

patterns, occupying nearly 42% of the total area, exceed the lands of double (21%) and single (22%) patterns. The predominantly double with some triple cropped lands are mainly moderate with some food agricultural lands which have shallow and moderately deeply flooding depth of 3 - 6 ft.

2.5 Land Classification of the Study Area

2.5.1 Land Class

Land capability classes indicate various groups of land which are fit to sustain production of common agricultural crops most economically. The sustenance of crops depends on the soil and land types, and the environmental conditions conducive to the growth of crops. The land capability classes, according to the USDA classification system, have been divided into class I to class V which ranges from very good, good, moderate, poor, very poor and non-agricultural lands.

Class I : The class I land is a very good agricultural land. It is generally level to gently undulating land which is intermittently flooded in the monsoon season. The soils are loamy, permeable, and well-drain, and contain almost favorable moisture holding capacity in the dry season. Normally it produces high yields of two wetland crops and one dryland crop. This land has slight or no limitation. The limitations are minor drought, minor drainage, and flash flood. These limitations need to be solved through moderate expenses to improve production of very high yield of three crops all the year round.

Class II : The class II land is a good agricultural land. The land is level to gently undulating and is intermittently to shallowly flooded in the monsoon season. The soils are loamy to clay which are moderately well-drained to poorly drained, and moderately permeable, and certain unfavorable moisture holding capacity in the dry season. The land normally produces one or two good wetland crops and one poor dryland crop. The land has slight limitations, such as, drought, poor drainage and flash flood. These limitations can be removed through moderate expenses to produce high yields of crops throughout the year.

Class III : The class III land is moderate agricultural land. The land is generally level to gently undulating or somewhat irregular, shallowly to deeply flooded in the monsoon season. The soils are loamy to clay, located in small ridges and basins and contain a very low moisture in the shallowly flooded ridge soils in the dry season. The land normally produces poor to moderate yields of one wetland crop and/or, one dryland crop. It has moderate to severe

limitations, such as, drought, severe drainage, deep flooding, slight to moderate salinity, unfavorable consistence and land levelling. All these limitations can be solved by adopting heavily expensive flood-protection, drainage, deep flooding, slight to moderate salinity, unfavorable consistence and land levelling. All these limitations can be solved by adopting heavily expensive flood-protection, drainage, tillage and irrigation measures for improvement of producing two good wetland crops and one moderate to good dryland crop.

Class IV : The class IV land is poor agricultural land. It is level to gently undulating, sloping to steps sloping land. The lands are mostly occupied by hills, forests, grasslands, deep basins and river banks. The soils are mostly loamy to clay and to some extent sandy and are moderately to deeply flooded. The soils are poorly drained and permeable with very low water holding capacity in the dry season. They have little potential for development. Normally, the land produces one poor to moderate broadcast Aman rice in a year. This has severe limitations, such as deep flooding combined with waterlogging in the dry season, strong salinity, severe erosion hazard, drought, on-rush of flood, tidal water and storm surges resulting to heavy damage of crops and deposits of infertile raw alluvium. Heavy expenditures will be incurred to protect such land from severe flood, storm-surge, drainage and tidal salinity and to heavily irrigate lands in the dry season in case one good transplanted Aman rice in the wet season and one good to very good Boro rice are produced in the dry season.

Class V : The class V land is very poor agricultural land. It also includes non-agricultural land. The land is generally level to gently undulating. The soils have shallow depth and are recently deposited in charlands and river banks. The soils are either barren or covered under grass. They have very little potential for improvement. The land has very severe limitations, such as infertile fresh alluvial deposits, strong salinity, severe erosion and storm-surge hazards which cannot support plant growth. The land is also not suitable for any form of improvement.

It may be mentioned here that the different land capability criteria, may it be good, moderate or poor, normally produce triple, double or single cropping patterns, do not always represent the corresponding triple, double or single cropped lands. The land capability by definition does not necessarily mean the soil and land qualities for growing a number of crops, but it expresses also the state of environmental conditions, such as, normal or flash flood, erosion and salinity hazards, drainage, tillage and irrigation problems which directly influence the crop performance in a particular land. All these environmental conditions constitute the limitations or difficulties encountered to land improvement which need to be done for producing much higher yields of more number of crops growing throughout the year. To avoid these difficulties, proper expenses will be necessary to protect lands from flood and drainage in the monsoon seasons,

droughtiness in the dry season. Such expenses in fact depend on the type of limitations for the particular land. If the limitations are slight, the expenses incurred will also be less in case of very good to good agricultural lands which will produce very good to good yields of crops throughout the year. For this type of land good quality soil and non-hazardous land types will be considered as the prerequisites. Hence the land capability criteria is the unique combination of both soil-land qualities and the degree of expenses to overcome limitations for soil and land improvement. One should not, therefore, forget that the land capacity criteria which do not only indicate the criteria of existing cropping patterns of yields, but they also indicate the limitations to overcome for better crop patterns and yields most economically in future.

2.5.2 Land Capability and Crop Suitability

The greater Comilla district has as many as 17 land capability association units (Table B.2.8) Out of the total district area of 2594 sq miles, the predominantly very good agricultural land association (covering 80% or more of very good land class) occupies 6%, predominantly good agricultural land 17%, predominantly moderate agricultural land 23% and predominantly poor agricultural land occupies 5% This means that the predominantly land classes of different categories occupy 51% of the total area of which predominantly moderate land has nearly one-half of the area.

The mainly good agricultural land association (covering 60% or more of good land class) occupies 12% mainly moderate land 13% mainly poor land and mainly very poor land occupy 1% each. Of the 27% of the total main land classes, mainly good and mainly moderate land classes together occupy 25% i.e., 92% of the total area of mainly land classes.

The remaining 24% of the total district area includes the mixed land classes, such as, very good and good, good and moderate, moderate and poor, poor and very poor, followed by homesteads and water bodies, non-agricultural land and urban land.

While considering the land capability classes in the individual districts of Comilla, Brahmanbaria and Chandpur, it is seen in Table B.2.8 that Comilla district has 55% of its area, covered mainly by very good and good agricultural lands, 20% area mainly covered by moderate agricultural land and the rest 7% is covered by moderate and poor agricultural lands. In case of Brahmanbaria district, mainly good agricultural land covers 5% mainly moderate agricultural land 48% and mainly poor agricultural land covers 22% of the district area. The Chandpur district has 35% of its total area covered mainly by very good and good agricultural land, 8% mainly by moderate agricultural land and 29% area, covered by moderate and good

agricultural land.

As regards the land type patterns of different capability classes, it may be mentioned here that the very good agricultural lands of this district have mainly slowly flooded with some moderately deeply flooded phases in the monsoon season. The good agricultural lands are mainly moderately deeply flooded to deeply flooded. The good agricultural lands have moderately well to imperfectly drained soils, partly subjected to slow drainage in the dry season. The poor agricultural lands are linked with deeply to very deeply flooded basin soils. The very poor agricultural lands constitute very steep hills, as well as, deeply flooded charlands with hazards of flood and river erosion.

Crop suitability classes are the relative suitability ratings of soils for production of specific crops. There are four crop suitability classes, ranging from class 1 for the most suitable soils to class 4 for the least suitable soils.

The crop suitability rating is the grading of individual crops, grown in the appropriate season of the year. While the land capability rating is based on the limitations of a soil for production of a common agricultural crop, growing throughout the year.

Soils are graded into different crop suitability ratings, based on the degree of individual crop production, resulted from the physical, hydrological and fertility status of the soil, as well as, crop responses to traditional or improved management practices, including flood protection, drainage and irrigation.

Suitability Class 1 : Highly Suitable

With traditional management the crop grows well and will produce moderate to high yields. For the crop under consideration, the soil has favorable physical and hydrological conditions during its growing period, and has a moderate to high fertility level and is responsive to good management with modern management the crop will produce high or very high yields.

Suitability Class 2 : Moderately Suitable

With traditional management, crop yields will be poor to moderate or subjected to occasional hazard of failure. The soil has somewhat unfavorable physical and hydrological characteristics for the crop under consideration, a medium to low fertility level or low response to management. With modern management crop yields will be moderate to high. Moderate

expenditure on flood protection, drainage and/or irrigation will be needed for the crop to produce very high yields.

Suitability Class 3 : Marginally Suitable

Under traditional management, the crop will produce no or poor yields or will be subjected to great hazard of failure. The soil has unfavorable physical and hydrological characteristics, and has low fertility level. The crop response to management is low. With modern management, major expenditure will be required for water control improvements or very intensive management practices will be required for the crop to give moderate to high yields. Generally the crop in this class is a marginal crop and is not recommended for the soil.

Suitability Class 4 : Not Suitable

Under traditional management little or no production is expected from the crop under consideration. The soil has rare physical, chemical and/or hydrological limitations for the crop, and has low response to management. Only with high expenditure for major improvements, such as, flood protection, drainage, terracing etc. or with special and intensive management practices, moderate to high yield is expected from the crop under consideration, but this will be uneconomic. The crop is not recommended.

2.5.3 Land Suitability Classes

(1) Debidwar

Debidwar has two land capability associations, such as, mainly good agricultural land and mainly moderate agricultural land (Figure B.2.10 and Table B.2.9). The good agricultural lands, cover 64.9% of the total area. Out of this, 41.6% are mainly good with some very good agricultural lands which are mainly moderately deeply flooded. Three remaining 23.3% are predominantly good agricultural lands which are mainly moderately deeply flooded. Mainly moderate agricultural lands occupy 18.3% of the area of which 8.3% are mainly moderate with some very good agricultural lands. The remaining 10% lands are predominantly moderate agricultural lands which are moderately deeply to very deeply flooded in the monsoon season and droughty in the dry season. It is estimated that very good agricultural land occupies around 18%, good agricultural land 47%, moderate agricultural land 17% and poor agricultural land 2% of the total area.

(2) Kachua

The Kachua upazila consists of three land capability units like, mainly good agricultural land associated with some very good agricultural land, mainly moderate agricultural land, and moderate and good agricultural land (Figure B.2.11). It is estimated from the land type patterns that very good agricultural land occupies about 7%, good agricultural land 41% and moderate agricultural land covers 32% of the total area of the upazila. Poor or very poor lands do not, however, exist in the Kachua upazila.

(3) Bancharampur

Six land capability associations have been observed in the Bancharampur upazila (Figure B.2.12). There are mainly good with moderate agricultural land, mainly moderate agricultural land, mainly moderate with some poor agricultural land, predominantly poor agricultural land, mainly poor with some good agricultural land, and very poor agricultural land. It is estimated that good agricultural land covers about 6%, moderate agricultural land 30%, poor agricultural land 38% and very poor agricultural land covers 11% of the total area of the district. The good land is shallowly flooded, moderate land is shallowly to deeply flooded, while the poor and very poor lands are deeply to very deeply flooded with hazards of flood and river erosion.

(4) Nabinagar

Like Bancharampur, Nabinagar upazila has six land capability association units, such as, mainly good with some moderate agricultural land, mainly moderate with some good agricultural land, mainly moderate with some poor agricultural land, mainly poor with some moderate agricultural land, mainly poor with some moderate agricultural land, and poor and very poor agricultural land (Figure B.2.13). The good agricultural land occupies around 23%, moderate agricultural land 49%, poor agricultural land 11% and very poor agricultural land occupies 1% of the total area in the upazila.

3. PRESENT AGRICULTURAL CONDITIONS

3.1 Overview

Agriculture plays a central role throughout the country. The agriculture ensures about 90% of the national food demand. As presented in Table B.3.1, the share of agricultural sector was about 40% of GDP in the past four years from 1985/6 to 1988/9. Taking into account barter and private trade outside cash economy, the real contribution of this sector might be much higher than its appearance in economic indicators presented in the official statics.

About 90% of the national population lives in rural areas and 80% depends primarily upon agriculture. Over 60% of the total labour forces in Bangladesh is engaged directly with the agricultural sector excluding agro-industries such as jute processing and manufacturing. Agriculture will continue to be the prime employer for many years to come.

The crop sub-sector is of much importance in the agricultural sector in terms of contribution to both food supply and earning of values. The livestock sub-sector is still of less importance in Bangladesh in spite of its steady growth, i.e. 3% per year. The crop sub-sector contributes 80% of the gross value added generated by agriculture compared to 8% for the livestock sub-sector. Both sub-sectors are integrated by supplementing each other. The livestock is to support the crop production as a source of work force. On the other hand, crop production provide feed sources to livestock where only a small extent of land is available for grazing. Animal population subsists largely on crop residues, e.g. rice straw, pulse hay, etc., grasses vegetating along uncultivated field borders, and crop by-products such as rice bran and oilseed cake.

3.2 Crop Production

3.2.1 Crops, Yield and Production

A diversity of crops are planted in Bangladesh as presented in Table B.3.2. Rice leads other crops in both planted area and production. With different types adapted to three main crop seasons, rice is planted throughout the year covering 80% of the total cropped area of Bangladesh. The distribution of land to crops in selected years is as follows.

Unit: %			
Crops	1973/74	1977/78	1981/82
Cereals	81.3	81.6	83.8
Rice	79.6	79.4	79.2
Wheat	0.9	1.5	4.0
Other cereals	0.8	0.7	0.5
Jute	7.2	5.8	4.3
Pulses	2.3	2.7	2.3
Oilseeds	2.3	2.6	2.3
Tubers	1.2	1.3	1.3
Others	5.8	6.0	6.0
Total	100.0	100.0	100.0

The production, planted area and unit yield of major crops in the project area are presented in Tables B.3.3 to 6.

(1) Rice

Rice dominates in the cropping patterns in Bangladesh. The annual production of rice is 15.5 million tons on average in the period from 1978/79 to 1988/89. The total planted area is 10.3 million ha giving the unit yield of 1.52 tons/ha. The following three types of rice are prevailing in cropping patterns which are determined by seasonal constraints and opportunities.

Crop	Planting Conditions	Growing Season	Planted Area
Aus	Rainfed Broadcasted and transplanted	March-September	3.0 (18.3)*
B. Aman	Rainfed 1. Broadcasted alone or mixed with Aus (Aus is harvested in June/July.) competing with flood from 0.5-4.0 m 2. Transplanted following Boro photoperiod-sensitive	March/April- November/December	1.7 (12.7)
T. Aman	Rainfed Transplanted in the areas with flood of less 0.5 m deep. photoperiod-sensitive	July/September- November/January	6.0 (44.3)
Boro	Irrigated Transplanted. Cold tolerance and photoperiod-insensitive. Nearly 87% of Boro is of modern varieties.	October/December- April/June	1.5 (12.5)

Source: BIRRI publication

Remark: *, () indicates percentage in the total cropped area.

Aus: This crop planted in the early part of the rainy season and is either broadcast (B. Aus) in March or transplanted (T. Aus) in April. They are harvested in July or August.

Aman: This is the main crop which is adapted to period of flooding and is usually transplanted (T. Aman) in July but can also be broadcast (B. Aman) in March. With photo-period sensitivity, Aman is ripen and harvested in December.

Boro: This is the main winter crop under irrigation: more than 80% of Boro is irrigated. This crop is sown in December and harvested in April. Average unit yield of Boro is more than twice those of Aus and Aman.

It seems to be possible to grow all three rice types on same farm plot over a one-year crop cycle, i.e. triple cropping of rice a year, on the basis only of their growth periods. However, it can not be achieved in practice. Three rice types are selectively planted depending on micro-topography governing flood conditions. The land conditions for each of three rice types are different from others. This results in combination of single or double cropping of rice and other crops.

Aman accounts for about 53% of the total rice production followed by Boro at 25% and Aus at 22%. Over the last nine years form 1979/80 to 1987/88, planted areas of Aman and Aus have been decreased. In contrast, both planted area and production of Boro have steadily increased in parallel to expansion of irrigated land. The increased rice production is derived mainly from expansion of Boro and contributes to the overall food supply in the nation.

The planted area production and unit yield of rice in the project area is summarized below.

Item	Kachua	Nabinagar	Bancharampur	Debidwar	Total/Average
1. Planted Area (ha)					
B. Aus (LV)	3,216	4,100	3,107	3,768	
T. Aus (LV)	1,168	3,610	2,366	5,655	
T. Aus (HYV)	2,032	1,632	3,898	988	
B. Aman (LV)	6,666	7,530	8,663	5,923	
T. Aman (LV)	1,758	2,200	691	2,157	
T. Aman (HYV)	4,558	1,456	1,125	13,944	
Boro (LV)	54	540	306	0	
Boro (HYV)	4,335	14,210	1,863	5,305	
Total (1)	23,787	35,278	22,019	37,740	118,824
2. Production (ton)					
B. Aus (LV)	2,277	3,972	2,936	3,346	
T. Aus (LV)	872	3,604	2,541	6,675	
T. Aus (HYV)	4,498	3,075	7,996	1,952	
B. Aman (LV)	7,550	7,850	9,103	6,602	
T. Aman (LV)	2,135	2,991	991	2,798	
T. Aman (HYV)	11,621	3,627	2,736	38,093	
Boro (LV)	105	1,493	696	0	
Boro (HYV)	15,077	45,234	6,316	18,910	
Total (2)	44,135	71,843	33,315	78,376	227,672
3. Unit Yield (ton/ha)					
B. Aus (LV)	0.7	1.0	0.9	0.9	
T. Aus (LV)	0.7	1.0	1.1	1.2	
T. Aus (HYV)	2.2	1.9	2.1	2.0	
B. Aman (LV)	1.1	1.0	1.1	1.1	
T. Aman (LV)	1.2	1.4	1.4	1.3	
T. Aman (HYV)	2.5	2.5	2.4	2.7	
Boro (LV)	1.9	2.8	2.3	-	
Boro (HYV)	3.5	3.2	3.4	3.6	
Average (3)	1.9	2.4	1.5	2.1	1.9

The major high yielding varieties (HYV) of Boro rice are BR varieties 3, 11, 12, 14, and 16 of which growth period is rather long, i.e. 135 days to 170 days. In Nabinagar, BR 14 is said to be less tolerant to cold hazard.

(2) Wheat

Wheat has drastically increased in both planted area and production during the last two decades. In the early 1970s, planted area of wheat was at the level of 100,000 ha in Bangladesh, while that attains to nearly 600,000 ha in the late 1980s, of which 240,000 ha or 40% are under irrigation. Accordingly, the production increased ten-fold. The increase of unit

yield is also substantial. The current output amounts to 1 million tons with average unit yield of 1.82 tons/ha, which is significantly higher than that of rice. It is said that the following four factors attributed to successful expansion of wheat.

- Availability of high yielding varieties (HYV) and appropriate technology packages
- Farmers' incentive by government support in price setting at an attractive level
- Less water requirement and drought resistance of wheat resulting in higher yields even under insufficient soil moisture conditions
- High demand of wheat

The planted area of wheat is also increasing in the project area. The following table presents the plated area, production and unit yield of wheat by Upazila.

Item	Kachua	Nabinagar	Bancharampur	Debidwar	Total/Average
1. Planted Area (ha)	3,280	4,649	4,766	4,101	16,796
2. Production (ton)	7,395	10,757	11,322	9,831	39,305
3. Unit Yield (ton/ha)	2.3	2.3	2.4	2.4	2.3

(3) Other cereals

In addition to rice and wheat, all other cereals are cultivated in an area of 220,000 ha in Bangladesh of which Italian millet (kaun) occupies 140,000 ha or 60%. In Greater Comilla, more than 90% of 19,000 ha for other cereals is covered by kaun. The other minor cereals include jab, barley, common millet (cheena), maize, pearl millet (bajra), great millet (joar), etc. These cereals constitute less than 1% of the total cereal production.

(4) Jute

Jute is the third most important crop in terms of plated area although it has declined over the last decade from 7% of the total cropped area in the early 1970s to less than 5% in the late 1980s with current planted area of 540,000 ha. Due to its greater value for international trade, however, raw and semi-processed jute still makes up about 60% of all merchandise exports.

The following table presents the plated area, production and unit yield of jute by Upazila of the project area.

Item	Kachua	Nabinagar	Bancharampur	Debidwar	Total/Average
1. Planted Area (ha)	815	2,717	1,568	775	5,875
2. Production (ton)	1,637	5,608	3,312	1,494	12,051
3. Unit Yield (ton/ha)	2.0	2.1	2.1	1.9	2.1

(5) Pulses

Pulses include lentil (masur), green gram (mung), gram (chola), black gram (mashkali), pigeonpea (arhar), chickling vetch (khesari), pea (matar), etc. of which masur is the most important crop. The planted area of pulses has steadily increased in Bangladesh from 300,000 ha to 460,000 ha during the last decade. Khesari occupies about 34% of the total pulses, followed by masur (28%) and chola (14%). Average yield remains at 700 kg/ha of which value is not attractive from the farmers' financial standpoint in comparison with wheat. Pulses is very important in terms of daily diet of Bangladeshi providing protein sources.

Pulses have always played a important role in the cropping system as well as component of diet in Bangladesh. In addition, pulses provide fodder to livestock either directly in grazing or as fodder after seeds have been harvested. The ability to fix nitrogen and return substantial amounts of organic matter to the soil are important factors in maintaining soil fertility.

The following table presents the plated area, production and unit yield of pulses by Upazila of the project area.

Item	Kachua	Nabinagar	Bancharampur	Debidwar	Total/Average
1. Planted Area (ha)	3,112	2,230	1,953	329	7,295
2. Production (ton)	2,145	1,934	1,633	251	5,712
3. Unit Yield (ton/ha)	0.7	0.9	0.8	0.8	0.8

(6) Oilseeds

Oilseeds are represented by rape and mustard, followed by sesame (til), linseed, groundnut, coconut, casters, etc. Without substantial expansion, oilseeds currently extends to 320,000 ha producing 250,000 tons. Mustard makes up 60% of the total oilseeds production. Pungent oil from mustard is suitable especially for culinary purposes, but production is stagnated and now under half of the national requirement. One of factors is increase of imported edible oil such as

soybean oil from U.S.A.

In the project area, mustard is the main oilseed crop. Only in Nabinagar, sesame is planted in 22 ha. The following table presents the plated area, production and unit yield of mustard by Upazila.

Item	Kachua	Nabinagar	Bancharampur	Debidwar	Total/Average
1. Planted Area (ha)	1,082	3,661	1,775	2,090	8,608
2. Production (ton)	1,048	3,170	1,621	1,779	7,618
3. Unit Yield (ton/ha)	1.0	0.9	0.9	0.9	0.9

(7) Potatoes

The area under this crop is 100,000 ha at present and the production amounts to some 1.1 million tons giving an average yield of 11 tons/ha. In the last decade, increases of production is attributed by use of HYVs and appropriate farm inputs although it is stagnant in recent years.

The following table presents the plated area, production and unit yield of pulses by Upazila of the project area.

Item	Kachua	Nabinagar	Bancharampur	Debidwar	Total/Average
1. Planted Area (ha)	3,007	695	1,598	2,711	8,011
2. Production (ton)	55,350	11,192	19,626	47,154	133,322
3. Unit Yield (ton/ha)	18.4	16.1	12.3	17.4	16.6

(8) Vegetables

The planted area of vegetables in Bangladesh has been sharply increased during the last three decades: 162,000 ha in 1960 and 454,000 ha including potato in 1983/84. Greater Comilla is the third largest producer of vegetable with output of 10% of the national production. As presented in Table B.3.7, various kind of vegetables are produced. The following table summarizes the planted area, production and unit yield of vegetables.

Item	Kachua	Nabinagar	Bancharampur	Debidwar	Total/Average
1. Planted Area (ha)	600	400	439	1,209	2,648
2. Production (ton)	12,380	7,215	9,301	22,619	51,515
3. Unit Yield (ton/ha)	20.6	18.0	21.2	18.7	19.5

(9) Others

The other crops are sugarcane, onions, tea, tobacco, fruits, cotton, sweet potato, spices, betel nuts and leaves, and barley.

3.2.2 Cropping Seasons

The cropping seasons are broadly categorized into three, namely (i) Rabi, (ii) Kharif-I and (iii) Kharif-II, according to temperature, rainfall and flood conditions as follows.

(1) Rabi season (October to March)

Rabi season falls in the dry winter, from October to March, characterized by little rainfall with much sunshine and no floods. Low temperature occurs in December to February. The main crops are Boro rice and diversity of crops such as wheat, potatoes, oilseeds, pulses, winter vegetables and so on. Due to insufficient residual soil moisture, crops can not ensure reasonable yields without irrigation water supply.

(2) Kharif-I season (April to June)

Air temperature rapidly increases and rainfall amount attains to the peak. Inundation by floods expands almost during the latter half of the season. Flood depth changes place by place dependent mainly on micro-topography of land. In higher land, such crops as Aus rice, oilseeds and vegetables are selectively planted. Some crops including chilli, sesame and vegetables are planted in both Rabi and Kharif-I seasons. Aman is broadcast more than one month before flooding.

(3) Kharif-II season (July to September)

Air temperature is still high in this season. Rainfall gradually decreases and flood depth is at the deepest in the year. B-Aman (deep water rice) sown in Kharif-I season continues to grow

under deeply flooded conditions. T-Aman intolerant to deep flood is cultivated in this season only in medium high lands.

3.2.3 Cropping Patterns

(1) Crop rotation

Various cropping patterns are applied in Bangladesh to overcome and utilize local topographic and flooding conditions, i.e. flood depth and duration. Multiple cropping is prevalent in the project area as presented in Figure B.3.1.

(2) Cropping intensity

Intensity of cropping represents the ration between total gross cropped area for annual crops and net area of farmland. It indicates the extent of use of land for annual crops for more than one crop in the same land. To make up food shortage due to rapidly increasing population, farmland tends to be used more intensively. The major factors which enable to enhance the cropping intensity are land fertility, irrigation, farm labour forces and machinery, short-maturity crops and varieties, and modern farm inputs including improved seeds, fertilizers, and agro-chemicals.

The cropping intensity in Bangladesh has been steadily increased from 148% in 1960 to 171% in 1983/84. It also changed depending upon farm land classes. Landless farmers with land holding size less than 0.05 acre (0.02 ha) intensively use their land as well as lease-in land at 368% of cropping intensity in 1983/84, while 187% for small farmers (0.05-2.49 acre), 171% for medium farmers (2.50-7.49 acre) and 153% for large farmer (7.50 acre or more). The cropping intensities in Greater Comilla are generally higher than the national average: 226% for landless farmers, 203% for small farmers, 188% for medium farmers and 171% for large farmers.

3.2.4 Farm Inputs

(1) Seeds

The distribution of improved seeds during the past eight years is presented in Table B.3.8. Out of the total seeds distributed in Bangladesh, i.e. 22,000 tons, 14,600 tons or 66% are wheat seeds followed by potato and paddy. Seeds for mustard and winter vegetables are also distributed for the limited amount. In Greater Comilla, 9% of the total improved seeds are used

as presented in Table B.3.8.

Use of improved seeds is highly limited except for wheat in Bangladesh. The standard farm input requirement set up by MOA is presented in Table B.3.9. On the basis of these sowing rates, availability of improved seeds for major crops is summarized below.

Crop	Sowing Rate (kg/ha)	Seeds Distributed (ton)	Area Sown (1000 ha)	Total Plant. Area (1000 ha)	Availability (%)
Boro Rice					
LV	24.2	6	3	-	-
HYV	21.9	1,141	52.1	-	-
Total	-	1,147	52.4	1,462	3.6
Wheat	74.8	14,565	194.7	574	33.9
Potato	1,243	4,258	3.4	111	3.1

(2) Chemical Fertilizers

According to the Agriculture and Livestock Census (1983/84), farmers applying chemical fertilizers have drastically increased during the period from 1960 to 1983/84, i.e. only 4.3% of the total farmers in 1960 to 62.0% in 1983/84. In greater Comilla, 86.3% of the farmers reported the use of chemical fertilizers in their farming.

The major fertilizers are Urea, Triple superphosphate (TSP) and Muriate of potash (KCl or MS) of which Urea is the most prevailing as presented in Table B.3.10. The sources of agro-chemicals are mainly domestic factories (67.9%) and the rest (32.1%) are imported as presented in Table B.3.11.

In the past four years from 1985/6 to 1988/9, Urea application accounted for 937,000 tons per year in Bangladesh, while 359,000 tons for TSP and 76,000 tons for MP. To make up shortage of S and Zn, Gypsum and Zinc were also applied at 2 to 3 tons per year. About 9% of agro-chemicals of major nutrients distributed in the nation was used in Greater Comilla in the said period, i.e. 75,700 tons of Urea, 41,500 tons of TSP and 7,100 tons of MP. Chemical fertilizers are applied selectively for some crops such as Boro (HYV) and winter vegetables which are planted under irrigation farming.

(3) Agro-Chemicals

The prevailing rice diseases are Bacterial Leaf Bright (BLB), Bacterial Leaf Streak (BLS), Leaf

Blast, Neck Blast, Tungro virus, etc. The pest diseases are representative by steam borer and rice hisper. Yellow music virus causes serious damages on beans and lady's finger. Late Blight is also prevailing in horticultural crops, e.g. tomato, pumpkin, watermelon, lady's finger.

The total usage of agro-chemicals is presented in Table B.3.12. In the nation, 4,400 tons of agro-chemicals are distributed, of which 10.7% is used in Greater Comilla. Insecticides are represented by Diazinon and Fenitrothion for control of rice stem borer. Soil fumigation is now a necessary practice to control nematode in potato field. Acaricide is applied to beans and vegetables. Application of agro-chemicals is highly limited in Bangladesh. The area of plant protection is presented by crop in Table B.3.13. Although annual fluctuation is observed, rice is the objective crop for plant protection. Some 7% of the total rice field is sprayed, likewise 4% of vegetables and 2% and wheat.

3.3 Livestock

3.3.1 Livestock Population

The livestock population in Bangladesh has increased during the past three decades as summarized below.

Unit: 1000 heads

Animal	1960	1977	1983/4	% increased*
Cattle	18,961	20,509	21,495	13.4
Buffaloes	455	469	567	24.6
Sheep	477	508	667	39.8
Goats	5,660	8,436	13,558	139.5
Poultry	20,096	53,590	73,713	266.8
- Chickens	-	41,465	61,093	
- Ducks	-	12,125	12,620	

Remark: *: 1983/4 / 1960

Cattle plays an important role in crop production by providing great bulk of draught power necessary for land preparation, threshing and transportation. According to the Livestock Survey (1983-84) more than 90 % of working cattle was used for cultivation purposes. To the limited extent, buffaloes are substitutive to cattle in terms of sources of draught power. Due to shortage of feed sources, herd sizes are regulated according to draught requirements and feed supplies are carefully allocated among animals. Those surplus to draught requirement and to feed supply are either slaughtered or more usually sold for cash generation.

Goats are more predominant than sheep in their population distribution. Such small stock provides meat and milk only for local consumption. Because of their ability to thrive on coarse vegetation, they can find a niche even in the intensively used land. Poultry is also the important source for meat and eggs. Chickens are more predominant, while ducks are of increasing importance since they are better adapted to obtaining their own food supply.

The livestock population of the project area is summarized below.

Unit: 1000 heads

Animal	Kachua	Nabinagar	Bancharampur	Debidwar	Total
Cattle	71.5	93.7	45.9	108.6	319.6
Sheep	0.2	1.6	4.9	1.0	7.6
Goat	57.0	9.8	36.3	65.4	168.5
Duck	143.2	108.6	89.2	152.5	493.6
Chickens	235.6	217.3	129.5	237.0	819.3

Source: Upazila profile 1990

The cattle breeds prevailing in the project area comprise Sindi (Pakistan origin), Sahiwal (Pakistan), Friesean (Australia) and Hatiana (India), of which the former two breeds are said to be of more productivity.

Livestock reared in homestead tend to increase according to land holding size. On an average 2.0 heads of bovine, 2.0 heads of goat/sheep and 7.9 heads of poultry are raised by a small farmer of the study area, while 5.6, 4.6 and 18.7 respectively by a large farmer. The animal population of the study area is summarized below.

3.3.2 Products

Production of livestock industry such as meat, milk and eggs is highly limited on per capita consumption basis in Bangladesh. Apart from their contribution as food sources, large animals provide a valuable asset in the form of manure which are used as an important source of fuel and organic matters for soil fertility management. Hides and skins are also important livestock products. Current output is estimated at 2.3 million cattle and buffalo hide and 5.9 million goat and sheep skins. They are processed into a wide variety of items for domestic market and for export. The total value of all leather goods exported is now about US\$ 60 million accounting for about 10% of all merchandise exports. Other products represented by wool, hair, bones and feathers are used as the basis for artisanal and industrial enterprises.

Major animal products are meat, milk and eggs. In the study area, per capita availabilities of

these products is estimated to be 1.2 kg for meat, 5.7 kg for milk and 13.9 eggs per annum on the basis of animal population, herd compositions and productivities as tabulated below.

Products	Kachua	Nabinagar	Bancharampur	Debidwar	Total
1. Meat (tons)					
- Beef	110	138	74	167	489
- Sheep and Goat	43	8	33	50	135
- Chicken and Duck	261	227	129	267	884
Total Meat	414	372	237	485	1,508
2. Milk (tons)					
- Cow	1,429	1,874	917	2,172	6,392
- Goat	114	20	73	131	337
Total Milk	1,543	1,894	990	2,303	6,729
3. Eggs (1000 nos.)					
- Hen	2,865	2,172	1,785	3,051	9,872
- Duck	2,356	2,173	1,295	2,370	8,193
Total Eggs	5,221	4,345	3,080	5,421	18,065

3.3.3 Feed Sources

Feed supplies change season to season due to availability of feed sources. During the monsoon, feed supply is at the lowest level when farmlands are all in use and crop residues from previous crops have been consumed. In addition, during flood seasons, cattle suffers from inaccessibility to small areas providing grazing sources. Consequently, animals reach their worst conditions at the end of rainy season, although the draught requirement in land preparation for winter (Boro) crops is at its peak.

The livestock sector is adjunct to the crop production sector rather than sources of food. Although the nutritional contribution from livestock products is qualitatively very valuable but small in quantity. The prospects for greatly increased livestock output are limited by extremely high pressure in land use. Under these circumstances, the intent to obtain greater supplies of fats and proteins from oilseeds and pulses increases in importance.

Feed supply conditions change season to season. During the monsoon, feed availability is at the lowest level when farmlands are all in use and crop residues from previous crops have been consumed. Cattle suffer from inaccessibility to grazing sources and, consequently, reach their worst conditions at the end of rainy season although the draught requirement for land preparation of winter (Boro) crops is at its peak. The minimum feed requirement estimated at the upazila offices is 695 kg/head/year consisting of 73 kg of grass, 511 kg of hay, 110 kg of water hyacinth, 0.73 kg of rice and wheat bran, and 0.37 kg of oilseeds cake. The total feed requirement is estimated at 222,200 tons per year against 168,100 tons of feed available giving

the overall feed availability at 76%.

3.4 Supporting System

3.4.1 Agricultural Extension

The GOB set up an integrated extension body, i.e. Department of Agriculture (DAE), which was formed by the following six departments and agencies responsible in September, 1982.

- Directorate of Agriculture (Extension and Management)
- Directorate of Agriculture (Jute Production)
- Directorate of Plant Protection
- Horticulture Department Board
- Tobacco Development Board
- Central Extension Resources Development Institute

The overall extension activities are now under responsibilities of DAE. In parallel, the following agencies also undertake extension services for their own aspects.

- Bangladesh Water Development Board
- Sugar and Food Industries Corporation
- Tea Board
- Directorate of Livestock
- Department of Fisheries

The organizational structure of DAE is Block at union level, Unit at upazila level, Zone at district level and Headquarters at national level. The core body is organized by Upazila Extension Officer and his staff. Under the upazila extension office, Block Supervisors (BS) function as front-line extension workers who provide technical advises directly to farmers. All the extension officers and BSs are the staff members of Ministry of Agriculture (MOA). Although the extension officers are responsible to the Upazila Chairmen, they have obligation to report the following aspects to MOA via Deputy Director of the District.

- Area and production of main crops such as rice, jute and vegetables monthly or bi-weekly
- Demand and supply conditions of seeds of major crops
- Use of both manual and power sprayer monthly
- Buffer storage and dealer's storage amount of insecticides

- Activities of BS

One BS is allotted to 500 acres (200 ha) and 1,000 farmers on an average and manages his block extension office. The number of Block and coverage of one BS are summarized below.

Upazila	BSs (no.)		Farmers/BS (households)	Farmland/BS (acre)
	Seats	Posted		
Kachua	39	39	1,190	590
Nabinagar	58	56	900	540
Bancharampur	30	30	1,090	560
Debidwar	54	54	900	430
Total	181	179	990	520

The Training and Visit (T&V) system is applied at upazila level. The BS's programme comprises farmer-visit schedules, training sessions, and time allotted to other activities. The programme covers a two-week cycle as follows.

	Duration (days)
- Visit to sub-blocks on the basis of a fixed schedule (10 farmers x 8 days)	8
- Routine training	1
- Meeting and reporting at the upazila office	1
- Office work (record up-dating, data collection, collection of samples, contact with other department)	2
- Holidays	2
	14

In each Block, 80 contact farmers are selected. According to the manual of the T&V system, each BS is to visit the demonstration farms of his contact farmers and provide the technical advises to general farmers in demonstration farms.

Several constraints are identified in T&V system. Some are derived from poor technical knowledge of BSs and lack of region-oriented research to be transferred to farmers by BSs. However, it seems that there is more crucial constraint originating from sociological factors as reported from many countries applying the T&V system. Poor familiarity of BSs to villagers is the biggest constraint. BSs are still "alien" persons to villagers in most of cases. Villagers are not linked with BSs administratively, economically, physically and psychologically.

Apart from human factor, lack of equipment of BS is also serious. Transportation means is a central issue. Although a BS makes an appointment with contact farmer to notice general farmers about visit of BSs, BSs can not sometimes visit farmers due to lack of transportation

means. This results in mistrust to extension workers among farmers. In Bangladesh, bicycles and boats are main transportation means of BSs. It should be noted that bicycles of BSs are not provided by MOA, but purchased by BSs. It may be highly difficult for BSs to make frequent visits to farmers.

3.4.2 Supporting System for Animal Husbandry

At the Upazila level, the following staff are deployed for livestock development.

- Upazila Livestock Officer
- Veterinary Assistant Surgeon
- Upazila Livestock Inspector
- Upazila Livestock Assistant
- Veterinery Field Assistant
- Field Assistant (Artificial Inseminator)

(1) Diseases control

The prevailing cattle diseases are represented by Foot and Mouth Disease (FMD), (ii) Hemmorhagic Septisemia (HS), Anthrax, Black Quarter (BR), diarrhoea, worms, wound infection, and Rinder Pest.

Unit: nos.

Animal	Kachua	Bancharampur	Nabinagar	Debidwar	Total
Veterinary Dispensary	1	1	1	1	4
Vaccination					
- Cattle	18,517	na	33,432	19,200	71,149
- Chickens	16,008	na	20,806	60,000	96,814
- Duck	10,940	na	na	na	10,940
Treatment					
- Cattle	17,719	1,000	3,915	4,000	26,634
- Chickens	6,437	3,000	7,806	4,000	21,243

Source: Upazila profile 1990

(2) Artificial Insemination (AI)

There are four AI Sub-centers and 11 AI points in the study area. AI is given on the request by farmers at the service charge of Tk 2 per AI. Lack of refrigerators is the most serious problems

at AI points. The performance is summarized below.

Unit: nos.

Item	Kachua	Bancharampur	Nabinagar	Debidwar	Total
AI Sub-center	1	1	1	1	4
AI Point	3	3	1	4	11
AI Performance (1989/90)					
- Target	18,517	1,500	1,100	-	21,117
- Actual	16,008	-	1,233	1,200	18,440
Castration	103	na	na	na	103

Source: Upazila profile 1990

4. AGRICULTURAL DEVELOPMENT PLAN

4.1 Development Constraints and Prospects

Various constraints are identified for development of crop production sector from both technical and economic viewpoints. Under the sponsorship of BIRRI and DAE, a series of workshop has been held since 1975 to identify and solve prevailing problems facing farmers. At the local government level, a widely ranged support activities are carried out by Upazila officers and their staff from BRDB, BADC, DAE, Directorate of Livestock, Department of Fisheries, etc. The major constraints identified by them are as follows.

- i. Lack of rationalized land use plan including selection of appropriate cropping pattern and farming techniques
- ii. Inadequate land use due to traditional custom in land tenure
- iii. Low unit yields due to poor seed quality, inadequate land preparation, poor soil management, lack of soil organic matters, delay of sowing and planting, insufficient of weed control, plant protection, etc.
- iv. Lack of irrigation facilities
- v. Lack of flood protection and drainage improvement measures
- vi. Inadequate price policy resulting low producer's incentives
- vii. Inadequate access to farm inputs and marketing
- viii. Limited institutional supports including credit, research and extension

Crop production in the study area suffers from unfavorable natural conditions represented by recurrent floods and cyclones. Depending upon length of flood period and water depth during monsoon, land use patterns and farm management systems differs place to place. Under such unfavourable indigenous conditions, however, local farmers have sustained crop production at certain level by applying traditional farming techniques adapted to natural conditions although crop productivity is rather low. To increase productivity, expansion of modern farming techniques is essential. In connection with modernization of farming twchniques, rational land use plan combined with selection of cropping patterns and farming practices should be established and transferred to local farmers.

With high density of population (728/km²) and limited land available for cultivation, the land-man ratio in Bangladesh is one of the lowest in the world. As a result of rapidly expanding population and land fragmentation, land holding size of average farm family tends to be declined for many years to come. Ultimate measures such as nationwide flood control are required for further development of potential land to overcome these constraints due to land

shortage. Although exploitation of land productivity has to be realized at regional level within the framework of the nationwide Flood Action Programme, minor flood control and drainage improvement as the components integrated with rural development should be considered for reduced flood damage and increased land productivity at village level.

Rice production in Bangladesh has kept good pace since 1970s as a result of expansion of irrigation facilities, i.e. DTW, STW and LLW, under minor irrigation programme called Irrigation Management Programme (IMP) promoted through the cooperative movement. The IMP is the primary measure for further crop expansion in Rabi season. In association with irrigation water supply, application of improved seeds (varieties) as well as farm inputs is also essential to increase crop yields. This directly results in heavier load on farmer's economy. As reported by JSARD, in addition, high-yielding rice varieties are susceptible to pests and diseases compared with traditional varieties. The fact was experienced through "Green Revolution" promoted worldwide. This calls comprehensive governmental supports including appropriate credit schemes, stable farm input supply, and extension services in accordance with long term strategies.

Crop production should be managed during optimum crop season by well-scheduled farming practices at appropriate time. In Bangladesh, optimum planting and harvesting periods fall in limited durations being dependent upon such natural conditions as climate, topography, limnology. Firstly, introduction of early maturity varieties enable to mitigate crop damage in harvesting season. In order to ensure optimum planting, secondly, land preparation has to be performed within right time resulting in labour shortage even in densely populated rural areas in Bangladesh. Expansion of farm machinery in short-term should be carefully discussed taking current huge job demand in rural areas into consideration.

Apart from the farming technology, producer's incentive is another important factor to increase crop productivity. The governmental supports for purchasing wheat outstandingly contributed to rapid expansion of wheat in the initial years. Appropriate price control and marketing policy are crucial.

(2) Livestock

Compared with crop production, contribution of livestock is limited in terms of regional economy and farm family income. But, importance of livestock is more recognized by observation of prevailing traditional crop-livestock integrated management in the rural area. Livestock is raised only for cash income but also as work force suppliers. In view of soil fertility management and fuel sources, role of livestock in rural areas is much valuable. In

addition, poultry enables women to provide opportunity to participate economic activities at homestead level. However, current livestock industries are facing the following constraints.

- i. Acute shortage of feeds and fodders
- ii. High incidence of animal diseases, especially foot and mouth disease (FMD) and Newcastle disease causing heavy mortality of cattle and chicks
- iii. Low productivity of local breeds of animals
- iv. Lack of support services including problem-oriented research, input and technical advisory, manpower and facilities
- v. Unfavourable market conditions

Among the above-mentioned constraints, shortage of feed sources is a crucial issue for further development of livestock industries in Bangladesh. Although DOL has promoted expansion of high productive grasses by setting up demonstration plot in rural areas, limited land would not allow to make up minimum feed requirement. Crop residues are also important feed sources. In fact farmers do not waste rice straw and plant residues of pulses. But, by-products of high feed value including rice bran and oilseeds cake are not in hands of local farmers under the current marketing system since farmers sell unhusked paddy and oilseeds to middlemen and mill owners. In addition to feed amount, seasonal change of feed availability is also key for stable livestock raising. During flood seasons, feed shortage becomes more serious due to limited grazing sources and livestock exhausts all crop residues derived from Rabi seasons.

Several animal diseases are identified in Bangladesh. Although services of vaccination and treatment are provided through Upazila Livestock Officer (ULO), they are far below than the actual requirement. Local cattle breeds are advantageous in terms of resistance to disease and unfavourable climatic conditions. However, their productivity of meat and milk is generally low. In order to increase productivity, improvement of cattle breeds is essential measure. In view of existing conditions of animal sanitation and feed supply, introduction of more productive breeds originated from temperate countries is highly risky. Expansion of cross-bred (hybrid) is more suitable for local social conditions of Bangladesh. In this regard, on-going artificial insemination (AI) services should be encouraged more.

Low marketing incentive is also a constraint to livestock development in the project area. Although more than 10 litre of milk per cow is gained by daily milking practice, there is no regular channel to sell their milk. There is no slaughter house to buy farmer's cattle at favourable prices. Under such circumstances, farmers are often discouraged.

4.2 Development Strategy

The Fourth Five Year Plan (FFYP) places the great emphasis on the development of production sectors, namely agriculture, livestock and fishery. In particular, the FFYP focuses on improvement of institutional measures including price policy, marketing, and research and extension. Taking the current conditions of the project area into consideration, the agricultural development should be realized in line with the following strategy.

(1) Crop production

- Promotion of irrigation farming to stabilize crop production susceptible to climatic changes
- Crop intensification and diversification
- Improvement of farm inputs and rural marketing
- Development of facilities related to crop production and marketing
- Problem-oriented research for improved farming practices and their extension

(2) Livestock

- Expansion of feed and fodder crops
- Introduction of improved breeds with high productivity and improved animal health treatment
- Expansion of non-ruminant livestock and poultry rearing
- Creation of employment opportunity through livestock development

4.3 Development Target

4.3.1 General

The agricultural sector will continue to play a pivotal role generating substantial portion of and as employee of labour. Therefore, the primary target of MRDPP II is placed to achieve the sectoral target in FYDP, i.e. 3.6% p.a. by 1995. In addition, MRDPP II aims at increasing employment opportunity to 122% of the present level by 1995.

4.3.2 Development Targets

The development targets were set up under the following conditions.

(1) Expansion of planted areas

To estimate the future crop production, firstly, expansion of planted area is projected. Due to farmland limitation, substantial area expansion is not expected under rainfed agricultural conditions. Except for Boro under LLP project and some upland crops with fractional pumps, only replacement of rice varieties is envisaged. (Table B.4.1)

- i. No expansion is considered for broadcasting rice, i.e. B. Aus and B. Aman
- ii. Local varieties of Boro, T. Aus and T. Aman are to be replaced by those high yielding varieties (HYV).
- iii. Boro (HYV) will be expanded by 6,500 ha under LLP promotion.
- iv. Under the crop diversification plan of the Government, potato, oilseeds, and pulses are to be expanded by supplemental irrigation with fractional pumps (FP) promotion.

(2) Unit yields and Production

Referring to the experimental data of BRRI and the unit yield obtained by leading farmers, anticipated yields of major crops were conservatively estimated as presented in Table B.4.2. On the basis of planted areas and unit yields, production was estimated for each of major crops as presented in Table B.4.3.

4.3.3 Input Requirement

The increased production mentioned in Section 4.3.2 can be realized by improvement of farm input supply. To mitigate adverse impacts to environment, especially contamination of agro-chemicals in water, farm inputs should be carefully selected and application amount should be minimized. The standard dosage of farm inputs is listed in Table B.4.4.

4.4 Crop Production Programmes

4.4.1 Crop Intensification and Diversification Programme

The GOB places a great emphasis on increased cereals production, i.e. mainly rice and wheat, to enhance a degree of self-sufficiency. As a result of substantial increase of rice and wheat, Bangladesh has now reached close to 90% in self-sufficiency of food grains. The first priority will continue to be given to both crops. Apart from cereals, crop production sector has not caught up the rapidly increasing demand of non-cereal crops which are also important diet for

Bangladeshi. The followings are diversification-oriented crops in this regard.

- Increasing a degree of self-sufficiency in edible oils - mustard and sesame
- Increasing root and tubers components of the diet - potatoes
- Enhancing protein quality in the Bangladesh - pulses

The Programme will include the farm input supply combined with extension and credit. In connection with promotion of FP, the above-mentioned crops will be expanded in each Upazila according to the following schedule.

Crop	Unit: ha			
	1993-1995	1996-2000	2001-2010	Total
Potatoes	300	400	300	1,000
Mustard	400	300	400	1,000
Pulses	300	300	300	1,000
Total	1,000	1,000	1,000	3,000
FP (no.)	200	200	200	600

4.4.2 Farm Input Supply Programme

Increased rice production will be the pivotal task of agricultural sector as it is. For this purpose, farm input supply is essential. The Programme will consist of (i) multiplication and distribution of paddy seeds and (ii) procurement of fertilizers under UCCA management supported by BIRRI and BADC.

(1) Seeds

Paddy seeds in the study area are seriously contaminated with off-type plant, weed seeds and disease-affected seeds. This may be caused by continuous cropping of paddy on same farm plots. In addition, farmers in the study area believe that risk for crop failure due to outbreak of plant disease and other unfavourable natural hazards can be reduced by mixing rice varieties. Due to elongated maturity period, however, this often results in low yield and low grain quality by mixture of unripping and overripping grains. The Programme aims at expansion of improved paddy seeds of high yielding varieties for T. Aus, T. Aman and Boro. The following table summarizes annual seed requirement between 1995 and 2010.

Unit: ton			
Crop	1993-1995	1996-2000	2001-2010
T. Aus (HYV)	250	250	250
T, Aman (HYV)	140	140	140
Boro (HYV)	180	120	120
Total requirement	570	510	510

Although it is ideal to use certified seeds in every crop season to increase productivity and quality of paddy grains, it is highly difficult to realize it under the current institutional set-up without seed multiplication farms and facilities in the study area. The frequency of seed renewal is targeted to be once for two to four seasons. This means that the actual seed requirement is 50% to 25% of the total requirement in the above table.

Seed preservation techniques can be transferred to individual farmers through T&V system of DAE. Alternatively, seed multiplication can be introduced as group activities of KSS/MSS with support of UCCA. At village level, for instance, the seed preservation technique is to be introduced to the selected cooperative members who will be responsible to produce and release pure seeds to other members. Frequent elimination of off-type plants and disease-affected plants is the primary practices for them. Farm inputs supply to seed producers will be performed by UCCA. To support their activities, variety selection and foundation/certified seeds production will be continuously carried out in the Comilla station of BRRI.

(2) Fertilizers

The fertilizer requirement is 260 kg/ha of urea, 130 kg/ha of TSP and 66 kg/ha of MP, which are equivalent to 120 kg of N, 60 kg of P₂O₅ and 30kg of K₂O. The total requirement will amount to 18,100 tons of urea, 9,000 tons of TSP and 4,600 tons of MP in 1995. In view of higher response to unit yield, first of all, supply of urea should be stabilized. Taking fertilizer requirement for fish pond into consideration, fertilizer business has to be developed more.

4.4.3 Tree Nursery Development Programme

The Programme aims at provision of tree seedlings maintained at nursery station to be managed under local governments or UCCAs. The area and facility requirement is under study. Those trees will be planted for the following purposes.

- i. Fruit tree crops are expected to be additional income sources if they can be

- maintained in homestead.
- ii. In connection with feeder and rural roads construction, trees are planted along the roads and maintained mainly by upazilas and unions.

4.4.4 Intensified Homestead Crop Production Programme

The Programme is set up mainly for participation of women in rural development. The crops to be planted are vegetables such as tomatoes, potatoes, brinjal, pumpkin, lady's finger, etc. The basic farm inputs including seeds and fertilizers are to be supplied by extension workers when they will visit group of village women. The main constraint is lack of female extension workers. As can be always observed in NGO's extension activities, e.g. Caritas, training for female extension workers has to be carried out in parallel to the Programme.

4.5 Livestock Production Programmes

4.5.1 Feed and Fodder Production Programme

The shortage of feed and fodder crops is crucial for further livestock development in the study area. The Programme will include:

- i. To establish a demonstration/multiplication plot for HYV fodder grasses in each Upazila. The promising grass species are (i) Napier, (ii) Para, (iii) Splendida, (iv) ipil-ipil, etc.
- ii. To establish community plots on embankment, road side, government land for high yielding grasses production
- ii. To train and motivate the farmers for grazing fodder and grasses on their own land
- iv. To produce some quick growing fodder between two food crops and cash crop

4.5.2 Semi-intensive Poultry Development Programme

Chicken and duck rearing plays an important role in the study area giving (i) additional cash incomes, (ii) provision of animal protein, and (iii) employment opportunity especially for women in villages. The Programme aims at introduction of semi-intensive techniques for poultry production under technical supervision of Directorate of Livestock (DOL). On farm level, firstly, chicken sheds will be extended more. In parallel, introduction of modern breeds will be attempted to the trial scale. Collection of by-products from post-harvest plants, i.e. rice and wheat brans, oilseeds cake, etc., will be assured by UCCA and primary societies. The

products will be traded under the cooperative's joint-marketing programme to be set up under MRDP II.

4.5.3 Veterinary Service Expansion Programme

There are only limited number of veterinary dispensaries and artificial insemination (A/I) centers at upazila level. To encourage the regional livestock industry, those services have to be expanded to every corner of the study area. The additional requirement for veterinary services is represented by:

- Establishment of union veterinary aid center,
- Additional provision of facilities and equipment at veterinary and AI centers, and
- Training facilities

The livestock extension activities in the study area are insufficient. In connection with veterinary and AI services, the technical knowledge of animal husbandry is transferred to the farmers. Under the Programme, the training will be emphasized more.

TABLES

Table B.2.1 Correlation of Seven Soil Tracts with 20 Physiographic Units and Generalized Soil Types

Sl. No.	Soil Tract	Physiographic Map Units (Generalized)	General Soil Type Map Units (Generalized)
1.	Madhupur Tract	18. Madhupur Tract	15. Deep Red-Brown Terrace Soils
2.	Barind Tract	20. Akhaura Terrace 17. Barind Tract	15. Deep Red-Brown Terrace Soils
3.	Gangetic Alluvium	7. Ganges River Floodplain 8. Ganges Tidal Floodplain (non-saline part) 9. Gopalgunj-Rhulan Bils 10. Arial Bil	4. Calcareous Dark Grey Floodplain Soil Ganges Floodplain Soils (non-saline phase) 8. Noncalcareous Dark Grey Floodplain Soils and Peat 10. Acid Basin Clays
4.	Tista Silt Tract	1. Old Himalayan Piedmont 2. Tista Floodplain 3. Karatoya-Bangali Floodplain 4. Lower Atrai Basin 5. Lower Purnabhaba Floodplain	9. Black Terai Soils 6. Noncalcareous Brown Floodplain Soils 5a. Noncalcareous Grey Floodplain Soils (non-saline) 4a. Noncalcareous Grey Floodplain Soils (non-saline) 7. Noncalcareous Dark Grey Floodplain Soils 10. Acid Basin Clays
5.	Brahmaputra Alluvium	6. Brahmaputra Floodplain 13. Surma-Kushiyara Floodplain 11. Meghna Rivere Floodplain 12. Meghna Esturareni Floodplain 14. Northern and Eastern Piedmont Plains 15. Chittagong Coastal Plain (Part)	5a. Noncalcareous Grey Floodplain Soil 5a. Noncalcareous Grey Floodplain Soil 5a. Noncalcareous Grey Floodplain Soil 16. Calcareous Alluvium (seasonally saline) 12. Grey Piedmont Soils 5a. Noncalcareous Grey Floodplain Soil (non-saline)
6.	Costal Saline Tract	12. Meghna (Young) Estuarine Floodplain (saline part) 8. Ganges Tidal Floodplain (Saline Part) 15. Chittagong Coastal Plain (part) 16. St. Martins Coral Island	16. Calcareous Alluvium (seasonally saline) 5b. Noncalcareous Grey Floodplain Soils (seasonally saline) 5a. Noncalcareous Grey Floodplain Soils (non-saline) 16. Calcareous Alluvium (seasonally saline)
7.	Hilly Tract	19. Northern and Eastern Hills	13. Brown Hill Soils

Tabl B.2.2 International Correlation of General Soil Types of Bangladesh

Sl. No.	General Soil Type	'Older' USDA Soil Classification	USDA Soil Taxonomy	FAO/UNESCO Soil Unit
Floodplain Soil				
1.	Calcareous Alluvium	Alluvial Soils	Mainly Fluvaguents	Calcaric Fluvisols
2.	Noncarcous Alluvium	Alluvial Soils	Mainly Fluvaguents Psammaguents	Eutric Fluvisols
3.	Calcareous Brow Floodplain Soils	Mainly Alluvial Soils (Calcareous) Brown Forest Soils on higher parts	Mainly Eutrocrepts, Some Haplaguepts, Ustochrepts	Calcaric, Gleyic Cambisols, Some Calcaric Fluvisols
4.	Calcareous Dark Grey Floodplain Soils	Alluvial Soils, some Grumu Soils	Mainly Haplaguepts, (locally) Haplagualls	Calcaric Fluvisols, Calcaric Gleysols, locally Mollic Gleysols
5.	Noncalcareous Grey Floodplain Soils	Alluvial Soils	Haplaguepts (Typic/Aeric)	Eutric Gleysols
6.	Noncalcareous Brown Floodplain Soils	Brown Forest Soils	Ustochrepts (Udic), Eutrochrepts (Dystric), Dystochrepts	Eutric/Dystric Cambisols, Gleyic Cambisols
7.	Noncalcareous Dark Grey Floodplain Soils	Alluvial Soils, Some Humic Gleis Soils	Mainly Haplaguepts, (locally) Humic/Mollic Gleysols	Eutric Fluvisols
8.	Black Terai Soils	Prairie Soils. Some Humic Gleis Soils	Haplumbrepts, Humaguepts	Humic Cambisols, Humic Gleysols
9.	Acid Basin Clays	Alluvial Soils, Some Grumosols	Haplaguepts (Typic/Aeric)	Eutric/Dystric Gleysols
10.	Acid Sulphate Soils	Alluvial Soils	Sulfaguents, Sulfaguepts	Thionic Fluvisols, Humic Gleysols
11.	Peat	Organic Soils (Bogsols)	Histosols (Fibrists, Hemists and Sapristis)	Eutric/Dystric Histosols
12.	Grey Piedmont Soils	Low Humic Glesoils on higher parts. Basin clays are alluvial soils.	Haplaguepts (Typic/Aeric)	Eutric/Dystric Gleysols
13.	Made-land Hill Soils		Arent (undifferentiated)	Fimic Anthrosol
14.	Brown Hill Soils	(Acid) Brown Forest Soils	Eutrochrepts, Slochrepts (Lithic), Dystochrepts	Eutric/Dystric Cambisols, Eutric/Dystric Regosols
15.	Shallow Red-Brown Terrace Soils	(Acid) Brown Forest Soils. Very shallow soils are Regosols.	Ustochrepts (Udic/Ultic), Halpustalfs/Hapulstults	Dystric (Some Eutric) Cambisols (or Orthic Acrisols) Very shallow soils are Eutric Regosols.

Table B.2.3 Spatial Distribution of General Soil Types

Sl. No.	General Soil Type	Area ha	Proportion %
Floodplain Soils		9,718,722	67.1
1.	Calcareous Alluvium	591,796	4.1
2.	Noncalcareous Alluvium	562,242	3.9
3.	Calcareous Brown Floodplain Soils	478,518	3.3
4.	Calcareous Grey Floodplain Soils	170,767	1.2
5.	Calcareous Dark Grey Floodplain Soils	1,434,678	9.9
6.	Noncalcareous Grey Floodplain Soils	3,387,153	23.4
7.	Noncalcareous Brown Floodplain Soils	383,312	2.6
8.	Noncalcareous Dark Grey Floodplain Soils	1,599,645	11
9.	Black Terai Soils	83,408	0.6
10.	Acid Basin Clays	348,994	2.4
11.	Acid Sulphate Soils	226,647	1.6
12.	Peat	130,005	0.9
13.	Grey Piedmont	215,279	1.5
14.	Made-land	106,278	0.7
Hill Soils		1,561,472	10.8
15.	Brown Hill Soils	1,561,472	10.8
Terrace Soils		1,028,030	7.1
16.	Shallow Red-Brown Terrace Soils	72,549	0.5
17.	Deep Red-Brown Terrace Soils	189,380	1.3
18.	Brown Mottled Terrace Soils	34,235	0.3
19.	Shallow Grey Terrace Soils	265,427	1.8
20.	Deep Grey Terrace Soils	352,152	2.4
21.	Grey Valley Soils	114,287	0.8
Miscellaneous Land Types		2,178,045	15
22.	Rivers, Bils, etc.	973,430	6.7
23.	Urban	81,945	0.6
24.	Homesteads + Tanks	1,122,670	7.7
Total		14,486,269	100

Table B.2.4 Physiographic Units with Area and Soil Association of Greater Comilla

Sl. No.	Physiographic Units	Area in sq. km			Total Area (%)	Soil Association Number			Total
		Brahmanbaria	Comilla Sadar North & South	Chandpur		Brahmanbaria	Comilla Sadar North & South	Chandpur	
1.	Hills (Lalmaj) and Old Piedmont Apron	15.0	64.8	79.8	(12.0)	3	3	6	
2.	Subrecent and Recent Piedmont Aprons	138.8	331.5	470.3	(7.0)	7	7	14	
3.	Akhaura Terrace	73.8		73.8	(1.1)	5		5	
4.	Old Meghna Estuarine Floodplain/ Brahmaputra Floodplain	1,000.0	2,157.5	3,696.1	(55.0)	11	18	32	
5.	Salda Floodplain	8.8		8.8	(0.1)	1		1	
6.	Sylhet Basin	279.2		279.2	(4.2)	3		3	
7.	Middle Meghna Floodplain	268.6	339.3	794.2	(11.8)	9	5	17	
8.	Lower Meghna River Floodplain		360.9	360.9	(5.4)		6	6	
9.	Lower Meghna Tidal Floodplain		5.8	5.8	(0.1)			1	
10.	Minor River Floodplain		95.9	95.9	(1.4)		3	4	
	Miscellaneous Land Types (water bodies, homestead, charlands, urban, etc.)	137.5	101.0	612.8	851.3				
		1,921.7	3,090.0	1,704.4	6,716.1	39	36	21	
					(100.0)			96	

Table B.2.5 Physiographic Units

No.	Symbol Physiographic Unit	Name	Area		Agroecological regions/ sub-regions number
			in sq. km.	Proportion	
1.	Ph	Old Himalayan Piedmont Plain	4,008	2.8%	1
2.	-	Tista Floodplain	10,304	7.1%	2+3
2a	Ta	Active Tista Floodplain	(836)		2
2b	Tm	Meghna River Floodplain	(9,464)	1.7%	16+17
3.	Kb	Karatoya - Bangali Floodplain	2,572	1.8%	4
4.	Al	Lower Atrai Basin	851	0.6%	5
5.	Pl	Lower Punarbhaha Floodplain	129	0.1%	6
6.		Brahmaputra Floodplain	16,344	11.3%	7,8,9
6a	Ba	- Active Brahmaputra-Jamuna Floodplain	(3,190)		7
6b	By	- Young Brahmaputra and Jamuna Floodplain	(5,920)		8
6c	Bo	- Old Brahmaputra Floodplain	(7,230)		9
7.		Ganges River Floodplain	24,508	17.2%	10,11,12
7a	Ga	- Active Ganges Floodplain	(3,350)		10
7b	Gh	- High Ganges River Floodplain	(13,205)		11
7c	Gl	- Low Ganges River Floodplain	(7,968)		12
8.		Ganges Tidal Floodplain	17,066	11.8%	13
8a	Gs	- Ganges Tidal Floodplain (non-saline)	(5,238)		13
8b	Gn	- Ganges Tidal Floodplain (saline)	(6,258)		13
8c	Gm	- Ganges Tidal Floodplain (sundarbans)	(5,570)		13
9.	Gb	Gopalganj-Khulna Bils	2,247	1.6%	14
10.	Ab	Arial Bil	144	0.10%	15
11.		Meghna River Floodplain	2,464	1.70%	16+17
11a	Mm	- Middle Meghna River Floodplain	(1,555)		16
11b	Ml	- Lower Meghna River Floodplain	(909)		17
			80,637		

Table B.2.6 Land Use of Greater Comilla

Land Use Association	Area (Sq. Miles)	Proportional Extent (%)	Major Cropping Patterns
01 Predominantly triple cropped land	282	10.9	1. Aus/Jute - T. Aman - Rabi 2. Mixed Aus and Aman - Rabi
02 Mainly triple with some double cropped land	306	11.8	1. Aus/Jute - T. Aman - Rabi 2. Mixed Aus and Aman - Rabi 3. Aus/Jute - T. Aman 4. Mixed Aus and Aman
03 Triple and double cropped land	533	20.6	1. Aus/Jute - T. Aman - Rabi 2. Mixed Aus and Aman - Rabi 3. Aus/Jute - T. Aman 4. Mixed Aus and Aman 5. B. Aman - Rabi 6. Jute - Rabi
04 Triple and single cropped land	28	1.1	1. Mixed Aus and Aman - Rabi 2. Mixed Aus and Aman 3. B. Aman - Rabi 4. Jute - Rabi
05 Mainly triple with some single cropped land	11	0.4	1. Mixed Aus and Aman - Rabi 2. B. Aman 3. Jute
06 Triple, double and single cropped land	12	0.5	1. Aus/Jute - T. Aman - Rabi 2. Aus/Jute - T. Aman 3. B. Aman - Rabi 4. B. Aman
07 Predominantly double cropped land	177	6.8	1. Aus/Jute - T. Aman 2. Mixed Aus and Aman
08 Mainly double cropped land	28	1.1	1. B. Aman - Rabi 2. Aus/Jute - T. Aman 3. Aus/Jute - Rabi - 7 4. Mixed Aus and Aman - Rabi
09 Mainly double with some triple cropped land	90	3.5	1. Aus/Jute - T. Aman 2. Mixed Aus and Aman 3. B. Aman - Rabi 4. Aus/Jute - T. Aman - Rabi 5. Mixed Aus and Aman - Rabi
10 Mainly double with some single cropped land	6	0.2	1. Mixed Aus and Aman 2. B. Aman 3. Boro
11 Double and single cropped land	136	5.2	1. Aus/Jute - T. Aman 2. Mixed Aus and Aman 3. B. Aman - Rabi 4. Aus/Jute - Rabi 5. T. Aman 6. B. Aman 7. Boro
12 Predominantly single cropped land	87	3.4	1. Boro 2. B. Aman 3. Mixed Aus and Aman 4. B. Aus - Rabi
13 Mainly single with some double cropped land	235	9.0	1. B. Aman 2. Boro 3. Mixed Aus and Aman 4. Aus/Jute - T. Aman 5. Aus/Jute - Rabi 6. B. Aman - Rabi 7. Grass Land
14 Single and triple cropped land	100	3.9	1. B. Aman 2. Mixed Aus and Aman 3. Aus/Jute - T. Aman - Rabi 4. Mixed Aus and Aman - Rabi
15 Orchard and double cropped land	13	0.5	1. Orchard 2. Aus - T. Aman 3. Aus - Rabi 4. Grass Land
16 Mainly uncultivated land with some double and single cropped land	27	1.0	1. Grassland 2. Aus 3. Aus - T. Aman
Homesteads	306	11.8	
Settlement (Urban)	16	0.6	
Mud and charland	53	2.0	
Water (Rivers)	184	5.7	
Total area	2,594	100.0	

Table B.2.7 Land Use of the Study Area (1/2)

Upazilas	Land Use Associations	Major Cropping Patterns	Area (Acres)	Percent of Total Area	
Debidwar	Predominantly triple crop land	Au/Ju - T Am - R M Au/Am - R	9075	15.6	
	Triple and double cropped land	M Au/Am - R M Au/Am	16500	28.3	
	Mainly triple with some double cropped land	Au/Ju - T Am - R Au/Ju - T Am M Au/Am - R M Au/Am	15500	26.6	
	Mainly double with some triple cropped land	M Au/Am M Au/Am - R Au/Ju - T Am - R	7389	12.7	
	Homesteads, water bodies & non-agricultural land			9776	16.8
Total Area			58240	100.0	
Kachua	Mainly double with some triple cropped land	Au/Ju - T Am Au/Ju - T Am - R M Au/Am M Au/Am - R	17400	29.6	
	Double and single cropped land	M Au/Am B Am	7068	12.0	
	Mainly single with some double cropped land	B Am M Au/Am	20301	34.5	
	Triple and single cropped land	M Au/Am - R M Au/Am R	942	1.6	
	Triple and double cropped land	M Au/Am - R M Au/Am	1413	2.4	
	Homesteads, water bodies & non-ag. land			11676	19.9
	Total Area			58800	100.0
Brahmanbaria	Predominantly triple cropped land	Au/Ju - T Am - R	2993	5.8	

Table B.2.7 Land Use of the Study Area (2/2)

Upazilas	Land Use Associations	Major Cropping Patterns	Area (Acres)	Percent of Total Area
	Mainly double with some triple cropped land	B Am - R M Au/Am - R	12185	23.8
	Triple, double and single cropped land	Au/Ju - T Am - R Au/Ju - T Am B Am B Am - R	6092	11.9
	Single and triple cropped land	B Am/Ju M Au/Am - R	3000	5.9
	Mainly double cropped land	B Am - R	10150	19.8
	Double and single cropped land	B Am - R B Am - Ju	9100	17.8
	Homesteads, water bodies & non-agricultural land		7680	15.0
	Total Area		51200	100.0
Nabinagar	Predominantly triple cropped land	Au/Ju - T Am - R M Au/Am - R	19720	21.3
	Triple and double cropped land	Au/Ju - T Am - R M Au/Am - R M Au/Am B Am - R	27608	29.8
	Single and triple cropped land	B Am/Ju Au/Ju - T Am - R	15776	17.0
	Mainly double cropped land	B Am - R	788	0.8
	Predominantly single cropped land	Boro B Am/Ju	14988	16.1
	Homesteads, water bodies & non-agricultural land		13920	15.0
	Total Area		92800	100.0

Table B.2.8 Land Capability Classification of Greater Comilla (1/4)

Land Capabilities Association	Brahmanbaria District			Comilla District			Chandpur District		
	Land Type Patterns	Area (sq. miles)	Per-cent	Land Type Patterns	Area (sq. miles)	Per-cent	Land Type Patterns	Area (sq. miles)	Per-cent
01 Predominantly very good agricultural land				Shallow flooded	123.0	10.3			
02 Very good and good agricultural land				Part shallowly flooded, part moderately deep flooded	18.4	1.5	Part shallowly flooded, part moderately deeply flooded	57.0	8.7
03 Predominantly good agricultural land	1. Imperfectly drained highland	4.2	0.6	1. Mainly above normal flood level 2. Mainly moderately deeply flooded	7.5	0.6	Mainly moderately deeply flooded	167.0	25.4
	2. Shallowly flooded and imperfectly drained highland	11.8	1.6		217.0	18.2			
	3. Very shallowly flooded land	1.2	0.2						
04 Mainly good with some very good agricultural land				Mainly moderately deeply flooded	225.5	18.9			
05 Mainly good with some moderate agricultural land	1. Moderately well drained terrace with some imperfectly drained valleys	21	2.8				Moderately deeply flooded, part slow draining in dry season	7.0	1.0
	2. Moderately well and imperfectly drained terrace with some deeply flooded basins, slow draining in dry season	0.7	0.1						
	3. Shallowly flooded land with some deeply flooded	8.9	1.2						

Table B.2.8 Land Capability Classification of Greater Comilla (2/4)

Land Capabilities Association	Brahmanbaria District			Comilla District			Chandpur District		
	Land Type Patterns	Area (sq. miles)	Per-cent	Land Type Patterns	Area (sq. miles)	Per-cent	Land Type Patterns	Area (sq. miles)	Per-cent
06 Mainly good with some poor agricultural land				Mainly shallowly flooded, part moderately deeply flooded & slow draining in dry season	72.6	6.1			
07 Good and moderate agricultural land	1. Shallowly to deeply flooded	15.0	2.0						
08 Good and poor agricultural land	1. Shallowly and very deeply flooded, part with flood hazard	5.4	0.7						
09 Predominantly moderate agricultural land	1. Moderately well drained closely dissected terrace and imperfectly drained valleys	4.6	0.6	1. Mainly moderately deeply flooded irregular relief	18.9	1.6			
				2. Moderately to very deeply flooded, draughty in dry season	66.7	5.6			
	2. Moderately deep to deeply flood basins, part with flood hazard	76.0	10.2	3. Deeply flooded, part slow draining in dry season	158.1	13.2			
10 Mainly moderate with some good agricultural land	1. Shallowly and moderately deeply flooded	213.6	28.8				Moderately deeply flooded, part slow draining in dry season	55.0	8.3
11 Moderate and good agricultural land							1. Part highland with irregular relief, part moderately deeply flooded	48.0	7.3
							2. Moderately deeply flooded, part slow draining in dry season	142.0	21.6

Table B.2.8 Land Capability Classification of Greater Comilla (3/4)

Land Capabilities Association	Brahmanbaria District			Comilla District			Chandpur District		
	Land Type Patterns	Area (sq. miles)	Per-cent	Land Type Patterns	Area (sq. miles)	Per-cent	Land Type Patterns	Area (sq. miles)	Per-cent
12 Mainly moderate with some poor agricultural land	1. Moderately deep to very deeply flooded	28.8	3.9						
	2. Moderately deep to very deeply flooded, part sandy and part with flood hazard	16.1	2.2						
	3. Moderately deep to very deeply flooded basins, part slow draining in dry season	4.5	0.6						
	4. Moderately deep to very deeply flooded basins, part slow draining in dry season, part with flood hazard	11.7	1.6						
	5. Deeply and shallowly flooded valley, slow draining in dry season, part with low bearing capacity	3.9	0.5						
13 Moderate and poor agricultural land				Deeply to very deeply flooded, partly very droughty in dry season	70.0	5.9			
14 Predominantly poor agricultural land	1. Deep to very deeply flooded basin, part with flood hazard	40.7	5.5	Highland, maling with severe erosion hazard	12.3	1.0			
	2. Deep to very deeply flooded basins with flood hazard, part with slow draining in dry season	79.6	10.7						

Table B.2.8 Land Capability Classification of Greater Comilla (4/4)

Land Capabilities Association	Brahmanbaria District			Comilla District			Chandpur District		
	Land Type Patterns	Area (sq. miles)	Per-cent	Land Type Patterns	Area (sq. miles)	Per-cent	Land Type Patterns	Area (sq. miles)	Per-cent
15 Mainly poor with some moderate agricultural land	1. Moderately deep to very deeply flooded with flood hazard	13.0	1.8						
	2. Moderately deep to very deeply flooded with flood hazard, part slow draining in dry season	16.2	2.2						
16 Mainly very poor with some moderate agricultural land	1. Very steep hills with some imperfectly drained valleys	3.7	0.5						
17 Poor and very poor agricultural land	1. Deeply flooded charland with hazard of flood silting erosion	14.8	2.0						
Total agricultural land		595.4	80.3		990.0	82.9		476.0	72.3
Homesteads & water bodies		137.0	18.5		189.0	15.8		127.0	19.3
Non-agricultural land, inc. mud & charland		1.6	0.2		9.0	0.8		53.0	8.1
Urban land		8.0	1.0		6.0	0.5		2.0	0.3
Total District Area		742.0	100.0		1194.0	100.0		658.0	100.0

B.2.9 Land Capability Classification of the Study Area (1/3)

Upazilas	Land Capability Associations	Land Type Patterns	Area (Acres)	Percent of Total Area
Debidwar	Mainly good agricultural land	1. Mainly good with some very good	24232	41.6
		2. Predominately good agricultural land, mainly moderate deeply flooded	13570	23.3
	Mainly moderate agricultural land	1. Mainly moderate with some very good agricultural land, mainly shallowly flood hazard	4846	8.3
		2. Predominantly moderate agricultural land, droughty in dry season, moderate deeply to very deeply flood	5816	10.0
	Homesteads, water bodies & non-agricultural land		9776	16.8
	Total Area		58240	100.0
Kachua	Mainly good agricultural land	1. Very good and good agricultural land, part shallowly flooded, part moderate deeply flooded	11781	20.0
		2. Predominately good agricultural land, mainly moderate deeply flooded	2356	4.0
		3. Mainly good with some moderate agricultural land, moderate deeply flooded, part slow draining in dry season	7037	12.0

B.2.9 Land Capability Classification of the Study Area (2/3)

Upazilas	Land Capability Associations	Land Type Patterns	Area (Acres)	Percent of Total Area
	Moderate and good agricultural land	Moderate and good agricultural land, part highland with irregular relief, part moderate deeply flooded	7100	12.1
	Mainly moderate agricultural land	Mainly moderate with some good agricultural land, moderate deeply flooded, part slow draining in dry season	18850	32.0
	Homesteads, water bodies & non-agricultural land		11676	19.9
	Total Area		58800	100.0
Bancharampur	Mainly good with moderate agricultural land	Shallowly flooded with some moderate deeply flooded	3482	6.8
	Mainly moderate with some poor agricultural land	Moderate deeply to very deeply flooded	13056	25.5
	Mainly moderate agricultural land	Shallowly to deeply flooded	6528	12.8
	Mainly poor with some good agricultural land	Moderate deeply to very deeply, part with flood hazard	3046	5.9
	Predominantly poor agricultural land	Deeply to very deeply flooded basins, part with flood hazard	8650	16.9
	Poor and very poor agricultural land	Deeply flooded charland with hazards of flood and river erosion	8758	17.1
	Homesteads, water bodies & non-agricultural land		7680	15.0
	Total Area		51200	100.0

B.2.9 Land Capability Classification of the Study Area (3/3)

Upazilas	Land Capability Associations	Land Type Patterns	Area (Acres)	Percent of Total Area
Nabinagar	Mainly good with some moderate agricultural land	Shallow flooded with some moderate deeply flooded	3105	3.3
	Mainly moderate with some good agricultural land	Shallow and moderate deeply flooded	55216	59.5
	Mainly moderate with some poor agricultural land	Moderate deeply to very deeply flooded, part with flood hazard	9466	10.2
	Mainly poor with some moderate agricultural land	Moderate deeply to very deeply flooded, part with flood hazard	6310	6.8
	Predominantly poor agricultural land	Deeply to very deeply flooded basins to flood hazard, slow draining in dry season	3205	3.5
	Poor and very poor agricultural land	Deeply flooded charland with flood hazard and river erosion	1578	1.7
	Homesteads, water bodies & non-agricultural land		13920	15.0
	Total Area		92800	100.0

Table B.3.1 Sectoral Share of Agriculture in GDP

Item	Unit: Million Taka				Ave. Annual Growth (%)
	At Constant Price (1984-85)				
	1885-86	1886-87	1887-88	1888-89	
Agricultural Sector					
1. Crops	139,599	139,596	137,119	134,509	-1.23
2. Forestry	11,413	11,168	12,038	12,309	2.63
3. Livestock	12,131	12,801	12,922	13,348	3.25
4. Fisheries	12,406	12,685	12,822	12,871	1.24
Total	175,549	176,250	174,901	173,037	-0.48
(Sector Share %)	(41.3)	(39.8)	(38.4)	(37.1)	
GDP	424,593	442,347	455,135	466,603	3.20
Per capita GDP	3,947	4,012	4,035	4,032	0.72

Table B.3.2 Sectoral Share in GDP from Agriculture (1988-89)

Item	Bangladesh		Greater Comilla	
	Million Taka	%	Million Taka	%
Agricultural Sector				
1. Crops	174,781	71.3	13,553	82.9
2. Forestry	27,286	11.1	56	0.3
3. Livestock	21,319	8.7	1,581	9.7
4. Fisheries	21,881	8.9	1,155	7.1
Total	245,267	100.0	16,345	100.0
(Sectoral Share %)	(37.2)		(39.1)	
GDP at market price	659,473		41,849	
Per capita GDP at factor cost (Tk)	5,701		5,206	

Table B.3.3 Cultivated Area, Production and Yield of Major Crops in Kachua (1/3)

Union	(Last two years average by Union)																				
	B Aus (L)			T Aus (L)			T Aus (Hyv)			B Aman (L)			T Aman (L)			T Aman (Hyv)			Boro (L)		
	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)
Sachar	164	116	0.7	74	56	0.8	133	296	2.2	270	310	1.1	194	238	1.2	466	1,180	2.5	0	0	0.0
Pathar	189	134	0.7	104	78	0.8	94	210	2.2	891	1,025	1.2	84	100	1.2	220	565	2.6	0	0	0.0
Bitara	364	255	0.7	89	65	0.7	195	428	2.2	472	535	1.1	223	273	1.2	453	1,150	2.5	0	0	0.0
Sahadebpur (E)	311	218	0.7	92	70	0.8	86	190	2.2	407	465	1.1	13	12	0.9	138	355	2.6	0	0	0.0
Sahadebpur (W)	139	98	0.7	62	47	0.8	103	225	2.2	967	1,050	1.1	114	136	1.2	346	880	2.5	43	85	2.0
Kachua (N)	188	134	0.7	116	89	0.8	86	192	2.2	327	380	1.2	148	180	1.2	318	815	2.6	0	0	0.0
Kachua (S)	119	83	0.7	81	62	0.8	104	230	2.2	288	310	1.1	26	30	1.2	326	825	2.5	0	0	0.0
Kadla	356	255	0.7	165	124	0.8	187	415	2.2	987	1,125	1.1	168	207	1.2	368	920	2.5	0	0	0.0
Karaia	562	402	0.7	92	66	0.7	367	822	2.2	925	1,060	1.1	167	200	1.2	693	1,751	2.5	11	20	1.8
Gohat (N)	263	185	0.7	112	83	0.7	133	290	2.2	110	120	1.1	39	47	1.2	376	983	2.6	0	0	0.0
Gohat (S)	258	182	0.7	103	75	0.7	316	700	2.2	338	385	1.1	115	142	1.2	271	697	2.6	0	0	0.0
Ashrafpur	303	215	0.7	78	57	0.7	228	500	2.2	684	785	1.1	467	570	1.2	583	1,500	2.6	0	0	0.0
Total Upazila	3,216	2,277	0.7	1,168	872	0.7	2,032	4,498	2.2	6,666	7,550	1.1	1,758	2,135	1.2	4,558	11,621	2.5	54	105	1.9

Source: Block Supervisors and Upazila Agriculture Office

Table B.3.3 Cultivated Area, Production and Yield of Major Crops in Kachua (2/3)

Union	Boro (Hyv)			Wheat			Jute			Potato			Mustard			Chilli		
	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)
Sachar	459	1,600	3.5	153	350	2.3	87	177	2.0	180	3,250	18.1	129	125	1.0	0	0	0.0
Pathar	354	1,240	3.5	208	470	2.3	19	40	2.1	115	2,000	17.4	73	78	1.1	0	0	0.0
Bitara	227	792	3.5	162	365	2.3	29	63	2.2	256	4,500	17.6	75	75	1.0	0	0	0.0
Sahadebpur (E)	315	1,100	3.5	215	485	2.3	45	97	2.2	218	3,100	14.2	86	75	0.9	51	56	1.1
Sahadebpur (W)	428	1,495	3.5	434	990	2.3	31	60	1.9	322	5,800	18.0	0	0	0.0	19	26	1.4
Kachua (N)	728	2,500	3.4	233	525	2.3	128	250	2.0	242	4,400	18.2	101	95	0.9	28	40	1.4
Kachua (S)	276	950	3.4	194	440	2.3	54	110	2.0	217	3,900	18.0	175	170	1.0	49	48	1.0
Kadla	290	1,000	3.4	539	1,215	2.3	136	270	2.0	411	7,300	17.8	59	50	0.8	3		0.0
Karaia	222	780	3.5	378	850	2.2	0	0		243	4,500	18.5	128	140	1.1	0	0	0.0
Gohat (N)	293	1,020	3.5	233	525	2.3	138	280	2.0	322	5,900	18.3	104	88	0.8	0	0	0.0
Gohat (S)	225	785	3.5	112	240	2.1	148	290	2.0	198	3,700	18.7	88	82	0.9	0	0	0.0
Ashrafpur	518	1,815	3.5	419	940	2.2	0	0		283	7,000	24.7	64	70	1.1	0	0	0.0
	4,335	15,077	3.5	3,280	7,395	2.3	815	1,637	2.0	3,007	55,350	18.4	1,082	1,048	1.0	150	170	1.1

Table B.3.4 Cultivated Area, Production and Yield of Major Crops in Nabinagar (1/3)

Union	(Last two years average by Union)																				
	B Aus (L)			T Aus (L)			T Aus (Hyy)			B Aman (L)			T Aman (L)			T Aman (Hyy)			Boro (L)		
	Area (ha)	Total Prod. (Ton)	Avg. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Avg. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Avg. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Avg. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Avg. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Avg. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Avg. Yield (T/ha)
Beergaun	228	220	1.0	96	112	1.2	106	128	1.2	291	301	1.0	162	153	0.9	49	92	1.9	27	34	1.3
Krishnanagar	90	85	0.9	162	185	1.1	49	112	2.3	319	345	1.1	268	298	1.1	169	317	1.9	68	91	1.3
Naighor	53	65	1.2	217	195	0.9	122	213	1.7	612	563	0.9	144	161	1.1	140	243	1.7	0	0	0.0
Biddayfut	445	335	0.8	278	226	0.8	163	232	1.4	786	871	1.1	0	0	0.0	0	0	0.0	0	0	0.0
Shibpur	110	85	0.8	165	175	1.1	60	160	2.7	295	309	1.0	161	142	0.9	181	443	2.4	34	68	2.0
Kaitala	606	404	0.7	215	274	1.3	110	287	2.6	402	419	1.0	0	0	0.0	0	0	0.0	0	0	0.0
Bitghor	147	135	0.9	160	125	0.8	94	176	1.9	525	621	1.2	212	324	1.5	0	0	0.0	0	0	0.0
Laurfotepur	88	95	1.1	174	186	1.1	40	91	2.3	126	109	0.9	154	217	1.4	93	291	3.1	88	218	2.5
Jinodpur	135	140	1.0	141	125	0.9	61	86	1.4	287	299	1.0	137	150	1.1	0	0	0.0	54	312	5.8
Saamora	326	375	1.2	116	110	0.9	89	112	1.3	291	315	1.1	87	91	1.0	105	319	3.0	0	0	0.0
Ratonpur	84	119	1.4	174	165	0.9	74	176	2.4	488	519	1.1	67	89	1.3	88	219	2.5	0	0	0.0
Rasullabad	180	210	1.2	224	212	0.9	48	107	2.2	214	207	1.0	62	59	1.0	70	172	2.5	0	0	0.0
Streerampur	62	86	1.4	211	229	1.1	77	123	1.6	524	495	0.9	122	187	1.5	126	315	2.5	0	0	0.0
Nabinagar (E)	204	210	1.0	316	301	1.0	154	331	2.1	291	354	1.2	176	243	1.4	103	298	2.9	48	142	3.0
Nabinagar (W)	44	46	1.0	196	123	0.6	26	63	2.4	306	319	1.0	93	189	2.0	58	254	4.4	0	0	0.0
Barikandi	728	773	1.1	140	176	1.3	119	200	1.7	346	323	0.9	117	276	2.4	114	243	2.1	173	543	3.1
Shamgram	124	134	1.1	197	186	0.9	86	143	1.7	444	495	1.1	61	121	2.0	0	0	0.0	0	0	0.0
Salimgonj	129	119	0.9	241	287	1.2	93	176	1.9	693	710	1.0	101	210	2.1	38	94	2.5	0	0	0.0
Ibrahimpur	317	336	1.1	187	212	1.1	61	159	2.6	290	276	1.0	76	81	1.1	122	327	2.7	48	85	1.8
Total Upazila	4,100	3,972	1.0	3,610	3,604	1.0	1,632	3,075	1.9	7,530	7,850	1.0	2,200	2,991	1.4	1,456	3,627	2.5	540	1,493	2.8

Source : Block Supervisors and Upazila Agriculture Office

Table B.3.4 Cultivated Area, Production and Yield of Major Crops in Nabinagar (2/3)

Union	Boro (Hvy)			Wheat			Jute			Potato			Mustard			Till		
	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)
Beergaun	178	764	4.3	30	76	2.5	34	72	2.1	8	211	26.4	51	48	0.9	9	8	0.9
Krishnanagar	1,179	5,512	4.7	308	596	1.9	418	912	2.2	89	1,076	12.1	263	215	0.8	0	0	0.0
Naighor	1,728	5,129	3.0	551	1,124	2.0	226	410	1.8	46	723	15.7	414	382	0.9	0	0	0.0
Biddayfur	1,680	3,365	2.0	415	1,017	2.5	142	281	2.0	21	438	20.9	159	121	0.8	0	0	0.0
Shibpur	968	4,312	4.5	254	629	2.5	119	229	1.9	33	542	16.4	163	156	1.0	0	0	0.0
Kaitala	529	2,543	4.8	134	229	1.7	187	320	1.7	84	1,191	14.2	124	114	0.9	6		0.0
Bitghor	705	2,981	4.2	122	231	1.9	181	423	2.3	0	0	0.0	147	128	0.9	0	0	0.0
Laurfotepur	224	834	3.7	76	210	2.8	0	0	0.0	0	0	0.0	46	32	0.7	7	5	0.7
Jinodpur	1,043	4,183	4.0	200	719	3.6	160	372	2.3	0	0	0.0	50	35	0.7	0	0	0.0
Satmora	377	1,729	4.6	267	729	2.7	35	82	2.3	86	1,292	15.0	211	198	0.9	0	0	0.0
Raionpur	1,419	3,151	2.2	290	704	2.4	400	795	2.0	0	0	0.0	710	662	0.9	0	0	0.0
Rasulabad	411	1,452	3.5	224	660	2.9	104	251	2.4	78	1,185	15.2	318	243	0.8	0	0	0.0
Sreerampur	1,914	4,015	2.1	418	920	2.2	65	198	3.0	0	0	0.0	116	87	0.8	0	0	0.0
Nabinagar (E)	432	1,098	2.5	250	693	2.8	150	310	2.1	80	1,276	16.0	228	195	0.9	0	0	0.0
Nabinagar (W)	642	1,906	3.0	221	449	2.0	113	193	1.7	65	1,321	20.3	141	98	0.7	0	0	0.0
Barikandi	0	0	0.0	115	227	2.0	91	173	1.9	14	265	18.9	86	54	0.6	0	0	0.0
Shangram	0	0	0.0	168	310	1.8	108	219	2.0	91	1,672	18.4	16	9	0.6	0	0	0.0
Salimgonj	0	0	0.0	291	542	1.9	96	176	1.8	0	0	0.0	223	206	0.9	0	0	0.0
Ibrahimpur	781	2,260	2.9	314	692	2.2	88	192	2.2	0	0	0.0	195	187	1.0	0	0	0.0
	14,210	45,234	3.2	4,649	10,757	2.3	2,717	5,608	2.1	695	11,192	16.1	3,661	3,170	0.9	22	13	0.6

Table B.3.4 Cultivated Area, Production and Yield of Major Crops in Nabinagar (3/3)

Union	(Last two years average by Union)												
	Pulses			Chilli			Vegetables			Others		Total	
	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Area (ha)	Total Prod. (Ton)
Beergaun	43	39	0.9	10	9	0.9	15	321	21.4	64	86	1,401	2,674
Krishnanagar	207	182	0.9	0	0	0.0	22	487	22.1	21	31	3,632	10,444
Natgor	297	210	0.7	14	14	1.0	5	194	38.8	53	67	4,622	9,693
Biddayfut	22	12	0.5	0	0	0.0	8	187	23.4	22	26	4,141	7,111
Shibpur	87	76	0.9	0	0	0.0	65	743	11.4	26	31	2,721	8,100
Kaitala	118	92	0.8	57	65	1.1	28	529	18.9	27	37	2,627	6,504
Bitghor	0	0	0.0	0	0	0.0	0	0	0.0	35	45	2,328	5,189
Laurfotepur	184	154	0.8	16	19	1.2	31	527	17.0	88	76	1,435	3,064
Jinodpur	0	0	0.0	0	0	0.0	0	0	0.0	64	59	2,332	6,480
Saimora	88	65	0.7	0	0	0.0	20	437	21.9	55	62	2,153	5,916
Ratonpur	0	0	0.0	88	102	1.2	16	222	13.9	61	72	3,959	6,995
Rasullabad	304	298	1.0	0	0	0.0	31	576	18.6	54	60	2,322	5,692
Sreerampur	0	0	0.0	31	53	1.7	0	0	0.0	34	41	3,700	6,749
Nabinagar (E)	411	382	0.9	0	0	0.0	31	841	27.1	80	86	2,954	6,760
Nabinagar (W)	120	114	1.0	0	0	0.0	0	0	0.0	118	137	2,143	5,212
Barikandi	91	76	0.8	24	28	1.2	18	627	34.8	87	92	2,264	4,076
Shamgram	66	54	0.8	0	0	0.0	0	0	0.0	74	68	1,435	3,411
Salimgonj	74	68	0.9	0	0	0.0	26	541	20.8	107	112	2,112	3,241
Ibrahimpur	118	112	0.9	0	0	0.0	84	983	11.7	119	108	2,800	6,010
	2,230	1,934	0.9	240	290	1.2	400	7,215	18.0	1,189	1,296	51,081	113,321

Table B.3.5 Cultivated Area, Production and Yield of Major Crops in Bancharampur (1/3)

Union	(Last two years average by Union)																				
	B Aus (L)			T Aus (L)			T Aus (Hvy)			B Aman (L)			T Aman (L)			T Aman (Hvy)			Boro (L)		
	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)
Teikhali	203	212	1.0	115	156	1.4	121	275	2.3	593	611	1.0	124	129	1.0	57	141	2.5	56	62	1.1
Paharakandi	269	261	1.0	85	123	1.4	307	564	1.8	469	552	1.2	0	0	0.0	165	387	2.3	41	97	2.4
Dariadawlah (E)	197	184	0.9	215	195	0.9	283	639	2.3	842	789	0.9	69	85	1.2	172	422	2.5	0	0	0.0
Dariadawlah (W)	290	206	0.7	324	311	1.0	728	1,450	2.0	768	789	1.0	0	0	0.0	65	187	2.9	0	0	0.0
Saifulakandi (E)	188	191	1.0	158	217	1.4	272	519	1.9	560	664	1.2	0	0	0.0	0	0	0.0	38	93	2.4
Saifulakandi (W)	282	250	0.9	124	116	0.9	449	933	2.1	485	511	1.1	0	0	0.0	152	361	2.4	0	0	0.0
Bancharampur (S)	243	193	0.8	87	95	1.1	461	889	1.9	592	621	1.0	102	135	1.3	0	0	0.0	76	199	2.6
Bancharampur (N)	119	127	1.1	96	87	0.9	115	263	2.3	685	718	1.0	0	0	0.0	0	0	0.0	0	0	0.0
Ruposhadi (E)	361	425	1.2	279	268	1.0	223	558	2.5	676	623	0.9	218	321	1.5	94	248	2.6	0	0	0.0
Ruposhadi (W)	163	142	0.9	264	245	0.9	465	894	1.9	526	499	0.9	67	141	2.1	42	84	2.0	0	0	0.0
Solimabad	425	387	0.9	312	367	1.2	256	524	2.0	1,080	1,142	1.1	0	0	0.0	67	140	2.1	0	0	0.0
Ujanchar (E)	189	147	0.8	95	142	1.5	102	243	2.4	809	967	1.2	44	97	2.2	195	467	2.4	0	0	0.0
Ujanchar (W)	178	211	1.2	212	219	1.0	116	245	2.1	578	617	1.1	67	83	1.2	116	299	2.6	95	245	2.6
Total Upazila	3,107	2,936	0.9	2,366	2,541	1.1	3,898	7,996	2.1	8,663	9,103	1.1	691	991	1.4	1,125	2,736	2.4	306	696	2.3

Source : Block Supervisors and Upazila Agriculture Office

Table B.3.5 Cultivated Area, Production and Yield of Major Crops in Bancharampur (2/3)

Union	Boro (Hyr)			Wheat			Jute			Potato			Mustard			Till		
	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)
Teikbali	88	324	3.7	256	816	3.2	105	207	2.0	39	958	24.6	160	134	0.8	61	32	0.5
Pahariakandi	126	424	3.4	396	1,145	2.9	180	354	2.0	27	662	24.5	118	112	0.9	0	0	0.0
Dariadawlah (E)	35	128	3.7	466	979	2.1	116	226	1.9	110	1,143	10.4	100	142	1.4	94	68	0.7
Dariadawlah (W)	26	83	3.2	456	892	2.0	154	324	2.1	102	1,235	12.1	94	103	1.1	0	0	0.0
Saifullakandi (E)	417	1,481	3.6	350	823	2.4	115	268	2.3	273	2,154	7.9	128	119	0.9	62	42	0.7
Saifullakandi (W)	390	1,169	3.0	362	786	2.2	108	198	1.8	150	1,989	13.3	215	196	0.9	27	19	0.7
Bancharampur (S)	107	386	3.6	400	705	1.8	127	274	2.2	191	1,843	9.6	150	115	0.8	101	87	0.9
Bancharampur (N)	72	264	3.7	459	951	2.1	182	349	1.9	83	1,635	19.7	117	83	0.7	34	24	0.7
Ruposhdi (E)	112	438	3.9	500	1,108	2.2	180	396	2.2	136	2,183	16.1	164	158	1.0	14	8	0.6
Ruposhdi (W)	295	959	3.3	218	654	3.0	76	205	2.7	241	2,254	9.4	129	96	0.7	0	0	0.0
Solimabad	22	84	3.8	468	973	2.1	54	138	2.6	222	2,587	11.7	181	175	1.0	11	9	0.8
Ujanchar (E)	64	215	3.4	116	576	5.0	76	197	2.6	24	983	41.0	150	146	1.0	0	0	0.0
Ujanchar (W)	109	361	3.3	319	914	2.9	95	176	1.9	0	0	0.0	69	42	0.6	0	0	0.0
	1,863	6,316	3.4	4,766	11,322	2.4	1,568	3,312	2.1	1,598	19,626	12.3	1,775	1,621	0.9	404	289	0.7

Table B.3.5 Cultivated Area, Production and Yield of Major Crops in Bancharampur (3/3)

(Last two years average by Union)

Union	Pulses			Chilli			Vegetable			Others			Total		
	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Area (ha)	Total Prod. (Ton)	Area (ha)	Total Prod. (Ton)
Tejkhali	137	97	0.7	28	32	1.1	36	857	23.8			2,179	5,043		
Paharakandi	120	83	0.7	4	5	1.3	10	211	21.1			2,317	4,980		
Daniadawlah (E)	141	124	0.9	63	73	1.2	63	1,452	23.0			2,966	6,649		
Daniadawlah (W)	87	74	0.9	16	19	1.2	51	1,144	22.4			3,161	6,817		
Saifullakandi (E)	193	167	0.9	11	21	1.9	0	0	0.0			2,765	6,759		
Saifullakandi (W)	218	167	0.8	54	64	1.2	8	221	27.6			3,024	6,980		
Bancharampur (S)	166	125	0.8	2	1	0.5	82	1,693	20.6			2,887	7,361		
Bancharampur (N)	184	163	0.9	12	10	0.8	106	1,954	18.4			2,264	6,628		
Ruposhdi (E)	67	47	0.7	14	10	0.7	19	482	25.4			3,057	7,273		
Ruposhdi (W)	114	108	0.9	8	9	1.1	0	0	0.0			2,608	6,290		
Solimabad	243	219	0.9	3	5	1.7	14	267	19.1			3,358	7,017		
Ujanchar (E)	157	147	0.9	19	26	1.4	16	239	14.9			2,056	4,592		
Ujanchar (W)	126	112	0.9	62	78	1.3	34	781	23.0			2,176	4,383		
	1,953	1,633	0.8	296	333	1.2	439	9,301	21.2	0	0	34,818	80,772		

Table B.3.6 Cultivated Area, Production and Yield of Major Crops in Debidwar (1/3)

Union	(Last two years average by Union)																				
	B Aus (L)			T Aus (L)			B Aman (L)			T Aman (L)			T Aman (Hyv)			Boro (L)					
	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)			
Barashalghar (N)	423	418	1.0	81	113	1.4	0	0	0.0	465	521	1.1	138	119	0.9	168	619	3.7	0	0	0
Barashalghar (S)	307	289	0.9	101	111	1.1	61	123	2.0	404	480	1.2	172	215	1.3	309	865	2.8	0	0	0
Rasulpur	170	155	0.9	214	231	1.1	89	189	2.1	425	456	1.1	170	208	1.2	366	789	2.2	0	0	0
Subil	311	254	0.8	323	436	1.3	110	245	2.2	506	567	1.1	202	178	0.9	1,052	2,238	2.1	0	0	0
Dabidwar	230	210	0.9	850	967	1.1	194	357	1.8	0	0	0	40	33	0.8	1,619	4,730	2.9	0	0	0
Fatehabad	356	345	1.0	445	417	0.9	0	0	0.0	748	700	0.9	364	454	1.2	937	2,644	2.8	0	0	0
Zafaragonj	97	82	0.8	526	680	1.3	61	115	1.9	0	0	0	80	113	1.4	769	1,930	2.5	0	0	0
Alahabad	307	288	0.9	823	1,040	1.3	76	134	1.8	0	0	0	76	99	1.3	1,107	3,198	2.9	0	0	0
Gumighar (N)	133	117	0.9	344	298	0.9	24	58	2.4	384	358	0.9	212	345	1.6	437	1,300	3.0	0	0	0
Gumighar (S)	279	227	0.8	506	666	1.3	0	0	0.0	384	417	1.1	190	445	2.3	469	1,476	3.1	0	0	0
Rajamehar (N)	253	228	0.9	68	87	1.3	129	245	1.9	688	798	1.2	202	140	0.7	129	381	3.0	0	0	0
Rajamehar (S)	167	166	1.0	161	169	1.0	88	190	2.2	647	706	1.1	80	136	1.7	414	1,293	3.1	0	0	0
Dhamoti (N)	230	189	0.8	161	143	0.9	112	218	1.9	565	760	1.3	40	56	1.4	3,846	7,649	2.0	0	0	0
Dhamoti (S)	384	267	0.7	182	188	1.0	17	30	1.8	627	747	1.2	71	135	1.9	522	2,000	3.8	0	0	0
Barakamta	121	111	0.9	445	513	1.2	27	48	1.8	80	92	1.2	80	66	0.8	809	2,955	3.7	0	0	0
Mohonpur	0	0	0.0	425	616	1.4	0	0	0.0	0	0	0.0	40	56	1.4	991	4,026	4.1	0	0	0
Total Upazila	3,768	3,346	0.9	5,655	6,675	1.2	988	1,952	2.0	5,923	6,602	1.1	2,157	2,798	1.3	13,944	38,093	2.7	0	0	0

Source : Block Supervisors and Upazila Agriculture Office

Table B.3.6 Cultivated Area, Production and Yield of Major Crops in Debidwar (2/3)

Union	(Last two years average by Union)																	
	Boro (Hvy)			Wheat			Jute			Potato			Mustard			Pulse		
	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)
Barashalghar (N)	278	813	2.9	354	764	2.2	39	68	1.7	26	220	8.5	257	233	0.9	32	23	0.7
Barashalghar (S)	202	933	4.6	174	386	2.2	98	216	2.2	35	213	6.1	236	174	0.7	45	40	0.9
Rasulpur	136	656	4.8	80	197	2.5	14	24	1.7	59	844	14.3	85	67	0.8	18	8	0.4
Subil	283	658	2.3	87	187	2.1	57	79	1.4	20	396	19.8	21	12	0.6	4	3	0.8
Dabidwar	1,072	3,789	3.5	263	814	3.1	107	127	1.2	133	2,273	17.1	237	190	0.8	18	9	0.5
Fatehabad	506	1,436	2.8	323	728	2.3	81	214	2.6	142	2,319	16.3	126	105	0.8	22	17	0.8
Zafargoni	400	1,677	4.2	202	705	3.5	48	123	2.6	149	2,563	17.2	97	87	0.9	8	7	0.9
Alahabad	359	856	2.4	222	456	2.1	32	86	2.7	425	6,513	15.3	86	85	1.0	6	5	0.8
Gunighar (N)	283	994	3.5	226	390	1.7	28	17	0.6	71	1,134	16.0	63	57	0.9	16	12	0.8
Gunighar (S)	60	291	4.9	293	781	2.7	30	39	1.3	44	670	15.2	230	202	0.9	28	24	0.9
Rajanehar (N)	130	540	4.2	344	877	2.5	59	134	2.3	55	690	12.5	223	187	0.8	44	31	0.7
Rajanehar (S)	404	1,959	4.8	323	688	2.1	39	88	2.3	129	2,112	16.4	110	98	0.9	34	30	0.9
Dhamoti (N)	121	459	3.8	363	978	2.7	53	105	2.0	53	1,013	19.1	192	169	0.9	3	2	0.7
Dhamoti (S)	323	1,243	3.8	364	645	1.8	15	28	1.9	196	2,964	15.1	65	56	0.9	44	34	0.8
Barakamta	404	1,279	3.2	346	890	2.6	63	125	2.0	506	10,780	21.3	23	21	0.9	0	0	0.0
Mohorpur	344	1,327	3.9	137	345	2.5	12	21	1.8	668	12,450	18.6	39	36	0.9	7	6	0.9
	5,305	18,910	3.6	4,101	9,831	2.4	775	1,494	1.9	2,711	47,154	17.4	2,090	1,779	0.9	329	251	0.8

Table B.3.6 Cultivated Area, Production and Yield of Major Crops in Debidwar (3/3)

Union	(Last two years average by Union)														
	Till			Chilli			Vegetables			Others			Total		
	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)	Area (ha)	Total Prod. (Ton)	Av. Yield (T/ha)
Barasahghar (N)	0	0	0	0	0	0	40	783	19.6	0	0	0	2,269	4,671	
Barasahghar (S)	0	0	0	0	0	0	43	597	13.9	0	0	0	2,142	4,602	
Rasulpur	0	0	0	0	0	0	37	597	16.1	0	0	0	1,845	4,413	
Subil	0	0	0	0	0	0	65	1,175	18.1	0	0	0	3,037	6,425	
Dabidwar	0	0	0	0	0	0	242	5,710	23.6	0	0	0	4,987	19,200	
Fatehabad	0	0	0	0	0	0	121	2,351	19.4	0	0	0	4,149	11,713	
Zafargoni	0	0	0	0	0	0	87	1,567	18.0	0	0	0	2,516	9,642	
Alahabad	0	0	0	0	0	0	69	1,157	16.8	0	0	0	3,582	13,912	
Gunighar (N)	0	0	0	0	0	0	79	1,156	14.6	0	0	0	2,284	6,224	
Gunighar (S)	0	0	0	0	0	0	77	1,567	20.4	0	0	0	2,562	6,781	
Rajamehar (N)	0	0	0	0	0	0	42	578	13.8	0	0	0	2,322	4,885	
Rajamehar (S)	0	0	0	0	0	0	66	783	11.9	0	0	0	2,628	8,388	
Dhamoti (N)	0	0	0	0	0	0	59	1,147	19.4	0	0	0	5,795	12,886	
Dhamoti (S)	0	0	0	0	0	0	61	1,427	23.4	0	0	0	2,827	9,730	
Barakamta	0	0	0	0	0	0	83	867	10.4	0	0	0	2,987	17,747	
Mohonpur	0	0	0	0	0	0	38	1,157	30.4	0	0	0	2,694	20,034	
	0	0	0	0	0	0	1,209	22,619	18.7	0	0	0	48,626	161,253	

Table B.3.7 Planted Area, Production and Unit Yield of Major Crops

Crop	Bangladesh			Greater Comilla		
	Planted Area (1000 ha)	Production (1000 ton)	Yield (ton/ha)	Planted Area (1000 ha)	Production (1000 ton)	Yield (ton/ha)
1. Cereals						
1.1 Rice	10,232.3	15,544	1.52	645.2	1,209	1.87
1.2 Wheat	560.5	1,022	1.82	65.2	113	1.73
1.3 Jowar	1.6	1	0.62			
1.4 Barley	17.8	11	0.62			
1.5 Barja	0.8	1	1.23			
1.6 Maize	3.2	3	0.93			
2. Beverages						
2.1 Tea	46.6	44	0.93			
3. Fibres						
3.1 Jute	543.9	805	1.48			
3.2 Cotton (bales)	17.0	41	2.41			
4. Fruits						
4.1 Banana	41.1	684	16.65	1.1	15	13.82
4.2 Mango	48.5	160	3.31	1.6	4	2.31
4.3 Jackfruit	24.8	254	10.24	0.9	6	6.90
4.4 Pineapple	13.7	145	10.63	0.1	1	9.54
4.5 Papaya		30				
4.6 Melon		116				
4.7 Orange		1				
4.8 Ber		9				
4.9 Guava		25				
4.10 Litchi	3.8	10	2.64	0.1	0.1	1.50
4.11 Citrus Fruit		8				
4.12 Other Fruit		44				
5. Oilseeds						
5.1 Rape and Mustard	317.9	222	0.70			
5.2 Til	82.1	49	0.60	3.3	2	0.46
5.3 Linseed	75.3	43	0.57			
5.4 Groundnut	38.5	48	1.24	1.7	2	1.28
5.5 Coconut	32.4	86	2.66	1.1	3.0	2.73
5.6 Caster	0.4	0	0.74			
5.7 Others	0.4	0	0.49			
6. Pulses						
6.1 Masur	216.7	159	0.73			
6.2 Moong	57.9	33	0.57			
6.3 Gram	103.3	75	0.73			
6.4 Mashkalai	70.5	52	0.74			
6.5 Arhar	5.7	4	0.71			
6.6 Others		216				
7. Spices						
7.1 Chillies	68.0	47	0.69			
7.2 Onion	34.0	139	4.09			
7.3 Garlic	12.6	38	3.03			
7.4 Others	28.8	80	2.78			
8. Sugarcane	172.1	6,707	38.97			
9. Vegetables						
9.1 Pumpkin		67				
9.2 Brinjail		164				
9.3 Potato	111.4	1,276	11.46			
9.4 Patal		20				
9.5 Lady's Finger		9				
9.6 Jhinga		17				
9.7 Karala		15				
9.8 Arum		67				
9.9 Puisak		11				
9.10 Chichinga		9				
9.11 Cucumber		13				
9.12 Cabbage		64				
9.13 Cauliflower		58				
9.14 Watergourd		60				
9.15 Tomato		81				
9.16 Radish		153				
9.17 Beans		33				
9.18 Others		95				
10. Other Crops						
10.1 Tobacco	47.2	42	0.88	1.1	1	0.70
10.2 Sweet Potato	52.2	544	10.41			
10.3 Betelnut	34.8	22	0.63			
10.4 Sunhemp	0.4	3	7.41			
10.5 Mulberry	0.8	3	3.70			

Table B.3.8 Distribution of Improved Seed by Crop

Year	Aus		Aman		Boro		Total Paddy	Wheat	Potato	Mustard	Winter Vegetable	Total
	LV	HYV	LV	HYV	LV	HYV						
I. Bangladesh												
1981-82	172	237	90	601	0	836	1,935	11,069	3,484	31	0	16,518
1982-83	108	451	71	1,260	2	1,086	2,978	13,402	2,611	92	3	19,086
1983-84	125	246	4	39	6	834	1,254	14,006	3,384	160	3	18,807
1984-85	130	108	190	1,687	10	1,206	3,331	19,422	3,296	49	4	26,102
1985-86	173	364	349	1,544	2	694	3,126	9,631	4,109	37	5	16,907
1986-87	110	392	35	1,808	9	1,285	3,639	12,514	4,012	58	7	20,229
1987-88	45	285	138	1,935	13	1,361	3,777	17,625	5,775	33	6	27,215
1988-89	82	399	196	2,195	5	1,831	4,708	18,852	7,396	99	7	31,062
Average	118	310	134	1,384	6	1,141	3,093	14,565	4,258	70	4	21,991
II. Greater Comilla												
1981-82	14	15	0	47	0	59	135	1,132	510	3	0	1,780
1982-83	2	32	5	118	0	62	219	913	440	4	0	1,577
1983-84	4	16	1	4	0	68	93	865	240	10	0	1,207
1984-85	5	7	30	210	0	40	292	1,177	498	1	0	1,968
1985-86	6	44	0	123	0	0	0	1,126	522	2	0	1,650
1986-87	15	30	2	204	0	134	386	1,142	358	3	0	1,889
1987-88	4	24	0	198	0	103	329	1,154	1,086	3	0	2,572
1988-89	12	27	13	238	0	90	380	1,787	1,215	8	1	3,391
Average	8	24	6	143	0	69	229	1,162	609	4	0	2,004
(% in nation)	(6.5)	(7.9)	(4.8)	(10.3)	(0.0)	(6.1)	(7.4)	(8.0)	(14.3)	(6.1)	(6.5)	(9.1)

Remarks: LV-Local Variety
HYV-High Yielding Variety

Table B.3.9 Farm Input Requirement Standardized by MOA

Crop	Seed	Unit: Kg/ha					
		N-fertilizer		P-fertilizer		K-fertilizer	
		Urea	N	TSP	P2O5	MP	K2O
Paddy							
B-Aus	80.6	103.6	47.7	103.6	47.7	39.1	23.5
B-Aman	86.3	76.0	35.0	76.0	35.0	36.8	22.1
T-Aman	26.5	103.6	47.7	103.6	47.7	39.1	23.5
Boro (LV)	24.2	103.6	47.7	103.6	47.7	39.1	23.5
Boro (HYV)	21.9	241.8	111.2	241.8	111.2	115.1	69.1
Wheat	74.8	92.1	42.4	46.0	21.2	34.5	20.7
Fibre							
White Jute	10.4	103.6	47.7	25.3	11.7	36.8	22.1
Tossa Jute	6.9	103.6	47.7	25.3	11.7	36.8	22.1
Mesta Jute	6.9	103.6	47.7	25.3	11.7	36.8	22.1
Pulses							
Masur	31.1	69.1	31.8	126.8	58.3	46.0	27.6
Khesari	25.3	69.1	31.8	92.1	42.4	46.0	27.6
Spices							
Bhadoi Chillies	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Rabi Chillies	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Onion	5.8	0.0	0.0	0.0	0.0	0.0	0.0
Turmeric	1,059.1	0.0	0.0	0.0	0.0	0.0	0.0
Ginger	1,059.1	0.0	0.0	0.0	0.0	0.0	0.0
Corriander	92.1	0.0	0.0	0.0	0.0	0.0	0.0
Others							
Potato	1,243.3	276.3	127.1	184.2	84.7	276.3	165.8
Sugarcane	5,065.4	276.3	127.1	276.3	127.1	184.2	110.5
Tobacco	0.1	82.9	38.1	50.7	23.3	80.6	48.4
Vegetable							
Brinjal	0.2	92.1	42.4	184.2	84.7	46.0	27.6
Cauliflower	0.3	92.1	42.4	138.1	63.5	46.0	27.6
Cabbage	0.3	184.2	84.7	46.0	21.2	46.0	27.6
Watergourd	0.9	92.1	42.4	92.1	42.4	46.0	27.6
Pumpkin	0.5	92.1	42.4	92.1	42.4	46.0	27.6
Tomato	0.1	138.1	63.5	184.2	84.7	46.0	27.6
Raddish	8.1	92.1	42.4	46.0	21.2	46.0	27.6
Spinach	23.0	138.1	63.5	46.0	21.2	46.0	27.6
Beans	2.0	0.0	0.0	3.5	1.6	3.5	2.1
Lady's finger	5.8	92.1	42.4	92.1	42.4	46.0	27.6
Cucumber	0.4	2.3	1.1	2.3	1.1	2.3	1.4
Karala (Bittergourd)	2.0	92.1	42.4	92.1	42.4	46.0	27.6

Table B.3.10 Distribution of Chemical Fertilizers

Item	Urea (N-46%)	TSP* (P2O5-46%)	MP** (K2O-60%)	DAP & Others	Gypsum	Zinc
I. Bangladesh						
1985-86	792,567	296,265	59,793	233	3,869	706
1986-87	911,581	334,352	65,803	238	2,824	1,353
1987-88	1,022,187	387,863	85,964	6,370	1,889	1,306
1988-89	1,023,348	415,993	94,172			
Average	937,421	358,618	76,433	2,280	2,861	1,122
(Nutrient Cont.)	(431,214)	(164,964)	(45,860)			
Annual G. Rate (%)	9.1	12.0	16.7			
II. Greater Comilla						
1985-86	66,340	33,847	5,189	2	28	43
1986-87	85,409	43,818	5,228		6	80
1987-88	89,789	48,690	8,800		16	81
1988-89	61,397	39,446	9,099			
Average	75,734	41,450	7,079	2	17	68
(Nutrient Cont.)	(34,838)	(19,067)	(4,247)			
Annual G. Rate (%)	0.8	7.2	24.2			

Remarks:

* TSP: Triple Superphosphate

** MP: Potassium Chloride/Muriate of potash

Table B.3.11 Sources of Chemical Fertilizers

Item	Domestic		Imported		Total	
	1000 ton	%	1000 ton	%	1000 ton	%
1. Urea						
1983-84	640		94		734	
1984-85	706		171		877	
1985-86	780		196		976	
1986-87	865				865	
1987-88	983				983	
Average	795	83.8	154	16.2	948	100.0
2. TSP						
1983-84	74		124		198	
1984-85	60		408		468	
1985-86	91		356		447	
1986-87	121		93		214	
1987-88	128		191		319	
Average	95	28.8	234	71.2	329	100.0
3. MP						
1983-84			60		60	
1984-85			75		75	
1985-86			87		87	
1986-87			47		47	
1987-88			83		83	
Average	0	0.0	70	100.0	70	100.0
4. Others*						
1983-84	1		79		80	
1984-85			14		14	
1985-86	3		1		4	
1986-87	3		12		15	
1987-88			19		19	
Average	2	8.5	25	91.5	27	100.0
Total						
1983-84	715		357		1,072	
1984-85	766		668		1,434	
1985-86	874		640		1,514	
1986-87	989		152		1,141	
1987-88	1,111		293		1,404	
Average	891	67.9	422	32.1	1,313	100.0

Remarks: *; Others include HP, NPK, DAP, SP, PS, Zinc, etc.

Note: Domestic sources are local marchants for urea, Chittagong fertilizer factory for TSP and gypsum.

Table B.3.12 Distribution of Agro-Chemicals

Item	Bangladesh (ton)	Greater Comilla	
		ton	%
1. Insecticides			
1986-87	3,431	400	
1987-88	3,852	437	
1988-89	4,650	533	
Average	3,978	457	11.5
2. Fumigation			
1986-87	239	2.5	
1987-88	139	2.0	
1988-89	120	2.0	
Average	166	2.2	1.3
3. Acaricide			
1986-87	25	1	
1987-88	59	7	
1988-89	62	5	
Average	49	4	8.9
4. Fungicides			
1986-87	115	4	
1987-88	49	4	
1988-89	110	10	
Average	91	6	6.6
5. Rodenticides			
1986-87	10	1.0	
1987-88	4	0.5	
1988-89	5	0.5	
Average	6	0.7	10.5
6. Herbicide			
1986-87	108	0	
1987-88	96	0	
1988-89	94	0	
Average	99	0	0.0
Total			
1986-87	3,928	409	
1987-88	4,199	451	
1988-89	5,041	551	
Average	4,389	470	10.7

Note: Some 85% of insecticides are used for rice stem borer.

Table B.3.13 Area of Plant Protection by Crop in Bangladesh

Unit: 1000 ha

Year	Paddy	Jute	Sugarcane	Vegetables	Pulses, Oil-seeds/Others	Potato	Wheat	Fruits	Total
1982-83	567	45	20	24	28	28	10	3	725
1983-84	577	75	27	19	42	32	13	4	788
1984-85	891	77	30	32	45	41	20	6	1,142
1985-86	810	41	20	20	36	20	20	8	976
1986-87	729	41	32	20	41	20	12	10	905
1987-88	425	4	34	4	41	32	6	1	548
1988-89	681	2	4	8	2	34	6	2	739
Average	669	41	24	18	33	30	12	5	832

Table B.4.1 Present and Target Planted Area by Crop

Crop	Unit: ha			
	1990	1995	2000	2010
1. Rice				
1.1 B. Aus (LV)	14,191	14,200	14,200	14,200
1.2 T. Aus (LV)	12,799	6,400	0	0
1.3 T. Aus (HYV)	8,550	15,000	21,300	21,300
1.4 B. Aman (LV)	28,782	28,800	28,800	28,800
1.5 T. Aman (LV)	6,806	3,400	0	0
1.6 T. Aman (HYV)	21,083	24,500	27,900	27,900
1.7 Boro (LV)	900	0	0	0
1.8 Boro (HYV)	25,713	30,100	33,100	33,100
Total (1)	118,824	122,300	125,300	125,300
Increased Area	0	3,400	3,100	0
2. Others				
2.1 Wheat	16,796	16,800	16,800	16,800
2.2 Jute	5,875	5,900	5,900	5,900
2.3 Potato	8,011	8,300	8,700	9,000
2.4 Mustard	8,608	9,000	9,300	9,700
2.5 Sesame	755	800	800	800
2.6 Pulses	7,295	7,600	7,900	8,200
2.7 Chilli	686	700	700	700
2.8 Vegetables	2,648	2,600	2,600	2,600
2.9 Others	1,189	1,200	1,200	1,200
Total (2)	51,863	52,900	53,900	55,000
Increased Area	0	1,000	1,000	1,100
Total Crop Production	170,687	175,200	179,200	180,300

Table B.4.2 Present and Target Unit Yield

Crop	Unit: ton/ha			
	1990	1995	2000	2010
1. Rice				
1.1 B. Aus (LV)	0.9	1.2	1.5	1.5
1.2 T. Aus (LV)	1.1	1.8	2.5	2.5
1.3 T. Aus (HYV)	2.1	2.6	3.0	3.0
1.4 B. Aman (LV)	1.1	1.1	1.1	1.1
1.5 T. Aman (LV)	1.3	2.1	2.8	2.8
1.6 T. Aman (HYV)	2.7	3.4	4.0	4.0
1.7 Boro (LV)	2.5	2.6	2.7	2.7
1.8 Boro (HYV)	3.3	3.9	4.5	4.5
2. Others				
2.1 Wheat	2.3	2.9	3.5	3.5
2.2 Jute	1.8	2.1	2.4	2.4
2.3 Potato	11.0	13.0	15.0	15.0
2.4 Mustard	0.9	1.1	1.3	1.3
2.5 Sesame	0.7	0.9	1.0	1.0
2.6 Pulses	0.8	1.0	1.2	1.2
2.7 Chilli	1.2	1.6	2.0	2.0
2.8 Vegetables	11.8	12.9	14.0	14.0
2.9 Other (Onion)	8.1	11.6	15.0	15.0

Table B.4.3 Present and Target Production

Crop	Unit: 1000 ton			
	1990	1995	2000	2010
1. Rice				
1.1 B. Aus (LV)	12.8	17.0	21.3	21.3
1.2 T. Aus (LV)	14.1	11.5	0.0	0.0
1.3 T. Aus (HYV)	18.0	38.3	63.9	63.9
1.4 B. Aman (LV)	31.7	31.7	31.7	31.7
1.5 T. Aman (LV)	8.8	7.0	0.0	0.0
1.6 T. Aman (HYV)	56.9	82.1	111.6	111.6
1.7 Boro (LV)	2.3	0.0	0.0	0.0
1.8 Boro (HYV)	84.9	117.4	149.0	149.0
Total (1)	229.34	304.93	377.43	377.43
2. Others				
2.1 Wheat	38.6	48.7	58.8	58.8
2.2 Jute	10.6	12.4	14.2	14.2
2.3 Potato	88.1	107.9	130.5	135.0
2.4 Mustard	7.7	9.9	12.1	12.6
2.5 Sesame	0.5	0.7	0.8	0.8
2.6 Pulses	5.8	7.6	9.5	9.8
2.7 Chilli	0.8	1.1	1.4	1.4
2.8 Vegetables	31.2	33.5	36.4	36.4
2.9 Others	9.6	13.9	18.0	18.0

Table B.4.4 Farm Input Requirement by Crop

1. Present Conditions						
Crop	Seed Kg/ha	Urea Kg/ha	TSP Kg/ha	MP Kg/ha	Chemicals Kg/ha	Labour man-day
1. Rice						
1.1 B. Aus (LV)	100	38	24	7	0.0	120
1.2 T. Aus (LV)	50	60	32	13	0.0	170
1.3 T. Aus (HYV)	50	110	70	27	1.0	145
1.4 B. Aman (LV)	100	29	13	1	0.0	100
1.5 T. Aman (LV)	50	61	0	0	0.0	100
1.6 T. Aman (HYV)	50	118	75	26	1.0	155
1.7 Boro (LV)	50	33	16	39	0.0	94
1.8 Boro (HYV)	50	190	120	80	1.0	184
2. Others						
2.1 Wheat	121	85	50	25	1.0	120
2.2 Jute	8	53	15	5	0.5	185
2.3 Potato	1,100	170	110	70	0.5	210
2.4 Mustard	14	60	40	30	0.5	61
2.5 Sesame	0	0	0	0	0.0	47
2.6 Pulses	35	0	0	0	0.0	50
2.7 Chilli	10	100	150	80	0.0	162
2.8 Vegetables	5	90	70	25	0.5	220
2.9 Others (Onion)	6	0	0	0	0.0	210
2. Future Conditions (2000)						
Crop	Seed Kg/ha	Urea Kg/ha	TSP Kg/ha	MP Kg/ha	Chemicals Kg/ha	Labour man-day
1. Rice						
1.1 B. Aus (LV)	100	105	105	40	1.0	100
1.2 T. Aus (LV)	40	105	105	40	1.0	150
1.3 T. Aus (HYV)	40	260	130	66	2.0	150
1.4 B. Aman (LV)	100	80	80	40	1.0	100
1.5 T. Aman (LV)	40	105	105	40	1.0	150
1.6 T. Aman (HYV)	40	260	130	66	2.0	150
1.7 Boro (LV)	40	260	130	66	1.0	150
1.8 Boro (HYV)	40	260	130	66	2.0	150
2. Others						
2.1 Wheat	75	95	50	40	1.0	100
2.2 Jute	10	105	30	40	1.0	160
2.3 Potato	1,250	280	190	280	2.5	140
2.4 Mustard	10	70	150	50	1.0	100
2.5 Sesame	5	100	100	20	1.0	100
2.6 Pulses	30	70	130	50	1.0	100
2.7 Chilli	10	100	190	100	1.0	200
2.8 Vegetables	5	150	150	100	2.0	300
2.9 Others (Onion)	6	150	150	100	2.0	300

FIGURES

PHYSIOGRAPHIC UNITS OF GREATER COMILLA DISTRICT



LEGEND FOR BRAHMANBARIA DIST.

- 1 Middle Meghna floodplain
- 2 Old Meghna estuarine floodplain
- 3 Salda floodplain
- 4 Sythet basin
- 5 Piedmont alluvial plain
- 6 Akhaura terrace
- 7 Hills (Dupi tila formation)

LEGEND FOR COMILLA AND CANDPUR DIST.

- 1 Lalmai Hills (a) and Old Piedmont apron (b)
- 2 Sub-recent and Recent Piedmont apron (a), including Comilla basin (b)
- 3 Old Brahmaputra floodplain
- 4 Middle Meghna floodplain
- 5 Lower Meghna river floodplain
- 6 Lower Meghna tidal floodplain
- 7 Minor river floodplain

CONVENTIONAL SIGNS

- International boundary
- District boundary
- Mapping unit boundary
- District boundary along river
- Unit boundary along river
- Wide tidal river
- Narrow river
- Main road
- Railway
- Upazila Headquarter
- Water bodies
- Urban land

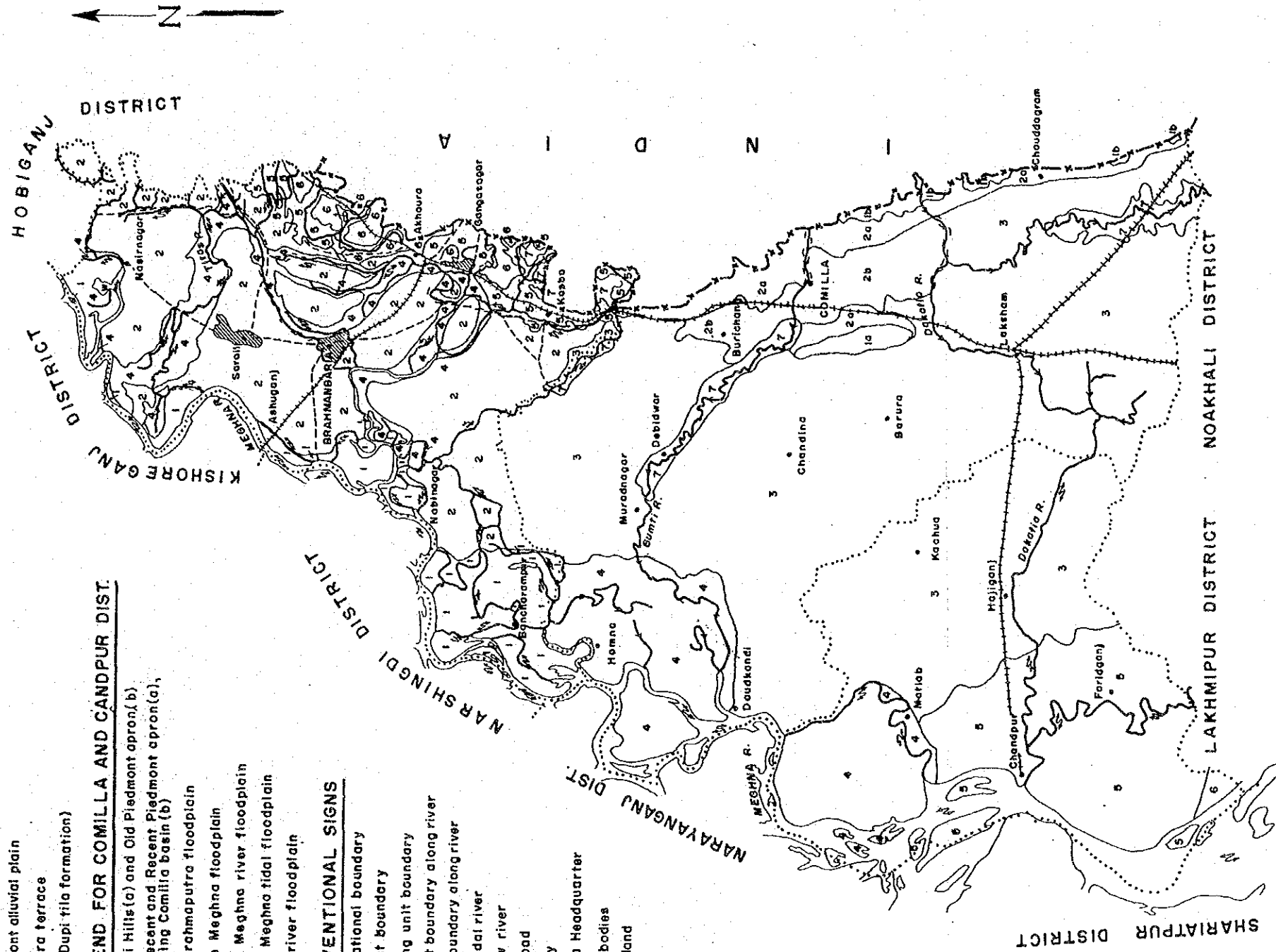


Figure B.2.1 Physiographic Units of Greater Comilla

SOIL ASSOCIATIONS OF KOCHUA UPAZILA CHANDPUR DISTRICT

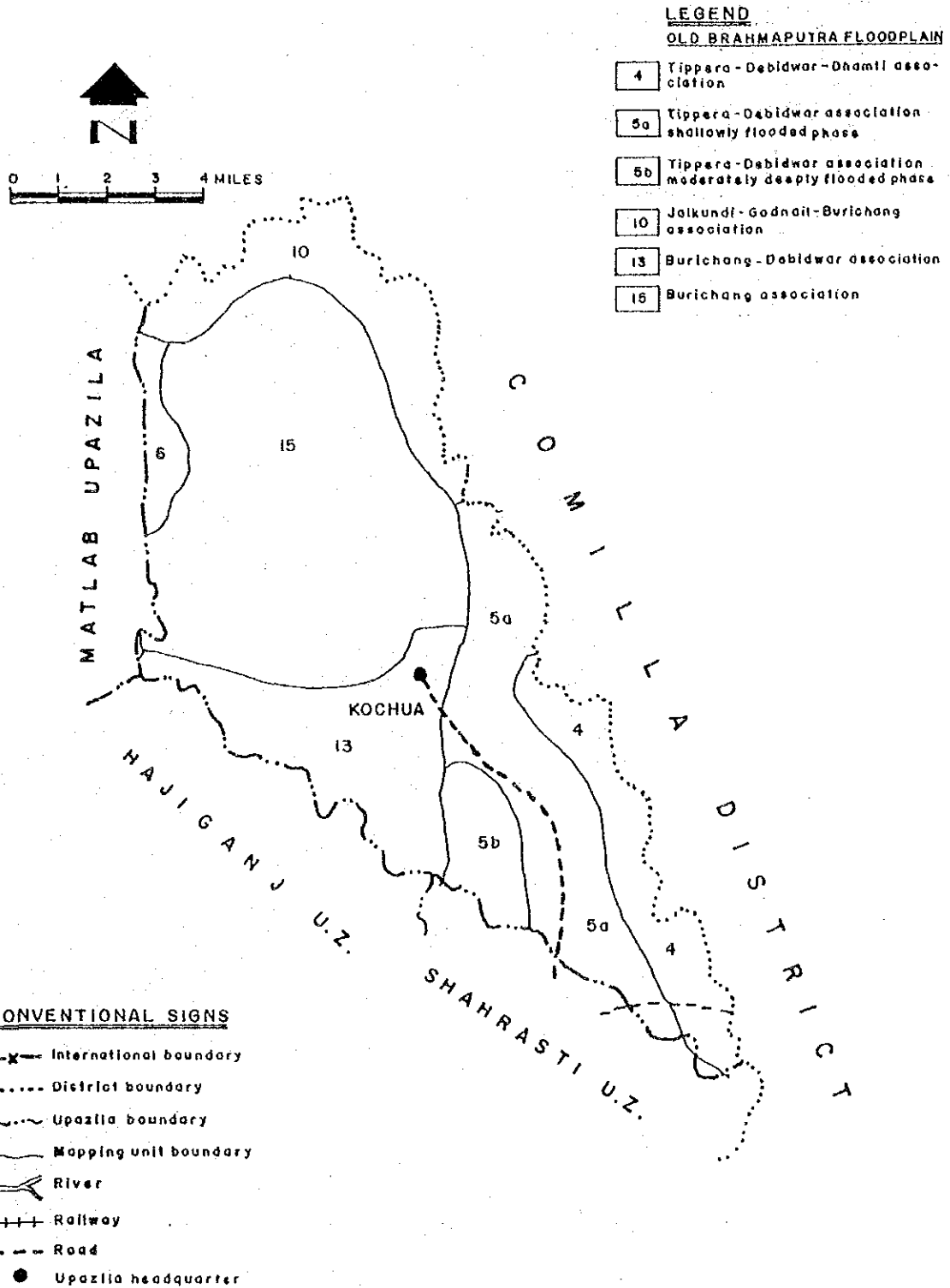


Figure B.2.2 Soil Map of Kochua

THE PEOPLE'S REPUBLIC OF BANGLADESH
THE MASTER PLAN STUDY ON THE MODEL RURAL
DEVELOPMENT PROJECT PHASE II FOR KACHUA,
NABINAGAR, BANCHARAMPUR AND DEBIDWAR UPAZILAS
JAPAN INTERNATIONAL COOPERATION AGENCY

SOIL ASSOCIATIONS OF NABINAGAR UPAZILA

LEGEND

MIDDLE MEGHNA FLOODPLAIN
Mainly ridges

- 1 Sandy and silty alluvium complex, undifferentiated
- 4 Fuldi-Banoharampur (medium high land phase) association
- 6 Fuldi series
- Basins and ridges**
- 9 Borda-Fuldi association
- OLD MEGHNA ESTUARINE FLOODPLAIN**
- 14 Dhamti-Barura (medium highland and medium lowland phases) association
- 15 Barura-Dhamti (medium lowland phase) association
- 17 Dhamti-Barura-Tippara association
- 20 Burlchang-Jaikundi association
- SYLHET BASIN**
- Titos floodplain**
- 24 Nabinagar-Nasirnagar association

CONVENTIONAL SIGNS

- International boundary
- District boundary
- Upazila boundary
- Mapping unit boundary
- Upazila headquarter
- River
- Railway
- Road

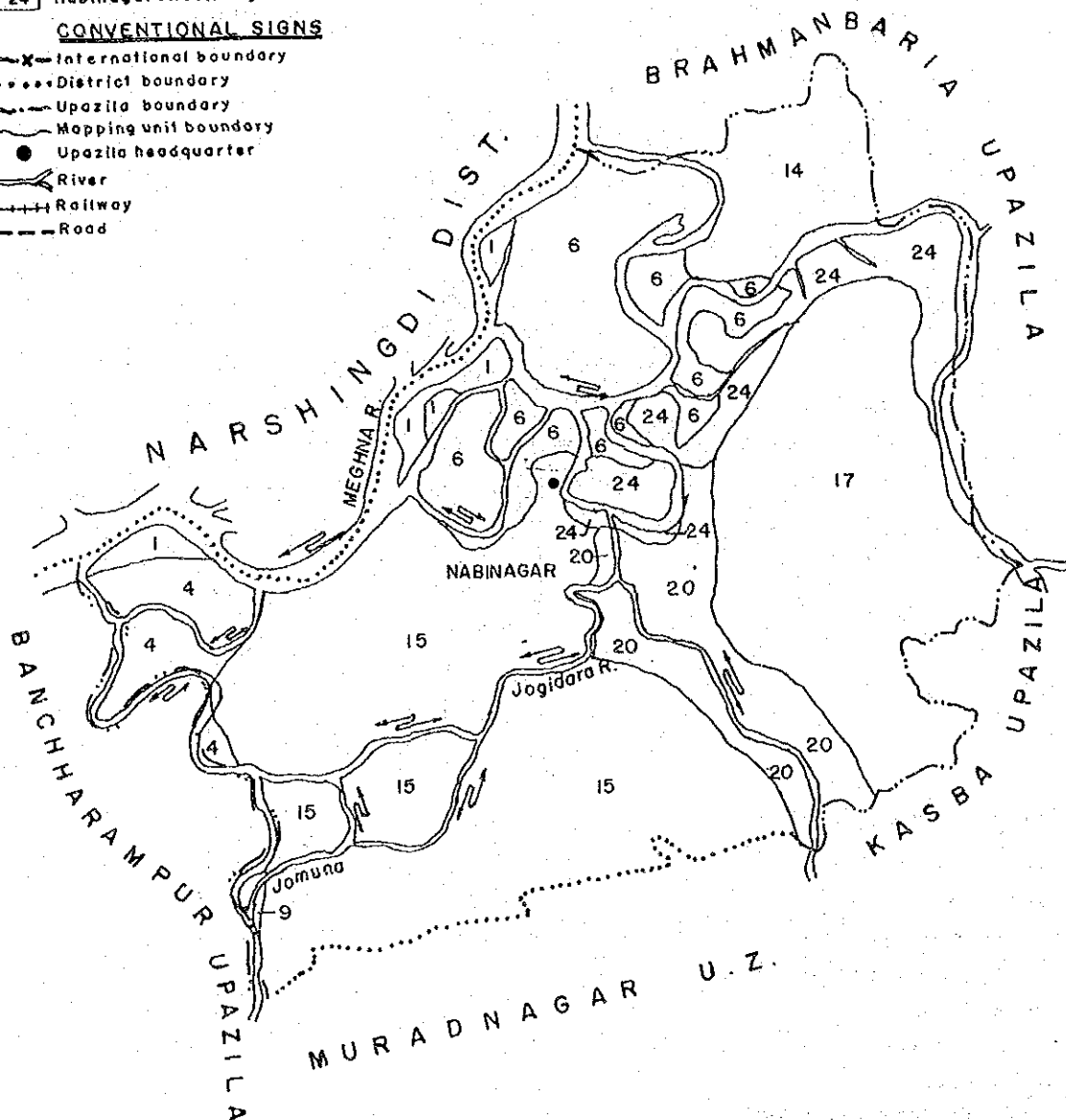
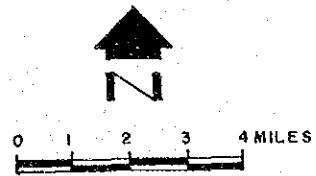


Figure B.2.3 Soil Map of Nabinagar

THE PEOPLE'S REPUBLIC OF BANGLADESH
THE MASTER PLAN STUDY ON THE MODEL RURAL
DEVELOPMENT PROJECT PHASE II FOR KACHUA,
NABINAGAR, BANCHARAMPUR AND DEBIDWAR UPAZILAS
JAPAN INTERNATIONAL COOPERATION AGENCY

SOIL ASSOCIATIONS OF BANCHARAMPUR UPAZILA BRAHMANBARIA DISTRICT

LEGEND

MIDDLE MEGHNA FLOODPLAIN
Mainly ridges

- 1 Sandy and silty alluvium complex, undifferentiated
- 2 Tanager ohar - Fuldi association
- 4 Fuldi-Bancharampur (medium highland phase) association
- 5 Fuldi-Bancharampur (medium lowland phase) association

Basins and ridges

- 8 Borda Bancharampur association
- 9 Borda Fuldi association

CONVENTIONAL SIGNS

- International boundary
- District boundary
- Upazila boundary
- Mapping unit boundary
- Upazila head quarter
- River
- Railway
- Road

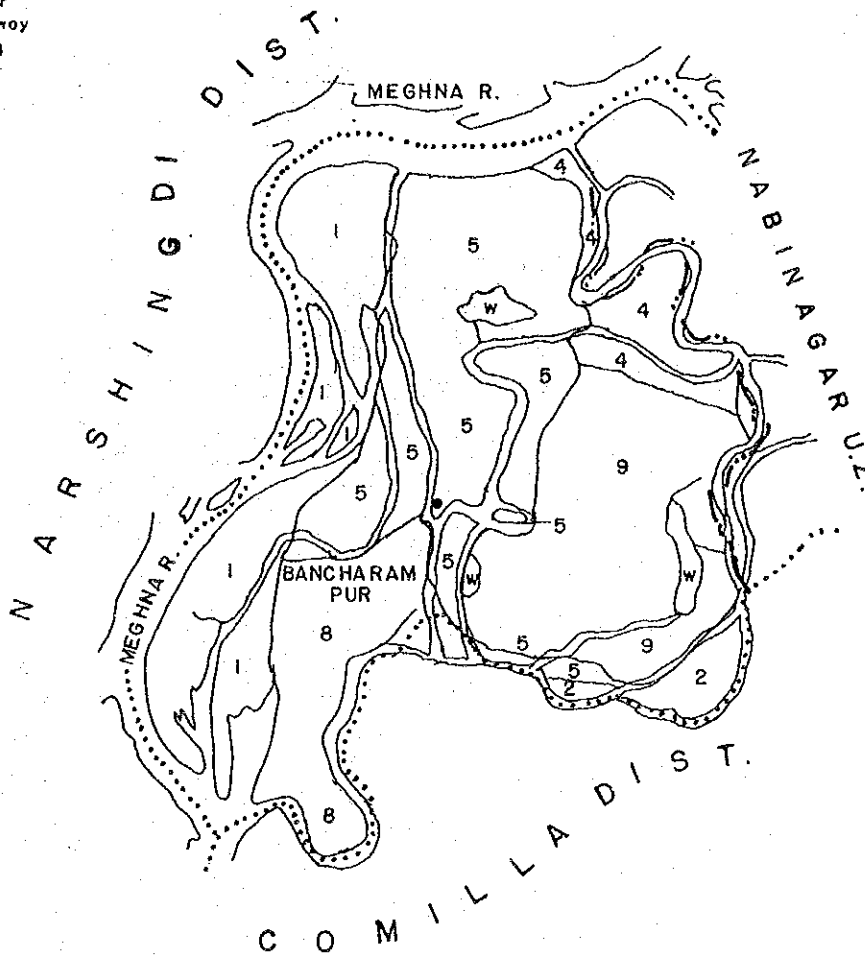


Figure B.2.4 Soil Map of Bancharampur

THE PEOPLE'S REPUBLIC OF BANGLADESH
THE MASTER PLAN STUDY ON THE MODEL RURAL DEVELOPMENT PROJECT PHASE II FOR KACHUA, NABINAGAR, BANCHARAMPUR AND DEBIDWAR UPAZILAS
JAPAN INTERNATIONAL COOPERATION AGENCY

SOIL ASSOCIATIONS OF DEBIDWAR UPAZILA COMILLA DISTRICT

LEGEND

OLD BRAHMAPUTRA FLOODPLAIN

- 11 Jalkundi-Godnail-Burichang
- 16 Barura
- 19 Debidwar-Barura
- 21 Tippera-Debidwar
- 24 Tippera-Jalkundi

MINOR RIVER FLOODPLAINS

- 33 Gumti-Tippera

CONVENTIONAL SIGNS

- International boundary
- District boundary
- Upazila boundary
- Mapping boundary
- River
- Railway
- Road
- Upazila headquarter

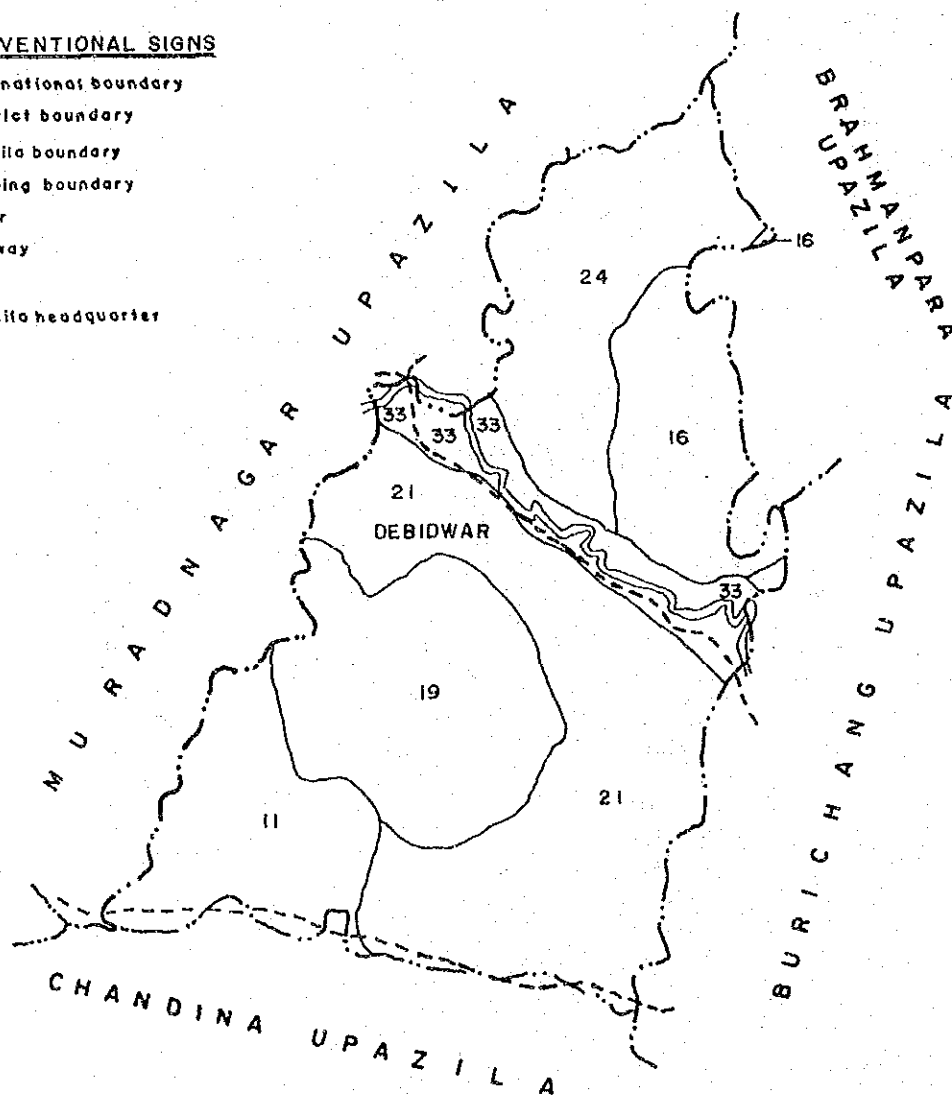
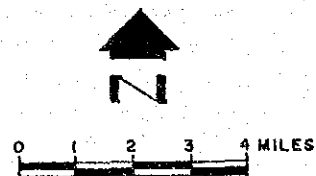


Figure B.2.5 Soil Map of Debidwar

THE PEOPLES REPUBLIC OF BANGLADESH
THE MASTER PLAN STUDY ON THE MODEL RURAL
DEVELOPMENT PROJECT PHASE II FOR KACHUA,
NABINAGAR, BANCHARAMPUR AND DEBIDWAR UPAZILAS
JAPAN INTERNATIONAL COOPERATION AGENCY

LAND USE ASSOCIATIONS OF KOCHUA UPAZILA CHANDPUR DISTRICT

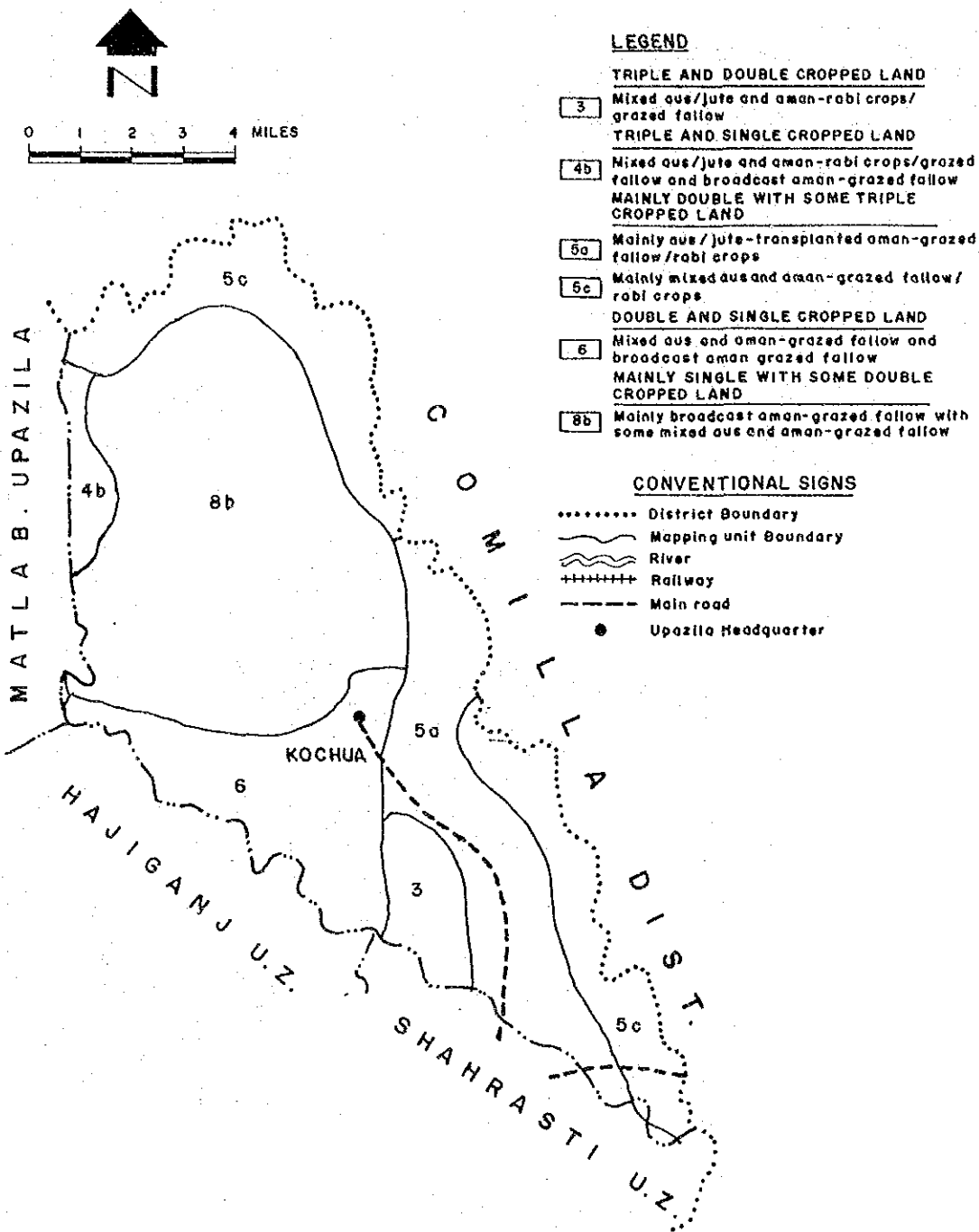


Figure B.2.6 Land Use Map of Kochua

THE PEOPLE'S REPUBLIC OF BANGLADESH
 THE MASTER PLAN STUDY ON THE MODEL RURAL
 DEVELOPMENT PROJECT PHASE II FOR KACHUA,
 NABINAGAR, BANCHARAMPUR AND DEBIDWAR UPAZILAS
 JAPAN INTERNATIONAL COOPERATION AGENCY

LAND USE ASSOCIATIONS OF

NABINAGAR UPAZILA

BRAHMANBARIA
DISTRICT

LEGEND

- 1a Aus/jute-transplanted Aman-rabi crops
- 1b Mixed aus and broadcast aman-rabi crops
- TRIPLE AND DOUBLE CROPPED LAND**
- 2a Aus/jute-transplanted aman-fallow rabi crops and mixed aus and broadcast aman-rabi crops/fallow
- 2b Aus/jute-transplanted aman-rabi crops/fallow, Mixed aus and broadcast aman-rabi crops and broadcast aman-rabi crops
- SINGLE AND TRIPLE CROPPED LAND**
- 6a Broadcast aman-fallow and aus/jute-transplanted aman rabi crops
- MAINLY DOUBLE CROPPED LAND**
- 8a Broadcast aman-rabi crops
- DOUBLE AND SINGLE CROPPED LAND**
- 9b Broadcast aman-rabi crops/fallow
- PREDOMINANTLY SINGLE CROPPED LAND**
- 11a Boro-fallow
- 11b Broadcast aman-fallow

CONVENTIONAL SIGNS

- District Boundary
- Upazila Boundary
- ~~~~~ Mapping unit Boundary
- ~~~~~ River
- +++++ Railway
- Main road
- Upazila Headquarter

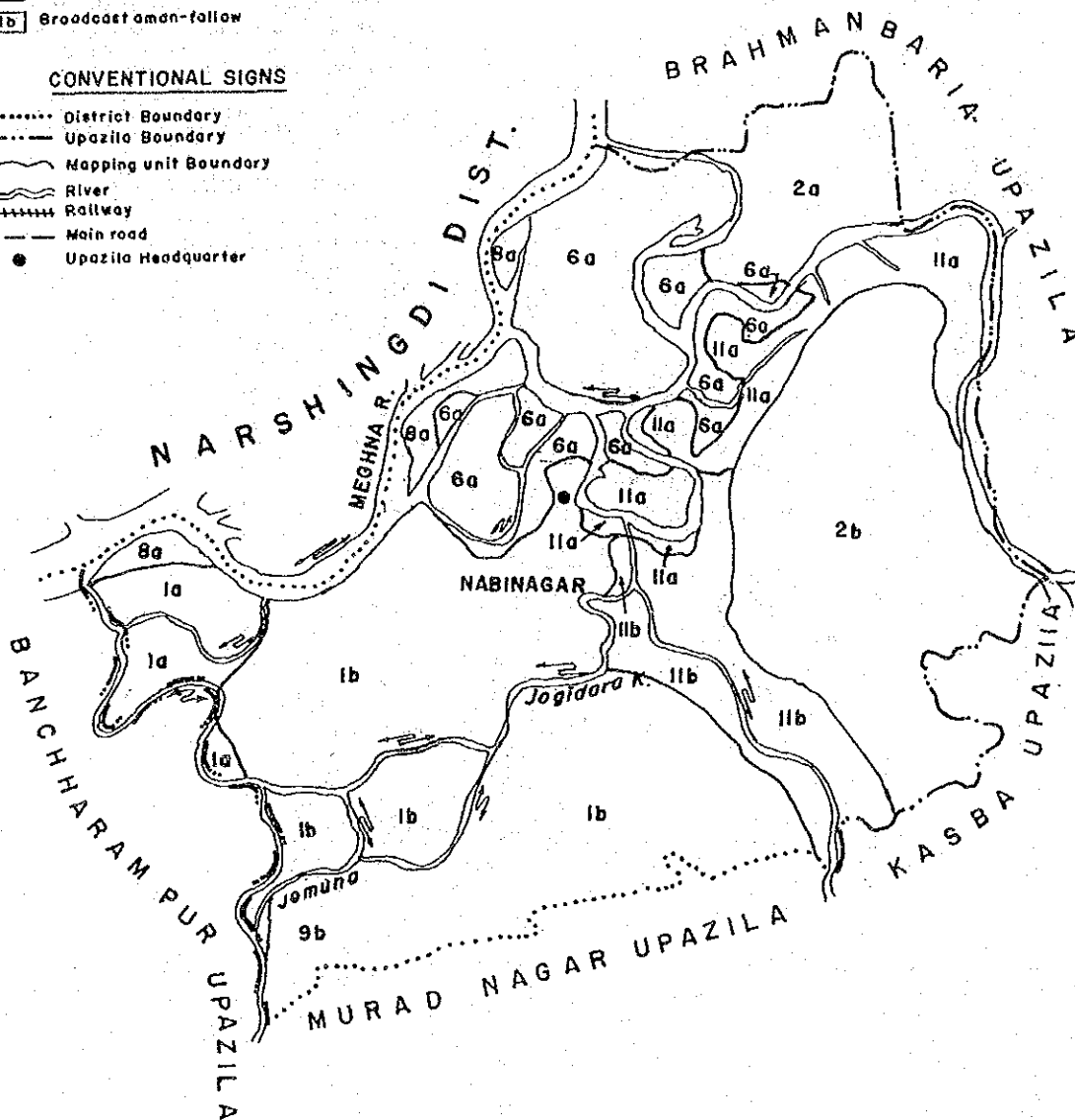
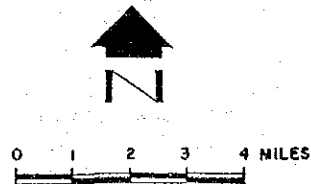


Figure B.2.7 Land Use Map of Nabinagar

THE PEOPLE'S REPUBLIC OF BANGLADESH
THE MASTER PLAN STUDY ON THE MODEL RURAL
DEVELOPMENT PROJECT PHASE II FOR KACHUA,
NABINAGAR, BANCHARAMPUR AND DEBIDWAR UPAZILAS
JAPAN INTERNATIONAL COOPERATION AGENCY

LAND USE ASSOCIATIONS OF

BANCHARAMPUR UPAZILA

BRAHMANBARIA DIST.

LEGEND

- PREDOMINANTLY TRIPLE CROPPED LAND**
- 1a** Aus/jute-transplanted aman-rabi crops
MAINLY DOUBLE WITH SOME TRIPLE CROPPED LAND
- 4** Broadcast aman-rabi crops and mixed aus and
broadcast aman-rabi crops
TRIPLE, DOUBLE AND SINGLE CROPPED LAND
- 5** Aus/jute-transplanted aman-rabi crops/fallow and
broadcast aman-fallow/rabi crops
SINGLE AND TRIPLE CROPPED LAND
- 6b** Broadcast aman-fallow and mixed aus and
broadcast aman-rabi crops
MAINLY DOUBLE CROPPED LAND
- 8a** Broadcast aman-rabi crops
DOUBLE AND SINGLE CROPPED LAND
- 9b** Broadcast aman-rabi crops/fallow

CONVENTIONAL SIGNS

- District Boundary
- Upazila Boundary
- ~~~~~ Mapping unit Boundary
- ~~~~~ River
- +++++ Railway
- Main road
- Upazila Headquarter

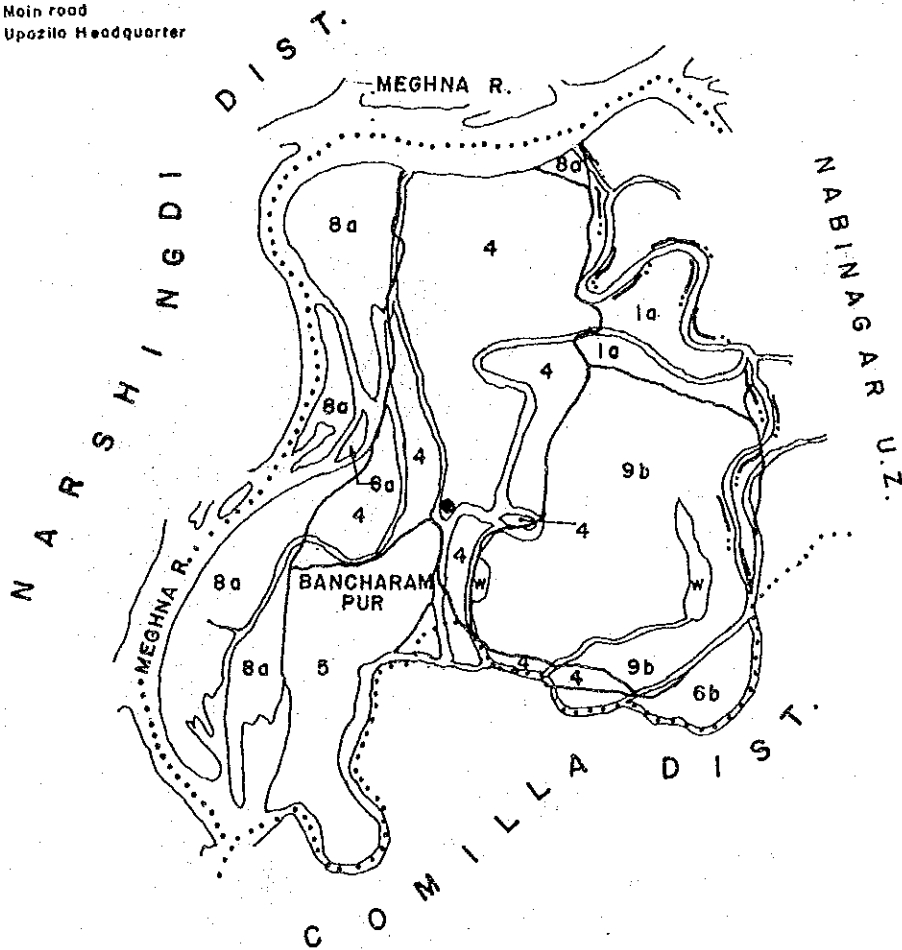


Figure B.2.8 Land Use Map of Bancharampur

THE PEOPLE'S REPUBLIC OF BANGLADESH
THE MASTER PLAN STUDY ON THE MODEL RURAL
DEVELOPMENT PROJECT PHASE II FOR KACHUA,
NABINAGAR, BANCHARAMPUR AND DEBIDWAR UPAZILAS
JAPAN INTERNATIONAL COOPERATION AGENCY

LAND USE ASSOCIATIONS OF DEBIDWAR UPAZILA COMILLA DISTRICT

LEGEND

- PERENNIAL AND PREDOMINANTLY TRIPLE CROPPED LAND**
- 1 Mainly aus/jute-transplanted aman-rabi crops and mixed aus and aman-khesari
- MAINLY TRIPLE CROPPED-WITH SOME DOUBLE CROPPED LAND**
- 2b Mainly aus/jute-transplanted aman-rabi crops/grazed fallow with some mixed aus and aman-rabi crops/grazed fallow
- TRIPLE AND DOUBLE CROPPED LAND**
- 5 Mixed aus/jute and aman-rabi crops/grazed fallow
- MAINLY DOUBLE WITH SOME TRIPLE CROPPED LAND**
- 6 Mainly mixed aus/jute and aman-grazed fallow/rabi crops with some aus/jute-transplanted aman-rabi crops.

CONVENTIONAL SIGNS

- Upazila Boundary
- - - Mapping unit Boundary
- ~ River
- + + + + + Railway
- - - Main road
- Upazila Headquarter

0 1 2 3 4 MILES

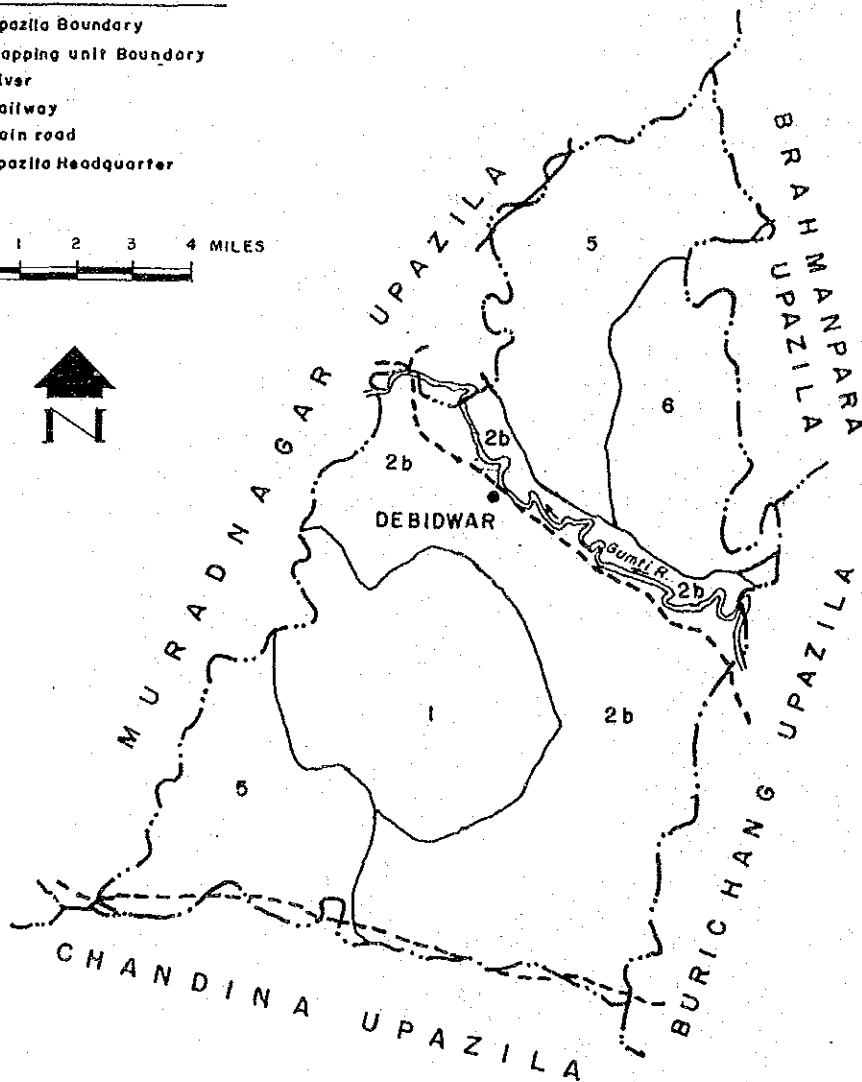
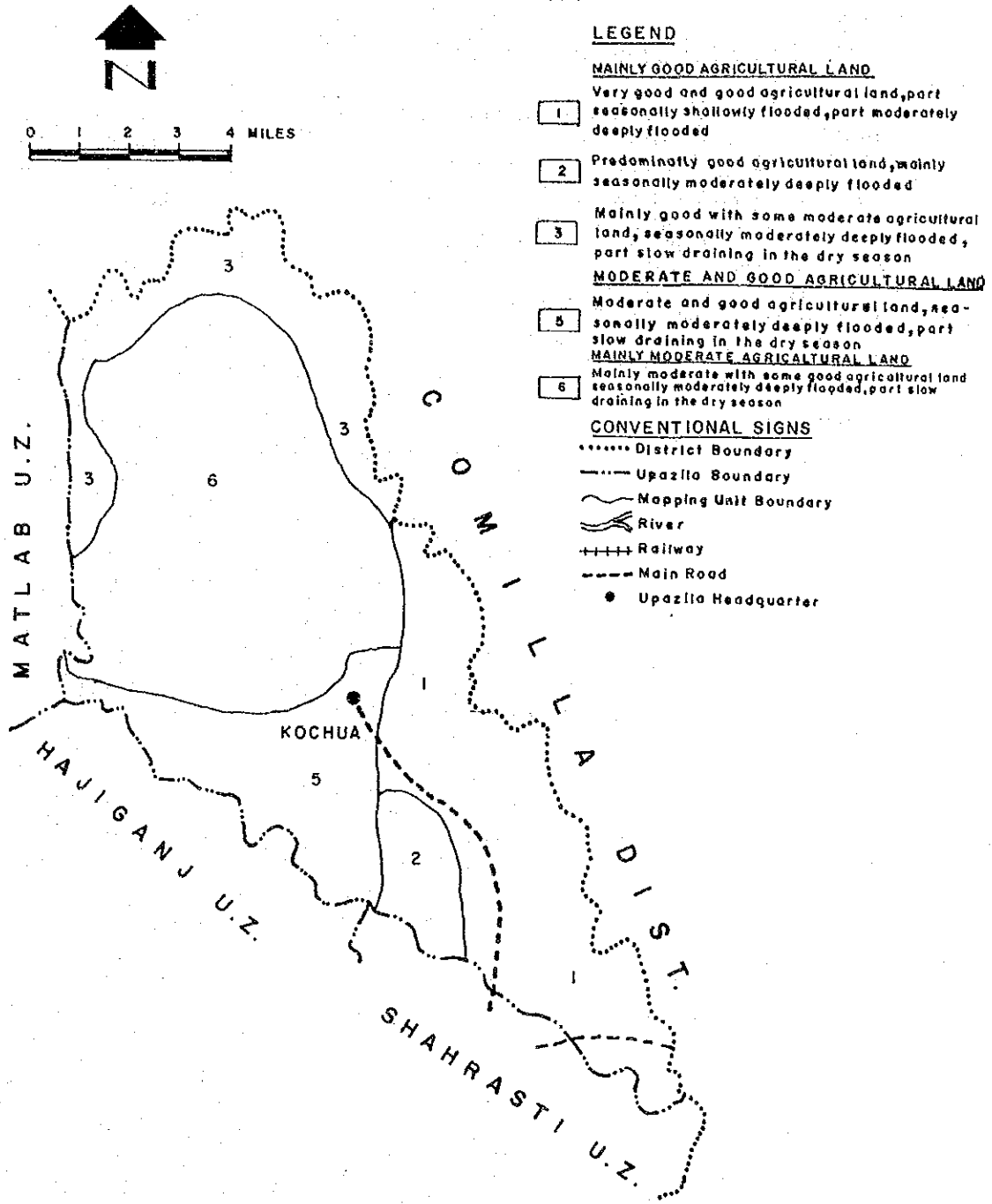


Figure B.2.9 Land Use Map of Debidwar

THE PEOPLE'S REPUBLIC OF BANGLADESH
THE MASTER PLAN STUDY ON THE MODEL RURAL
DEVELOPMENT PROJECT PHASE II FOR KACHUA,
NABINAGAR, BANCHARAMPUR AND DEBIDWAR UPAZILAS
JAPAN INTERNATIONAL COOPERATION AGENCY

LAND CAPABILITY ASSOCIATIONS OF KOCHUA UPAZILA CHANDPUR DISTRICT



LEGEND

MAINLY GOOD AGRICULTURAL LAND

- 1 Very good and good agricultural land, part seasonally shallowly flooded, part moderately deeply flooded
- 2 Predominantly good agricultural land, mainly seasonally moderately deeply flooded
- 3 Mainly good with some moderate agricultural land, seasonally moderately deeply flooded, part slow draining in the dry season

MODERATE AND GOOD AGRICULTURAL LAND

- 5 Moderate and good agricultural land, seasonally moderately deeply flooded, part slow draining in the dry season

MAINLY MODERATE AGRICULTURAL LAND

- 6 Mainly moderate with some good agricultural land seasonally moderately deeply flooded, part slow draining in the dry season

CONVENTIONAL SIGNS

- District Boundary
- Upazila Boundary
- Mapping Unit Boundary
- ~~~~~ River
- +++++ Railway
- Main Road
- Upazila Headquarter

Figure B.2.10 Land Capability Map of Kochua

THE PEOPLE'S REPUBLIC OF BANGLADESH
THE MASTER PLAN STUDY ON THE MODEL RURAL DEVELOPMENT PROJECT PHASE II FOR KACHUA, NABINAGAR, BANCHARAMPUR AND DEBIDWAR UPAZILAS
JAPAN INTERNATIONAL COOPERATION AGENCY

LAND CAPABILITY ASSOCIATIONS OF NABINAGAR UPAZILA BRAHMANBARIA DISTRICT

LEGEND

- MAINLY GOOD WITH SOME MODERATE AGRICULTURAL LAND**
- 6 Seasonally shallowly flooded land with some moderately deeply flooded land
- MAINLY MODERATE WITH SOME GOOD AGRICULTURAL LAND**
- 9 Seasonally shallowly and moderately deeply flooded land
- MAINLY MODERATE WITH SOME POOR AGRICULTURAL LAND**
- 12 Seasonally, moderately deeply to very deeply flooded land, part sandy, part with flood hazard
- MAINLY POOR WITH SOME MODERATE AGRICULTURAL LAND**
- 18 Seasonally moderately deeply to very deeply flooded land, part with flood hazard
- PREDOMINANTLY POOR AGRICULTURAL LAND**
- 21 Seasonally deeply to very deeply flooded basins with flood hazard, part slow draining in dry season
- POOR AND VERY POOR AGRICULTURAL LAND**
- 23 Seasonally deeply flooded charland with hazards of flood and river erosion

CONVENTIONAL SIGNS

- District Boundary
- Upazila Boundary
- ~~~~~ Mapping unit Boundary
- ~~~~~ River
- +++++ Railway
- Main Road
- Upazila Boundary

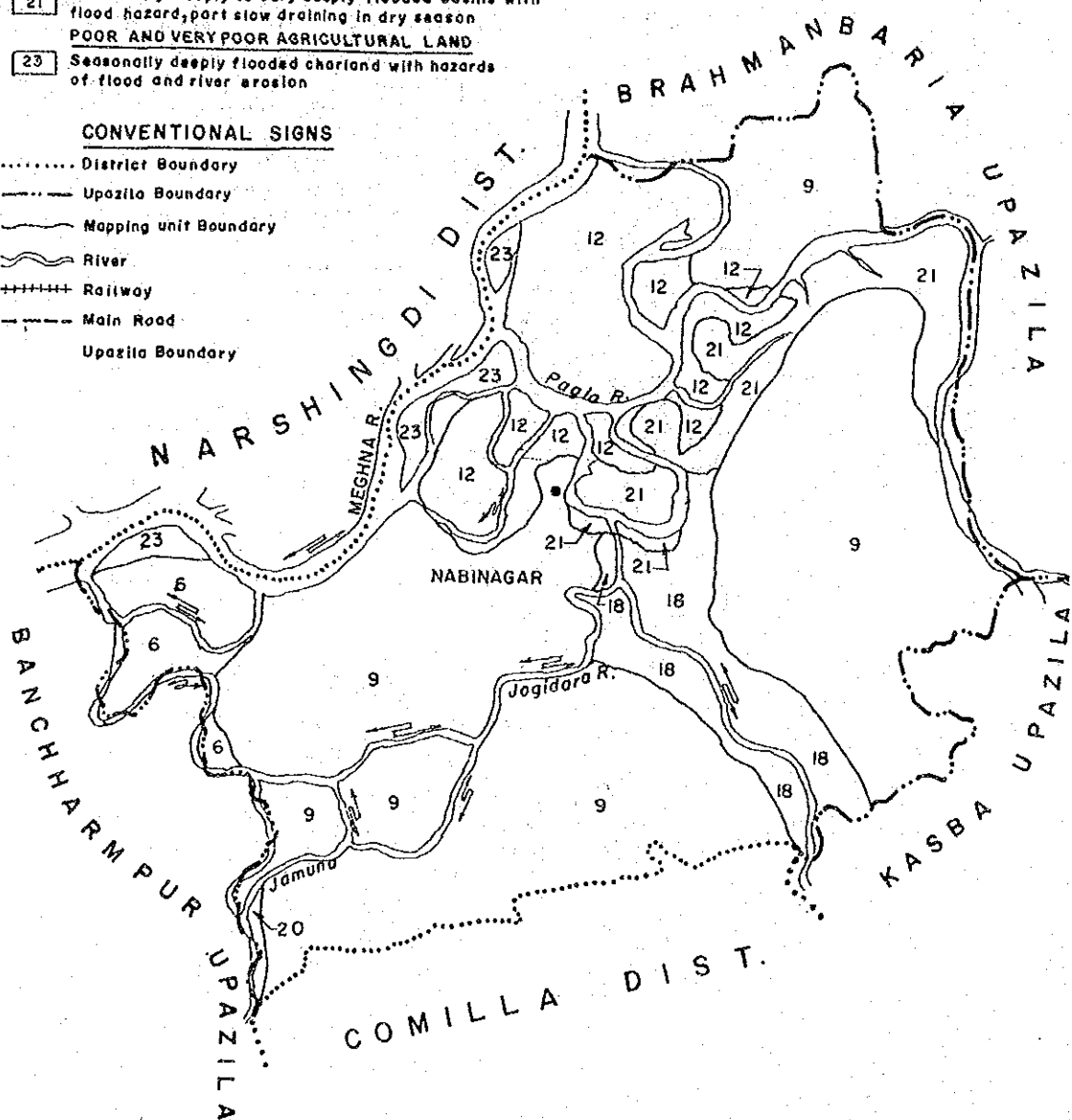


Figure B.2.11 Land Capability Map of Nabinagar

THE PEOPLE'S REPUBLIC OF BANGLADESH
THE MASTER PLAN STUDY ON THE MODEL RURAL
DEVELOPMENT PROJECT PHASE II FOR KACHUA,
NABINAGAR, BANCHARAMPUR AND DEBIDWAR UPAZILAS
JAPAN INTERNATIONAL COOPERATION AGENCY

LAND CAPABILITY ASSOCIATIONS OF BANCHARAMPUR UPAZILA BRAHMANBARIA DISTRICT

LEGEND

- MAINLY GOOD WITH SOME MODERATE AGRICULTURAL LAND**
- 6 Seasonally shallowly flooded land with some moderately deeply flooded land
- MAINLY MODERATE WITH SOME GOOD AGRICULTURAL LAND**
- 9 Seasonally shallowly and moderately deeply flooded land
- MAINLY MODERATE AGRICULTURAL LAND**
- 10 Seasonally shallowly to deeply flooded land
- MAINLY MODERATE WITH SOME POOR AGRICULTURAL LAND**
- 11 Seasonally moderately deeply to very deeply flooded land.
- MAINLY POOR WITH SOME MODERATE AGRICULTURAL LAND**
- 18 Seasonally moderately deeply to very deeply flooded land, part with flood hazard
- POOR AND VERY POOR AGRICULTURAL LAND**
- 23 Seasonally deeply flooded charland with hazards of flood and river erosion
- 20 **PREDOMINANTLY POOR AGRICULTURAL LAND**
Seasonally deeply to very deeply flooded basins, part with flooded hazard

CONVENTIONAL SIGNS

- District Boundary
- Upazila Boundary
- ~~~~~ Mapping unit Boundary
- ~~~~~ River
- +++++ Railway
- Main road
- Upazila Headquarter

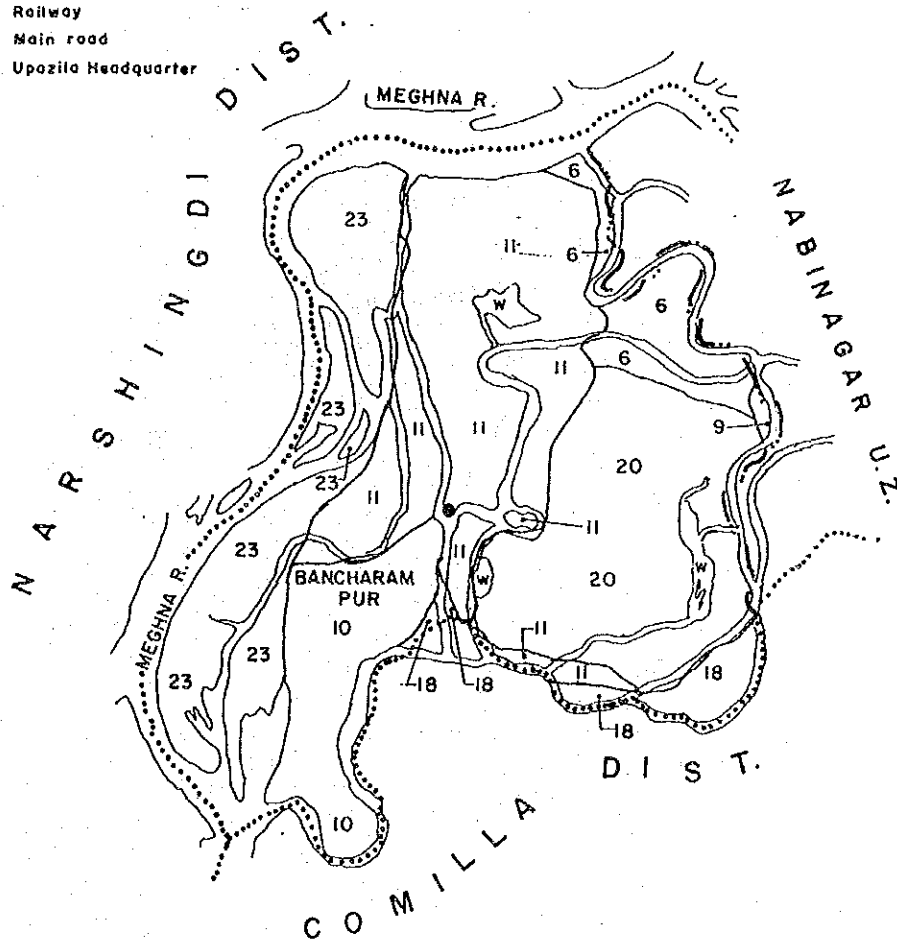
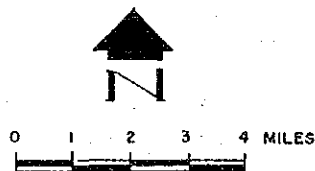


Figure B.2.12 Land Capability Map of Bancharampur

THE PEOPLE'S REPUBLIC OF BANGLADESH

THE MASTER PLAN STUDY ON THE MODEL RURAL
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JAPAN INTERNATIONAL COOPERATION AGENCY

LAND CAPABILITY ASSOCIATIONS OF DEBIDWAR UPAZILA COMILLA DISTRICT

LEGEND

- MAINLY GOOD AGRICULTURAL LAND**
- 2b Mainly good with some very good agricultural land, mainly moderately deeply flooded
 - 3a Predominantly good agricultural land, mainly moderately deeply flooded
- MAINLY MODERATE AGRICULTURAL LAND**
- 5 Mainly moderate with some very good agricultural land, mainly shallowly flooded, mainly with flood hazard
 - 6b Predominantly moderate agricultural land, deeply flooded, part slow draining in the dry season



CONVENTIONAL SIGNS

- Upazila Boundary
- Mapping unit Boundary
- ~ River
- ++++ Railway
- - - Main road
- Upazila Headquarter

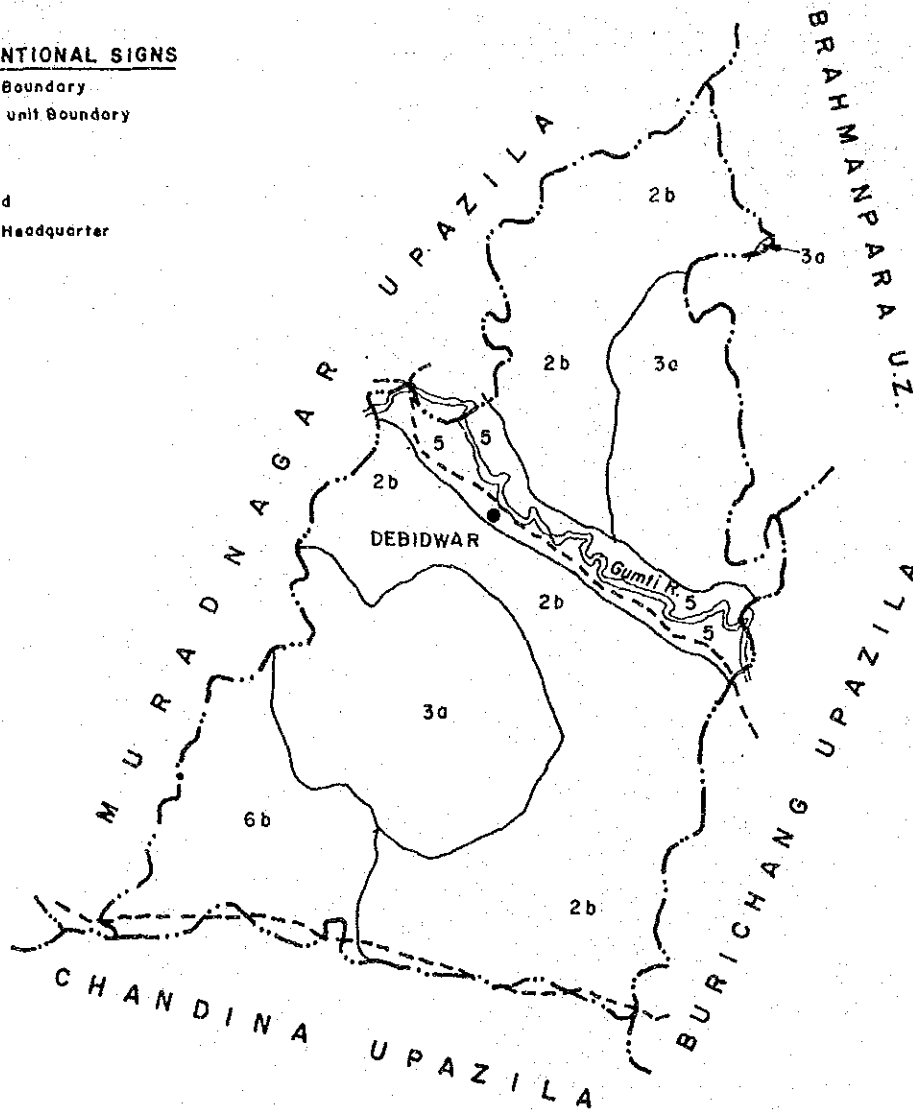


Figure B.2.13 Land Capability Map of Debidwar

THE PEOPLE'S REPUBLIC OF BANGLADESH
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