takes a few days and aims at getting a general picture of the area.

This survey is followed by a **preliminary survey** of the whole compartment. All disciplines in the CPP Team are involved in this survey. The aim is to get a multi-disciplinary overview of the situation, mainly based on secondary data, and to tentatively decide on the sub-compartmental boundaries. The team members report their findings in Technical Notes. These are then discussed and result in a "SUMMARY OF THE PRELIMINARY SURVEY" of the compartment. This information is the starting point for the baseline survey.

Next comes that **baseline survey**. Some parts of this survey are done by members of the CPP Team while other parts are conducted by specialized local firms. The results of the baseline survey will be used in two ways. First of all the results feed into the design phase of the compartment. Secondly the information gathered will be used in monitoring and ultimately in the post-project evaluation.

On the basis of the outcome of the baseline survey a **monitoring programme** will be designed measuring key indicators on a regular basis throughout the project lifetime.

Finally the experimental nature of the project calls for in-depth **special studies** to supplement the broad surveys. The reason is that there are areas, relevant to compartmentalization, where existing practices are clearly in-effective, as well as areas about which little is known and/or where there are few if any solutions. The baseline information is used to up-date the tentative list of special studies drawn up during the inception phase.

2.5 Different components of the baseline survey

The baseline survey comprises the following four surveys, each with specific aims and objectives;

- The **household survey** is designed to provide statistically valid baseline data mainly covering social, economic and agricultural issues. The survey is of the questionnaire type. This data will be used to some extent in the planning process, but the main use of this data will be in the multi-criteria analysis of the alternatives, and the post-project evaluation.

- The **hydrological survey** provides vital information for the planning, the mathematical modelling and the post-project evaluation. This survey includes levelling, recording water levels and discharge measurements.

- The focus of the **multi-disciplinary sub-compartmental (MDSC) survey** is the interrelation between all the relevant facets of life in each sub-compartment. Typical items are history of the area, environment, transport, fisheries, rural industry, hydrological situation, agricultural status etc. Data is collected using a Rapid Rural Appraisal approach. The main use of the information is in planning and design. At the post-project evaluation stage the data will again prove useful as qualitative, descriptive baseline information.

- Through the **institutional survey** information is gathered at the compartmental level regarding the institutions relevant to water management. The information is gathered using open ended checklist questionnaires. The data is feed into the design and implementation of the institutional development.

This Annex 1.1 covers only the household survey. Annex 1.2 the topographic and hydrological survey, Annex 1.3 covers the MDSC-survey and Annex 5 (Institutional report) the institutional survey.

2.6 Geographic coverage of the household survey

The household survey will cover three basically different geographic areas. The first one is the **area inside the main borders** of the CPP project. This is the area that is expected to benefit from the project. However, in spite of all-out efforts to prevent this from happening, it is likely that at least some in this area will be dis-benefitted: for instance through land acquisition, loss of boat transport facilities or access to common capture fisheries resources.

The second area to be influenced by the CPP project, and therefore to be covered by the household baseline survey, is the **area adjacent to the project boundary** but hydrologically or socio-economically linked to it. The impact in some parts of this area could be negative.

There are four distinct parts to the adjacent area. The first is the area up-stream from the Tangail CPP area, North of the *Gala Khal* and the River *Lohajang* between the rivers *Pungli* and *Dhaleswari* up to the road from *Bara Basalia* to *Mirpur*. The second is the area between the Western embankment of the CPP to the right of the river *Dhaleswari* with as the northern boundary the road from *Mirpur* to *Kali Keutil* up till *Bhangabari* to the South. A third area lies in *Delduar* Thana south of the southern boundary of the CPP area, with as western boundary the river *Elanjani*, as eastern boarder the *Karatia-Dhaka* Road, and as southern boarder the *Elashin-Delduar-Pakula* Road. Finally the fourth area is that to the East of the project, i.e. the river *Pungli* and its left floodplain. Here the influence of the CPP is likely to be minimal but a stretch of about half to one km East of the river will be surveyed.

As per the "Guidelines for Project Assessment" of the FPCO the baseline survey must include a third distinct area, the **"control area"**. This is an area, presently similar to the project area, but not influenced by the CPP. It will facilitate the distinction between project impact and impacts from more general developments in the region.

In consultation with FAP 3 (NCRS) the decision has been made to use the Kalihati Thana, North of the Tangail CPP, as a control area for the Tangail CPP household survey.

2.7 Basic approach to the household survey

The main effect of compartmentalization will be on the timing of flooding, the speed of water level changes and possibly water levels. Because the main direct impacts of compartmentalization will be on agriculture, livestock and fisheries the bulk of the survey households (the main household survey) will be selected from the rural area. Besides the main household survey two supplementary household surveys will be executed.

The basic stratification is as mentioned above, i.e. the area inside the project area, the adjacent area and a control area. It has been decided to stratify the study area further by making a distinction between rural and urban areas. As the main impact of compartmentalization will be on the rural area the main household survey will only cover that part of the three study areas.

Within the rural area the farm households are distinct from the non-farm households. The former are likely to obtain most of the structural and direct benefits. The non-farm households are likely to only receive temporary and secondary benefits. Therefore both groups will have to be seen as distinct populations, with their own domain and therefore coverage.

The process of urbanization is likely to continue in the decades to come. Therefore the needs of the urban section of the society must be taken into account in the FAP. FAP 20 will accordingly cover the urban population through a supplementary household survey.

Fishermen communities are often concentrated in a few specific villages/paras. They might be under-represented in the main household survey. If that is the case, they too will be covered through supplementary household surveys.

3 THE METHODOLOGY

3.1 Introduction

The Quality and achievement of the obectives of a survey mainly depend on the methods adopted for it. The consultants select a package which is in line with that used by FAP 12 and approved by FPCO.

The Sampling Technique: The sampling techniques that were followed for the baseline surveys of farm, non-farm, fishermen, and urban households are detailed and systematically presented below:

Sampling Universe, Sampling Technique and Sample Size: The baseline survey covered the following three geographic areas as identified by the CPP authority:

- Tangail Compartmentalization Pilot Project (CPP) Area
- CPP Adjacent Area (influenced by the Tangail CPP)
- Control Area (Kalihati Thana)

3.2 The sampling method

Because of problems related to simple random sampling, cluster sampling will be adopted in the household survey. For this study the confidence level for the household survey has been fixed at 90% for 2-tailed populations. On the basis of the FAP 12 methodology the sample size for both the farm and the non-farm household survey, assuming clusters of households, works out at 121 (K=1.64, V=0.5, D=0.1, m=5 and d=0.2).

The principles of probability sampling require that the selection of each member of the sample is done in such a way that every member of the total population has the same (non-zero) chance of being selected. As the 1991 census data is not yet available a first stage selection of sample villages/mauzas will be made based on the 1981 census data. From this a selection will be drawn on the basis of probability to size.

The second stage sample frame will be made by conducting a village/muhalla census, listing all the households. From this the population will be divided up in the farm and non-farm categories. For the farm household group this will be done by a linear systematic sampling after the farm households have been listed according to farm size. For the non-farm households selection will also be done by linear systematic sampling after the households have been grouped according to primary occupation. The size of the sample in each village/mauza is determined at five for both the farm and non-farm sections.

3.3 The baseline survey components

Within the rural area the farm households are distinct from the non-farm households. The former are likely to obtain most of the structural and direct benefits. The non-farm households are likely to only receive temporary and secondary benefits. Therefore both groups will have to be seen as distinct populations, with their own domain and therefore coverage.

The process of urbanization is likely to continue in the decades to come. Therefore the needs of the urban section of the society must be taken into account in the FAP. FAP 20 will accordingly cover the urban population through a supplementary household survey.

Fishermen communities are often concentrated in a few specific villages/paras. They might be under-represented in the main household survey. If that is the case, they too will be covered through supplementary household surveys.

Women make up half of the population and are responsible for the mjor items that influence the quality of life of the floodplain households. Therefore the senior female of all selected households were interviewed, covering items specifically related to their roles in the household.

3.4 Sample Size

For socio-economic household survey (farm and non-farm) the size of the sample villages was set at 24 from each of the three study areas. For supplementary household survey (fisherman and urban) the size of sample villages/paras were 20 (10 fisherman villages and 10 urban paras) from each of the study areas.

As the first step, the sample frame was drawn by conducting village and para census. Based on village census information, the socio-economic household survey respondents, 5 farm and 5 non-farm households (Male and Female) were selected from each of the sample villages. The supplementary household survey respondents, 5 fisherman and 5 urban households (Male and Female) were also selected from each of the sample villages/paras.

In sample selection, linear systematic sampling technique was applied in each selection phase i.e. for village/para and household. Table 3.1 presents the number and spread of sample households covered in the baseline survey.

Table 3.1 : Sample Village/Para and Household Sample Frame

Study Area	Socio- Economic Baseline Survey				Supplementary Survey					Total	
	Farm		No-Farm		Fisherman		Urban		Sub-Total	Village /Para	House-hold
	Village (No.)	Farm House-hold (No.)	Non-Farm HH (No.)	Sub Total HH (No.)	Fisher-man Village	Fisher-man HH (No.)	Para (No.)	House hold (No.)	House-hold (No.)	(No.)	(No.)
CPP Area	24	132	132	264	10	50	10	50	100	44	364
CPP Adjacent Area	24	131	133	264	10	50	10	50	100	44	364
Control Area	24	125	134	259	10	51	10	50	101	44	360
Total	72	388	399	787	30	151	30	150	301	132	1088

Tangail Household Baseline Survey (Dec, 1991-April,1992) DPC

3.5 Selection of sample villages

For socio-economic household survey (farm and non-farm), the village selection procedure in the three study areas was as follows:

3.5.1 CPP area

All the villages in CPP area was listed according to BBS Population Census, 1981, and the required number of 24 villages were selected by linear systematic sampling technique.

3.5.2 Adjacent area

The adjacent areas to be influenced by the CPP project were divided into four parts based on hydrological considerations, as detailed above in 2.6.

All the villages from each segment were listed. It should be noted that the Delduar Thana headquarters and Karatia satellite town were treated as urban area and were excluded from the listing of villages. Finally the required number of 24 villages were selected by linear systematic sampling technique.

3.5.3 Control area

All the villages of the Kalihati Thana were listed according to BBS 1981 Population Census. It should be noted that the Kalihati thana headquarters area was treated as urban area and excluded from the listing of villages. The required number of 24 villages were selected by using the linear systematic sampling technique.

For supplementary survey (fisherman and urban) the village/para selection procedures in the three study areas were as follows:

3.5.4 Fisherman village

Generally the fishermen communities are concentrated in a few specific villages/paras and eke out a living on the fish resource available in the catchment areas. Past experiences, indicate that the fishermen communities are not sufficiently represented, if the fishermen villages are not properly identified and the fishermen household survey separately structured. Guided by the experience the following technique were adopted for the selection of the fisherman villages :

- All fishermen villages/paras/clusters (those villages having more than 25 active fisherman households were listed on the basis of village census fisherman habitation) collected from Thana Fisheries Office.

- The pre-determined number of 10 fishermen villages was selected for each of the three study areas.

3.5.5 Urban para

The recognized urban sites study areas are Tangail municipality and Kalihati and Delduar thana headquarters including Karatia satellite town. For selection of sample para from these urban sites the following procedures were applied:

Tangail municipality : The para list collected from the Municipality Office. Next, the required number of 10 sample paras of Thana headquarters including Karatia satellite town were selected by linear sampling technique.

Delduar and Kalihati Thana headquarters : The para list was collected from the Thana Engineering Offices.

Next, the required number of 10 sample paras were selected by linear technique. The list of selected rural villages, fishermen villages and urban paras/mahallas for three survey areas is appended (ref. Annex)

3.6 Socio-economic household survey

For selection of sample households (farm and non-farm) household census (100%) of the sample villages were conducted. The census list categorized households into two groups: (a) farm (operates more than 50 decimals of cultivable land), (b) non-farm (landless and mainly engaged in off-farm activities).

3.6.1 Farm household selection

For each sample village a list of all households was prepared in ascending order off Farm size. Then 5 farm households were selected by linear technique from 24 village.

3.6.2 Non-farm household selection

A list of non farm households by size of the occupational group denoted by the number of household in each group was prepared. Then 5 households were selected linear technique from 24 villages.

3.7 Supplementary household survey

To select supplementary survey households (fisherman and urban), a census (100%) of the sample villages/paras were undertaken.

3.7.1 Fishermen household selection

All fishermen households (actively engaged) were categorized by type of fisherman (Owner Fisherman-hired labour), Owner Fisherman (family labour), shared Fisherman, Labour Fisherman and Fish Paddlers. Next, 5 Fisherman households were selected by using linear systematic sampling technique from 10 sample villages.

3.7.2 Urban household selection

A list of households in each sample para was prepared by type of housing structure (kutcha, semi-pucca, and pucca). Then, 5 urban households were for each of 10 sample paras.

3.8 Preparation, field testing and finalization of questionnaires

To cover the baseline survey components in different phases different types of survey instruments were developed. Two basic type survey instruments were prepared :

Village/Para Census : a. Village census form -- for selection of farm and non-farm households; b. Fisherman village/para census form -- for selection of fisherman sample households; c. Para census form -- for selection of sample urban households.

Household Baseline Survey : a. Farm household questionnaire; b. Non-farm household questionnaire; c. Fisherman household questionnaire; d. Urban household questionnaire; e. Women questionnaire.

These survey instruments were prepared both in Bengali and English While designing these instruments, special attention were given to simplicity, consistency, maximum coverage of relevant variables and ease of administration.

The draft survey instruments were tested in non sample areas in the presence of core members of FAP-20 consultants team.

Field test results were thoroughly examined. Irrelevant questions and duplications were eliminated and coding list was further improved. The set of questionnaires were finalized through discussions between, CPP consultants, contracted survey consultants and field supervisors.

3.9 Execution of the survey

3.9.1 Survey team

The socio-economic baseline survey programme was executed by deploying a field crew of 14 (8 male & 6 female) investigators under the supervision of 3 (2 male & 1 female) supervisors and under the guidance and control of an experienced survey coordinator.

The field team was imparted 4 days training by the survey coordinator and senior members of CPP consultant group before actual data collection started.

The male respondents (Household heads) were interviewed by male investigators. The senior female member of all sample households were interviewed by female investigators. For female headed households, the respondent was interviewed by female investigator.

3.9.2 Quality control of survey operations

The quality of the households baseline survey is vital to the final evaluation of the compartmentalization Pilot Project at the end of the project life cycle.

To achieve this objective the entire baseline survey program was executed under the constant and overall guidance and supervision of FAP - 20 Project consultant team sociologists.

On the part of the contractors, the quality of survey data was ensured through comprehensive training of field crews by subject specialist, feed back and editing supervision on the desk by survey coordinator.

In the field the supervisors were required to carry out 100% scrutiny filled-in questionnaires. Also, they carried out checking and testing consistency by re-interviewing randomly selected households.

3.10 Data base development and output generation

This is the most critical part of the study. For ensuring the highest quality of data and development of a reliable computerized database the following approaches and measures were taken:

- The questionnaires/forms were fully precoded for data entry to computer directly without transferring to code sheet.

- Every questionnaire/form was checked and edited on the desk before data entry.

- The database was structured in such a way that it would be applicable/usable for different applications.

- For validity checking and errors cleaning from the computerised data a batch of application programs were developed.

- The database has been built in dbase IV keeping more than two key fields in each data file for effective relational database management.

- dBase IV, dbstats and Lotus 1-2-3 packages were used for speedy processing of the data and to generate a good number of output both the tabular and the graphics. For data analysis advanced statistical analysis and testing were applied. A complete documentation for the database has been prepared.

3.11 Monitoring and evaluation

The outcome of this baseline survey has been used to define and finalize the indicators that will be monitored throughout the project life. For details see the TANGAIL CPP INCEPTION REPORT (Main volume).

Keeping this end in view, the data base has been designed for easy retrieval at any time. The data files have been systematized to facilitate structuring output tables to include any combination of variables to reflect the identified key indicators.

4 DEMOGRAPHIC CHARACTERISTICS

4.1 Household size and composition

Household Size

The survey methodology defines household as comprising of persons who live together in a dwelling unit and share common kitchen. To qualify as a member of the household, one must reside with the group at least for six months. Household members include family members as well as lodgers and servants. A household is managed by a head, generally the eldest male or female earner of the household is considered to be the head of the household.

The average size of the household in the project area is 5.7 compared to 5.6 in the adjacent area and 5.4 in the control area. These are close to the national average size of 5.32 revealed in the 1991 Population Census. The farm household has the largest mean size in the project area (7.1) followed by 6.4 in the adjacent area and the lowest in the control area (6.3). There is no significant differences in the mean size of both non-farm and fisherman households in all three areas. The average size of urban households is just the same (5.1) in all survey areas. Details are furnished in table 4.1.

Table 4.1: Household Size in Different Study Areas

Area	Farm	Non-farm	Fishermen	Urban	All HH
Project	7.1	5.1	4.8	5.1	5.7
Adjacent	6.4	5.1	5.2	5.1	5.6
Control	6.3	4.8	5.1	5.1	5.4

Tangail CPP Baseline Survey, (Dec, 1991 - April, 1992),DPC

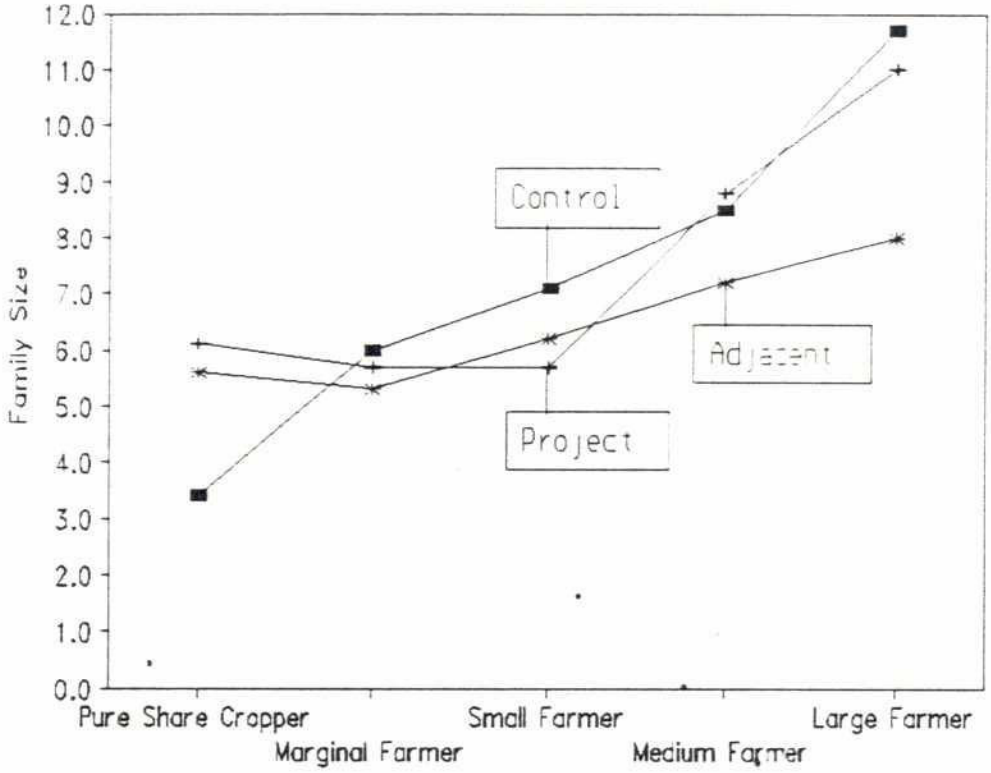
Positive correlation is found between family size and social strata of farm households as depicted in Fig-1. The higher the farm is up in the social stratification, the larger is the family size. The large farmer households have a mean family size of 11.7 against 3.4 of pure share cropper household in the project area. Several factors are accountable for the perceived big family size among the large farmers. Large subsistence capacity, higher labour demand, ensuring consolidated farm holding are chief factors influencing the large farmers to retain big family size.

Sex ratio

It is seen from the table 4.2 that male - female ratio (100 M/F) for the project area stands at 108 compared to national figure of 106 (1991 population census). Sex ratio for the adjacent area is 105 and 108 for the control area. Sex ratios, however, vary in magnitude according to category of households and survey areas. Farm households have highest sex ratio (125) in the control area and the lowest (111) in the project area. Sex ratio for non-farm households stand at 95 in both adjacent and control area and 102 in the project area. Sex ratio for fisherman households is 95 in the control area and 103 in the project area. Sex ratio for urban households varies from 118 in the project area to 88 in the adjacent area.

Table 4.2: Sex Ratio (100 M/F) in Different Study Area

Fig 1: Household Size by Land Holding Strata



Area	Farm	Non-farm	Fishermen	Urban	All HH
Project	111	102	103	118	108
Adjacent	116	95	118	88	105
Control	125	95	93	111	108

Tangail CPP Baseline Survey, (Dec. 1991 - April, 1992),DPC

Age distribution of household members

Age distribution pattern that emerges from the survey data more or less conforms to the national pattern. Table 4.3 (ref. table 104, 204 and 304 in Annex - A) presents the details of distribution of population by age in different survey areas. It is seen 54.3 percent of the population are in the age group of 15-59, considered as adult working group, in the project area against the national figure 47.8 percent (1981 population census). The percentages of adult working group stand at 52.3 and 55.5 in adjacent area and control area respectively. Persons falling within the age group 0-14 constitute about 40 percent of all household members taken together in all the survey areas. But noticeable variations are observed in minor age group composition between types of household.In project area, 0-14 age group constitutes 36.4 percent of farm household members, 43.4 percent of non farm household members, 47 percent of fishermen household members and 38.4 percent of urban household members. In adjacent area, it varies from 38.4 to 49 percent between different types of household. In control area, it varies from 34.3 percent to 43.4 percent. Fishermen

households have the highest percentage of minor age group population in all the three study areas. In other words, fishermen households have the largest supply of child labour.

Table 4.3: Age Distribution of Population in Different Study Areas

(Figure in percentage)

Area	Farm	Non-farm	Fishermen	Urban	All HH
Project					
0 - 14	36.4	43.4	47.9	38.4	40.2
15 - 59	56.1	52.4	49.2	57.3	54.3
60 +	7.5	4.2	2.9	4.3	5.5
Adjacent					
0 - 14	38.4	43.7	49.0	43.3	42.2
15 - 59	54.2	51.9	48.7	51.6	52.3
60 +	7.3	4.5	2.2	5.1	5.5
Control					
0 - 14	37.0	43.4	41.8	34.3	39.4
15 - 59	56.9	53.0	54.0	58.5	55.5
60 +	6.0	3.6	4.2	7.2	5.1

Tangail CPP Baseline Survey.(Dec. 1991 - April. 1992).DPC

4.2 Educational status

Table 4.4 shows literacy rate prevailing in the different study areas. Considering members of all households over the age 4 years, the highest literacy rate (41.4%) is recorded in the project area, followed by 34.0% in the control area and the lowest (29.4%) in the adjacent area. Looking at the literacy rate by household type, urban households enjoy the highest literacy rate in all three survey areas (38.1% in adjacent area, 55.5% in control area and 65.5% in project area). It seems that the literacy rate in Urban of project area is high because of the fact that the people of district town are much more aware about the education than thana level and union level and they also have much more available infrastructural facilities for education. The lowest literacy rate is observed among fisherman households ranging from 9.7% in the adjacent area to 16.0% in the project area. It is seen that literacy rates prevailing in the study areas are comparatively higher than the national literacy rate of 24%.

The variation may be explained by the fact that the survey methodology adopted a wider definition of literacy by considering a person literate who has had some formal schooling and can sign his name. Population census survey considers reading and writing ability, which requires full primary level education to determine literacy rate. Literacy rate is very close to the national figure, if this definition is adopted. Female literacy rate is just half of the rate attained by male members of each type of households.

Table 4.4: Literacy Rate in Different Study Areas

Area	Farm	Non-farm	Fishermen	Urban	All HH
Project	44.3	36.3	16.0	65.5	41.4
Adjacent	27.0	23.8	9.7	38.1	29.4
Control	40.1	26.9	10.8	55.7	34.0

Tangail CPP Baseline Survey, (Dec. 1991 - April. 1992),DPC

4.3 Marital status

Married persons are highly predominant in the population over 14 years of age in all the three study areas (ref. Annex). In the CPP project area, about 74.1% of farm household members, 78.0% of non-farm household members, 84.7 % of fisherman household members and 66.3 % of urban household members are married. Among the unmarried members, male clearly out-class females. A small percentage of members suffer from widowhood (ranging from 3.8% of farm household members to 5.7% urban household members). Separation, divorce and abandonment accounts for national status of less than 1.0% of all household members.

4.4 Dependency ratio

Table 4.5 presents demographic and economic dependency ratios for four categories of households in different study areas. The demographic dependency ratio are 0.84 in the project area, 0.90 and 0.80 in the adjacent and control area respectively, as against the national ratio 0.92. The highest demographic dependency ratio is observed for fisherman household in adjacent area (1.05) and the lowest (0.70) for urban households in the control area.

The economic dependency ratios are 1.6 in the project area, 1.81 and 1.54 in the adjacent and the control area respectively, as against the national ratio 2.8. The highest economic dependency ratio is observed for urban households in the adjacent area (2.1) and the lowest (1.41) for fisherman households in the control area. Economic dependency ratio is varied form area to area as because of the employment opportunity is also varied from area to area. Considering by categories of households, there is no significant variation in dependency ratios in different survey areas.

Table 4.5: Demographic and Economic Dependency Ratio in Different Area

Area	Farm		Non-farm		Fisherman		Urban		All Household	
	Demog-raphic	Econ-omic	Demog-raphic	Econ-omic	Demog-raphic	Econ-omic	Demog-raphic	Econ-omic	Demog-raphic	Econ-omic
Project	0.78	1.46	0.91	1.83	1.00	1.70	0.75	1.51	0.84	1.60
Adjacent	0.84	1.70	0.92	1.78	1.05	2.02	0.95	2.20	0.90	1.81
Control	0.76	1.47	0.89	1.78	0.85	1.41	0.70	1.38	0.80	1.54

Tangail CPP Baseline Survey, (Dec, 1991 - April, 1992),DPC

4.5 Findings and observations

- Average size of households in project, adjacent and control area are 5.7, 5.6 and 5.4 respectively and close to national average of 5.3 (1991)
- Male-Female ratio for the project, adjacent and control area stands at 108,105 and 108 respectively. National figure for the same is 106.
- Age distribution pattern in the study areas more or less conforms to the national data.
- Literacy rate is higher than the national rate (25% of 1991) in all the three areas with highest (41.4%) in the project area.
- Population over 14 years of age pre-dominated by married persons. The rate is highest 84.7% with fisherman households.
- Demographic dependency ratio is 0.84 in project area, 0.90 in adjacent and 0.80 in control area. The corresponding national figure is 0.92.
- Economic dependency ratio in the project area is 1.6 while that of adjacent and control areas are 1.81 and 1.54 respectively. National figure for the same 2.8. There is no significant variation in dependency ratio in different survey areas.

5 EMPLOYMENT AND OCCUPATION

5.1 Labour force

Labour force is considered to be the active population within the working age group of 15-59 years and employed labour force is considered to be a group of persons who are involved in productive (income earning) activities viz. crop cultivation, on and off-farming labour, fishing, artisan, trade and other gainful employment. As per the labor force survey of 1989, the countries civilian labor force is 50.7 of which 50.1 are employed.

Labour force participation rate is defined as the ratio of workers to total adult working age population. The highest labour force participation rate (55.5%) has been observed in the control area followed by 54.3% in the project area and 52.3% in the adjacent area (Table 5.1). This figure is significantly higher than the estimated national figure of 46.9% (the Statistical Year Book of Bangladesh, 1991). Labour force participation rate for both farm and non-farm households are quite close in all survey areas (54.2% to 56.9% for farm and 51.9% to 53.0% for non-farm household). Labour force participation rate for fishermen household varies considerably among three survey areas. It is 48.7% in adjacent area as compared with the highest 54% in control area. Similarly, participation rate for urban labour varies from the highest 58.5% in control area and 57.3% in CPP area to the lowest 51.6% in adjacent areas.

Table 5.1: Labour Force in Different Study Area by Category of Household Members

(Figures in Percentages over household members)

Area	Farm	Non-farm	Fisherman	Urban	All HH
Project	56.1	52.4	49.2	57.3	54.3
Adjacent	54.2	51.9	48.7	51.6	52.3
Control	56.9	53.0	54.0	58.5	55.5

Tangail CPP Baseline Survey, (Dec,1991 - April, 1992), DPC

5.2 Employment

Employment rate is defined as the ratio of working people employed to total labour force Table 5.2 shows the highest employment rate (51.4%) is observed in the control area followed by that in the project area (50.7%) and the lowest in the adjacent area (49.9%). These figures are, significantly lower than the estimated national figure of 74.5% (the Statistical Year Book of Bangladesh, 1991). Considering all projects and household categories together, there exist variations in employment rates. Among farming household, employment rate (53.6) is the highest in the project area. Non-farming household is the highest in the adjacent area (52.1%) whereas fishing and urban population employment rates are found to be the highest in the control area.

In case of male employment rate, the trend is found to be similar. Considering all the projects and household categories together, female employment rate is the highest in the control area, second in the project area and the lowest in adjacent area. In the control area, urban female employment rate (14.9%) is the highest amongst the household and there is no female employment in the fisherman category in the adjacent area.

Table 5.2: Employment of Labour Force in Different Study Areas by Category of Households

(Figures in Percentages over adult labour force population)

Area	Farm	Non-farm	Fisherman	Urban	All HH
Project	53.6	49.6	45.9	47.3	50.7
Adjacent	49.0	52.1	52.4	43.9	49.9
Control	51.2	49.9	58.2	51.4	51.4

Tangail CPP Baseline Survey, (Dec.1991 - April, 1992), DPC

5.3 Mandays employed

Highest mandays employed (355 man days/year) is found in adjacent area and the lowest (304 man days/years) is found in the control area. The figure of 306 man days /year is found in the project area. An earning members of farm household in the adjacent area engaged in work minimum 342 man days/year whereas the lower figure 274 man days/year is found for urban household in the project area (Table 5.3).

Table 5.3 : Mean Days Employed by Type of Household in Different Study Areas

(Figures in mean days)

Area	Farm	Non-farm	Fisherman	Urban	All HH
Project	310	315	303	274	306
Adjacent	342	331	325	331	306
Control	300	294	316	326	304

Tangail CPP Baseline Survey, (Dec.1991 - April, 1992), DPC

Table 5.4 shows the average days employed by category of farm household in different study areas. All farm households have more work days in adjacent areas than the project and control areas. In the project and adjacent areas pure share croppers are employed for moved days that other category of farms, but for control area it is inverse. An earning member of pure share cropper in adjacent area is engaged in work for a maximum 334 mandays a year whereas it was lowest 283 mandays per year for pure sharecropper in control area.

Table 5.4: Mean Days Employed by Category of Farm Households in Different Study Areas

(Figures in mean days)

Area	Pure Share	Marginal	Small	Medium Cropper	Large Cropper	All Farmer
Project	333	313	311	309	309	310
Adjacent	334	312	312	317	317	315
Control	283	289	294	318	315	300

Tangail CPP Baseline Survey, (Dec.1991 - April, 1992), DPC

5.4 Crude and refined activity rates

The crude activity rate is defined as the ratio of economically active population of 14 years and above to total population. In case of refined activity rate, the denominator is the population of the same age group. The crude rates are nearly the same in the project (28.4%) and control study (28.9%) areas (Table 5.5), it is the lowest in the adjacent area (26.2%).

Table 5.5: Crude Activity Rates in Different Study Areas by Category of Households

(Figures in Percentages over household)

Area	Farm	Non-farm	Fisherman	Urban	All HH
Project	30.0	25.9	29.8	28.2	28.4
Adjacent	26.8	27.0	25.5	22.8	28.2
Control	29.2	26.4	32.6	30.0	28.9

Tangail CPP Baseline Survey, (Dec.1991 - April, 1992), DPC

The refined activity rate within the range of 40.4% to 45.8% for the urban population; for farm households, it is 47.2% in the project area, 46.5% for control area and 43.1% for adjacent area (Table 5.6). The refined activity rates in all the three study areas are lower than the national figure (74.5%) of 1989 but similar to the national figure of 1985-86 as well as 1984-85 indicating definitional variations.

This fact can be explained further by endangerment of some of the very significant traditional employment sector in the study areas. For instance, traditional employment were cut off in forest/forest product marketing sector due to sharp decreasing of the Modhupur track forest area and in the water transport sector due to decreasing of water navigation routes etc. Another reason may be that one of the most important traditional cottage industry i.e. brass crookeries and bell works, mat is almost endangered today and that has narrowed the refined activity in the area. In addition, the employment in the horse/hackney carriage which was dominant even before two/three decades is almost absent today in the Tangail area and it also may have a caused decrease in the refined activities.

Table 5.6 : Refined Activity Rates by Category of Household in Different Areas

(Figures in Percentages over household)

Area	Farm	Non-farm	Fisherman	Urban	All HH
Project	47.2	45.8	43.5	43.9	52.6
Adjacent	43.1	48.0	50.0	40.0	45.4
Control	46.5	46.7	53.9	45.8	47.4

Tangail CPP Baseline Survey, (Dec.1991 - April, 1992), DPC

5.5 Occupation

From this rural household census data, out of 18,257 heads of households, 14,856 (81.4%) are involved in income generating or productive work. Table 5.7 shows that agriculture is the main occupation of most (30.5%) of the heads of the households in all the study areas taken together. The importance of agriculture in rural household as the main occupation however varies across the study areas, it is highest (37.2%) in adjacent area followed by 31.3% in control and lowest (28.5%) in project area in comparison to national available

figure (72.7%) it seems a large difference, due to definitional variations. In case of fisherman and urban household category, only 0.1% and 9.7% heads of households respondents are involved in agriculture as their main occupation. Due to predominance of landless, marginal and small farmer in the study areas, sale of labour as the principal occupation is significant.

Table 5.7: Occupational Distribution of Household Head in Different Study Areas

(Figures in percentages over household head of census households)

Occupation	Project			Adjacent			Control		
	Rural	Fish-ermen	Urban	Rural	Fish-ermen	Urban	Rural	Fish-ermen	Urban
Agriculture	28.5	-	6.6	37.2	0.4	17.8	31.3	-	6.6
Wage Labourer	31.0	-	27.5	30.4	-	27.9	20.7	-	20.1
Service	7.6	-	29.4	8.5	-	6.9	3.0	-	19.9
Trading	9.2	-	20.0	9.2	-	26.2	21.2	-	28.5
Fisherman	0.1	98.2	2.6	0.1	99.6	-	0.5	100.0	10.1
Artisan	15.0	-	4.6	6.6	-	14.3	12.5	-	0.9
Other	4.6	-	7.3	5.8	-	1.5	9.9	-	3.6
Unemployed	4.0	1.8	2.0	0.7	-	1.4	1.0	-	1.2

Tangail CPP Baseline Survey, (Dec,1991 - April, 1992), DPC

In rural household category, project area has the highest rate of wage labourer (31.0%) followed by that (30.4%) in adjacent area, the lowest percentage figure (20.7%) is found in control area. The national agricultural labour households as percent of total household found 39.8%. No heads in fisherman households category are involved as wage labourer. But for urban household category, on an average, 25.8% heads are involved in wage labour as their main occupation.

In all survey areas taken together, services and trading in urban household category accounts for employment of 23.5% and 24.6% of heads of households respectively as their main occupation. However,there are some variation across the study area. In fisherman household category, taking all the survey areas together, 99.2% heads are involved in fishing as their main occupation. The highest (14.3%) employment for urban household category is in adjacent area and are involved in artisan activities as their main occupation.

5.6 Findings and observations

- Highest labour force participation has been found in control area (55.5%) households and the lowest (52.3%) in adjacent area, control area also has the highest employment rate (51.4%). Farm household employment is highest in project area (53.6%) and non-farming household employment is highest in adjacent area (52.1%). Urban female employment rate is highest (14.9%) in control area while fisherman households in adjacent area have zero female employment.

- Adjacent areas has highest man days employment (355 days/year) while project area has 306 days and control area has 304 days/year by types. All farm households have more work days in adjacent areas. Pure share croppers in control areas have lowest (283 days/years) mandays employment.

- Refined activity rate (40-47%) in the study area are similar to national figures of 1965-86, 1984-85 but substantially lower than the national figure for 1989(74%).

- 81.4% of heads of rural households are engaged in income generating activities Agriculture is the main occupation (30.5%) for all HHs taken together. It is 37% in adjacent, 31.3% in control and 28.5% in project area against national average of 72.7%. In case of fishermen household, 0.1% to 9.7% heads are involved in agriculture.

- Project area has the highest wage laborers (31%). Sale of labor is a principal occupation indicating for dominance of landless, marginal and small farmers.

6 LAND HOLDING STRUCTURE, TENURIAL PATTERN AND CHANGE IN LAND OWNERSHIP

6.1 Land Holding

The sample farm household 132 have been surveyed in project area, 131 farm household in adjacent area and 125 farm household in control area. Land holding size by farmers category in different study areas is shown in Table 6.1. Land holding constitute of cultivable land, homestead, pond and other non-cultivable land.

Table 6.1: Land Holding Size by Farmers Category in Different Study Area

(Figure indicates av. area in hectare)

Study Area	Pure Share Cropper	Marginal Farmer	Small Farmer	Medium Farmer	Large Farmer	All Farmer
Project	0.19	0.44	0.66	1.40	3.08	0.83
Adjacent	0.08	0.44	0.82	1.57	4.13	1.09
Control	0.06	0.37	0.55	1.67	2.40	0.74

Tangail Household Survey (Dec,1991-April,1992), DPC

Unequal land distribution pattern is clearly reflected from the above table. Land holding size is highest (1.09 hectares) in adjacent area followed by 0.83 hectare in project area, where as lowest 0.74 hectare is found in control area. The large farmer households have a mean landholding size of 4.13 hectare in the adjacent area, 3.08 hectare in the project area and 2.40 hectare in the control area. The pure share cropper household have a mean landholding size 0.08 hectare in the adjacent area, 0.19 hectare in the project area and 0.06 hectare in the control area.

In the project area however only 5.3 of all farm household who belong to the large farmer category own about 21 percent cultivable land. On the other hand, as many as 80 percent of the poor farmer (pure share cropper, marginal and small farmer) own 53.4 percent of the cultivable land. Medium farmer can attain some degree of stability out of land ownership since 15 percent own about 26 percent of the cultivable land.

6.2 Farm size and distribution

The average size of own cultivated land is 0.95 hectare per household in adjacent area which is the highest own size land of all three study areas, 0.71 hectare own size land per house hold in project area and lowest 0.65 hectare own size land per house hold in control area (Table 7.2).

The pure share cropper in the adjacent area have own cultivated land per household 0.01 hectare, 0.10 hectare land belong to share cropper in the project area and 0.02 hectare land owned by the share cropper of the control area. It is further observed that the own cultivated land size of different categories of farmers have direct relationship with their land holding sizes. That is, the larger the land holding size of a farmer, the larger is his own cultivated land size, and vice versa.

Table 6.2: Farm Size (Own Cultivated Land) by Farmers Category in Different Study Areas

(Figure indicates av. area in hectare)

Study Area	Pure Share Cropper	Marginal Farmer	Small Farmer	Medium Farmer	Large Farmer	All Farmer
Project	0.10	0.36	0.56	1.20	2.82	0.71
Adjacent	0.01	0.38	0.64	1.44	3.46	0.95
Control	0.02	0.31	0.48	1.51	3.05	0.65

Tangail Household Survey (Dec,1991-April,1992), DPC

Table 6.3: Farm Size (Operated Land) by Farmers Category in Different Study Areas

(Figure indicates av. area in hectare)

Study Area	Pure Share Cropper	Marginal Farmer	Small Farmer	Medium Farmer	Large Farmer	All Farmer
Project	0.43	0.34	0.70	1.36	2.63	0.80
Adjacent	0.69	0.39	0.66	1.49	3.28	1.00
Control	0.63	0.33	0.65	1.49	2.66	0.78

Tangail Household Survey (Dec,1991-April,1992), DPC

Generally marginal and small farmers own cultivated lands of smaller units which are not capable enough to produce required food for their families. To produce more food, they take lands of others on share crop or lease in basis for a particular season or year. Some of these poor farmers mortgage out or mortgage in apart of their own cultivated lands to or from medium or large farmers against cash payment. All such additional lands of others which are crop share, lease or cash payment basis plus their own cultivated lands constitute the actual operated land for a particular farmer.

The average operated farm size per household is 1.0 hectare in adjacent areas, 0.8 hectare farm size in the project area where as 0.78 hectare land size owned by per household in the control area. Operated farm size per household of marginal farmer was lower than other category of land operated households in all three areas. The large farmer have 3.28 hectare operated land in adjacent area which is the highest operated land size (Table 6.3).

Table 6.4: Ratio of Operated Land Size and Owned Land Size in Different Study Area by Farmers Category

(Figure indicates av. area in hectare)

Study Area	Pure Share Cropper	Marginal Farmer	Small Farmer	Medium Farmer	Large Farmer	All Farmer
Project	4.30	0.94	1.25	1.13	0.93	1.13
Adjacent	69.00	1.03	1.03	1.03	0.95	1.05
Control	31.05	1.06	1.35	0.97	0.87	1.20

Tangail Household Survey (Dec,1991-April,1992), DPC

From Table 6.4 it has been revealed that the ratio between operated land size and owned land size is 1.2 in control area, 0.13 in the project area and 1.05 in adjacent area. The ratio for pure share cropper 4.3 in project area, 69 in adjacent area and 31.5 is control area respectively. It means that pure share cropper operate 4.3 in project area. For large farmer it is found that the ratio is less than 1 in all three areas. It does mean that they do not operate their whole cultivable farm. They usually rent out their land to the share cropper. For small farmer the ratio is larger than 1 which indicates that they operate more land. But it is lower than pure share cropper.

For marginal farmer the ratio is less than 1 in project area and higher than 1 in other two areas. For medium farmer the ratio is less than 1 in control area and higher than 1 in other two areas.

6.3 Land Fragmentation

With the rapid growth of the households numbers, the lands are also being fragmented numerously in Bangladesh. In the CPP project area, average plot no. per households is found to be 9.1, which is the basic indicator of land fragmentation. This situation can be explained by the fact of higher population density and major urban influence in that area. In the adjacent and control areas average plot no. per household has been enumerated to 5.3 and 5.7 respectively. This figures are very close to the national average.

From Table 6.5, it has been revealed that the average plot no. per households increases as the farm size is larger. This relationship is found in the CPP project, control and adjacent areas among all categories of owner-farmers. Another relationship exists between the farm size and average plot size owned by a household. From the same table it can be concluded that as the farm size is larger, the average plot size is bigger and the plots are more segmented.

Table 6.5: Fragmentation of Operated Land by Farmers Category in Different Study Area

(Figure indicates av. no. of plot/farmer and av. area in ha/plot)

Farmers Category	Project		Adjacent		Control	
	Av plot No.	Av area/ Plot	Av plot No.	Av area/ Plot	Av plot No.	Av area Plot
Pure Share Cropper	3.5	0.11	4.0	0.17	4.1	0.15
Marginal	3.1	0.10	3.3	0.12	3.8	0.10
Small	5.9	0.12	4.7	0.14	5.8	0.11
Medium	9.2	0.15	7.8	0.19	7.8	0.19
Large	12.6	0.24	10.7	0.31	9.1	0.34
All	9.1	0.13	5.7	0.18	5.3	0.15

Tangail Household Survey (Dec,1991-April,1992), DPC

6.4 Tenurial pattern

Table 6.6 shows that pure share cropper have 0.68 hectare share-in-land in adjacent area, 0.34 hectare share in land in project area and 0.60 hectare share in land in control area. These are the high share in land in comparison to other farmer category.

Table 6.6: Share-in-Land in Different Study Area By Farmers Category

(Figure indicate av. area in hectare)

Study Area	Pure Share Cropper	Marginal Farmer	Small Farmer	Medium Farmer	Large Farmer	All Farmer
Project	0.34	0.05	0.11	0.23	0.20	0.13
Adjacent	0.68	0.17	0.34	0.49	0.49	0.48
Control	0.60	0.25	0.25	0.35	0.73	0.28

Tangail Household Survey (Dec,1991-April,1992), DPC

Table 6.7: Share-Out-Land in Different Study Area by Farmers Category

(Figure indicate av. area in hectare)

Study Area	Pure Share Cropper	Marginal Farmer	Small Farmer	Medium Farmer	Large Farmer	All Farmer
Project	-	0.02	0.30	0.05	0.20	0.02
Adjacent	-	-	0.64	0.97	3.24	1.09
Control	-	0.94	-	1.16	3.47	1.68

Tangail Household Survey (Dec,1991-April,1992), DPC

Table 6.7 stated that the share croppers do not have any land to give share out in all three study areas. Large farmer have their own enough cultivable land and it is their usual practice to give share out land to the share-croppers.

6.5 Terms of share cropping

It is found that the term of share cropping practiced in all the three study areas is by sharing of 50% of produced crop by the share cropper. However, the terms of share cropping also include sharing of by-products by the share cropper and the share percentage varies from 50% to 100%. It has been enumerated that about 58% households in the project area share 50% of the by-products, whereas about 40% households share the 100% of the by products. In the control and project areas, 50% by-products is shared by about 36% and 54% households and rest of the share cropper households reported to share 100% of by-products.

From the Table 6.9 it has been revealed that the 100% of labour and draught power are provided by all the surveyed share cropper households for share cropping. However, the vital agriculture inputs like irrigation water charges, chemical fertilizer, insecticides/pesticides, seeds etc. are by both the land lord and share cropper. More than 90% of households reported to bear 100% of seeds, whereas in the project area about 95 irrigation water charges are provided by the land lord.

Table 6.8: Share of Crop and by Products by Share Cropper Farmer in Different Study Areas (Figure indicate percentage of share cropper)

Study Area	Crop* 50%	By Product*		
		50%	75%	100%
Project	100	58.3	2.1	39.6
Adjacent	100	54.8	-	45.2
Control	100	36.5	1.9	61.6

Tangail Household Survey (Dec.1991-April,1992), DPC
* Share of share cropper

Table 6.9: Share of Inputs* by Share Cropper in Different Study Areas

(Figure indicate percentage of share cropper)

Input	Project			Adjacent			Control		
	50%	75%	100%	50%	75%	100%	50%	75%	100%
Labour	-	-	100.0	-	-	100.0	-	-	100.0
Draught Power	-	-	100.0	-	-	100.0	-	-	100.0
Seed	8.3	-	91.7	19.3	-	80.7	-	3.8	96.2
Chemical Fertilizer	43.7	-	56.3	25.8	-	74.2	17.3	1.9	80.8
Insecticides/ Pesticides	12.5	-	87.5	3.2	-	96.8	3.8	-	82.7
Irri. Water Charges	95.8	2.1	2.1	67.7	-	32.3	44.2	3.8	46.2

Tangail Household Survey (Dec,1991-April,1992), DPC
* Input supplied/provided by sharecropper

6.6 Findings and observations

- Land holding size is highest (1.09 ha) in adjacent area.
- Highest average own cultivated land of 0.95 hectare is there in the adjacent area while project area average 0.71 hactre.
- Larger own size land holding has a direct correlation with cultivable land size among different categories of farmers. The ratio between the two varies among households.
- Average number of plot per household is found to be 9.1 in project, 5.3 in adjacent and 5.7 in control areas. The figures are close to national average and confirms fragmented characteristics of land holdings.
- Except pure share croppers, most other farmers share out land.
- Most common terms for share-cropping in the study area is 50% sharing. Sharing of by product varies from 40-100%

7 CROP PRODUCTION

7.1 Present land use

According to the distribution of operated farm land, by flooding depth within the study areas (Table 7.1) the F_2 area (medium lowland) inside the adjacent and the project areas has the maximum percentages of operated lands (53.1% and 49.3% respectively) as compared to F_0, F_1 and F_2 areas. On the other hand, the F_0 land area (flood free) has the minimum percentage distribution of operated lands. This is due to the presence non-operated sandy type, highland soils not fit for crop cultivation.

Table 7.1: Distribution of Farm (Operated) Land by Flood Criteria in Different Study Areas

(Figure indicate percentages over net operated area)

Study Area	F0	F1	F2	F3
Project	4.3	30.6	49.3	15.9
Adjacent	1.5	25.9	53.1	19.5
Control	9.6	43.1	27.5	19.8

Tangail Household Baseline Survey (Dec,1991 - April,1992),DPC

Small farmers have the maximum operated farmlands in the project area (44.6%), whereas medium farmers in the adjacent and control areas have the maximum operated lands up to 33.3% and 27.2% respectively (Table 7.2). The pure share croppers in the study areas have the lowest percentage of farmlands.

Table 7.2: Distribution of Farm (Operated) Land by Farmers Category in Different Study Area

(Figure indicate percentages over net operated area)

Farmers Category	Project	Adjacent	Control
Pure Share Cropper	2.4	4.7	9.4
Marginal Farmer	9.9	9.6	16.8
Small Farmer	44.6	24.8	24.6
Medium Farmer	25.7	33.3	27.2
Large Farmer	17.4	27.6	22.0

Tangail Household Baseline Survey (Dec,1991 - April,1992),DPC

While analyzing the effects of various categories of farmers and flood depth on the distribution of operated farmlands, it is seen in the Table 7.3, that the pure share cropper in the F2 area has the highest percentage of operated lands, varying between 50.6% and 58.5% as compared to F0, F1 and F3 areas. The small farmer in all study areas has the next highest percentage of operated land in the F1 areas (highest 50.9% in the control area and lowest 26.5% in adjacent area). The large farmer has also the highest 69.1% operated land in F2 area in the project area.

Table 7.3: Distribution of Farm (Operated) Land by Farmers Category and Flood Criteria in Different Study Area

Figure indicate percentages over net operated area)

Farmers Category	Project				Adjacent				Control			
	F0	F1	F2	F3	F0	F1	F2	F3	F0	F1	F2	F3
Pure S Cropper	-	36.0	58.5	5.5	2.3	39.3	58.4	-	3.0	25.7	50.6	20.6
Marginal Farmer	1.9	34.8	40.5	22.8	2.7	18.8	63.4	15.2	3.6	44.1	33.6	13.8
Small Farmer	2.5	32.9	48.4	16.8	1.0	26.5	49.9	22.7	8.7	50.9	25.2	15.2
Medium Farmer	9.1	38.2	40.0	12.8	1.7	25.0	49.8	23.5	7.3	46.7	21.1	24.9
Large Farmer	3.7	10.3	69.1	16.8	1.0	26.6	55.6	19.7	16.9	36.7	23.4	22.8
All Farmer	4.3	30.6	49.3	15.9	1.5	25.9	53.1	19.5	9.6	43.1	27.5	19.8

Tangail Household Baseline Survey (Dec,1991 - April,1992),DPC

Double cropped area is the dominant pattern through the study areas, varying from 49.9% of net cropped area in the CPP area to 64.2% in the adjacent area. The double crop patterns crops include Boro/Wheat followed by T. Aman/T.Aus/B.Aus or T.Aman/T.Aus/B.Aus followed by Pulses/Oilseeds/wheat or T. Aus/B. Aus followed by Potato/Vegetables or mixed Aus and Aman followed by wheat/Oilseeds or Jute followed by T.Aman/oilseed/pulses (Table 7.4). After the double cropped area comes the next highest single cropped area, varying from 26.7% in the adjacent area to 24.0% in the project area. The single patterns of crops include mixed Aus and Aman, B.Aman, Jute and Sugarcane.

Table 7.4: Crop Land Distribution in Different Study Areas

(Figure indicates percentages over net operated area)

Study Area	Single Cropped Area	Double Cropped Area	Triple Cropped Area
Project Area	24.0	49.9	26.1
Adjacent Area	26.7	64.2	9.1
Control Area	25.2	52.1	22.7

Tangail Household Baseline Survey (Dec,1991 - April,1992),DPC

Triple cropped area, is maximum (26.1%) in the project area. In the other two study areas, the triple cropped areas are minimum (9.1% and 22.7% respectively). The high proportion of triple cropped area just after the double cropped area in the project area is the direct benefit of better water availability and other inputs supply in the project area.

The triple patterns of crops include Boro/wheat/vegetables followed by T. Aus/ B.Aus followed by T.Aman or T.Aus/B.Aus followed by T.Aman followed by pulses/ oilseeds or Boro/wheat followed by T.Aus/B. Aus followed by Potato/Vegetables, or B. Aus/Jute followed by T.Aman followed by Pulses/Oilseeds/Wheat.

As seen in the Table 7.5, the pure share cropper has the maximum percentage of operated land (63.9%) in the project area. Whereas the marginal farmer has the highest area of double cropped land (70.2%) in the adjacent study area. The small, medium and large farmers have the maximum double cropped land in all study areas. This shows that all

categories of farmers (excepting share cropper in project area) have the maximum double cropped area and single cropped areas followed by triple cropped areas in almost all study areas.

Table 7.5: Distribution of Crop Land by Farmers Category in Different Study Area

(Figure indicate percentages over net operated area)

Farmers Category	Project			Adjacent			Control		
	Single Cropd	Double Cropd	Triple Cropd	Single Cropd	Double Cropd	Triple Cropd	Single Cropd	Double Cropd	Triple Cropd
Pure Sh Cropper	9.1	4.0	63.9	39.3	60.7	-	12.8	53.3	33.9
Marginal Farmer	18.5	50.0	31.5	13.6	70.2	16.1	23.9	46.7	29.4
Small Farmer	26.7	47.0	26.4	22.5	65.6	11.8	26.8	53.5	19.7
Medium Farmer	18.0	60.2	21.8	24.0	63.2	12.7	26.1	54.2	19.7
Large Farmer	31.0	45.6	23.4	35.8	62.7	1.5	28.8	51.5	19.7
All Farmer	24.0	49.9	26.1	26.6	64.4	9.1	25.2	52.1	22.7

Tangail Household Baseline Survey (Dec,1991 - April,1992),DPC

7.2 Cropping intensity

It is found in the table 8.6 that the overall cropping intensity is the highest (202%) in the project area. The lowest intensity (182.4%) is in the adjacent area. Better irrigation and extension facilities in the project area has brought the cropping intensity to the maximum, compared to the other study areas. The intensity, depending on the type of land elevation and characterizing the nature and behavior of types of soils, as well as, crops is the highest, (232.1%) in the F_1 lands or medium highlands of the project area. Whereas the cropping intensity is lowest (144.8%) in F_0 lands of the project area.

Table 7.6: Cropping Intensity by Flood Criteria in Different Study Areas

(Figure indicate percentages)

Study Area	F_0	F_1	F_2	F_3	All
Project	144.8	232.1	206.0	147.6	202.0
Adjacent	154.8	192.8	185.8	161.5	182.4
Control	183.0	209.0	205.0	169.0	197.0

Tangail Household Baseline Survey (Dec,1991 - April,1992),DPC

Table 7.7: Cropping Intensity by Farmers Category in Different Study Area

(Figure indicate percentages)

Farmers Category	Project	Adjacent	Control
Pure Share Cropper	254.7	160.7	221.0
Marginal Farmer	213.0	202.5	205.0
Small Farmer	199.7	188.7	193.0
Medium Farmer	203.6	188.7	194.0
Large Farmer	192.3	165.7	190.0
All Farmer	202.0	182.4	197.0

Tangail Household Baseline Survey (Dec,1991 - April,1992),DPC

Analysis of the cropping intensity by the categories of farmers in different study areas, shown in the Table 7.7 shows, it is seen that the pure share cropper in the project area has the highest cropping intensity of 254.7%. The cropping intensities achieved by different farmers categories in the project area is also higher than that in the adjacent and control areas. Such higher cropping intensity in the project area among all categories of farmers is due to higher irrigation and extension facilities available in this area.

7.3 Cropping pattern

Table 7.8 presents a generalized cropping pattern and sequences of the study areas; locally, one particular cropping pattern may predominate. The farmers like elsewhere in the country, are innovative and had adopted their cropping sequences primarily depending on the elevation of the land in relation to flooding during the monsoon season, irrigation facilities and the available soil moisture during the rabi season, soils and potentialities ease of management.

The major crop is IRRI Boro (Braus) as single crop or double and triple crop (follow by Rabi crops and T Aman). This data clearly indicates that all the study areas have a remarkable transformation to the modern agricultural technology. The single pattern in the study areas cover 22.5% to 27% of the total cropped area. Of them, the highest percentage of the single cropped area lies in the control area and the lowest in the project area. IRRI-Boro is the dominating single crop in all three study areas from 14.3% to 15.6%.

The double pattern in the study area 50% to 61% of the total cropped area. Of them,the highest percentage of the double cropped areas lies in the adjacent area and the lowest in the project area. IRRI-Boro followed by other minor crops is the dominating double crops in all study areas, varying from 11.8% to 25.6%. Of them the highest percentage lies in the lowest area and the next highest (20.9%) in the project area. The next dominant double pattern in the project area. The next dominant double pattern in the project area and adjacent area in jute-wheat/poto/pulse/mustered /spices, varying between 13.7% and 17% respectively, while in the control area the second dominant double pattern (10.2%) is Irri-Boro (Brause) pato/mustered/pulse.

The triple pattern within study areas cover 9.1% to 26.2% of total cropped area. Of them, the highest percentage of the triple cropped area lies in the project area and the lowest in the adjacent area. Irri-Boro(Braus) Aman-wheat/pluse/mustered/poto/spies is the dominating triple crops in all study areas, varying from 5.3% to 19.5% . Of them the highest percentage lies in the project area and the next highest percentage (17.1%) in the control area. While comparing the single ,double and triple cropped areas at the study areas with those of the latest national statistics, it is observed that the national estimate of the single, double and triple cropped areas are 30.9%, 52.7% and 16.4% respectively. his means that the study areas have almost some percentage of the single and double cropped areas, and much higher triple cropped areas as compared to the latest national statistics of the BBS, 1991.

Table 7.8: Cropping Pattern in Different Study Area

(Figure indicates percentages over total cropped area)

Cropping Pattern	Project	Adjacent	Control
Single Cropped			
Current Fallow	-	1.0	-
Boro	0.9	-	1.6
IRRI-Boro (Braus)	15.6	14.4	14.3
B Aus	0.3	0.9	0.7
Mixed Aus Aman	-	0.3	-
T Aus	-	0.5	0.1
B Aman	0.2	-	0.4
T Aman	-	-	3.9
Jute	3.0	5.0	3.8
Wheat	0.2	-	0.1
Other Rabi Crops (Potato, mustered, pulse, spices)	1.0	1.0	2.2
Vegetables	0.7	0.3	0.2
Other Minor Crops	0.6	0.2	0.4
Double Cropped			
B Aman- Wheat/Potato/Pulse/Mustered	0.4	0.9	0.8
B Aman- Other Minor Crops	0.1	0.4	-
T Aman- Boro-	0.3	-	1.2
T Aman- Wheat/Potato	-	0.3	0.3
T Aman- Other Minor Crops	0.7	1.9	0.7
B Aus - Wheat/Mustered/Pulse	3.0	9.2	2.2
B Aus - Potato/Vegetable	-	0.9	0.3
B Aus - Other Minor Crops	0.3	0.5	0.3
T Aus - Other Minor Crops	0.2	-	0.4
Jute - Wheat/Potato/Pulse/Mustered/Spices	13.7	17.0	5.5
Jute - T Aman	2.4	1.2	3.0
Jute - Other Minor Crops	1.2	0.6	0.4
Mix Aus Aman-Wheat/Mustered/Pulse	1.3	2.0	1.3
Mix Aus Aman-Other Minor Crops	-	1.7	-
IRRI-Boro (Braus)-Potato/Mustered/Pulse	5.5	13.2	10.2
IRRI-Boro (Braus)-Other Minor Crops	20.9	11.8	25 6
Triple Cropped			
B Aus-T Aman-Wheat	0.3	0.5	1.0
B Aus-T Aman-Mustered/Pulses/Vegetable	1.8	1.2	1.2
T Aus-T Aman-Boro	-	-	0.5
T Aus-T Aman-Wheat/Mustered/Pulse	-	-	0.6
Jute-T Aman-Wheat/Pulses/Mustered/Potato/Spices	4.2	1.8	1.9
Jute-T Aman- Other Minor Crops	0.4	0.3	-
IRRI Boro (Braus)-T Aman-Wheat/Pulses/Mustered/Potato/Spices	19.5	5.3	17.1
Perineal Crops			
Sugarcane	1.3	3.2	3.8

Tangail Household Baseline Survey (Dec.1991 - April,1992),DPC

7.4 Crop yield and production

The yield of paddy is maximum (2.89 ton/ha) in the project area, while in the adjacent and control areas it is some what lower (2.58 and 2.21 ton/ha respectively). Wheat has the maximum yield of 2.31 ton/ha in the control area. similarly potato and pulses have the maximum yield of 10.35 and 1.02 ton/ha respectively in the control area. Oilseeds, spices

and vegetables have the highest yields of 0.95, 2.58 and 12.52 ton/ha respectively in the project area. These crops have appreciably low yields both in the adjacent area and control area. Sugarcane has the highest yield of 18.85 ton/ha in the project area against 15.8 ton/ha in the control area.

Table 7.9: Area by Major Crops and Yield Rate in Different Study Areas

Crops	Project		Adjacent		Control	
	Area (%)	Yield Rate Ton/ha	Area (%)	Yield Rate Ton/ha	Area (%)	Yield Rate Ton/ha
Paddy	55.4	2.89	51.3	2.58	67.8	2.21
Wheat	6.0	1.69	12.0	1.93	4.4	2.31
Potato	0.8	7.63	1.3	7.21	0.7	10.35
Pulses	4.2	0.82	6.0	0.94	1.5	1.02
Oilseeds	16.3	0.95	11.5	0.88	15.8	0.92
Spices	0.6	2.58	0.5	1.18	0.1	1.30
Vegetables	0.7	12.52	0.3	14.26	0.7	9.18
Jute	13.6	1.48	14.5	1.56	7.6	1.36
Sugarcane	0.9	18.85	1.1	9.51	0.1	15.80
Other Minor Crops	1.4	1.55	1.5	1.49	1.3	4.92

Tangail Household Baseline Survey (Dec,1991 - April,1992),DPC

HYV and local variety paddy yield rate

The yield rate of HYV paddy is the highest (4.15 ton/ha) in the adjacent area. The yield of HYV paddy is slightly lower (4.03 ton/ha) in the project area. It is 3.56 ton/ha and the lowest in the control area. Similarly, the paddy has the highest yield of 0.86 ton/ha in the adjacent area against 0.78 and 0.76 ton/ha in the project and control areas respectively.

Table 7.10: Productivity and Area Coverage of High Yielding Variety (HYV) and Local Variety (LV) of Paddy in Different Study Areas

Paddy Variety	Project		Adjacent		Control	
	Area (%)	Yield Rate Ton/ha	Area (%)	Yield Rate Ton/ha	Area (%)	Yield Rate Ton/ha
Paddy HYV	61.8	4.03	47.7	4.15	51.7	3.56
Paddy LV	38.2	0.78	52.3	0.86	48.3	0.76

Tangail Household Baseline Survey (Dec,1991 - April,1992),DPC

7.5 Crop damage

Heavy damages of crops have been caused due to early rain and river water, and also pest attack. Other factors, like speedy rise of flood water and drought bring about low crop damages. For example, the early rain water affect about 37% of the total damage area in the adjacent study area, while the damage is much lower, i.e. 19.6% in the project area and 17% in the control area (Table 7.5). The early rise of river water causes the maximum damage of 32.5% of T. Aman and Jute area, while it is relatively lower in the other study areas.

varying between 15.6% in the control area and 23% in the adjacent area. The crop damage due to pest attack is found maximum up to 42.6% in the control area, while it is 24.8% in the project area. The crops affected by pest are mainly Irri, Aus and mustard, Due to drought only 5.3% of the damages has occurred in the project area and 5.6% in the control area.

Table 7.11: Crop Damage by Causes in Different Study Areas

(Figure indicate percentages over total cropped area)

Causes	Project	Adjacent	Control
Early rain water	32.4	31.6	22.2
Early rise in river water	35.4	34.2	35.7
High water rise in river	33.1	28.5	33.7
Speedy water rise	26.1	23.1	40.9
Draught	30.0	27.5	37.7
Pest attack	30.0	27.5	37.7
Others	30.0	27.5	37.7

Tangail Household Baseline Survey (Dec,1991 - April,1992),DPC

7.6 Coverage of Irrigation

The irrigated crop land is maximum in all study areas during Karif 1 season. It covers 72.7% of the total cropped land in the control area, 65.7% in the project area and 52% in the adjacent area. The irrigation coverage in not so pronounced in Rabi season. It covers only 3.6% of the total cropped area in project area and 8% in the control area. There is almost no irrigation in the Kharif-2 season with only 0.1% in the project area. There is nil irrigation during kharif-2 in the other study areas (Table 7.14).

Table 7.12: Irrigation Coverage by Farmers Category in Different Study Area

(Figure indicate percentages over net cropped area)

Farmers Category	Project	Adjacent	Control
Pure Share Cropper	65.5	57.6	43.7
Marginal Farmer	71.5	62.4	70.3
Small Farmer	66.9	52.0	66.4
Medium Farmer	52.7	42.1	80.6
Large Farmer	60.6	50.2	74.3
All Farmer	62.8	49.4	70.1

Tangail Household Baseline Survey (Dec,1991 - April,1992),DPC

Table 7.13: Irrigation Coverage by Flood Criteria in Different Study Area

(Figure indicate percentages over net cropped area)

Flood Criteria	Project	Adjacent	Control
Fo	6.1	6.4	45.3
F1	43.8	30.1	64.1
F2	70.7	54.3	77.4
F3	90.4	65.2	86.3

Tangail Household Baseline Survey (Dec,1991 - April,1992),DPC

7.7 Irrigated crop land by farmers category

The irrigated crop lands belonging to marginal farmers are maximum in all study areas (varying from 62.4% to 70.3% of the net cropped area). The pure share croppers irrigate 65.5% of their net cropped area, the small farmers in the same area 66.9%, while 52.7% to 60.6% land is irrigated by medium and large farmers (Table 7.12). In the adjacent area, pure share cropper irrigates 57.6% cropped land, while the small and medium farmer in the same area irrigate less land, varying from 42.1% to 52.0%. The large farmers in the control area irrigate 74.3% cropped area and they irrigate 50.2% to 60.6% area in the other study area.

Table 7.14: Irrigation Coverage by Crop Season in Different Study Area

(Figure indicate percentages over total cropped area)

Crop Season	Project	Adjacent	Control
Kharif I	65.7	52.0	72.7
Kharif II	0.1	-	-
Rabi	3.6	1.1	8.0
All Season	31.4	27.1	35.6

Tangail Household Baseline Survey (Dec,1991 - April,1992),DPC

7.7 Irrigation technology

In the project area, STW covers maximum area of 57.2%, DTW 40.8% and LLP 0.15% land under irrigation. HTW, treadle pump and indigenous method cover less than 2% of the irrigated land in the project area. In the adjacent area as much as 54% of the land is irrigated by DTW and 42.7% by STW. The highest irrigation coverage in the control area is provided LLP (48.8%) followed by 34.3% by STW. The above statistics indicate that irrigated lands by different methods do not follow same proportions in all study areas.

7.8 Yield rate of irrigated and non-irrigated crops

Data on yield rates of irrigated crops in different study areas, presented in Table 4.18 that shows that the yield of IRRI-Boro (Braus) is the highest in the project area. It is 4.21 ton/ha in the project area, 4.16 ton/ha in the adjacent area and 3.59 ton/ha in the control area. The

local Boro has almost same yield of 2.21 ton/ha in both project and control areas. The yield of wheat in the project area in 2.43 ton/ha, while it is 1.2 ton/ha in the control area.

Non-irrigated crop yield rates

B. Aus is maximum yield in the adjacent area (1.19 ton/ha), while it is 1.08 ton/ha in the project area 1.15 ton/ha in the control area. The IRRI-Boro (Braus) has 3.71 ton/ha yield in the adjacent area compared to 3.53 ton/ha in the control area. In the non-irrigated area, HYV T. Aman has the maximum yield of 2.27 ton/ha against the lowest yield of 1.62 ton/ha in the project. Wheat has the maximum yield of 2.34 ton/ha in the control area, while it is 1.93 ton/ha in the adjacent area and 1.68 ton/ha in the project area. Potato has the maximum yield of 10.87 ton/ha in the control area, compared to 7.64 ton/ha and 7.21 ton/ha in the project and adjacent areas respectively.

7.9 Findings and observation

- Medium lowland (F2) inside the adjacent and project areas have maximum operated lands.
- Large farmers in project areas has highest percentage of operated F2 land.
- Of the cropped area in adjacent area 64.2% has double cropping pattern while with project area, it is about 50%. But the project area has the maximum triple cropping pattern (26%). Corresponding national figure is 38% for double cropping and 8% for triple cropping.
- Over all cropping intensity is highest in project area (202%) while it is lowest (182%) in adjacent area.
- Yield of paddy is maximum (2.89 ton/hectre) in project area. Potato and pulses have maximum yield of 10.35 and 1.02 ton/hec respectively in control area. Yields thus vary highest in the adjacent area. In non-irrigated lands, the maximum yield of Aus paddy in project area is 1.08 ton/ha.
- Crops are damaged by flood and draught alike. Damage is maximum in control area (42.6).
- Irrigation coverage is maximum during Karif-1 season (73.0% in control and 66% in project area) and minimum during winter crop (Rabi) season (up to 8% only).
- Marginal farmers in study areas have maximum irrigated land (62.4-71.5%)
- STW, DTW and HTWs are the main technology used in irrigation. Treadle pumps and other indigenous technologies have very limited use.

8 CROP MARKETING AND STORAGE

8.1 Crop marketing

Geographically all the three study area, specially Tangail CPP area are in favorable location in terms of crop marketing. With internal well developed road network connected with the town at the center, it is the active transit point for road transport linking capital via Tangail to Northern districts. Marketing pattern within the project area, like that in other areas of the country, is largely traditional. Farmer producers dispose of part or, in some cases, all of their crops immediately after harvest. The reasons alluded to crop sales just after harvest are : (a) need for cash, (b) inability to hold grain in storage, (c) to meeting the crop loan obligations and/or (d) sharing of crops under tenurial arrangements.

Paddy sale tops the list in all three survey areas. The highest sale of paddy per household seen in control area (657 Kg), followed by adjacent area (477 Kg) and project area (279 Kg) Project area is due to being one of the important jute growing region in the country. Jute is marketed by land and water transport. Oilseed is the third important crop coming to the market in all three survey areas. Adjacent area has bigger marketable surplus of wheat compared to that in project area and control area. Both adjacent area and control area have an edge over project area in the sale of potato (Table 8.1).

Table 8.1: Average Sale of Farm Households by Crops in Different Study Areas

(Figure indicates average sale/farm household in Kg)

Crop	Project	Adjacent	Control
Paddy	279	477	567
Wheat	42	102	28
Potato	38	95	104
Jute	234	148	130
Oilseeds	142	135	142
Pulses	21	75	15
Spices	7	9	-
Vegetables	77	43	98
Sugarcane	67	112	-
Others	13	2	33
Total	820	1198	1117

Tangail Household Baseline Survey (Dec, 1991- April, 1992). DPC

Paddy is the highest selling item among the crops in terms of monetary value. The survey reveals that 11.8% of the total paddy production are sold and that 80.6% of this sale are effected during harvesting time, while 28.3% of total wheat produce are sold out. Jute, oilseed, lentil and vegetables have higher percentage of sale volume, ranging between 62.9% to 78.9% of total production. Significant quantity of different crops such as lentil (85.7%), oilseed (59.3%) and cowpea (40 %). are stored for 2-3 months after harvest to get higher price.

8.2 Period of crop marketing

Crop marketing in the project area is synchronized with the harvesting time of the concerned crop. Kharif-I crops such as broadcast Aman and Jute are marketed from Shrabon to Ashwin, while IRRI paddy the major crops of the season, in Ashar - Srabon, Major crops of Kharif-II season are T.Aman (LV) and B. Aman which are harvested in Aghrahayan and Poush respectively and marketed in the months of Poush and Magh. Rabi crops and vegetables are made available in the market throughout the winter season from Magh to Baishakh, while perennial crop like sugarcane are harvested and sold out during Poush-Magh.

Field survey reveals that pure share croppers generally have inadequate crop for their own consumption still 5.5% of their available crops are sold out 2-3 months after harvest and 1.1% during harvesting time, whereas, marginal farmers sell out 10.8% of their total produced crops during harvesting time and 3.1% of the crops 2-3 months after harvest. Large farmers are found to sell 11.5% during harvesting and 2.6% of their total production after 2-3 months after harvest (Table 8.2).

Table 8.2: Period of Crop Sale in Different Study Areas

(Figure indicates percentages over crop sold)

Crop	Project		Adjacent		Control	
	Harvesting Time	2-3 m After Harvest	Harvesting Time	2-3 m After Harvest	Harvesting Time	2-3 m After Harvest
Paddy	80.6	19.4	39.6	60.4	26.3	73.7
Wheat	100.0	-	15.5	80.5	17.0	83.0
Potato	-	-	36.1	63.9	88.1	11.9
Jute	75.8	24.2	9.7	90.3	52.4	47.6
Oilseeds	40.7	59.3	19.1	80.9	34.3	65.7
Pulses	60.0	40.0	20.5	79.5	82.9	17.1
Spices	100.0	-	100.0	-	-	-
Vegetables	100.0	-	100.0	-	-	-
Sugarcane	91.2	8.8	100.0	-	100.0	-
Others	100.0	-	100.0	-	36.1	63.9

Tangail Household Baseline Survey (Dec. 1991- April, 1992), DPC

Among marketed major crops, 80.6% of paddy, 75% of Jute, 100% of wheat, spices and vegetables in the project area are sold at harvest time, while less than 40% of marketed quantities of these crops in both adjacent area and control area are sold at the harvesting time. This situation may be interpreted to mean that the farmers in adjacent area and control area are under less pressure or are less attracted to dispose of surplus produce immediately after harvest. They can hold lock their stock for a reasonable period to obtain better prices.

8.3 Crop Price

Survey data presented in table 8.3 shows that prices of all crops at the harvest time in all the survey areas are lower compared to those prevailing 2-3 months after harvest. Maximum price gains are obtained for oilseeds and pulses by defering sale by a couple of months after harvest. There is no significant divergence between harvest time price and price ruling 2-3 months after harvest of paddy.

Table 8.3 : Period-wise Average Sale Price by Crop in Different Study Areas

(Figure indicates average sell value Tk/Kg)

Crop	Project		Adjacent		Control	
	Harve-sting Time	2-3 m After Harvest	Harve-sting Time	2-3 m After Harvest	Harve-sting Time	2-3 m After Harvest
Paddy	6.28	6.62	6.25	6.61	6.23	6.61
Wheat	5.55	-	5.53	-	5.48	-
Potato	1.94	-	1.95	-	1.93	-
Jute	5.40	5.95	5.38	5.96	5.33	5.95
Oilseeds	9.59	10.74	9.57	10.71	9.55	10.70
Pulses	6.28	8.12	6.26	8.10	6.29	8.15
Spices	-	-	4.12	-	4.12	-
Vegetables	4.14	-	4.07	-	4.11	-
Sugarcane	11.60	-	11.52	-	11.57	-
Others	3.78	-	3.81	-	3.79	-

Tangail Household Baseline Survey (Dec. 1991- April. 1992), DPC

8.4 Storage facilities

The study reveals that the farmers in the project area have traditional storage facilities using indigenous materials. Majority of the farmers (81.8%) use bamboo made container locally known as **'dole'** for storage of paddy and wheat. It is found that 43.2% farmers have store houses for jute. Metallic container like drum is used by 15% of the households for storage of Oilseeds and paddy, while 15.2% of the households has in-house platform facilities for crop storage. Earthen containers (Kola/Jala) are found in 5.3% households for storage of paddy, wheat and oilseeds. Table 8.4 shows type of storage used for different crops in project area. The pattern is more or less similar in both adjacent area and control area.

Table 8.4 : Type of Storage Use for Different Crops in Different Study Areas

(Figure indicates percentages of households)

Storage Type	Project			Adjacent			Control		
	Paddy/ Wheat	Jute	Potato/ Onion	Paddy/ Wheat	Jute	Potato/ Onion	Paddy/ Wheat	Jute	Potato/ Onion
Store House	8.3	43.2	1.5	13.0	48.1	-	20.0	35.2	-
Dole (Bamboo container)	81.8	4.6	-	83.2	3.8	-	79.2	0.8	-
Kola (Earthen container)	3.8	-	-	9.9	-	-	-	-	-
Drum/Tin	4.6	-	-	6.1	-	-	1.6	-	-
Mucha (Platform)	7.6	-	-	18.3	-	-	8.8	-	-

Tangail Household Baseline Survey (Dec, 1991- April, 1992), DPC

8.5 Problems of crop storage

Damage to or loss of stored crops is an important issue in the study area. Survey data to CPP area shows that 93.9% stored paddy or wheat of the farm households are damaged by rodents. It is also reported by 18.9% of the farm households that rodent damaged their stored oilseeds. Pest and insect attack on stored crops is significant in the project area as reported by the 44.4% of the households. Another 14.4% of the farm households mentioned that pest and insect damaged their stored oilseeds. Storage problems of crops due to flood is insignificant and 0.8 % of the farm households mentioned that their stored oilseeds were damaged due to flood.

Table 8.5: Storage Problems for Different Crops in Different Study Areas

(Figure indicates percentages of households)

Storage Type	Project			Adjacent			Control		
	Paddy/ Wheat	Oil-seed	Potato/ Onion	Paddy/ Wheat	Oil-seed	Potato/ Onion	Paddy/ Wheat	Oil-seed	Potato/ Onion
Rodent Damage	93.9	18.9	2.3	97.7	22.9	5.3	88.8	4.8	1.6
Damages by Pest & Insect.	44.4	14.4	2.3	32.1	21.4	1.5	22.4	1.6	0.8
Flood Damage	3.8	0.8	-	1.5	-	0.8	4.8	12.8	4.0

Tangail Household Baseline Survey (Dec, 1991- April, 1992), DPC

In adjacent area, rodent damage to stored paddy and wheat were reported by 97.7% of household and to oilseeds by 22.9% household. Damages by pest and insect to paddy and wheat stock were reported by 32.1% household and to oilseeds by 21.4% household.

In control area, rodent damages to stored wheat and paddy were reported by 88.8% household. But damages to other stored crops are not significant. Significant damages by pests were reported for paddy and wheat by 22.4% household.

8.6 Findings and observations

- All the three study areas, especially the project area is favorably located for marketing of products.

- Paddy is the major crop for sale. Highest household sale of 657Kg has been recorded in control area. The highest volume for the project is 279 Kg, due mainly to the fact that it is pre dominantly a jute growing area. Potato production in project area is also less.

- 80.6% of the paddy 75% of Jute and 100% of wheat, spices and vegetables are sold during harvest time. Sales vary by household types also.

- Significant quality of lentils (85.7%), oil seeds (60%), cow-pea (40%) and some paddy one stored for few months.

- Maximum gains on price is obtained by deferring sales of oil seeds and pulses. Paddy price varies little over start period.

- Majority of farmers use traditional bamboo made container called 'dole' for storage,43% of the farmers in project area has store house for jute.

- 94% of the stored paddy or wheat are damaged by rodents. 44.4% of the crops in project area are damaged by pests.

9 PROFESSIONAL FISHERMAN

9.1 Background

The study area is the flood plain formed by the river systems of the Jamuna, Dhaleswari and their innumerable tributaries. The existence of a large number of beels, canals, pagars and natural depressions make the project area rich in fishery resources in terms of both quantity and bio-diversity. From time immemorial, fishermen community commonly known as Rajbongshi, Malo, Kaibarta Das and Kaibarta Dhar in the locality, used to make a living on fish catches alone. But due to geophysical and anthropogenic interventions, permanent wetlands as well as common property resources are observed to be shrinking and adversely affecting open water fishery. Under the above circumstances, professional fishermen in the project area are in the vulnerable situation caused by the existing dwindling rather than sustainable fishery resource base.

9.2 Categories of fishermen

A representative sample of 50 fishermen households from three areas including Tangail CPP area, adjacent area and control area were selected for the survey. On the basis of the mode of fishing operations, the fishermen in the study areas were classified into the following 5 groups:

Labour Fishermen: This group constitute those fishermen who do not own or posses any fishing equipment but work for fishermen who own these on daily wage basis;

Share Fishermen: In this category falls those fishermen who generally fish in groups and equipment needed are owned only by some of them. They also catch among themslves;

Owner Fishermen (Family labour based): Here the fishermen own the necessary gears/gears and fishing operations are conducted with the help and active participation of the own family members;

Owner Fishermen (Hired labour based): The fishermen who own the equipment but do not have adequate family members and depend on hired labourers to carry out fishing operation falls under this category;

Fish Peddlers: The households who are not directly engaged in fishing but submit on fish peddling belong to this group.

The various family size among various groups varied from 4.4 to 5.7 members with an average of 4.8 members per household. It can also be observed from the table that owner fishermen (with family labour) constitute the overwhelming majority in the Project as well as in the Control areas. Share fishermen constitute about 45.1% of the surveyed households. Other fishermen (with hired labourers) constitute only 6.1%, 22% and 13.8% of the total households in Project, adjacent and control areas.

Table 9.1 : Distribution of Category of Fishermen Households in Different Study Areas

(Figure in percentages over total households)

Category of Fishermen	Project	Adjacent	Control
Labour Fishermen	4.0	4.0	7.8
Share Fishermen	14.0	18.0	45.1
Owner Fishermen (with family labour)	46.0	54.0	21.6
Owner Fishermen (with hired labour)	6.0	2.0	11.8
Fish Peddlers	30.0	22.0	13.8

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

9.3 Occupational structure of fishermen and employment status

In the 50 sampled households 71 earning members were found. Fishing and fisheries related activities were found to be the primary occupations of about 85% of the earning members, of which 2.8% labour fishermen, 9.8% shared fishermen, 38% owner fishermen (with their family laborers), 8.5% owner fishermen (with hired laborers) and 25.4% fish peddlers (Table 9.2). Primary occupations of the rest 15% earning members were found distributed in different activities other than fishing viz. 8.5% artisans, 1.4% non-agricultural activities, 4.2% trading and 1.4% in other professions.

Fishing and fisheries activities were observed to be the secondary occupation of 12.6% earning members of fishermen households. Of them 7% are engaged in fish peddling and 5.6% in fishing. Only 2.8% of earning members are engaged in agricultural activities as their secondary occupation. In addition, 4.2% of earning members are involved as artisans, 7% as non-agricultural laborers, 1.4% as transport workers, 1.4% as traders and 4.2% in other profession as their secondary occupation. Not a single member of the fishermen households was found to be engaged either in service or in agriculture as laborship.

In adjacent area, 86.3% of earning members of fishermen household are engaged in fishing and fisheries related activities and 10.7% of them are engaged as artisans. Pursuit of secondary occupations by earning members in the adjacent area was found to be insignificant.

In control area, 84.5% of earning members are engaged in fishing and fisheries related activities as main occupation, followed by 8.2% in other unspecified activities, 2.4% in agriculture and the rest 2.4% in trading as main occupation. Only 3.5% of them engage themselves in agriculture as secondary occupation service, trading and other unspecified activities each offer secondary employment opportunities for 1.2% of all earning members.

Table 9.2 : Occupational Structures of Fisherman HH Members in Different Study Areas

(Figure in percentages over total employed population)

Occupation	Project		Adjacent		Control	
	Main	Secon.	Main	Secon.	Main	Secon.
Fish & Fisheries related activities	84.5	12.6	86.3	-	84.5	-
Agriculture	-	2.8	-	0.8	2.4	3.5
Agricultural Labour	-	-	3.0	0.4	1.2	-
Service	-	-	-	-	-	1.2
Artisan	8.5	4.2	10.7	0.8	1.2	-
Non-Agril. Labour	1.4	7.0	-	0.4	-	-
Transport Worker	-	1.4	-	-	-	-
Trading	4.2	1.4	-	-	2.4	1.2
Others	1.4	4.2	-	-	8.2	1.2

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

9.4 Land ownership of fishermen

Most of the fishermen households (98%) have homestead land, while only 12% of households own cultivable and 16% of households maintain operated land besides homesteads. Out of 50 fishermen households in the CPP area, 49 possess homestead land varying from a minimum of 1.5 decimal to a maximum of 7 decimal with an average of 6.5 decimal (Table 9.3). Of the 2 labour fishermen, none possesses any cultivable or operated land except homestead land on average of 1.5 decimals. They are landless and hence work as labour fishermen. Of the 7 shared fishermen, 2 own, on an average, cultivable land to the extent of 14 decimals and 3 possess operated land to the extent of 20 decimals.

Out of 23 owner fishermen (with family laborers) having an average homestead area of 6.4 decimals, 1 household possesses 1.3 decimals of cultivable land and 1 household possesses 4 decimals of operated land. Three fishermen household with hired labour possess 4 decimals of homestead land. 1 out of 3 owner fishermen (with hired labour) fishermen possesses 10 decimals cultivable land and 1 possesses 5 decimals of operated land. Of the 15 fish peddlers, 14 have homestead land of an average of 7 decimals, 2 own cultivable land of 1.6 decimals and 2 household have got operated land of average 6.7 decimals. The size of cultivable and operated lands are too small to contribute to support their livelihood. The poor fishermen do not have resources to afford fishing materials as such they often work as hired labourers or catch fish on share basis. Therefore, the livelihood of poor fishermen often dependent on large owner fishermen of the area.

Table 9.3 : Land Ownership of Fishermen by Land Use in Different Study Areas

(Figure in % indicates household having land and area indicates average area/household in decimal)

Area	Homestead		Cultivable		Operated	
	%	Area	%	Area	%	Area
Project	98.0	6.5	12.0	4.9	16.0	6.9
Adjacent	98.0	8.3	2.0	2.2	4.0	4.1
Control	88.0	6.2	14.0	5.2	7.8	3.1

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

In adjacent area, 49 out of 50 fishermen households own average homestead land measuring 8.3 decimals. Only 2% household own cultivable land measuring 2.2 decimals on average and 4% of household manage operated land measuring 4.1 decimal on an average.

In control area, 44 out of 50 sample households possess average homestead area of 6.2 decimals and 14% of sample households possess cultivable land with an average size of 5.2 decimals. About 7.8% of sample household manage operated land measuring 3.1 decimal, on average.

9.5 Asset Ownership of Fisherman

About 4% of household in both CPP area and adjacent area and 7.8% in control area own boat and scine net. Current net and drag net are possessed by 14% of household in project area; 18% of household in adjacent area and 45.1% of household in control area. Gill net and lift net are possessed by 4% of household in project area; 4% of household in adjacent area and 7.8% of household in control area. Push net, bamboo trap, hook and harpoon are possessed by 14% of household in project area; 18% of household in adjacent area and 45% of household in control area (Table 9.4).

Table 9.4 : Fishing Gears and Equipment Possession by Category of Professional Fisherman in Different Study Areas

(Figure in percentages over total households)

Gears/Equipment	Project	Adjacent	Control
Boat	4.0	4.0	7.8
Scine Net	4.0	4.0	7.8
Current Net	14.0	18.0	45.1
Drag Net	14.0	18.0	45.1
Gill Net	4.0	4.0	7.8
Lift Net	4.0	4.0	7.8
Push Net	14.0	18.0	45.1
Bamboo Trap	14.0	18.0	45.1
Hook	14.0	18.0	45.1
Harpoon	14.0	18.0	45.1

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

9.6 Fish catch by sources and sale value

The fishermen catch fish in all the available water-bodies of CPP area which include river, canal, beel, floodplain and derelict ponds. All of the 50 sample fishermen households were found to catch fish in beels. Sample household explored more than one source for fish catch. About 72% of household were found to catch fish in floodplain followed by 64% household in rivers, 26% in canals and 8% in derelict ponds. The average annual catch of fish per household vary by the types of the water-bodies. The highest average annual catch of 213 kg fish per household was found in canals followed by 154 kg/household in beel, 126 kg/household in river, 80 kg/household in floodplain and 46 kg/household in derelict ponds (Table 9.5).

Table 9.5 : Fish Catch by Fishing Ground in Different Study Areas

(Figure in percentages over fisherman household)

Area	River	Canal	Beel	Flood Plains	Others
Project	64.0	26.0	100.0	72.0	8.0
	(126)	(213)	(154)	(80)	(46)
Adjacent	50.0	34.0	52.0	76.0	20.0
	(292)	(363)	(176)	(159)	(517)
Control	50.0	10.0	96.0	44.0	24.0
	(320)	(160)	(300)	(250)	(132.5)

Tangail Household Baseline Survey (Dec,1991-April,1992), DPC'
(Figure in parenthesis indicates mean catch/fishermen hh Kg by fishing ground)

In adjacent area, the highest number of household (76%) catch fish from flood plains, followed by beels (52%), rivers (50%), canals (34%) and others (30%). Highest average catch/household in adjacent area was available from others source, (517) kg, followed by 363 kg from canal.

In control area, almost all the household (96%) carry out fishing in beels, followed by rivers (50%), floodplains (44%), others (24%) and canal (10%). The highest average catch/household was available from rivers (320 kg), followed by 300 kg from beels and 250 kg from floodplain.

9.7 Annual fish catch and incomes

In CPP area, fishermen households collected an average catch of 351.3 kg annually, sold at Tk 34/kg on average. They earned an average annual income of Tk.11,945 from fish catch. In adjacent area, average annual fish catch per fishermen household was 585.2 kg. sold at Tk.24.6/kg on average. They earned an average annual income of Tk.14,385 from fish catch. In control area, average annual fish catch was 563.5 kg, sold at Tk.20.7/kg. The fishermen household in control area earned an average annual income of Tk. 11,667 from fish catch (Table 9.6).

Table 9.6 : Annual Fish Catch, Sale Rate and Annual Income from Fish in Different Study Areas

Areas	Catch (Kg/Year/HH)	Sale Rate (Tk/Kg)	Annual Income (Tk/Year/HH)
Project	351.3	34.0	11,945
Adjacent	585.2	24.6	14,385
Control	563.5	20.7	11,667

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

As reported by most of the fishermen (94%) they have no problem in marketing fish in CPP area. However, a few households (6%) mentioned that they sometimes face difficulties in marketing fish due to long distances of fish market from fishing grounds.

9.8 Fishing arrangements

The fishermen in CPP area catch fish in both the lease-free and leased-out water-bodies. However, the maximum fishermen catch fish in the lease-free water-bodies throughout the year (Table 9.7). The leasing system was observed to be applicable for rivers, canals and beels while the floodplain and derelict ponds were found as completely lease-free areas. In rivers, 25% fishermen catch fish at lease free areas, 72% under fishermen cooperative leasing arrangement and 3% on rent on equipment basis. In canals, 46% fishermen households catch fish at lease free areas and 54% household under private sub-leasing arrangements. In beels, 48% catch fish in lease-free areas, 12% under cooperative leasing and 38% under private sub-leasing arrangements.

Table 9.7 : Fishing Arrangement in Open Water in Different Study Areas

(Figure in percentages over fishermen household)

Area	River		Canal		Beel		Floodplain		Others	
	Lease Free	Lea-sed	Lease Free	Lea-sed	Lease Free	Lea-sed	Lease Free	Lea-sed	Lease Free	Lea-sed
Project	25.0	75.0	46.0	54.0	48.0	52.0	100.0	-	100.0	-
Adjacent	38.9	61.1	91.7	9.3	100.0	-	100.0	-	100.0	-
Control	18.0	72.0	100.0	-	75.0	25.0	100.0	-	100.0	-

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

Floodplain are fishing ground without any legal restrictions under adjacent area also, leasing and lease free arrangement for fishing in open water bodies exist. In rivers, 38.9% household catch fish at free areas and 6.1% household in leased areas. In canals, 91.7% household catch fish at free areas and 9.3% household in leased areas with sub leasing arrangements.

Beels and floodplain areas in adjacent area are free open waters under in control area, canals and floodplain are free open water bodies. In rivers, 18% household catch fish at free areas, while 72% household carry out fishing efforts in leased areas. In beel, 25% household catch fish under leasing arrangements.

9.9 Opinion on decrease in fish size and quantity

The sample fishermen households were asked to express their opinion on decrease in fish size and fish quantity, if any, observed over the last 10 years. Some interesting information were obtained from the fishermen. In CPP area, about 48% and 24% households informed that they had no observation on decreasing fish size and quantity respectively (Table 9.8).

On decreasing fish size, 18% household felt that insufficient fish food is responsible, while 4% mentioned uses of chemical fertilizers and pesticides, 28% household mentioned fish epidemics and 2% household pointed out catching of under size fish as affecting factors. Regarding decrease in fish quantity, 20% household mentioned insufficient fish food, 22% household mentioned fish habitat, 10% household felt uses of chemical fertilizers and pesticides, 52% household believed fish epidemics, 10% household mentioned catching of brood fish and 2% pointed out catching of undersize fish as factors responsible for decrease in fish quantity in open water-bodies of CPP area.

Table 9.8 : Opinion on Decrease in Fish Size and Quantity in Different Study Areas

(Figure in percentages over total households)

Opinion	Project		Adjacent		Control	
	Size	Quantity	Size	Quantity	Size	Quantity
Not observed	48.0	24.0	18.0	18.0	61.6	60.8
Feed insufficiency	18.0	20.0	26.0	2.0	9.6	4.8
Decrease of fish habitat	-	22.0	26.0	8.0	8.8	8.0
Affected by agro-chemical	14.0	10.0	28.0	4.0	0.8	17.6
Epidemic	28.0	52.0	-	32.0	17.6	2.4
Catch of brood fish	-	10.0	-	22.0	-	-
Catch of restricted size of fish	2.0	2.0	-	8.0	1.6	6.4

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

About 18% household in adjacent area and 61.6% in control area had no observation on decrease in size and quantity of fish. In adjacent area, feed insufficiency was mentioned as factor affecting size of fish by 26% household and decrease of fish habitat 26% of household, agro-chemicals by 28% household. On decrease in quantity of fish feed insufficiency was mentioned by 22% household, decrease in fish habitat by 8% household, agro-chemicals by 4% household, epidemics by 32% household and catch of brood fish by 22% household as factors responsible.

In control area, feed insufficiency as a factor affecting adversely the size of fish was pointed out by 79.6% household, and decrease of fish habitat by 8.8% household, epidemics by 17.6 %. The major factors causing decrease in quantity of fish were singled out by household are decrease of fish habitat (8%) agro-chemicals (17.6%) and catching of restricted size of fish (6.4%).

9.10 Observation on declining of fish habitats

It is generally believed that the country's open water fish habitats have been declining at an alarming rate because of siltation, FCD/I and unplanned road project interventions, use of chemicals, other water uses, etc. The sample fishermen households were asked to express their opinion on declining of fish habitat in the study areas. In the CPP area, 44% expressed their opinion that the consecutive annual siltation of river, beel and other water-bodies might be the reason for declining of fish habitats, 36% mentioned the effects of flood control embankments and only 2% household mentioned the effects of roads. While 18% observed no change in fish habitats (Table 9.9).

Table 9.9 : Observation of Declining of Fish Habitats in Different Study Areas

(Figure in percentages over total households)

Observation	Project	Adjacent	Control
No change	18.0	32.0	60.0
Silting of water bodies	44.0	18.0	20.0
Adverse effect of embankment	36.0	18.0	4.0
Adverse effect of road	2.0	32.0	16.0

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

In the adjacent area the maximum respondents (32%) mentioned that the adverse effect of roads and 18% mentioned the siltation effects of embankment. While 32% observed no change in fish habitats. In the control area, the majority sample fishermen households pointed out siltation as the major factor for decline fish habitats, 16% and 4% mentioned adverse effects of roads and embankments respectively, while 60% observed no change of fish habitats in their area.

However, the such findings indicated that the existing embankments and water control hydraulic structures have already adversely affected on the fish habitats in the CPP area.

9.11 Suggestions on increasing open water fish stock

The fishermen households also expressed their opinion as to how to increase the quantity of fish in open water bodies. In the CPP area, 44% household suggested for massive re-excavation of water-bodies, 30% household suggested for effective restriction on undersize fish catch, 12% household was in favour of allowing flood water at least for short period,

8% household emphasized ban on using current net (monofilament nylon gill net) and 6% suggested releasing of fish fry in open waters (Table 9.10).

Table 9.10: Suggestion on Increase Open Water Fish Quantity by Professional Fisherman in Different Study Areas

(Figure in percentages over total households)

Suggestion	Project	Adjacent	Control
Releasing adequate fish fry in open water	6.0	22.0	5.9
Massive re-excavation of rivers, canals, beels etc.	44.0	48.0	39.2
Allow flood water for a short period during starting of monsoon	12.0	2.0	17.7
Effective restriction of young fish catch	30.0	8.0	-
Effective restriction on 'Current net' use	8.0	18.0	7.8
Control use of agro-chemicals	-	-	25.5
Sufficient credit for fishery	-	2.0	-
Others	-	-	3.9

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

In adjacent area, favored measures are: release of adequate fish fry (22%); massive re-excavation of rivers-beels-canals (48%); and effective restrictions on the use of current net (18%). In control area, the major recommendations are ; massive re-excavation of rivers-beels-canals (39.2%), allow flood water for a period during monsoon (17.7%) and control of agro-chemicals use (25.5%).

9.12 Problems of taking lease of open water bodies

The study revealed that the fishermen households face some sorts of problems in taking lease of open-water bodies. In the CPP area, 12% households mentioned that they were unable to pay the required money for taking lease, 10% mentioned that the authority did not consider the poor for bidding, 8% said that they were subsided by the local influential people and 26% mentioned other various problems which made them unable to get lease of open water-bodies (Table 9.11).

In the adjacent and control areas, the major problems of taking lease was to be created by the local influential people while this problem is less in CPP area.

Table 9.11 : Problems of Taking Lease Open Water Fishery in Different Study Areas

(Figure in percentages over total households)

Problems	Project	Adjacent	Control
No problem	56.0	60.0	9.8
Influential people	42.0	40.0	66.7
Lease holder charge too much	2.0	-	-
Others	-	-	23.0

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

9.13 Rights and heritage

As reported by the fishermen of the CPP and adjacent areas it is understood that their fishing rights in open-water areas have not yet been fully collapsed. However, their absolute free access to such resources do not exist as before. Most of the fishermen households 56% in CPP area and 60% in adjacent area mentioned that they did not face any problem in fishing in open water-bodies. However, 42% households in the CPP area and 40% in the adjacent area mentioned that local influential people often, some how, create problem in fishing in open water-bodies and only 2% households in CPP area who fish under private sub-leasing arrangements, mentioned that the lease holders charged very high from them (Table 9.12).

Table 9.12 : Problems of Lease Taking of Open Water Bodies in Different Study Areas

(Figure in percentages over total households)

Problems	Project	Adjacent	Control
No lease to the poor	10.0	30.0	11.8
Unable to invest money	12.0	20.0	9.8
Bribe problem	-	-	4.0
Obstacle of influential people	8.0	50.0	56.7
Others	26.0	-	17.6

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

In the control area maximum households (67%) mentioned problems created by influential people, 21% mentioned other problems, while only 10% opined no problem fishing in open-water bodies.

9.14 Fisheries extension services

Like in other parts of the country of all the three study areas were observed to having no back-up of technical and other support services as 84%, 96% and 88% households from project, adjacent and control areas respectively mentioned that they have so far, got any services from any agencies. However very few households in project areas mentioned that they got some training and other services on occasional basis which they believe hardly had any contribution towards improving their skill and efficiency (Table 9.13).

Table 9.13 : Fishery Extension Services in Different Study

(Figure in percentages over total households)

Problems	Project	Adjacent	Control
Nothing	84.0	96.0	88.3
Sometime provide services	10.0	2.0	7.7
Protect fisherman interest	-	2.0	2.0
Others	6.0	-	2.0

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

9.15 Rare fish species

Following other parts of the country, some species of fish have also been rarely observed in the water-bodies in the study areas. Eleven species of freshwater fish e.g. Gannya, Ellong, Shar Puti, Kalibaush, Guji Aair, Cital, Pabda, Tara Baim, Tatkini, Taki and Meni were found rare in all of the three study areas (Table 9.14).

Table 9.14 : Observation on Non-Availability of Fish by Species

(Major species)

Project	Adjacent	Control
Ghunnya	Ellong	Ellong
Ellong	Shar Puti	Shar Puti
Shar Puti	Ghunnya	Ghunnya
Kalibaos	Pabda	Pabda
Guzi Aier	Meni	Meni
Tara Baim	Guzi Aier	Guzi Aier
Tatkeni	Kalibaous	Kalibaous
Taki	Cital	Cital
Meni	Chapila	Tatkeni

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

9.16 Fish epidemics

Outbreak of fish epidemics : Epizootic Ulcerative Syndrome (EUS) was first observed in some areas of the country in late 1987 and then it aggravated in subsequent years. The fishermen informed that the epidemic first observed in CPP and the Control areas in 1987 in some water bodies which in the year 1988-89 became severe and spreaded in most of the water-bodies. The EUS then showed gradual decrease over the year 1990 & 1991 (Table 9.15). This observation has the similarity with the over all trend of EUS in other parts of the country. The severity of EUS, as reported, was less in adjacent area than project and control areas.

Table 9.15 : Fish Epidemic Dispersion During Last Five Years in Different Study Area

(Figure in percentages over total employed popu'ation)

Year	Project					Adjacent					Control				
	Nil	Very Low	Med-ium	High	Very High	Nil	Very Low	Med-ium	High	Very High	Nil	Very Low	Med-ium	High	Very High
1991	-	42	10	36	10	-	-	36	50	16	7.9	7.8	29.4	35.3	19.6
1990	4	18	42	30	6	-	-	22	48	32	2	5.9	33.3	43.1	15.7
1989	-	2	32	34	32	-	-	22	36	44	2	2	11.8	58.8	25.4
1988	8	6	10	26	48	-	2	22	46	30	25.6	7.8	13.7	9.8	43.1
1987	60	8	14	8	4	-	20	14	28	4	98	2	-	-	-

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

9.17 Migration and change of profession

In last 5 years, both fishermen households as well as some members of the households emigrated out of the CPP area. In addition, switching over to other profession by the fishermen households and their members were observed in last 5 years for various reasons e.g. decrease in fish and fishing land, loss of fishing rights, insufficient gears etc. The over all rate of switching over to other profession was observed higher than the rate of emigration of fishermen. Decreasing in fish and fish habitats were found as the major reasons for both emigration and switching over to other profession (Table 9.16).

Table 9.16 : Reasons for out Migration/Profession Switching by Fisheries

(Figure indicates percentage of household)

Reasons	Out Migration by HH Member			Profession switching by		
	Project	Adjacent	Control	Project	Adjacent	Control
Decrease of fish land	2.0	-	-	-	4.0	2.0
No more prestigious	-	-	-	4.0	-	2.0
Insufficient gears	-	-	-	4.0	-	-
Less rights & heritage	-	-	-	-	-	3.9
Others	2.0	-	-	-	-	-

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

9.18 Fishermen participation in pond fishery

Fishermen generally come from the poor section of the rural community. Most of them do not have any cultivable land except the homestead hence they do not possess ponds. Fishermen, by tradition, are skilled in fishing activities in open water-bodies rather than doing fish culture in ponds. Therefore in most cases, they were found reluctant to take up pond fishery as means of livelihood. They, however, sometimes do fish culture in leased ponds at traditional or extensive level of management.

Table 9.17 : Fishermen Households Pond Information in Different Study Studies

(Figure in percentages over total households)

Status	Project	Adjacent	Control
Fishermen having pond	2.0	2.0	2.0
Average area/pond (Dec)	67	40	30

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

All the three study area fishermen households were found to have less number of ponds suitable for fish production. In CPP area, only 1 Owner Fisherman owned a pond of 66 decimals on private lease basis (Table 9.17). The pond was utilized for fish production at extensive level by the fishermen. He stocked the ponds with major carps fingerlings namely Catla, Rui and Mrigal collected by himself from the floodplain within the CPP area. As per the leasing agreement, the fisherman had to bear all the cost of fish culture inputs as well as to manage the total production activities including pond preparation, stocking, feeding, harvesting, marketing, etc. While the owner would get the 50% of the total fish out put, mainly in cash as rent of his pond.

9.19 Findings and observation

- Due to geo-physical and anthropogenic interventions, fish catchment areas are shrinking and adversely affecting open water fishery, which is the means of livelihood for many ethnic minority Hindus. Professional fishermen in the project area are now in more vulnerable situation.

- On the basis of their mode of fishing, fishermen households are categorised in five groups viz, labour fishermen, share fishermen, Family labor based and hired labor based owner fisherman and fish peddlers. Owner fishermen with family labor constitute the overwhelming majority in project area.

- Fishing and fishery related activities are primary occupation of over 85% of the earning member while it is secondary occupation to only 12.6%.

- 98% of the fishermen households have homesteads land while 12% of have cultivable land. 16% maintain operated lands beside homesteads. Of the 50 sampled fishermen households in CPP area 49 possess 6.5 decimal land on average.

- Lack of adequate resources to by fishing equipments poor fisherman at the mercy of the large owner fisherman at the area to get job as hired labourer.

- Households in project area generally possess less fishing equipments than their fellow fishermen in other two areas.

- Highest average annual catch of 585 Kg was made in adjacent area which was sold at Tk 24/Kg fishermen in CPP area households collected on an average 351 Kg annually sold at a price of tk. 34/Kg. This indicate better quality fish availability in the project area.

- Maximum fishermen catch fish in lease free water bodies throughout the year. Leasing was observed to be applicable for rivers,canals and beels while the flood plain and ponds were found as completely lease free areas win the project area. Different leasing arrangements were in vague.

- In CPP area, about 48% and 24% households informed that they had no observation on the declining trend in fish size and quantity respectively. Those observing the declining trend in size attributed in varied percentage,the cause to insufficient fish feed (18%), chemical fertilizer 4%,fish epidemics 28%, catching of fish frys 2%, similar reasoning was attributed to declining quantity also. The control area households were the least observers.

- Shrinkage of Fish habitats have been reported to have caused by siltation 44% FCD/I 36% and unplanned road project interventions 2% etc. 1.8% observed no change in fish habitats.

- 44.% households suggested dredging re-excavation, 30% suggested stricter restriction under size, 12% suggests allowing flood for short period which asked to suggest measures to adopted.

- Cited problems encountered during leasing, include :

  - Authority's non-(consideration of poor for bidding(10%)
  - Were unable to pay lease money (12%)
  - Local influential groups stops them (8%)
  - Couple of reasons (26%)

- Fishing in lease free bodies still trouble free with 60%

- Technical back stopping almost non-existent. Unsystematic, training had been provided to vary few, who also doubt its effectiveness.

- Country aide fish-epidemic also had its makes in CPP area in during 1987-90 which shows marks of gradual decrease.

- Emigration of fishermen has been on individual and household basis had been observed over the last five years (2%) change of profession have also been noticed --4%).

10 URBAN POPULATION

10.1 Introduction

Archeological discoveries in Bogra district of Bangladesh confirms existence of a civitization as well as urban like life in the area in as early as the second century B.C.

Urbanization flourished during the British rule with administrative de-centralization and creation of districts, sub-divisions municipalities and Police stations (Thana) Besides, some pocket areas were urbanized due mainly to concentration of business establishments, markets, industries and educational institution.

The country experiences are of the highest urban population growth (about 5.7%) against national population growth of 2.17% (1991). Among developing countries and already 20% of the total population lives in urban areas. Tangail District : Tangail, previously a sub-division of Mymensingh district has been up graded to a district in late sixties. Although its municipality status dates back to July 1, 1887.

10.2 Sample data

The study area : In all, the sample urban area urban the study has 2595 households with a population of 13921 as urban :

Area	Municipality	Upazila (Thana)	No. Of Para	No. Of Household	Total Population
Project	Tangail	Tangail	10	1398	7580
Adjacent	-	Delduar	10	504	2762
Control	-	Kalihati	10	693	3579
Total				2595	13921

Following table shows land owned by Urban Household in Different Study Areas.

(Figure indicated Percentages oveer Census household population)

Area (Dec)	Project	Adjacent	Control
0	21.8	0.8	13.0
1-50	73.5	95.0	87.5
51-100	2.6	3.2	0.6
101-200	1.6	0.4	0.3
201-300	0.2	0.2	-
301-400	0.1	-	0.3
401+	0.1	0.4	0.1

Housing Pattern of Urban Household in Different Study areas are shown in the following table.

Type of House	Project			Adjacent			Control			
	Owned	Avg Room	Rental	Avg. Room	Owned	Avg. Room	Rental	Avg. Room	Owned	Avg. Room	Rental	Avg. Room
Kutch	69.8	1.8	27.5	2.2	80.5	2.6	50.0	1.0	83.3	1.6	54.3	1.2
Semi-Pucca	24.1	5.5	16.4	3.1	18.9	5.1	50.0	1.0	13.2	3.2	28.4	1.5
Pucca	6.2	4.5	56.1	2.3	0.6	5.0	-	-	3.5	4.8	17.3	3.1

* Percentage of owner household
* Percentage of Tenant household

Table: 11.1 Main Occupation of Urban Household in Diferent Study Areas.

Figure indicated Percentages oveer Census household population

Occupation	Project	Adjacent	Control
Agriculture	6.6	17.8	6.6
Agriculture Labour	2.8	8.7	11.8
Service	29.4	6.9	19.9
Fisherman	2.6	-	10.1
Artisian	3.6	14.3	0.9
Non-Agri. Labour	9.9	11.3	0.9
Transport Worker	14.8	7.9	7.4
Professional	1.4	1.4	0.7
Trading	18.6	24.8	27.8
Others	8.2	1.5	3.6

Table: 11.2 The fllowing table gives a few particulars on Different items For Urban Households in Different Study Area.

Figure indicated Percentages oveer Census household population

Perticulars	Project	Adjacent	Control
Literacy Rate	65.5%	38.1%	55.7%
Employment Labour Force	47.3	43.9%	51.4%
Sex Ratio	118	88	111
Polygamy	2.0%	12.0%	2.0%
Average Size of Household	5.1	5.1	5.1
Home Stead	.03(ha)	-	0.04
Depedency Ratio	75%	94%	70.0
Water Supply:			
Tubewell	86.0	92.0	94.0
Piped supply	14.0	-	-
Sanitation:			
Unhygine	22.0	54.0	28.0
Sanitary	70.0	36.0	60.0
Energy Consumption Lighting :			
Electricity	42.0	22.0	50.0
Karosine	58.0	78.0	50.0
For Cooking:			
Electricity	-	-	-
Kerosine	22.0	-	12.0
Fire Wood	78.0	100	66.0
Children Immunization	83.3	68.5	95.2
Annual Per Capita (Taka) :			
Income	4212	2976	4319
Expenditure	22197	14392	21598

10.3 Service facilities

Tangail municipality has 77 km of road, only one third of which is pucca. Only 3300 metres of pucca and 5800 mtrs of kutcha drain is existing. The drainage system is otherwise taken care of by the three rivers running througjh or by it. It area being relatively low lying, water logging is woman.

Piped water supply from DTW source was intoduced in 1969. Out of 12700 residential holdings, Oonly 1585 have piped water connections installed. 17 sheet hydrents and 165 commercial connections supplement the safe water supply besides a handfull (492) of mostky

private hand pumps. No piped water supply is available in urban localities of the control and adjacent areas. Shallow tubewells are however sufficient in these areas.

Provision of Latrine serviceing was withdrawn by Tangail municipality in 1983 but the town, hence the project area still has 22% un-hyginic latrines. For control and adjacent areas, the figure are 28% and 54% households respectively.

10.4 Flood issues

Flood water does not normally create any serious problem in Tangail. During 1980,1988 floods, Tangail was under 3-5 feet water and it took 15-2 days for all water to recede. Erosion is taking place in atleast two areas of town since 1986. No other urban areas are facing any serious threats of erosion.

Flood damage to Urban Sample Household Houses in Different Study Areas.

(Figure indicates Percentage of Urban households)

	Project		Adjacent		Control	
Year	Fully	Partially	Fully	Partially	Fully	Partially
1986	-	-	-	-	-	8.0
1987	-	2.0	-	-	10.0	16.0
1988	24.0	50.0	20.0	74.0	20.0	44.0
1989	-	4.0	-	-	-	16.0
1990	-	2.0	-	-	-	8.0

10.5 Findings and observation

- The sample urban area consists of 2595 households with a population of 13921 located in Tangail municipality area, Kalihati and Delduar upazila

- Trading is the main occupation of majority of urban households in control (27.8%) and adjacent (24.8%) areas while service is the main occupation of urban households in the project area (29.4%).

- In the adjacent area census households own less than 50 decimals of land were 95% while 87.5% of control and 73.5% of project area households falls within this bracket.

- Literacy rate is highest (65.5%) in the project area but employed labour force (47.3%) is less than the control area (51.4%) and slightly higher than adjacent area (43.9%).

- Piped water supply is only available on limited scale in project area and rest of the urban areas depend on shallow tubewells (handpumps) for safe water. 22% of the project area lack adequate sanitation while the figure is 54% for adjacent and 28% for control area.

- Maximum electricity is consumed by control households (50%) while only 22% households in the control and 42% households is project area consume electricity for lighting.

- 100% of adjacent area households depends on fire wood for cooking while 78% of households in project area do so.

- Project area has a better rate of children immunization and per capita expenditure

- Partial damage to households during 1988 flood was highest with adjacent area households (74%) against 50% of project area households. But fully damaged houses was more (24%) with project area households than adjacent and control area (20% both).

11 WOMEN

11.1 Background and review

Women constitute roughly 48% of the countries 108 million population (1991). The lives of women in Bangladesh are profoundly affected by the socio-economic changes arising from increased landlessness and poverty. Poverty is increasingly breaking down the traditional family support system and pushing women out of their homes in search of employment directly needed for their survival.

The woman today in Bangladesh basically lives in between the pressures of her traditional and cultural setting and the setting causes by winds of change in social fabric. This limits her activities in the family. But women are not equipped to face the challenges of the outside world, where they are being pushed out of the existing system. They are to cope with a world they know little about, a world that gives them no easy access to knowledge, no opportunities to services and facilities to develop themselves and no means to overcome the gender constraints that refuse to allow them to enter the job and/or labor market.

Whatever development program is initiated in Bangladesh, it cannot but take this hard reality into account if it is to evolve genuine strategies for community and women's development. Present study supports the general belief that socio-cultural and economic conditions of women are highly different from those men folk.

11.2 Marriage age of women

Table 11.1 shows mean marriage age of women by different study areas. In all study areas the mean age is a little more than 14 years. For the urban population - for project and control areas, age at marriage of the women is slightly higher than that in the other areas, and their of rural population. In project area, the lowest mean marriage age (13.6) is found for farm households and the highest for urban households (15.1). In adjacent area, the lowest mean age is again found for farm households and the highest for fishermen households. In control area, the lowest mean marriage age (12.9) found among fishermen households and the highest among urban households.

Table 11.1: Mean Marriage Age by Family Background in Different Study Areas

(Figures indicate mean marriage age in years)

Area	Farm	Non-farm	Fisherman	Urban	All HH
Project	13.6	14.5	14.0	15.1	14.2
Adjacent	13.8	14.7	14.9	14.4	14.4
Control	14.2	14.8	12.9	15.3	14.4

Tangail Household Baseline Survey (Dec 1991 - April 1992), DPC

It is also observed from the table that the mean age of marriage ranges between 12.9 years (lowest) and 15.3 years (highest) corresponding national data (1987) 17.9 [1] . The difference of mean between all the households by type and areas is only 2.4 years, by which it can be concluded that general marriage age of the female is less than 16 years. This age is at least two years lower than that of boys. The government permitted minimum age for marriage is 18 yrs and that of man is 21 yrs.

Table 11.2: Marriage Age by Family Background in Different Study Areas

(Figures indicates percentages over marriage age group)

Area	Farm		Non-farm		Fisherman		Urban		All HH	
	Upto 15yr	Above 15yr	Upto 15yr	Above 15yr	Upto 15yr	Above 15yr	Upto 15yr	Above 15yr	Upto 15yr	Above 15yr
Project	74.8	25.2	67.7	32.3	70.0	30.0	70.0	30.0	70.9	29.1
Adjacent	75.7	24.3	68.2	31.8	66.0	34.0	62.0	38.0	69.8	30.2
Control	72.0	28.0	56.7	43.3	74.6	25.4	18.0	82.0	59.2	40.8

Tangail Household Baseline Survey (Dec 1991 - April 1992), DPC

Table 11.2 shows the opposite side of the picture, which also supports the results that have been presented in table 11.1. For all households of control area which is the least figure than the other areas - 59.2% girls get married before their 15th birthday. For all households in project and adjacent areas these percentages are 70.9% and 69.8% respectively. For farm households, the situation of all areas is similar. 75.7% girls of the adjacent area become married within 15 years of age. About 74.8% and 72.0% girls of the project and control areas respectively enjoy(!) their marriage ceremony within 15 years age.

A better picture has emerged for the control area, where only 18.0% girls were married before 15 years and the rest 82% were married after 15 years. But the picture of the control area urban households is just reverse for the other areas and household groups. The second lowest marriage age below 15 years group (56.7%) is for non-farm households in the control area. In all other areas, around 30% girls wait for marriage after 15 years. This 30% had comparatively delayed marriage because of two opposite causes - (i) Marriage is a major economic burden for parents of the girls in the present society of Bangladesh. So, most of them had to wait after 15 years age because of inability of their parents/guardians, and (ii) a smaller number waited because of low education and for better matches.

11.3 Women labour and employment

The total number of civilian labour force estimated by the labour Force Survey of 1989 stands at 50.7 million of which 21 million are female representing 41.4% whereas urban females constitute only 1.5% of the female labour force, the rural females constitute 19.5%. The Statistical Year Book quotes LFS survey figures showing 50.1 million (98.8%) as employed of which 20.7 million are females or 41.3% of the labour force, against that of 3.2

[1] Vital Registration Survey

million in 1985. The reason, attributed to such a sharp rise has been inclusion of specific activities carried out by female members in agriculture at households like domestic poultry,rice boil and threshing & boiling,food processing etc. Excluding the new inclusions, the number of employed females stand at 3.6 million of the total 36 million labour force representing 10% of the total.

The total female population in sampled households stands at 2936 nos. As shown in table 11.9, although female labour force in a Farm, Non-Farm,Fisherman and Urban households varies between 52.3% , 48%,48.7% and 50.8% in project area, employed females labour force is only 2%,3%,nil and 1.5%. In adjacent areas, the figures varies between 46-60% with 3%-5.6% employment . However, in the control areas, female employment varies between 4%-14.9%a against female labour force constituting 53-62% of the total (Table 2.9).

The significantly higher percentage (14.9%) in the urban sector of control area is attributed to the existence of more employment opportunities there. Table 11.10 give picture of full time and part time employment in the project, adjacent and control areas. As depicted in the table,maximum full time employment of female labour is among the farm households while it is nil with fishermen households. Similarly, maximum part time job is found with urban households in project and fishermen households in adjacent area.

11.4 Problems of co-wife, dowry and divorce/separation

Incidence of the respondents having co-wives is insignificant in both project and control areas ranging between 0.8% and 3.8% of households. But urban households in adjacent area has the incidence rate of 12% followed by 6% in non-farm households (Table 11.3).

Table 11.3 : Information of Co-wife by Family Background in Different Study Areas

(Figures indicate percentage of respondents)

Area	Farm	Non-farm	Fisherman	Urban	All HH
Project	3.8	3.0	2.0	2.0	3.0
Adjacent	1.5	6.0	-	12.0	3.4
Control	0.8	2.2	-	2.0	1.4

Tangail Household Baseline Survey (Dec 1991 - April 1992), DPC

Dowry: Farm households are the least affected social group facing dowry burden in all surveyed areas (25.8% in project area, 30.5% in adjacent area and 37.6% in control area). The worst sufferers are fishermen households 78% in adjacent area, 52.9% in control area and 64% in project area.

Table 11.4 : Information of Dowry Case by Family Background in Different Study Areas

(Figures indicate percentage of respondents)

Area	Farm	Non-farm	Fisherman	Urban	All HH
Project	25.8	49.2	64.0	46.0	42.3
Adjacent	30.5	53.4	78.0	64.0	49.7
Control	37.6	53.7	52.9	40.0	46.1

Tangail Household Baseline Survey (Dec 1991 - April 1992), DPC

11.5 Women property heirs/rights

Rights of women on property are rarely enforced in Bangladesh. A picture of women's rights/heirs on property is seen in table 11.5. It appears from the table that for all households, only 6.9%, 7.4% and 8.3% of the respondents from project, adjacent and control areas respectively, women have actually received property from family. For farm households 10.6%, 10.7% and 13.6% respectively from project, adjacent and control area woman received property from the family. Except for urban households of the adjacent area (18.0%), the recipients figure varies between 2.0% to 7.5% for all areas and household types.

Table 11.5 : Information on Getting Property/Heirs Property from Family by Family Background in Different Study Areas

(Figures indicate percentage of respondents)

Area	Farm	Non-farm	Fisherman	Urban	All HH
Project					
Not in practice	3.8	13.6	78.0	10.0	18.4
Unwilling to take	34.8	25.0	6.0	24.0	25.5
Father is landless	6.1	16.7	10.0	8.0	10.7
Not matured	35.6	35.7	4.0	46.0	32.7
Deprived	9.1	4.5	-	6.0	5.8
Received property	10.6	4.5	2.0	6.0	6.9
Adjacent					
Not in practice	1.5	6.8	68.0	2.0	17.4
Unwilling to take	34.3	16.5	-	6.0	19.2
Father is landless	6.9	16.5	14.0	14.0	12.3
Not matured	42.0	51.9	16.0	56.0	43.9
Deprived	4.6	6.0	-	4.0	4.3
Received property	10.7	2.3	2.0	18.0	7.4
Control					
Not in practice	4.8	7.5	74.5	32.0	19.4
Unwilling to take	32.8	28.4	2.0	28.0	26.1
Father is landless	5.6	13.4	11.7	8.0	9.7
Not matured	33.6	33.6	2.0	26.0	28.0
Deprived	9.6	9.7	5.9	4.0	8.3
Received property	13.6	7.5	3.9	2.0	8.3

Tangail Household Baseline Survey (Dec 1991 - April 1992), DPC

Farm households property is defined by landownership, but non-farm fishermen and urban households usually has no specified fixed asset like land. A few daughters of these three household groups in all areas has received property/heirs. The table 11.5 shows, a sizeable percentage of women answered that they are not willing to get benefit from their family. Normally, this is not the case but most of these respondents answered like this because of uncongenial social/family pressures and dependance problems. Directly or indirectly these women are also deprived from the property.

An interesting finding from the table 11.5 is that fishermen households in all areas rarely practice transfer property/heirs property for the women members. Only 2% both in project and adjacent areas and, 3.9% in control areas respondents received property/heirs property from their family, for fishermen households.

On the other hand, 78%, 68% and 74% respectively from project, adjacent and control areas fishermen do not practice property transfer for women members. This is a reality among the fishermen households in all the three surveyed areas because those households belonged to Rajbangshi, Malo and Kaibartadas, castes of Hindu religion/community, and Hindu property laws in general do not entitle their women folk to any property rights through inheritance/legal transfer. Moreover,fishermen households being usually very poor class have so little percents of property that they can not afford to transfer something to their daughters /sisters even if they want to do so.

11.6 Womens income and its utilization

In nearly every culture, women spend more of their earnings than man on households improvements and also on any item they will make life better for their children. Even a small increase in income made to women usually shows a higher resultant of utility of life of the family as measured by nutrition, educational level, health, morbidity etc than a larger increase in income for men.

As found through the Base line Survey in the project, control and adjacent areas, major income generation of employed women is derived through activities like weaving,domestic service (house made);rice husking, Bidi making and job-service etc. Domestic service accounts for 50% the full time female service activity in control area and 10% in urban sector of the project and control areas. Net making is a 100% part time job for the adjacent areas but for project and control areas.it is 68% and nil for control area. maximum income is derived through full time service jobs (TK. 18,100 annually in adjacent area while maximum income in part time job is derived through rice husking.

In the study areas also maximum number of households supplement the day to day expenditure fund with earnings by the employed female member.

11.7 Women's share in family management

Women in most traditional societies made all the important decisions.They made seed selection,educated the children or made sacrifices to send them to school,managed the

provision, preparation and storage of food and water. Their role has gradually changed turning them to marginal ones. Constitutionally , women in Bangladesh enjoy equal rights but only a few of these rights can be practiced. Although the national literacy rate is 29% (1991 census says it is 25%), is only 18%. Table 11.6 shows respondents opinion on children education - whether importance of their opinion is properly taken car of. Farm households shows that highest percentages give importance on boys education (56.1% for project, 55.7% for adjacent and 74.4% for control areas). Also, for education of daughters, farm households have the highest figures for all areas (54.5%, 39.7% and 58.4%). All households of the control area shows highest percentages - 61.9% for male and 48.6% for female children. Daughters are given less importance for education in all the areas. Gaps between male and female children regarding their education are highest for the fishermen households in adjacent area.

Table 11.6 : Information on Respondent's Opinion Regarding Children Education (Sex wise) Considered by Household Head by Type of Household

(Figures indicate % of respondents opinion by sex of children)

Area	Farm		Non-farm		Fisherman		Urban		All HH	
	Son	Daug-hter	Son	Daug-hter	Son	Daug-hter	Son	Daug-hter	Son	Daug-hter
Project	56.1	54.5	41.7	31.1	36.0	22.0	58.0	36.0	48.3	39.0
Adjacent	55.7	39.7	29.3	30.1	32.0	10.0	32.0	26.0	39.6	30.2
Control	74.4	58.4	58.2	44.0	45.1	37.3	60.0	48.0	61.9	48.6

Tangail Household Baseline Survey (Dec 1991 - April 1992), DPC

Table 11.7 shows another dimension of unfortunate picture for daughters of the study area. The table shows that expectation of parents for their daughters' better employment after proper education is too low compared to that for their sons for all areas and household types. Some of the parents aspect minimum education for their children alike, but in case of daughters such minimum education is sought by as many as 18.9% households.their target being also lesser for daughters, though it is basically a real but hopeless hope in the prevalent socio-cultural setting that every parent want to fulfil their inner desire for education to fructify through their children's education..

Table 11.7 : Information on Respondent's Plan for Children's Career Build-up by Type of Household

(Figures indicate percentages of respondents opinion by sex of children)

Area	Farm		Non-farm		Fisherman		Urban		All HH	
	Son	Daughter	Son	Daughter	Son	Daughter	Son	Daughter	Son	Daughter
Project										
-Not applicable	38.6	47.0	39.4	35.6	28.0	39.0	24.0	64.0	35.4	43.1
-No plan	-	3.0	5.3	9.8	18.0	20.0	4.0	36.0	4.9	12.3
-Inability	0.8	0.8	3.8	6.1	4.0	6.0	2.0	-	2.4	3.2
-Minimum education	2.3	18.9	6.8	17.4	6.0	24.0	-	-	4.1	16.4
-Affordable (as far as)	32.5	28.8	28.8	26.6	34.0	16.0	28.0	-	30.7	22.2
-Honorable employment after educn.	25.8	1.5	15.9	4.5	10.0	2.0	42.0	-	21.9	2.5
Adjacent										
-Not applicable	30.5	38.9	36.1	31.6	18.0	32.0	22.0	32.0	29.6	34.3
-No plan	6.1	9.9	12.8	18.0	12.0	24.0	2.0	2.0	8.7	13.7
-Inability	0.8	2.3	0.8	8.8	12.0	14.0	6.0	16.0	3.0	6.3
-Minimum education	4.6	15.3	4.5	15.8	14.0	4.0	34.0	34.0	9.8	16.4
-Affordable (as far as)	32.1	27.5	24.1	27.1	40.0	-	26.0	-	29.4	19.7
-Honorable employment after educn.	26.0	6.1	21.8	3.8	4.0	-	-	-	17.8	3.5
Control										
-Not applicable	23.2	35.2	32.8	41.0	45.1	51.0	36.0	52.0	31.6	41.9
-No plan	2.4	4.8	1.5	3.0	5.9	7.8	2.0	4.0	2.5	4.4
-Inability	4.8	3.2	7.5	11.2	9.8	7.8	2.0	10.0	6.1	7.7
-Minimum education	2.4	25.6	1.5	19.4	9.8	19.6	2.0	24.0	3.0	-
-Affordable (as far as)/	25.6	25.6	29.1	22.4	17.6	13.7	18.0	10.0	22.2	20.5
-Honorable employment after educn.	41.6	5.6	27.6	3.0	11.8	-	40.0	-	31.9	3.1

Tangail Household Baseline Survey (Dec 1991 - April 1992), DPC

Table 11.8 : Information on Women's Opinion on Involvement in Matters of Family Maintenance and/or Investment by Type of Household

(Figures indicate percentage of respondents)

Area	Farm	Non-farm	Fisherman	Urban	All HH
Project					
Not Applicable	0.8	2.3	-	4.0	6.0
Always	44.7	53.0	36.0	58.0	48.3
Sometime	51.5	43.2	62.0	36.0	47.8
Never	3.0	1.5	2.0	2.0	2.1
Adjacent					
Not Applicable	3.8	0.8	-	-	1.6
Always	44.3	52.5	70.0	42.0	50.5
Sometime	48.1	45.2	30.0	58.0	45.9
Never	3.8	1.5	-	-	1.9
Control					
Not Applicable	11.2	9.7	5.9	8.0	9.4
Always	47.2	51.5	45.1	58.0	50.0
Sometime	38.4	33.6	33.3	34.0	36.2
Never	3.2	5.2	15.7	-	5.3

Tangail Household Baseline Survey (Dec 1991 - April 1992), DPC

Table 11.8 shows respondents' answers on involvement in family affairs. The respondents always involved in their family matters for the farm households are 44.7%, 44.3% and 47.2% respectively. This is least for the fishermen households in the project area (36%) and highest for the same category households in the adjacent area (70%). On the contrary, 15.7% respondents of the fishermen household in the control area never receive opinion of women. For other area and households ranging from 0 to 5.2% never accept women's opinion on family matters.

11.8 Child mortality rate (CMR)

Child mortality rate is one of the most important indicator of social as well as economic life. It is highly related with the standard of living, educational level of the mother, age at marriage of the mother, family planning practice, type of employment of the head of the household, per capita income and consumption pattern of the household members, health consciousness etc. and finally, years gap between children or average number of children per mother.

Figures in table 12.9 show that child mortality varies between 8.6% (in adjacent area urban households) and 21.3% in control area farm households. In adjacent area the average CMR is reasonably lower than that of other areas/household groups. Except the fishermen and urban from adjacent area, where CMR are comparatively lower than, the range is between 14.9% and 21.3%. From these figures it appears that factors relating to CMR are almost common for all the surveyed areas. National average of child mortality ratio is 9.4 (BBS,1991) which is lower than the figure of all the areas except 8.6% for urban and 8.8% for fishermen in adjacent area.

Women potential for decision making and management is being increasingly explored in the modern day development programs by way of involving them in implementing participatory approaches. Their community level management roles have been successfully tested and acclaimed through various water supply & sanitation projects in Africa and Asia including Bangladesh. Women caretakers are successfully maintaining over hundred deep set tubewells and about 500 twin pit sanitary latrines in Mirzapur area of Tangail since 1990 after completion and withdrawal of World Bank/UNDP interventions & support . The pioneer community management project experience of Mirzapur has been accepted as one of national strategies for promotion of water supply and sanitation.

The following table shows women's extensive role in maintaining homestead forestry etc.

Table 11.9: Child Mortality Rate by Type of Household

(Figures indicate percentage of respondents)

Area	Farm	Non-farm	Fisherman	Urban	All HH
Project	18.5	17.5	20.1	16.1	18.0
Adjacent	15.5	18.8	8.8	8.6	14.8
Control	21.3	19.9	17.8	14.9	18.8

Tangail Household Baseline Survey (Dec 1991 - April 1992), DPC

11.9 Age of last child

Table 11.10 shows the age of the last child of the respondents. According to he table,in project area,among the category farm,non-farm,fisherman and urban 9.8%,24.2%,20.0% and 20.0% respectively bear below 1 year aged children respectively. Similarly 9.8%,16.7%,16.0 % and 4.0% percent bears 1-2 years aged children and 9.8%,19.0%,22.0% and 10.0% bear 3-4 years old children. Also the above categories of household 70.6%,40.1%,42.0% and 66.0% respondents bear 5 and above years old children.

Table 11.10: Age of Last Child by Type of Household

(Figures indicate percentage of respondents)

Area/Child Age	Farm	Non-farm	Fisherman	Urban	All HH
Project					
Below 1 year	9.8	24.2	20.0	20.0	17.8
1 - 2 years	9.8	16.7	16.0	4.0	12.3
3 - 4 years	9.8	19.0	22.0	10.0	14.8
5 years and above	70.6	40.1	42.0	66.0	54.8
Adjacent					
Below 1 year	12.2	22.6	20.0	18.0	17.8
1 - 2 years	6.9	12.8	16.0	24.0	12.6
3 - 4 years	16.0	24.8	32.0	18.0	21.7
5 years and above	64.9	39.8	32.0	40.0	47.7
Control					
Below 1 year	29.6	30.6	25.5	18.0	27.7
1 - 2 years	4.8	13.4	5.9	2.0	7.7
3 - 4 years	7.2	14.1	13.7	12.0	11.3
5 years and above	58.4	41.8	54.9	64.0	52.5

Tangail Household Baseline Survey (Dec 1991 - April 1992), DPC

In adjacent area,among the categories of farm,non-farm,fisherman and urban households 12.2%,22.6%,20.0% and 18.0% bear below 1 year old children respectively. Similarly 6.9%,12.8%,16.0% and 24.0% bear 1-2 years old children, and 16.0%,24.8%,32.8% and 18.0% bear 3-4 years aged children. Also above category of households 64.9%,39.8%,32.0% and 40.0% percent bears 5 and above years old children.

In control area,among the categories farm,non-farm,fisherman and urban 29.6%,30.6%,25.5% and 18.0% bear below 1 year old children respectively. Similarly 4.8%,13.4%,5.9% and 2.0% bear 1-2 years old children and 7.2%,14.1%,13.7% and 12.0% bears 3-4 years old children. Also above category of household 58.4%,14.8%,54.9% and 64.0% bear 5 and above years aged children.

11.10 Findings and observations

- Mean marriage age of girls of all households in project area is 14.2 yrs while that of both adjacent and control area is 14.4 yrs. 20% of fishermen and urban households have child below 1 year age. CMR varies from 14% to 18%.

- Polygamy is existing with 0.8% and 3.8% of project and control area households. The incidence in urban households in adjacent area is 12%

- Hindu laws do not entitle daughters to property rights. most of fisherman households being hindu, transfer or receipt of inherited property i s almost absent. A sizable portion of married women in muslim households are unwilling to take inherited property. however, cases of deprivation is also common.

- Whereas female labor force by household types varies from 48-52% in project area, only 0-3% is employed .Only in control area, employment ranges between 4%-15% against labor force of 53-62%.

- Maximum full time employment is among farm household in project area while it is nil with fisherman households. maximum part time job is with urban households in project area and fishermen households in adjacent area.

- Maximum income is derived through service jobs in adjacent area while maximum income in parttime job is derived through rice husking.

- Female members income is mostly spent on household expenses. In many households, mostof these are taken by or given to husband and/or son.

- Women members are seldom consulted on children education.

- As much as 18.9% parents in households think a rare minimum education for heir daughters is enough. Only 2.5-3.5% households wants or plans for honourable equipment or their daughters.
- Women are playing an extensive role in maintaining homestead forestry the study area.

12 LIVESTOCK, POULTRY AND KITCHEN GARDENING

12.1 Livestock

Livestock plays a major role in the overall farming system of the country. It provides most It provides most of the power for agricultural operations and farm yard manures, supply protein foods like milk and meat, and also share about one third of the farm capital thereby contributing about 6.5 percent of the GDP. Moreover, livestock products, hides and skins are important export items of the country and contribute about 13 percent of the foreign exchange earnings of the country. Moreover, growing of feeds and fodder for animals provide economic motivation for environmentally sound crop production systems.[2]

In the study areas per capita availability of livestock is highest in the control area (0.37) followed by that (0.3) in adjacent area, and lowest in the CPP area (0.25) as against national average of 0.3 (Table 12.1). It is remarkable that there is an inverse relation between livestock availability and cropping intensity. Such a scenario indicates that the project area is in critical situation since the cropping intensity is highest (202%) here in relation to adjacent area (182%) and control area (197%). This situation will be further aggravated particularly in the project area in terms of animal power need after the implementation of the project. Ultimate objective of the project to increase crop production by reducing flood hazard through water management may not be achieved if either supply of adequate animal power or its replacement by mechanization is not timely ensured.

Table 12.1: Per Capita Availability of Livestock in Different Study Areas

(Figure indicates mean no. of livestock/members)

Study Area	Farm	Non-Farm	All
Project	0.35	0.10	0.25
Adjacent	0.45	0.11	0.30
Control	0.57	0.14	0.37

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

This survey reveals that the per household availability of draft power is lowest in the project area (1.53) and highest in the control area (1.90) and all these figures are far below the national average (2.6).[3] It is also observed that per hectare availability of draft power is only 1.90 in the project area, while in adjacent and control area. These are 1.72 and 2.37 respectively all of which are found below national average of 3.2 per hectare. The problem of draft power need will be more acute after the implementation of project if more land under cultivation is realized.

[2] Saadullah, M. Livestock-its importance, problems and potential and its linkage with agriculture and energy, in Training Manual on Environmental Management in Bangladesh, Department of Environment, Dhaka, 1992.

[3] Saadullah, M. Opcit, p.84

Table 12.2: Availability of Draft Power in Different Study Areas Per Household and Per Hectare of Farm Land

(Figure indicates mean no. of draft animal/hh and hectare of farm land)

Study Area	Per Household	Per Hectare
Project	1.53	1.90
Adjacent	1.82	1.72
Control	1.90	2.37

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

12.2 Animal power and mechanization of cultivation

Table 12.3 pinpoints the fact that all the three study areas are suffering from shortage of draught power supply and the case of project area is relatively more critical. Since additional draught power is needed for agriculture in order to reach a minimum power requirement, it may be met either by increasing power output by individual animal (by increasing feeds and fodder) or by efficient utilization of animal power through the use of better designed animal drawn implements or alternately by going for cooperatively managed mechanization.

Table 12.3: Availability and Requirement of Draught Power (Energy)

Study Area	Total Cropped Area (ha)	Draught Power Needs (kw)	Availability of Draught (kw)2	Deficit/Surplus of Draught Power (kw)
Project	214	79.82	56.56	-23.26
Adjacent	239	89.15	69.16	-19.99
Control	198	73.85	66.64	- 7.21

Tangail Household Baseline Survey (Dec, 1991-April, 1992), DPC

1: 0.373 kw/ha of cropped area (World Bank, 1982 and Hossain & Sarker, 1987)

2: 0.28 kw (range 0.22-0.34)/draught animal (World Bank, 1982 and Hossain & Sarker, 1987)

12.3 Poultry

Poultry birds are important source of animal protein supply for household consumption and Table 12.4 shows that inhabitants in the project area are in better position having per capita 1.3 poultry birds which is a little higher than the national average of per capita 1.2 poultry birds, while, per capita availability of poultry birds in a adjacent and control areas are very poor and far below the national average. Better impression in terms of availability of poultry birds in the project area (Table 12.5) does not necessarily imply better consumption rate by households but for commercial purpose due to high market demand of poultry birds and the existence of market within walking distance.

Table 12.4: Per Capita Availability of Poultry Birds by Type of Household in Different Study Areas

(Figure indicates mean no. of poultry birds/hh members)

Study Area	Farm	Non-farm	Fisherman	Urban	All
Project	1.2	1.5	1.1	1.2	1.3
Adjacent	0.9	0.5	0.6	0.7	0.7
Control	1.2	0.8	0.5	0.9	0.9

Tangail Household Baseline Survey (Dec, 1991-April, 1992), DPC

Table 12.5: Per Household Availability of Poultry Birds by Type of Household in Different Study Areas

(Figure indicates mean no. of poultry birds/hh)

Study Area	Farm	Non-farm	Fisherman	Urban	All
Project	8.9	7.9	5.5	6.3	7.7
Adjacent	5.6	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

12.4 Kitchen gardening

Kitchen garden is the source of cash earning and supplemental nutrition supply for most of the households in the study areas. Women are mostly responsible for kitchen garden production. Participation in kitchen gardening is very high among the farm households ranging from 84% in adjacent the area to 96% in the project area. Average participation irrespective of household type shows that in project area 75% is engaged in kitchen gardening, while, in adjacent and control areas participation rates are 76.7% and 77.7% respectively.

Table 12.7 shows average production of vegetables per household and the production performance is found to be highest in the control area (116 Kg/H.H), while, in project area and adjacent area vegetable production per household are 69% and 97% respectively. Figure for project area is low due to the presence of urban households in the sample where participation of households in kitchen gardening is only 19%.

Table 12.6: Participation in Kitchen Gardening by Type of Household in Different Study Areas

(Figure indicates percentages over total household)

Study Area	Farm	Non-farm	Fisherman	Urban	All
Project	96.0	73.0	62.0	38.0	75.0
Adjacent	84.0	81.2	90.0	40.0	77.7
Control	92.8	76.1	52.9	62.0	76.7

Tangail Household Baseline Survey (Dec, 1991-April, 1992), DPC

Table 12.7: Average Production of Vegetables from Kitchen Gardening by Types of Households in Different Study Areas

(Figure indicates mean production (kg) of vegetables/hh)

Study Area	Farm	Non-farm	Fisherman	Urban	All
Project	123	46	35	19	69
Adjacent	147	79	58	53	97
Control	138	122	87	78	116

Tangail Household Baseline Survey (Dec, 1991-April, 1992), DPC

12.5 Findings and observations

- Per capita availability of livestock is highest in control area (0.37) and lowest in project area (0.25). As corresponding inverse correlation asserts, crop intensity is highest (202%) in project area and anticipated fall in animal power need after project implementation is likely to aggravate the situation.

- Per households availability of draft power is lowest in project area (1.53) and highest in control area. Per hectare availability of draft power is also low (1.90) in project area compared to national average of 3.2.The problem is like to be more acute upon completion of the CPP.

- Households in project area has more poultry birds per capita 1.3 which is higher than the national per capita of 1.2 birds.

- Participation in kitchen gardening is about 75.0% - 77.7% in the households of the study in control area (116kg/HH). In urban households,participation rate is only 19%.

13 OPEN WATER FISHERY

13.1 Contribution of open water fishery in rural life

Rural resource system in the Tangail CPP area is closely synchronized with the behavioral pattern of the floodplain of Jamuna-Dhaleswari river systems which is subject to regular seasonal inundation. The low topo areas of the floodplain remains inundated for a substantial part of the year and the existence of beels, canals, pagars and depressions (which covers about 66% of the CPP area) creates wider opportunity for rural poor to gain from common property resources. Open water capture fishery being one of the sources of such resource, plays an important role in health and nutrition as well as employment and economic gain.

Traditionally, people from different social classes of such floodplain area catch fish during monsoon and post-monsoon period in open water areas mainly at subsistence level i.e. for their own consumption. However, the poorer section of subsistence fishing households often sale a portion of the catch to supplement their family income. Thus open water fishery system is perceptible contributor to nutrition and employment for rural poor.

13.2 Role of Subsistence Fishery

A total of 264 households (132 farm and 132 non-farm households) were surveyed with a view to having clear understanding on the level and extent of subsistence fishing in the Tangail CPP area. In adjacent area, the number of sample households was 264 (131 farm and 133 non-farm) and in the control area the sample size was 259 (125 farm and 134 non-farm).

It was observed that 83.3% of the farm and 58.3% of the non-farm households do practice fishing to some extent at subsistence level. On an average, 70.8% of the rural households were found involved in subsistence fishing in the CPP area (Table 13.1). The subsistence fishing households fish in all most all available types of water-bodies in the CPP area which include rivers, canals, beels, floodplain, boropits and derelict ponds.

Table 13.1: Subsistence Fisherman by Type of Rural Household in Different Study Areas

(Figures in percentages over household)

Study Area	Farm	Non Farm	All Rural HH
Project	83.3	58.3	70.8
Adjacent	61.8	40.6	51.1
Control	52.0	51.5	51.7

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

In the adjacent area, 51.1% (61.1% farm and 40.6% non-farm) rural households were found involved in subsistence fishing and in the control area the subsistence fishing households, were 51.7% (52% farm and 51.5% non-farm). So the rate of participation of rural

households in subsistence fishery was found comparatively higher in the project area than that of the adjacent and control areas.

13.3 Fishing efforts by households

The average annual catch days of the subsistence fishing households were found highest in adjacent area (48.6 days) followed by 42.7 days in project area and 42.4 days in control area (Table 13.2). Based on the findings, it may be assumed that the adjacent area is rich in open water fisheries resources than the CPP and the control areas.

In CPP and adjacent areas, the farm households make higher fishing efforts (45 and 51.1 catch days) compared to non-farm households (39.5 and 44.9 catch days). While in control area, the situation is reverse, where non-farm households carryout higher efforts (47.8 days) compared to farm households (36.4 days).

Table 13.2: Average Days involved in Subsistence Fishing by Type of Rural Household in Different Study Areas

(Figures in average catch days/subsistence fisherman)

Study Area	Farm	Non Farm	All Rural HH
Project	45.0	39.5	42.7
Adjacent	51.1	44.9	48.6
Control	36.6	47.8	42.4

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

The study revealed that among the maximum farm households catch fish in beels (46.2%) and the minimum fish in the boropits (2.3%) in the CPP area. Among the farm households, the average annual catch day varied from a maximum of 39.2 days in the rivers to a minimum of 24.6 days in floodplain. Among the non farm households the maximum of 30% fish in beels and the minimum of 2.3% fish in the boropits. While their average annual catch days varied from a maximum of 45 days in boropits to a minimum of 21.4 days in floodplain.

As in CPP area, beels are the major fishing ground for the subsistence fishing in the control area maximum (38.6%) fishing households (31.2% farm and 45.5% non-farm) catch fish in the beels. While in the adjacent area, most (21.6%) of the subsistence fishing is practiced in the flood plain (26% farm and 17.3% non-farm). Again the survey findings positively indicate that the adjacent area floodplain has higher fish resource potential. This may be due to the fact that the riverbanks of the adjacent area were not widely covered by flood control embankments and hydraulic structures compared to other two study areas.

13.4 Fishing rights and heritage on open water bodies

Most of the subsistence fishing households of both from farm and non-farm categories, catch fish in lease free water-bodies in all the three study areas. However, in the CPP area only 12.5% households catch fish in rivers under private leasing arrangements. While 15.2% households catch fish in canals under private leasing arrangements and 3% fish in beel under cooperative leasing arrangements. It is, thus observed that the subsistence fishing households area dependent mostly on lease-free common property capture fishery resources in study areas.

13.5 Fishing season and fishing intensity

The subsistence fishing households catch fish round the year in different types of water-bodies. In the CPP area it was observed that they do catch fish for 11 months (Baishakh through Falgoon) in rivers, 8 months (Ashar through Magh) in canals, 5 months (Agrahayan through Chaitra) in beels, 6 months (Ashar through Agrahayan) in floodplain, 5 months (Kartik through Falgoon) in boropits and 5 months (Magh through Jaistha) in derelict ponds. In the CPP area the peak fishing period in river was the months of Poush and Magh, while that was Agrahayan - Poush in the adjacent area and Magh in the control area, in canals is Kartik - Magh (Kartik - Agrahayan in the adjacent area and Agrahayan in the control area), whereas for beel is Aswin (Magh both in the adjacent and control area), and for all three floodplain Aswin is the common period.

Based on the above findings, it can be concluded that the major fishing activities start in late monsoon (Aswin) with the recession of flood water and continues up to Summer (Falgoon-Chaitra). In summer, fishing efforts are mainly centered around derelict ponds.

Catch days of subsistence fishing households found confined within the range of 1 - 100 days in a year in different water-bodies. The average catch days per year is found to be 32.7 days in river, 34.1 days in canals, 25.9 days in beels, 23.3 days in floodplain, 35 days in boropit and 34.3 days in derelict ponds. Survey data show that the beel fishery provides most of the subsistence fishing vis-a-vis employment.

13.6 Fishing Gears and Equipment Owned

During the survey period it was observed in all the study areas that the rural people including children use various types and sizes of fishing gears and equipments.

Table 13.3: Fishing Gears/Equipments Owned by Rural Households in Different Study Areas

(Figures in percentages over total household)

Gears/ Equipments	Project			Adjacent			Control		
	Farm	Nonfarm	All	Farm	Nonfarm	All	Farm	Nonfarm	All
Scine Net	-	-	-	-	-	-	0.8	-	0.8
Current Net	4.6	2.3	3.4	1.5	1.5	1.5	4.0	1.5	2.7
Drag Net	0.8	-	0.4	0.8	-	0.4	0.8	-	0.4
Gill Net	16.7	5.3	11.0	6.1	5.3	5.7	8.0	3.7	5.8
Cast Net	32.6	15.9	24.2	33.6	17.3	25.4	15.2	4.5	9.7
Lift Net	53.8	33.3	43.6	30.6	17.3	23.9	20.0	4.5	12.0
Push Net	25.7	18.2	21.9	16.1	11.3	0.4	12.0	3.7	7.7
Bamboo Trap	6.8	1.5	4.2	2.3	2.3	2.3	6.4	0.8	3.5
Hooks/Lines	6.1	10.6	8.3	4.6	2.3	3.4	4.0	2.2	3.1
Harpoons	4.6	3.0	3.8	-	0.8	0.4	0.8	0.8	0.8

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

Nine types of fishing gears and equipments are commonly used by the fishing households in the study areas. However, lift net ('Dharma Jal') and found as cast net ('Jhaki Jal') are most popular fishing gears. In the CPP area, maximum rural households (43.6%) possess lift net followed by cast net (24.2%). While, in the adjacent area, households owns cast and lift net 25.4% and 23.9% respectively. But in control area rural households fishing gears availability is relatively lower in comparison to other areas (Table 13.3). This indicates that all three study areas are still active open water fish resourceful floodplain, which provides opportunities for subsistence fish for the rural peoples.

13.7 Pond Fishery

Unlike other parts of the country, pond fishery in the CPP, adjacent and control areas was found to be not very popular. Most of the ponds are captured ponds (100% in the adjacent, 84% in the project and 50% in the control area).

Table 13.4: Pond Ownership by Type of Pond in Different Study Areas

(Figures in percentages over total household)

Study Area	Farm	Nonfarm	All
Project	14.4	4.5	9.5
Adjacent	7.6	-	3.8
Control	3.2	6.0	4.6

Tangail Household Baseline Survey (Dec, 1991 - April, 1992), DPC

In general, the households were observed reluctant to take up pond based pisciculture mostly due to the damage caused by floods.

In the project area (9.5%) having ponds, followed by control area (4.6%), while in the adjacent area only 3.8% rural household having pond (Table 13.3). Of the rural households having ponds, project area has the highest percentage (9.5%) followed by control area (4.6%) and then the adjacent area with only 3.8%.

13.8 Findings and observations

- About 71% of rural households in the study area are involved in open water subsistence fishing, carried out through out the year with varied peak seasons.

- Average annual catch days of subsistence fishing households were highest in adjacent area (49 days) followed by project and control area with 42 days for both. Fishing is carried out in lease free and leased out areas.

- Unlike other parts of the country, pond fishery in study areas was not found to be quite popular.

14 FLOOD

Flood is a regular feature in Bangladesh which is a deltaic plain cris-crossed by innumerable rivers & rivulets and which is subject to heavy monsoon rains. Natural phenomena and too a lesser extent de-forestation at the upstream areas of the major rivers result in a heavy silt flow. According to some lack of dredging and also obstruction of the discharge course all have added to an apparent increased re-occurrence of floods and damage caused by floods.

14.1 Flooding type

The main physiographic formation of the Tangail CPP area is its extensive floodplain system bordered by the Jamuna-Dhaleswari in the West, Pungli in the North and East and Lohajang flowing through the central area dividing the project area into south west and north east parts. The topography of the floodplain of the study area is relatively flat, but the local relief is determined by three dominant morphological features which are relevant to understand the flooding type and extent in the area. First, natural levees are alluvial ridges, commonly 1-2 m higher than the floodplain surface, that are formed by deposition of sediment as flood waters top the river banks. Second, backswamps or levee flank depressions are areas of minor relief, usually 1-2 meter lower than the floodplain surface. Third, an important morphologic feature of all three floodplain is their extensive abandoned channel systems, known as either oxbow lakes or cutoffs.

14.2 Flood occurrence

The incidence of flood is comparatively at the lower rate as experienced by the inhabitants of the control area, followed by the project and then adjacent area. Such a pattern of flooding is compatible with the topographic gradients of the overall region which is inclined from North-West to South-East. Percent of households reported that flood did not occur in 1986 in Control, Project and adjacent areas are 92%, 78.8% and 77.1% respectively , while in 1990 these figures stood at 8%, 11.4% and 13% respectively.

14.3 Flood types

Floods can be caused by both local rainfall and can be river induced. The effect of flooding depends a lot on the timing and the speed with which the water rises of enters the area. Table 14.1 reveals that in most years early river water rise is the main type of flooding experienced. The only major exception is 1988 when the flood was identified as caused by high water rise in the river.

In the adjacent area the floods are perceived in a different way. There the early rise of the river water in 1988 has been identified as the main type of flooding. This is not altogether unexpected because the adjacent area has less protection and has a more open connection with the rivers. The control area faces flooding that is more similar to that of the project. High water levels figure more prominently in the control area. This may well be due to the fact that part of that area boarders the Jamuna river.

Table 14.1: Flooding Information by Flood Type in Different Study Areas (Last five years)

(Figure indicates percentage of household)

Area by Type Flood	1990	1989	1988	1987	1986
Project					
Early rain water	4.1	2.8	0.5	5.2	-
Early rise in river flood	83.5	51.1	3.0	22.0	17.0
High water rise in river	1.4	27.7	88.7	4.1	-
Speedy water raise	0.3	0.3	4.1	0.3	-
Adjacent					
Early rain water	1.9	2.2	0.3	1.6	1.6
Early rise in river flood	72.8	1.4	17.6	23.3	61.5
High water rise in river	6.9	83.2	0.5	-	15.4
Speedy water raise	1.1	1.1	15.1	-	-
Control					
Early rain water	5.8	2.7	2.2	3.6	0.8
Early rise in river flood	61.5	65.0	9.9	17.9	6.3
High water rise in river	15.4	12.6	78.6	12.9	1.6
Speedy water raise	1.9	1.1	2.2	0.8	-

Tangail Household Baseline Survey (Dec 1991-April 1992), DPC

14.4 Spatial pattern of household affected by river flood

This study identified that early river flood was always high in the project area, followed by the adjacent and control areas. The project area seems reasonably well protected against early river rise flooding. Apart from 1990, and as far as the adjacent area is concerned 1989, people of the project area reported less early river flooding than in the other areas and years. It is quite obvious that the control area is much a more regular pattern of flooding than either the project or the adjacent area.

14.5 Flood damages

Magnitude of house damage due to flood as reported by the selected respondents in the different study areas over last five years indicate that control area household area highest affected (30.8% households), followed by adjacent areas (19.7% households) and then project area (19.5% households). Such Spatial pattern of house damage may be related with the flooding type in overall region as explained in section 14.2 about the topographic gradient which indicates water flow from the control area to adjacent area. This scenario implies that high velocity of flood water touches the control area first. There are two more reasons for relatively higher house damage in control and adjacent areas are due to the location of the area is closer to the main river Jamuna and Dhaleswari and both areas are exposed to direct flooding, since there is almost no such intervention to reduce the flood hazard.

Table 14.2: Average Records on Magnitude of Houses Damages by Flood and Type of Household in Different Study Areas (Last five years)

(Figure indicates percentage of household)

Study Area	Farm	Non-Farm	Fisherman	Urban	All HH
Project	19.6	20.4	20.0	16.0	19.5
Adjacent	19.8	19.6	20.0	20.0	19.7
Control	30.4	33.0	31.3	26.0	30.8

Tangail Household Baseline Survey (Dec 1991-April 1992), DPC

If we look at the magnitude of house damage by type of households in the control area being the highest affected area, it is found that non farm households area the highest affected group (33% household) followed by fishermen community (average damage reported by 31.3% fishermen households. Since the quality of the house structure as well level and frequency of homestead inundation for non-farm and fishermen households are in disadvantageous position than those of farm and urban dwellers. Same observation is applicable for project and adjacent area. However, in project area, urban dwellers are least affected (average 16% urban household reported damage over last five years). It is obvious, since the area is protected by different interventions as well better housing structures in comparison to other study areas.

Table 14.3: Magnitude of Houses Damage by Flood in Different Study Areas (Last five years)

(Figure indicates percentage of household)

Area by Type Household	1990	1989	1988	1987	1986
Project					
Farm	0.8	3.0	88.6	4.6	-
Non-farm	0.8	3.8	90.9	5.3	-
Fisherman	2.0	10.0	88.0	2.0	-
Urban	2.0	4.0	74.0	2.0	-
All HH	1.4	4.4	87.1	4.1	-
Adjacent					
Farm	4.6	4.6	86.2	3.8	0.8
Non-farm	3.0	3.8	85.0	5.4	0.8
Fisherman	-	4.0	96.0	-	-
Urban	2.0	8.0	88.0	-	-
All HH	3.0	4.7	87.4	3.3	0.5
Control					
Farm	20.0	28.8	88.8	11.2	0.8
Non-farm	29.9	37.0	86.6	17.2	2.4
Fisherman	3.9	43.1	100.0	5.9	-
Urban	18.0	16.0	64.0	26.1	8.0
All HH	21.1	28.6	86.0	14.7	2.2

Tangail Household Baseline Survey (Dec 1991-April 1992), DPC

Year-wise breakdown of the extent of house damage by type of households in different study area shows that except 1988 being the exceptional flood when most of the people suffered severely, but 1987 and 1989 also damaged substantially. In control area flood of 1989 was more damaging than that of 1987, while in project and adjacent area farm and non-farm households are found to report more house damage in 1987. Early river flood is found to be

more prominent in project and adjacent area that of control area in recent years (1989 to 1990).

14.6 Findings and observations

- Flooding of different types affect all three study areas. Only urban dwellers suffer slightly less, apparently because the rural population build houses of poor quality and often built then at vulnerable places.

- The control area suffers most from flooding while the project and the adjacent area are affected to about the same extent.

- In the project area early flooding is the major type, except in 1988, but in the adjacent and control area high river water flooding also has a considerable impact.

15 QUALITY OF LIFE

15.1 General

Judged from the joint WHO/FAO definition of poverty line-1 as the weighted average per capita daily in take of 2122 calories and 18 grams of protein and poverty ii as 85% of this intake, (hard core poor), 51% of the population lie below the poverty tines. (Household survey, 1985-86). Level of housing, water supply systems, sanitation arrangements, energy consumption level, health, children health, extent of hunger,income & expenditure pattern,asset position etc.are the key indicators for the quality of life enjoyed by a community or a group of people. Following sections present the status of these indicators in the study areas.

15.2 Housing

47% of the estimated 14 millions households of the country live thatched houses and only 5% live in buildings. Average floor space per household is only 288 sq.ft. with city slum dwellers, it is only 50-70 sf.ft. It is evident that overwhelming number of households in all the three study areas have kutcha houses. Survey shows the existence of pucca living dwelling structure for 7% of all household in the project area as compared to only 1.7% and 3.1% in the adjacent area and control area respectively. This depicts the poor living environment of the survey areas keeping in view drinking water position (Table 15.2), sanitary practices (Table 15.3) and disease incidence (Table 15.6) as explained in subsequent sections.

Table 15.1: Type of Structure of the Dwelling Units House in Different Study Areas by Type of Household

(Figure indicates percentage of household)

Household Type	Project			Adjacent			Control		
	Kutcha	Semi-Pucca	Pucca	Kutcha	Semi-Pucca	Pucca	Kutcha	Semi Pucca	Pucca
Farm	98.0	2.0	-	94.0	6.0	-	100.0	-	-
	(1.5)	(2.0)		(2.0)	(2.0)		(2.0)		
Non-Farm	98.0	2.0	-	100.0	-	-	100.0	-	-
	(1.0)	(1.0)		(1.2)			(1.6)		
Fisherman	98.0	2.0	-	100.0	-	-	100.0	-	-
	(1.5)	(1.5)		(1.7)			(1.7)		
Urban	34.0	12.0	56.0	76.0	14.0	12.0	78.0	-	22.0
	(1.7)	(1.6)	(2.0)	(1.2)	(1.3)	(1.4)	(1.5)		(2.0)
All HH	89.0	3.3	7.7	94.2	4.1	1.7	96.9	-	3.1
	(1.3)	(2.5)	(2.0)	(1.5)	(0.6)	(1.4)	(1.7)		(2.0)

Tangail Household Baseline Survey (Dec,1991-April,1992), DPC

(Figure in parenthesis indicates average no. of housing structures/household)

Excepting urban households in all the three survey areas, over 90% of respondent households live in kutcha structures (made of indigenous materials of poor durability). Considering urban households alone, in project area, 12% Households own semi pucca structures and 56% households own pucca structures. In adjacent area, 14% urban households own semi pucca structures and 12% households pucca structures. In control area, 22% own pucca structures with none owning semi pucca structure.

15.3 Water supply

Compared to the national coverage figure of 77% rural and 27% urban the safe drinking water figures are quite high (87.5 - 89.3). This is reflection of the generally high level of development in the area.

Table 15.2: Sources of Drinking Water by Type of Household in Different Study Areas

(Figure indicates percentage of household)

Household Type	Project			Adjacent			Control		
	Piped	Tube-Well	Ringwell/ Water Pond	Piped	Tube-Well	Ringwell/ Water Pond	Piped	Tube-Well	Ringwell/ Water Pond
Farm	-	87.1	12.9	-	88.5	11.5	-	85.6	14.4
Non-Farm	-	91.7	8.3	-	89.5	10.5	-	88.1	11.9
Fisherman	-	82.0	18.0	-	88.0	12.0	-	84.3	15.7
Urban	14.0	86.0	-	-	92.0	8.0	-	94.0	6.0
All HH	1.9	89.7	8.4	-	89.3	10.7	-	87.5	12.5

Tangail Household Baseline Survey (Dec,1991-April,1992), DPC

15.4 Sanitation

The scenario of the sanitation practices in the combined study areas does not appear satisfactory. As compared to households of adjacent area and control areas, about 40.6% of all households in project area use safe latrines out of which 70% safe latrines are used sensibly by urban households. Granted that both absence of latrines and unhygienic latrines are health hazards for both households and community life, due preventive attention need be paid to provide safe latrines to all study areas, especially to project area which is under scrutiny regarding living conditions and standards in a wholesome environment.

Table 15.3: Sanitation Practices by Type of Household in Different Study Areas

(Figure indicates percentage of household)

Type of House-hold	Project			Adjacent			Control		
	No La-trine	Unhygnc. Latrine	Sanita. Latrine	No La-trine	Unhygnc. Latrine	Safe Latrine	No La-trine	Unhygnc. Latrine	Sanita. Latrine
Farm	4.5	48.5	47.0	5.3	56.4	38.3	16.0	70.4	13.6
Non-Farm	22.0	50.0	28.0	14.3	66.4	19.3	26.0	57.5	16.5
Fisherman	22.0	40.0	28.0	22.0	54.0	24.0	51.0	31.3	17.7
Urban	8.0	22.0	70.0	10.0	54.0	36.0	12.0	28.0	60.0
All HH	13.7	45.7	40.6	11.5	59.3	29.1	24.2	48.6	27.2

Tangail Household Baseline Survey (Dec,1991-April,1992), DPC

15.5 Energy consumption

Energy consumption for lighting purpose was surveyed in the three study areas by the use of electricity and kerosine separately. Electricity used mostly by the urban households being highest in control area (50%), followed by project area (42%) and adjacent area (22%). In terms of farm households, project area ranks highest (16.7%), followed by control area (13.6%) and adjacent area (6.9%). Correspondingly, kerosine for lighting purpose is overwhelmingly used by farm, non-farm and Fishermen households in all the three study areas. Urban households have lesser consumptive tendency to use Kerosine.

For cooking purpose, it is found that most of the households of all types and areas use firewood and some such other materials with no use of either electricity or kerosine. Single exception is the use of electricity by 22% of urban households in control area.

Table 15.4: Energy Consumption by Type of Household in Different Study Areas

(Figure indicates percentage of household)

Household Type by Study Area	For Lighting		For Cooking		
	Electricity	Kerosine	Electricity	Kerosine	Firewood etc
Project					
Farm	16.7	83.3	-	-	100.0
Non-Farm	7.6	82.4	-	-	100.0
Fisherman	12.0	88.0	-	-	100.0
Urban	42.0	58.0	-	22.0	78.0
All HH	16.2	83.8	-	2.8	97.2
Adjacent					
Farm	6.9	93.1	-	-	100.0
Non-Farm	4.5	95.5	-	-	100.0
Fisherman	-	100.0	-	-	100.0
Urban	22.0	78.0	-	-	100.0
All HH	7.1	92.9	-	-	100.0
Control					
Farm	13.6	86.4	-	2.4	97.6
Non-Farm	7.5	92.5	-	-	100.0
Fisherman	7.8	92.2	-	-	100.0
Urban	50.0	50.0	22.0	12.0	66.0
All HH	22.5	77.5	3.1	2.5	94.4

Tangail Household Baseline Survey (Dec,1991-April,1992), DPC

15.6 Health

Up to June 1990, the country had a public sector bed-population ratio of 1:3200. Only 40-50% of the population are covered by health facilities. Access to doctors is an important key to understand the quality of life. It is known and table 15.5 also shows that the urban people can get health facilities more than the rural people. It is important to note that the people in the adjacent area is lagging behind both the project area and control area. In the rural areas the farming households have more access to the doctors in both project and control areas in comparison with both non-farm and fisherman household in all the three study areas.

Table 15.5: Access To Doctors for Treatment by Type of Household in Different Study Areas

(Figure indicates percentage of household)

Study Area	Farm	Non-Farm	Fisherman	Urban	All HH
Project	35.6	25.0	28.0	62.0	34.9
Adjacent	23.7	21.1	26.0	58.0	27.7
Control	34.4	26.9	25.5	66.0	34.7

Tangail Household Baseline Survey (Dec.1991-April.1992), DPC

Incidence of diseases suffered by household members depicts almost the identical position both in the project area and the adjacent area as viewed against that in control area. Prevalent major diseases common to all types of study areas and all types of households sufferer are cholera/diarrhoea, dysentery, influenza, running nose (due to common cold etc.) and typhoid. Fortunately, diseases like chicken pox, malaria, kala-azar and hepatitis are fewer in terms of household members suffering from such expensive medical treatment ordeals It should be noted that scabies is a major problem in the study areas. It is a infectious disease and an indicator of poor hygienic condition.

Moreover it significant to note that kala-azar cases are being reported during the study period in both project and adjacent areas. It is not known whether this disease has been imported in the area or the sandfly population in that area is high and is infected by Leishmania donovani. It seems that the incidence of diseases by types of household members is fortuitously and fortunately too is in a comfortable position in control area there those in both the project area and adjacent area.

Table 15.6: Incidence of Disease by Type of Household Members in Different Study Areas

(Figure indicates percentage of household member)

Disease	Project				Adjacent				Control			
	Farm	Non-Farm	Fisherman	Urban	Farm	Non-Farm	Fisherman	Urban	Farm	Non-Farm	Fisherman	Urban
o Cholera/ Diarrhoea	8.0	11.1	3.9	2.8	3.5	5.7	7.2	6.2	20.9	20.7	15.2	25.0
o Tetanus	0.2	0.3	-	-	-	-	-	-	-	0.9	2.2	-
o Tuberculosis	0.7	0.6	-	-	-	-	-	-	-	-	-	-
o Chick. Pox	4.5	1.2	1.6	4.7	4.6	0.9	-	70.9	3.5	3.4	2.2	13.9
o Cough	5.2	6.6	3.1	6.5	4.1	6.0	11.2	5.4	9.3	7.8	19.6	11.1
o Typhoid	2.1	2.1	2.3	1.9	1.9	1.2	0.9	-	7.0	10.3	4.3	-
o Dysentery	13.5	16.0	16.4	10.3	15.8	13.6	17.8	15.2	23.3	16.4	-	19.4
o Hepatitis	0.7	1.5	3.9	-	1.1	1.5	0.9	-	2.3	5.2	30.4	-
o Influenza	8.7	10.2	11.7	13.1	9.8	6.0	5.7	3.6	44.2	33.6	11.7	22.2
o Malaria	1.2	1.8	-	-	0.5	2.1	-	0.9	2.3	-	-	-
o Kala-azar	0.5	0.3	-	-	0.3	-	-	-	-	-	-	-
o RuningNose	22.9	24.4	25.8	31.8	25.3	35.2	34.7	39.3	5.8	0.9	10.9	-
o Gastr.Ulcer	8.0	4.2	10.9	12.1	6.0	7.2	8.0	10.7	-	-	-	-
o Scabis	7.8	8.7	10.9	3.7	12.5	8.4	6.4	8.0	3.5	0.9	-	2.8
o Abdomi.Pa.	4.3	3.6	3.1	1.9	4.9	3.9	4.0	5.3				
o Others	10.6	6.3	3.1	18.7	9.0	7.3	3.2	3.6	1.2	0.9	6.5	
Population suffered (%)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

15.7 Immunization

An expanded programme for Immunization (EPI) was launched in 1985 through out the country with UNICEF support with an objectives for Immunizing 85% children under 1 year and pregnant months by 1990. The programme implemented through NGO collaboration was a tremendous success with a 86% coverage on BCG , 69% of DPT, 65% on Polio with 70% of months immunized (WHO survey 1991). It is interesting to note that immunization rate in the control area is higher than that of other areas. Moreover, the adjacent area is again lagging behind the other two. Table 15.7 also shows that only the fisherman households achieved 100 percent immunization in the control area.

Table 15.7: Children Immunization Rate by Type of Household in Different Study Areas

(Figure indicates percentage over eligible children)

Study Area	Farm	Non-Farm	Fisherman	Urban	All HH
Project	80.8	75.9	83.3	83.3	79.4
Adjacent	73.9	73.9	83.3	68.5	74.1
Control	94.4	91.5	100.0	95.2	92.8

Tangail Household Baseline Survey (Dec,1991-April,1992), DPC

15.8 Hunger

Table 15.8 shows that 42% fisherman households in project area, 54% in adjacent area and 51% in control area live on one meal/day half fast. Regarding similar one meal/day half fast

Table 15.8: Extent of Hunger by Type of Household in Different Study Areas

(Figure indicate percentage of household)

Study Area by Missing Meal Combination	Farm		Non-Farm		Fisherman		Urban		All HH	
	Half Fast	Full Fast	Half Fast	Full Fast	Half Fast	Full Fast	Half Fast	Full Fast	Half Fast	Full Fast
Project										
One Meal a Day	15.9	8.3	37.1	22.7	42.0	24.0	16.0	14.0	27.2	16.5
Two Meal a Day	3.8	-	6.1	2.3	4.0	-	2.0	-	4.4	0.8
Three Meal a Day	-	-	-	-	-	-	-	-	-	-
Adjacent										
One Meal a Day	20.6	17.6	44.4	36.1	54.0	17.0	24.0	24.0	34.3	25.3
Two Meal a Day	1.5	-	4.5	2.3	12.0	10.0	-	-	4.9	2.2
Three Meal a Day	-	-	-	-	-	-	-	-	-	-
Control										
One Meal a Day	27.2	9.6	37.3	25.4	51.0	47.1	22.0	18.0	33.6	21.9
Two Meal a Day	3.8	0.8	3.0	2.2	13.7	3.9	2.0	-	4.7	1.7
Three Meal a Day	2.3	-	1.5	-	-	-	2.0	-	1.7	-

Tangail Household Baseline Survey (Dec,1991-April,1992), DPC

condition in lesser percentage are non-farm households being 37.1% in project area, 44.4% in adjacent area and 37.3% in control area respectively. Still in lesser percentage farm and so in more hopeful condition ascending order are farm households and urban households. Of all households, one meal/day half past households are 27.2% in project area, 34.3% in adjacent area and 33.6% in control area. compared to this situation, picture of two meal/day households in project area, adjacent area and control area being 4.4%, 4.9% and 4.7% is some what tolerable.

Table 15.9 shows another dimension of hunger i.e. period of hunger. The Table shows that the months of Falgoon, Chaitra and Baisakh in a year, specially Baisakh month, are more worse-off period for hunger-stricken households in the study areas in general, marked by occasional one-meal/day and two meal/day half fast. It can be safely assumed that during these three months, those households have no sufficient earning to meet their least modest food demand. Not to speak of any savings on their part. The dry seasons start from Falgoon and goes on ward to Ashar. Chaitra and Baisakh are the peak dry season when as because most of the Khal, Beel, Haor, Baor etc. are almost dried up, fishermen have no access to fish catch and then cash and/or food.

Table 15.9 : Period of Hunger by Type of Household in Different Study Areas

(Figure indicates percentage of household)

Months	Project				Adjacent				Control			
	Farm	Non-Farm	Fisherman	Urban	Farm	Non-Farm	Fisherman	Urban	Farm	Non-Farm	Fisherman	Urban
Baishakh	16.7	29.6	46.0	22.0	14.0	17.6	36.8	54.0	18.0	21.6	32.1	51.0
Jaishtha	-	2.3	-	-	-	-	10.0	-	-	0.8	2.0	-
Ashar	-	9.1	-	4.0	0.8	3.0	-	6.0	0.8	3.7	11.8	-
Srabon	-	2.3	-	-	0.8	-	-	-	0.8	0.8	-	-
Bhadra	-	1.5	-	-	0.8	0.8	-	-	0.8	1.5	-	-
Aswin	1.5	0.9	-	-	0.8	2.3	-	-	6.4	3.0	3.9	6.0
Kartik	3.1	1.5	2.0	-	0.8	-	-	-	8.0	9.0	5.9	2.0
Agrahayan	1.5	0.8	-	-	-	-	4.0	-	1.6	2.2	-	-
Poush	2.3	0.8	-	-	3.1	-	2.0	-	2.4	2.2	5.9	-
Magh	6.8	0.8	-	-	0.8	1.5	8.0	-	4.0	3.2	7.8	-
Falgun	3.0	2.3	12.0	-	1.5	3.0	6.0	-	10.9	5.3	7.8	4.0
Chaitra	0.8	-	20.0	-	3.1	0.8	-	-	3.2	4.5	5.9	-

Tangail Household Baseline Survey (Dec,1991-April,1992), DPC

15.9 Household Income

The household survey collected data on both cash income and expenditure. It should be pointed out however that questionnaire type surveys are notoriously weak when it comes to collecting data on income and expenditure. The two main weaknesses are that all kinds of income and expenditure in kind are left out of the survey and that a once-off recall survey cannot possibly give an accurate picture of such a complex area of life. The figures on income and expenditure should therefore only be treated as indicative.

Table 15.10 shows that by all households, total annual cash income is the largest in project area (Tk. 16920) followed by control area (Tk.16455) and adjacent area (Tk.15029). But by mere category of households, those urban is the control and project areas are almost on the same footing (Tk. 21835 and Tk.21484 respectively) than those in adjacent area (Tk.15238 only). Annual cash income from crop /bi-product and salary/wages are greater in adjacent area (Tk.4049 and Tk. 3701) than project area households (Tk.3771 and Tk. 3258) and control area (Tk. 33932 and Tk.2104). It is interesting to note that Farm, non-farm and fisherman households excepting urban households in the project area are annually earning more income than all those three-category households in both the adjacent and control areas. urban households in adjacent area (Tk.1847) and control area (Tk.1592) are earning more on cottage industry front than that in project area (Tk. 817 only).

Table 15.10 : Annual Cash Income/Household by Type of Household in Different Study Areas

(Figure indicate average cash income/household in taka by sources)

Sources of Cash Income	Project					Adjacent					Control				
	Farm	Non-Farm	Fish-erman	Urban	All HH	Farm	Non-Farm	Fish-erman	Urban	All HH	Farm	Non-Farm	Fish-erman	Urban	All HH
Crop/Bi-product	3771	102	18	1628	1268	4049	795	-	1809	1997	3932	274	-	448	1529
Livestock/Poultry	548	155	-	-	255	318	174	-	132	196	964	158	39	61	408
Fish	-	-	11945	-	1141	-	-	14385	-	2015	-	-	11667	-	1620
Salary/wages	3258	4992	494	7506	2974	3701	2637	894	3334	2585	2104	4099	777	5891	3199
Property Mortgage/lease	1958	8	-	1120	966	349	141	-	600	260	1388	755	617	572	999
Business	189	3422	486	3839	2628	1610	3917	-	3061	1888	2832	2892	435	5758	2926
Remittance	756	299	-	1054	527	2417	2745	-	1392	2064	2341	1030	-	2446	1542
Vegetable	178	44	49	12	86	165	50	46	23	87	105	23	12	2	47
Cottage Industry	1083	5906	1612	817	2868	415	1555	176	1847	1050	355	1115	167	1592	414
Others	4801	4707	1009	5508	4207	4198	3372	230	3040	2887	2094	2948	884	5083	3771
Total	16542	19135	15613	21484	16920	17222	15386	15731	15238	15029	16115	13294	14598	21853	16455

Tangail Household Baseline Survey (Dec,1991-April,1992), DPC

Table 15.11 shows per capita annual income of the study population. All households in control area earn more (Tk.3046) than that in project area (Tk. 2431) and adjacent area (Tk.2693). per capita annual income of the farm households in all the three study areas though varying a list among themselves (Tk. 2689/Adjacent, Tk. 2566/Control and Tk. 2318/project) are noticeably less than those incomes of non-farm,fisherman and urban households in the three survey areas because farm households consume themselves a sizeable portion of farm produce - such consumptions are not valued in monetary terms. It is safe to conclude that the urban households' per capita income are more or less higher than those of other households in those project areas -a conclusion duly supported by the corresponding total figures as depicted in table 15.11.

Table 15.11 : Per Capita Annual Income by Types of Household in Different Study Areas

(Figure indicates per capita annual income in taka)

Household Type	Project	Adjacent	Control
Farm	2318	2689	2566
Non-farm	3792	3023	2753
Fisherman	3280	3037	2852
Urban	4212	2976	4319
All HH	2931	2693	3046

Tangail Household Baseline Survey (Dec,1991-April,1992), DPC

15.10 Household expenditure

Expenditure pattern of a households in one the dependable and meaningful indicators to measure the quality of life as well as living standard. This study (Table 15.12) based on combined sources of cash income in all the surveyed areas shows that annual expenditure by all households and categories, project area ranks first (Tk. 17275). One interesting but reasonable finding is that farm households as against other three categories of households spend annually less on food items due to the fact that they consume a substantial part of their agricultural consumption items.

The picture is different we see clothing and Treatment (Tk.2609 and Tk. 1300 respectively) are comparatively all the three survey areas than those in the adjacent and control areas. Another interesting finding is that expenditure on education both in the farm households (Tk.1452) and in the urban households (Tk.1683) in the project area are more or less higher as compared to that of urban households (Tk.2176) in control area. An annual expenditure pattern on housing also, both farm households (Tk. 1509) in the control area. In totality, it can be safely concluded that of the three survey areas, project area annual expenditure amount and pattern are better than those in two other areas but this comparative a bit vary picture should not be treated as a matter of complacency for the project area.

Table 15.12 : Annual Expenditure/Household by Type of Household in Different Study Areas

(Figure indicates average expenditure/household in taka by items)

Sources of Cash Income	Project					Adjacent					Control				
	Farm	Non-Farm	Fish-erman	Urban	All HH	Farm	Non-Farm	Fish-erman	Urban	All HH	Farm	Non-Farm	Fish-erman	Urban	All HH
Fooding	7556	11124	10948	12088	9938	7058	9960	10756	8032	8760	6878	9644	10863	10351	8954
Clothing	2609	1495	1441	2299	2002	2118	1603	1431	1526	1754	1834	1300	1058	2773	1660
Education	1452	431	185	1683	939	959	308	91	829	584	626	563	127	2176	753
Housing	1509	232	613	1435	913	885	817	298	609	742	1073	660	709	1705	964
Treatment	1300	377	336	412	711	469	415	271	472	422	983	494	498	929	726
Others	3225	2053	2229	4016	2772	6298	2217	2508	2872	3822	3304	1334	1284	3614	2334
Total	17130	18997	16087	22197	17275	17244	15472	15538	14392	16093	14207	13950	14601	21598	15391

Tangail Household Baseline Survey (Dec,1991-April,1992), DPC

Again, The same comparative comfortable scenario stands out for the project area against control area and definitely against adjacent area in Table 15.13 where sources of cash income though condensed into four sources in place of six as depicted in Table 15.12 and where

findings more on the basis of annual per capita expenditure by all households puts forth project area in the first place followed by control area and then by adjacent area, For similar reasons as mentioned before, per capita annual expenditure on food by farm households in all three survey areas are less than other those category households therein.

Table 15.13 : Annual Per Capita Expenditure by Type of Household in Different Study Areas

(Figure indicates per capita annual expenditure in taka by items)

Sources of Cash Income	Project					Adjacent					Control				
	Farm	Non-Farm	Fish-erman	Urban	All HH	Farm	Non-Farm	Fish-erman	Urban	All HH	Farm	Non-Farm	Fish-erman	Urban	All HH
Fooding	1064	2181	2281	2370	1744	1178	1953	2068	1575	1638	1095	1997	2122	2045	1656
Clothing	367	293	300	451	351	331	314	275	299	313	291	271	207	544	307
Treatment	183	74	70	81	125	73	81	52	93	75	156	103	98	182	134
Others	867	538	636	1399	801	1266	2378	2431	1977	1869	797	495	414	1481	749
Total	2400	3765	3380	4352	2992	2226	3034	2988	2822	2659	2262	2889	2853	4268	2940

Tangail Household Baseline Survey (Dec,1991-April,1992), DPC

15.11 Assets

Asset is an important yardstick to measure the socio-economic status of households, which has shown in Table 15.14. From this table, it reveals that percent of farm households having shallow tube well for multipurpose use in project, adjacent and control areas are 7.5%, 7.6% and 8.0% respectively. Shallow Tube wells are basically used for irrigation purpose. While 29.8% of the farm household in the adjacent area posses hand tube well followed by 9.9% in the project area and 8.8% in the control area. Percent of farm households having plough is found to be highest 91.7% in the project area followed by control area 81.6% and 79.4% in adjacent area. Project area farm households are comparatively in better position in having agricultural equipments.

In case of non-farmer households control area highest owners of STW 1.5% followed by project area and adjacent area equally 0.8%. In terms of transport ownership, study found that all the study areas have 0.8% of farm households with animals carts. Highest percent of farm households having boat is found in the control area 18.4% followed by project area 14.4% and adjacent area 9.2%. Among the fisher-men community, 37.3% of the households in the control area have boats, while in project and adjacent area this figure stood at 26% and 24% respectively.

Under the head cottage industry, highest percentage of households having hand loom is found among the non-farm households 8.3% of the project area, followed by adjacent and control area equally by 1.5% of households. Overall ownership of other cottage industries such as shutter, spinning wheel, sana, wheel, blower are found more or less in all the areas, however,the project area non-farm households are comparatively in better position. This survey reveals that the fishermen community of the adjacent area possess 10 types of fishing gears, while possession of gears by type in control and project area are 3 and 8 respectively. Sine net is found highest 47% in control area followed by project area 30% and adjacent area

12%. While, percent of fishermen household having cast net is found highest in control area 82.4%, followed by project area 74% and adjacent area 66%. Such pattern of gear availability by area implies that flood plain capture fishery is more practiced in adjacent area. This study also identified the percent of households having cash in hand and it is found that adjacent area's 42% of fishermen households have cash in hand followed by project area 26% and control area 7.8%.

Table 15.14 : Ownership of Agricultural Implements by Farmers Category in Different Study Areas

(Figure indicates average no. of implements/household)

Farmers Strata	Plough	Ladder	Sickle	Wider	W.Hammer	Spade	HTW	STW	LLP	DTW	Done
Project											
Pure Share Cropper	1.4	1.0	1.2	1.6	0.6	1.0	0.4	0.2	-	-	-
Marginal Farmer	1.2	0.8	1.4	1.6	0.7	1.0	0.1	0.1	0.03	-	-
Small Farmer	1.3	1.0	1.5	1.7	0.9	1.0	0.2	0.1	-	-	-
Medium Farmer	1.7	1.3	2.2	2.3	1.2	1.2	0.6	0.1	-	-	-
Large farmer	2.7	1.6	3.0	3.9	1.4	1.7	0.4	0.3	0.1	-	0.1
All Farmer	1.4	1.0	1.7	1.9	0.9	1.1	0.2	0.1	0.02	-	0.01
Adjacent											
Pure Share Cropper	1.3	0.9	1.6	1.4	0.4	1.0	0.3	-	-	-	0.1
Marginal Farmer	1.4	0.8	1.4	1.6	0.8	1.1	0.2	0.1	-	-	-
Small Farmer	1.3	0.8	1.6	1.5	0.8	0.9	0.2	0.02	-	-	-
Medium Farmer	1.7	1.1	1.9	1.9	0.9	1.2	0.4	0.1	-	-	-
Large farmer	3.2	1.7	2.5	3.0	1.6	1.5	0.6	0.3	-	-	-
All Farmer	1.6	0.9	1.7	1.7	0.8	1.1	0.3	0.1	-	-	0.01
Control											
Pure Share Cropper	1.0	0.7	1.9	1.3	0.7	0.9	0.1	0.1	-	-	-
Marginal Farmer	1.2	0.8	1.1	1.2	0.7	0.9	0.1	0.1	-	-	0.02
Small Farmer	1.3	0.9	1.2	1.3	0.9	1.0	0.1	-	0.1	-	0.03
Medium Farmer	2.4	1.2	2.6	2.4	0.8	1.1	0.1	0.4	-	0.1	0.1
Large farmer	4.3	1.4	4.1	3.7	1.0	1.4	0.6	0.4	-	-	-
All Farmer	1.5	1.9	1.6	1.6	0.8	1.0	0.1	0.1	0.02	0.01	0.02

Tangail Household Baseline Survey (Dec,1991-April,1992), DPC

15.12 Other living standard indicators

Of all the households taken together, 17% household in project area use floor space for sleeping, 11.8% in adjacent area and 24% in control area (Table 15.15). Khat or Chowki are affordable by 83% house-hold in project area compared to 88.2% in adjacent area and 72.6% in control area. In all cases, Khat/Chowki is shared some members of the household.

Table 15.16 shows Furniture, Watch, Radio, TV, and Bank Account use of the households in the study area. Over 50% of farm households and urban households in all the study areas use some furniture. About one third of farm households and fishermen households can only afford some utensils while about one fourth of farm households in all study areas have opportunities to listen to radios. Only 6% to 19.5% of non-farmer and fishermen families have such opportunities. Less than 5% of all households excepting urban households are fortunate to watch

TV. Some 26% urban households in project area can enjoy TV entertainments, followed by 8% in adjacent area and 18% in control area.

Table 15.15 : Sleeping Practices by Type of Household in Different Study Areas

(Figure indicates percentage of household)

Type of House-hold	Project			Adjacent			Control		
	Only Floor for Sleeping	khat/ Chowki	Av.No. Person/ Chowki	Only Floor for Sleeping	khat/ Chowki	Av.No. Person/ Chowki	Only Floor for Sleeping	khat/ Chowki	Av.No. Person/ Chowki
Farm	11.4	88.6	2.0	10.7	89.3	2.0	6.8	83.2	1.9
Non-Farm	22.7	77.3	1.5	4.5	95.5	1.0	38.8	61.2	1.1
Fisherman	22.0	78.0	1.0	26.0	74.0	0.8	45.1	54.9	1.1
Urban	12.0	88.0	2.0	20.0	80.0	1.4	6.0	94.0	1.2
All HH	17.0	83.0	1.7	11.8	88.2	1.4	24.0	72.6	1.4

Tangail Household Baseline Survey (Dec,1991-April,1992), DPC

Table 15.16 : Furniture, Watch, Radio, TV, and Bank Account Using/Adopting by Type of Household in Different Study Areas

(Figure indicates percentage of household Using/adopting)

Months	Project				Adjacent				Control			
	Farm	Non-Farm	Fisherman	Urban	Farm	Non-Farm	Fisherman	Urban	Farm	Non-Farm	Fisherman	Urban
Chair-Table	57.6	29.8	30.0	70.0	67.2	27.1	10.0	50.0	47.2	26.9	23.5	72.0
Watch	50.0	25.8	38.0	60.0	39.7	20.3	26.0	54.0	43.2	30.6	15.7	60.0
Radio	25.0	9.9	16.0	8.0	28.2	19.5	6.0	24.0	27.2	13.4	13.7	34.0
TV	3.8	4.5	-	26.0	2.3	3.0	-	8.0	4.0	-	-	18.0
Bank Ac.	3.8	3.8	2.0	14.0	11.5	8.3	8.0	16.0	11.2	6.0	12.0	36.0

Tangail Household Baseline Survey (Dec,1991-April,1992), DPC

15.13 Findings and observations

- Judged from different standards , quality of life of the people in the study area is no exception to those with the vast majority living in perpetual poverty. Never the less, they are better off by some indicators and worse off by some others.

- **Housing** : As evident from the survey, in the three study areas more households (live in Kutcha houses (89-97%) against national figure of 47% but none are homeless. The Project area has the highest percentage of buildings and lesser percentage of kutcha houses indicating relatively better housing condition of households.

- **Water Supply & Sanitation** : Except 1.9%of the households liked to piped water supply, almost all are dependent on tube well and surface water. 88% of the population have access to safe water. Sanitation statistics points to a relatively better situation than the national average both in terms of coverage and health awareness.

- **Energy consumption** : Kerosine is the main source of lighting

energy (over 80% in rural households) while electricity is available with only 16.2%house holds in project , 7% in adjacent and 22% in control areas. Fishermen villages in adjacent area has no electricity.

- **Health & Immunization** : Besides common type diseases, prevalence in large scale of scabies has been reported. Kala-azar cases has been reported from the project and adjacent areas. Incidence of diseases is less in the control area households.

- Immunization campaign apparently was most successful with fisherman hh in control area (100%) while it was minimum in adjacent area.

- **Hunger** : The month of Baishakh is the worst period for the households for ensuring square meals. The two previous months of Chaitra and Falgoon also are the lean periods in the harvest imcome -food cycle,resulting in several one insufficient meal days. The lean periods slightly varies with professions of the household heads.

- **Household Income & Expenditure** : All households taken together cash, income in the project area is highest (Tk. 16920) and least (Tk. 15029) in the adjacent area. Per-capita annual income is highest (Tk.3046) in control area and least (Tk. 2431) in project area. This indicates a narrow demand supply gap in project area.

- In terms of expenditure data, project area ranks first with Tk. (17275) indicating a deficit situation. Farm households in all areas spend less on food and more on clothing & medicine. Expenditure on education is highest in project area.

- **Assets** : 29% of farm households posses shallow tube wells in the adjacent areas against 9.9% in project and 8.8% in control area. Highest number of farm households having boat is found in control area *(18.4) while adjacent area has the least (9.2%) .8.3 % non-farm households in project area has weaving looms against 1.5% household in the other two areas. Fisherman households in the adjacent area has maximum cash in hand (4.2% households) against 26% in project and 7.7% in control area.

- About half of the farm and urban households and one third in non farm and fishermen house holds in the study areas can effort some furniture. Only 6% non-farm and 19.5% fishermen households has access to radio listening. Except urban households, less than has access to T.V.

16 FORMAL AND NON-FORMAL INSTITUTIONS

16.1 Introduction

Bangladesh has been perusing different approaches for alleviation of poverty involving varies agencies and institutions. The success has been limited and no replicable single model has yet been developed. The countries Fourth Five Year Plan (1990-1995) envisaged implementation of a comprehensive village development programme under the institutional arrangement of a village based cooperative system. Besides, the 4th FYP will be implementing the National Cooperative Policy of 1889 aimed at increased contribution by the cooperatives to the economy and ensuring effective participation of the disadvantaged groups.

Similarly, the government recognized the important role played by the NGOs in the socio-economic development of the country and suggests that NGO activities should supplement the main thrust towards decentralized participatory planning.

Government and NGO collaboration is increasingly taking place on formal basis in several sectors of the economy, notable among them are social forestry, rural housing, water supply and sanitation, rural credit. Country's largest benevolent Trust (Kumudini Welfare Trust) operating before partition of India is based in Mirzapur and Tangail Sadar thana area. Grameen Bank also as a project first started its operation in Tangail soon after it started its activities in an area (Jabura village) near Chittagong University. Country's Pioneer Integrated Approach and Community Management Approach based projects under the initiative of World Bank were started in Mirzapur area. This is also the pilot project area of US NGO, Prism with Duckweeds. Several national (i.e. Nijera Kori, Ubinig, SSS) and local NGOs are also active in the same area.

16.2 Cooperative Coverage

One of the objectives of the baseline survey was to investigate the existing level of awareness of the respondents about the existence of cooperative and NGOs and the extent of people's participation in formal and non-formal institutions. Level of awareness and participation in cooperative organization is found highest among the fishermen communities. It is reported that 66% of the fishermen households are aware about cooperatives and 54% of them are directly involved. While the farm and non-farm households knowledge about the existence of cooperative are 34.1% and 31.8% respectively. Further, it is found that the participation rate in cooperative is so poor that only 10.6% of the farm and 5.3% of the non-farm households have cooperative members. But, the performance of urban households is at the lowest level, since only 6% have knowledge about cooperative and only 4% of them have membership with cooperative (Table 16.1).

Table 16.1: Existence of Co-operatives in Different Study Areas

(Figure indicates percentages of household)

Study Area	Knowledge of Existence of Cooperative	Household with Cooperative Member
Project		
Farm	34.1	10.6
Non-Farm	31.8	5.3
Fisherman	66.0	54.0
Urban	6.0	4.0
Adjacent		
Farm	14.5	0.8
Non-Farm	12.8	0.8
Fisherman	40.0	38.0
Urban	20.0	-
Control		
Farm	32.8	9.6
Non-Farm	27.6	3.7
Fisherman	86.3	76.4
Urban	40.0	6.0

Tangail Household Baseline Survey (Dec 1991-April 1992), DPC

16.3 NGO Coverage

NGOs are very much confined in some pocket area and their coverage is very much limited to non-farm and urban sectors. Sample survey reveals that the knowledge about existence of NGOs in the study area are known by 44.7% to 47.7% by farm and non-farm household in rural area. While, only 26% of urban households are familiar about the NGO activities. In institutional case, Grameen Bank, Bangladesh Krishi Bank and BRDB are found to play an important role in credit delivery programme. However, other than Bangladesh Krishi Bank, all are found to be insignificant in the credit market.

Table 16.2: Existence of NGOs in Different Study Areas

(Figure indicates percentages of household)

Study Area	Knowledge of Existence of NGOs	Household with NGO Group Member
Project		
Farm	47.7	-
Non-Farm	44.7	2.3
Fisherman	46.0	-
Urban	26.0	2.0
Adjacent		
Farm	42.0	-
Non-Farm	42.1	0.8
Fisherman	40.0	-
Urban	54.0	-
Control		
Farm	32.8	-
Non-Farm	26.9	7.5
Fisherman	62.7	76.5
Urban	72.0	0.1

Tangail Household Baseline Survey (Dec 1991-April 1992), DPC

16.4 Findings and observations

- Level of awareness and participation in cooperative activities is highest among fisherman households (66% aware, 54% involved)
- Urban households are least aware (6%) and least active (4%) in cooperatives.
- Knowledge about NGO existence is less with urban households (26%) and more with farm & non farm households (over%)
- Institution like grameen Bank, Bangladesh Krishi Bank, Bangladesh Rural Development Board (TCCA/UCCA) are found active. Except Krishi Bank, others contribution is insignificant in the credit market.

17 CREDIT

17.1 Sources of Credit

The credit market in the Tangail CPP area has spatial and sectoral dimensions. Spatially, there are rural and urban areas and the supply of credit in urban area is dominated by the non-institutional sources, while the rural area is marginally dominated by the institutional source. In the project area it was found that farm or peasant households and non-farm (including weavers) households are two major, and roughly balanced groups of credit users, who are receiver of 80.7 percent of the total credit amount. From table (17.1) it is revealed that houselholds take credit more from institutional sources in the adjacent (74.9%) and thr project (55.4%) area but from institutional sources in the control (50.2%) area.

In case of institutional sources Grameen Bank and Krishi Bank are found to play dominant role in credit disbursement. Grameen Bank play more dominant role than Krishi Bank in the project and adjacent areas respectively. But for control area it is inverse. The highest 93.3% of fisherman household group in adjacent area take credit from Grameen Bank wheareas the highest 44.5% of urban household in the same area take credit from Krishi Bank.

Table 17.1: Source of Credit by Type of Households in Different Study Areas

(Figure indicate percentage of households)

Source of Credit	Project					Adjacent					Control				
	Farm	Non Farm	Fisher-men	Urban	All HHs	Farm	Non Farm	Fisher-men	Urban	All HHs	Farm	Non Farm	Fisher-men	Urban	All HHs
NON-INSTITUTIONAL															
Friends/ Relatives	24.4	29.1	11.1	62.5	27.7	36.4	30.4			19.7	7.8	19.2	21.1	69.3	24.5
Money Lend. /Others	17.8	20.0	16.7		16.9	9.1	4.3	6.7		4.4	24.4	49.7	17.6	18.8	25.7
Subtotal	42.2	49.1	27.8	62.5	44.6	45.5	34.7	6.7		25.1	32.2	69.0	38.7	83.1	50.2
INSTITUTIONAL Comm. Bank	11.1	1.8			6.0	3.0			11.1	3.6	23.0	10.2	3.5	12.9	16.1
Krishi Bank	22.2	5.5	22.2	12.5	16.0	39.4	8.7		44.5	32.0	17.7	12.7	21.1	2.9	26.0
Grameen Bank	17.8	38.2	50.0	25.0	26.2	9.1	47.8	93.3	33.3	39.9	8.8	6.1	35.2	1.1	6.0
Cooperatives	6.6	5.4			4.9	3.0	8.8		11.1	3.4	18.0	2.0	1.4	-----	4.5
Subtotal	57.8	50.9	72.2	37.5	55.4	54.5	65.3	93.3	100	74.9	67.8	31.0	61.3	16.9	49.8

Tangail Household Baseline Survey (Dec 1991 - April 1992),UPS

From the table (17.2) it is found that there is a big difference between the credit need and the credit availability. The households those who expressed their need of credit they were not able to get the credit. The fact revealed that they had to face complicated procedure to take the credit from the institutional source. Beside this there were found not available institution to disburse credit. Over all scenario of economic position of the study area found that credit supply from the institutional source was insufficient compared to its demand.

Non-institutional credit source where the credit holder had to pay high rate of interest. Inspite of need of credit the high rate of interest discouraged the borrowers those who needs to manage the credit. It may be mentioned here that the supply of credit ware not sufficient compared to the demand.

Table 17.2: Credit Needs and Availability in Different Study Areas

(Figure indicate percentage of households)

Area	Farm		Non Farm		Fishermen		Urban		All Household	
	Need	Received	Need	Received	Need	Received	Need	Received	Need	Received
Project	78.8	31.1	87.1	34.9	80.0	30.0	66.0	16.0	80.2	30.3
Adjacent	69.5	25.2	79.7	15.8	98.0	30.0	72.0	18.0	77.5	21.4
Control	87.2	32.8	72.4	24.6	98.0	37.3	60.0	26.0	79.4	29.4

Tangail CPP Baseline Survey, (Dec, 1991 - April, 1992), DPC

Credit need depends on the gap between economic need and potential income gap of the people. But it is observed that in the study area a few number of the society are economically solvent.

17.2 Extent of credit

From table (17.3) it is found that amount of taka borrowed per houshold from non-institutional sources in higher than institutional sources in the project and adjacent areas respectively. But per controll area it is inverse. The amount oftaka borrowed per household from institutional sources is found to be the higher (Tk. 5500) in the controll area whereas the lowest amount (5500) amount Tk. 1769 in the same area. Incase of non-institutional sources, the highest amount of tk 11018 per household is for urban household is adjacent area and lowest Tk. 1375 for non-farmer household in controll area.

Table 17.3: Average Credit Taken by Households in Different Study Areas

(Figure indicate Mean credit taken in taka)

Area	Farm		Non Farm		Fishermen		Urban		All Household	
	Inst.	Non-In.	Inst.	Non-In.	Inst.	Non-In.	Inst.	Non-In.	Inst.	Non-In.
Project	5250	6421	3857	2796	3769	2500	3167	6200	4255	4537
Adjacent	3600	4436	2525	4866	2000	6833	-	11018	2514	5433
Control	4819	2285	3006	1375	5500	3346	1769	8908	3817	3016

Tangail CPP Baseline Survey, (Dec, 1991 - April, 1992), DPC

17.3 Utilization of Credit

From table (17.4) it is revealed that households in different study areas mainly use their credit for the purpose of crop input, food purchase and for business capital. Credit utilization by farm household (46.3%) in controll area is found the highest for crop input collection and urban household (61.5%) in controll area for food collection whereas fisherman household(53.3%) in project area for business capital purpose is also found to be the highest. Significant percent of households in different study areas also utilise their credit for amount collection. 18.1% households is controll area and 13.8% households in adjacent area also use theis credit for equipment collection childern education purpose. Few percent of household in different study areas use their creddit for other purposes.

Table 17.4: Utilization of Credit for Different purpose by Type of Households in Different Study Areas

(Figure indicate percentage of households)

Purpose	Project					Adjacent					Control					
	Farm	Non Farm	Fisher-men	Urban	All HHs	Farm	Non Farm	Fisher-men	Urban	All HHs	Farm	Non Farm	Fisher-men	Urban	All HHs	HHs Crop
Input	41.5	6.5	-	-	18.2	27.3	8.7	-	11.1	15.0	46.3	9.1	-	-	24.8	
Equipment	2.4	4.3	-	-	2.7	-	-	-	-	-	14.6	12.1	44.4	7.7	18.1	
Animal	24.5	4.3	-	-	10.9	6.1	8.7	-	11.1	6.3	7.3	-	-	7.7	3.8	
Food collec.	12.2	32.7	26.7	25.0	23.6	33.4	-	-	-	13.8	19.5	30.3	-	61.5	24.8	
Social oblig.	2.4	-	-	12.5	1.8	3.0	-	-	-	1.3	4.9	-	-	-	1.9	
Childern ed.	-	-	-	-	-	3.0	34.8	-	22.3	13.8	-	6.1	16.7	-	4.8	
Debt Payment	-	2.2	-	12.5	1.8	-	-	-	-	-	4.9	6.1	-	-	3.8	
Land Purches	2.4	4.3	-	12.5	3.6	-	-	-	-	-	2.4	3.0	-	-	1.9	
Business Cap.	2.4	23.9	53.3	12.5	19.1	3.0	4.4	46.7	44.4	16.3	12.2	33.3	27.8	-	20.0	
Fishing Eqip.	-	-	20.0	-	2.7	-	-	6.7	-	1.3	-	-	-	-	-	
Dower	-	4.3	-	12.5	2.7	3.0	13.0	6.7	-	6.3	-	3.0	-	-	1.0	
Others	12.2	17.5	-	12.5	12.7	21.2	30.9	40.0	11.1	26.3	-	6.1	11.1	23.1	5.7	

Tangail CPP Baseline Survey, (Dec, 1001 - April, 1002), DPC

According to sample survey average amount of credit per household in rural area including farm and non-farm is Tk.1452.8, while the money borrowed by fisherman household and urban household are Tk.1021.7 and 810 respectively. Further, the farm household received the highest credit Tk.1743 per household. Among the farm households, majority (41.5%) used credit for buying agricultural input packages and next major group (26.8%) use credit for animal procurement. The survey revels that almost 100% of the credit were used for the purpose they received. In case of non-farm households, majority (34.9%) used their credit for business capital and another 17.4% non-farm households spent their borrowed money for food procurement. It is reported that 60.0% of the fishermen households invest their credit in business capital and another 20% of the borrower households spent their credit for collection of fishing gears and fishing equipments (Table 17.2). Whereas urban households used their credit for purchasing land (25%), business capital (12.5%).

17.4 Rate of interest

This sample survey reveals that interest rate on credit is significantly higher in rural area than urban area. Farm households are helpless victims of exceptionally high interest rate on credit from non institutional sources. It is reported that 41.5% borrower farm household received credit at the rate of interest of more than 100% from non-institutional sources. However, 65.9 % of the farm households received credit from institutional sources paying standard interest rate of 16-20%.

Interest rate by type of credit source for non-farm household shows that 67.4 % receives credit from the institution source at the interest rate between 16-20%. But, 42.1% of the households pay less than 10% interest rate for non-institutional source of credit. At the same time 21.8% of the households deserved to pay more than 100% interest for non-institutional credit.

Table 17.3 : Interest rate of Non-Institutional Credit in Different Study Areas

(Figure indicate percentage of household)

Area	Rate of Interest (%)						
	Upto 10%	11%-15%	16%-20%	21%-30%	31%-50%	51%-100%	100%+
Project	78.8	-	3.5	-	5.4	5.7	30.1
Adjacent	23.7	1.2	1.2	-	2.5	6.5	7.8
Control	23.8	-	0.9	1.9	3.0	1.9	27.6

Tangail CPP Baseline Survey, (Dec, 1991 - April, 1992), DPC

In case of fishermen, 86.6% of the borrower households pay interest at the rate of 16-20% for institutional source. Generally, Bangladesh Krishi Bank and Grameen Bank run credit program for the fishermen communities. However, 46.7% of the borrower households received credit from non-institutional source at the rate of less then 10% and 26.7% of borrowers from the same source are paying interest at the rate of 51-100%.

17.5 Credit needs and availability

Sample survey findings on credit needs and availability indicates that majority of the households in the project area need, credit to maintain their normal family live since their socio-economic condition is generally very poor. Both farm and non-farm household as well as fishermen are mostly earning their livelihood at subsistence level. Whatever cash or material they earn out of their economic activity is almost entirely utilized for buying food and other daily necessities.

This study identified that only 40% out of the total the farm and non-farm households need credit and received credit in last year. In case of fishermen only 37.5% of the needy households and 24.25% of the urban total credit expectant got credit.

In CPP area, 78.8% farm family needed credit, while 31.1% farm household only received some credit. In adjacent area, only 25% farm household received credit, compared to 69.5% household in need of credit. In control area, 32.8% farm households would secured credit against 87.2% household requiring credit. The situation is more or less similar for non-farm households. Over 80% of fishermen households in the study areas needed credit but only 30% to 37% fishermen households would secure some credit.

17.6 Findings and observations

- Credit needs are met over 50% from institutional sources.
- Only between one third and half of the credit needs are met.
- Among the non-institutional sources interst rates can be both very low to extremely high, depending on the relationship of the borrower with the lender.