

ANNEX 15

MASTER PLAN ON SSWRD IN SHERPUR DISTRICT

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
MINISTRY OF LOCAL GOVERNMENT,
RURAL DEVELOPMENT AND COOPERATIVES (MLGRD&C)
LOCAL GOVERNMENT ENGINEERING DEPARTMENT (LGED)

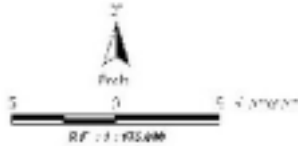
**MASTER PLAN STUDY
ON
SMALL SCALE WATER RESOURCES DEVELOPMENT
FOR
POVERTY ALLEVIATION THROUGH EFFECTIVE USE OF SURFACE WATER
IN GREATER MYMENSINGH**

**MASTER PLAN
OF
SMALL SCALE WATER RESOURCES DEVELOPMENT
IN
SHERPUR DISTRICT**

NOVEMBER 2005

PACIFIC CONSULTANTS INTERNATIONAL (PCI), JAPAN

SHERPUR DISTRICT DHAKA DIVISION



LEGEND

Administrative Boundaries	Physical Infrastructures	Natural Features	Socio-economic Infrastructures
<ul style="list-style-type: none"> International Boundary District Boundary Upazila Boundary Union Boundary Municipal Boundary 	<ul style="list-style-type: none"> National Highways Regional Highways Zip Road Specific Road Water Canal Water Drain Railway Network Embankment 	<ul style="list-style-type: none"> Water River Water Drain Char Area 	<ul style="list-style-type: none"> Growth Centre Small Post Office Police Station Upazila Health Complex College High School University
ADMINISTRATIVE HQs <ul style="list-style-type: none"> District HQ Upazila HQ Union HQ 			

DIGITAL DATA SOURCES: DISTRICT OFFICE, SHERPUR
 NATIONAL BUREAU OF STATISTICS, DHAKA
 DISTRICT OFFICE, SHERPUR
 DATE: 2018
 LOCAL CONTACT: 01711-1234567890

**JICA MASTER PLAN STUDY ON SMALL SCALE WATER RESOURCES DEVELOPMENT
FOR POVERTY ALLEVIATION THROUGH EFFECTIVE USE OF SURFACE WATER
IN GREATER MYMENSINGH**

**MASTER PLAN
ON
SMALL SCALE WATER RESOURCES DEVELOPMENT
IN
SHERPUR DISTRICT**

Map of Sherpur District

Chapter 1 Outline of the Master Plan Study

1.1 Background	1
1.2 Objectives and Scope of the Study	1
1.3 The Study Area	2
1.4 Counterparts of the Study	2
1.5 Survey and Workshops conducted in the Study	3

Chapter 2 Sherpur District

2.1 General Conditions	4
2.2 Natural Conditions	4
2.3 Socio-economic Conditions	5
2.4 Agriculture in the District	5
2.5 Fisheries in the District	6
2.6 Livestock in the District	7
2.7 Zoning of the District	8
2.8 Water Resources Development	8

Chapter 3 Problem Analysis and Participatory Workshops in the District

3.1 Problem Identified through the Workshops in the District	10
3.2 Problems and Issues Identified	11
3.3 Participatory Workshop (PRA) for Sustainable Water Resources Management	12

Chapter 4 Small Scale Water Resources Development Potential

4.1 Surface Water Resources in the District	16
4.2 Small Scale Water Resources Development in the District	16
4.3 Identification of Potential Subprojects	16
4.4 Prioritization of Potential Subprojects	19

Chapter 5 Master Plan on Small Scale Water Resources Development

5.1 Basic Concepts on Small Scale Water Resources Development Plan	25
5.2 Small Scale Water Resources Development Plan	25
5.3 Relevant Sectors' Development Strategies and Plan	27
5.4 Priority Programs	28
5.5 Implementation Plan (Action Plan)	29

Chapter 6 Further Activities Required at Upazila Level

6.1 Union Level	31
6.2 Upazila Level	31

APPENDIX: UPAZILA-WISE SUMMARY OF UNION QUESTIONNAIRE	A - 1
---	-------

List of Tables

Table 1.1	Outline of National Water Policy (NWPo)	32
Table 4.1	List of Proposed Subproject to SSWRDSP-2 in Sherpur District	33
Table 4.2	List of Prioritized Potential Subprojects in Sherpur District	34
Table 5.1	List of Potential Subproject for SSWRDP in Sherpur District	36
Table 5.2	Major Development Potential of Agroecological Zone in Sherpur District	39
Table 5.3	Promising Farming in various Area in Sherpur District	40
Table 5.4	Development Potential of Fish Production by Agroecological Zone in Sherpur District	41

List of Figures

Fig. 2.1	Topographic Map of Sherpur District and Greater Mymensingh	42
Fig. 2.2	Perennial Water Bodies and Large Scale Water Resources Development in Sherpur District and Greater Mymensingh	43
Fig. 2.3	Zoning of Sherpur District and Greater Mymensingh	44
Fig. 3.1	Problem Trees of Union Level Workshops in Sherpur District	45
Fig. 3.2	Problem Analysis Model for Greater Mymensingh	47
Fig. 4.1	Location of Identified Potential Subproject in Sherpur District	48
Fig. 4.2	Location of Verified Potential Subproject in Sherpur District	48
Fig. 4.3	Location of Prioritized Subproject in Sherpur District	49

Abbreviations

ADB	Asian Development Bank
BADC	Bangladesh Agricultural Development Corporation
BBS	Bangladesh Bureau of Statistics
BMD	Bangladesh Meteorological Department
BRDB	Bangladesh Rural Development Board
BWDB	Bangladesh Water Development Board
CAD	Command Area Development
DAE	Department of Agricultural Extension
DFID	Department for International Development of UK
DI	Drainage Improvement
DIWC	Drainage Improvement and Water Conservation
DOC	Department of Cooperatives
DOE	Department of Environment
DoF	Department of Fisheries
DPHE	Department of Public Health Engineering
DTW	Deep Tubewell
EIRR	Economic Internal Rate of Return
FAP	Flood Action Plan
FCD	Flood Control and Drainage
FCDI	Flood Control, Drainage and Irrigation
FD	Forestry Department
FM	Flood Management
FMDI	Flood Management and Drainage Improvement

GDP	Gross Domestic Product
GIS	Geographical Information System
HQ	Headquarter
HTW	Hand Tubewell
HYV	High Yield Variety
IEE	Initial Environmental Examination
IFAD	International Fund for Agricultural Development
IMCC	Inter-ministerial Coordination Committee set under the TAPP
JICA	Japan International Cooperation Agency
LCS	Labour Contracting Society
LGED	Local Government Engineering Department
LGI	Local Government Institutions
LLP	Low Lift Pump
M&E	Monitoring and Evaluation
MIS	Management Information System
MLGRD&C	Ministry of Local Government, Rural Development and Co-operatives
MoA	Ministry of Agriculture
MoEF	Ministry of Environment and Forest
MoFL	Ministry of Fisheries and Livestock
MoL	Ministry of Land
MoWR	Ministry of Water Resources
NGO	Non-Governmental Organization
NWMP	National Water Management Plan
NWPo	National Water Policy
NWRD	National Water Resources Database
O&M	Operation and Maintenance
PMO	Project Management Office
PRA	Participatory Rural Appraisal
PWD	Public Works Datum (0.0 m PWD = 0.457 m of SOB datum)
SOB datum	Survey of Bangladesh datum (identifiable with mean sea level)
SP	Subproject
SSWRDSP	Small-Scale Water Resources Development Sector Project
STW	Shallow Tubewell
TIP	Thana Irrigation Program
TK.	Taka, US\$ 1.00= Tk 57.4 as of October 2004
UDCC	Upazila Development Coordination Committee
UP	Union <i>Parishad</i> (Council)
UE	Upazila Engineer
WARPO	Water Resources Planning Organization
WC	Water Conservation
WMA(WMCA)	Water Management (Cooperative) Association

Chapter 1 Outline of the Master Plan Study

1.1 Background

The provisions of the National Water Policy (NWPo) of 1999 states that the local government and relevant agencies are responsible for planning and execution of water management based on the National Water Management Plan (NWMP) approved by the National Water Resources Council (NWRC) on 31st March 2004, and in regard to the regional features of local water resources¹.

The Government of Bangladesh (hereinafter referred to as “GOB”), with the support from ADB, IFAD and the Government of the Netherlands, has carried out the Small Scale Water Resources Development Sector Project (SSWRDSP-1) aiming at the rehabilitation and improvement of small-scale water resource management systems. The project was carried out from 1995 covering 37 districts of the western part of Bangladesh. Following the same concept, the second phase of this project (SSWRDSP-2), covering 61 districts throughout the country commenced in 2003 with the planned period of 7 years. However, from lessons learned from SSWRDSP-1, the preparation of district level small scale water resources development plans are recognized to have significant importance for further implementation of SSWRDSP.

Under such circumstances, the GOB requested the Government of Japan (hereinafter referred to as “GOJ”) for technical assistance regarding the preparation of district level plans for small scale water resources development (SSWRD), which will be considered as the basic development plans at district levels. In response to the GOB’s request, the GOJ dispatched a Preparatory Study Team from February to March, 2004, and signed the Scope of Work for *the Master Study on Small Scale Water Resources Development for Poverty Alleviation through Effective Use of Surface Water in Greater Mymensingh of Bangladesh* (hereafter referred as “the Study”) on February 25, 2004.

Based on the Scope of Works, the JICA Study Team, carried out the Study in Bangladesh from July 18, 2004 to July 23, 2005.

1.2 Objectives and Scope of the Study

(1) Objectives

The overall goal of the Study is **to secure safe and sustainable water resources management and to increase farmers’ income**, and objectives of the Study are;

- 1) to formulate Plan for SSWRD in Greater Mymensingh comprising program of priority programs, and the scope for the follow-on investment projects which include effective use of surface water, and
- 2) to enhance and strengthen the capacity of the counterpart in preparation of the SSWRD Plan

(2) Scope of the Study

The Study is conducted in the following 2 phases:

- Phase I: Field Survey in wet season, Identification of problems on SSWRD in the Study Area (July 2004 to November 2004)
- Phase II: Field survey and Formulation of Small Scale Water Resources Development Plans (January 2005 to July 2005)

The Study will consist of the following study items.

1) Data Collection and Analysis

- (a) Collect and review the existing data and information on physical, socio-economical and institutional settings, including hydrology, water availability and quality, land use, population, poverty and other human development indices, income, gender issues and occupational patterns; and collate the same with project objectives and outputs.

¹ Outline of the NWPo (1999) is shown in Table 1.1.

- (b) Assess the performance and issues of the economic activities of the Sub-districts (Upazila), including agriculture, fishery, forestry, and other natural resources, roads and road transport, water supply and sanitation.
 - (c) Collect information on the ongoing and proposed interventions in the Upazila in water and other relevant sectors
- 2) Inventory Survey and Participatory Rural Appraisal (PRA)
- (a) Carry out the inventory survey of existing infrastructure related to water resources, along with their status and location maps
 - (b) Select potential areas for SSWRD
 - (c) Undertake PRA at representative Unions and Upazilas that includes the potential area and assess the following: i) development status, needs and priorities; ii) water-related problems, their causes and proposed solutions; iii) stakeholders' views on the ongoing and proposed initiatives; and iv) stakeholders' willingness to contribute to the construction, operation and maintenance (O&M).
- 3) Preparation of Master Plan for SSWRD with the Target Year of 2015
- (a) Strategies and priority programs which could include flood management, irrigation and drainage, agriculture and fishery extension, rural water supply, arsenic mitigation, and institutional strengthening.
 - (b) Preparing guidelines for project assessment
 - (c) Preparing prioritized list of sub-projects
 - (d) Preparing Action Plans
- 4) Technology transfer to counterpart personnel
- (a) On-the-job training in the process of preparing the Master Plan
 - (b) Conduct workshops

1.3 The Study Area

The Study Area, as indicated in the location map, covers the six districts (Mymensingh, Tangail, Sherpur, Jamalpur, Netrakona and Kishoreganj) of the Greater Mymensingh area. The Study Area is located in the north-central part of the country bordered by the Meghna River in the east, Gazipur District and Dhaka City in the south, the Jamuna River in the west, and the Indian state of Meghalaya in the north. The Old Brahmaputra River runs through the Area flowing from the northwest to the southeast. In the southern part of the Study Area, the Madhupur terrace with an elevation of about 15 m lies in the 3 m-lowlands. The Study Area occupies 11.3 % of the country with a land area of 16,672 km², and has a population of 12.6 % (15.5 million people) of the total population (BBS, 2001). The local administration in the Study Area comprises of 6 Districts, 58 Upazilas (sub-districts) and 562 Unions.

1.4 Counterparts of the Study

As stated in S/W, the GOB counterpart institution is Integrated Water Resources Management Units (IWRMU) of Local Government Engineering Department (LGED) under the Ministry of Local Government, Rural Development and Cooperatives (MLGRD&C).

The counterparts of the Study are consisting of the staff of LGED headquarters and Executive Engineers and Upazila Engineers at the local government institution in the Study Area.

1.5 Surveys and Workshops conducted in the Study

The Study designed as participatory plan formulation with several workshops and meetings, and several surveys at each level of the administration. They are summarized as follows:

Stages	Workshops/Surveys	IMC	National	District	Upazila	Union	Community
Phase I: Problem Identification	W/S on the Inception Report and PCM Problem Analysis						
	Socio-economic Interview Survey						
	Farm Household Interview Survey						
	Union Questionnaire Survey(UQS)						
	W/S on Phase I Survey Results						
	W/S on Interim Report						
Phase II: Development Potential and Master Plan Formulation	W/S on Planned Field Survey & Questionnaire Survey to Upazila Engineers						
	Participatory Workshops (PRA)						
	Inventory Survey						
	UQS Verification Survey						
	CM of UDCC/DSSWRDC on Master Plan Concepts and verification of potential subproject						
	Explanation on Master Plan Concepts and verified of Potential Subproject						
	W/S on Draft Master Plan Explanation and Discussion						

Notes: W/S= Workshop(s), PCM=Project Cycle Management, UQS= Union Questionnaire Survey, PRA= Participatory Rural Appraisal, CM= Consultation Meeting(s), UDCC= Upazila Development Coordination Committee(s), DSSWRDC= District Small Scale Water Resources Development Committee, IMCC= Inter-ministerial Coordination Committee, = main targeted group, =secondary targeted group

Chapter 2 Sherpur District

2.1 General Conditions

Sherpur District (the District) with an area of 1,363.76 km², lies between 24°53' and 25°18' north latitudes and 89°50' and 90°19' east longitudes, and it is bounded by Garo Hills of Meghalaya (India) on the north, Mymensingh and Jamalpur districts on the south, Mymensingh district on the east, Jamalpur district on the west.

Sherpur District was established in 1984; earlier it was a subdivision under the Mymensingh district. The district consists of two (2) municipalities with 18 wards, five (5) upazilas, 52 union parishads, 73 mahallas, 500 mouzas and 796 villages. Upazilas and their areas are shown in table below.

Upazila-wise Area in km²

Name of Upazila	Effective area	Riverine area	Forest area	Total area	% over District
District Total	1 305.15	6.81	51.80	1 363.76	100.00
Jhenaigati	198.86	-	32.14	231.00	16.94
Nakla	173.01	1.79	-	174.80	12.82
Nalitabari	325.15	1.68	0.78	327.61	24.02
Sherpur Sadar	356.67	3.34	-	360.01	26.40
Sreebardi	251.46	-	18.88	270.34	19.82

Source: Census of Agriculture 1996

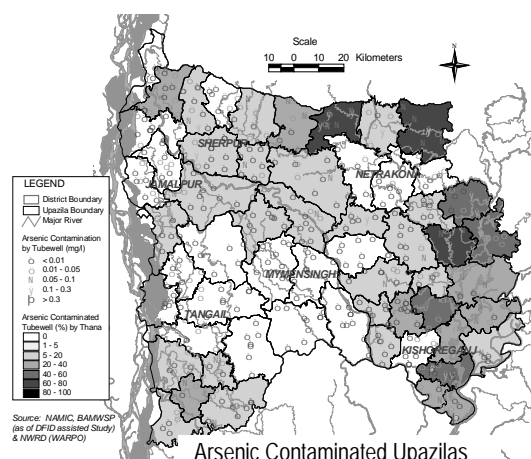
2.2 Natural Conditions

The climate of the District is relatively mild. Temperature rises steadily from February to April, remains fairly steady from April to October and then falls to reach the lowest in January. Annual average maximum and minimum temperature are 33.3 °C, 12 °C, respectively. Rainfall is not evenly distributed throughout the year. During the period from November to February, rainfall is negligible. About 70% of total rainfall occurs in the months from June to September. The average annual rainfall at Sherpur Town is recorded 2,258 mm, 69% of it concentrated in monsoon season (June - September) and only 3.7% of the annual rainfall in dry season (December to March).

The District belongs to the Northwestern part of North Central Hydrological Zone. The main rivers running through the District are the Old Brahmaputra, Bhugai, Badal, Malighi, Marisi and Rajkhali rivers (Fig. 2.2). Most of them are tributaries of the Old Brahmaputra. They are all navigable during the monsoon by boat. The total length of the rivers flowing through the District is about 129 km with an area of about 6.81 km² (BANGLAPEDIA). Gazari forests are notable.

The District has three types of soil, e.g., a) Piedmont alluvial plain (terrace soil), b) Active and young Jamuna-Brahmaputra floodplain and c) Old Brahmaputra and Jamuna floodplain. The north eastern part of the District contains grey and brown silty clay of the sub-recent piedmont alluvial plain. The southern part contains sandy non-calcareous greyish loam of the active and Young Jamuna Brahmaputra floodplain. In the central part it contains silty brown loam of the Old Jamuna Brahmaputra floodplain.

Arsenic contamination of groundwater in the District is not serious compare with districts in haor area of the Study Area.



2.3 Socio-economic Conditions

Population of the district is 1.41 million; male 50.87%, female 49.13%; Muslim 95%, Hindu 4%, Christian 0.5% and others 0.5%. Ethnic nationals are; Garo, Koch, Hajong, Banai and Rajbanshi. Main occupations are; agriculture 46.51%, fishing 1.45%, agricultural laborer 23.61%, wage laborer 3.01%, commerce 9.5%, service 3.14%, transport 1.32% and others 11.46%.

Average literacy rate of the District is 32.4%; male 38.6% and female 26.2%. Educational institutions are; government college 3, non-government college 11, government high school 3, non-government high school 92, junior high school 27, government primary school 358, non-government primary school 275, madrasa 194, agricultural training institute 1, nursing training institute 1, vocational training institute 1.

GDP of the District at current market prices in 1999-2000 is estimated at Tk. 18,842 million with growth rate at 6.86 %, and per capita GDP is US\$ 273 (or Tk. 13,748) which ranked the 55th among 64 districts in Bangladesh. Sectorial shares of GDP are; 24.4 % by crops & horticulture, 4.5 % by fishing, 10.0 % by wholesale & retail trade.

According to “Local Estimate of Poverty and Malnutrition in Bangladesh (BBS & WFP, 2004)”, the population ratio below the lower poverty line in the District is mostly high (31% to 37%) except Sreebordi upazila which show very high at 37% to 55%. Percentage of population with calories intake lower than 1,805 Kcal/capita/day is moderate to high (10 to 30%) except Sherpur Sadar shows high level at 20 to 30% in the District.

2.4 Agriculture in the District

According to the DAE annual report, the total agriculture land is 114,200 ha; cultivable fallow land at 200 ha, seasonal fallow land 400 ha. Major cropping pattern is Boro – Fallow – T.Aman (48%), Fallow – Aus - Aman (22%), Wheat – Aus - T.Aman (9%).

The cropping pattern and area land holding of the District is as follows:

Land holding and use	No. of holding		Operated area	
	No.	%	ha	%
Total	235,000	100.0	252,179	100.0
Non farm holding	81,796	34.8	5,086	2.0
Small holding	123,127	52.4	105,089	41.7
Medium holding	26,636	11.3	102,608	40.7
Large holding	3,441	1.5	39,386	15.6

Source: Census of Agriculture, 1996

Cropping pattern	Area (ha)	Share of Total Area
Single cropped area	17,160	16.2%
Double cropped area	68,135	64.3%
Triple cropped area	20,712	19.5%
Net cropped area	106,007	-
Cropping Intensity %	203.3%	

Source: 2000-2001 Annual Report of DAE

As shown the above table, 52% of the numbers of farm house holdings belong to the small farm holdings with an area of less than 1 ha. The medium and the large farm holdings were 11% and 1.5% respectively in the District. In the Study Area 84.1% of the farm holdings belong to the small farm holdings. Comparison of the 1983/84 of holdings with the 1996 indicates that the non-farm holdings increased by 1.57 times during this period. The farm holdings increased by 1.26 times, much smaller than the non-farm holdings. The small farm holdings increased by 1.46 times. On the other hand, the medium farm holdings decreased to 0.81, and the large farm holdings decreased to 0.69.

The area in the district under the cultivation of rice is significantly higher than that of the crop average of the total Study Area, while other crops excluding vegetables and potato showed smaller amounts. The gross cropped area and the percentage of distribution of crops in the Study Area is shown below:

Distribution of Crops in the District and Study Area (%)

District	Gross Cropped Area (1,000 acre)	Aus	Aman	Boro	Rice Total	Wheat/maize	Potato	Vegetables	Spices	Pulses	Oil Seeds	Jute	Sugar Cane
Sherpur	409	16.0	40.6	29.0	85.7	3.3	1.6	1.7	2.2	0.4	2.6	2.9	0.2
Study Area Average	-	12.9	31.7	32.6	77.3	4.2	1.4	1.2	2.5	1.3	5.4	5.5	0.8

Source: Census of Agriculture - 1996 (BBS)

Gross value-added of major crops in the Study Area is shown below.

Gross value-added of agriculture by District at constant Prices (2000-01)

(Unit: million Taka)

District	Crops	Animal farming	Forestry	Fishing	Total
Sherpur	3,746	642	443	752	5,583
Bangladesh	287,664	59,470	36,996	120,020	504,150
<Share (%) in Agriculture>					
Sherpur	67.1	11.5	7.9	13.5	100.0
Study Area Average	59.0	11.6	7.7	20.4	100.0
Bangladesh	57.1	11.8	7.3	23.8	100.0

Source: Statistical Yearbook of Bangladesh (2001)

2.5 Fisheries in the District

(1) Production of Fishery in Greater Mymensingh Area

Inland water fisheries of Bangladesh are divided into two types. One is Inland open-water (river & estuary, Sundarban, Beel, Kaptai Lake, flood land), and the other is Inland close-water (pond & ditch, baor, shrimp (freshwater shrimp) & fish farm).

In the rainy season, a lot of young and old men and women in rural areas catch fish in the floodplain, public canal, river etc. In addition, backyard pond culture using the hole that has been dug when soil is taken for the construction of house, road etc., becomes active every year. Freshwater fish is an important source of animal protein accounting for around 60% of the total animal protein intake. Moreover, freshwater fish, both caught in public water and cultured, is also an important source of cash income. The table below shows annual fisheries production from inland waters in six districts of Greater Mymensingh in 2002. Pond and shrimp farm are culture fisheries and others are capture fisheries.

Total catch of inland water, 2002

(Unit: MT)

No.	District	River	Beel	Floodland	Pond	Shrimp farm	Total
1	Mymensingh	2,607	5,332	25,270	23,314		56,523
2	Kishoreganji	1,284	5,584	19,191	9,237	15.82	35,312
3	Netrakona	1,344	8,013	8,867	15,682		33,906
4	Tangail	1,032	1,456	9,341	5,605		17,434
5	Jamalpur	755	2,287	6,746	3,241		13,029
6	Sherpur	85	2,330	3,830	2,486		8,731
Total		7,107	25,002	73,245	59,565	15.82	164,935

Source, Fisheries Statistical Yearbook of Bangladesh (2002), Department of Fisheries

Total catch and catch/ha from Beel in 2002 is shown in the following table. Kishoreganj District and Netrakona District are most productive in Beel fisheries. So far it is not known whether the high productivity in those two districts is due to abundance of fisheries resources or intensive fishing effort.

Area and fisheries production of Beels, 2002

District	Area of Beels(ha)	Total Catch(MT)	Catch(kg)/ha
Jamalpur	3,360	2,287	680.7
Kishoreganji	6,837	5,584	816.7
Mymensingh	7,346	5,332	725.8
Netrakona	8,355	8,013	959.1
Sherpur	3,508	2,330	664.2
Tangail	2,333	1,456	624.1
Total	31,739	25,002	4,470.6

Source, Fisheries Statistical Yearbook of Bangladesh (2002), Department of Fisheries

(2) Fisheries in Sherpur District

Total production in the District is lowest among six districts, while the ratio of fishery industry production to GDP is as high (12%) as that in Mymensingh and Netrakona Districts. The ratio of subsistence fisheries households is also high as 80.03%.

As shown in table below, the catch from the flood land in the District was rapidly decreased until 2001 to the level of almost 40% of the level in 1998. Since it is difficult to obtain fish fry in Sherpur District, fish culture farmers buy fish fry from Mymensingh District. The demand on fish fry by farmers keeps increasing.

Annual catches from inland waters in the Sherpur District (MT)

Location	1998	1999	2000	2001	2002
River	169	223	46	78	85
Beel	n.a.	n.a.	n.a.	n.a.	2,330
Flood land	6,754	5,838	5,507	2,575	3,830
Pond	1,585	2,642	2,741	1,905	2,486
Shrimp farm	-	-	-	-	-
Total	8,508	8,703	8,294	4,558	8,731

Source: Fisheries Statistical Yearbook of Bangladesh, DoF

Total catch of subsistence fisheries households in the District tended to decrease year by year, while there was no change in the number of subsistence fisheries households from 1989 to 2001. The number of subsistence fisheries households increased in 2002, indicating that the population depending on fisheries increased.

2.6 Livestock in the District

Climatic and topographic conditions, especially the high temperature and high humidity and frequent flooding, are not suitable to domestic animals. Pasture lands are not abundantly available for cattle and goats. Recently water shortages and development of agricultural machinery have caused unfavorable conditions to water buffalos. Due to the low feed efficiency, it has been difficult to enhance livestock farming in Bangladesh under the low food self-sufficiency. From these reasons, livestock farming has not been a priority area in the past. However, livestock is necessary to be developed in the future as an important income source of farmers. Livestock can be a demand-driven product. As the national economy develops, consumption of livestock will be increased.

(1) Production

Number of livestock in the District and Study Area according the size of holdings is shown below.

Number of livestock in the District and Study Area (1996)

	Districts	Number in 1000s					
		Holdings		Farm Holdings			
		All	Non-farm	Total	Small	Medium	Large
Cattle	Sherpur	57	3	54	30	20	5
	Study Area Total	2,526	156	2,370	1,493	724	152
Goats	Sherpur	143	29	114	81	27	5
	Study Area Total	1,351	260	1,091	805	244	42
Fowls	Sherpur	909	179	730	507	187	37
	Study Area Total	10,346	2,070	8,311	6,088	1,896	328

Source: Census of Agriculture - 1996 (BBS)

Percentages of households which raise animals are generally high in all the size of farm holdings. It indicates that the farming is closely related with animal husbandry, and recycling and scavenging of livestock are well functioned. Difference in the number by district in the Study Area was not large in cattle. The high water level during rainy seasons is suitable for water animals and brings about high value. In the scavenging livestock, farming area of the farm lands has large effects on number of animals.

Land limitation causes a shortage of feed supply in Bangladesh. In dry seasons, competitions between animal feeds and vegetables are also severe. Various chars along large rivers such as the old Brahmaputra River are expected to be good pasturing areas. For that purpose, the water management of the rivers is important.

In Bangladesh, veterinary services are key issues for the development of livestock farming. According to the officers in Ministry of Livestock and Fisheries, the veterinary services in the Greater

Mymensingh are not much different among the districts. Vaccination to poultry is already well organized. However, vaccination services to cattle and ducks are not well managed. Veterinary services in Kishoreganj and Netrakona, where duck farming is widely extended, need to be improved.

2.7 Zoning of the District

Based on the Agroecological Zone (AEZ) and inundation land type, upazilas in the District is mainly dominated by lowlands being classified as 1) medium highlands of North-western Plains and 2) Medium highlands and highlands of Old Brahmaputra Floodplain (Fig. 2.3). Shares of zone classifications in the Upazila are shown in the table below.

(unit in ha)

Upazila	Union	Young Brahmaputra and Jamuna (802)	Old Brahmaputra Floodplain (901, 902)		North-western Plains and Basins (2202)	Northern and Eastern Piedmont (2201)	Northern and Eastern Basins (2204)	Northern and Eastern Hills (2901)	Total
		F1	F0	F1	F1	F0	F3	F0	
Jhenaigati	Total	0	0	3,311	11,052	0	721	5,547	20,632
	Share	0.0%	0.0%	16.0%	53.6%	0.0%	3.5%	26.9%	100.0%
Nakla	Total	1,243	6,084	8,694	0	0	1,150	0	17,171
	Share	7.2%	35.4%	50.6%	0.0%	0.0%	6.7%	0.0%	100.0%
Nalitabari	Total	0	0	2,912	20,699	93	5,989	2,964	32,657
	Share	0.0%	0.0%	8.9%	63.4%	0.3%	18.3%	9.1%	100.0%
Sherpur Sadar	Total	8,580	15,765	10,563	0	0	0	0	34,908
	Share	24.6%	45.2%	30.3%	0.0%	0.0%	0.0%	0.0%	100.0%
Sreebardi	Total	0	6,341	5,549	11,050	0	0	2,643	25,583
	Share	0.0%	24.8%	21.7%	43.2%	0.0%	0.0%	10.3%	100.0%
District Total		9,823	28,189	31,030	42,801	93	7,860	11,154	130,950
Share		7.5%	21.5%	23.7%	32.7%	0.1%	6.0%	8.5%	100.0%

2.7 Water Resources Development

(1) Hydrological Region and NWMP

The Study Area is covered by North East or North Central regions. The District is under the Northeast Hydrological Zone. According to the National Water Resources Management Program, there is no specific regional water resources program except national level program for the Study Area.

The FAP study in relation to the District is FAP 6: Northeast Regional Water Management Plan submitted in May 1994. The Study proposed the following projects related to the District:

- Upper Kangsh River Basin Development
- Mrigi Rivr Drainage Improvement

(2) Large Scale Water Resources Development Projects

Among the large scale water resources constructed by BWDB, major information in the District is as follows:

According to the NWRD of WARPO (Fig. 2.2), there are four large scale water resources development projects, which were constructed by BWDB. Its outline is summarized as follows:

Name of Project	Length of Embankment (km)	Length of canal (km)	No. of Regulator/Sluice Gate	New Type of System	Project Area (ha)	Irrigable Area (ha)	Starting Year	Completion Year	Status
Janokipur Khal Regulator	0.37	1.25	1	FCDI	950	380	1980	1982	Complete
Malijhee River Bridge Cum Reg.	0.00	0.00	1	I + DR	3,832	1,990	1983	1986	Complete
Chilla Khali System Reh.	35.00	0.00	1	FCDI	1,970	502	1982	1986	Complete
Mirgi River System	0.00	0.00	1	FCD	316	0	1981	1982	Complete

Source: National Water Resources GIS Data Base (NWRDB)

Present conditions of these projects are as follows:

- Mirgi River System Project is old and is obsolete. Now new project is on-going instead of the old project.
- Malijhee River Bridge cum Regulator Project is not functioned now.

(3) Minor Irrigation Development

Minor irrigation equipment and irrigated area during Boro 2003 in the Upazila and Districts are show as follows:

		Upazila					Sherpur District
		Sherpur	Nakula	Sreebordi	Jhenaigati	Nalitabari	
DTW	Numbers.	14	5	18	49	184	270
	Area (ha)	110.10	46.00	214.00	810.00	3,340.59	4,520.69
STW	Numbers.	3,757	3,801	2,048	2,509	1,191	156,497
	Area (ha)	9,837	13,041	11,366	13,713	5,566	441,009
LLP	Numbers.	172	170	176	197	306	8,068
	Area (ha)	2,084	1,245	1,639	2,325	2,336	79,708
Total Irrigated (ha)		13,358	15,430	13,228	16,344	8,823	631,268

Sources: Survey Report on irrigation Equipment and irrigated Area 2003, BADC, Total irrigated area including the area irrigated by other traditional equipment

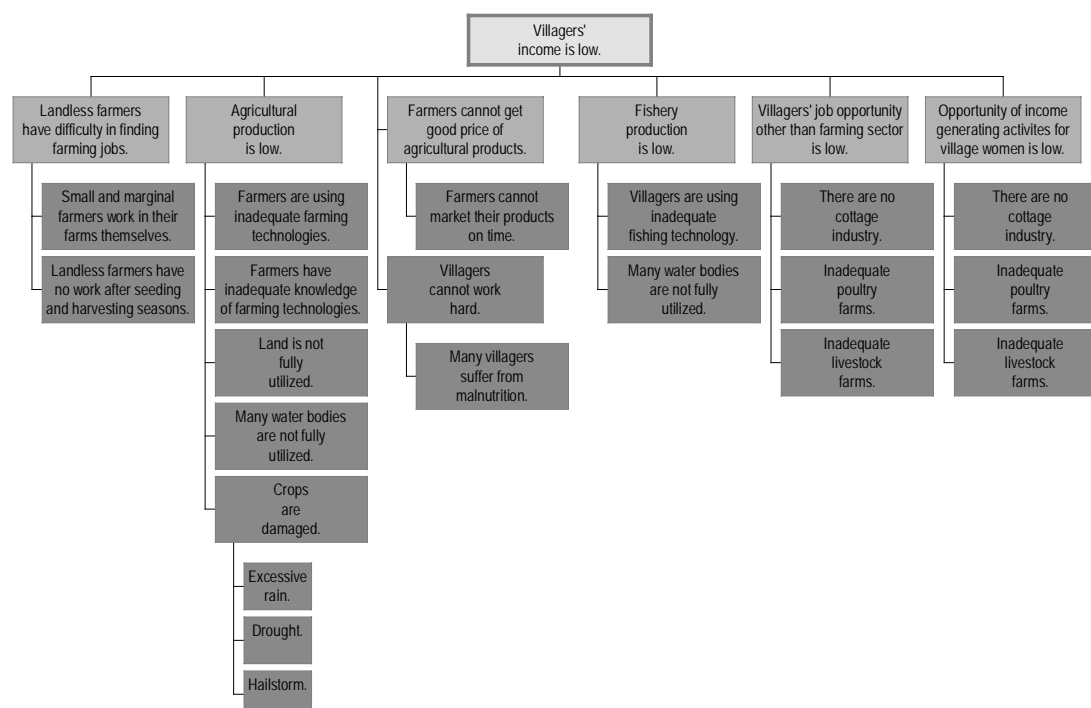
Chapter 3 Problem Analysis and Participatory Workshops (PRA)

3.1 Problem Identified through Workshops in the District

To clarify the main issues concerning water resources management and livelihood in the Study, three (3) workshops were held at district, Pakuria Union of Sherpur Sadar Upazila, Marichpuran Union of Nalitabari Upazila and Noya Beel Union of Nalitabari Upazila in the District. Problem analyses were carried out in each workshop.

(1) Problem Identification Workshops of District Officials

Workshops targeting government officials were held at district levels. Participants were LGED officials/officers, government district agencies and representative of Union *Parishads*. Results are shown in the following problem trees.



(2) Problem Identification Workshops of Villagers in Subproject Areas

Selection of the workshop sites was done based on the zoning of the Upazilas. Workshops at Pakuria, Marichpuran and Noya Beel unions were held in September 2004. Problem trees are shown in Fig. 3.1.

(3) Summary of the Problem Analysis Workshops

Problem analyses were undertaken at each workshop with the core problem defined as “villager’s income is low”. Direct causes in each workshop are shown below.

Name of Upazila/Union	Sherpur District	Union, Sherpur Sadar Upazila	Union, Nalitabari Upazila	Noya Beel Union, Nalitabari Upazila
Direct Cause 1.	Less farming jobs	1. Low agriculture production	Low agriculture production	1. Low agriculture production
Direct Cause 2.	Low agriculture Production	2. Low fish production	No jobs / work	2. No jobs / work in the area
Direct Cause 3.	Low price of products	Little money from trees.	Low fish production	3. Low products' price
Direct Cause 4.	Low fish production	Low livestock production	Low livestock production	4. No income from livestock
Direct Cause 5.	No jobs / work	Women can not earn.	High expenditure	Low fish production

The direct causes identified as the least common multiplier of all the problems identified together with workshops in the Study Area are: 1) Low agricultural production, 2) Limited work opportunity, 3) Low profit from products, 4) Low fish production, 5) Large family expenditure, and 6) Women cannot earn, low livestock production, etc. (Fig. 3.2).

3.2 Problems and Issues Identified

(1) Problems identified in the District

Problems for small scale water resources development identified in the District are summarized in the following table

Problems related to Natural conditions:		
- Flat low lying terrain	- Strong Seasonal Bias of Rainfall	
Problems related to Socio-economic Conditions:		
- Poverty/Vulnerability of Farmers	- Gender Issues	- Local Conflicts
- Illegal Land Occupation	- Fragmented Agricultural Area and Small Landholdings	
- Communication Gap between Local Government and Villagers		
Problems related to agriculture, livestock and fisheries:		
(Agriculture)		
- Land development	- Water Related Problems	- Rice Monoculture
- Problems of deficit farmers	- Seed Production and Supply	- Traditional Farming
- Malnutrition by poor protein supply		
(Fisheries)		
- Flood damages	- Shortage of water during dry season	- Lack of freezing storage
- Insufficient fishery extension services	- No management of indigenous fish and conservation area	
- Hard to access for water bodies leasing by poor fishermen		
(Livestock)		
- Feed shortages in dry seasons	- Integrated forestry-livestock farming	- Veterinary services
(Marketing)		
- Poor marketing environment		
Rural Infrastructure Conditions:		
- Damages to roads	- Rural Community Water Supply	- Poor road network

(2) Findings of Farm Household Interview Survey and Union Questionnaire Survey

The survey was conducted to understand/identify profitable farming style. According to the results of farmers' interview survey, farmers expressing their request to the Union Parishads are summarized in the table. As far as water resources concerned, irrigation and drainage problems are expressed by farmers.

Priority of Farmers Requests to Union

Requests	Sherpur	Average
Transportation (Marketing)	1	1.2
Sanitary facilities	1	1.7
Irrigation	3	3.0
Seed supply	7	4.5
Drainage	4	4.8
Health services	5	5.2
Fertilizer supply	6	5.5
Training for new technologies	9	7.2
Credit services.	8	8.7
Information services	9	9.5
Cooperative services	9	9.8

Source: JICA Farm household survey (2004)

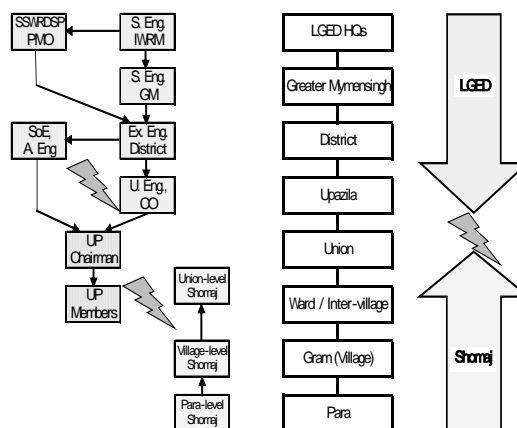
(3) Other Issues

1) PRA used in SSWRDSP-2

The PRA used in SSWRDSP-2 is a step of a project appraisal process by SSWRDSP-2. Therefore, PRA starts from the proposed project, not from the needs of the villagers or their future image. However, PRA workshops become the venue to talk about the development of the area, to get better consensus among stakeholders and improve subproject design.

2) Communication Gap

There found two major communication gaps in subproject planning, one between Union level and village/para level, and the other between project employee and LGED employee line. The former gap hinders getting the consensus of the people and establishing participation and ownership of the people. The latter gap hinders identifying and designing a good subproject. In this context, more participation of Upazila Engineer and Community Organizer to design-discussion meeting seems to be necessary. Also, consensus of *shomaj* elders at village-level and *para*-level should be



Communication Gap

reached before finalizing the proposal of subproject.

3.3 Participatory Workshop (PRA) for Sustainable Water Resources Management

(1) Methodology

1) Issues:

Two communication gaps; one between union level and *gram* (village) / *para* level, and the other between project employee and LGED employee line.

2) Assumptions:

Organizing several participatory workshops (PRA) at *gram* level beside sub-project level, with active participation of villagers, local leaders, UEs, AEs (SP-2), SoEs (SP-2), SAEs (SP-2) and other local LGED staff, can conquer these communication gaps and promote better project design and better consensus among all the actors.

The Team requested AE (SP-2) and/or SoE (SP-2) of each district to choose one promising sub-project area to organize participatory workshops.

➤ Benefits for the Study Team / LGED

To collect more grass-roots information especially on decision-making and collaboration in the community-base projects and activities.

To clarify the needs of the community

To verify a participatory planning and decision making process for small-scale water resources development including involvement of UEs, AEs (SP-2), SoEs (SP-2), SAEs (SP-2) and other local LGED Staff.

➤ Expected benefits for the local communities as a by-product

To share the ideas and opinions at intra-*gram*, inter-*gram* and sub-project levels.

To start some collaborative actions for consensus and for the future.

Capacity building of the individuals and the communities.

(2) Process of Participatory Workshops (PRA)

➤ Arrangement of workshops with local leaders

Preparation of about four *gram* level workshops to strategically cover all the study area.

Preparation of one integrated workshop at sub-project level for summary and some consensus building.

Miking by UP Chairpersons, UP Members, *matabbors* and other local leaders for participation.

➤ Gram level interviews and workshops

Interviews focused on poor villagers.

Mapping, rich-poor profile and other RRA tools if necessary.

Appreciative Inquiry : a) Discovery Stage by sharing success stories of community- based projects and activities, b) Dream Stage by sharing the future image of individuals and the community where they can repeat more success stories, c) Design Stage by sharing what actions they can take today, tomorrow and next week.

➤ Integrated workshops

Presentation of the results of the *gram* level workshops.

Presentation of observation and analysis by the Team: identification of intra-*gram* / inter-*gram* issues, and sub-project / *upazila* / district level issues if any.

Discussion especially on inter-*gram* and sub-project level issues, and on immediate actions.

Interviews and Participatory Workshops Schedule at Each Sub-project Area

<u>1st – 3rd day:</u>	Meeting with key persons and arrangement of workshops by the Study Team, transect of the study area and interviews of villagers by the PRA Contractor.
<u>4th – 7th day:</u>	Four <i>gram</i> level workshops (three <i>para</i> level workshops at the sub-project area in <i>Sherpur</i> District) using mapping, rich-poor profile and <i>Appreciative Inquiry</i> .
<u>8th day:</u>	An integrated workshop at sub-project level: <ul style="list-style-type: none"> - Presentation of the results of the four <i>gram</i> level workshops by villagers - Presentation of the observation and analysis by the Study Team and the PRA Contractor - Technical issues of the proposed sub-project by UE and/or AE (SP-2) or SA (SP-2) - Social issues and WMCA by SoE (SP-2) - Question & answer, and free discussion
<u>9th – 10th day:</u>	Reporting by the PRA Contractor.

(3) Records of Participatory Workshops (PRA) in Sherpur District

<u>Sub-project Name:</u> Kharamura Drainage Sub-Project	<u>Gram:</u> Kharamura <u>Paras:</u> 1) Porabari, 2) Kutchpara, 3) Kharamura, 4) Garopara, 5) Tilapara, 6) Nahanpara, and 7) Moddhppara	<u>Appraisal Status:</u> UDCC approved.
<u>Type / Project Area (Benefited Area):</u> Command area development and drainage improvement / 201 ha (160 ha).		
<u>Major Proposed Activities / Facilities:</u> Lining of drainage canals.		
<u>Necessary Modification:</u> The benefited area has been irrigated for nine years now, so that the project purpose is not command area development but drainage improvement only.		
Major activity of this sub-project is lining of the drainage canal of a 100% community-based project initiated by a matabbor. This is the ninth season and usually 20 to 30 landowners invest in the construction of the earthen dam (200-250 ft long) before Boro season and collect the water fee of Tk. 800/acre from other landowners after the season. The fee is Tk. 500/acre for the investors and small landowners with 20-25 decimals are exempted of the fee. Damage to the harvest is also considered. This season, 29 landowners and one landless invested about Tk.,240,000 of which about Tk. 90,000 in the construction (35 laborers x 30 days x Tk.100/day) and Tk. 50,000 in guard (6 persons x 6 months x Tk. 1,500/month). The benefited area is about 450 acre so that expected revenues are about Tk.360,000 (Tk. 450 acre x 800/acre). Because of drought in Aman season, rice production was quite low two years ago. So no landowners could become the members of the management committee and could invest in the construction of the earthen dam. Landless (33 people) constructed the earthen dam voluntarily and they became the management committee. Landowners were supposed to pay Tk. 600/acre that year, but some landowners did not pay. Some management committee members of that year, who constructed the earthen dam and collected the water fee, mishandled the money and escaped to Dhaka.		

(4) Some Cross Sectional Analysis

1) Rich-poor profiles at the *gram* level workshop

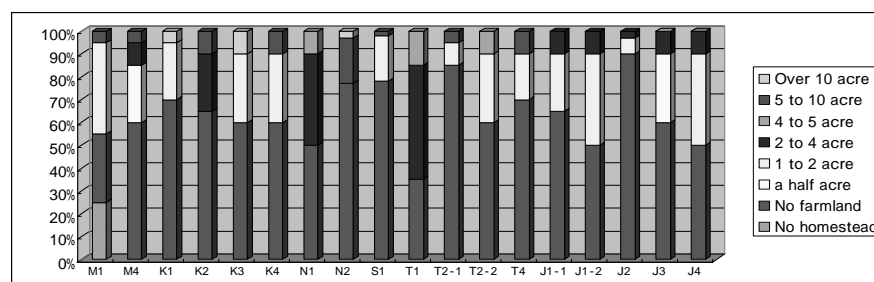
18 Rich-poor profiles conducted at the *gram* level workshops show that villagers define landless farmers as poor and the ratio of the poor ranges from 50% to 85%

Rich-Poor Profile at Gram Level Workshops

	M1	M4	K1	K2	K3	K4	N1	N2	S1	T1	T2-1	T2-2	T4	J1-1	J1-2	J2	J3	J4	
No homestead	25%																		
No farmland	30%	60%	70%	65%	60%	60%	50%	77%	78%	35%	85%	60%	70%	65%	50%	90%	60%	50%	
a half acre		25%																	30%
1 to 2 acre	40%		25%		30%	30%			20%		10%	30%	20%	25%	40%	7%			40%
2 to 4 acre		10%		25%			40%			50%				10%	10%	3%	10%		10%
4 to 5 acre							10%			15%		10%							
5 to 10 acre	5%	5%		10%		10%		20%	2%		5%		10%						
Over 10 acre			5%		10%			3%											

2) Cash income of relatively poor villagers

The PRA Consultant Team made 92 interviews in total, 15 or 16 interviews at each sub-project site. They did a purposeful sampling of



Note: Mymensingh (M1, M4), Kishoreganj (K1 to 4), Netorakona (N1, N2), Sherpur (S1), Tangail (T1, T2-1, T2-2, T4), Jamalpur (J1-1, J1-2, J2 to 4)

interviewees by visiting rather small and shabby huts. 26 out of 92 interviewees or 28.3% are women, and strikingly, 14 out of 26 or 53.8% of the women are single (13 widows and one divorcee). At the sub-project area in *Kishoreganj*, all the four women interviewed are widows.

8 out of 26 female interviewees or 30.8% said they are doing maid and earn something like three meals and Tk. 30/day or 0.5 kg of rice per day to 1 *mond* (40kg) per month. 6 out of 26 or 23.1% are day laborer earning Tk. 30 to 100 and they are all in *Sherpur*. 5 out of 26, or 19.2% said they are hawkers of fishes, vegetables and household goods, and earn Tk. 25 to 60/day. Also another 5 said they are housewives.

32 out of 92 interviewees or 34.8% said their major income source is day labor and the daily wages range from Tk. 30 to 100/day. At the sub-project area in *Sherpur*, 14 out of 15 interviewees or 93.3% are engaged in day labor of farming, forestry and earthen work etc. One villager said he is a farmer with 50 decimal (0.5 acre) of farmland.

The daily wages and availability of farming labor vary from month to month. For example in *Jalalpur*, the wage is about Tk. 50/day in July-September, about Tk. 60/day in January-March, about Tk. 80/day in November-December, and about Tk. 100 in April-June. Usually one meal and 0.5 kg of rice are provided by the landowners in planting and weeding seasons, and two meals and 1 kg of rice in harvesting season.

9 out of 92 interviewees or 9.8% said they are sharecroppers but their land sizes are something like one or two *bigha* (0.33 or 0.66 acre) and they do day labor substantially. 8 out of 92 interviewees or 8.7% are rickshaw/van pullers and earn Tk. 50 to 200/day. Some are working in Dhaka. 7 out of 92 interviewees or 7.6% are hawkers of fishes, vegetables, ice cream and household goods and earn Tk. 25 to 100 (Tk. 25 to 60 for women)/day.

In conclusion, options of day labor for women are less and wages are lower than men. Men can choose fishery or farm labor in high season, and rickshaw/van pullers, earthen work or hawkers in low season. Many of them can still make Tk. 50-70 per day all year round. Maximum wages women can make, however, is Tk. 60/day if earthen work is available. Only some women are lucky enough to find wood cutting / planting jobs or to be able to work in the field. Otherwise, to work as a maid might be the best regular occupation.

The majority of poor farmers (55 out of 92 interviewees or 59.8%, the cases with no interest are excluded) are borrowing money at very high interest (8% to 20% per month or 100% to 240% per year). 57.9% are the loans for food, agriculture, business etc. and the average amount is Tk. 1,873. 34.2% are for health problems and the average amount is Tk. 3,431. Others are for land and houses (Tk. 20,000 and Tk. 14,000 from NGOs), and for wedding (Tk. 7,800)

(5) Participatory Planning and Decision Making Process

COMMON ISSUES	POSSIBLE IMMEDIATE ACTION
On Project Designing	For Project Designing
1 All of the six sub-projects where the Team had workshops go beyond union borders. If the benefited area is close to 1,000 ha and the area of each union is something like 2,000-3,000 ha, the sub-project most likely is a multi-union project.	1 Assuming all the sub-projects are multi-union, UE, AE (SP-2), SoE (SP-2) and other local LGED Staff need to check all the sub-project proposals and rewrite them accordingly.
2 Negative impacts tend to occur near the border of the project area, especially beside the facilities such as embankment, sluice gates and culverts. They are not paid attention so that no mitigation measures can be taken, if appraisal teams only study inside of the project area.	2 The study area for the appraisal teams need to include potentially affected areas such as outside of embankment, outlets or inlets of sluice gates and culverts, and upstream of dams. The study area must be significantly wider than the project area.
3 Project purpose, major project facilities and activities are not so clear in the sub-project proposals, and they are being refined through "appraisal" process by the appraisal teams.	3 UEs, AEs (SP-2), SoE (SP-2) and other local LGED staff must refine the sub-project proposals so that the project purpose, major project facilities and activities are clear.
4 UEs, AEs (SP-2) and other local LGED staff are not involved in substantial project designing because it is considered as "appraisal" process.	4 Full and active participation of UEs, AEs (SP-2), SoE (SP-2) and other local LGED staff in project designing is a must. Participation does not only mean participation of the villagers, but of all the actors.
5 Phasing of the projects and priority in <i>upazila</i> / district development (plans) are not so clear.	5 UEs, AEs (SP-2) and other LGED staff at <i>Upazila</i> and District levels need to add comments to the sub-project proposals on phasing and priority in the <i>upazila</i> and the district.

On Consensus Building	For Consensus Building
1 Few districts or <i>upazilas</i> have full appraisal reports, so that local LGED staff cannot explain the results, either the proposals pass or fail, fully to UP Chairpersons and villagers.	1 For transparency and accountability to UP Chairpersons, UP members, local leaders and villagers, copies of all the appraisal reports must be sent to each district and the <i>upazila(s)</i> so that AEs (SP-2), SoE (SP-2), UEs and other local LGED staff can explain the results of appraisals to them.
2 Few UP Chairpersons consult <i>gram</i> level leaders, sometimes not even UP members, before submitting sub-project proposals.	2 Accountability to the villagers and consensus of <i>gram</i> level leaders such as <i>matabbors</i> need to be the pre-requisites for UP Chairpersons to submit sub-project proposals
3 One transect walk and one workshop in a sub-project area are not enough for consultation. Important negative impacts and social conflicts can be unrecognized by the appraisal teams, and many questions of the villagers will be unanswered.	3 Two-day interviews and three to five <i>gram</i> level workshops need to be conducted in addition to one transect walk and one workshop by the PRA team. A workshop for more than three <i>grams</i> usually cannot attract so many ordinary villagers from all the grams. A workshop for every one or two <i>grams</i> is recommended.
4 Neighboring villagers of a sub-project do not have opportunities to be consulted by the appraisal teams	4 The villagers of neighboring <i>grams</i> and unions must be included to the interviews and workshops by the PRA team. They could be affected negatively by the proposed sub-project. The primary purpose of impact assessment is not to show there are little negative impacts, but to show how many mitigation measures are identified and how much project design has improved from the original one.
5 Many villagers do not have opportunities to get information on WMCA so that they do not know what WMCA is even after they have agreed to join WMCA.	5 Full explanation to the villagers on major activities, pre-requisites and benefits of WMCA is necessary before asking about their promises to join WMCA.

(6) WMA or WMCA

1) WMAs in SSWRDSP-1

There are 280 sub-projects in SSWRDSP-1 and the average members of WMA are 413, of which 100 or 24.2% in average are female members. The members are largest at 833 (an average of four WMCAs) in Pabna District and smallest at 110 (an average of four WMCAs) in Bogra District.

The target amount of beneficiary contribution is Tk. 128,417 in average per WMA. The amount is highest at Tk. 363,342 (an average of six WMCAs) in Chapai Nawabganj District and lowest at Tk. 27,259 (an average of seven WMCAs) in Thakurgaon District.

The collected amount of beneficiary contribution is Tk. 290 per member in average. It is highest at Tk. 1,247 per member in Bogra District and lowest at Tk. 104 per member in Jhenaidah District.

2) Community-Based Projects

From the success stories of community-based projects, the Team has found that about 20 villagers invested for a gram level earthen dam project in *Sherpur* District about Tk. 240,000 every season for nine years. In case of a gram level DTW project in *Mymensingh*, 35 villagers invested Tk. 350,000. The amount is almost as much as the target amount of beneficiary contribution in *Chapai Nawabganj* District.

The water fee of the earthen dam project in *Sherpur* District is Tk. 800 per acre, and that of the DTW project in *Mymensingh* District is Tk. 140 per Katha (Tk. 1,750 per acre). The investment, water fee, construction wages and who work as day laborer etc. were decided by *shomaj* of *matabbors* and villagers have had no serious problems of investment nor collecting water fees.

The interviews showed that more than 20% of the poorer households in the villages could be female-headed. Also more than half of the population is usually landless and poor. The figure could be as high as 90% in some grams.

Women have much less options and opportunities for cash income in the villages. If they are not lucky enough to be able to work in the forest or in the paddy field, the best they can do is to find temporary earthen work, work as a maid (usually 40kg of rice per month plus three meals) or as a hawker (could be Tk. 30-40/day).

3) RECOMMENDATION

It seems to be very difficult for poor families, especially female-headed families, to contribute Tk. 300, sometimes more than Tk.1,000 in cash to join WMCA. They might not be the direct beneficiaries of the sub-projects either if they are landless. On the other hand, it is not difficult for villagers to invest Tk. 300,000 at gram level if they are community-based projects, the decision was made through shomaj, and landowners, who are more likely the real direct beneficiaries of sub-projects, invest and pay the water fee. Therefore:

To exempt poor landless farmers, especially female-headed households, from cash contribution to join WMCA.

To introduce progressive cash contribution system based on gram level decision.

To charge operation and maintenance fee solely on landowners' accounts.

To include community-based water resources development projects into WMCAs under SSWRDSP-2 even if they are not selected as sub-projects.

4. Small Scale Water Resources Development Potential

4.1 Surface Water Resources in the District

(1) Perennial/seasonal waterbodies

According to the NWRD of WARPO, there are about 131,687 perennial waterbodies, with a total area of about 2,415 ha which cover 1.8% of the District (Fig. 2.2). Among them, beels are counted as 98 with an area of 1,304 ha in the District as shown in the following table. There is 19 unions which have no beel; in other wards, 63% of unions have beels in the District.

District	Total Numbers		Number having Beel		No. of Beel*	Beel Total Area (ha)
	Upazila	Union	Upazila	Union		
Sherpur	5	52	5	33	98	1,304
Study Area Total	58	565	52	250	664	15,033

Source: NWRD, WARPO

Notes: * because a beel locates in the several unions

In regard to the water scarcity in dry season, it may be said that all waterbodies especially beels with considerable scale have some potential for SSWRD. Installation of supplemental water retention facilities or dredging may improve its utilization.

(2) Flood water

While floods are the major constraints for livelihood in the District, it is also a fact that it is a source of water, and with an excessive amount. Retention and utilization of flood water for supplementary irrigation may enhance agricultural production particularly in areas with relatively high altitude.

4.2 Small Scale Water Resources Development in the District

(1) Previous SSWRD Program

There was not significant project operated in the District except Thana Irrigation Program (TIP) in 1960s and Canal Digging Program (CDP) since 1979 up to 1996, Also the SSWRDSP, started 1995, was implemented in the western part of Bangladesh. Since July 2002, the SSWRDSP-2 has started covering the District.

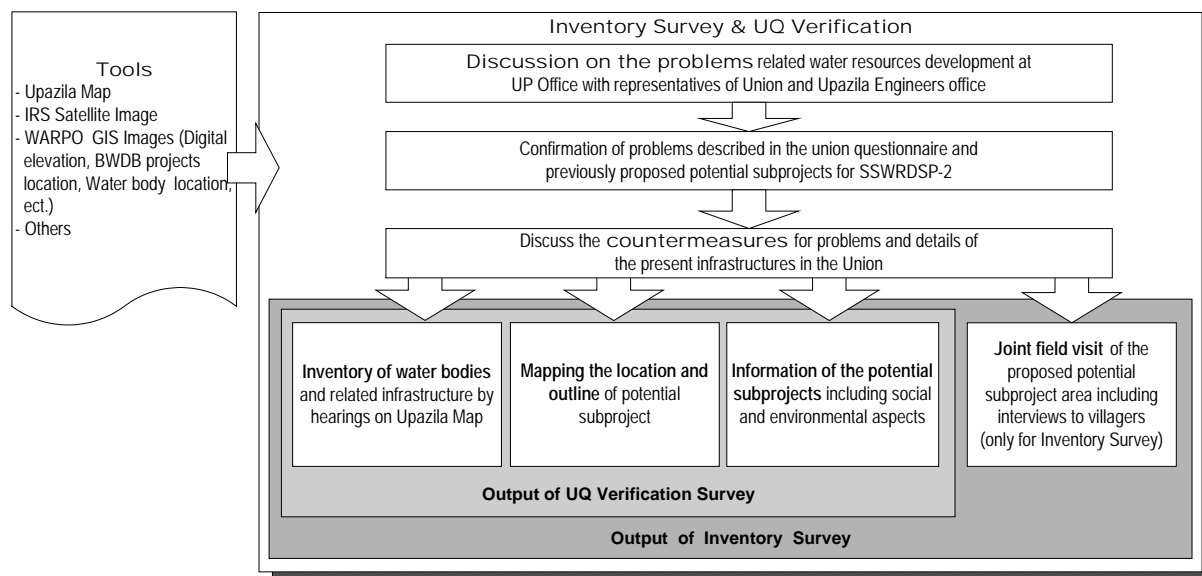
(2) Progress of SSWRDSP-2

According to PMO office of SSWRDSP-2, there are 21 subprojects proposed from 15 unions of the District as shown in Table 4.1. The subprojects proposals were screened by the following procedures: 1) prescreening at district level, 2) reconnaissance by PMO, 3) PRA/Pre-feasibility survey by local consultants, 4) Feasibility Study by consultant. Up to the reporting period, one subproject was granted approval for implementation. Most of reasons for failure at prescreening stage are incomplete format.

4.3 Identification of Potential Subprojects

(1) Methodology

Identification of potential SSWRD subproject was conducted by the inventory and union questionnaire verification surveys. Both surveys conducted firstly, discussion and clarification of the answer of union questionnaires on the water related problems in the Union among UP chairman and members, representative of villagers and staff of Upazila engineer's office at Union office. Then the locations, necessary countermeasures for the problems faced by people in the Union were confirmed. These scopes of works for the potential subprojects not only the technical aspects but also environmental and social aspects were discussed and recorded by surveyor and enumerator of the Study Team. In case of the inventory survey, the proposed potential subprojects were visited to confirm the present conditions and conduct the preliminary technical assessment including interviewing the potential beneficiaries by members discussed in the Union office. Processes of both surveys are shown below:



(3) Inventory Survey

1) Objectives

To examine the situation of water resources related infrastructure, confirm the contents of the collected Union Questionnaires and to identify the potential subprojects for SSWRD in selected 17 Unions of the District

2) Selection of Unions to be surveyed

Selection of unions to conduct the inventory survey was done based on the submission of subproject proposals for SSWRDSP-2. Unions, which were previously selected, based on the understanding that information on present water bodies and related infrastructure is required.

3) Survey Procedures

The survey was conducted by dispatching consultants to each Union and by conducting interviews to relevant government officers, UP chairmen and members, village heads, Upazila Engineers and other local stakeholders and actual field survey to the water resources infrastructures and potential subproject sites. The survey process for each union was as follows:

- a) Explanation of survey to relevant officers at Union complex
- b) Identification of water bodies / infrastructure location and access route
- c) Survey on water bodies / infrastructure
- d) Verification of information indicated in the Union Questionnaires
- e) Discussion with relevant officers at Union complex for identification of potential subproject areas and possible intervention plans based on identified water bodies/ infrastructure

(3) Union Questionnaire Verification Survey

1) Objective

To verify the contents of the collected Union Questionnaires and to identify/collect information relevant to potential subprojects for SSWRD in the 35 unions of the District, which were not selected for the Inventory Survey.

2) Survey Procedures

The Survey was done through interviews to local stakeholders including UP chairmen, members, village heads, Upazila Engineers and other local representatives.

(4) Identified Potential Subprojects

1) Results of Potential Subproject Identification Survey

In preparation of the list of potential subprojects for SSWRD in the District, the results of field surveys were carefully examined and necessary modification were made. Accordingly, the Study Team identified 55 ungrouped potential subprojects in the District. The identified potential subprojects were categorized into four types; 1) Flood Management: FM, 2) Drainage Improvement: DI, 3) Command Area Development: CAD and 4) Surface Water Conservation: WC, accordingly to their contents. The type, scale of gross area and relation with BWDB projects in the district are summarized in the following tables, while the locations of these subprojects are indicated in Fig. 4.1. However, it must be clearly noted that these figures are of preliminary stage and not yet meant for indicating the number of subprojects for implementation. The preliminary list of potential subprojects has further been screened to clarify whether they should be implemented under small-scale water resources development schemes, and then has been prioritized in order to select those for further implementation arrangements.

Identified Potential Subprojects by type

District	FM	DI	CAD	WC	FM&DI	FM & WC	DI&WC	FM, WC&DI	Total
Sherpur	8	19	0	7	1	1	19	0	55
Study Area Total	118	145	2	67	83	25	185	69	694
% within total	17.0	20.9	0.3	9.7	12.0	3.6	26.7	9.9	100

Identified Potential Subprojects by Scale of Area

District	Gross Subproject Area (ha)					BWDB Related
	1,000	1,000 < 1,500	1,500 < 2,000	> 2,000	Total	
Sherpur	42	11	2	0	55	18
Study Area Total	572	57	18	47	694	176

2) Verification of Identified Potential Subprojects

After discussion in the UDCC, DSSWRCC and IMCC, the identified subprojects were reviewed in the light of the comments received in these meetings. The hydrological features and contents of the identified subprojects were also examined to verify its adequacy as a single subproject. Consequently, a total of 44 potential subprojects were verified. About 20% of the potential subprojects were grouped in the District. This was mainly due to: 1) multiple upstream-downstream subprojects with contents of re-excavation continuously located on the same river/*khal* and 2) multiple subprojects with continuous contents of embankment rehabilitation/construction.

Out of the 44 verified subprojects, 35 had gross areas of 1,000 ha or below. This counts up to some 80% of the total verified subprojects.

Verified Potential Subprojects by type

District	FM	DI	CAD	WC	FM&DI	FM & WC	DI&WC	FM,WC &DI	Total	Total before verification
Sherpur	9	12	0	7	1	1	14	0	44	55
Study Area Total	91	101	2	57	80	23	157	82	593	694
% within total	15.3	17.0	0.3	9.6	13.5	3.9	26.5	13.8	100.0	-

Verified Potential Subprojects by Scale of Area

District	Gross Subproject Area (ha)					BWDB Related
	1,000	1,000 < 1,500	1,500 < 2,000	> 2,000	Total	
Sherpur	35	2	3	4	44	17
Total	473	63	24	33	593	170

4.4 Prioritization of Potential Subprojects

(1) Necessity of Prioritization

In order to effectively utilize limited inputs, development activities of the Master Plan should be implemented at the right place for the right purposes, contributing at the maximum extent to its overall goals. Prioritization of subprojects should be done with necessary criteria to select the most important interventions. Before prioritization, the verified subprojects which were obviously unqualified for SSWRDSP were screened out, and then the qualified potential subprojects were scored and categorized into four categories (A, B, C and D) depending on their scores and maturity in planning.

(2) Method of Prioritization

Identification of potential subprojects was done by first identifying the needs of the local villagers and then by formulating a package of measures to cope with these problems. This was done so that the measures to cope with the most important problems were not forced to take the form of SSWRD, neglecting the possibilities of other forms such as medium and large-scale interventions, which may be more suitable in certain cases. In this context, the verified subprojects were not necessarily designed as SSWRD subprojects from the beginning.

Among prioritization, the verified potential subprojects were pre-screened to exclude subprojects that clearly do not fit into the SSWRD scheme. For this process, the gross area and location of the verified subprojects were applied, where medium and large-scale subprojects as well as small-scale subprojects lying in areas protected for the purpose of environmental conservation were excluded.

After pre-screening, the qualified subprojects were scored by applying a method for multi-criteria analysis. The criteria and weight of the scores were carefully examined based on available information, and each qualified subproject was scored accordingly. The main items regarded in the criteria were:

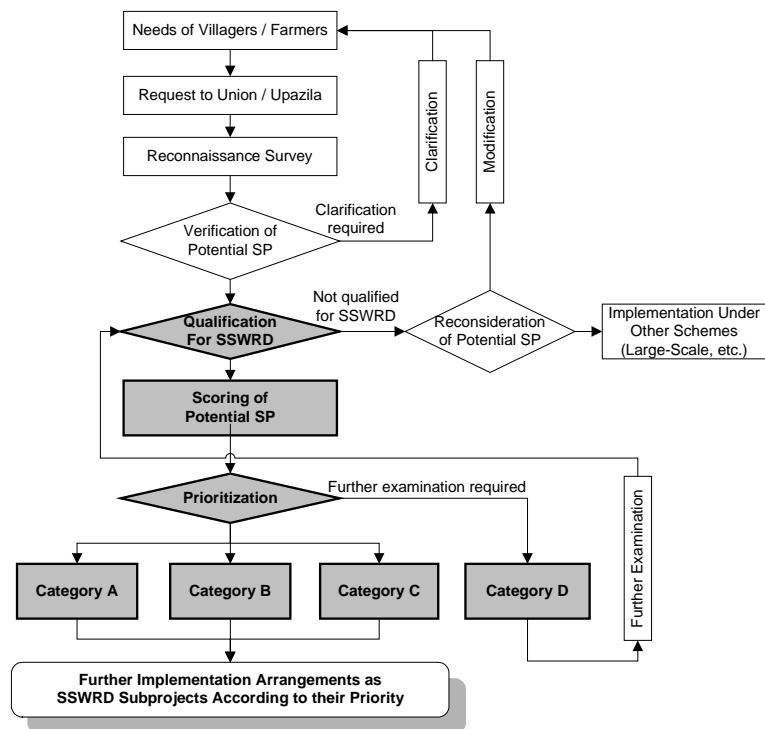
- Impact on Poverty Alleviation
- Significance of Benefit
- Hydrological and Environmental Considerations, and
- Easiness of Implementation of the Subproject and O&M by Local Beneficiaries in the Subproject Area

Subsequently, the maturity of the qualified subprojects were checked based on the criteria developed under the SSWRDSP-2, which is the current scheme for implementation of SSWRD subprojects. Those found to require further examination for implementation as SSWRD subprojects were categorized as Priority D, while others were categorized into A, B and C according to their scores.

(3) Qualification of Verified Subprojects

1) Criteria for Qualification of Verified Subprojects

Under the NWPo, water resources development interventions with the benefiting are of 1,000 ha or less are categorized as “Small-Scale”. In this regard, all such interventions can be referred to as potential SSWRD subprojects. However, LGED has developed a set of selection criteria under the



Flow of Prioritization

SSWRDSP-1 and 2 to qualify subprojects that are expected to be effective and efficient. This criterion covers a wide range of issues from economic viability / technical feasibility to social acceptability and environmental soundness.

In regard that the potential subprojects that are identified and prioritized under this study are to be implemented by LGED, and that the SSWRDSP-2 following its first phase is currently the only scheme under LGED to implement SSWRD subprojects, these criteria (or modified according to future needs) would be most appropriate in qualifying such potential subprojects.

However, in order to give concrete decisions on whether the potential subproject is fully qualified or not, analysis must be done in detail for each individual criteria. In regard that the Master Plan Study has not stepped in to the very details of the individual subprojects, but rather concentrated in collecting general but overall information to provide the directionality for SSWRD, it is not favorable to completely judge the potential subprojects at this stage, where those judged unqualified will be excluded from further examinations. In this regard, two fundamental criteria were applied for qualification (pre-screening) of the verified potential subprojects, while the remaining selection-criteria were considered later on for the prioritization of qualified subprojects.

The criteria applied were:

Gross subproject area : Based on the definition of SSWRD subprojects, the benefiting area of each subproject must be 1,000 ha or less. At this stage, detailed analysis of topography and hydrology is not done for individual subprojects, therefore, accurate figures of benefiting areas are not presented. Taking into regard that based on GIS analysis of the layout of verified subprojects, some 20% of the subprojects area is expected to be settlements, roads etc., qualification of the subprojects were done by adding 20% margin to the current frame. Also taking into regard that the range of benefiting area as defined in SSWRDSP-2 is 50 to 1,000 ha, verified subprojects with the gross area falling outside of the range of 60 to 1,200 ha were excluded.

Overlapping with protected areas : In order to prevent obvious negative impact on the environment, implementation of subprojects in protected areas should be avoided. In this regard, verified subprojects located in Madhupur National Park and its buffer zone as defined by the Department of Forestry was excluded.

2) Qualified potential subprojects

Through the process of pre-screening in regard to the criteria set above, some 20% of the verified subprojects were considered to be of large scale, while 1 was located within Madhupur National Park. As a result, 496 subprojects out of the 593 verified subprojects were found qualified. These qualified subprojects will be prioritized for further implementation arrangements. The average area of a single qualified subproject is 587 ha in the District. Out of the whole District, 15.1% will be under the gross subprojects area if all 35 subprojects are implemented. By type, subprojects with the objective of DI were most dominant. This was followed by FM.

Number and Area of Qualified Subprojects

District	Number of verified subprojects	Number of qualified subprojects	Total gross area of subprojects (ha)	Average gross area of subproject (ha)	Total area in the District (ha)	% of Total gross area within the District
Sherpur	44	35	20,564	587.5	136,400	15.1
Total	593	496	266,743	537.8	1,667,200	16.0

Type-wise Number of Qualifies Subprojects

District	FM	DI	CAD	WC	FMDI	FMWC	DIWC	FMDI & WC	District Total
Sherpur	8	11	0	6	1	1	8	0	35
Total by Type	81	89	2	52	70	21	118	63	496

(4) Prioritization of Qualified Potential Subprojects

1) Prioritization Method

After qualification, the potential subprojects were prioritized and categorized into four categories (A, B, C and D) according to their priority. This was done by two approaches. One to screen out and lower the priority of potential subprojects that are qualified but yet require additional information to confirm if they satisfy certain criteria for SSWRDSP-2. The other is to score the qualified subprojects by using a multi-criteria analysis method, and selecting those with higher priority based on a set of criteria. The potential subprojects selected in the former process was categorized into category D, while the remaining were categorized in to A, B, and C.

a) Screening of Category D Subprojects

Out of the set of selection criteria developed under SSWRDSP-2, two were applied in the process of qualifying the potential subprojects. The remaining criteria were not applied in consideration that the potential subprojects should not be completely screened at Master Plan level. However, based on the information collected in the study, preliminary judgment for the criteria concerning subproject construction cost can be made, where potential subprojects not satisfying the criteria at this point should be bound for further examination. In regard that such examination will require more time and resources, they should have lower priority among implementation. The potential subprojects not satisfying the criteria were categorized into “Category D”, which require further examination to clarify whether they can (with or without modification) satisfy the set of selected criteria.

SSWRDSP-2 Selection Criteria and its Application for Screening “D Category” Subprojects

SSWRDSP-2 Selection Criteria	Application	Reason
The SP must be in line with district strategies and guidelines for SSWR and approved by DIAPEC	Applied for qualification	The Master Plan itself is positioned as the district strategy for SSWRD. Approval of DIAPEC will be done at the stage of implementation
More than 40 % of the SP benefited area will be operated by landless share croppers, marginal farmers	Not applied	Examination should be done based on reliable information obtained at the stage of feasibility study
No more than 30 % of the households depend on subsistence capture fisheries.	Not applied	Examination should be done based on reliable information obtained at the stage of feasibility study
Each SP will entail rehabilitation / upgrading of an existing water control system	Not applied	Examination will be done at field reconnaissance
SP cost must not exceed \$ 1000/ha for CAD and \$ 500 for other schemes without ADB's prior approval.	Applied	Examination will be done by checking the contents of the potential SPs
Benefited area served by the SP must be more than 50 ha and not exceed 1000 ha.	Applied for qualification	Already applied for qualification of verified subprojects
Each subproject must be technically feasible; economically viable (EIRR > 12 %)	Not applied	Detailed study should be examined at the stage of feasibility study.
Capacity of beneficiaries in ensuring the sustainability of submersible embankments must be shown for Interventions in the deeply flooded part of the Northeast Region	Not applied	Detailed study should be examined at the stage of feasibility study
The SP shall be environmentally sound and IEE/EIA study has to be undertaken and appropriately approved after consulting the beneficiaries and project affected people	Partially applied for qualification	SP areas in environmentally sensitive areas have been taken into consideration
The SP shall be socially sound and require no or minimal displacement of people and land acquisition, and not involving sensitive areas	Not applied	Detailed study should be examined at the stage of PRA
Enrollment of 70 % of the direct beneficiary households as member of the WMA.	Not applied	Detailed study should be examined at the stage of PRA – WMA formulation
Recurrent cost of subproject O&M shall be covered by beneficiaries through formulated WMA	Not applied	Detailed study should be examined at the stage of PRA – WMA formulation

b) Scoring Method of Qualified Subprojects

Scoring of subprojects was done by applying *Analytical Hierarchy Process* (AHP) method, which is a tool for decision making with various parameters (multi-criteria analysis). During the last three decades, especially when the social or administrative and environmental or hydrological impacts have been emphasized in decision making process, traditional methodologies such as Cost-Benefit Analysis (CBA) or Cost-Utility Analysis (CUA) have been gradually replaced or complemented by

Multi-Criteria Decision Methods (MCDM), with prominence for AHP. The main concept is to examine relative importance of various factors for decision-making using a matrix chart called a "decision-tree". Comparison of importance is examined by hierarchy by examining relations of two items and then integrating the relations into one matrix.

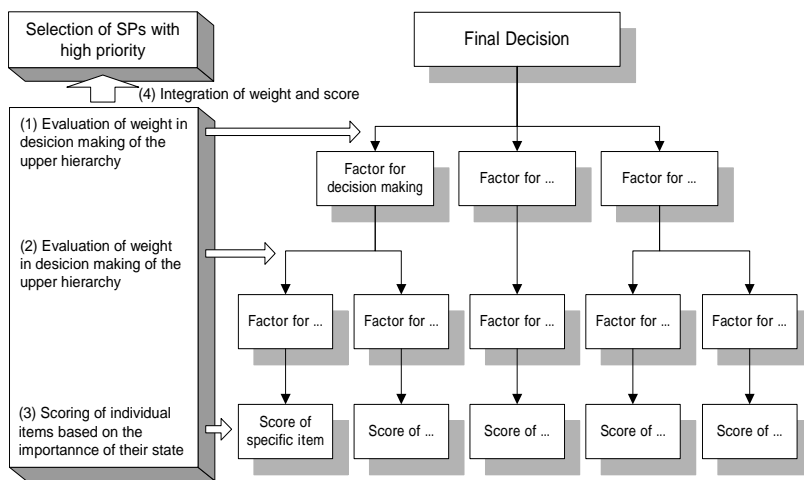
Relative importance of items/decision factor called “natural states” regarded for categorization of SPs was considered and weights for scoring of these items were examined. The main procedure consists of four steps.

- Examining weight of importance of each category
- Examining weight of importance of each item in the same category
- Scoring of individual items in consideration of each state
- Integration of individual scores and weight to prioritize potential subprojects

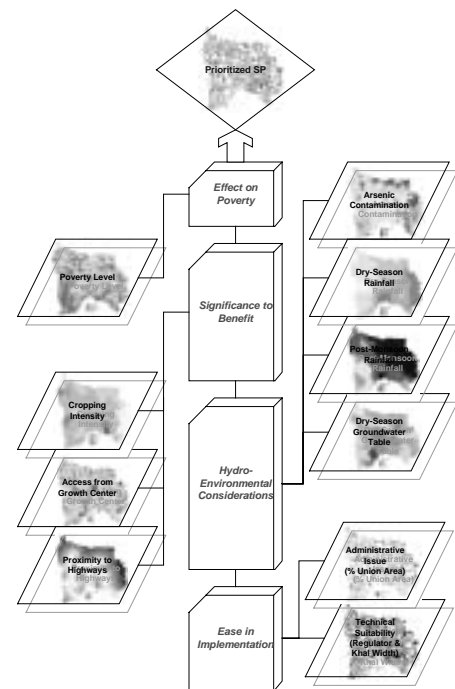
In scoring individual items, a pair-wise comparison matrix is formed reflecting relative importance of the items based on a nine-point Relative Importance Scale as shown in the right table.

Pair wise Comparison Scale

Relative Preference / Importance	Numerical Rating
Extremely preferred/important	9
Very strong to extremely	8
Very strongly preferred/important	7
Strongly to very strongly	6
Strongly preferred/important	5
Moderate to strongly	4
Moderately preferred/important	3
Equally to Moderately	2
Equally preferred/important	1



Process of Subprojects Prioritization



AHP Data Layers

c) Criteria for Scoring

Among implementation, the basic requirements for SSWRD subprojects will be covered by applying the selection criteria of SSWRDSP-2. In this regard, scoring for prioritization of potential subprojects shall concentrate on selecting subprojects that may have more positive effect than the others. The items for considering the scoring of the subprojects are: 1) Effect on Poverty by the Subproject (applicable to all types of subprojects), 2) Significance of Benefit, 3) Hydrological and Environmental Considerations, and 4) Easiness in Implementation of the Subproject and O&M by Local Beneficiaries.

d) Weighting of Scoring Criteria

The basic idea of calculating evaluation weight of categories/items and scoring of individual items are shown in the table below. Importance of each factor is calculated so that the total of each category / item will sum up to a total of one (1). The method and weight of each criterion for prioritization are indicated in the following table.

In applying the AHP method, overlaying subproject with various data collected, updated and developed by the study team and converted them to buffers and grids, has been carried out under GIS environment. The figure on the right gives an image of the GIS data layers used in prioritization.

Sensitivity Analysis has been carried out to check the effect of weight of particular criteria on overall scores of the sup-projects. This eliminates skewness in sup-project priority such that a single criterion doesn't play a sharp role in overall priority and smoothes out the effect of different criteria. Through such sensitivity analysis, the final weights of the criteria have been decided. The table in the next page shows the final criteria and weight.

Weight of Multi-Level Criteria for Subproject Prioritization

Primary Criteria (Level 1)	Weight	Secondary-Criteria (Level 2)	Weight	Tertiary Criteria (Level 3)	Weight
Effect on Poverty by the Subproject (Applicable to all types of SPs)	0.61*	Very High Poverty Area	0.59	-	-
		High Poverty Area	0.22	-	-
		Moderate Poverty Area	0.12	-	-
		Low Poverty Area	0.07	-	-
Significance of Benefit (applicable to all types of SPs)	0.13*	Cropping Intensity	0.75	Low having Inundation Land Type F3 & F4	0.76
				Medium having Inundation Land Type F2	0.16
				High having Inundation Land Type F0 & F1	0.08
		Access to and from Growth Center	0.18	Easy	0.68
				Moderate	0.22
				Difficult	0.10
		Proximity to National and Regional Highways	0.07	Close	0.68
				Moderate	0.22
Far	0.10				
Hydrological and Environmental Considerations (depends on types of SP)	0.10*	Arsenic Contamination (applicable to WC type only)	0.64*	High Contaminated Area	0.69
				Medium Contaminated Area	0.23
				Low Contaminated Area	0.08
		Dry Season Rainfall: Nov. ~ Mar. (applicable to WC type only)	0.14*	Low Rainfall	0.65
				Moderate Rainfall	0.23
				High Rainfall	0.12
		Post-Monsoon Rainfall: Sep. ~ Oct. (applicable to DI type only)	0.14*	High Rainfall	0.65
				Moderate Rainfall	0.23
				Low Rainfall	0.12
		Dry Season Ground Water Table: Nov. ~ Mar. (applicable to WC/ CAD type only)	0.08*	Deep Groundwater Table	0.65
Medium Groundwater Table	0.23				
Shallow Groundwater Table	0.12				
Easiness in Implementation of the SP and O&M by Local Beneficiaries in the SP Area (applicable to all types of SPs)	0.16*	Administrative Issue	0.75	Single Union	0.83
				Multiple Unions	0.17
		Technical Suitability	0.25	Structures are of adequate scale	0.90
				Structures exceed adequate scale	0.10

* Different weight applied depending on type of SPs. For detailed figure, refer to Annex-7.

2) Prioritization of Potential Subprojects

a) Screening of D Category Subprojects

Screening of Category D subprojects were done based on the costs of individual subprojects estimated from their components. In the District, out of the 35 qualified subprojects, 4 subprojects were determined to have costs exceeding US\$500/ha (US\$1,000/ha for CAD type subprojects). In addition to this, one CAD type subproject was screened into category D in regard that necessity of low-lift pumps should be further examined. In total, 146 subprojects were screened into Category D. The numbers of such subprojects by district are indicated below.

Screening of Category D Subprojects

District	Number of qualified subprojects	Number of category D subprojects	Number of category A- C subprojects	Gross area of category A-C subprojects (ha)	Average gross area of category A-C subprojects (ha)	Total area in the District (ha)	% of gross area of category A-C subprojects within the District
Sherpur	35	4	31	18,864	608.5	136,400	13.8
Study Area Total	496	146	350	200,942	574.1	1,667,200	12.1

Type-wise Number of Category D Subprojects

	FM	DI	CAD	WC	FMDI	FMWC	DIWC	FMDI & WC	District Total
Sherpur	1	0	0	3	0	0	0	0	4
Study Area Total by type	32	3	2	22	25	7	32	23	146

b) Prioritization of Qualified Subprojects

After screening of Category D subprojects, each of the remaining subprojects are marked with a score indicating its relative importance in the light of the set criteria. The scores varied from 0.18 to 0.98 with the average of 0.45. However, it should be noted that because of the characteristics of the AHP method, the scores do not indicate the value of actual importance of the subprojects, but represent relative importance between the subprojects.

Prioritization of the scored subprojects was done upazila-wise in regard of the capacity of the Upazila Engineer office in implementation. One subproject with the highest score was selected in each upazila for implementation under the short-term activities of the Master Plan. Such subprojects were categorized as Priority A. Furthermore, some 30% were selected from the remaining 26 subprojects for categorization in Priority B. This counted up to 8 subprojects. Finally, the remaining 18 subprojects were categorized into Priority C, which will be implemented under the long-term activities of the Master Plan. The prioritized subprojects have been checked upazila-wise and then district-wise so that implementations of the prioritized subprojects become distributed among the upazilas and districts. Lists of prioritized subproject in each district are shown in Table 4.2. The following table summarizes the number of subprojects in each category. The distribution of prioritized subprojects is indicated in Fig. 4.3.

Prioritized Verified Potential Subprojects by Type

District	Category	FM	DI	CAD	WC	FMDI	FMWC	DIWC	FMDI & WC	Total	BWDB related
Sherpur District	Category A	1	1	0	0	0	1	2	0	5	2
	Category B	3	2	0	2	1	0	0	0	8	2
	Category C	3	8	0	1	0	0	6	0	18	5
	Category D	1	0	0	3	0	0	0	0	4	2
	Total	8	11	0	6	1	1	8	0	35	11
Study Area Total	Category A	15	13	0	4	6	2	11	7	58	17
	Category B	13	21	0	15	15	2	24	9	99	21
	Category C	21	52	0	11	24	10	51	24	193	63
	Category D	32	3	2	22	25	7	32	23	146	35
	Total	81	89	2	52	70	21	115	59	496	136

Chapter 5 Master Plan on Small Scale Water Resources Development

5.1 Basic Concepts of Small Scale Water Resources Development Plan

(1) Objectives

The National Water Policy (NWPo) has been formulated to provide direction to all agencies working with the water sector, and institutions that relate to the water sector, for achievement of specified objectives. Under this policy, the sector agencies of Government and local bodies will prepare sub-regional and local water-management plans and approved Government project appraisal guidelines. In regard of the above, the Master Plan of District Water Resources Development has been started by LGED including the Study covering 6 districts in Greater Mymensingh as one of the pioneers. The overall goal of the Study is to secure safe and sustainable water resources management and to increase farmers' income. The Master Plan is prepared comprising of strategies, prioritized subproject list, priority programs, and the scope for the follow-on investment project which include effective use of surface water.

(2) Basic Concepts of the Small Scale Water Resources Development

Integrated Rural Development: Improvement plan of agriculture, livestock, and fisheries including extension credit, system, post harvesting, marketing, etc., shall be conducted in the subprojects.

Water Resources Development complying with NWPo and NWMP: The Master Plan prepared through this Study should be positioned under the NWPo and NWMP, and must be in line with the contents of the policy.

Flood-proofing in Small Scale Water Resources Development: Human life shall be protected from all the conceivable floods. In reality, complete flood-proof conditions cannot be realized, and flood-proofing would be improved only in steps both in areal extent and increase level of protection.

Participatory Development Process: At all stages of the subproject, local stakeholders shall be involved or participated in order to formulate the ownership of the subproject.

Income Generation for Weak through the Project Implementation: Specific measures shall be taken to ensure the poor, marginal/small farmers and destitute women benefit from the subprojects.

Institutional Strengthening: Small scale water resources development is implemented in the rural area, and Union and Upazila level officials shall act as the enabler. But considering the present conditions, they need capacity building for implementation.

5.2 Small Scale Water Resources Development Plan

(1) Target Year and Phasing of the Implementation

The target year of these plans, the target year of the Master Plan shall be the year of 2015. And the target year of the Master Plan is set in the following three stages;

- Short Term: by 2007 to implement 5 Priority A subprojects
- Mid Term: by 2010 to implement 8 Priority B subprojects
- Long Term: by 2015 to complete 18 Priority C subprojects

(2) Strategy of Small Scale Water Resources Development Plan

Basically the implementation of Master Plan will follow the on the line of SSWRDSP-2 after modification of its procedures.

Upazilas in the Study Area is categorized into five (5) zones; 1) highland, 2) medium highland, 3) Medium lowland, 4) lowland, and 5) very lowland. Strategies for the small scale water resources development of each zone shall be set as follows:

Highland: The Madhupur Tract area is a typical area of the highland zone. Strategy of SSWRD shall

be based on water retentions of the monsoon flood water and rainfall for irrigation during the dry season. The development potential of the pond at the depression of the hill shall be examined.

Medium highland: The medium highland spreads outside of the highland zone in the old Brahmaputra flood plain. Strategy of the SSWRD of the zone shall be based on flood management to reduce damage of *aman* at the beginning of flood season and to drain submerged water for the early re-trans planting *aman* paddy.

Medium lowland: The medium lowland spread outside of the lowland and the young Brahmaputra and Jamuna rivers. The strategy of SSWRD shall be based on flood management to delay the submergence of grown *aman*, and drainage after flooding. Embankment height will be reasonably set.

Lowland: The lowland with inundation depth between 180 and 300 cm spread outside of the Haor area. Because of the inundation depth, flood proofing in this zone is rather difficult without major river flood management, and strategy of SSWRD shall be concentrated mainly on drainage after flood season.

Very lowland: The very lowland zone is the *Haor* area of the old Meghna estuarine flood plain. The strategy of the small scale water resources development shall be mainly concentrated to the drainage acceleration before *boro* cultivation and flood management of early flood.

Char Land: In this Plan, SSWRD in char area will be implemented at prioritized subprojects at the stable char land, effects of the erosion have not been observed for 20 years or longer, in the District.

Paurshavas: In this Master Plan Study, paurshavas areas are excluded from the Study Area.

(3) Upazila-wise hydrological condition and Development Strategy of SSWRD

1) Jhenaigati

The Upazila locates on the foot of Megalay Hill at the elevation more than 30 m mswl. Hydrologically the Upazila belongs to the North East Hydrological Region. Main rivers are the Shomeshwari, Maharashi and Subarnakhali rivers, and they are originated from Megalay Hill of India and flows eastward to the haor area. The annual average rainfall at BWDB Nalitabari station, the nearest station, is recorded at 2,668 mm of which 67 % of rainfall concentrates in monsoon season.

Most area of the Upazila spread on the hill land, consisting of medium highland of North-western Plains and Basins, and Northern and Eastern Hills.

The strategy of SSWRD in the medium highland will be the flood management to reduce the damage of planted paddy in the pre-monsoon season and drainage improvement at post monsoon season to accelerate transplanting Aman or Boro paddy. The Upazila spreads on the foot of Indian hills, so that the flash flood management shall be carefully considered for the SSWRD. On the other hand, there is potential to store the water in the river channel by the rubber dam for the irrigation where the river has deep channel.

2) Nakla

The Upazila mostly locates in the Old Brahmaputra floodplain, southern area is on the old char lands. There is no large river except the Old Brahmaputra Rivers, there are 10 major beels in the Upazila, of which the most noted is Mehedidanga Beel. The annual average rainfall at BWDB Sherpur Town station, the nearest station, is recorded at 2,258 mm of which 69 % of rainfall concentrates in monsoon season. The land in the Upazila is at the elevation between 15 m to 20 m-PWD.

Most part of the Upazila classified as highland or medium highland of Old Brahmaputra Floodplains. The strategy of SSWRD in the Upazila is as same as Jhenaigati Upazila.

3) Nalitabari

The Upazila locates on the foot of the Indian Hills. Heavy rain on the Indian Hill brings the flash flood to the Upazila. Main rivers are the Kangsa, Marisi, Thalang and Bhugai rivers. The annual average rainfall at BWDB Nalitabari station is recorded at 2,668 mm of which 67 % of rainfall concentrates in monsoon season. The land in the Upazila is at the elevation between 20 m to 100 m-PWD.

Most part of the Upazila is classified as medium highland of North-western Plains and Basins.

The strategy of SSWRD in the medium highland will be, as same as Jhenaigati Upazila, the flood management of monsoon and flash floods to reduce the damage of planted paddy in the pre-monsoon season and drainage improvement at post monsoon season to accelerate transplanting Aman or Boro paddy.

4) Sherpur Sadar

The Upazila locates on the floodplain and river terrace of the Old Brahmaputra River. Main rivers are the Old Brahmaputra, Mrigi and Dashani rivers, noted beels are; Kodaljhara; Aurabaura, Nishla, Dhala, Isli, Mausi beels. The annual average rainfall at BWDB Sherpur Town station is recorded at 2,258 mm of which 70 % of rainfall concentrates in monsoon season. The land in the Upazila is at the elevation between 15 m to 20 m-PWD.

Most part of the Upazila classified as highland (45%) and medium highland (30%) of Old Brahmaputra Floodplain. The strategy of SSWRD in the medium highland and highland is as same as Nakla Upazila.

5) Sreebardi

The Upazila locates on the foot of the Indian Hills. Heavy rain on the Indian Hill brings the flash flood with sand and silt to the Upazila. Main rivers are the Someshyvari and Katakhal rivers. Other notable water bodies are; Khalisakuri Beel, Tenachura and Puragarh Canals. The annual average rainfall at BWDB Sherpur Town station, the nearest station, is recorded at 2,258 mm of which 70 % of rainfall concentrates in monsoon season. The land in the Upazila is at the elevation between 15 m to 90 m-PWD.

The Upazila is classified as highland and medium highland of Old Brahmaputra Floodplain, North-western Plains and Basins or Northern and Eastern Hills. The strategy of SSWRD in the medium highland and highland will be as same as Jhenaigati Upazila.

5.3 Relevant Sectors' Development Strategies and Plan

(1) SSWRDP and Other Relevant Sector Development Plans

As the nature of SSWRD other sector activities can not involve in the project like those in integrated rural development. It is considered that beneficiary sector activities will be implemented by the other financial resources. However, beneficiary sector development shall be implemented together with small scale water resources development in order to achieve the targets of the Master Plan.

(2) Agricultural Development

- Improve human nutrition by diversified agriculture
- Focus on profitable farming through higher productivity
- Upgrade of general agricultural technology–Technical packages other than water management will not be obstacle to agricultural production
- Collaborate with other agricultural projects
- Develop Value Added Agriculture
- Develop community-based activities to fulfill basic regional needs for the rural human security
- Develop wide-area based water management: Ex. Multiple function of paddy fields
- Human Resources Development

(2) Fishery Development

- Encouragement of integrated fish culture
- Introduction of tilapia culture
- Introduction of freshwater prawn culture
- Introduction of freshwater ornamental fish culture
- Conservation of indigenous/natural fish in Beel, Khal, River and Haor
- Propagation of indigenous/natural fish by fish culture

(3) Livestock Development

- Stability of feed supply
- Development of animal health
- Processing/ slaughtering of animals

(4) Suggestions to Future Development in Agriculture and Livestock

- Rice Terrace Cultivation in. Haor Area
- Rural Industrial Complex
- Development of vaccination system in rural areas.
- Efficient Irrigation Technology in Highland Area.
- Small Scale Mechanization
- Field Training for Seed Production and Processing for Farmers Own Use.
- Development of Rural Recycling in Farming System
- Integrated forestry-livestock farming
- Development of market information system for fish and fresh vegetables
- Human Resources Development

5.4 Priority Programs

In order to implement the SSWRD Project smoothly and assure the expected effects, the priority programs will be conducted in parallel with the SSWRD subproject implementation.

(1) Collaboration and Coordination among Stakeholders

Collaboration works with relevant government agencies are strongly expected to the implementation of SSWRD Project. National, district and Upazila level government agencies coordination committees should be maintained to achieve multiplication effects of the Project.

(2) Strengthening of Local Government Engineering Department

In order to support the smoother implementation of daily works of the Project at District and Upazila Level, their office equipment and facilities will be improved. This includes transportation vehicles, computer and peripherals/software, photocopy machines, etc.

(3) Capacity Building of the Local Government Level Technical Officials

There are not enough water resources development planners/engineers in LGED, especially at district and upazila level. Technical training program shall be considered to strengthen the capacity of local government officials of LGED for planning and implementation of SSWRD.

(4) Water Management Associations

In order to maintain the sustainability of SSWRDP sub-projects, capacity building of WMA members is indispensable. In parallel with training of WMA members, national level federation of WMAs will be formulated to exchange experiences and information among individual WMAs.

(5) GIS and IT

At present, the GIS coordination system between WARPO and LGED is deferent. Standardization is required for exchanging information of GIS. Inventory of water bodies and existing projects under the NWRD is no completed yet. It needs to formulate nation wide inventory survey of water resources among stakeholders under the coordination of WARPO.

5.5 Implementation Plan (Action Plan)

(1) Project Implementation

The Project aims to achieve the sustainable agriculture and improve the farmers' living conditions through increase of agricultural production and resources mobilization in the Project Area. The Project consists of two major components; 1) SSWRD Subprojects and 2) Priority programs. Considering the similarity of interventions, implementation arrangement of SSWRDSP-2 will be applied for the Project with improvement, if appropriate. The Project is basically assumed to be implemented by the Bangladesh Government budget with external financial support. The LGED will be the executing agency of the Project.

(2) Executing Agencies

The project management office (PMO) will be established at LGED headquarters. The major functions of the PMO are: i) coordination of agencies concerned, ii) preparation of overall implementation plan, annual project work plans and budget, iii) review and approve subproject appraisals, iv) review and approve designs, v) supervise LGED district offices in preparing tender documents, evaluating bids, and awarding contracts, vi) maintain financial accounts, vii) prepare periodic reports on implementation progress and viii) monitor project progress and evaluate environmental impact. PMO will procure the consultants to support the PMO on the technical aspects and institutional strengthening.

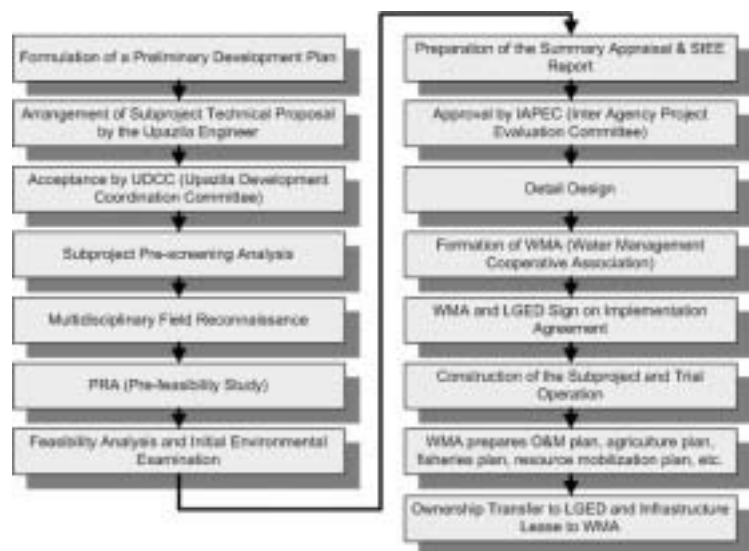
Under close guidance and supervision of the PMO, LGED district offices will be responsible for the day-to-day implementation at the subproject level with assistance from the upazila offices. The LGED district Executive Engineer will act as Subproject Manager and 1) prepare individual subproject implementation with stakeholder participation, 2) coordinate with other agencies and organizations, 3) support organization of WMAs, 4) carry out field surveys, 5) supervise construction activities and make payments to contractors, and 6) monitor and report subproject development to the PMO.

At National Level, Inter-ministerial Coordination Committee (IMCC) shall coordinate the agencies for smooth implementation of the Project. District-level Small-scale Water Resources Development Committees (DSSWRDCS) will meet when required to coordinate the activities of the district level Government agencies. MOLGRDC will issue an order requiring the Upazila Development Coordination Committee (UDCC), composed of the union chairpersons and upazila-level officials, to put the review of subproject progress on the agenda of all its regular meetings. LGED district offices will maintain close coordination with BWDB through the Inter-Agency Project Evaluation Committee to ensure that proposed subprojects do not conflict with planned or existing BWDB projects.

(3) Implementation Plan

Identification and appraisal process for an individual sub-project on SSWRDSP-2 set by the LGED are as indicated in the diagram.

The high priority subprojects, after prioritization, are not equally distributed to each district and upazila. Some Upazila concentrate many high priority subprojects and only few high priority subprojects in some upazila. If subproject selected to implement from higher priority, some upazila has no subproject and some upazila concentrate more than 3 subprojects. To avoid these cases, SPs will be selected based on higher prioritized subprojects in the upazila.



Selection of subprojects in each phase, are set as follows:

Short term (2 years): select to start 5 Priority A subproject of each upazila
Medium term (3 years): select around 7 Priority B subproject of each upazila
Long term (5/4 years): select around 16 Priority C subproject of each upazila

Civil works of subproject will be contracted with local contractors under local competitive bidding (LCB) under the standard LGED procurement procedures. Small scale earthwork contracts with labour contracting societies (LCSs).

After completion of the subproject construction, WMA conduct O&M/management under guidance of Upazila engineer office for one year. After one year, O&M committee of WMA takes responsibility of subproject O&M. WMA bare the O&M expenses by collecting fees, based on the investment cost of subproject, from WMA members.

Implementation schedule of the whole Project component are indicated in the chart.

Phase	Short Term		Medium Term			Long Term					Total
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Small Scale Water Resources Development (No. of Subproject)											
Sherpur	2	3	2	2	3	4	4	4	4		28
Study Area Total	27	31	30	33	34	43	45	47	44	0	334
Monitoring & Evaluation by PMO											
Engineering Services											
Priority Programs											
Improvement & Capacity Building of Upazila Engineers Office											
Training of WMA Management Board Members											
GIS Database system improvement											
Collaboration works on the Stakeholders											

6. Further Activities Required at Upazila Level

Potential subprojects identified and prioritized through surveys under the Study are only at the initial stage of the whole procedure. Upazila LGED is required to take necessary measures to mature the technical proposals of these subprojects. In this process, emphasis should be put on potential subprojects with higher priority. At the actual proposal preparation stage, some of them will be selected and requested as subprojects for SSWRDSP-2 or BWDB projects.

6.1 Union Level

The potential subproject appeared through the discussion with UP members and representatives of villagers. It is necessary to discuss among the potential stakeholders at union level to confirm the needs and get the consensus among stakeholders to the potential subproject. It is recommended to conduct the PRA among stakeholders as the JICA Study team demonstrated in Noabad, Joyka nad Boulai Unions of Karimganj Upazila in the District. During the formulation of consensus of the potential subproject, technical assistance will be required from the upazila engineer's staff. The proposal will be discussed and authorized at UP meeting for submission to Upazila Engineer.

6.2 Upazila Level

After the approval of the prioritized potential subproject list, the upazila engineers are expected to start the technical support for the stakeholders' discussions/workshops in the union level for the preparation of the technical proposal to submit to District LGED executive engineers.

Table 1.1 Outline of National Water Policy (NWPo)

Issues	Description
<i>River Basin Management</i>	The government will work with co-riparian countries to establish a system for exchange of information and data on relevant aspects of hydrology, morphology, water pollution, ecology, changing watershed characteristics, cyclone, drought, flood warning, etc., and to help each other understand the current and emerging problems in the management of the shared water sources.
<i>Planning and Management of Water Resources</i>	<ul style="list-style-type: none"> WARPO will prepare, and periodically update, a NWMP addressing the overall resource management issues in each region and the whole of Bangladesh. Sector agencies of the government and local bodies will prepare and implement sub-regional and local water-management plans in conformance with the NWMP and approved government project appraisal guidelines. The Executive Committee of the National Water Resources Council (ECNWRC) will resolve any interagency conflict in this regard. BWDB will implement all major surface water development projects and other FCDI projects with command area above 1,000 hectares. The Local Government will implement FCDI projects having a command area of 1,000 hectares or less after identification and appraisal through an interagency Project Appraisal Committee. Any interagency dispute will be resolved by means prescribed by the government
<i>Water Rights and Allocation</i>	<ul style="list-style-type: none"> In general, the priority for allocating water during critical periods in the water shortage zones will be in the following order: domestic and municipal uses, non-consumptive uses (e.g. navigation, fisheries and wild-life), sustenance of the river regime, and other consumptive and non-consumptive uses such as irrigation, industry, environment, salinity management, and recreation. The above order of priority could however be changed on specific socio-economic criteria of an area by local bodies through local consensus. The government may empower the local government or any local body it deems fit, to exercise its right to allocate water in scarcity zones during periods of severe drought, and it will monitor the water regime and enforcement of the regulations through specifically designed mechanisms.
<i>Public and Private Involvement</i>	<ul style="list-style-type: none"> The management of public water schemes, barring municipal schemes, with command area up to 5,000 ha will be gradually made over to local and community organizations and their O&M will be financed through local resources. Public water schemes, barring municipal schemes, with command area of over 5,000 ha will be gradually placed under private management, through leasing, concession, or management contract under open competitive bidding procedures, or jointly managed by the project implementing agency along with local government and community organizations. Ownership of FCD and FCDI projects with command area of 1,000 ha or less will gradually be transferred to the local governments, beginning with the ones that are being satisfactorily managed and operated by the beneficiary/ community organizations.
<i>Public Water Investment</i>	<ul style="list-style-type: none"> Planning and feasibility studies of all projects will follow the Guidelines for Project Assessment (GPA), the Guidelines for People's Participation (GPP), the Guidelines for Environmental Impact Assessment (EIA), and all other instructions that may be issued from time to time by the government. Interests of low-income water users, and that of women, are adequately protected in water resource management.
<i>Water Supply and Sanitation</i>	<ul style="list-style-type: none"> Preserve natural depressions and water bodies in major urban areas for recharge of underground aquifers and rainwater management. Mandate local governments to create awareness among the people in checking water pollution and wastage.
<i>Water and Agriculture</i>	<ul style="list-style-type: none"> Improve efficiency of resource utilization through conjunctive use of all forms of surface water and groundwater for irrigation and urban water supply. Strengthen crop diversification programs for efficient water utilization.
<i>Water and Industry</i>	Standards of effluent disposal into common watercourses will be set by WARPO in consultation with DOE
<i>Water and Fisheries and Wildlife</i>	<ul style="list-style-type: none"> Water bodies like baors, haors, beels, roadside borrow pits, etc. will, as far as possible, be reserved for fish production and development. Perennial links of these water bodies with the rivers will also be properly maintained. Water development plans will not interrupt fish movement and will make adequate provisions in control structures for allowing fish migration and breeding.
<i>Water and Navigation</i>	<ul style="list-style-type: none"> Water development projects should cause minimal disruption to navigation and, where necessary, adequate mitigation measures should be taken. Minimum stream-flows in designated rivers and streams will be maintained for navigation after diversion of water for drinking and municipal purposes.
<i>Water for Hydropower and Recreation</i>	Recreational activities at or around water bodies will be allowed provided it is not damaging to the environment.
<i>Water for the Environment</i>	<ul style="list-style-type: none"> Give full consideration to environmental protection, restoration and enhancement measures consistent with the National Environmental Management Action Plan (NEMAP) and the NWMP. Adhere to a formal environmental impact assessment (EIA) process, as set out in EIA guidelines and manuals for water sector projects, in each water resources development project or rehabilitation program of size and scope specified by the Government from time to time. Protect against degradation and resuscitate natural water-bodies such as lakes, ponds, beels, khals, tanks, etc. affected by man-made interventions or other causes.
<i>Preservation of Haors, Baors, and Beels</i>	<ul style="list-style-type: none"> Haors that naturally dry up during the winter will be developed for dry season agriculture. Take up integrated projects in those water bodies for increasing fish production.
<i>Economic and Financial Management</i>	<ul style="list-style-type: none"> Water charges realized from beneficiaries for O&M in a project would be retained locally for the provision of services within that project. Effective beneficiary participation and commitment to pay for O&M will be realized at the project identification and planning stages by respective public agencies.
<i>Research and Information Management</i>	Develop a central database and management information system (MIS) consolidating information from various data collection and research agencies on the existing hydrological systems, supply and use of national water resources, water quality, and the eco-system.
<i>Stakeholder Participation</i>	<ul style="list-style-type: none"> The "Guidelines for People's Participation (GPP) in Water Development Projects" be adhered to as part of project planning by all institutions and agencies involved in public sector management of water resources. Guidelines for formation of water user groups (WUG) and similar community organizations will be formulated. Generally 25 % of the earthwork of any public water project will be offered to specific target groups or beneficiaries. New projects proposed by a community or local institution will be considered for implementation on a priority basis only when the beneficiaries have mobilized a certain percentage of the total cost as their contribution to the project.

Table 4.1 List of Proposed Subproject to SSWRDSP-2 in the District

Upazila	Union	No. of SP	Propose Subproject Name	Pre-screen	Reconnai ssance	PRA	Appraisal
Jhenaigati	Kangsha	1	Someshwari River Subproject	Passed	X		
Nakla	Chandrokona	1	Charbetmari-Hatimara Khal Subproject	Passed	X		
	Char Aushta Dhar	1	Burudobi, Narayankhola, Sutinadi Subproject	Passed	X		
	Nakla	1	Boleswar Khal Subproject	Passed	X		
	Talki	1	Kurshabeel-Talki Khal Subproject	Passed	Passed	X	
	Urfa	1	Urfa Kalinadi Subproject	Passed	X		
Nalitabari	Bagber	2	Bagber Subproject	?			
			Hushikhali Khal Subproject	Passed	Passed	Passed	Passed
	Jogania	1	Jogania Subproject	?			
	Kalaspar	2	Dudua Khal Subproject	Passed	Passed	?	
			Kalaspar Subproject	?			
	Marichpuran	3	Huchikhali Subproject	?			
			Bhogai River Rubber Dam CAD Subproject (RB)	Passed	Passed	?	
			Bhogai River Rubber Dam CAD Subproject (LB)	Passed	Passed	?	
	Nalitabari	1	Nalitabari Subproject	?			
	Nayabeel	2	Dudkura Khal Subproject	Passed	X		
Nayabeel Subproject			?				
Sherpur Sadar	Char Sherpur	1	Gowaldanga Beel to Mrigi Nadi Subproject	Passed	X		
	Kamarer Char	1	Katakhal Subproject	Passed	X		
	Pakuria	2	Gaowa Beel-Dorungi Beel Subproject	Passed	Passed	Passed	X
			Tilkandi-Chinabari Subproject	Passed	X		
4	15	21		15	6	2	1

Table 4.2 List of Prioritized Potential Subprojects in Sherpur District (1/2)

Upazila	Proposed Union	SP_ID	Title	Type	Gross Area (ha)	BWDB Project	Priority	Remarks
Jhenaigati	Malijhikanda	38937050	Dargar khal SP	DI	386	None	A	
	Dhansail	38937020	Kalgusha Khal SP	DI	887	None	C	
	Kangusa	38937010	Kalghosa Rubber Dam Project	WC	623	None	D	Further examination to be required
	Gauripur & Nalkura	38937041	Chowmohani - Amalchuri Khal, Ranjana Khal SP	DIWC	1,793	Embankment by BWDB.	L	Benefited area more than 1,000 ha
Jhenaigati & Sherpur Sadar	Hatibandha & Jhenaigati Sadar & Malijhikanda & Gazirkhamar	38937032	Malishi Nadi Khal (Dargarpar STW - Tinani Bazar), Someswari Khal (Dholi Beel - Paglamukh Bazar), Dheki Beel - Khailla Beel, Buriar Beel - Charalla Beel - Kalash Beel SP	DI	3,082	Embankment by BWDB	L	Benefited area more than 1,000 ha
Nakla	Chandrakona	38967080	Mehedidanga Beel SP	DIWC	445	Janokipur Khal Regulator.	A	
	Baneswardi	38967051	Muzarkanda - Aria Kanda Eidgah Embankment SP	FM	53	None	B	
	Char Ashtadhar	38967100	Debuarchar Embankment SP	FM	798	None	B	
	Baneswardi	38967052	Kobutormari - Garapaddi Rampur Road Junction Embankment SP	FM	85	None	C	
	Talki	38967060	Kursa Beel - Kharia Beel SP	DIWC	799	None	C	
	Talki	38967070	Rangarkuri Beel - Kursa Beel SP	DIWC	578	None	C	
	Pathakata	38967090	Burodubi Beel - Godadanga Beel SP	DIWC	861	None	C	
	Ganapaddi & Gouardhar & Nakla & Urpha	38967010	Biharipar Beel - Pekua Beel, Badager Beel - Amankuri Beel - Chikrai Beel, Shubarnokhali Khal SP	DIWC	4,318	None	L	Benefited area more than 1,000 ha
Nalitabari	Nalitabari	38970070	Aliakhali - Shoalmari Embankment SP	FMWC	915	None	A	
	Jogania	38970110	Kapasia SP	WC	538	None	B	
	Kakarkandi	38970080	Kakardi Bazar Bridge - Sutia Nadi SP	WC	877	Khal by BWDB but silted up.	B	
	Jogania	38970101	Sutarbari Khal - Harikhali Khal SP	WC	670	None	C	
	Ramchandrakura Mondaliapara	38970040	Fulpur (village under the UP) - Mondoliapara Embankment SP	FM	146	None	C	
	Baghber	38970060	Jingira Khal - Dudua Khal Embankment SP	DIWC	459	Chilla Khali System Rehabilitation Project	C	
	Rupnarayanкура	38970090	Moragang Khal SP	DI	773	None	C	
	Marichpuran	38970120	HosiKhali Khal SP	DIWC	652	None	C	
	Poragaon	38970010	Chellakhali River (Barkuchi Gudaraghat - Batkuch Namapara Jhararpar) Embankment SP	FM	157	Embankment by BWDB	D	Further examination to be required
	Nunni	38970020	Batkuchi Bazar - Nunni Uttarban - Chellakhali River SP	WC	163	Embankment by BWDB	D	Further examination to be required
	Nayabil	38970030	Dudhkura Khal - Dalukona - Katabari Khal SP	WC	1,314	Chilla Khali System Rehabilitation Project	L	Benefited area more than 1,000 ha
	Kalaspur & Rajnagar	38970051	Shrutkhali Khal (Sagardi - Malijhee River), Srutkhali (Amlatali - Sagardi) SP	DIWC	1,779	Chilla Khali System Rehabilitation Project	L	Benefited area more than 1,000 ha

Table 4.2 List of Prioritized Potential Subprojects in Sherpur District (2/2)

Upazila	Proposed Union	SP_ID	Title	Type	Gross Area (ha)	BWDB Project	Priority	Remarks
Sherpur Sadar	Char Mucharia	38988070	Kamarchar Bazar - Tankasar SP	FM	850	Embankment by BWDB	A	
	Char Pakhimari	38988090	Char Mucharia - Dakpara Guchhagram Embankment SP	FM	947	Embankment by BWDB.	B	
	Baliar Char	38988100	Paikartala - Kurmer Char Adarsa Gram Embankment SP	FMDI	778	None	B	
	Char Pakhimari	38988160	Satpakia beel-Das Ani river SP	DI	546	None	B	
	Kamarer Char	38988010	Dhandibidhi-Katakhal SP	DI	888	Brahmaputra River Left Bank Embankment Project	C	
	Char Sherpur	38988020	Goaldanga-Kaladanga SP	DIWC	764	Mrigi River System	C	
	Dhala	38988060	Singa Beel - Dhala Beel - Biri Beel SP	DI	817	None	C	
	Betmani Ghugrakandi	38988110	Gomaitala Beel - Shobhoner Char Beel SP	DI	207	Embankment by BWDB	C	
	Bhatsala	38988120	Mrigi River (Chhankanda Eidgah - Kotorakanda) SP	DI	781	None	C	
	Betmani Ghugrakandi	38988130	Agrakhali Beel SP	DI	393	Embankment by BWDB	C	
	Kamaria	38988140	Roshekura Beel - Chaira Beel - Chinikari Beel SP	DI	320	None	C	
	Rauha	38988150	Char Ranjagannath - Charkhawa Char Embankment SP	FM	340	None	C	
	Bajitkhila & Pakuria	38988030	Igli Beel - Fulya Beel - Aurabaura Beel, Gaoya Beel-Dorungi Beel SP	DIWC	2,442	None	L	Benefited area more than 1,000 ha
	Lasmanpur	38988080	Dhopaghata Bridge - Lasmanpur Ferry Ghat Embankment SP	FM	1,922	None	L	Benefited area more than 1,000 ha
Gazirkhamar	38988040	Please Refer to SP38937032 of Jhenaigati/Sherpur						
Sreebordi	Bhelua	38990040	Ruparpara to Fulkarchar Khal SP	DIWC	466	None	A	
	Sreebordi	38990030	Chatla Beel, Buchadaha Beel and Boysa Beel Khal SP	DI	845	None	B	
	Singa Baruna	38990010	Karnajhara Rubber Dam SP	WC	757	None	D	Further examination to be required
	Gosajpur & Kakilakura & Kharia Kazirchar & Tantihati	38990022	Uttar Shatkakra to Kholishakuri Beel Khal, Bhurkura Beel to Teengharipara Khal, Boysa Beel to Kazirchar Khal, Majli Khal SP	DIWC	4,126	BWDB Khal	L	Benefited area more than 1,000 ha
	Garjaripa & Kurikahania	38990051	Kudamoni Bridge - Kalidasagar Beel - Kathal khali Khal SP	DIWC	1,213	BWDB Khal	L	Benefited area more than 1,000 ha

Table 5.1 Potential Subprojects for SSWRDP in Sherpur District (1/3)

SR. No.	Upazila	Proposed union	Priority	SP_ID	Title	Type	Gross Area (ha)	Expected Work Volume		BWDB Project	Investment Cost (Tk. '000)
								Earthworks	Structure		
1	Jhenaigati	Malijhikanda	A	38937050	Dargar khal SP	DI	386	Re-excavation of Dargar khal from East Baniarpar Dargar khal- Hashlibatia. L=1 km, W=15 m, D=3m.	1 Regulator	None	5,595
2	Nakla	Chandrakona	A	38967080	Mehedidanga Beel SP	DIWC	445	Re-excavation of Mehendidanga Khal: L= 4.5 km, W=7.5m, D=2 m	The existing regulator constructed by BWDB is now inoperative. Reconstruction of One regulator at Jankipur (Chandrakona)	Janokipur Khal Regulator.	5,879
3	Nalitabari	Nalitabari	A	38970070	Aliakhali - Shoalmari Embankment SP	FMWC	915	Re-excavation of Alia Khali Khal: L=2.75km, W=12m, D=1.5m Re-excavation of Showlmary Khal: L=3.75km, W=12m, D=1.5m Re-habilitation and hightening of embankment: L=5km, W=4.2m, H=2.4m.	None	None	7,859
4	Sherpur Sadar	Char Mucharia	A	38988070	Kamarchar Bazar - Tankasar SP	FM	850	Rehabilitation of embankment: L=2km, W=9.6m, H=3.6m	None	Embankment by BWDB	16,240
5	Sreebordi	Bhelua	A	38990040	Ruparpara to Fulkarchar Khal SP	DIWC	466	Re-excavation of Ruparpara to Fulkarchar Khal (L=4km, W=15m, D=3m)	1 WRS 1).	None	11,179
6	Nakla	Baneswardi	B	38967051	Muzarkanda - Aria Kanda Eidgah Embankment SP	FM	53	Rehabilitation New construction of Embankment (Muzarkanda - Aria Kanda - Endgah): L=2km, W=10.8m, H=2.4m	None	None	518
7	Nakla	Char Ashtadhar	B	38967100	Debuarchar Embankment SP	FM	798	Rehabilitation of embankment: L=1.5km, W=4.2m, H=2.4m, and New construction of embankment: L=5km, W=4.2m, H=3m	None	None	18,777
8	Nalitabari	Kakarkandi	B	38970080	Kakardi Bazar Bridge - Sutia Nadi SP	WC	877	Re-excavation of Khal: L=5km, W=15m, D=3m	One regulator at Kalapagla	Khal by BWDB but silted up.	15,774
9	Nalitabari	Jogania	B	38970110	Kapasias SP	WC	538	None	One regulator at Aria	None	7,200
10	Sherpur Sadar	Char Pakhimari	B	38988090	Char Mucharia - Dakpara Guchhagram Embankment SP	FM	947	Rehabilitation of embankment: L=10km, W=9m, H=2.4m	None	Embankment by BWDB.	25,694
11	Sherpur Sadar	Ballar Char	B	38988100	Paikartala - Kurmer Char Adarsa Gram Embankment SP	FMDI	778	Re-excavation of Khal: L=3.5km, W=6m, D=1.8m New construction of embankment: L=6km, W=10.8m, H=1.8m	None	None	19,170
12	Sherpur Sadar	Char Pakhimari	B	38988160	Satpakia beel-Das Ani river SP	DI	546	Excavation of Satpakia beel-Das Ani river -via Das Ani Khal: L=2km, W=6m, D=1.5m	None	None	7,555
13	Sreebordi	Sreebordi	B	38990030	Chatla Beel, Buchadaha Beel and Boysa Beel Khal SP	DI	845	Re-excavation of Khal (L=3km, W=4.5m, D=1.5m)	None	None	639

Table 5.1 Potential Subprojects for SSWRDP in Sherpur District (2/3)

SR. No.	Upazila	Proposed union	Priority	SP_ID	Title	Type	Gross Area (ha)	Expected Work Volume		BWDB Project	Investment Cost (Tk. '000)
								Earthworks	Structure		
14	Jhenaigati	Dhansail	C	38937020	Kalgusha Khal SP	DI	887	Re-excavation of Kalgusha Khal: L=5.5km, W=15m, D=3.6m	None	None	16,803
15	Nakla	Baneswardi	C	38967052	Kobutormari - Garapaddi Rampur Road Junction Embankment SP	FM	85	Rehabilitation and new construction of embankment (Kobutormari - Garapaddi Rampur Road Junction): L=3km, W=10.8m, H=2.4m	None	None	777
16	Nakla	Talki	C	38967060	Kursa Beel - Kharia Beel SP	DIWC	799	Re-excavation of khal (Kursa - Khaira): L=7km, W=10.5m, D=1.8m	1 regulator at Miskipara bridge.	None	10,304
17	Nakla	Talki	C	38967070	Rangarkuri Beel - Kursa Beel SP	DIWC	578	Re-excavation of khal (Ranger Kuri - Bara): L=2.5 km, W=7.5m, D=1.5m	None	None	7,822
18	Nakla	Pathakata	C	38967090	Burodubi Beel - Godadanga Beel SP	DIWC	861	Re-excavation of Khal: L=4km, W=9m, D=2.4m	1 regulator at Kajaikata bridge.	None	12,437
19	Nalitabari	Ramchandrankura Mondaliapara	C	38970040	Fulpur (village under the UP) - Mondoliapara Embankment SP	FM	146	Rehabilitation of embankment: L=5km, W=4.2m, H=2.1m	None	None	1,983
20	Nalitabari	Baghber	C	38970060	Jingira Khal - Dudua Khal Embankment SP	DIWC	459	Re-excavation of Jingira Khal: L=4.5km, W=9m, D=1.5m, and New construction of Simultala-Kalinagar embankment: L=3.5km, W=2.5km, H=1.5m	One regulator at Kalinagar	Chilla Khali System Rehabilitation Project	11,127
21	Nalitabari	Rupnarayankura	C	38970090	Moragang Khal SP	DI	773	Re-excavation of Moragang Khal: L=5km, W=15m, D=2.4	None	None	11,520
22	Nalitabari	Jogania	C	38970101	Sutarbari Khal - Harikhali Khal SP	WC	670	Re-excavation of Harikhali Khal: L=3km, W=7.5m, D=1.5m, and Re-excavation of Sutiari Khal: L=2.5km, W=7.5m, D=1.5m	None	None	8,568
23	Nalitabari	Marichpuran	C	38970120	Hosikhali Khal SP	DIWC	652	Re-excavation of Hosikhali Khal: L=6km, W=12m, D=1.8m	One regulator at Rajmotkhali	None	10,372
24	Sherpur Sadar	Kamarer Char	C	38988010	Dhandibidhi-Katakhal SP	DI	888	Re-excavation of Khal: L=6.5 km, W=9m, D=3 m	None	Brahmaputra River Left Bank Embankment Project	13,571
25	Sherpur Sadar	Char Sherpur	C	38988020	Goaldanga-Kaladanga SP	DIWC	764	Re-excavation of Khal: L=4.5km, W=7.6m, D=1.5m	None	Mrigi River System	1,140
26	Sherpur Sadar	Dhala	C	38988060	Singa Beel - Dhala Beel - Biri Beel SP	DI	817	Re-excavation of khal: L=7km, W=6m, D=2.4m	None	None	1,273
27	Sherpur Sadar	Betmani Ghugrakandi	C	38988110	Gomaitala Beel - Shobhoner Char Beel SP	DI	207	Re-excavation of khal: L=3km, W=6m, D= 3m	None	Embankment by BWDB	4,026

Table 5.1 Potential Subprojects for SSWRDP in Sherpur District (2/3)

SR. No.	Upazila	Proposed union	Priority	SP_ID	Title	Type	Gross Area (ha)	Expected Work Volume		BWDB Project	Investment Cost (Tk. '000)
								Earthworks	Structure		
28	Sherpur Sadar	Bhatsala	C	38988120	Mrigi River (Chhankanda Eidgah - Kotorakanda) SP	DI	781	Re-excavation of khal: L=4km, W=5m, D=2.4m	None	None	7,624
29	Sherpur Sadar	Betmani Ghugrakandi	C	38988130	Agrakhali Beel SP	DI	393	Re-excavation of khal: L=6km, W=6m, D=3 m	None	Embankment by BWDB	4,453
30	Sherpur Sadar	Kamaria	C	38988140	Roshekura Beel - Chaira Beel - Chinikari Beel SP	DI	320	Re-excavation of Khal: L=3.5km, W=6m, D=2.5m	None	None	4,222
31	Sherpur Sadar	Rauha	C	38988150	Char Ranjagannath - Charkhawa Char Embankment SP	FM	340	New construction of embankment: L=3.5km, W=4.2 m, H=1.8m	One regulator	None	5,378

Table 5.2 Major Development Possibilities of Agroecological Zones in Sherpur District

No	Region	Major Development Possibilities						
		Agriculture	Fishery	Livestock	Water resources	Infrastructure	Socio economy	Forestry/ Environment
1	Hilly Areas (AEZ-22: Northern and eastern piedmont and AEZ-29 Northern and eastern hills)	Integrated agriculture on cereals, horticultural (especially pineapple, jack fruit, banana), green manure crops.	Open water and closed water fisheries	Dairy farm. Aqua animal mainly duck.	Surface water storage by dyking hill streams.	Development of road communication, settlements market places.	Improvement of social amenities.	Protection of the environment.
3a	Floodplain Areas (AEZ-9: Old Brahmaputra & Jamuna river)	Rice based agriculture is the main economic output of the area and increased production is caused by inadequate pre-monsoon and post-monsoon drainage. On-going sediment deposition in the drainage system will result in increasing crop losses in dry season.	Open water and closed water fisheries	Aqua animal (Duck in T.Aman field).	Planned expansion and efficient use of tube-well irrigation Multipurpose development of surface water.	Improvement of road communication, housing and settlements, commercial, administrative and educational centers.	Planned population settlement. Backyard poultry and kitchen, gardening to improve family income. Village banking to promote saving habit.	Protection against water and air pollution. Strict compliance of land use policy. Expansion of trees through annual programs.

Table 5.3 Promising Farming in Various Areas in Sherpur District

Zone	Characteristics	Promising Farming System
Characteristics of char area (Unstable)	The area is composed of sandy soil newly sedimented by river water, especially flooding. Almost no vegetation are appeared on the sand, and the land is eroded or sediment; therefore, the land itself are unstable/moving by flood.	Fishing is the major work, and it is performed all year round. However, crops of short growth periods can be grown in these areas during winter There are no permanent fields, but depending on land conditions short growing crops such as mustard and feed crops can be grown
Char area (Stable)	The soil of the area is silty- sand, and inhabited without scoring/erosion over 20 years. The agricultural land is porous and has high percolation. It needs frequent irrigation and fertilization. Through the field observation, costs of these inputs were generally 20% higher than ordinary soils. Organic substances in soils are less than other soils. Soil fertility is low but clean in biological infection	In Chadfassion, Bhola, water depth was decreased/ managed by the water works of the SSWRDSP-1. Areas of cropped land was not changed karge, but by its activities HYV of Aus and Aman were introduced instead of LT (Local variety Transplanted) The areas of HYV were increased from 90 ha at pre-project to 364 ha at post-post project. The area of Rabi decreased in the post-project. It indicates that the post-project cultivation still needs appropriate irrigation. Mungbean was changed to potato and lentil. In char area irrigation cost is about Tk. 4,000/acre, while in normal fields irrigation of Tk. 3000-3,500 /acre is required. Other costs are also estimated to be higher in char areas
Medium lowland	In the appropriate natural conditions integrated agricultural activities can be widely accepted by various combination of agriculture.	The integrated farming is useful for the development of rural areas. It has already been practiced in various areas , and successful cases are reported. Examples of development projects are: (1) Integrated rice-duck farming (2) Rice-fish farming
Medium highland	The area is flood-free or slightly flooded but no sedimentation area. Triple cropping is practiced in the area: Boro-Aman-potato/ vegetables. Due to Boro-Aman crop rotation, soil-born diseases or laterization are limited.	Examples of development projects. (1) Triple paddy + potato cropping after flood-free condition by SSWRDSP-1, Kanmona-Haraboti WCS Subproject, Kalai, Joypurhat> (2) Traditional potato farmers, Kishoreganj (3) Goat rearing by a rural woman of farm household.
Highland area	Highland areas are flood-free, but soil problems such as soil-nematode and laterization always happen. Water is usually supplied to soil only by rainwater. The water is short for crop growth, especially in winter.	Although natural conditions are severe, there are several promising farming systems in these areas. a. Perennial crops such as banana and pineapples b. Rice cultivation in depressed areas. c. High value-added crops can be cropped using DTW. d. Aman-vegetables-livestock (poultry) e. Crop rotation, ex. Eggplant-wheat-leek will be effective Due to no submerged conditions, damages by soil nematode are severe, crop rotation is important as well as chemicals to nematodes
Hilly land	The areas are flood-free, but soil erosion happens, and damages by flush water are also serious problems. Upland terrace and upland ridges will be useful to protect lands from soil erosion. Cover crops are also effective to protect agricultural lands. Livestock is a suitable farming system, but it often accelerates soil erosion, when grasses are eaten from roots by animal.	Due to steep slope, poor irrigation facilities and road network, farming systems vary depending on location. In steep slope area, tree crops such as rubber, tea and fruits are appropriate for marketing. Vegetable growing at homestead area can be developed. In the valley area aman rice can be grown for family consumption. For the cash generating, integrated farming with vegetable/forest-cattle will be promising. Besides the agricultural production, water conservation for Boro cultivation in dry season is also important work in the areas

Table 5.4 Potential Development of Fish Production by Agroecological Zone in Sherpur District

No	Region	Potential of development fish production in SSWRD
1	Hilly area (AEZ-22:Northern and eastern piedmont and AEZ-29 Northern and eastern hills)	<p>Generally it is not suitable for fish culture. If water remains in ponds/ditches/khals/rivers more than 50 cm depth and minimum for 6 months, it may be possible to introduce low cost seasonal fish culture such as;</p> <ul style="list-style-type: none"> • Closed water bodies- pond and ditches <ul style="list-style-type: none"> ◦ Tilapia mono culture, ◦ Tilapia with <i>Pangas</i> poly culture, ◦ Integrated fish culture; major carps, grass carp or plankton feeder fish with chicken/duck and vegetable crop on the dike, • Open water bodies- Khals and rivers (dries up at dry season) <ul style="list-style-type: none"> ◦ Small size pen culture (tilapia, major carps, grass carp, plankton feeder fish, <i>rajpunti</i>),
3a	Floodplain Areas 8AEZ-9: Old Brahmaputra & Jamina river)	<p>Generally it is a partly suitable for fish culture. If water remains in ponds/ ditches/ khals/ rivers/ beels more than 1m depth and minimum 6-10 months, it may be possible to introduce low cost subsistence fish culture or income generating fish culture such as;</p> <p>Closed water bodies- pond and ditch etc.,, if the flood doesn't break the pond or ditch.</p> <ul style="list-style-type: none"> • Closed water bodies- pond and ditch <ul style="list-style-type: none"> ◦ Tilapia with <i>Pangas</i> poly culture, ◦ Integrated fish culture; major carps, grass carp or plankton feeder fish with chicken/duck and vegetable crop on the dike, ◦ Rice- com fish culture with duck, ◦ Poly fish culture ◦ Indigenous/natural fish (fish naturally enters the pond due to a flood) and stocking fish culture <p><u>To need investment large amount of finance</u></p> <ul style="list-style-type: none"> ◦ Integrated fish culture: fish with chicken/duck (poultry house on the pond or side) and vegetable crop on the dike, ◦ Fresh water shrimp poly culture (shrimp with fish, except carnivorous fish) ◦ Fresh water ornamental fish poly culture (golden fish, fancy carp etc.,) ◦ Indigenous/natural fish culture (for natural resource propagation) <ul style="list-style-type: none"> • Open water bodies- Khal/ beel/river <ul style="list-style-type: none"> ◦ Khal: pen or cage culture of <i>Pangas</i> or Major carps ◦ Beel fish culture (stocking cultured fingerling only or with natural fish) ◦ Khal ,beel and river: Indigenous/natural fish conservation and capture by Katas/ pen (making habitat and fishing ground ◦ Kuas in beel, khal (like small hole, pool, it becomes fish shelter in low level water) by some structure) and Kuas

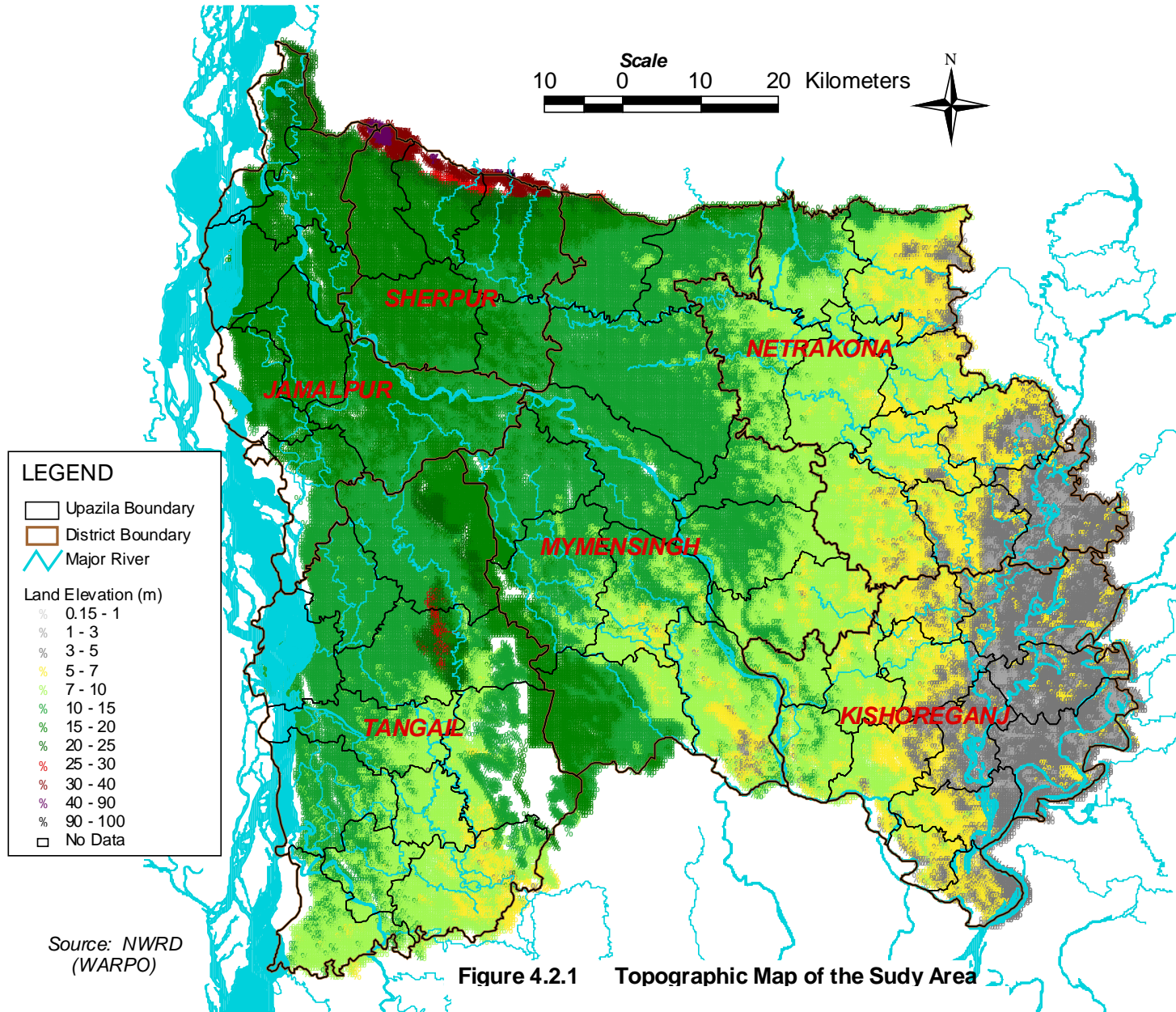


Figure 4.2.1 Topographic Map of the Study Area

Fig. 2.1 Topographic Map of Sherpur District and Study Area

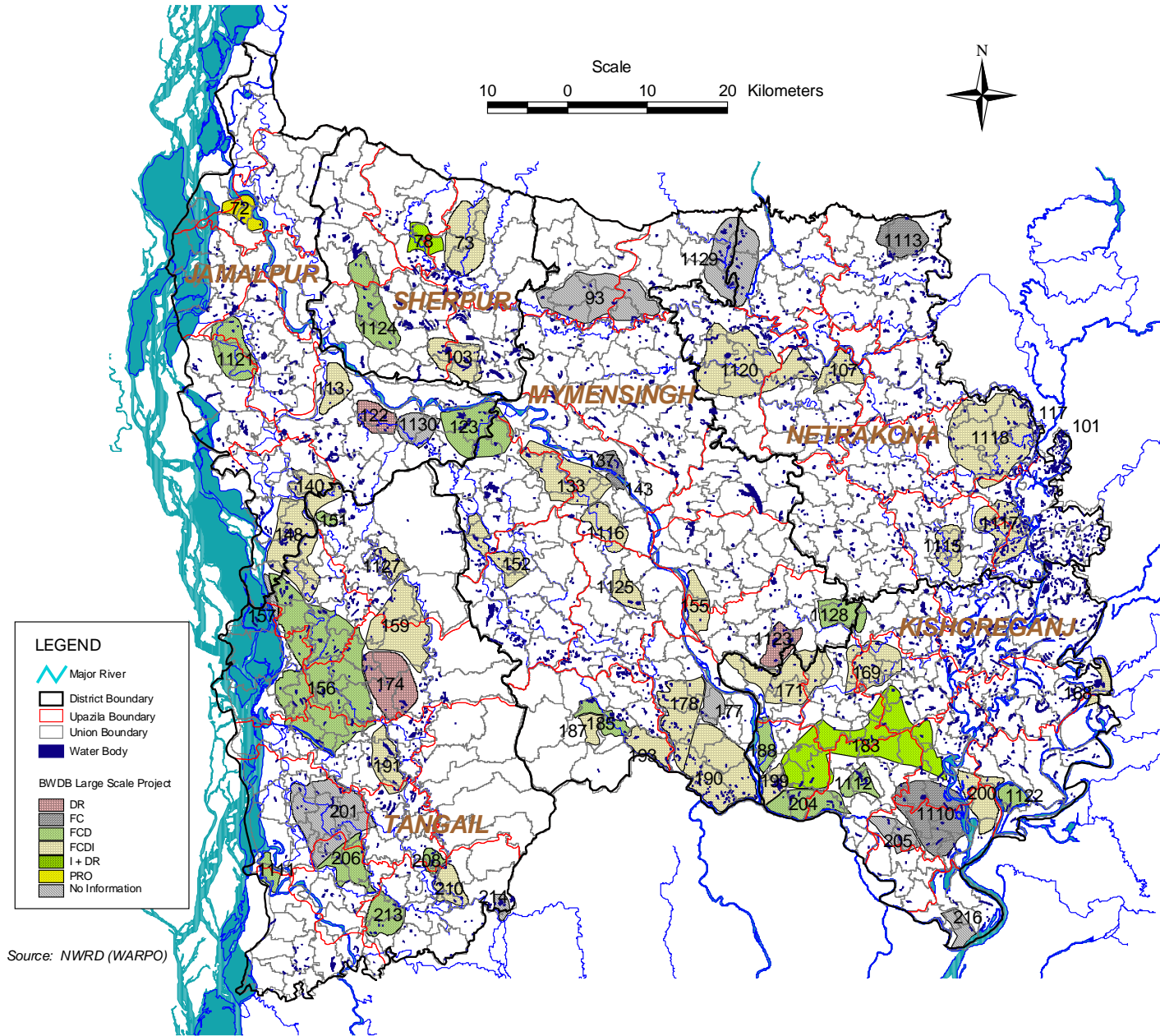


Fig. 2.2 Perennial Water Bodies and Large Scale Water Resources Development Projects of BWDB in the Study Area

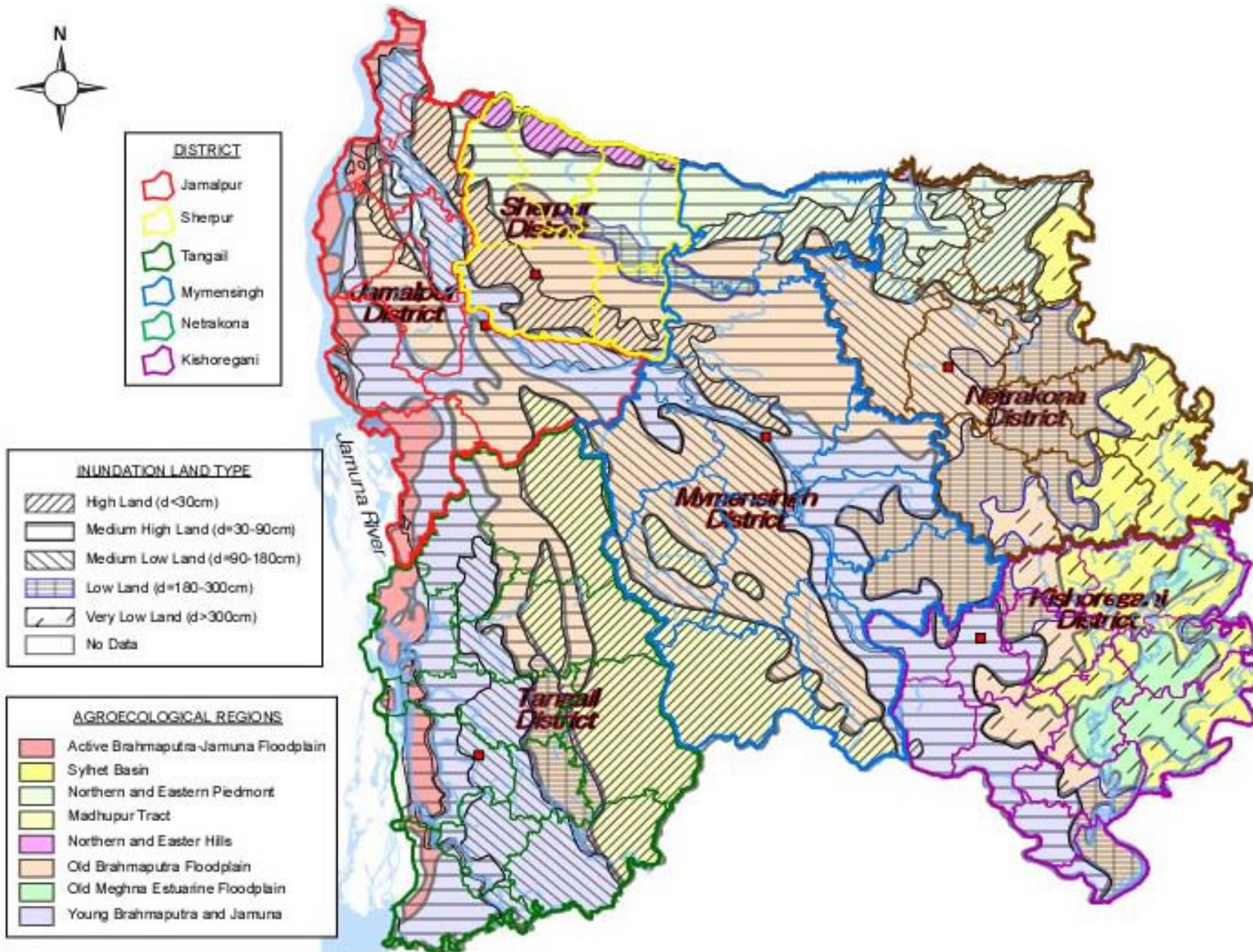
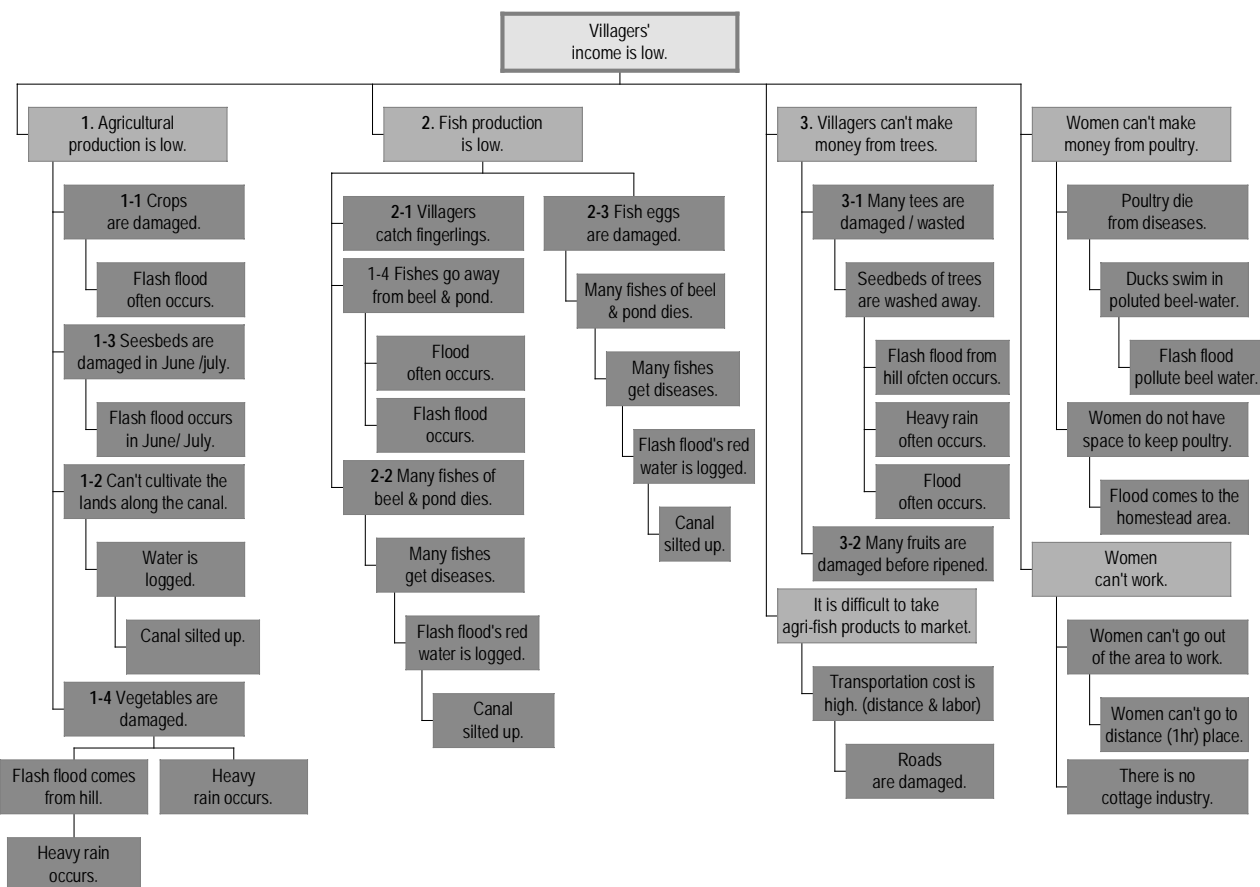
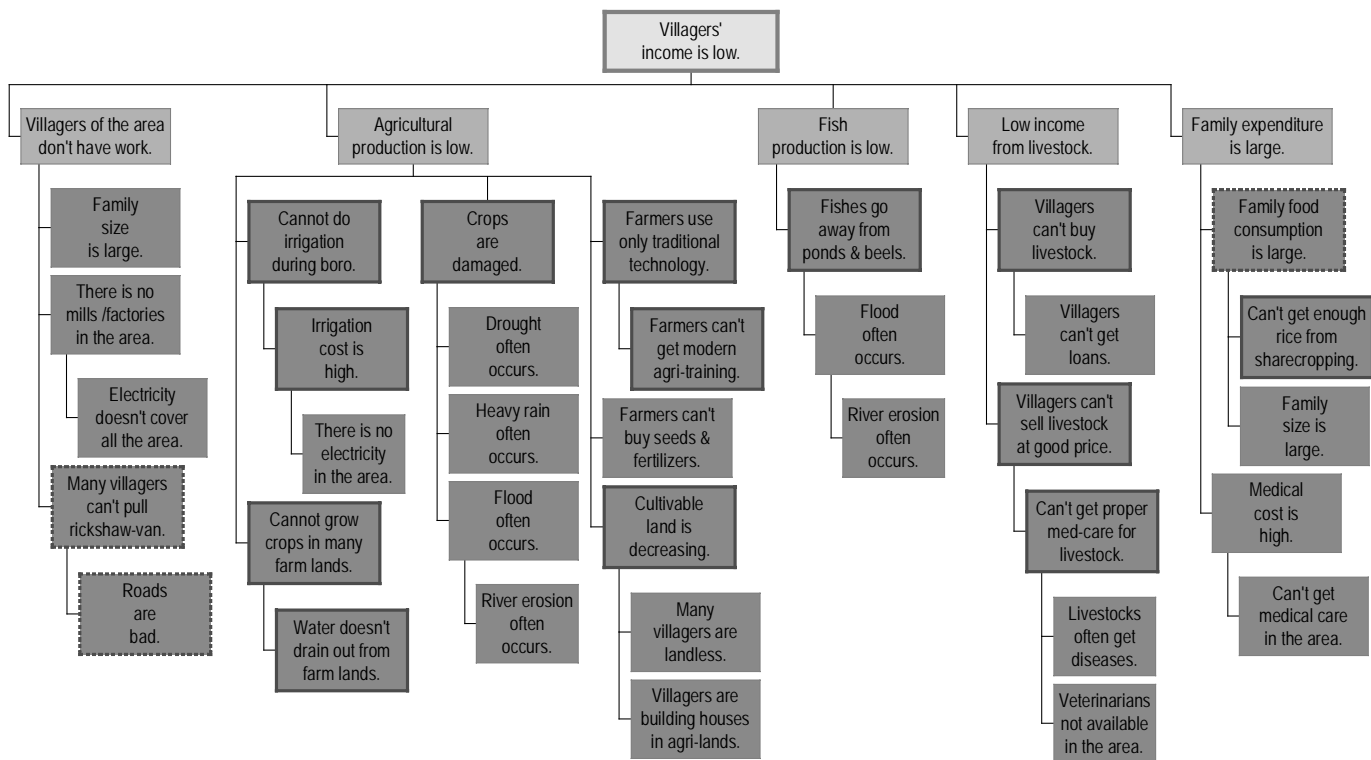


Fig. 2.3 Zoning of Sherpur District and the Study Area



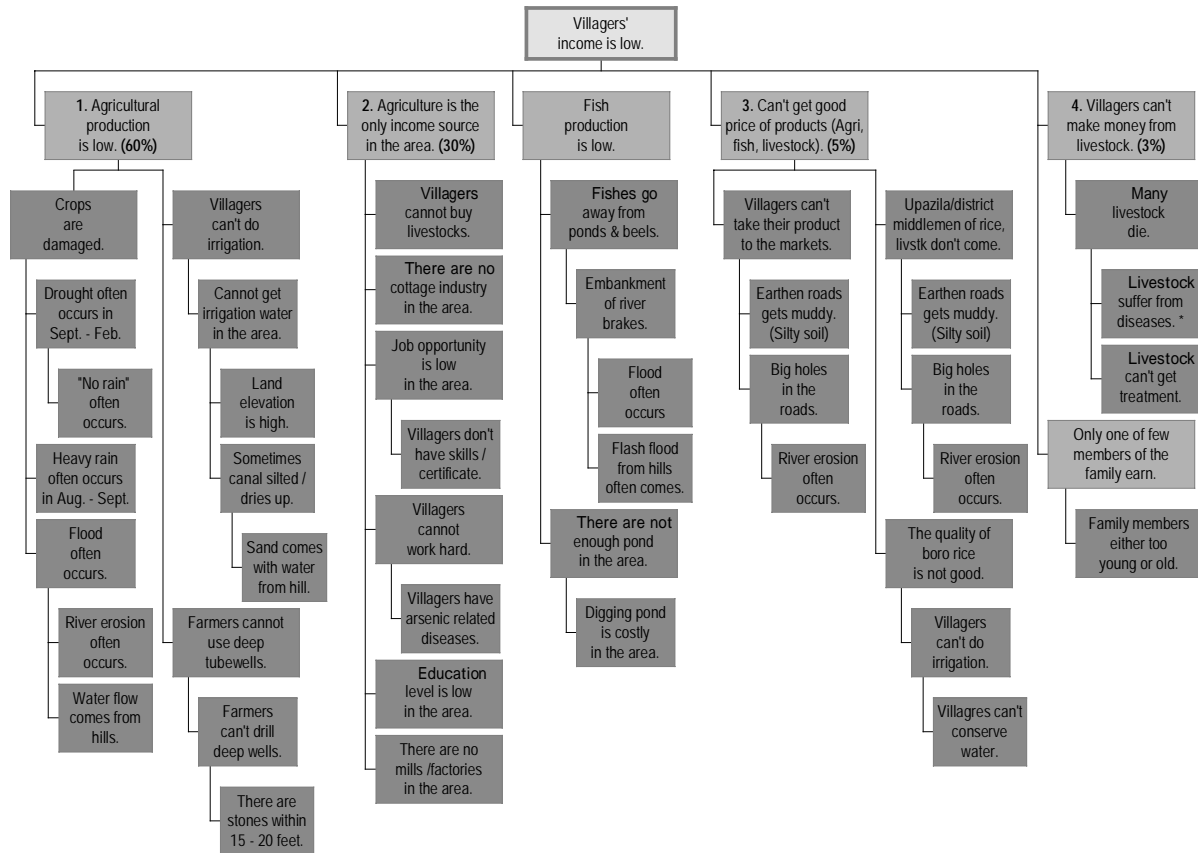
A. Pakuria Union, Sherpur Sadar Upazila, Sherpur District (18 September 2004)



B. Marichpuran Union, Nalitabari Upazila, Sherpur District (19 September 2004)

Fig. 3.1 Problem Trees of Union Level Workshops in Sherpur District (1/2)

Note: * Chicken suffers from Ranikhet, duck from Plague, cow from Pox Fever and Bath, and goat from fever and cough. C. Noya Beel



Union Nalitabari Upazila, Sherpur District (19 September 2004)

Fig. 3.1 Problem Trees of Union Level Workshops in Sherpur District (2/2)

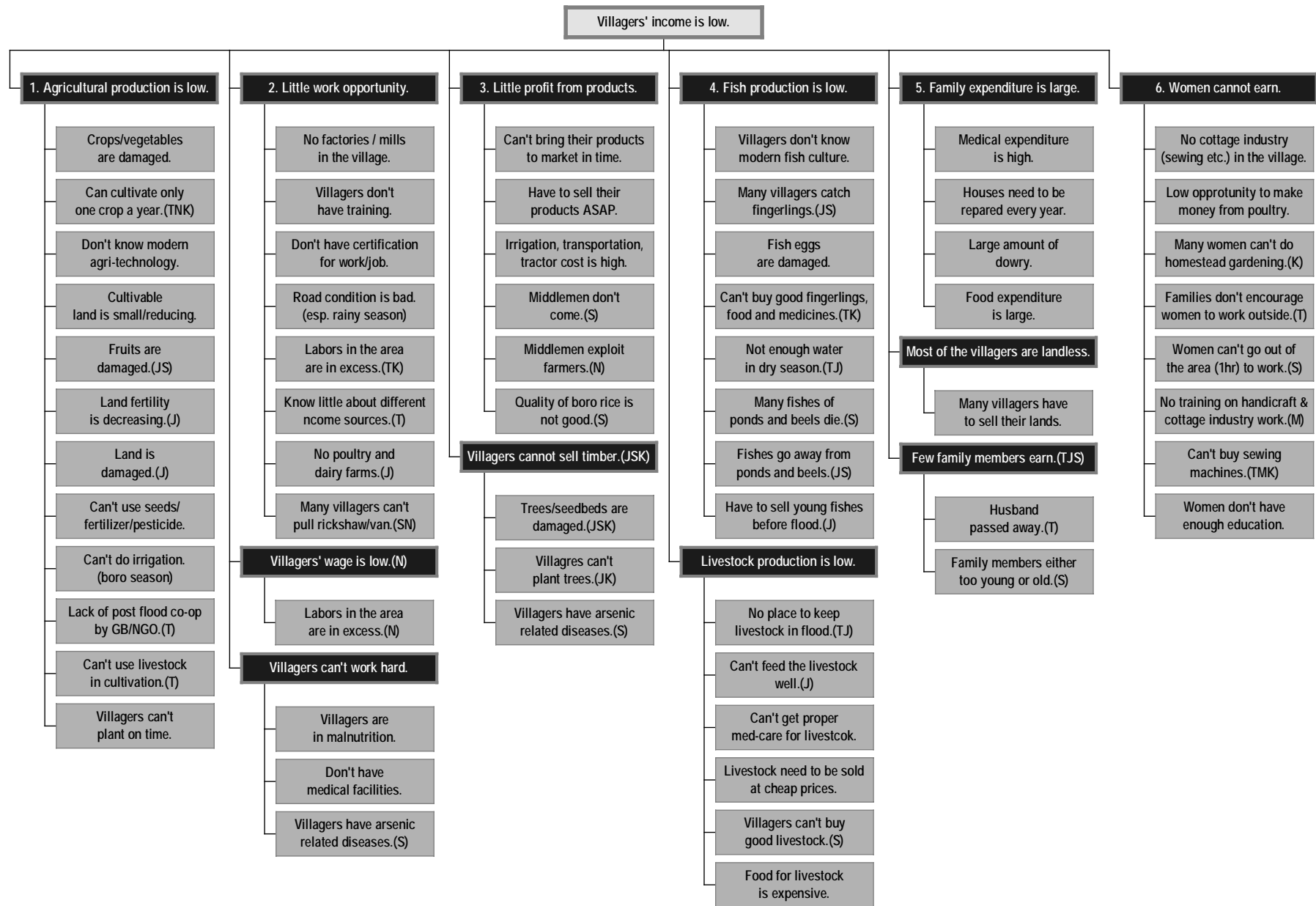


Fig. 3.2 Problem Trees after Problem Analysis in the Study Area

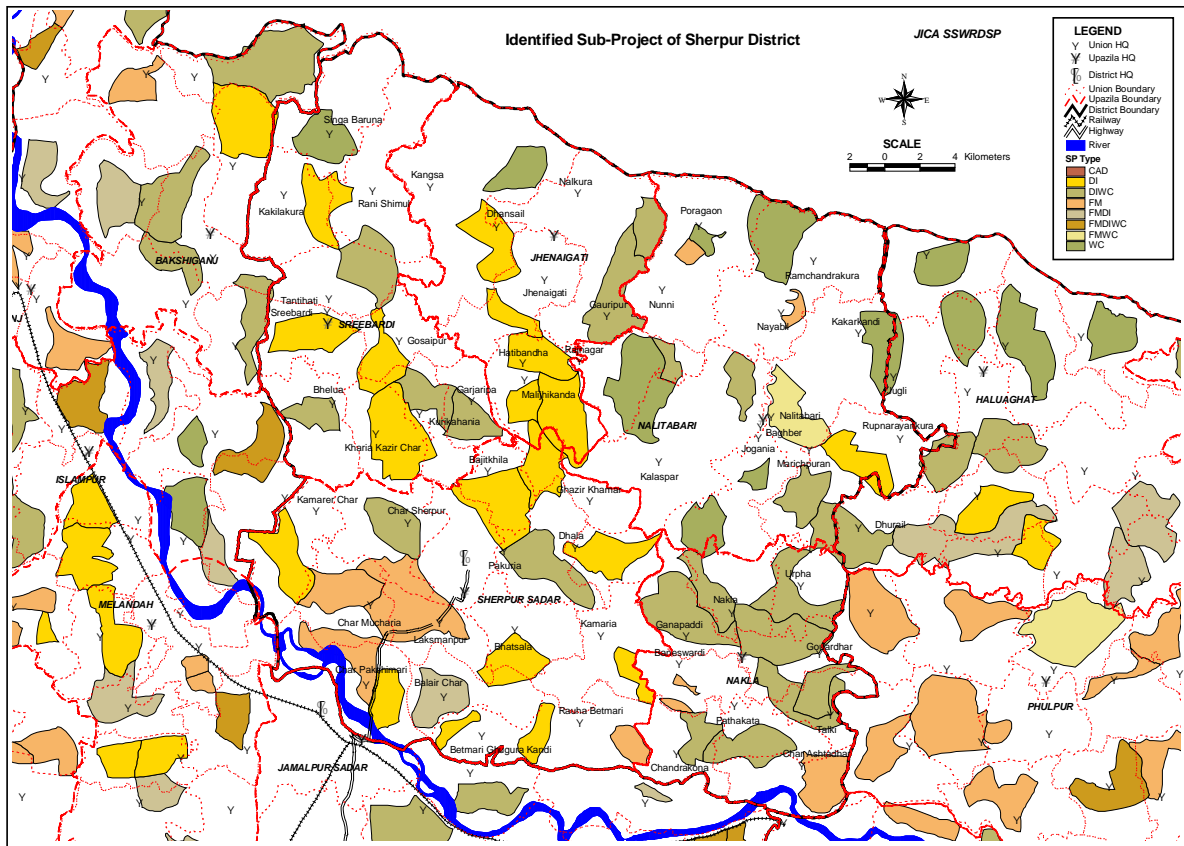


Fig. 4.1 Location of Identified Potential Subprojects in Sherpur District

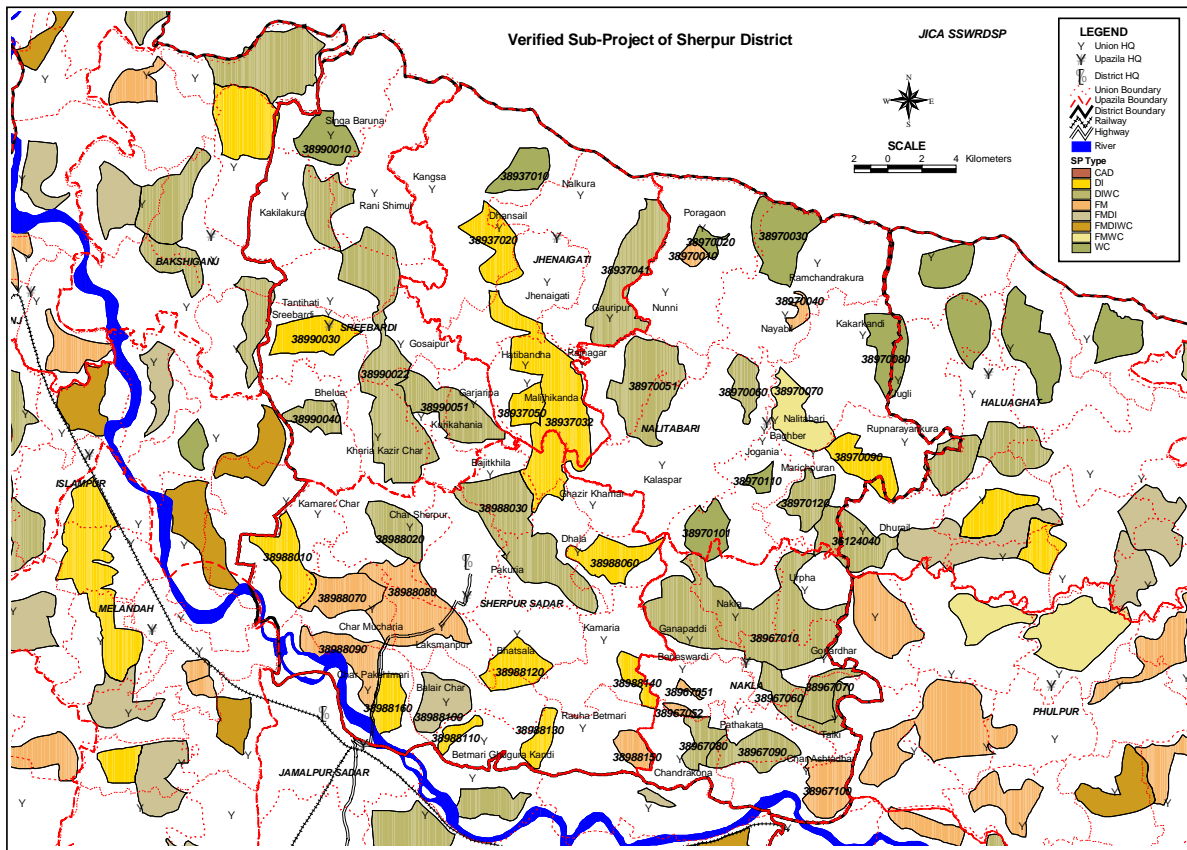


Fig. 4.2 Location of Verified Potential Subprojects in Sherpur District

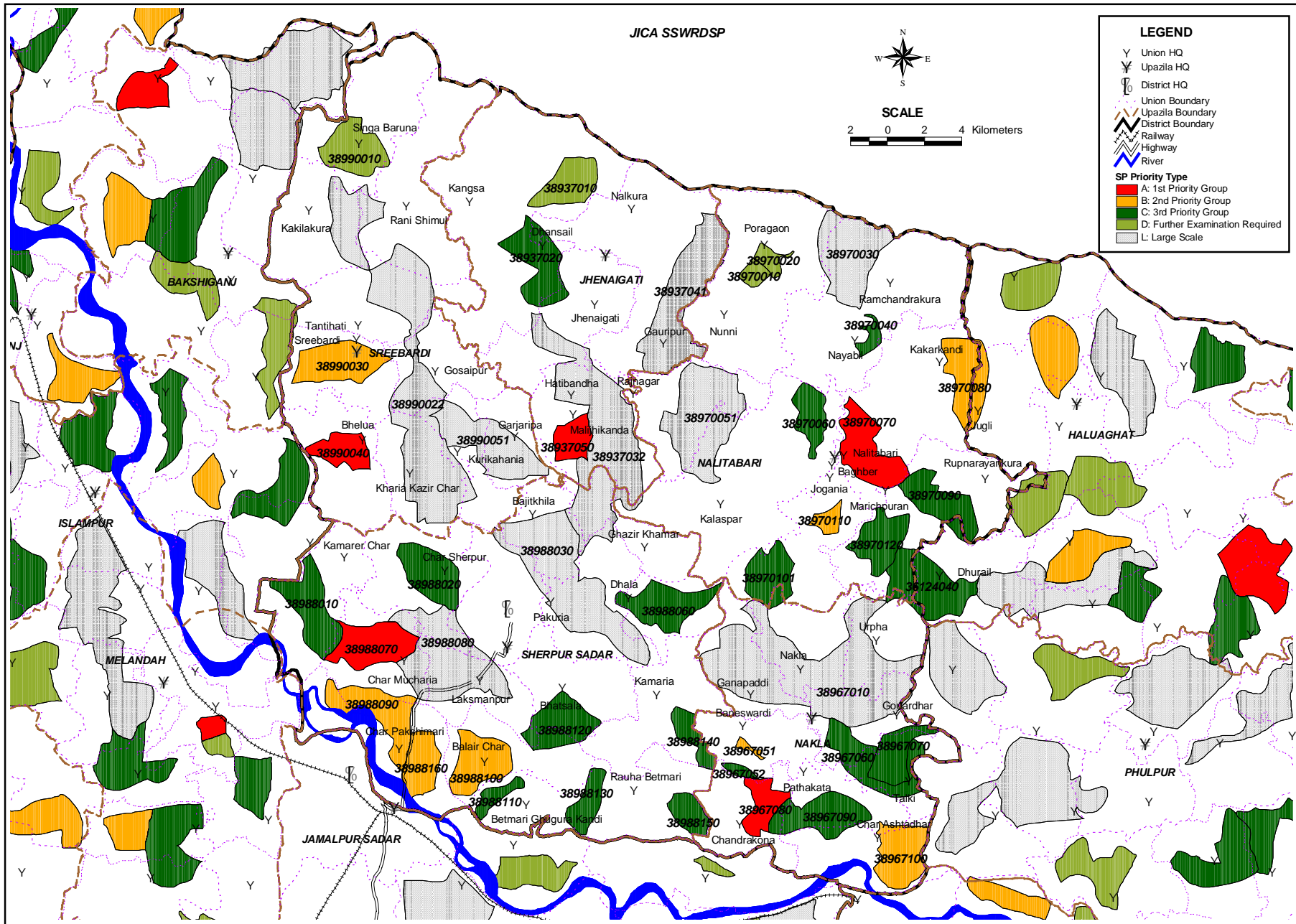


Fig. 4.3 Location of Prioritized Subprojects in Sherpur District

APPENDIX

UPAZILA WISE SUMMARY OF UNION QUESTIONNAIRE

Table : Summary of Upazila wise Data for Sherpur District

GeoCode No	Type of Data	893705	896709	897008	898806	899015	District	Ratio of Union		
Upazila Name		Jhenaigati	Nakla	Nalitabari	Sherpur	Sreebardi				
Agro-ecological Zone										
1. OUTLINE OF FIELD CONDITION (Expected to be answered by Upazila Engineer):										
1.2. Land and Land Use										
1.2.1	Total Area of Union	acre	T	65,483.00	40,340.00	84,037.16	83,310.00	61,701.88	334,872.04	100.0%
1.2.2	Total Forest Area	acre	T	12,675.00	7,253.00	3,948.00	7,061.75	7,830.00	38,767.75	88.5%
a	Government reserve forests	acre	T	4,095.00	510.00	2,372.00	100.00	5,312.55	12,389.55	78.8%
b	Homestead Area	acre	T	1,100.00	5,263.00	1,915.87	5,061.75	2,873.30	16,213.92	96.2%
1.2.3	Wet lands	acre	T	1,876.20	8,068.00	1,819.79	5,920.25	6,530.65	24,214.89	98.1%
1.3 Demography (2001)										
1.3.1	Total Population	persons	T	179,181	254,875	264,101	421,570	233,327	1,353,054	100.0%
1.3.2	Female Ratio	%	A	50.83	52.35	50.50	52.10	47.14	50.65	100.0%
	Male Ratio	%	A	49.17	47.65	49.50	47.90	52.87	49.35	100.0%
1.3.3	Population more than 18 years old	persons	T	13,000.00	12,315.00	18,378.50	15,285.00	20,000.00	20,000	61.4%
1.3.4	Annual Growth Rate	%	A	1.87	3.71	2.48	2.19	1.55	2.36	96.2%
1.3.5	Literacy	(%)	A	33.32	30.44	37.23	28.93	25.93	31.12	100.0%
1.4 Social Infrastructure										
1.4.1	Number of Primary Schools									
	Primary School	in No.	T	98	87	85	172	152	594	100.0%
	Madrasa	in No.	T	45	28	36	54	63	226	98.1%
1.4.2	Number of Primary Health Care Centers	in No.	T	14	12	24	31	32	113	90.4%
1.4.3	Rural Water Supply									
a	Number of Community Wells		T	22,827	27,981	37,945	43,515	32,343	164,611	98.1%
b	Quality of domestic water (such as arsenic or other contamination)									
	Yes	%	A	6.86	5.86	46.08	8.32	14.50	18.88	96.2%
	No	%	A							3.8%
1.4.4	Total Household	Nos.	T	34,465	43,598	51,200	82,212	52,588	264,063	98.1%
1.4.5	% of electricity installed household	%	A	22.50	62.78	24.90	25.16	24.60	31.71	92.3%
1.5	Is there any BWDB Project in your Union ?									
	Yes		C	1	-	5	3	-	9	17.3%
	No		C	6	9	7	7	8	37	71.2%
2 FARM MANAGEMENT DEVELOPMENT										
2.1	General idea of agricultural development									
2.1.1	Cropping Pattern									
	Considering the favorable natural and agro-ecological conditions of Bangladesh, establishment of <Rice + alpha> as a farming system is recommended: rice for food supply and alpha (Veg									
	Yes		C	5	9	11	13	9	47	90.4%
	No		C	-	-	-	-	-	-	0.0%
(1)	Limitation of agricultural land									
1)	Serious		C	-	-	-	-	1	1	1.9%
2)	Medium		C	4	1	4	2	1	12	23.1%
3)	Low		C	3	8	8	12	8	39	75.0%
2	Improved seeds									
1)	Serious		C	1	-	-	-	1	2	3.8%
2)	Medium		C	-	1	5	6	1	13	25.0%
3)	Low		C	6	8	7	8	8	37	71.2%
3	Irrigation water supply in dry season									
1)	Serious		C	-	1	1	4	1	7	13.5%
2)	Medium		C	5	7	7	7	7	33	63.5%
3)	Low		C	2	1	4	3	2	12	23.1%
4	Flood damages in monsoon season									
1)	Serious		C	7	8	11	14	10	50	96.2%
2)	Medium		C	-	1	2	-	-	3	5.8%
3)	Low		C	-	-	-	-	-	-	0.0%
5	Less development of land preparation									
1)	Serious		C	-	-	-	-	3	3	5.8%
2)	Medium		C	6	8	8	10	6	38	73.1%
3)	Low		C	2	1	3	4	1	11	21.2%
6	Less development of agricultural technology									
1)	Serious		C	-	-	-	1	-	1	1.9%
2)	Medium		C	3	1	6	4	2	16	30.8%
3)	Low		C	4	8	5	9	8	34	65.4%
7	Low inputs (fertilizer, chemicals, capital, labour)									
1)	Serious		C	-	-	-	-	1	1	1.9%
2)	Medium		C	3	2	3	4	2	14	26.9%
3)	Low		C	4	7	9	11	7	38	73.1%
8	Constraints in marketing									
1)	Serious		C	1	-	1	3	-	5	9.6%
2)	Medium		C	2	8	8	7	7	32	61.5%
3)	Low		C	4	1	4	3	3	15	28.8%
9	Less crop diversification									
1)	Serious		C	3	9	3	11	7	33	63.5%
2)	Medium		C	3	-	6	-	1	10	19.2%
3)	Low		C	1	-	3	2	1	7	13.5%
10	Mechanization									
1)	Serious		C	3	8	5	8	8	32	61.5%

Table : Summary of Upazila wise Data for Sherpur District

GeoCode No	Type of	893705	896709	897008	898806	899015	District	Ratio of	
Upazila Name	Data	Jhenaigati	Nakla	Nalitabari	Sherpur	Sreebardi		Union	
2) Medium	C	3	1	4	6	-	14	26.9%	
3) Low	C	-	-	2	-	1	3	5.8%	
2.2 Collection of data/ information on									
2.2.1 Breakdown of farm holdings by size by									
Landless	%	A	24.24	37.00	23.73	25.40	29.74	27.54	94.2%
0.05- 0.49	%	A	30.36	27.09	27.26	25.59	30.06	27.69	98.1%
0.50- 0.99	%	A	20.38	17.65	16.81	18.50	16.51	17.86	98.1%
1.00- 1.49	%	A	12.53	11.51	12.33	12.64	9.15	11.74	98.1%
1.50- 2.49	%	A	7.88	6.79	8.94	9.38	5.79	7.98	98.1%
2.50- 7.49	%	A	4.39	3.51	6.50	5.03	3.13	4.69	98.1%
7.50 – 14.99	%	A	2.12	1.22	3.47	2.24	2.11	2.33	96.2%
15.00 – 24.99	%	A	1.24	0.48	1.41	0.98	0.81	1.02	84.6%
25.00 & above	%	A	0.40	0.34	0.92	-	1.40	0.73	32.7%
Total (100)	%	A	100.00	100.00	100.00	100.00	100.00	100.00	100.0%
2.2.2 Classification of land and cultivated									
(1) Area of Indundation Type in %									
Highland (0-30)	%	A	18.20	16.10	12.12	13.44	12.68	14.12	98.1%
Med. Highland (30-90)	%	A	34.63	32.57	38.10	34.23	32.64	34.62	98.1%
Med Lowland (90-180)	%	A	36.53	39.41	38.47	39.17	40.38	38.89	96.2%
Lowland (above 180)	%	A	7.65	10.42	8.44	8.21	6.14	8.20	94.2%
Very lowland (above 180)	%	A	5.50	3.50	4.00	9.00	3.43	5.41	94.2%
Total (100)	%	A	100.00	100.00	100.00	100.00	100.00	100.00	100.0%
2.2.3 Crop Production									
Type of crop rotation									
(1) Type A	Cropl								
1) Name of crop			Mustard	Mustard	Mustard	Mustard	Mustard		
Date of sowing/transplting			Oct	Oct	Oct	Nov	Oct		
Date harvesting			Nov	Nov	Nov	Dec	Nov		
2) Name of crop			Boro	Boro	Boro	Boro	Boro		
Date of sowing/transplting			Dec	Dec	Dec	Nov	Dec		
Date harvesting			Feb	Feb	Feb	Jan	Feb		
3) Name of crop			T Aman	B Aman	T Aman	Aus	B Aman		
Date of sowing/transplting			Apr	Apr	Apr	Feb	Sep		
Date harvesting			May	May	May	Apr			
4) Share	%	A	57.57	58.89	60.00	57.46	60.50	58.92	98.1%
(2) Type B									
1) Name of crop			Wheat	Wheat	Wheat	Wheat	Wheat		
Date of sowing/transplting			Nov	Nov	Nov	Nov	Nov		
Date harvesting			Dec	Dec	Dec	Dec	Dec		
2) Name of crop			Jute	Jute	Jute	Jute	Jute		
Date of sowing/transplting			Mar	Mar	Mar	Feb	Mar		
Date harvesting			Apr	Apr	Apr	Mar	Apr		
3) Name of crop			Vegetables	Vegetables	Vegetables	Fallow	Vegetables		
Date of sowing/transplting			Jul	Jul	Jul		Jul		
Date harvesting			Sep	Sep	Sep		Sep		
4) Share	%	A	30.14	30.00	25.42	32.75	29.30	29.44	96.2%
(3) Type C	Cropl								
1) Name of crop			Vegetables	Vegetables	T Aman	Vegetables	Vegetables		
Date of sowing/transplting			Oct	Oct	Jul	Sep	Oct		
Date harvesting			Dec	Dec		Dec	Dec		
2) Name of crop			Fallow	Fallow	T Aman		Fallow		
Date of sowing/transplting					Jul				
Date harvesting									
3) Name of crop			Vegetables	Vegetables	T Aman		Vegetables		
Date of sowing/transplting			Oct	Oct	Jul		Oct		
Date harvesting			Dec	Dec			Dec		
4) Share	%	A	12.29	11.11	16.25	10.83	10.20	12.26	96.2%
Total (100)	100%	A	100.00	100.00	101.67	90.71	100.00	97.88	100.0%
2.2.4 Rice production and processing methods									
(1) Land preparation									
Mechanized and name of machines	A		55.14	65.56	60.91	56.15	61.50	59.82	100.0%
Traditional and name of tools	A		44.86	34.44	39.09	43.85	38.50	40.18	100.0%
House labor .men	A		58.83	57.78	63.00	56.67	61.30	59.49	92.3%
House labor .women	A		7.67	6.25	7.22	5.45	6.70	6.55	86.5%
Hired labor men	A		33.00	26.67	25.56	29.58	23.70	27.51	92.3%
Hired labor women	A		13.33	11.25	9.38	10.45	10.50	10.81	82.7%

Table : Summary of Upazila wise Data for Sherpur District

GeoCode No	Type of	893705	896709	897008	898806	899015	District	Ratio of Union	
Upazila Name	Data	Jhenaigati	Nakla	Nalitabari	Sherpur	Sreebardi			
(2)	Seed sowing								
	Mechanized and name of machines								
	Traditional and name of tools								
	House labor .men	A	100.00	100.00	100.00	98.46	100.00	99.60	100.0%
	House labor .women	A	72.57	66.67	70.50	70.42	70.20	70.00	94.2%
	Hired labor men	A	8.57	3.25	3.33	4.00	6.20	4.95	84.6%
	Hired labor women	A	17.00	26.89	23.20	23.58	22.50	22.94	94.2%
	Hired labor women	A	4.00	2.75	3.67	4.10	2.80	3.45	84.6%
(3)	Transplanting								
	Mechanized and name of machines								
	Traditional and name of tools								
	House labor .men	A	100.00	100.00	99.50	100.00	100.00	99.90	96.2%
	House labor .women	A	58.43	47.22	56.44	51.67	50.50	52.49	92.3%
	Hired labor men	A	3.57	3.22	2.57	6.09	2.30	3.68	84.6%
	Hired labor women	A	33.00	45.00	36.89	38.75	42.10	39.45	92.3%
	Hired labor women	A	5.00	5.38	7.00	6.45	5.10	5.76	80.8%
(4)	Weeding								
	Mechanized and name of machines								
	Traditional and name of tools								
	House labor .men	A	7.71	9.44	6.67	8.64	6.11	7.76	88.5%
	House labor .women	A	92.29	90.56	94.55	92.69	94.50	93.02	100.0%
	Hired labor men	A	44.00	43.33	54.30	47.83	43.78	47.00	92.3%
	Hired labor women	A	5.00	2.89	2.44	6.55	2.25	3.93	84.6%
	Hired labor men	A	43.00	45.00	38.10	44.67	45.89	43.32	92.3%
	Hired labor women	A	7.29	6.75	5.00	7.64	5.56	6.45	84.6%
(5)	Irrigation								
	Mechanized and name of machines								
	Traditional and name of tools								
	House labor .men	A	93.86	92.44	91.18	92.67	95.00	92.94	98.1%
	House labor .women	A	6.14	8.50	8.82	14.46	5.56	9.29	96.2%
	Hired labor men	A	98.57	87.78	93.50	98.64	98.00	95.32	92.3%
	Hired labor women	A	10.00		1.00	5.00		5.33	5.8%
	Hired labor men	A		55.00	24.50		10.00	29.83	13.5%
	Hired labor women	A			5.00	100.00		52.50	3.8%
(6)	Fertilizer/Chemicals								
	Mechanized and name of machines								
	Traditional and name of tools								
	House labor .men	A		18.00	34.25	56.67	42.50	37.17	26.9%
	House labor .women	A	100.00	94.00	88.45	93.33	91.50	92.94	96.2%
	Hired labor men	A	72.86	81.67	87.50	73.75	88.50	81.04	94.2%
	Hired labor women	A		10.00				10.00	1.9%
	Hired labor men	A	26.57	17.22	13.75	25.00	11.50	18.40	84.6%
	Hired labor women	A	2.00		10.00			4.67	5.8%
(7)	Harvesting								
	Mechanized and name of machines								
	Traditional and name of tools								
	House labor .men	A		10.00				10.00	3.8%
	House labor .women	A	100.00	98.89	100.00	100.00	90.50	97.90	98.1%
	Hired labor men	A	45.71	48.89	60.80	53.33	43.89	51.13	94.2%
	Hired labor women	A	30.00		13.75	3.00		11.75	17.3%
	Hired labor men	A	45.14	49.22	37.60	43.64	50.33	44.96	90.4%
	Hired labor women	A	4.00	2.43	2.67	3.57	5.38	3.68	65.4%
(8)	Transportation								
	Mechanized and name of machines								
	Traditional and name of tools								
	House labor .men	A							
	House labor .women	A	48.57	48.33	48.57	48.85	45.00	47.83	88.5%
	Hired labor men	A	51.43	51.67	69.09	51.15	59.90	56.98	96.2%
	Hired labor women	A	28.57	25.00	38.50	32.50	21.00	29.38	92.3%
	Hired labor men	A	80.00			7.50	36.00	26.00	13.5%
	Hired labor women	A	52.14	66.11	56.60	62.09	62.50	60.30	90.4%
	Hired labor women	A	12.50	10.00	7.00	7.44	8.50	8.90	76.9%
(9)	Threshing								
	Mechanized and name of machines								
	Traditional and name of tools								
	House labor .men	A							
	House labor .women	A	15.14	17.33	13.00	5.18	7.38	11.29	86.5%
	Hired labor men	A	86.14	82.67	88.18	95.62	94.10	90.02	98.1%
	Hired labor women	A	47.00	43.67	49.80	44.17	47.22	46.28	92.3%
	Hired labor men	A	6.14	6.33	3.00	10.27	3.88	6.31	82.7%
	Hired labor women	A	41.00	42.89	42.10	43.18	44.89	42.89	90.4%
	Hired labor women	A	5.86	4.25	6.11	7.45	4.33	5.70	84.6%
(10)	Drying								
	Mechanized and name of machines								
	Traditional and name of tools								
	House labor .men	A	45.00				1.00	23.00	0.0%
	House labor .women	A	93.57	100.00	100.00	100.00	91.00	97.30	96.2%
	Hired labor men	A	52.00	30.00	52.00	32.00	7.50	36.47	28.8%
	Hired labor women	A	11.71	14.22	17.50	24.55	18.13	17.79	82.7%
	Hired labor men	A	49.33	11.67	16.40	7.50	20.00	19.72	34.6%
	Hired labor women	A	53.86	75.22	58.56	74.00	74.44	67.98	84.6%
(11)	Cleaning & Grading								
	Mechanized and name of machines								
	Traditional and name of tools								
	House labor .men	A			15.00	1.00		8.00	5.8%
	House labor .women	A	100.00	100.00	98.64	99.92	100.00	99.67	94.2%
	Hired labor men	A		50.00	50.00	24.00	11.67	31.15	25.0%
	Hired labor women	A	15.83	16.11	18.13	19.55	20.00	18.10	80.8%
	Hired labor men	A		10.00	8.75	17.50	9.00	11.33	28.8%
	Hired labor women	A	84.17	76.11	68.89	72.27	72.22	73.98	84.6%

Table : Summary of Upazila wise Data for Sherpur District

GeoCode No	Type of	893705	896709	897008	898806	899015	District	Ratio of		
Upazila Name	Data	Jhenaigati	Nakla	Nalitabari	Sherpur	Sreebardi		Union		
(12)	Milling							0.0%		
	Mechanized and name of machines	A	70.00	78.33	78.18	76.15	77.50	76.53	98.1%	
	Traditional and name of tools	A	38.57	21.67	23.00	23.85	24.38	25.53	90.4%	
	House labor .men	A		70.00	40.00	60.00	53.33	53.75	17.3%	
	House labor .women	A	20.00	20.00	50.00	22.50	10.00	19.44	17.3%	
	Hired labor men	A		10.00	70.00	47.50	57.67	49.71	15.4%	
	Hired labor women	A			90.00	46.67	5.67	35.29	13.5%	
(13)	Par-boiling/boiling							0.0%		
	Mechanized and name of machines	A	4.80	7.50	9.30	15.70	11.43	10.35	76.9%	
	Traditional and name of tools	A	95.86	93.33	91.55	87.54	91.11	91.35	98.1%	
	House labor .men	A	26.29	25.33	31.67	32.27	20.00	27.38	88.5%	
	House labor .women	A	48.00	50.78	48.50	45.83	55.00	49.30	88.5%	
	Hired labor men	A	14.29	15.38	16.25	14.50	14.00	14.90	78.8%	
	Hired labor women	A	8.57	7.44	8.13	10.91	10.88	9.28	82.7%	
(14)	Storage							0.0%		
	Mechanized and name of machines			5.00				5.00	3.8%	
	Traditional and name of tools	A	100.00	98.89	100.00	100.00	100.00	99.80	98.1%	
	House labor .men	A	73.57	71.67	73.00	74.50	75.63	73.67	90.4%	
	House labor .women	A	26.43	25.63	24.00	25.55	30.00	26.16	84.6%	
	Hired labor men	A		15.00	15.00	25.00	15.00	16.67	13.5%	
	Hired labor women	A		10.00	5.00			7.50	3.8%	
(15)	Marketing							0.0%		
	Mechanized and name of machines		5.00	5.00		50.00	80.00	35.00	7.7%	
	Traditional and name of tools	A	100.00	99.44	100.00	96.15	83.00	95.50	100.0%	
	House labor .men	A	78.00	75.56	83.00	79.58	75.30	78.42	94.2%	
	House labor .women	A	8.14	5.71	6.67	7.78	5.25	6.73	76.9%	
	Hired labor men	A	13.86	19.44	12.22	15.91	19.67	16.31	88.5%	
	Hired labor women	A		10.00			4.33	5.75	7.7%	
2.2.5	Services of Extension Workers									
(1)	Number of agricultural extension workers	in No	T	15	25	24	45	30	139	98.1%
(2)	Frequency of visit to farmers	Time/Mo	A	2.33	4.11	2.67	3.00	1.90	2.82	98.1%
2.2.7	Cooperative Activities									
(1)	Numer of Cooperatives	in No.								
	Farmers' cooperatives	T	99	18	100	101	74	392	92.3%	
	Credit group	T	73	56	187	84	82	482	90.4%	
	Water management association	T	2	5	6	5	6	24	42.3%	
	Fishery Cooperative Association	T	13	18	11	17	13	72	65.4%	
	Others	T	36	14	50	19	28	147	78.8%	
	Total	T	223	111	354	226	203	1,117	100.0%	
(2)	Organization Ratio by house holding in %									
	Farmers' cooperatives	A	31.57	28.56	25.18	22.55	54.50	32.11	94.2%	
	Credit group	A	29.14	32.44	34.83	53.45	65.70	44.06	94.2%	
	Water management association	A	7.50	9.20	10.83	8.75	8.80	9.17	46.2%	
	Fishery Cooperative Association	A	5.33	6.00	4.50	6.20	6.33	5.74	67.3%	
	Others	A	9.40	7.00	10.05	6.36	5.89	7.70	76.9%	
	Total	A	76.29	79.11	76.06	67.61	135.60	85.79	100.0%	
2.2.8	Production cost									
	Are there any survey information /data on in Tk									
	Rice	A	7,433.33	7,362.50	6,600.00	6,623.08	7,015.00	6,923.96	92.3%	
	Jute	A	7,000.00	5,987.50	1,173.33	3,790.91	5,283.33	4,545.52	55.8%	
	Wheat	A	4,000.00	5,187.50	2,075.71	3,063.64	5,771.43	3,946.57	67.3%	
	Vegetables	A	14,333.33	13,625.00	8,903.00	10,375.00	9,890.00	11,031.09	90.4%	
	Oilseeds	A	3,860.00	4,375.00	2,501.11	1,881.82	3,042.86	2,970.25	76.9%	
	Pulses	A	3,660.00	3,375.00	2,700.00	2,575.00	2,866.67	2,958.33	75.0%	
2.2.9	Livestock									
(1)	Number of animals and source of feed in your Union (2002 – 03)									
1)	Cattle									
	Number of animals	T	31,225	17,000	36,925	73,450	40,370	198,970	100.0%	
	Rice straw	C	7	9	12	13	10	51	98.1%	
	Green Fodder	C	7	9	12	12	10	50	96.2%	
	Waste of human food	C	1	-	3	1	3	8	15.4%	
	Farmer's own produced cereal feed	C	1	-	1	1	-	3	5.8%	
	Procured cereal feed	C	6	9	11	12	10	48	92.3%	
2)	Buffalo									
	Number of animals	T	7,360	1,735	2,975	1,780	3,915	17,765	98.1%	
	Rice straw	C	7	9	11	13	10	50	96.2%	
	Green Fodder	C	7	9	11	12	10	49	94.2%	
	Waste of human food	C	1	-	2	-	2	5	9.6%	
	Farmer's own produced cereal feed	C	1	-	1	1	-	3	5.8%	
	Procured cereal feed	C	6	9	11	11	8	45	86.5%	

Table : Summary of Upazila wise Data for Sherpur District

GeoCode No	Type of Data	893705	896709	897008	898806	899015	District	Ratio of Union	
Upazila Name		Jhenaigati	Nakla	Nalitabari	Sherpur	Sreebardi			
3) Goat / sheep									
Number of animals	T	45,400	20,200	41,260	44,761	19,935	171,556	96.2%	
Rice straw	C	5	4	5	6	4	24	46.2%	
Green Fodder	C	6	9	10	12	8	45	86.5%	
Waste of human food	C	2	-	1	1	2	6	11.5%	
Farmer's own produced cereal feed	C	2	-	1	-	-	3	5.8%	
Procured cereal feed	C	1	2	1	2	2	8	15.4%	
4) Fowls									
Number of animals	T	119,180	44,500	144,600	150,512	75,500	534,292	98.1%	
Rice straw	C	-	-	-	-	-	-	0.0%	
Green Fodder	C	-	-	-	2	2	4	7.7%	
Waste of human food	C	7	9	11	12	8	47	90.4%	
Farmer's own produced cereal feed	C	2	3	1	3	-	9	17.3%	
Procured cereal feed	C	2	2	4	5	5	18	34.6%	
5) Ducks									
Number of animals	T	43,700	17,400	68,800	35,517	35,080	200,497	98.1%	
Rice straw	C	-	-	-	-	-	-	0.0%	
Green Fodder	C	-	-	-	2	1	3	5.8%	
Waste of human food	C	4	3	8	8	4	27	51.9%	
Farmer's own produced cereal feed	C	3	1	4	3	2	13	25.0%	
Procured cereal feed	C	2	-	2	4	3	11	21.2%	
(2) Seriousness of major problems in animal production in terms of the following items: Your oppening (0)									
1) Feed supply									
High	C	-	-	-	-	-	-	0.0%	
Medium	C	7	9	11	14	10	51	98.1%	
Low	C	-	-	1	-	-	1	1.9%	
Countermeasures									
2) Water supply in dry season									
High	C	-	-	-	1	1	2	3.8%	
Medium	C	7	9	8	11	6	41	78.8%	
Low	C	-	-	4	2	3	9	17.3%	
Countermeasures									
3) Vaccination									
High	C	6	8	8	7	7	36	69.2%	
Medium	C	-	-	-	2	2	4	7.7%	
Low	C	1	1	5	5	1	13	25.0%	
Countermeasures									
4) Shelter at flooding									
High	C	-	-	1	1	1	3	5.8%	
Medium	C	2	-	-	1	-	3	5.8%	
Low	C	5	9	10	11	9	44	84.6%	
Countermeasures									
5) Easiness of access to veterinary surgeon									
High	C	1	-	1	-	-	2	3.8%	
Medium	C	6	6	8	8	4	32	61.5%	
Low	C	-	3	2	6	6	17	32.7%	
Countermeasures									
2.2.10 Fisheries									
(1) How many farmers with fisheries and specialized fishers are working in your Union ?									
(i) Farmers with fisheries									
Open water fisheries	T	4,900	4,202	6,394	10,717	5,743	31,956	96.2%	
Aquaculture	T	5	-	621	2,217	100	2,943	25.0%	
Fishery in water bodies	T	2,680	1,542	1,851	2,741	2,057	10,871	96.2%	
Others (fish processing and fish dealers)	T	20	-	5	560	50	635	9.6%	
(ii) Specialized fishers.									
Open water fisheries	T	2,815	635	660	5,720	973	10,803	98.1%	
Aquaculture	T	1,550	1,365	1,930	1,630	1,700	8,175	73.1%	
Fishery in water bodies	T	-	105	150	550	250	1,055	19.2%	
Others (fish processing and fish dealers)	T	-	-	-	-	-	-	0.0%	
(2) Open water fisheries									
1) Name of major species									
Fishing place		Rui River, Beel	Rui Khal, Beel	Rui River, Khal, Beel	Rui Pond, Beel	Rui River			
Total Catch/year (kg)	Kg	T	32,650	9,050	19,025	576,350	11,700	648,775	92.3%
Sold fish /production (%)	%	A	43.00	35.00	42.33	34.58	40.00	38.76	88.5%
Selling price (Tk/kg)	Tk/Kg	A	100.00	96.67	91.67	109.17	93.00	98.16	98.1%
Change	(%)								
Increase		C	1	2	2	1	1	7	13.5%
Constant		C	-	-	-	1	-	1	1.9%
Decrease		C	4	7	10	12	7	40	76.9%

Table : Summary of Upazila wise Data for Sherpur District

GeoCode No	Type of Data	893705	896709	897008	898806	899015	District	Ratio of Union
Upazila Name		Jhenaigati	Nakla	Nalitabari	Sherpur	Sreebardi		
2) b.Major species								
Fishing place		Catla Pond	Catla Khal	Catla Floodplain	Catla Pond, khal	Catla Khal		
Total Catch/year (kg)	Kg	2,000	1,000	4,500	35,200	4,700	47,400	26.9%
Sold fish /production (%)	%	50.00	40.00	51.67	26.25	53.33	42.50	23.1%
Selling price (Tk/kg)	Tk/Kg	100.00	92.22	89.17	106.92	93.00	96.40	98.1%
Change	%							
Increase		1	2	1	-	-	4	7.7%
Constant		-	-	-	-	-	-	0.0%
Decrease		4	7	10	13	8	42	80.8%
3) c.Major species								
Fishing place		Mrigal Floodplain	Mrigal Khal	Mrigal Khal	Mrigal Beel	Mrigal Beel		
Total Catch/year (kg)	Kg	5,000	1,050	4,600	31,100	3,680	45,430	25.0%
Sold fish /production (%)	%	50.00	40.00	48.33	15.00	51.67	39.55	21.2%
Selling price (Tk/kg)	Tk/Kg	101.67	91.88	84.17	98.85	93.00	93.27	96.2%
Change	%							
Increase		1	1	1	-	-	3	5.8%
Constant		-	1	-	-	-	1	1.9%
Decrease		4	6	10	13	8	41	78.8%
4) d.Major species								
Fishing place		Sarpunti Floodplain		Punti Khal	Punti Beel	Punti Pond		
Total Catch/year (kg)	Kg	20,000	200	3,700	22,750	3,600	50,250	21.2%
Sold fish /production (%)	%	50.00	40.00	36.67	35.00	43.33	39.55	21.2%
Selling price (Tk/kg)	Tk/Kg	73.33	71.25	83.75	79.58	74.00	77.29	94.2%
Change	%							
Increase		1	-	1	-	-	2	3.8%
Constant		-	1	-	-	1	2	3.8%
Decrease		4	7	10	12	7	40	76.9%
5) e.Major species								
Fishing place		Silvercarp		Tengra Khal	Tengra Khal	Tengra, Koi Beel		
Total Catch/year (kg)	Kg	15,000	180	4,150	10,600	2,030	31,960	21.2%
Sold fish /production (%)	%	50.00	40.00	48.33	25.00	36.67	38.18	21.2%
Selling price (Tk/kg)	Tk/Kg	83.33	76.88	77.50	85.00	83.00	81.15	94.2%
Change	%							
Increase		1	1	1	-	-	3	5.8%
Constant		-	1	-	-	1	2	3.8%
Decrease		4	6	10	12	7	39	75.0%
6 e.Major species								
Fishing place								
Total Catch/year (kg)	Kg	15,000	350	275	-	-	15,625	5.8%
Sold fish /production (%)	%	50.00	40.00	35.00			41.67	5.8%
Selling price (Tk/kg)	Tk/Kg	66.67	90.00	78.75	75.00	70.00	77.38	40.4%
Change	%							
Increase		1	-	-	-	-	1	1.9%
Constant		-	1	-	-	-	1	1.9%
Decrease		2	4	4	6	3	19	36.5%
(3) Aquaculture								
1) Name of major fish species								
Culturing year period		Rui Jun-Jul	Rui Jun-Jul	Rui Jun-Jul	Rui Jun-Jul	Rui Jun-Jul		
Source of finhgerling							Private & govt Hatcharies.	
Type of water body		Pond	Pond	Pond	Pond	Pond		
Sold fish production(%)	A	80.71	85.56	83.00	80.00	78.99	81.58	92.3%
Selling price (Tk/kg)	A	82.86	71.25	71.00	80.00	71.00	75.11	92.3%
Change of fish production in last few years	in Kg							
Start								
End								
2) Name of major fish species								
Culturing year period		Catla Jun-Jul	Catla Jun-Jul	Catla Jun-Jul	Catla Jun-Jul	Catla Jun-Jul		
Source of finhgerling							Private & govt Hatcharies.	
Type of water body		Pond	Pond	Pond	Pond	Pond		
Sold fish production(%)	A	70.00	78.75	87.50	60.00	90.00	81.25	23.1%
Selling price (Tk/kg)	A	81.43	71.43	75.91	86.36	74.00	78.15	90.4%
Change of fish production in last few years	in Kg							
Start								
End								

Table : Summary of Upazila wise Data for Sherpur District

GeoCode No	Type of Data	893705	896709	897008	898806	899015	District	Ratio of Union
Upazila Name		Jhenaigati	Nakla	Nalitabari	Sherpur	Sreebardi		
3) Name of major fish species		Mrigal	Mrigal	Mrigal	Mrigal	Mrigal		
Culturing Year/ period		Jun-Jul	Jun-Jul	Jun-Jul	Jun-Jul	Jun-Jul		
Source of finhgerling								
Type of water body		Pond	Pond	Pond	Pond	Pond		
Sold fish production(%)	A	65.00	82.50	92.50	60.00	90.00	81.11	17.3%
Selling price (Tk/kg)	A	72.14	65.71	66.36	74.55	68.00	69.46	90.4%
Change of fish production in last few years	in Kg							
Start								
End								
4) Name of major fish species		Carpio	Carpio	Carpio	Carpio	Shingi, Magur		
Culturing Year/ period		Jun-Jul	Jun-Jul	Jun-Jul	Jun-Jul	Jun-Jul		
Source of finhgerling								
Type of water body		Pond	Pond	Pond	Pond	Pond		
Sold fish production(%)	A	75.00	77.50	92.50	60.00	90.00	80.00	17.3%
Selling price (Tk/kg)	A	61.43	64.29	62.27	67.00	59.44	62.95	86.5%
Change of fish production in last few years	in Kg							
Start								
End								
5) Name of major fish species			Silvercarp			Koi		
Culturing year period			Jun-Jul			Jun-Jul		
Source of finhgerling								
Type of water body			Pond			Pond		
Sold fish production(%)	A	70.00	83.33		40.00		72.00	9.6%
Selling price (Tk/kg)	A	86.67	45.00		110.00	77.50	70.67	30.8%
Change of fish production in last few years	in Kg							
Start								
End								
(2) How many nurseries in your Union (in Nos.)								
By government	T	5	-	2	-	-	7	3.8%
By private	T	103	22	13	39	10	187	61.5%
How many Hatcheries in your Union?	T	-	-	-	-	-	-	0.0%
By government	T	-	-	-	-	1	1	1.9%
By private	T	6	18	18	19	15	76	59.6%
(3) Seriousness of damages in aquaculture								
1) Damage by Fish diseases								
Serious	C	-	-	3	1	2	6	11.5%
Medium	C	7	9	10	13	7	46	88.5%
Low	C	-	-	-	-	-	-	0.0%
Mitigation measure		Take advice from fisheries dept.			Advice	from	Advice	from
2) Loss by flooding								
Serious	C	6	8	9	12	10	45	86.5%
Medium	C	1	1	2	2	-	6	11.5%
Low	C	-	-	-	-	-	-	0.0%
Mitigation measure		Heighten the embankment around the ponds.			Protection	of		
3) Shortage of water								
Serious	C	1	-	-	-	-	1	1.9%
Medium	C	1	-	5	3	5	14	26.9%
Low	C	5	9	8	11	5	38	73.1%
Mitigation measure		Establish artificial water reservoir.			Installation	of		
4) Shortage of fingerling supply								
Serious	C	-	-	2	2	-	4	7.7%
Medium	C	2	1	3	2	2	10	19.2%
Low	C	4	8	7	9	8	36	69.2%
Mitigation measure					Fingerlings			
5) Damage by Water Pollution								
Serious	C	3	-	2	-	-	5	9.6%
Medium	C	-	-	4	1	-	5	9.6%
Low	C	-	2	3	3	2	10	19.2%
Mitigation measure								
6) Damages by others(Please specify)								
Serious	C	1	-	1	-	-	2	3.8%
Medium	C	-	-	-	-	-	-	0.0%
Low	C	-	-	-	-	-	-	0.0%
Mitigation measure								
(4) Is there any facility of fish storage in your Union ?								
Yes	C	-	7	-	-	-	7	13.5%
No	C	3	-	7	1	5	16	30.8%
(4.1) How many Ice factory and storage capacity in your Union								
Number of Ice factory	in No	C	2	7	1	5	15	36.5%
Capacity	in MT	T	-	-	-	1	1	1.9%

Table : Summary of Upazila wise Data for Sherpur District

GeoCode No	Type of Data	893705	896709	897008	898806	899015	District	Ratio of Union
Upazila Name		Jhenaigati	Nakla	Nalitabari	Sherpur	Sreebardi		
(4.2) How many refrigerated/ Ice van and capacity								
Number of refrigerated/Ice van in No	C	2	6	5	1	4	18	34.6%
Capacity in MT	T	-	-	-	-	-	-	0.0%
2.2.11 Marketing								
1 How many markets in your Union ? in No.								
Number of daily markets	T	21	27	29	37	34	148	98.1%
Number of 1 - 3 markets in a week	T	9	53	19	26	35	142	63.5%
Total	T	30	80	48	63	69	290	100.0%
Registration by: Union Parishad or other								
Upazila	C	2	-	-	1	-	3	5.8%
Union Parishad	C	5	8	5	8	9	35	67.3%
Others	C	-	-	-	-	-	-	0.0%
2 Management by : Union Parishad or other								
Upazila	C	-	-	-	-	-	-	0.0%
Union Parishad	C	6	8	6	8	7	35	67.3%
Others	C	-	-	-	-	-	-	0.0%
3 Selling methods								
1) Selling to %	A							0.0%
Self	A	64.29	61.11	67.08	66.15	53.00	62.65	100.0%
Through middlemen	A	41.67	38.89	39.50	33.85	47.00	39.69	92.3%
Contract	A		10.00				10.00	1.9%
Through cooperatives	A		2.00				2.00	1.9%
Others	A		8.00				8.00	1.9%
2) Selling by %								
Independently	A	61.67	62.67	75.83	76.43	54.00	67.73	100.0%
Jointly	A	46.00	39.56	29.00	36.67	46.00	38.74	82.7%
4 Major transportation for marketing								
1) Rice,								
Walking	A	15.00	21.11	24.00	20.42	22.00	20.83	94.2%
Cart	A	10.33	13.88	25.00	16.82	6.11	13.50	76.9%
Richshaw	A	17.14	23.11	30.58	20.00	11.00	20.92	98.1%
Van	A	38.33	30.00	34.36	32.50	50.56	36.66	94.2%
Refrigerated/Ice van	A	50.00		15.00		20.00	25.00	7.7%
Truck	A	13.00	14.86	15.00	18.57	18.00	16.12	53.8%
Boat	A	20.00	2.00	10.00	11.25	7.50	10.22	19.2%
Distance from farm to markets farmers usu Km	A	4.00	2.00	4.33	10.00	2.00	5.13	86.5%
2) Jute								
Walking	A	26.67	25.83	22.78	22.75	26.00	24.33	78.8%
Cart	A		25.00	12.50	11.63	4.00	13.53	36.5%
Richshaw	A	30.00	15.00	20.29	22.50	32.67	23.18	46.2%
Van	A	62.50	58.33	39.44	45.91	69.11	53.38	78.8%
Refrigerated/Ice van	A			15.00		5.00	11.67	5.8%
Truck	A	5.00	26.67	14.00	7.67	5.00	13.20	42.3%
Boat	A		5.00		28.25	10.00	21.33	13.5%
Distance from farm to markets farmers usu Km	A		2.00	5.00	10.00	2.00	4.75	76.9%
3) Vegetables								
Walking	A	48.57	42.50	41.67	40.45	38.33	41.91	90.4%
Cart	A	10.00	10.00	16.67	7.00	12.50	11.90	21.2%
Richshaw	A	15.00	29.38	24.09	15.73	16.67	20.29	88.5%
Van	A	24.17	22.86	29.09	29.82	30.71	27.81	82.7%
Refrigerated/Ice van	A	20.00		15.00		30.00	21.67	11.5%
Truck	A	37.50	15.00	15.00	18.33	19.00	19.47	36.5%
Boat	A		5.00		20.00		12.50	5.8%
Distance from farm to markets farmers usu Km	A	4.00		4.00			4.00	44.2%
4) Potato								
Walking	A		10.00		50.00	30.00	30.00	5.8%
Cart	A		10.00		10.00	10.00	10.00	5.8%
Richshaw	A		50.00		15.00	30.00	31.67	5.8%
Van	A		20.00		20.00	30.00	23.33	5.8%
Refrigerated/Ice van	A							0.0%
Truck	A		10.00		5.00		7.50	3.8%
Boat	A							0.0%
Distance from farm to markets farmers	A							3.8%
5) Wheat								
Walking	A	12.50	10.00	37.50	4.00	27.50	21.13	15.4%
Cart	A	30.00	5.00	20.00	10.00	5.00	14.00	11.5%
Richshaw	A	16.50	50.00	20.00	16.00	2.00	20.14	15.4%
Van	A	30.00	25.00	32.50	65.00	47.50	38.75	17.3%
Refrigerated/Ice van	A							0.0%
Truck	A	5.00	20.00		2.00		9.00	5.8%
Boat	A	20.00			3.00		11.50	5.8%
Distance from farm to markets farmers usu Km	A	4.00		4.00			4.00	13.5%
6) Banana								

Table : Summary of Upazila wise Data for Sherpur District

GeoCode No	Type of	893705	896709	897008	898806	899015	District	Ratio of Union	
Upazila Name	Data	Jhenaigati	Nakla	Nalitabari	Sherpur	Sreebardi			
	Walking	A						0.0%	
	Cart	A						0.0%	
	Richshaw	A						0.0%	
	Van	A						0.0%	
	Refrigerated/Ice van	A						0.0%	
	Truck	A						0.0%	
	Boat	A						0.0%	
	Distance from farm to markets farmers usu Km	A						0.0%	
7)	Mustard								
	Walking	A		20.00		42.00	37.60	9.6%	
	Cart	A		10.00		17.33	15.50	9.6%	
	Richshaw	A		50.00		21.25	27.00	11.5%	
	Van	A		10.00		19.50	17.60	11.5%	
	Refrigerated/Ice van	A						0.0%	
	Truck	A		10.00		6.00	7.33	5.8%	
	Boat	A				5.00	5.00	3.8%	
	Distance from farm to markets farmers usu Km	A						9.6%	
8)	Sugarcane								
	Walking	A		20.00			20.00	3.8%	
	Cart	A		25.00			25.00	3.8%	
	Richshaw	A						0.0%	
	Van	A		35.00			35.00	7.7%	
	Refrigerated/Ice van	A						0.0%	
	Truck	A		40.00			40.00	7.7%	
	Boat	A		10.00			10.00	1.9%	
	Distance from farm to markets farmers usually sell pr	A						3.8%	
9)	Oilseed								
	Walking	A		20.00			20.00	1.9%	
	Cart	A		10.00			10.00	1.9%	
	Richshaw	A		4.00			4.00	1.9%	
	Van	A		60.00			60.00	1.9%	
	Refrigerated/Ice van	A						0.0%	
	Truck	A		6.00			6.00	1.9%	
	Boat	A						0.0%	
	Distance from farm to markets farmers usu Km	A						1.9%	
10)	Pulses								
	Walking	A						0.0%	
	Cart	A						0.0%	
	Richshaw	A						0.0%	
	Van	A						0.0%	
	Refrigerated/Ice van	A						0.0%	
	Truck	A						0.0%	
	Boat	A						0.0%	
	Distance from farm to markets farmers usu Km	A						0.0%	
11)	Pineapple								
	Walking	A						0.0%	
	Cart	A						0.0%	
	Richshaw	A						0.0%	
	Van	A						0.0%	
	Refrigerated/Ice van	A						0.0%	
	Truck	A						0.0%	
	Boat	A						0.0%	
	Distance from farm to markets farmers usually sell products	A						0.0%	
12)	Chilli								
	Walking	A						0.0%	
	Cart	A						0.0%	
	Richshaw	A						0.0%	
	Van	A						0.0%	
	Refrigerated/Ice van	A						0.0%	
	Truck	A						0.0%	
	Boat	A						0.0%	
	Distance from farm to markets farmers usually sell pr	A						0.0%	
5	What type of complains raised by the farmers in your Union (0 yes)								
	Distance of market	C	7	8	11	10	8	44	84.6%
	Poor condition of rural road	C	7	9	12	12	10	50	96.2%
	Lack of market information	C	2	-	3	2	2	9	17.3%
	Others								

Table : Summary of Upazila wise Data for Sherpur District

GeoCode No	Type of Data	893705	896709	897008	898806	899015	District	Ratio of Union		
Upazila Name		Jhenaigati	Nakla	Nalitabari	Sherpur	Sreebardi				
2.3	Collection of data on food consumption and human security in rural areas									
2.3.1	Food consumption and nutrition problems									
(1)	Breakfast									
	Not take	%	A	3.50	3.67	8.56	5.63	6.80	5.81	80.8%
	Yes		C	7	9	12	14	10	52	100.0%
	Type of Food			Rice, Bread, Pul Rice, Bread, Pulse: Panta Rice, Brez Rice, Bread, Veç Water Rice, Bread, Puffed rice						
(2)	Lunch									
	Not take	%	A	5.00	2.50	28.50	27.00	30.00	18.23	25.0%
	Yes		C	7	9	12	14	10	52	100.0%
	Type of Food			Rice, Fish, Vege Rice, Fish, Meat, P Rice, Bread, Veç Rice, Fish, Meat Rice, Fish, Pulses, Meat						
(3)	Dinner									
	Not take	%	A	5.00	1.75	50.00	29.60	2.00	17.67	23.1%
	Yes		C	7	9	12	14	9	51	98.1%
	Type of Food			Rice, Bread, Pul Rice, Vegetables, F Rice, Bread, Pul Rice, Fish, Brear Rice, Fish, Pulses						
(4)	Child nutrition: Number and ratio of									
	Wasting	in No.	T	11,520	13,357	14,885	25,020	16,945	81,727	78.8%
		%	A	34.86	32.00	30.08	31.45	29.11	31.24	88.5%
	Stunting	in No.	T	7,700	3,915	4,030	6,800	3,630	26,075	73.1%
		%	A	10.86	9.63	10.75	20.18	9.06	12.46	90.4%
	Underweight: Percent in person	in No.	T	41,200	40,595	29,235	39,600	25,700	176,330	69.2%
		%	A	57.57	62.50	60.08	53.83	62.78	59.06	92.3%
2.3.2	Sufficiency of items in human security in your Union (please answer by)									
(1)	Sufficiency of drinking water									
	Sufficient		C	5	8	8	14	9	44	84.6%
	Insufficient		C	2	1	4	-	1	8	15.4%
(2)	Source of drinking water									
	Well		C	7	9	12	14	10	52	100.0%
	River		C	1	-	1	-	-	2	3.8%
	Pond		C	-	1	-	-	-	1	1.9%
	Others		C	-	-	2	-	-	2	3.8%
(3)	First Aide services									
	Yes		C	4	9	7	12	8	40	76.9%
	No		C	3	-	5	3	1	12	23.1%
	If yes, what type of organizations provides the services									
	Vaccination		C	3	9	6	13	8	39	75.0%
	Weight		C	2	8	4	8	6	28	53.8%
	Family planning		C	3	9	6	11	7	36	69.2%
	Healthcare to mother and child		C	-	-	-	-	-	-	0.0%
	Others		C	2	7	4	9	4	26	50.0%
(4)	Access to electricity in household									
	Government	%	A	5.00		20.00	18.33	20.00	17.50	15.4%
	Other sources (please specify)		A	57.20	60.56	46.71	36.55	41.67	47.63	73.1%
	No electricity		A	28.75	39.44	64.36	62.75	57.71	54.30	88.5%
(5)	Housing									
	Sufficient		C	-	1	2	1	-	4	7.7%
	Insufficient		C	7	8	10	13	10	48	92.3%
(6)	Percentage of Primary School/Madrash: %									
a.	Primary School									
	Boys		A	54.00	46.33	48.91	44.36	45.80	47.29	98.1%
	Girls		A	53.14	42.67	44.45	38.21	39.70	42.69	98.1%
b.	Madrassa									
	Boys		A	17.57	24.00	22.36	16.54	17.80	19.56	96.2%
	Girls		A	11.57	15.00	22.91	10.69	10.20	14.18	96.2%
2.3.3	Household economy in rural area. Please put the estimated information on income based on source of income									
(1)	Major sources of cash income									
		Tk/family/year								
1)	Aus		A	1,833.33	875.00	4,080.00	2,250.00	6,650.00	2,984.62	50.0%
2)	Aman		A	6,571.43	6,555.56	7,416.67	6,707.86	7,350.00	6,950.19	100.0%
3)	Boro		A	6,583.33	6,777.78	10,050.00	8,642.86	7,844.44	8,254.00	96.2%
4)	Jute		A	1,466.67	1,200.00	1,125.00	3,025.00	2,933.33	2,011.54	50.0%
5)	Vegetables		A	5,142.86	5,077.78	4,125.00	4,892.86	5,070.00	4,815.38	100.0%
6)	Livestock		A	3,000.00	2,444.44	2,333.33	1,938.46	2,000.00	2,278.43	98.1%
7)	Non agricultural work and others		A	3,333.33	4,244.44	4,000.00	3,708.33	4,055.56	3,897.87	90.4%
8)	Fish		A	800.00	1,100.00	1,607.14	1,428.57	2,500.00	1,330.00	48.1%
9)	Pulses		A	-	400.00	200.00	250.00	1,000.00	257.89	36.5%
10)	Oil seeds		A	-	666.67	1,240.00	800.00	1,000.00	690.91	42.3%
11)	Poultry		A	2,428.57	1,222.22	1,833.33	992.86	1,220.00	1,463.46	100.0%
12)	Sale of self labour		A	7,416.67	2,188.89	1,958.33	1,907.69	2,000.00	2,650.00	96.2%
13)	Total		A	35,400.00	30,844.44	36,645.83	31,465.00	31,010.00	32,995.38	100.0%

Table : Summary of Upazila wise Data for Sherpur District

GeoCode No		Type of Data	893705	896709	897008	898806	899015	District	Ratio of Union	
Upazila Name			Jhenaigati	Nakla	Nalitabari	Sherpur	Sreebardi			
(2)	Major expenditure	Tk/family/year								
1)	Food	A	16,071.43	17,222.22	20,258.33	15,321.43	18,100.00	17,425.00	100.0%	
2)	Housing	A	800.00	2,000.00	1,000.00	2,375.00	3,666.67	2,104.17	46.2%	
3)	Clothes	A	4,928.57	3,544.44	3,791.67	3,821.43	4,200.00	3,988.46	100.0%	
4)	Health	A	2,071.43	1,833.33	2,333.33	1,750.00	2,300.00	2,048.08	100.0%	
5)	Child education	A	3,428.57	1,488.89	3,291.67	1,928.57	2,350.00	2,450.00	100.0%	
6)	Entertainment	A	1,457.14	911.11	1,270.00	1,092.31	1,333.33	1,193.75	92.3%	
7)	Credit Refund	A	1,200.00	-	-	6,333.33	2,000.00	3,823.53	32.7%	
8)	Agriculture	A	3,400.00	2,416.67	9,122.22	9,909.09	5,000.00	6,988.24	65.4%	
9)	Total	A	31,814.29	27,277.78	37,658.33	37,728.57	30,950.00	33,803.85	100.0%	
3.2	Problem Occurrences									
3.2.1	Describe the water related problems									
(1)	Flood									
	Area	Acre	T	13,300	10,852	17,585	31,034	38,300	111,071	88.5%
	Depth	Feet	A	2.50	1.90	2.99	2.30	27.50	4.46	59.6%
	Length	Km	A							0.0%
	Duration	Months	A	2.75	2.22	2.67	2.92	3.50	2.81	80.8%
	Month of the Year			Jul-Sep	Aug-Sep		Jul-Sep			
(2)	Drought									
	Area	Acre	T	6,400	8,400	4,330	9,600	2,200	30,930	63.5%
	Depth	Feet	A							0.0%
	Length	Km	A							0.0%
	Duration	Months	A	3.75	4.50	3.71	3.56	4.60	4.00	63.5%
	Month of the Year	Months		Mar-May	Mar-May, Sep-Oct					
(3)	Shortage of irrigation water in agriculture									
	Area	Acre	T	24,800	8,250	9,990	9,200	2,400	54,640	63.5%
	Depth	Feet	A							0.0%
	Length	Km	A							0.0%
	Duration	Months	A	3.75	3.63	3.00	3.50	4.00	3.55	55.8%
	Month of the Year	Months			Apr-May, Sep-Oct					
(4)	Soil Erosion									
	Area	Acre	T	2,000	1,180	800	1,500	400	5,880	17.3%
	Depth	Feet	A							0.0%
	Length	Km	A							0.0%
	Duration	Months	A				4.50	4.00	4.25	7.7%
	Month of the Year									
(5)	Water Logging									
	Area	Acre	T	4,750	3,850	1,131	2,600	1,600	13,931	51.9%
	Depth	Feet	A	6.00		5.00			5.50	3.8%
	Length	Km	A							0.0%
	Duration	Months	A	3.75	4.25	4.00	3.86	3.80	3.97	57.7%
	Month of the Year			Oct-Jan	Oct-Jan		Jul-Dec			
(6)	Domestic water supply									
	Area	Acre	T	-	-	-	-	-	-	0.0%
	Depth	Feet	A							0.0%
	Length	Km	A							0.0%
	Duration	Months	A				4.00	5.00	4.50	3.8%
	Month of the Year									
(7)	Water quality (Arsenic related problem)									
	Area	Acre	T	-	-	-	10	-	10	1.9%
	Depth	Feet	A							0.0%
	Length	Km	A							0.0%
	Duration	Months	A	12.00	12.00	12.00	12.00	12.00	12.00	38.5%
	Month of the Year									
(8)	Other problems (please specify)									
	Area	Acre	T	-	-	-	-	-	-	0.0%
	Depth	Feet	A							0.0%
	Length	Km	A							0.0%
	Duration	Months	A							0.0%
	Month of the Year									
3.2.2	Describe the water related problems that occurred in your union in extreme year.(Please identify the problematic areas on as many maps as needed)									
(1)	Flood									
	Area	Acre	T	7,300	11,650	21,585	24,600	34,250	99,385	86.5%
	Depth	Feet	A	2.00	1.78	1.47	4.25	5.00	2.48	36.5%
	Length	Km	A							0.0%
	Duration	Months	A	3.00	2.56	2.88	2.69	3.56	2.91	82.7%
	Month of the Year	Months		Jul-Sep	Aug-Sep	Jul-Sep	Jul-Aug	Jul-Sep		
(2)	Drought									
	Area	Acre	T	2,550	6,700	11,730	7,400	3,700	32,080	61.5%
	Depth	Feet	A							0.0%
	Length	Km	A							0.0%
	Duration	Months	A	3.50	4.38	4.13	3.44	4.80	4.03	65.4%
	Month of the Year	Months		Mar-May	Mar-May, Sep-Oct	Mar-May	Mar-May	Oct-Dec		
(3)	Shortage of irrigation water in agriculture									

Table : Summary of Upazila wise Data for Sherpur District

GeoCode No	Type of Data	893705	896709	897008	898806	899015	District	Ratio of Union	
Upazila Name		Jhenaigati	Nakla	Nalitabari	Sherpur	Sreebardi			
Location									
Name of mouza / village				Konkanda, Sultanpur, B		Jhograrchar			
Area	Acre	T	3,350	7,150	12,150	10,290	3,150	36,090	57.7%
Depth	Feet	A							0.0%
Length	Km	A							0.0%
Duration	Months	A	4.00	3.75	3.17	3.00	4.00	3.52	55.8%
Month of the Year	Months		Apr-May, Sep-Oct		Apr-May, Sep-Oct	Mar-Apr	Dec-Mar		
(4) Soil Erosion									
Area	Acre	T	-	-	900	-	-	900	3.8%
Depth	Feet	A							0.0%
Length	Km	A							0.0%
Duration	Months	A			2.00			2.00	3.8%
Month of the Year	Months								
(5) Water logging							kodomtoli		
Area	Acre	T	200	1000		200		-	35.6%
Depth	Feet	A							1.9%
Length	Km	A							0.0%
Duration	Months	A	3.33	4.14	4.33	4.00	3.67	3.96	53.8%
Month of the Year	Months		Oct-Jan	Oct-Jan		Jul-Nov	Oct-Dec		
(6) Domestic water supply									
Area	Acre	T	-	-	-	-	-	-	0.0%
Depth	Feet	A							0.0%
Length	Km	A							0.0%
Duration	Months	A					5.00	5.00	1.9%
Month of the Year	Months						Oct-Dec		
(7) Water quality (Arsenic related problems)									
Area	Acre	T	-	-	5	-	-	5	1.9%
Depth	Feet	A							0.0%
Length	Km	A							0.0%
Duration	Months	A	12.00	12.00	12.00	12.00	12.00	12.00	44.2%
Month of the Year	Months								
(8) Other problems (please specify)									
Area	Acre	T	-	-	-	-	-	-	0.0%
Depth	Feet	A							0.0%
Length	Km	A							0.0%
Duration	Months	A	12.00					12.00	1.9%
Month of the Year	Months								
3.3 Water Related Problems									
3.3.1 How does the water related problems affect your Union in a normal year?									
(1) Human									
Number affected		T	34,000	49,387	33,905	116,300	68,400	301,992	96.2%
Total area	Acre	T	-	-	-	-	-	-	0.0%
Length	Km	T	-	-	-	-	-	-	0.0%
Estimated Quantity affected	in Tk.	T	-	-	-	-	-	-	0.0%
(2) Houses									
Number affected		T	2,910	6,453	6,975	51,120	11,160	78,618	98.1%
Total area	Acre	T	-	-	-	-	-	-	0.0%
Length	Km	T	-	-	-	-	-	-	0.0%
Estimated Quantity affected	in Tk.	T	2,750,000	4,625,000	8,675,000	13,150,000	2,585,000	31,785,000	82.7%
(3) Crops									
Number affected		T	6	-	251	1,000	-	1,257	11.5%
Total area	Acre	T	2,160	3,307	8,270	11,811	3,955	29,503	90.4%
Length	Km	T	-	-	-	-	-	-	0.0%
Estimated Quantity affected	in Tk.	T	72,580,000	24,320,000	24,450,000	88,575,720	27,630,000	237,555,720	94.2%
(4) Livestock									
Number affected		T	3,393	13,900	2,188	10,280	3,870	33,631	94.2%
Total area	Acre	T	-	-	-	-	-	-	0.0%
Length	Km	T	-	-	-	-	-	-	0.0%
Estimated Quantity affected	in Tk.	T	4,350,000	570,500	2,627,000	815,800	1,565,000	9,928,300	84.6%
(5) Road									
Number affected		T	6	2	2	10	5	5	60.4%
Total area	Acre	T	-	-	-	-	-	-	0.0%
Length	Km	T	84	29	74	341	85	612	88.5%
Estimated Quantity affected	in Tk.	T	6,850,000	4,300,000	10,805,000	18,300,000	17,750,000	58,005,000	98.1%
(6) Embankment									
Number affected		T	7	-	24	4	-	35	25.0%
Total area	Acre	T	-	-	-	-	-	-	0.0%
Length	Km	T	9	-	1,057	11	-	1,077	21.2%
Estimated Quantity affected	in Tk.	T	3,400,000	-	1,700,000	1,050,000	-	6,150,000	26.9%

Table : Summary of Upazila wise Data for Sherpur District

GeoCode No	Type of	893705	896709	897008	898806	899015	District	Ratio of
Upazila Name	Data	Jhenaigati	Nakla	Nalitabari	Sherpur	Sreebardi		Union
(7) Bridge								
Number affected	T	-	1	16	34	2	53	28.8%
Total area	Acre T	-	-	-	-	-	-	0.0%
Length	Km T	-	70	75	345	-	490	15.4%
Estimated Quantity affected	in Tk. T	-	-	12,950,000	15,980,000	2,000,000	30,930,000	25.0%
(8) Culvert								
Number affected	T	15	20	20	86	40	181	38.5%
Total area	Acre T	-	-	-	-	-	-	0.0%
Length	Km T	-	27	-	110	-	137	15.4%
Estimated Quantity affected	in Tk. T	500,000	250,000	1,600,000	8,128,000	2,000,000	12,478,000	34.6%
(9) Regulator								
Number affected	T	-	-	-	-	-	-	0.0%
Total area	Acre T	-	-	-	-	-	-	0.0%
Length	Km T	-	-	-	-	-	-	0.0%
Estimated Quantity affected	in Tk. T	-	-	-	-	-	-	0.0%
(10) Others								
Number affected	T	-	-	-	-	-	-	3.0%
Total area	Acre T	-	-	-	-	-	-	0.0%
Length	Km T	-	-	-	-	-	-	0.0%
Estimated Quantity affected	in Tk. T	-	-	800,000	-	-	800,000	1.9%
3.3.2	Describe the water related problems that occur in your Union in extreme year.(Please identify the problematic areas on as many maps as needed)							
(1) Human								
Number affected	T	53,800	65,726	71,252	162,800	114,350	467,928	98.1%
Total area	Acre T	-	-	-	-	-	-	0.0%
Length	Km T	-	-	-	-	-	-	0.0%
Affected Year	Year							
(2) Houses								
Number affected	T	9,225	7,510	14,735	28,200	33,700	93,370	100.0%
Total area	Acre T	-	-	-	-	-	-	0.0%
Length	Km T	-	-	-	-	-	-	0.0%
Affected Year	Year	2004	2004		2004			
(3) Crops								
Number affected	T	6	-	5,051	5,000	-	10,057	11.5%
Total area	Acre T	16,000	12,950	17,378	46,700	20,200	113,228	82.7%
Length	Km T	-	-	-	-	-	-	0.0%
Affected Year	Year	2004	2004	2004				
(4) Livestock								
Number affected	T	27,503	15,500	21,612	43,875	49,200	157,690	96.2%
Total area	Acre T	-	-	-	-	-	-	0.0%
Length	Km T	-	-	-	-	-	-	0.0%
Affected Year	Year		2004	2004		2004		
(5) Road								
Number affected	T	90	59	154	366	141	810	100.0%
Total area	Acre T	-	-	-	-	-	-	0.0%
Length	Km T	188	137	2,590	795	189	3,899	76.9%
Affected Year	Year	2004	2004	2004		2004		
(6) Embankment								
Number affected	T	9	1	38	11	3	62	36.5%
Total area	Acre T	-	-	-	-	-	-	0.0%
Length	Km T	12	3	1,060	31	-	1,105	21.2%
Affected Year	Year							
(7) Bridge								
Number affected	T	10	7	24	41	30	112	76.9%
Total area	Acre T	-	-	-	-	-	-	0.0%
Length	Km T	260	131	190	712	380	1,673	55.8%
Affected Year	Year			2004		2004		
(8) Culvert								
Number affected	T	44	46	48	120	117	375	92.3%
Total area	Acre T	-	-	-	-	-	-	0.0%
Length	Km T	483	124	90	310	310	1,317	59.6%
Affected Year	Year	2004	2004			2004		
(9) Regulator								
Number affected	T	-	-	-	-	1	1	1.9%
Total area	Acre T	-	-	-	-	-	-	0.0%
Length	Km T	-	-	-	-	-	-	0.0%
Affected Year	Year					2004		
(10) Others								
Number affected	T	51	55	48	138	66	358	71.2%
Total area	Acre T	-	-	-	-	-	-	0.0%
Length	Km T	-	-	-	-	-	-	0.0%
Affected Year	Year	2004	2004		2004			

Table : Summary of Upazila wise Data for Sherpur District

GeoCode No	Type of	893705	896709	897008	898806	899015	District	Ratio of		
Upazila Name	Data	Jhenaigati	Nakla	Nalitabari	Sherpur	Sreebardi		Union		
3.4	Describe the water bodies lying inside or flowing through your union.(Please identify the water bodies on as many maps as needed)									
3.4.1	River									
	Name	Shomeswari, Marsha			Boleshor River kghiya, Laksmidangri.					
	Area	Acre	T	1,697	1,325	2,559	12,640	2,050	20,271	88.5%
	Width	Feet	A	288.57	348.33	349.50	257.78	390.00	320.95	90.4%
	Depth	Feet	A	18.00	14.83	22.00	15.38	20.00	18.29	88.5%
	Perennial	Ö	C	-	-	-	14	10	24	46.2%
	Seasonal	Ö	C	7	6	9	13	10	45	86.5%
	Length of water stay	Months	A	8.29	7.17	8.56	8.88	8.67	8.36	88.5%
	Month of the Year	Months		Jun-Dec			Jun-Jan	Jun-Jan		
3.4.2	Khal									
	Name	Gurguri khal.			Norkoia Khal Velua, Kodomtoli,					
	Area	Acre	T	1,293	765	1,380	2,920	2,570	8,928	92.3%
	Width	Feet	A	128.00	90.63	137.80	255.00	202.86	156.55	94.2%
	Depth	Feet	A	32.00	10.13	14.20	11.00	14.57	15.51	92.3%
	Perennial	Ö	C	-	-	-	14	10	24	46.2%
	Seasonal	Ö	C	7	8	10	14	10	49	94.2%
	Length of water stay	Months	A	6.57	4.63	7.30	5.88	6.75	6.27	94.2%
	Month of the Year	Months		Jun-Nov	Jun-Sep	Jan-Dec	Jun-Sep	Jun-Oct		
3.4.3	Large water body (Haor, Baor, Beel)									
	Name	Eashli Beel			Shimulchora					
	Area	Acre	T	900	2,825	3,925	6,387	4,690	18,727	84.6%
	Width	Feet	A	185.33	400.00	964.29	407.50	270.00	563.67	67.3%
	Depth	Feet	A	102.50	4.00	8.43	12.00	10.00	19.89	65.4%
	Perennial	Ö	C	-	-	-	14	10	24	46.2%
	Seasonal	Ö	C	5	9	7	14	10	45	86.5%
	Length of water stay	Months	A	10.40	12.00	9.00	11.67	10.56	10.89	84.6%
	Month of the Year	Months			Jan-Dec	Jul-Dec	Jan-Dec	Jan-Dec		
3.4.4	Pond/Dighi									
	Name	Not answered			Laksmidangri					
	Area	Acre	T	60	170	186	505	1,200	2,121	63.5%
	Width	Feet	A			1,150.00	225.00		780.00	51.9%
	Depth	Feet	A			10.50	11.00		10.67	53.8%
	Perennial	Ö	C	-	-	-	14	10	24	46.2%
	Seasonal	Ö	C	2	2	8	14	10	36	69.2%
	Length of water stay	Months	A	5.00	3.00	11.75	8.25	6.13	8.22	67.3%
	Month of the Year	Months				Jan-Dec	Not answered	Jun-Dec		
3.5	Describe the water supply sources and									
3.5.2	Ground Water									
	Type and number of water supply sources in No.									
	Number of wells by type									
	Hand TW		T	24,820	23,839	29,853	46,347	31,940	156,799	94.2%
	Shallow TW		T	1,005	968	1,580	4,889	2,131	10,573	98.1%
	Deep TW		T	69	59	112	65	98	403	76.9%
	Is there groundwater table lowering?	in feet								
	Yes		C	6	8	10	13	10	47	90.4%
	No		C	-	-	1	-	-	1	1.9%
	Constant		C	-	-	-	-	-	-	0.0%
4	Statistics on Yearwise Area, Yield, and Production of Agricultural Crops									
4.1	HVV Aus									
4.1.1	Year 2001									
	Area	000 Acre	T	5,000	3,850	11,441	3,660	7,820	31,771	76.9%
	Yield	MT/Acre	A	20.00	1.03	1.28	3.37	0.84	2.20	75.0%
	Production	MT	T	100,000	3,975	14,208	7,161	2,552	127,895	100.0%
4.1.2	Year 2002									
	Area	000 Acre	T	4,000	4,350	9,696	3,712	2,830	24,588	73.1%
	Yield	MT/Acre	A	20.00	1.00	1.30	17.03	0.85	6.18	73.1%
	Production	MT	T	80,000	4,350	12,266	29,831	2,579	129,026	100.0%
4.1.3	Year 2003									
	Area	000 Acre	T	5,000	4,150	11,216	3,876	8,860	33,102	75.0%
	Yield	MT/Acre	A	20.00	1.00	1.28	17.07	0.85	6.18	73.1%
	Production	MT	T	100,000	4,150	13,677	30,061	2,609	150,497	100.0%
4.1.4	Average of three Years									
	Area	000 Acre	T	4,660	4,117	10,222	3,949	9,636	32,584	75.0%
	Yield	MT/Acre	A	20.00	1.00	1.36	49.76	0.85	15.66	73.1%
	Production	MT	T	93,200	4,117	13,369	191,818	2,264	304,768	100.0%
4.2	HVV Aman									
4.2.1	Year 2001									
	Area	000 Acre	T	6,000	2,475	38,366	36,922	26,000	109,763	84.6%
	Yield	MT/Acre	A	40.00	1.97	1.48	172.35	1.05	58.02	82.7%
	Production	MT	T	240,000	4,225	55,149	40,590	12,255	352,219	100.0%

Table : Summary of Upazila wise Data for Sherpur District

GeoCode No		Type of Data	893705	896709	897008	898806	899015	District	Ratio of Union	
Upazila Name			Jhenaigati	Nakla	Nalitabari	Sherpur	Sreebardi			
4.2.2	Year 2002									
	Area	000 Acre	T	6,000	2,510	32,091	42,080	10,940	93,621	80.8%
	Yield	MT/Acre	A	40.00	1.99	1.50	1.03	1.16	2.29	80.8%
	Production	MT	T	240,000	4,379	46,130	41,795	13,124	345,427	100.0%
4.2.3	Year 2003									
	Area	000 Acre	T	6,000	2,640	29,078	41,295	12,590	91,603	82.7%
	Yield	MT/Acre	A	40.00	1.96	1.50	1.03	1.15	2.28	80.8%
	Production	MT	T	240,000	4,569	42,271	41,134	12,825	340,799	100.0%
4.2.4	Average of three Years									
	Area	000 Acre	T	24,000	2,565	32,719	47,393	10,977	117,654	80.8%
	Yield	MT/Acre	A	40.00	1.97	1.50	1.21	1.15	2.35	80.8%
	Production	MT	T	960,000	4,439	47,747	69,001	12,920	1,094,106	100.0%
4.3	HYV Boro									
4.3.1	Year 2001									
	Area	000 Acre	T	-	1,125	29,932	38,900	16,500	86,457	73.1%
	Yield	MT/Acre	A	-	1.88	1.77	2.01	1.80	1.87	71.2%
	Production	MT	T	-	1,713	52,698	#VALUE!	26,220	#VALUE!	100.0%
4.3.2	Year 2002									
	Area	000 Acre	T	-	1,150	26,889	38,810	13,300	80,149	78.8%
	Yield	MT/Acre	A	-	2.06	1.80	2.00	1.74	1.91	78.8%
	Production	MT	T	-	1,870	50,484	80,351	24,026	156,730	100.0%
4.3.3	Year 2003									
	Area	000 Acre	T	-	1,300	23,901	38,420	15,970	79,591	80.8%
	Yield	MT/Acre	A	-	2.09	1.80	2.01	1.82	1.94	78.8%
	Production	MT	T	-	2,181	43,752	79,608	26,178	151,718	100.0%
4.3.4	Average of three Years									
	Area	000 Acre	T	-	1,225	25,574	42,616	15,457	84,872	80.8%
	Yield	MT/Acre	A	-	2.08	1.90	2.33	1.79	2.05	78.8%
	Production	MT	T	-	1,972	47,540	124,677	25,879	200,067	100.0%
4.4	Local variety rice									
4.4.1	Year 2001									
	Area	000 Acre	T	-	14,900	14,663	625	2,530	32,718	59.6%
	Yield	MT/Acre	A	-	1.79	1.39	1.13	0.92	1.34	57.7%
	Production	MT	T	-	29,416	19,468	586	1,909	51,379	100.0%
4.4.2	Year 2002									
	Area	000 Acre	T	-	14,900	17,003	628	2,150	34,681	57.7%
	Yield	MT/Acre	A	-	1.87	1.38	1.14	0.95	1.38	57.7%
	Production	MT	T	-	29,570	23,539	605	2,056	55,770	100.0%
4.4.3	Year 2003									
	Area	000 Acre	T	-	15,380	14,193	618	2,500	32,691	59.6%
	Yield	MT/Acre	A	-	1.88	1.38	1.14	0.95	1.38	57.7%
	Production	MT	T	-	30,562	18,788	597	1,965	51,912	100.0%
4.4.4	Average of three Years									
	Area	000 Acre	T	-	15,126	15,343	1,024	2,057	33,550	57.7%
	Yield	MT/Acre	A	-	1.87	1.38	2.24	1.04	1.51	57.7%
	Production	MT	T	-	30,031	20,656	3,035	2,328	56,050	100.0%
4.5	Wheat									
4.5.1	Year 2001									
	Area	000 Acre	T	-	7,890	460	2,445	1,690	12,485	73.1%
	Yield	MT/Acre	A	-	1.00	1.07	0.92	0.78	0.93	71.2%
	Production	MT	T	-	7,890	443	2,307	1,367	12,007	100.0%
4.5.2	Year 2002									
	Area	000 Acre	T	-	7,895	461	2,405	1,460	12,221	71.2%
	Yield	MT/Acre	A	-	1.01	1.12	0.92	0.76	0.93	71.2%
	Production	MT	T	-	7,900	446	2,289	1,202	11,836	100.0%
4.5.3	Year 2003									
	Area	000 Acre	T	-	7,950	459	2,510	1,650	12,569	73.1%
	Yield	MT/Acre	A	-	1.02	1.07	0.93	0.80	0.94	71.2%
	Production	MT	T	-	7,960	442	2,391	1,363	12,156	100.0%
4.5.4	Average of three Years									
	Area	000 Acre	T	-	7,912	460	3,022	3,077	14,470	73.1%
	Yield	MT/Acre	A	-	1.01	1.09	1.14	0.77	1.01	71.2%
	Production	MT	T	-	7,916	444	5,905	1,250	15,515	100.0%
4.6	Maize									
4.6.1	Year 2001									
	Area	000 Acre	T	-	390	14	12	360	776	46.2%
	Yield	MT/Acre	A	-	1.00	1.83	1.00	0.53	0.94	44.2%
	Production	MT	T	-	390	27	12	199	628	100.0%
4.6.2	Year 2002									
	Area	000 Acre	T	-	390	16	11	345	762	44.2%
	Yield	MT/Acre	A	-	1.25	1.83	1.00	0.54	1.04	44.2%
	Production	MT	T	-	490	31	11	234	766	100.0%

Table : Summary of Upazila wise Data for Sherpur District

GeoCode No		Type of Data	893705	896709	897008	898806	899015	District	Ratio of Union	
Upazila Name			Jhenaigati	Nakla	Nalitabari	Sherpur	Sreebardi			
4.6.3	Year 2003									
	Area	000 Acre	T	-	390	14	11	435	850	46.2%
	Yield	MT/Acre	A	-	1.00	1.83	1.00	0.56	0.96	44.2%
	Production	MT	T	-	390	27	11	241	669	100.0%
4.6.4	Average of three Years									
	Area	000 Acre	T	-	390	15	11	550	966	44.2%
	Yield	MT/Acre	A	-	1.00	1.83	1.00	0.54	0.95	44.2%
	Production	MT	T	-	390	28	11	230	659	98.1%
4.7	Potato									
4.7.1	Year 2001									
	Area	000 Acre	T	-	545	1,456	3,000	1,230	6,231	82.7%
	Yield	MT/Acre	A	-	2.93	4.43	7.57	2.72	4.79	80.8%
	Production	MT	T	-	1,623	6,779	25,306	3,376	37,084	100.0%
4.7.2	Year 2002									
	Area	000 Acre	T	-	560	1,458	3,185	1,155	6,358	78.8%
	Yield	MT/Acre	A	-	2.79	4.59	7.65	2.62	4.81	78.8%
	Production	MT	T	-	1,565	6,799	27,303	3,368	39,035	100.0%
4.7.3	Year 2003									
	Area	000 Acre	T	-	565	950	3,420	2,164	7,099	80.8%
	Yield	MT/Acre	A	-	2.98	4.60	7.62	2.64	4.84	78.8%
	Production	MT	T	-	1,689	5,332	29,270	3,425	39,716	100.0%
4.7.4	Average of three Years									
	Area	000 Acre	T	-	553	945	3,502	2,155	7,155	80.8%
	Yield	MT/Acre	A	-	2.96	4.59	6.48	2.66	4.45	78.8%
	Production	MT	T	-	1,650	5,313	23,841	3,421	34,225	100.0%
4.8	Vegetables									
4.8.1	Year 2001									
	Area	000 Acre	T	100	9,410	262	1,195	1,180	12,147	78.8%
	Yield	MT/Acre	A	500.00	1.56	5.76	2.99	1.67	15.35	76.9%
	Production	MT	T	50,000	14,120	1,961	6,046	2,539	74,666	100.0%
4.8.2	Year 2002									
	Area	000 Acre	T	100	9,262	236	1,248	1,053	11,899	75.0%
	Yield	MT/Acre	A	500.00	1.61	5.16	2.99	1.66	15.50	75.0%
	Production	MT	T	50,000	13,905	1,743	6,375	2,446	74,469	100.0%
4.8.3	Year 2003									
	Area	000 Acre	T	100	9,615	267	1,392	1,200	12,574	76.9%
	Yield	MT/Acre	A	500.00	1.62	15.44	2.92	1.64	17.32	75.0%
	Production	MT	T	50,000	14,439	7,594	6,700	2,563	81,296	100.0%
4.8.4	Average of three Years									
	Area	000 Acre	T	100	9,462	263	1,320	1,078	12,223	73.1%
	Yield	MT/Acre	A	500.00	1.54	17.73	3.49	1.66	17.91	73.1%
	Production	MT	T	50,000	13,612	7,583	6,688	2,516	80,399	100.0%
4.9	Spices									
4.5.1	Year 2001									
	Area	000 Acre	T	-	-	10	-	95	105	11.5%
	Yield	MT/Acre	A	-	-	2.20	-	0.36	0.67	11.5%
	Production	MT	T	-	-	22	-	41	63	100.0%
4.5.2	Year 2002									
	Area	000 Acre	T	-	-	11	-	103	114	11.5%
	Yield	MT/Acre	A	-	-	2.20	-	0.36	0.66	11.5%
	Production	MT	T	-	-	24	-	42	66	100.0%
4.5.3	Year 2003									
	Area	000 Acre	T	-	-	12	-	98	110	11.5%
	Yield	MT/Acre	A	-	-	2.20	-	0.36	0.67	11.5%
	Production	MT	T	-	-	26	-	41	68	100.0%
4.5.4	Average of three Years									
	Area	000 Acre	T	-	-	11	-	599	610	13.5%
	Yield	MT/Acre	A	-	-	2.20	-	4.19	3.86	11.5%
	Production	MT	T	-	-	24	-	328	352	100.0%
4.1	Pulses							#REF!		0.0%
4.10.1	Year 2001									
	Area	000 Acre	T	-	659	44	70	435	1,208	50.0%
	Yield	MT/Acre	A	-	0.67	0.89	0.54	0.48	0.62	48.1%
	Production	MT	T	-	460	29	40	172	701	100.0%
4.10.2	Year 2002									
	Area	000 Acre	T	-	644	46	68	338	1,096	48.1%
	Yield	MT/Acre	A	-	0.67	0.95	0.54	0.49	0.63	48.1%
	Production	MT	T	-	450	33	40	179	701	100.0%
4.10.3	Year 2003									
	Area	000 Acre	T	-	680	46	65	443	1,234	50.0%
	Yield	MT/Acre	A	-	0.67	0.89	1.47	0.54	0.76	48.1%
	Production	MT	T	-	475	31	122	198	826	100.0%

Table : Summary of Upazila wise Data for Sherpur District

GeoCode No	Type of	893705	896709	897008	898806	899015	District	Ratio of		
Upazila Name	Data	Jhenaigati	Nakla	Nalitabari	Sherpur	Sreebardi		Union		
4.10.4	Average of three Years									
	Area	000 Acre	T	-	664	45	128	339	1,176	48.1%
	Yield	MT/Acre	A	-	0.67	1.58	3.67	0.54	1.13	48.1%
	Production	MT	T	-	463	44	933	193	1,634	100.0%
4.11	Oil seeds									
4.11.1	Year 2001									
	Area	000 Acre	T	-	865	221	20	560	1,666	42.3%
	Yield	MT/Acre	A	-	0.76	0.68	0.38	0.38	0.59	42.3%
	Production	MT	T	-	686	109	8	147	950	100.0%
4.11.2	Year 2002									
	Area	000 Acre	T	-	890	224	18	585	1,717	42.3%
	Yield	MT/Acre	A	-	0.76	25.43	0.37	0.32	5.07	42.3%
	Production	MT	T	-	704	608	7	154	1,472	100.0%
4.11.3	Year 2003									
	Area	000 Acre	T	-	905	225	18	570	1,718	42.3%
	Yield	MT/Acre	A	-	0.76	0.68	0.38	0.31	0.56	42.3%
	Production	MT	T	-	714	113	7	146	980	100.0%
4.11.4	Average of three Years									
	Area	000 Acre	T	-	893	223	19	665	1,800	44.2%
	Yield	MT/Acre	A	-	0.76	0.68	0.37	0.36	0.58	42.3%
	Production	MT	T	-	706	112	7	148	974	100.0%
4.12	Sugarcane									
4.12.1	Year 2001									
	Area	000 Acre	T	-	805	30	-	435	1,270	40.4%
	Yield	MT/Acre	A	-	1.00	3.08	-	2.26	1.88	38.5%
	Production	MT	T	-	805	93	-	900	1,798	100.0%
4.12.2	Year 2002									
	Area	000 Acre	T	-	790	45	-	355	1,190	38.5%
	Yield	MT/Acre	A	-	1.00	3.17	-	2.23	1.88	38.5%
	Production	MT	T	-	790	129	-	884	1,803	100.0%
4.12.3	Year 2003									
	Area	000 Acre	T	-	800	30	-	455	1,285	40.4%
	Yield	MT/Acre	A	-	1.00	3.15	-	2.24	1.88	38.5%
	Production	MT	T	-	800	95	-	951	1,845	100.0%
4.12.4	Average of three Years									
	Area	000 Acre	T	-	795	35	-	548	1,378	40.4%
	Yield	MT/Acre	A	-	1.00	3.13	-	2.27	1.89	38.5%
	Production	MT	T	-	795	105	-	917	1,817	100.0%
4.13	Jute									
4.13.1	Year 2001									
	Area	000 Acre	T	-	435	72	1,785	2,170	4,462	67.3%
	Yield	MT/Acre	A	-	0.88	0.89	0.74	0.92	0.84	65.4%
	Production	MT	T	-	381	71	1,471	1,109	3,031	100.0%
4.13.2	Year 2002									
	Area	000 Acre	T	-	415	62	1,770	1,175	3,422	65.4%
	Yield	MT/Acre	A	-	0.88	0.89	0.73	0.90	0.83	65.4%
	Production	MT	T	-	364	61	1,426	1,102	2,952	100.0%
4.13.3	Year 2003									
	Area	000 Acre	T	-	415	62	1,800	1,165	3,442	65.4%
	Yield	MT/Acre	A	-	0.88	0.89	0.74	0.91	0.83	65.4%
	Production	MT	T	-	364	61	1,484	1,093	3,001	100.0%
4.13.4	Average of three Years									
	Area	000 Acre	T	-	418	65	2,386	1,163	4,033	65.4%
	Yield	MT/Acre	A	-	0.82	0.89	0.86	0.91	0.87	65.4%
	Production	MT	T	-	344	64	3,379	1,093	4,880	100.0%
4.14	Cotton									
4.14.1	Year 2001									
	Area	000 Acre	T	-	65	-	-	10	75	17.3%
	Yield	MT/Acre	A	-	0.74	-	-	0.40	0.70	17.3%
	Production	MT	T	-	48	-	-	4	52	100.0%
4.14.2	Year 2002									
	Area	000 Acre	T	-	71	-	-	0	71	17.3%
	Yield	MT/Acre	A	-	0.74	-	-	4.00	1.10	17.3%
	Production	MT	T	-	52	-	-	2	54	100.0%
4.14.3	Year 2003									
	Area	000 Acre	T	-	70	-	-	110	180	19.2%
	Yield	MT/Acre	A	-	0.74	-	-	0.40	0.70	17.3%
	Production	MT	T	-	52	-	-	4	56	100.0%
4.14.4	Average of three Years									
	Area	000 Acre	T	-	70	-	-	210	280	19.2%
	Yield	MT/Acre	A	-	0.74	-	-	0.40	0.70	17.3%
	Production	MT	T	-	52	-	-	4	56	100.0%
5	Damages by the 2004 flood.Please									

Table : Summary of Upazila wise Data for Sherpur District

GeoCode No	Type of	893705	896709	897008	898806	899015	District	Ratio of Union	
Upazila Name	Data	Jhenaigati	Nakla	Nalitabari	Sherpur	Sreebardi			
5.1	How was the damage by the flood in 2004								
	Much higher	C	-	1	5	1	3	10	19.2%
	Higher	C	-	2	3	1	4	10	19.2%
	As-usual	C	-	2	1	-	1	4	7.7%
	Less	C	-	-	1	-	-	1	1.9%
5.2	How was the damage in the items below:								
5.2.1	Roads	%							
	Fully	A	15.00	8.33	22.73	48.18	37.40	28.21	73.1%
	Partial	A	45.00	52.78	23.75	31.25	44.44	36.93	84.6%
	No damage	A	82.86	38.89	55.42	35.36	41.30	48.13	100.0%
5.2.2	Houses	%							
	Fully	A	5.00	7.22	17.18	19.18	30.00	16.76	71.2%
	Partial	A	40.00	27.22	22.58	25.54	35.56	27.45	84.6%
	No damage	A	93.57	65.56	61.67	61.21	53.00	64.85	100.0%
5.2.3	Agricultural lands	%							
	Fully	A	75.00	31.11	41.82	26.82	57.14	38.72	75.0%
	Partial	A	10.00	42.22	23.33	27.69	47.86	32.50	80.8%
	No damage	A	87.86	26.67	38.33	53.21	26.50	44.71	100.0%
5.2.4	Crops	%							
	Fully	A	75.00	28.33	41.64	50.45	80.86	48.95	75.0%
	Partial	A	87.50	71.67	61.83	48.57	43.40	59.33	98.1%
	No damage	A	14.29	-	-	11.79	-	5.10	100.0%
5.2.5	Fisheries	%							
	Fully	A	100.00	35.00	46.36	69.17	96.67	62.50	80.8%
	Partial	A		58.33	23.33	24.17	20.00	32.79	65.4%
	No damage	A	85.71	6.67	34.17	20.00	11.00	28.08	100.0%
5.2.6	Livestock	%							
	Fully	A		5.00	13.36	20.70	39.00	17.32	65.4%
	Partial	A		25.56	18.75	14.46	30.71	20.93	78.8%
	No damage	A	100.00	70.00	69.00	71.79	59.00	72.17	100.0%
5.3	Damages in agricultural fields								
5.3.1	Damages in standing crops	%							
	Fully	A		42.50	45.00	45.00	84.29	51.89	71.2%
	Partial	A		42.78	20.00	28.85	48.00	31.79	75.0%
	No damage	A	100.00	19.44	38.75	37.86	17.00	39.23	100.0%
5.3.2	Loss of seedlings	%							
	Fully	A	100.00	74.38	49.09	73.33	100.00	72.18	75.0%
	Partial	A		23.13	22.08	26.82	90.00	28.03	63.5%
	No damage	A	85.71	13.33	32.92	16.07	12.00	28.08	100.0%
5.3.3	Loss of seeds	%							
	Fully	A	100.00	70.00	47.73	34.00	74.00	54.58	69.2%
	Partial	A		26.11	22.73	28.33	35.83	27.37	73.1%
	No damage	A	85.71	3.89	35.42	51.43	41.50	42.21	100.0%
5.3.4	Delay of cropping by flood	%							
	Fully	A	50.00	90.00	45.00	31.00	90.00	58.75	69.2%
	Partial	A	10.00	10.22	20.83	20.83	42.50	20.32	73.1%
	No damage	A	91.43	9.78	37.92	60.00	29.00	44.48	100.0%
5.3.5	Accumulation of mud	%							
	Fully	A		10.00	18.67	25.50	57.00	26.14	55.8%
	Partial	A		23.89	21.40	16.09	34.29	22.86	71.2%
	No damage	A	100.00	70.56	68.17	69.14	47.50	69.15	100.0%
5.3.6	Erosion of fields	%							
	Fully	A	20.00	5.00	10.22	12.11	24.00	12.62	55.8%
	Partial	A	40.00	34.29	30.60	16.00	34.44	28.89	69.2%
	No damage	A	91.43	70.56	66.83	81.93	57.00	72.96	100.0%
5.3.7	Loss of fodder	%							
	Fully	A	50.00	69.38	33.00	45.91	31.00	45.57	67.3%
	Partial	A	20.00	28.38	26.36	25.77	36.67	28.62	80.8%
	No damage	A	90.00	13.11	48.33	40.00	51.50	46.21	100.0%
5.3.8	Loss of cultured fish	%							
	Fully	A	100.00	55.44	49.09	74.55	100.00	68.98	76.9%
	Partial	A		32.22	27.08	19.27	40.00	26.27	63.5%
	No damage	A	85.71	12.33	27.92	26.29	16.00	30.27	100.0%
5.3.9	Loss of fingerlings	%							
	Fully	A	100.00	36.67	40.00	72.27	100.00	62.56	78.8%
	Partial	A		52.78	28.64	18.08		31.06	63.5%
	No damage	A	85.71	10.56	37.08	26.43	10.00	30.96	100.0%
5.3.10	Damages of aquaculture facilities	%							
	Fully	A	50.00	85.00	30.00	13.75	72.86	45.43	44.2%
	Partial	A	40.00	32.22	19.17	12.00	40.00	24.04	53.8%
	No damage	A	87.14	39.44	80.42	84.43	37.00	66.96	100.0%
5.3.11	Damages of fishing area	%							
	Fully	A	40.00	76.25	37.73	24.09	91.67	53.88	76.9%
	Partial	A	50.00	20.00	20.83	25.15	75.00	24.63	67.3%

Table : Summary of Upazila wise Data for Sherpur District

GeoCode No	Type of	893705	896709	897008	898806	899015	District	Ratio of Union	
Upazila Name	Data	Jhenaigati	Nakla	Nalitabari	Sherpur	Sreebardi			
	No damage	A	87.14	14.44	44.58	57.71	10.00	41.98	100.0%
5.3.12	Damage of Animal								
	Fully	A				18.75		18.75	15.4%
	Partial	A				23.75		23.75	15.4%
	No Loss	A	100.00	100.00	100.00	75.71	100.00	93.46	100.0%
5.3.13	Damage of Cattles								
	Fully	A	2.00	8.13	16.18	10.20	27.50	13.44	65.4%
	Partial	A	10.00	48.89	21.83	12.92	31.25	26.60	80.8%
	No Loss	A	98.29	43.89	63.33	81.64	64.00	69.73	100.0%
5.3.14	Dmage of Goats	%							
	Fully	A	5.00	20.00	21.82	20.50	23.00	20.71	67.3%
	Partial	A	20.00	51.67	25.67	9.25	30.56	27.42	82.7%
	No Loss	A	96.43	30.56	54.33	77.43	61.00	63.38	100.0%
6.3.15	Diseases of animals	%							
	Serious	A	20.00	13.50	16.36	13.45	41.00	18.36	69.2%
	Medium	A	30.00	66.33	23.92	13.31	30.63	30.98	82.7%
	Low	A	92.86	21.67	61.08	77.07	55.00	61.67	100.0%
Type of Data - T:Total, A:Average, C:Count									