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

MAIN REPORT

DECEMBER 1991

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

In response to a request from the Government of the People's Republic of Bangladesh, the Government of Japan decided to conduct a master plan study on the Model Rural Development Project Phase II for Kachua, Nabinagar, Bancharampur and Debidwar Upazilas and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Bangladesh a study team headed by Mr. Hiroshi Yamamoto, Nippon Koei Co., Ltd., three times between September 1990 and August 1991.

The team held discussions with the officials concerned of the Government of Bangladesh, and conducted field surveys at the study area. After the team returned to Japan, further studies were made and the present report was prepared.

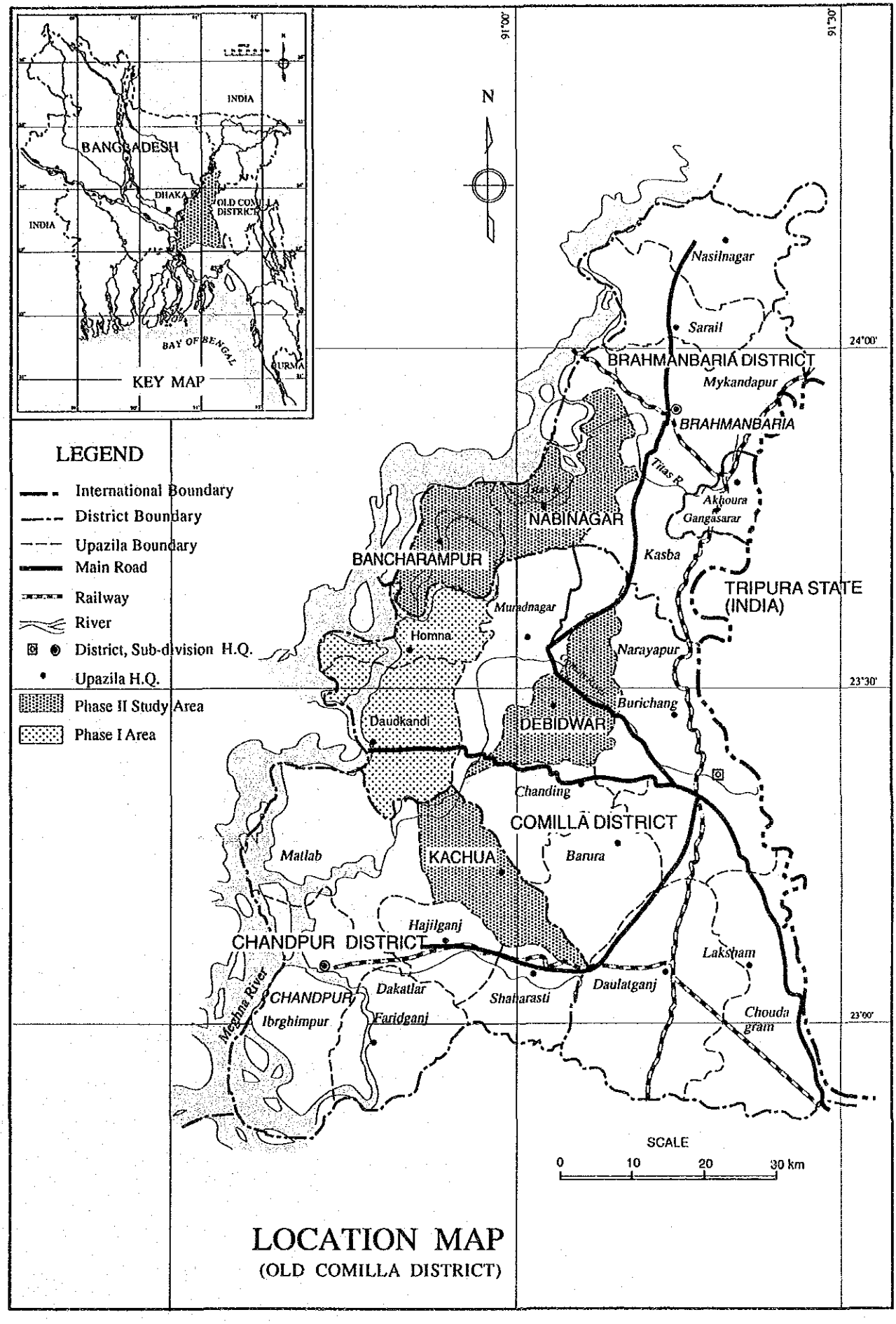
I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the People's Republic of Bangladesh for their close cooperation extended to the team.

December 1991

Kensuke Yanagiya

Kensuke Yanagiya
President
Japan International Cooperation Agency



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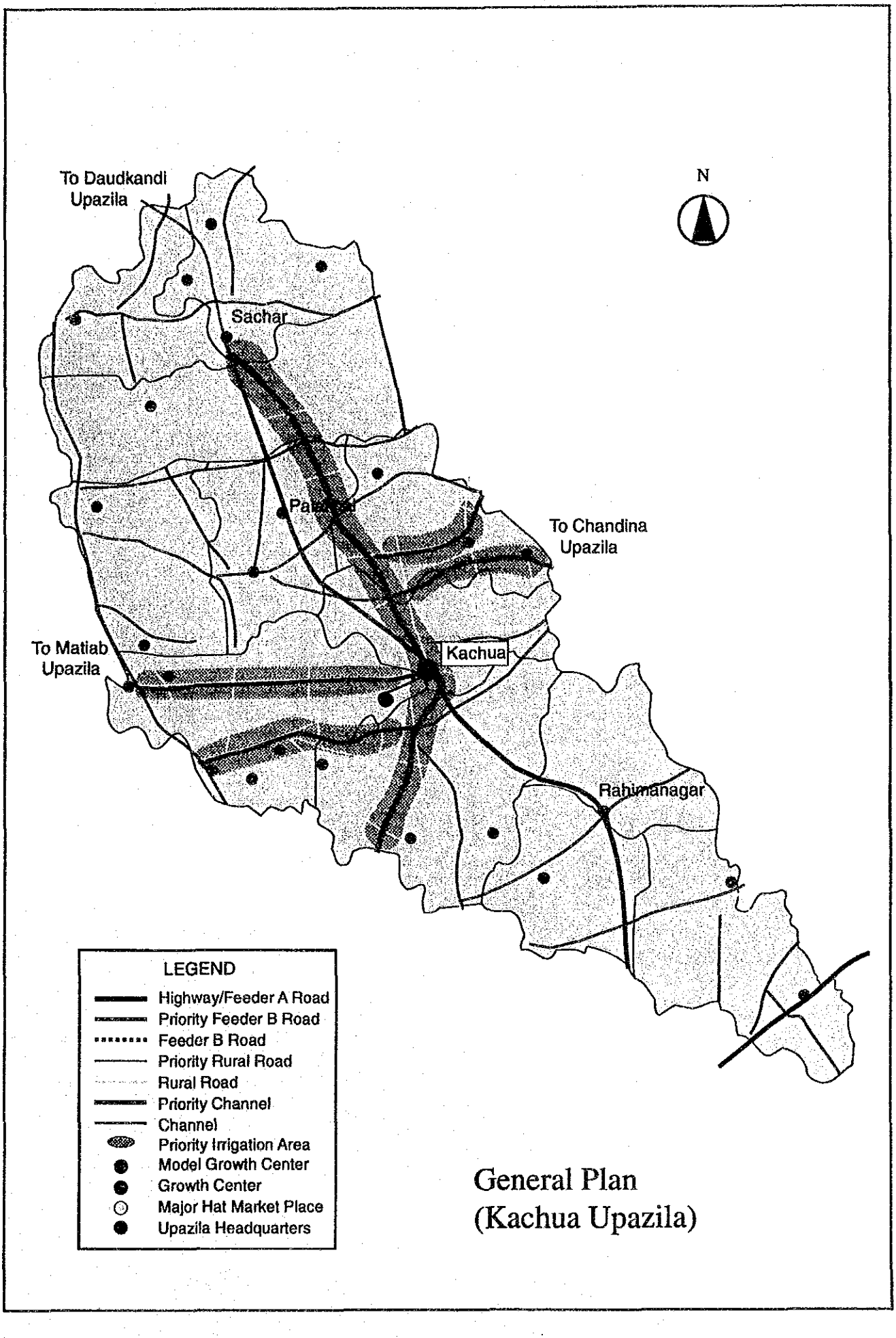

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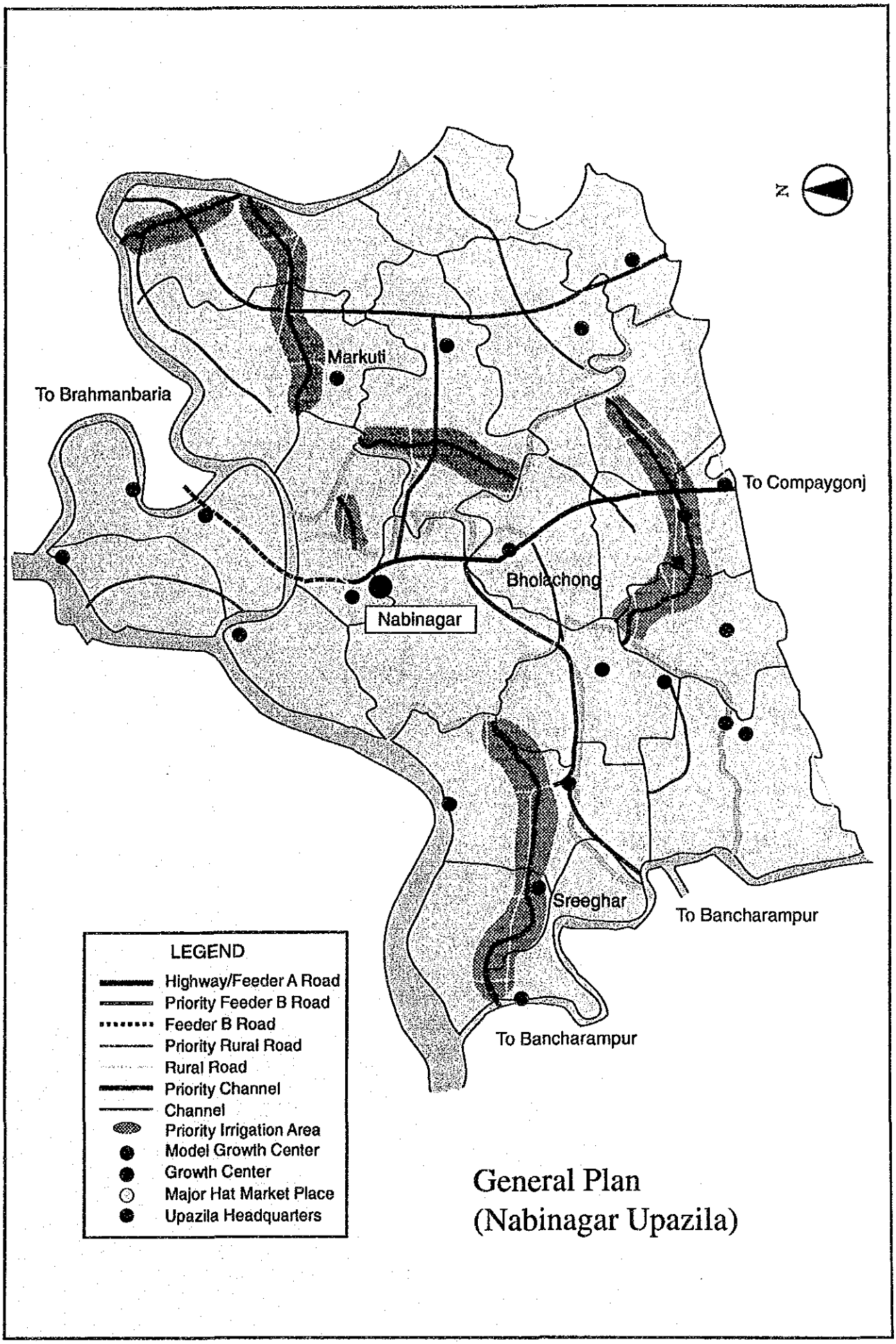

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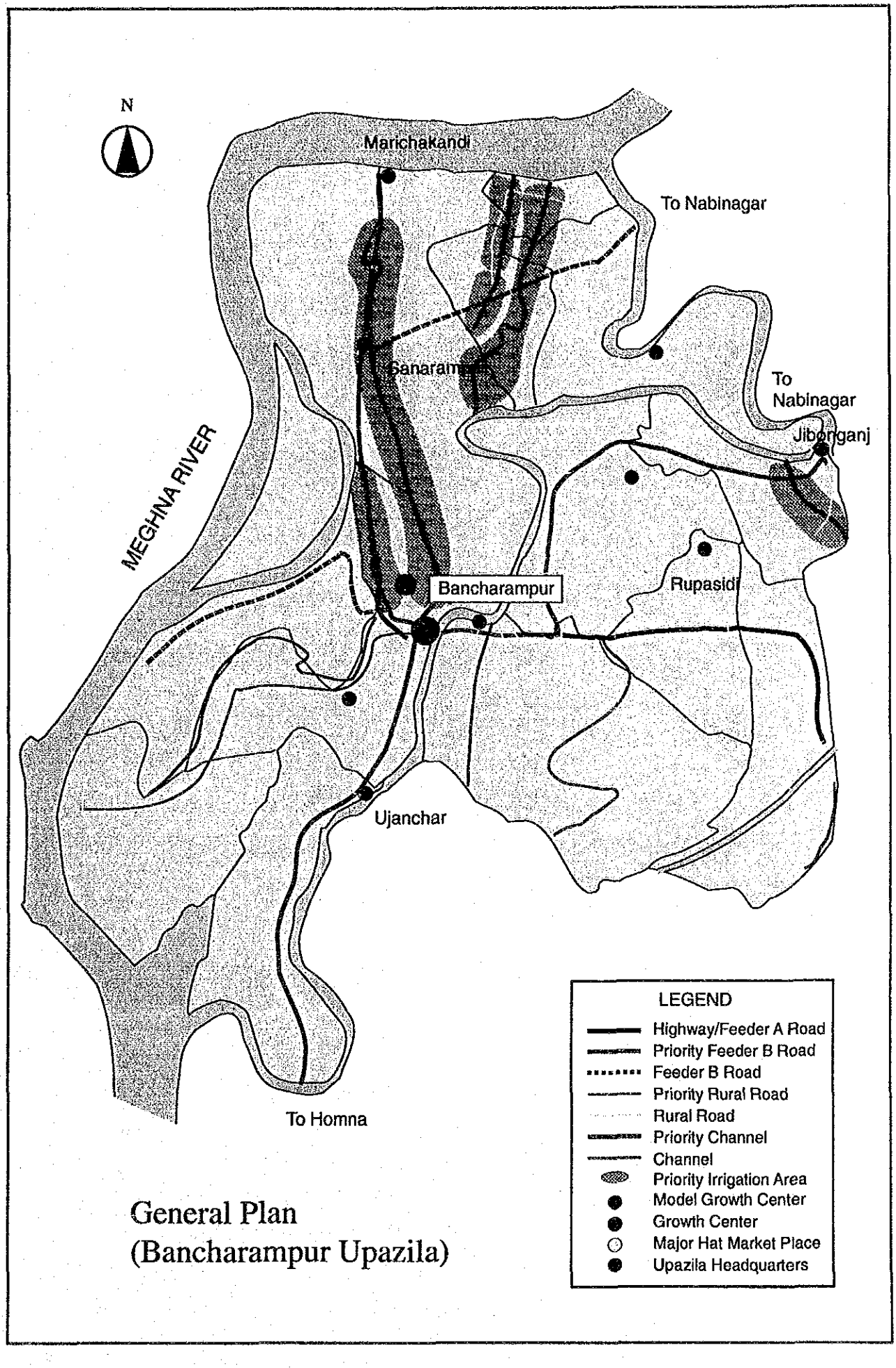

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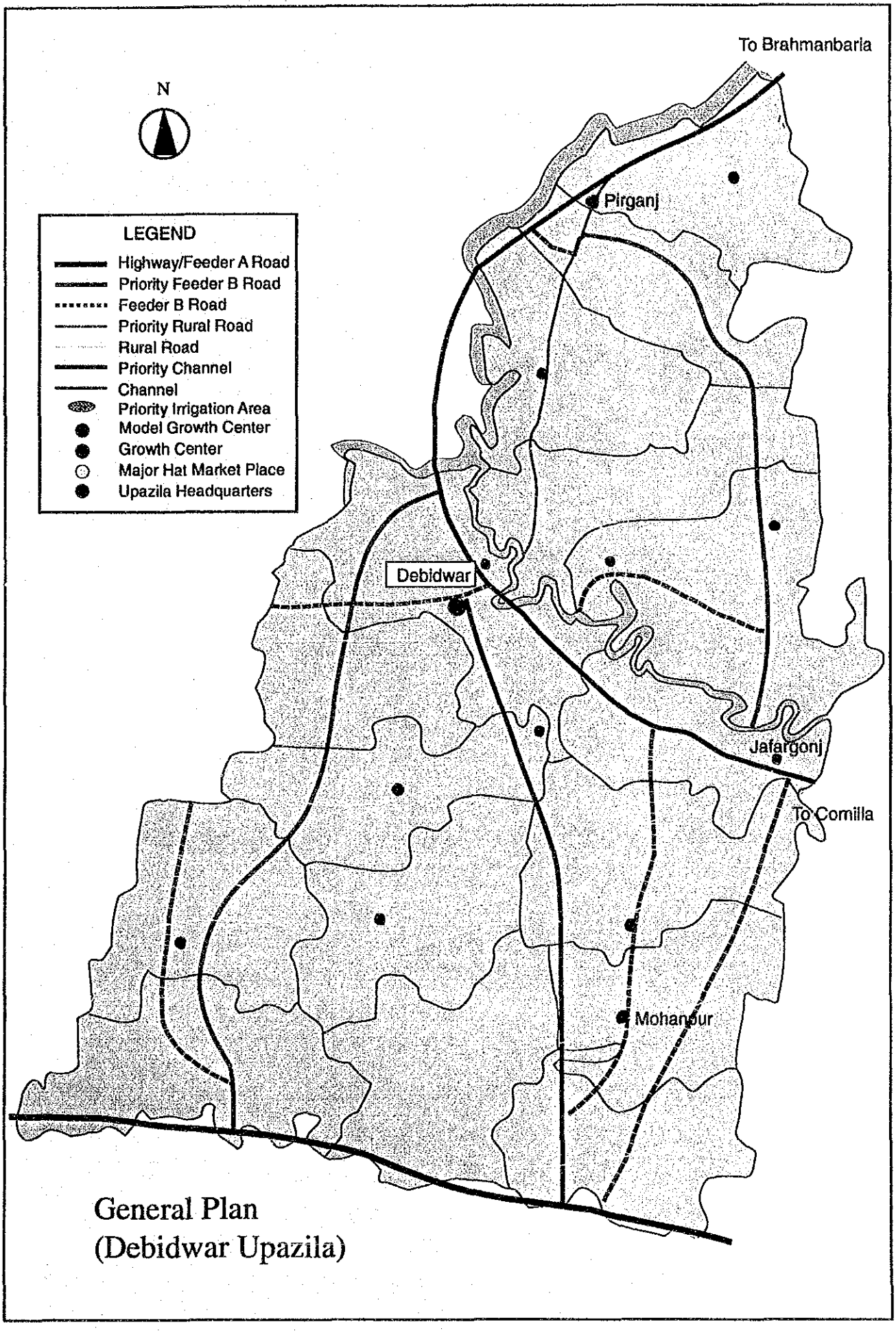

General Plan
(Debidwar Upazila)

SUMMARY

AUTHORITY

1. At the request of the People's Republic of Bangladesh, Japan International Cooperation Agency (JICA) conducted the study on the Model Rural Development Project Phase II (MRDP II) for Kachua, Nabinagar, Bancharampur and Debidwar Upazilas, Old Comilla District, from September, 1990 to August, 1991.

BACKGROUND

2. Bangladesh has 144,000 km^2 of land with 113 million of population increasing at 2.4% a year and 785 person/km^2 of population density. About 85% of population inhabit in rural areas. Agriculture plays a pivotal role in Bangladesh. It supplies about 90% of the food requirement of the country and generates about 90% of its export earning. Agriculture continues to generate 37% of Tk 659 billion of Gross Domestic Products (GDP) in 1988/89 at current market prices. The total cultivated areas are 9.3 million ha and the number of farm households is 10 million, of which 70% are small land holders with 0.2 ha to 1.0 ha. About 45% of households in the rural area is landless.

3. The study area consists of four (4) Upazilas formerly belonging to Greater Comilla District. Comilla city is located 88 km south-east of Dhaka along the Dhaka-Chittagong highway immediately adjacent to the study area. The total extent of the study area is 1,058 km^2 comprising Kachua (236 km^2), Nabinagar (376 km^2), Bancharampur (207 km^2) and Debidwar (239 km^2). Under the recently re-structured local governments, Kachua Upazila belongs to Chandpur District, Nabinagar and Bancharampur in Brahmanbaria, and Debidwar in Comilla. They are composed of 60 unions which are further divided into 786 villages. Of those, 505 villages are registered as "mouzas".

4. The Government of Bangladesh (GOB) has placed a great emphasis on improvement of the socio-economic situations in the Fourth Five Year Plan (1990-95, FFYP). The FFYP aims at the (i) accelerating economic growth, (ii) poverty alleviation and employment generation through human resource development, and (iii) increased self-reliance. In the FFYP, it is envisaged that poor and disadvantaged people play a more efficient and productive role in the economy.

MODEL RURAL DEVELOPMENT PLAN II

5. MRDP II is prepared as a compound of development programmes and expected to supplement those programmes each other. The programmes of MRDP II are formulated taking into consideration (i) production sector activation, (ii) human resources development, (iii) target group oriented development, and (iv) institutional development.

6. MRDP II will be implemented through three (3) phases: (i) 1990-1995, (ii) 1996-2000, and (iii) 2001 to 2010. MRDP II will largely contribute to increase of GRDP and employment opportunity. The overall economic growth rates of agricultural sector are 4.1% per annum in 1990-95 and 4.0% in 1995-2000. Employment opportunity are expected to increase 2.6% in 1990-95 and 1.5% in 1995-2000.

7. MRDP II aims at directing the selected four (4) Upazilas to the appropriate goals with aspiration. MRDP II is formulated as multi-purpose development plan consisting of 27 candidate programmes stipulated in the following table, of which 11 eligible programmes were selected taking the following conditions into consideration.

   i. Programmes suitable for UCCA's economic activities
   ii. Programmes for income generation of cooperative members
   iii. Programmes for generation of employment opportunities
   iv. Programmes to contribute to large mass of beneficiaries directly and indirectly
   v. Programmes for local government with suitable fund requirement
   vi. Programmes with high expectation of supplemental and multiplier effects
   vii. Programmes not covered by the other existing programmes to avoid technical conflicts

	MRDP II Programme	Selection
(1)	LLP Irrigation Development and Drainage Improvement Programme	Eligible
(2)	Fractional Pump Promotion Programme	Eligible
(3)	Crop Intensification and Diversification Programme	Eligible
(4)	Farm Input Supply Programme	Eligible
(5)	Tree Nursery Development Programme	
(6)	Intensified Homestead Crop Production Extension Programme	
(7)	Model Farm Credit Programme	Eligible
(8)	Feed and Fodder Production Programme	
(9)	Semi-Intensive Poultry Production Programme	
(10)	Veterinary Service Expansion Programme	
(11)	Semi-Intensive Fish Pond Culture Development Programme	Eligible
(12)	Homestead Integrated Fish Culture Programme	
(13)	Open Water Capture Fishery Development Programme	
(14)	Post-Harvest Plants Expansion Programme	Eligible
(15)	Cold Storage Installation Programme	
(16)	Homestead Food Processing Extension Programme	
(17)	Upazila Food Grains Marketing Programme	Eligible
(18)	Joint Marketing Promotion Programme	Eligible
(19)	Feeder and Rural Roads Improvement Programme	Eligible
(20)	Growth Center Improvement Programme	Eligible
(21)	Drinking Water Supply Development Programme	
(22)	Sanitation Improvement Programme	
(23)	Rural Electrification Extension Programme	
(24)	Communication Improvement Programme	
(25)	Cluster Formation of Rural Housing Programme	
(26)	School Building Improvement Programme	
(27)	Training Facilities Development Programme	

PRIORITY PROJECT

8. The priority projects are formulated by integration of 11 eligible programmes as a first step of MRDP II.

9. Irrigation Development and Drainage Improvement Project is set up in collaboration with Farm Input Supply Programme and Model Farm Credit Programme. The Project envisages virtual integration of essential inputs for Boro rice, namely irrigation water

supply, improved seeds of high yielding varieties and chemical fertilizers. The UCCAs in the study area have an experience of technical and administrative management. To avoid competitive use of domestic water supply, low lift pumps (LLP) will be promoted for Boro rice under the Project. Farm input supply should be integrated to irrigated rice production to enhance and stabilize unit yield and grain quality of irrigated paddy. The Project will include re-excavation of the existing canals of 123 km and introduction of 173 LLPs with 2.0 cusec capacity for irrigating 3,440 ha of Boro rice. To support irrigated rice farming, short term package crop loan will be supplied under Model Farm Credit Programme.

10. Fractional Pump Promotion Project is the pilot project to sound applicability of fractional pumps for irrigation purposes by lifting up water from under-exploited ponds and other water bodies scattering in the study area. The more intention is given to participation of BSS members to substantial irrigation activities. In view of pump capacity, they will be used for supplemental irrigation for upland winter crops. The Project will be introduced with promotion of oilseeds, potatoes, and pulses selected under Crop Intensification and Diversification Programme. The Project will introduce 200 fractional pumps with 0.5 to 0.75 cusec capacity for command area of 1,000 ha.

11. Feeder and Rural Roads Improvement Project emphasizes urgent improvement of the most important feeder roads type "B" which are now fully under the responsibility of local government. The biggest constraint of the Rural Road Improvement Programme is its extremely huge fund requirement. Not only construction but also maintenance is the largest load of Upazilas. The Programme will be realized in line with long-term strategy. The Project will undertake rehabilitation of the most important feeder road B in each Upazila. The total length of road rehabilitation is estimated to be 98.5 km.

12. Growth Center Improvement Project aims at improving existing market facilities to encourage small business to be made by marginal farmers and/or the rural poor and at strengthening self-reliance of Upazila for market development and maintenance by increasing lease money. For this purpose, four growth centers in each Upazila are taken up. The growth center at Upazila headquarters is called Model growth center. In the Model growth center, UCCA facilities such as godown, workshop for LLP are constructed and expansion of hat market area is considered.

13. UCCA Complex Establishment Project aims at integration of Post-Harvest Plants Expansion Programme and Upazila Food Grains Marketing Programme in corroboration with Growth Center Improvement Programme. The Project envisages

the establishment of UCCA complex within the growth center located in the Upazila headquarters. This will act as the future "Model" growth center. In view of food security, strategic reserve of staple food grains should be realized at farm level, village level, upazila level and national level, respectively. The systematic approach will largely contribute to stabilization of grain prices and reduced storage loss. UCCA is in the best position to own and manage godowns at village level by controlling the terminal management to be done by primary societies. As a first step of strategic grain storage, typical conventional warehouses will be built. Beside the storage, rice mills and flour mills will be attached. UCCA will operate those mills according to well-scheduled operation programme and release final products to domestic markets. In addition to grain mills, oil mills can also be attached. UCCA will control purchasing raw materials, i.e. paddy, wheat, and oilseeds, from KSS. All the employees will be BSS members.

14. Semi-Intensive Fish Culture Project aims at increased production of animal protein sources for the region as well as income generation of rural poor. Under the Project, the comprehensive approach is made in coordination with DOF, formulation of assetless people to BSS members, re-activation of existing ponds, provision of training, supply of materials and fry/fingerling. The Project will also envisage the proper management of lease ponds owned by the Government. The Project emphases the establishment of management system and will include no large investment such as establishment of new hatchery. The command area of fish ponds in each upazila is 280 ha.

15. MRDP II will be implemented by Upazila Parishad and UCCA under Central Coordination Committee (CCC). CCC will be formed in Dhaka, where the headquarters of BRDB and LGEB are located. Its functions are administrative coordination at central level and monitoring, and advising. The members will be headed by Secretary of Ministry of Local Government and Rural Development & Cooperative. The execution of the Project will be directly under the responsibility of BRDB and LGEB. At local level, Upazila Engineering Committee and Upazila Production and Employment Committee will be formed.

16. The total cost of MRDP II is estimated at Tk 10,831.4 million, while the cost of priority projects amount to Tk 3,647.3 million, respectively. The economic evaluation for the priority projects indicated an economic internal rate of return (EIRR) at 5 % as a whole. With examination of the financial cashflow for each project, high financial viability is

recognized for each of priority projects. The project works and cost for priority project are shown in table below.

(Unit : million Taka)

Items	Stage - I (1993) Work Q'ty	Amount L/C	Amount F/C	Amount Total	Stage - II (1994) Work Q'ty	Amount L/C	Amount F/C	Amount Total	Stage - III (1995) Work Q'ty	Amount L/C	Amount F/C	Amount Total
I. Direct Construction Cost												
1 Irrigation Development and Drainage Improvement		8.1	50.3	58.4		6.2	30.6	36.7		5.6	27.6	33.1
1.1 Chanel Re-excavation	34 km	4.1	20.2	24.3	47.5 km	6.2	30.6	36.7	41.5 km	5.6	27.6	33.1
1.2 Low Lift Pump (LLP)	173 nos	2.8	24.9	27.7	0 nos	0.0	0.0	0.0	0 nos	0.0	0.0	0.0
1.3 Workshop for LLPs	3 place	1.3	5.1	6.4	0 place	0.0	0.0	0.0	0 place	0.0	0.0	0.0
2 Fractional Pumps (FP) Promotion	200 nos	3.0	19.0	22.0	0 nos	1.0	1.0	2.0	0 nos	1.0	1.0	2.0
3 Feeder and Rural Roads Improvement		91.2	279.4	370.6		201.2	627.2	828.4		176.6	669.8	846.4
3.1 Feeder B												
3.1.1 Road Embankment	14.1 km	11.7	59.2	70.9	68.6 km	34.0	172.5	206.6	19.2 km	19.9	100.9	120.8
3.1.2 Bridge & Culvert	40 nos	68.8	188.2	257.1	55 nos	114.7	289.3	403.9	0 nos	0.0	0.0	0.0
3.1.3 Pavement, Tree Planting , Turffing	0 km	0.0	0.0	0.0	12.9 km	15.3	53.9	69.2	57.8 km	68.6	241.3	309.9
3.2 Rural Road												
3.2.1 Road Embankment	0 km	0.0	0.0	0.0	0 km	0.0	0.0	0.0	25 km	38.8	196.5	235.3
3.2.2 Bridge & Culvert	6 nos	10.7	32.0	42.6	23 nos	37.2	111.6	148.8	31 nos	49.3	131.1	180.5
3.2.3 Pavement, Tree Planting , Turffing	0 km	0.0	0.0	0.0	0 km	0.0	0.0	0.0	0 km	0.0	0.0	0.0
4 UCCA Complex Establishment		17.3	50.1	67.5		0.0	0.0	0.0		0.0	0.0	0.0
4.1 Parboiled Rice Mill	4 place	1.7	7.0	8.7	0 place	0.0	0.0	0.0	0 place	0.0	0.0	0.0
4.2 Flour Mill	4 place	1.7	6.9	8.5	0 place	0.0	0.0	0.0	0 place	0.0	0.0	0.0
4.3 Oil Mill	4 place	1.7	7.0	8.7	0 place	0.0	0.0	0.0	0 place	0.0	0.0	0.0
4.4 Godown (500 ton)	4 place	12.3	29.2	41.5	0 place	0.0	0.0	0.0	0 place	0.0	0.0	0.0
5 Growth Center Improvement		26.3	21.5	47.8		7.6	2.9	10.5		7.6	2.9	10.5
5.1 G.C at Headquarter (Model G.C)	4 place	26.3	21.5	47.8	0 place	0.0	0.0	0.0	0 place	0.0	0.0	0.0
5.2 Growth Center	0 place	0.0	0.0	0.0	8 place	7.6	2.9	10.5	4 place	7.6	2.9	10.5
Sub- total		146.0	420.3	566.3		216.0	661.7	877.7		190.7	701.3	892.1
II. Administration		7.3	21.0	28.3		10.8	33.1	43.9		9.5	35.1	44.6
III. Physical Contingency		21.9	63.1	84.9		32.4	99.3	131.7		28.6	105.2	133.8
IV. Engineering Services		21.9	63.1	84.9		32.4	99.3	131.7		28.6	105.2	133.8
Total		197.0	567.5	764.5		291.5	893.3	1184.9		257.5	946.8	1204.3
V. Price Contingency		41.4	34.6	75.9		96.5	82.8	179.3		119.5	118.8	238.3
VI. Grand Total		238.4	602.0	840.5		388.0	976.2	1364.2		377.0	1065.6	1442.6

Note : These amount are excluding Value Added Tax which has been introduced since 1st July, 1991.

CONCLUSION AND RECOMMENDATION

17. It is recommended that the GOB would embark on financial arrangement for implementation of priority project as soon as possible. The GOB should make all the efforts for administrative and institutional arrangement for smooth and stable project implementation for BRDB and LGEB. Likewise, both agencies should keep the close relation with Upazila Parishads and UCCAs concerned.

18. To ensure the technical support to both central and local administrations, the GOB is requested to organize the Project Supporting Unit (PSU), for which involvement of expatriates and other qualified experts will be much effective. In addition, it is preferable that Pre-construction Environmental Impact Study (PEIS) would be carried out prior to project implementation. Environment monitoring for MRDP I for Homna and Daudkandi is also essential practice to provide various information for environmental assessment for MRDP II.

THE MASTER PLAN STUDY ON
THE MODEL RURAL DEVELOPMENT PROJECT PHASE II
FOR KACHUA, NABINAGAR, BANCHARAMPUR AND DEBIDWAR UPAZILAS

MAIN REPORT

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ABBREVIATIONS (1/2)

AUDP	Annual Upazila Development Programme
BADC	Bangladesh Agricultural Development Corporation
BARC	Bangladesh Agricultural Research Council
BARD	Bangladesh Academy for Rural Development
BARI	The Bangladesh Agricultural Research Institute
BAU	Bangladesh Agricultural University
BB	Bangladesh Bank
BBS	Bangladesh Bureau of Statistics
BKB	Bangladesh Krishi Bank
BPDB	Bangladesh Power Development Board
BRAC	Bangladesh Rural Advancement Committee
BRDB	Bangladesh Rural Development Board
BRRI	Bangladesh Rice Research Institute
BS	Block Supervisor
BSBL	Bangladesh Samabaya (Cooperative) Bank Ltd.
BSCIC	Bangladesh Small and Cottage Industries Corporation
BSS	Bhumiheen-Bityaheen Samabaya Samity
BWDB	Bangladesh Water Development Board
CERDI	Central Extension Resources Development Institute
DAE	Department of Agriculture Extension
DOC	Department of Cooperatives
DOF	Department of Fisheries
DPHE	Department of Public Health Engineering
DTW	Deep Tube-Well
FAO	Food and agricultural Organiation of the United Nations
FFW	Food-for-Work
FFYP	Fourth Five Year Plan
GDP	Gross Domestic Product
GNP	Gross National Product
GOB	Government of Bangladesh
HTW	Hand Tube-Well
HYV	High Yielding Varieties
IDP	Infrastructure Development Programme
IMP	Irrigation Management Programme
JICA	Japan International Cooperation Agency
JSARD	Joint Study on Agricultural and Rural Development
KSS	Krishak Samabaya Samity
LGEB	Local Government Engineering Bureau
LLP	Low-Lift Pump
MBSS	Mahila Bhumiheen-Bityaheen Samabaya Samity
MFL	Ministry of Fisheries and Livestock
MJSS	Fishermen Cooperative Society

ABBREVIATIONS (2/2)

MOA	Ministry of Agriculture
MRDPP	Model Rural Development Project Programme
MSS	Mahila Samabaya Samity
NCB	Nationalized Commercial Bank
NGO	Non-Governmental Organization
PBS	Pali Bidui Samittes
PLMCS	Primary Land Mortgage Cooperative Society
PSGCS	Primary Sugarcane Growers Society
RAKUB	Rajshahi Krishi Unnayan Bank
RDA	Rural Development Academy
RDTI	Rural Development Training Institute
REB	Rural Electrification Board
RHD	Roads and Highways Department
RMP	Road Maintenance Programme
RWSP	Rural Water Supply Programme
S/W	Scope of Work
SEBS	Socio-Economic Baseline Survey
SFFW	Special Food-for-Works
STW	Shallow Tube-Well
T & V	Training and Visit
TSS	Wavers Cooperative Society
UCCA	Upazila Central Cooperative Association
UCMDS	Union Cooperative Multipurpose Society
UEO	Upazila Extension Officer
UIC	Upazila Irrigation Committee
UIT	Upazila Irrigation Team
UNDP	The United Nations Development Programme
UNICEF	United Nations Children's Fund
UPU	Universal Postal Union
UTDC	Upazila Training and Development Center
VGF	Vulnerable Group Feeding Programme
WFP	World Food Program
WHO	World Health Organization

ABBREVIATIONS OF MEASUREMENTS

Length

mm	=	millimeter		
cm	=	centimeter		
	=	0.39 in.		
m	=	meter	=	1.09 yd
	=	3.28 ft.		
km	=	kilometre	=	0.62 ml
in.	=	inch	=	2.54 cm
ft.	=	foot	=	30.48 cm
yd.	=	yard	=	91.44 cm
ml.	=	mile	=	1.61 km

Area

cm^2	=	square centimeter		
m^2	=	square meter		
km^2	=	square kilometer		
	=	100 ha		
ha	=	hectare	=	0.01 km^2
	=	2.5 ac		
ac	=	acre	=	0.41 ha
	=	4,047 m^2		
ft^2	=	square feet		
	=	0.09 m^2		
$mile^2$	=	square mile	=	2.59 km^2

Electrical Measures

kW	=	kilowatt	=	1,000 watt
MW	=	megawatt	=	1,000 KW
GW	=	gigawatt	=	1,000 MW
kV	=	kilovolt	=	1,000 volt

Other Measures

%	=	percent
°	=	degree
'	=	minute
"	=	second
℃	=	degree in Celsius
lakh	=	10^5
crore	=	10^7
Hp, PS	=	horse power
TPH	=	ton per hour

Volume

lit.	=	litter		
cm^3	=	cubic centimeter		
m^3	=	cubic meter		
	=	1,000 lit.		
MCM	=	million m^3		
	=	$1x10^3$ m^3		
ft^3	=	cubic feet	=	0.028 m^3
	=	28.32 lit.		
ac-in.	=	acre inch	=	102.79m^3
ac-ft.	=	acre feet	=	1,234 m^3

Weight

g	=	gram			
kg	=	kilogram			
t	=	metric ton	=	1,000	kg
lb	=	pound	=	454	g
cavan	=	sack (bag)			
		paddy	=	50	kg/sack
		paddy seed	=	45	kg/sack
		corn seed	=	50	kg/sack
		pod peanut seed	=	25	kg/sack

Time

scc	=	second	
min	=	minute	= 60 seconds
hr	=	hour	= 60 minutes
	=	3,600 seconds	
day	=	24 hrs	= 1,440 minutes
	=	86,400 seconds	
yr	=	year	

Derived Measures

m^3/sec	=	cubic meter per second (Cumec)
ft^3/sec	=	cubic foot per second (Cusec)

Monetary

US$	=	US dollar
¥	=	Japanese yen
TK	=	Bangradesh Taka

CHAPTER 1

INTRODUCTION

CHAPTER 1 INTRODUCTION

1.1 Authority

This is the Main Report of the Model Rural Development Project Phase II (hereinafter referred to MRDP II) for Kachua, Nabinagar, Bancharampur and Debidwar Upazilas, Old Comilla District, the People's Republic of Bangladesh. This study has been carried out in accordance with the Scope of Work (the S/W) agreed upon between the Government of Bangladesh (GOB) and the Government of Japan (GOJ) through the Bangladesh Rural Development Board (BRDB) and Local Government Engineering Bureau (LGEB) of the one part, and the Japan International Cooperation Agency (JICA) of the other part on December 13, 1989. Members of MRDP II Study Team, the counterpart personnel assigned by BRDB and LGEB, and members of the Advisory Committee are listed in Table 1.1.

1.2 Background of the Study

The agricultural sector of Bangladesh, which absorbs almost three quarters of national labor force, has accounted for about a half of Gross Domestic Products (GDP) and about three quarters of export in 1985/1986. Bangladesh is one of the least-developed countries (LDC) with economic indicator, i.e. US$170 for per-capita GNP. Local farmers have continuously faced crucial constraints, namely recurrent floods, droughts and cyclones. Moreover, her food security tends to become more serious due to rapidly increasing population.

Expansion of the population results in the decline of land-population ratio and limited job opportunity. According to the agricultural census in 1983/1984, 21.6 percent of local farmers were categorized into landless farmers. The job opportunity in agricultural sector is limited, while the industry sector is too stagnant to absorb workable population.

In the Third Five Year Development Plan (1985-1990), the GOB envisaged (i) enlargement of production oriented employment, (ii) self-sufficiency in food, and (iii) fulfillment of people's basic and minimum needs. Particularly the Ministry of Local Government, Rural Development and Cooperatives (MLGRD&C) gave a top priority to overall development of rural and agricultural infrastructures, marketing facilities and agro-industries.

Under the said conditions, the GOB requested the GOJ to extend the technical cooperation programme to the Model Rural Development Project (MRDP) of Old Comilla District in June 1986. In response to the GOB's request, JICA took up the Project and sent the study team for

execution of the master plan study of MRDP Phase I for Homna and Daudkandi Upazilas in Old Comilla District. Following the Phase I study, the GOB further requested to execute the Phase II study for formulation of MRDP II covering other Upazilas of Old Comilla District in September 1988. In response to the request, the GOJ dispatched the Preliminary Survey Team in December 1989 to conclude the S/W for MRDP II in which the study area was defined by selecting four (4) Upazilas, namely Kachua, Nabinagar, Bancharampur and Debidwar.

The Study was conducted in two stages spreading over 12 months from September, 1990 to August, 1991; the first stage for data collection, field investigation, preliminary formation of MRDP II and selection of priority projects and the second stage aiming at supplemental field survey, in-depth study of priority projects and finalization of the Study.

1.3 Objectives of the Study

In accordance with the S/W, the objectives of the Study are;

i. To formulate, with long-term development strategies, the Master Plan of the Model Rural Development Project Programme Phase II (MRDP II) for Kachua, Nabinagar, Bancharampur and Debidwar Upazilas, Old Comilla District,

ii. To formulate the priority projects to be selected among the MRDP II, and

iii. To transfer the knowledge to the GOB side through joint operation with the JICA Study Team.

CHAPTER 2

DEVELOPMENT POLICIES

CHAPTER 2 DEVELOPMENT POLICIES

2.1 Fourth Five Year Plan (1990-95)

The GOB has placed a great emphasis on the improvement of the socio-economic situations since her independence and realized as planning effort started in 1973. The First and Second Year Plans had to struggle with both inadequate social mobilization and rapid deterioration of the international economic situation. During the Third Five Year Plan (1985-90, TFYP), substantial progress has achieved particularly in agriculture and infrastructure sectors as well as in structural adjustment. However, Bangladesh has still basic problems such as structurally unfavorable balance of payments, chronic financial deficit, lack of job opportunities and poverty.

The Fourth Five Year Plan (1990-95, FFYP) has been formulated as part of the Twenty Year Perspective Plan (1990-2010) and was commenced in July 1990. The FFYP aims at (i) accelerating economic growth, (ii) poverty alleviation and employment generation through human resource development, and (iii) increased self-reliance envisaging the definite goals summarized in Table 2.1. In the FFYP, a group-based approach for relatively poor and disadvantaged people is emphasized with a sector-based approach. The FFYP expects poor and disadvantaged people to play a more efficient and productive role in the economy by promoting new strategies as spelled out below:

- Integration of a group-based approach with a sector-based approach
- Community involvement in the implementation of public sector programmes in rural areas
- Promotion of decentralized participatory planning
- Cultivation of an efficient culture throughout the economy

2.2 Rural Development Policy

In view of alleviation of poverty and job creation, the FFYP focuses on rural development and strengthening institution for the productive use of rural resources. Giving a priority to such target groups as landless, agricultural labourers, small farmers and rural informal workers, all the rural development projects are to take up at least one component in one whole district.

- Production and employment programme for the rural poor:
  The programme has two target groups, i.e. firstly with landless/assetless men and women and marginal farmers, secondly with small farmers. This programme will be developed as a package programme consisting of institutions (BSS, MBSS and informal groups), technology and training, credit, other inputs and market.

- Irrigation and minor flood control works:
  This programme will be executed through farmer's cooperatives (UCCA-KSS system) and also will emphasize on distribution of minor irrigation equipment, implementation of irrigation programmes and arrangement of credit to farmers belonging to cooperatives and groups.

- Development of physical infrastructures:
  Development of physical infrastructures is projected to activate rural socio-economy. This programme will include development of rural hats and bazaars identified as growth centers and feeder roads B types linking growth centers with Upazila headquarters or arterial road system.

CHAPTER 3

PRESENT CONDITIONS OF THE STUDY AREA

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3.1 Natural Conditions

3.1.1 Physiography and Topography

The study area is located on the left bank of the Meghna river between 23°50'N and 23°20'N in latitude and 91°00'E and 91°40'E in longitude. Greater Comilla District extends on large flat terrain with extremely gentle gradient with the E-W direction from Tripura Hills of India to the Meghna river. More than 90% of the study area is covered by floodplain, which is susceptible to recurrent floods caused by the Meghna, Titas, Gumti, Dhanagoda and Dakatia rivers. The elevation of the study area ranges from El. 0.0 m to El. 5.5 m of which 92% is above El. 2.1 m.

3.1.2 Meteorology and Hydrology

Bangladesh falls in the typical tropical monsoon zone with three pronounced seasons, i.e. (i) hot summer with high humidity from March to June, (ii) hot and humid monsoon season with heavy rainfall from June to October, and (iii) relatively cooler and drier winter from November to March. The meteorology of the study area is illustrated in Figure 3.1.

The annual discharge of the Meghna is about 3,500 m^3/sec. The other rivers running through the study area are Gumti and Titas. The water level of the Meghna and Titas rivers rise steadily in the monsoon period to their peak at the beginning of August, while the discharge of the Gumti and Titas are highly coincident with rainfall patterns. The water level of the Gumti river is at peak during mid to late July.

3.1.3 Geology

The floodplains are formed by Quaternary sediments of the Ganges, Brahmaputra, Meghna and other streams. They are generally characterized by dark and loose compacted materials with high water content and with variable but considerable quantities of organic materials. Late Pleistocene to early recent sediments occupy slightly elevated land in the central and eastern parts of Greater Comilla. Older Pleistocene alluvium deposits on the fringe of extreme eastern parts adjacent to the Indian border.

3.1.4 Groundwater

The main aquifer is interbeded by a layer of clay, silt sand and medium coarse sand materials. There is a fairly extensive aquifer at a very shallow depth of 6~12m below ground level which is generally drawn by the hand tubewells for domestic as well as irrigation purposes. Deeper aquifers at about 60~120 m depth are also identified. Recharge to aquifer occurs mainly by percolation of rain water and influence of river stages in the study area. Actual groundwater recharge in the study area varies from 96 mm to 191 mm.

Groundwater quality in the study area is dependent mainly on conditions of deposit of sediments and geologic condition rather than depth of aquifer. Groundwater quality in the study area is generally good except for chloride content in Kachua as high as over 700 pm. Table 3.1 presents physical and chemical characteristics of groundwater and development potentials by the groundwater development zone which are illustrated in Figure 3.2.

3.1.5 Soils

The soils are derived mostly from old and sub-recent alluvial deposits on floodplains formed by the Meghna and Brahmaputra, which cover 617,000 ha or 92% of Greater Comilla. They are subject to flooding and river erosion hazards during monsoon seasons. Although the soils change in physical and chemical characteristics by origin of alluvium, they are generally deficient in major plant nutrients and trace elements such as S and Zn. The hill soils and piedmont soils form to the limited extent, i.e. 8,000 ha or 1.2% and 47,000 ha or 7.0% of the total area, respectively.

3.2 Socio-Economic Conditions

3.2.1 Demography

The study area consists of four (4) Upazilas formerly belonging to Greater Comilla District. Comilla City is located 88 km south-east of Dhaka along the Dhaka-Chittagong highway immediately adjacent to the study area. The total extent of the study area is 1,058 km^2 comprising Kachua (236 km^2), Nabinagar (376 km^2), Bancharampur (207 km^2) and Debidwar (239 km^2). Under the recently re-structured local governments, Kachua Upazila belongs to Chandpur District, Nabinagar and Bancharampur to Brahmanbaria District, and Debidwar to Comilla District. They are composed of 60 unions which are further divided into 786 villages. Of those, 505 villages are registered into "mouzas". The demographic conditions of the study area are summarized below.

Upazila	Total Area/1 (ha)	Total land/2 (ha)	Population/3 (1000)	Pop. Density/4 (pers/km^2)
Kachua	23,600	23,100	299	1,294
Debidwar	23,900	23,400	341	1,457
Bancharampur	20,700	19,900	259	1,302
Nabinagar	37,600	31,700	401	1,265
Study Area	105,800	98,100	1,300	1,325
National Total	14,400,00	11,655,000	113,000	785

Source: /1 and /2: Upazila statistics as of January, 1985

/3 and /4: Estimated on the basis of actual population in 1981 and annual growth rate of 2.2%.

3.2.2 Regional Economy

Agriculture plays a pivotal role in Bangladesh. It supplies about 90% of the food requirement of the country and generates about 90% of its export earning. 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 statistics. Despite of some poor harvests in recent years, agriculture continues to generate 37% of Tk 659 billion of GDP in 1988/89 at current market prices. Agriculture is also the mainstay of the regional economy of Comilla sharing 39% of the Gross Regional Domestic Product (GRDP), which amounted to Tk 41.8 billion or 6.3% of GDP. The following table presents the current situations of agricultural land use and the gross value added of the agricultural sector of Bangladesh and Greater Comilla.

Item	Bangladesh		Greater Comilla	
Land Use	Area (1000 ha)	%	Area (1000 ha)	%
1. Arable Land	9,260	64.3	548	82.0
2. Uncultivable Land	3,206	22.3	120	17.9
3. Forest	1,934	13.4	1	0.1
Total Land	14,400		669	
GDP (1988/9)	Tk billion	%	Tk billion	%
Total	659.5	100.0	41.8	100.0
Agriculture	245.2	37.2	16.3	39.1
		(100.0)		(100.0)
- Crops	174.7	(71.3)	13.4	(82.9)
- Forestry	27.3	(11.1)	0.1	(0.3)
- Livestock	21.3	(8.9)	1.6	(9.7)
- Fisheries	21.9	(8.9)	1.2	(7.1)

There is a limited number of small agro-industries such as rice mills, oil mills, etc. and a large number of homestead cottage industries such as bricks factories, handloom work, jute works, bamboo cane work, etc. The industrial sector of Grater Comilla contributes only 5% of the GRDP.

The working age group (10 years and older) is estimated to occupy 25% of the total population in Greater Comilla. The non-working and unemployment ratio, except for students and home workers, is 22%. Agriculture is predominantly absorbing 67% of the working population. On the other hand, business and manufacturing sub-sectors share 11% and 5%, respectively.

3.3 Production Sector in the Study Area

3.3.1 Overview

Agriculture is divided into crop production, livestock raising, and fisheries sub-sectors. Forestry sub-sector in the study area is negligible. The crop sub-sector is the most important 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 spite of its steady economic growth. Both sub-sectors are integrated by supplementing each other. Animal husbandry is to support crop production as a source of work force. Likewise, crop production provides 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. The fisheries sub-sector is important in terms of nutrition, income, employment and foreign exchange earnings. Fish contributes about 80% of the animal protein intake of the population and is thus of extreme nutritional significance.

3.3.2 Crop Production

(1) Land Use

The present land use of the study area is summarized in Table 3.2. Out of 101,700 ha, 82,800 ha or 81.5% are used for crop production. It is followed by homestead area, road and other miscellaneous land with 13,840 ha or 13.6% of a total study area.

(2) Crop Seasons

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

i. 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.

ii. 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.

iii. 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) Crops and Production

The cropped area, production and unit yield of major crops are presented in Table 3.3 and summarized below.

Crop	Bangladesh			Study Area		
	Cropped Area (1000 ha)	Production (1000 ton)	Unit Yield (ton/ha)	Cropped Area (1000 ha)	Production (1000 ton)	Unit Yield (ton/ha)
Paddy	10,232	15,544	1.52	118.8	227.7	1.92
Wheat	561	1,022	1.82	16.8	39.3	2.34
Potato	111	1,276	11.5	8.0	133.3	16.6
Jute	543	805	1.48	5.9	12.1	2.05
Mustard	318	222	0.70	8.6	7.6	0.88
Pulses	454	323	0.71	7.3	5.7	0.78
Vegetable	-	936	-	2.7	51.5	19.5

Source: Statistical Year Book (1990)
Upazila Nirbani Officer, "Upazila Profile, 1990"

Paddy leads the other crops in both production and planted area. In Bangladesh, rice covers some 10.2 million ha or 75% of the total cropped area giving cash income to a great number of farmers. Rice grows under several conditions such as irrigated, rainfed and deep water conditions in four (4) distinct rice seasons, namely (i) Aus, (ii) transplanted Aman (T. Aman), (iii) broadcasted Aman (B. Aman) or deep water Aman, and (iv) Boro, of which T. Aman is the most important crop occupying 44% of the total rice cropped area. Under the irrigated conditions, Boro yields higher than any others. The overall average yields of paddy are 1.52 ton/ha in the nation and 1.92 ton/ha in the study area as presented in Table 3.3.

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 the country, while nearly 600,000 ha in the late 1980s, of which 40% are under irrigation. Accordingly, the production increased ten-fold. In the study area, wheat is planted in 16,800 ha accounting for 2.8% of the national total. The unit yield has been increased and is significantly higher than that of rice. It is recognized that successful expansion of wheat was attributed by some factors: (i) availability of high yielding varieties (HYV) and appropriate technology packages, (ii) government's price incentive, (iii) less water requirement and drought resistance of wheat resulting in higher yields even under insufficient soil moisture conditions, and (iv) high demand of wheat.

Jute is the third most important crop of Bangladesh in terms of cropped 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. Due to its greater value for international trade, however, raw and semi-processed jute still makes up about 60% of all merchandise exports. In the study area, planted area has decreased year by year. At present, 5,900 ha is covered by this crop producing some 12,100 tons of raw stems.

Pulses include lentil (masur), green gram (mung), gram (chola), black gram (mashkali), pegionpea (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 during the last decade. Khesari occupies about 34% of the total pulses, followed by masur (28%) and chola (14%). In the study area, pulses are planted in 7,300 ha producing 5,700 tons in total. Pulses is very important in terms of daily diet of Bangladesh providing protein sources and 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.

Oilseeds in Bangladesh are represented by mustard, followed by sesame (til), linseed, groundnut, coconut, casters, etc. Mustard makes up 60% of the national 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.

Potatoes occupy 100,000 ha with production of some 1.1 million tons giving an average yield of 11 tons/ha. In the last decade, increases of production are attributed by use of HYVs and appropriate farm inputs although it is stagnant in recent years. Vegetables have been sharply increased in terms of cropped area and production 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 vegetables producer with output of 10% of the national production.

(4) Cropping Patterns and Intensity

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 study area as illustrated in Figure 3.3.

The cropping intensity in Bangladesh has been steadily increased from 148% in 1960 to 171% in 1983/84. 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.

(5) Farm Inputs

Use of improved seeds is highly limited except for wheat in Bangladesh. 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. Mustard seeds and vegetable seeds are also distributed to the limited amount. In Greater Comilla, 9% of the total improved seeds are used as presented in Table 3.4.

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. The sources of fertilizers are mainly domestic factories (67.9%) and the rest (32.1%) are imported. In Greater Comilla, 86.3% of the farmers reported the use of fertilizers in their farming. About 9% of fertilizers distributed in the nation was used in Greater Comilla, i.e. 75,700 tons of Urea, 41,500 tons of TSP and 7,100 tons of MP (Muriate of potash). Chemical fertilizers are applied selectively for some crops such as Boro (HYV) and winter vegetables under irrigation farming.

Application of agro-chemicals is highly limited. In the country, 4,400 tons of agro-chemicals were distributed in 1983/4, of which 10.7% was used in Greater Comilla. Although annual fluctuation is observed, rice (stem borer) is the objective crop for plant protection. Some 7% of the total rice field is sprayed, likewise 4% of vegetables and 2% of wheat.

3.3.3 Livestock

(1) Animal Population

Animal husbandry in the study area aims at: (i) income source, (ii) provision of work-force and (iii) animal protein source mainly for home-consumption. The livestock population of the study 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

Animals in an average homestead are 1.7 heads of cattle, 0.8 heads of goat/sheep and 8.2 heads of poultry. They are highly dependent upon land holding size: 1.2 heads of cattle, 0.7 heads of goat/sheep and 6.5 heads of poultry by a small farmer, while 5.9, 1.5 and 15.3 respectively by a large farmer.

Cattle provide great bulk of draught power necessary for land preparation, threshing and transportation. More than 90 % of working cattle is used for cultivation purposes. Prevailing breeds in the study 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. 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 by draught power requirements and animal feed 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. Because of their ability to thrive on coarse vegetation, they can find a niche even in the intensively used land. Chickens are more predominant, while ducks are of increasing importance since they are better adapted to local conditions.

(2) Products

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

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.

(3) Feed Sources

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%.

3.3.4 Inland Fishery

(1) Fisheries Sources

The study area has good fisheries resources, i.e. river, beels/haor, floodplains, canals and ponds. There are number of rivers and streams, of which estimated surface coverage is 4,448 ha including about 2,000 ha of floodplains in Bancharampur and 1,000 ha in Nabinagar. Besides, there are 18,460 ponds covering 2,079 ha giving an average pond size of 0.11 ha. Out of them, 10,762 ponds or 1,397 ha are used for fish culture. The fisheries sources and production are summarized below.

Products	Kachua	Debidwar	Bancharampur	Nabinagar	Total
Fisheries Resources					
1. Open Waters (i+ii)					
i. Recognized in area (ha)	40	49	2,314	2,045	4,448
ii. Recognized in length (km)	-	-	100	120	220
2. Close Waters (ha)	487	474	378	740	2,079
Production (ton/year)					
1. Open Water Capture Fishery	74	78	1,436	5,099	6,678
2. Pond Fishery	601	588	457	921	2,567
Total Production	675	666	1,893	6,020	9,254

The fishery sub-sector in the study area is characterized as follows.

i. Open water fisheries are more important than close water fisheries in terms of fish production as a whole. The open water fishery represents about 6,687 tons or 72% of the total fish production in the study area, i.e. 9,254 tons.

ii. Because of high dependence on open water fishery, the fish production in the study area is highly susceptible to flood hazards.

(2) Fish Culture Practices

There are 18,460 ponds and tanks with a total coverage of 2,079 ha in the study area. Out of them, 58% are used for fish culture and produce 2,567 tons of fish. The pond culture thus seems to contribute about 28% to the total fish production.

The culture practices are mainly centered around polyculture of carps in ponds on extensive and semi-extensive, low input/low yield techniques, with little stocking of fry with or without fertilization. No intensive fish culture is practised in the area. There is minimal preparation and supervision of the ponds, little attempt at fertilization or supplementary feed, or any form of stocking, management or predator control. Semi-intensive culture, through is yet to develop although the Inland Fisheries Project is now undertaken by Rotary Foundation to maintain hatcheries and nurseries for improved fish stock.

Most of the ponds are not designed for fish culture. They were dug to provide land fills for raising homesteads or for other domestic purposes including drinking water sources, bathing, duck farming, etc. Almost all the ponds have been rainfed or filled by ground water.

In Kachua and Debidwar, where closed water fishery is predominantly important in comparison to the other two Upazilas, the stocking materials such as spawn, fry and fingerlings are found locally through the governmental Fish Seed Multiplication Farms (FSMFs) and private fish hatcheries. The demand of fry/fingerlings in Bancharampur and Nabinagar is less; usually the farmers collect them from adjacent upazilas.

Common ingredients of fish feed are mustard oil cake, rice bran and wheat bran. Use of fish meal in fish feed was not reported in the study area. Cow dung, urea and TSP are commonly used for manuring the ponds. Most of the fish farmers do not check or monitor fish growth/health by sample netting. Many farmers do not harvest the fish annually and the fish are usually kept for 2-3 years, as they believe that the carps do not attain marketable size in the first year. Production of fish range from 700-1,500 kg/ha/year.

3.3.5 Agro-Industry

The rural industries in the study area are classified into four (4) categories, i.e. large, medium, small and cottage industries according to scale of equipment, investment and number of workers. In the study area, except for a cold storage of 3,000 ton capacity in Debidwar, no industries of large and medium scale of more than 20 employees exist, but a considerable number of small and cottage industries are in operation. Among the agro-based industries, rice mills, flour mills and oil mills are predominant in the study area as summarized below.

Upazila	Rice mill	Flour mill	Oil mill
1. Kachua	16	9	5
2. Nabinagar	26	12	3
3. Bancharampur	13	9	2
4. Debidwar	19	13	6
Total (1 to 4)	49	31	30

In the study area, about 2,100 persons are working for small industries while 25,000 persons are engaged with cottage industries. Contribution of industries is limited in terms of creation of job opportunity, i.e. 1 to 2 family workers and 0.5 to 1.5 hired workers. The average investment of small industry is estimated at Tk 80,000 per unit.

3.4 Rural Infrastructure

3.4.1 Irrigation Development

(1) Current situation of minor irrigation

The irrigation development in Bangladesh is categorized broadly into two (2), namely major irrigation development under Bangladesh Water Development Board (BWDB) and minor one under Bangladesh Agricultural Development Corporation (BADC) and BRDB. The minor irrigation development applying low-cost equipments such as deep tubewell (DTW), shallow tubewell (STW), low lift pump (LLP) and hand tubewell (HTW) is more important than major ones in terms of proportional extent.

The total irrigated area of Bangladesh is 3.1 million ha as of 1989/90 which corresponds to 34% of the national cultivated land. Out of the national total, the irrigated area of minor

irrigation schemes was 2.9 million ha, while the remaining 0.2 million ha was under major irrigation schemes with gravity irrigation system. During the last decade, expansion of irrigation area has been dependent highly upon promotion of minor irrigation schemes.

In the study area, the irrigated land extends to 32,400 ha or 38% of the total farmland of 84,600 ha as follows.

Upazila	Total Area (ha)	Farmland (ha)	Planted Area (ha)	Cropping Intensity (%)	Irrigated Area (ha)	Proportion of Irrig. Area (%)
Kachua	23,600	19,100	28,000	147	6,800	36
Nabinagar	33,500	27,400	51,800	189	10,000	36
Bancharampur	20,700	18,500	37,200	201	7,400	40
Debidwar	23,900	19,600	45,300	231	8,200	42
Total	101,700	84,600	162,300	192	32,400	38

Source: Upazila Profile, Upazila information 1990, FFYP

Among irrigation equipments, LLP is predominant in both number of equipments and irrigated area occupying 19,500 ha or 61% of the total irrigated area in the study area.

Equipment	DTW		STW		LLP		Manual Type		Total
Upazila	Nos.	Irri. Area (ha)	Nos.	Irri. Area (ha)	Nos.	Irri. Area (ha)	Nos.	Irri. Area (ha)	Irri. Area (ha)
Kachua	61	1,700	13	80	293	3,600	1,170	1,400	6,780
Nabinagar	26	530	173	1,000	540	8,200	320	320	10,050
Bancharampur	16	520	440	2,100	350	4,700	730	100	7,420
Debidwar	92	2,400	428	2,800	192	3,000	-	-	7,600
Total	195	5,150	1,054	5,980	1,375	19,500	2,220	1,820	31,850

Note: Manual Types are Swing Basket, Dhoou, and Rower Pump
Source: Upazila Information 1990

(2) Irrigation Management Programme (IMP)

Currently, the minor irrigation schemes are promoted as one of main activities of cooperative operation under the Irrigation Management Programme (IMP). The IMP commenced in 1979/80 on pilot basis under RD-I (IDA) and has been developed as nationwide programme

since 1981/82. At present, some 565,000 ha is under IMP. The national total of irrigation equipments and irrigated area as of June, 1989 are tabulated below.

Equipment	Total sold (nos.)	Under operation (nos.)	Irrigated Area (ha)	Unit Area (ha)
DTW	11,308	10,873	228,000	20.9
STW	40,002	38,000	160,000	4.2
LLP	4,585	4,000	62,000	15.5
HTW	-	273,000	115,000	0.4
Total	55,895	325,873	565,000	-

Source: Annual Report of BRDB 1988/89

The objectives of IMP are (i) to maximize command area , participation of farmers and yields per equipment and hectare, (ii) to maximize utilization of irrigation equipment by ensuring effective repair and maintenance, (iii) to maintain accounts of irrigation expense, (iv) to minimize irrigation cost per hectare, and (v) to strengthen cooperatives.

Under the Central Coordination Committee headed by Minister for Agriculture, the IMP is executed by the multi-agency consisting of BRDB, BADC, Department of Agricultural Extension (DAE) and LGEB, whose roles are spelled out below.

BRDB : Leading agency responsible for physical and financial management of the irrigation schemes

BADC : Co-agency responsible for maintenance of the irrigation equipment

DAE : Co-agency for provision of technical advises to farmers on improved agricultural practices

LGEB : Co-agency for provision of technical advises and assistance to farmers on improved water conveyance system

Upazila Irrigation Committee (UIC) consists of staff members seconded from Upazila Parishad, BADC, BRDB, DAE and Sonali Bank under the leadership of Upazila Chairman. UIC is organized for pre-commissioning execution of (i) technical assessment for proposed schemes, (ii) financial arrangement for promising schemes, (iii) technical guidance to farmers and (iv) maintenance support. The proposed schemes are surveyed and checked by UIC in terms of (i) accessibility to proposed scheme, (ii) distance from the existing schemes to ensure anticipated discharge of groundwater, (iii) soil suitability with particular attention to soil fertility, (iv) topographic conditions, (v) inundation depth during the monsoon, and

(vi) appropriate crop selection, i.e. rice, wheat, and vegetables. Upazila Irrigation Team (UIT) is also organized for pre-commissioning execution.

Once the proposed schemes are judged to be eligible, the loan arrangement is started by BRDB. Sonali Bank is the sole lender of this loan, of which maximum amount is Tk 175,000 (US$ 4,900) per scheme. The schemes are privately owned by cooperative members. The water charge is collected by owners on the basis of actual expenditure ranging from Tk 2,500 to Tk. 5,000 per hectare. The operation and maintenance (OM) is done by cooperative members. In case that wells need repair work, the cooperatives request to UIT for its repairing. For this purpose, BADC deploys mechanics in the upazila offices. At present the standard components, construction costs and water charges incurred the minor irrigation systems are indicated in Table 3.5.

3.4.2 Flood and Drainage

Floods prevailing in the study area can be categorized into three (3) patterns in view of its causes as mentioned below:

Category - 1	Monsoon floods from river Meghna
Category - 2	Flash flood from river originated in the Tripura Hills , and
Category - 3	Localized floods caused by heavy and intensive local rainfall

With respect to the monsoon flood and flash flood, a large scale protection plan has been recently formulated in the Flood Action Plan-5 (FAP-5) and will be implemented very near future. Nevertheless, inundation and poor drainage condition caused by the flood of category-3 will not be eliminated by FAP-5. The localized floods are principally caused by:

i. restricted drainage due to reduced drain capacity of channels by siltation
ii. increased headlosses in natural drainage networks improved by new cross drainage structures, and
iii. increased headlosses in natural drainage networks imposed by new road embankment which increase drainage path length.

These increased drainage channel length surely reduce hydraulic gradient. This effect is associated with reduced flood velocities, consequent reduced sediment caring capacity and possible increase in sedimentation within drainage channel networks. Meanwhile, the localized floods can also be caused by development of flood embankment if inadequate drainage provisions are made. From topographic and hydrological conditions poor drainage caused by

such a localized floods is remarkable in Upazilas Bancharampur and Nabinagar as shown in Table 3.6.

3.4.3 Feeder and Rural Road

The roads of Bangladesh are classified into following five (5) categories.

Category	Organizations	Pavement
1. National Highway	Road & Highway Department(RHD) Ministry of Communication	metalled
2. Regional Highway	RHD	metalled
3. District Road	District Board	metalled
4. Feeder Road		
4.1 Feeder A	RHD	metalled
4.2 Feeder B	Upazila	metalled
5. Rural Road (1,2,3)	Upazila	not metalled

Functions of the road system are as follows.

- National highways : Dhaka - four (4) Divisions
- District Roads/ Regional highways : District office - business centers connecting to national highways
- Feeder A (F.A) : Upazila headquarters - national highways, regional highway
- Feeder B (F.B) : Feed(s) A / Upazila headquarters - Growth Centers / business centers
- Rural 1 (R1) : Union headquarters / market(s) - Upazila headquarters / Feed(s)
- Rural 2 (R2) : Villages/farmlands within unions
- Rural 3 (R3) : Within villages

In the rural area, plan formulation and implementation of Feeder A road development are executed by RHD. On the other hand, Feeder B and Rural Roads are developed and maintained by allocating upazila budgets. The density of metalled (pucca) roads varies with upazila, i.e. higher in Debidwar and lower in Bancharampur, due to topographic and flood conditions. The existing conditions of roads in each Upazila are summarized below.

	Kachua	Nabinagar	Bancharampur	Debidwar
RHD Road				
- Number of roads	1	1	1	2
- Length (in Km)	13.3	10.0	(Not passable)	42.5
Feeder Road B				
- Number of roads	2	2	3	7
- Length (in Km)	17.2	17.6	55.3	68.4
Rural Road				
- Number of roads	36	43	21	13
- Length (in Km)	275.1	266.8	176.0	169.4
Density of roads (in km/Sq.km)	1.32	0.93	1.16	1.20
(in km/1,000persons)	1.02	0.73	0.89	0.82

In Bancharampur and Nabinagar, high embankment roads are required not only to provide rural access but also to protect villages and other facilities from recurrent floods. In order to cross numerous tributaries and streams, bridges and culverts are also required at quite high density. The deterioration of road and related structures is accelerated by flood and splash by heavy rainfall. The serious deterioration of road surface of Feeder A roads is observed in Kachua Upazila. The road conditions in Debidwar are rather good comparing with ones in other upazilas because not only of rather frequent maintenance work but of the flood protection dikes recently constructed along the Gumti river.

3.4.4 Growth Center

The Growth Centers and *hats* play important roles as the business core in the rural area. *Hats* are a kind of market which open once or twice a week at the certain area leased by either union or upazila councils. Growth Centers are large-scaled *hats* and function not only as business center but as regional social service center including post office, banks, dispensary, drinking water supply and sanitation facilities, etc. In each upazila, there are four (4) Growth Centers at present. The total number of the existing Growth Centers and *hats* combined in the study area is tabulated below.

Upazila	Total Number	Estimated No. of people covered by one *Hat* market
Kachua	24	12,460
Debidwar	26	13,120
Bancharampur	20	12,950
Nabinagar	19	21,100

Source : * BBS, Population Census,1981

The location of Growth Centers is selected taking accessibility and other socio-economic conditions into consideration. About 80% of villagers live within 3 km from either Growth Center or *hat* in the study area. Most of existing *hats* and Growth Centers are owned by respective union and upazila councils. Overall operation and maintenance of the local markets is done by these councils.

Every *hat* is leased to a private bidder who has a right to manage daily activities in the market for one year. The lessor collects tolls in cash and/or in kind from vendors, importers, exporters, transports loading or unloading merchandise. Bid money is major income source for the upazila administration, but the fund is limited to carry out necessary market development. Number of markets and bid money collected in the study area are summarized below.

Item/Upazila	Nabinagar	Bancharampur	Debidwar	Kachua
I. Ownership				
(1) Growth Center				
- Upazila council	4	4	4	4
(2) Hat				
- Upazila council	8	6	14	9
- Union council	7	10	8	10
- Private	-	-	-	1
II. Average of Bid Money (Tk'000/year)				
- Growth center	135.7	51.6	150.6	129.6
- Hat	5.0	4.6	15.5	6.6

3.4.5 Drinking Water Supply and Sanitation

The data and information were collected at Department of Public Health Engineering (DPHE), UNICEF and Bangladesh University of Engineering and Technology (BUET). The Study was firstly directed to review the on-going nationwide Rural Water Supply Programme (RWSP) sponsored by UNICEF.

The two (2) water sources, i.e. surface water and ground water, are utilized for drinking purposes by the rural habitants in the study area. The quality of surface water, e.g. pond and pool water, is not always suitable for drinking. Especially in dry season, quality of stagnant water bodies alters to seriously bad. In order to supply more safe water, 800,000 units of HTW with average depth of 100 to 150 feet have been installed in the nation under the RWSP giving the average density of 143 persons per well. This density is remarkably high comparing with the other countries under similar economic conditions. About 10,000 HTWs have been installed in the study area and cover 70% of the target of DPHE/UNICEF. In the study area, one HTW supplies drinking water to 10 families or 70 to 100 population. Based on the target

density of the RWSP and the present population, the additional HTW requirement amounts to 4,500 units. To install them, it will take over 10 years at annual rate of 5 or 6 HTWs per union.

Irrigation and HTW generally draw water from the same aquifer. The intensive water use by power-driven DTW and STW in the dry reason results in a significant decline of groundwater levels during this season. Although the groundwater levels recover in the monsoon, an increasing number of the shallow hand tubewells used for drinking purposes become inoperative during the end of the dry season because the water level falls below the suction limit.

The water quality is examined for two items, i.e. iron and chloride, prior to installation of HTW. The iron content of groundwater in the study area is rather high, i.e. 1 to 5 ppm, comparing with both the WHO and Bangladesh standards, i.e. less than 1.0 ppm, while the chloride content falls within the safety range in most cases.

In the rural areas of Bangladesh, the low quality water causes a number of death. In general, rural poors do not have latrines. Therefore, surface water as well as groundwater is easily contaminated. Diarrhoea is by far the largest killer of children between the age group of one and five years. It was reported that the risk of post-neo-natural (between one month and one year of age) was three times greater in families without a latrine than those with a latrine. Out of total households in the study area, some 3% have own latrines.

DPHE is the leading agency promoting the rural sanitation. There are latrine factories, i.e. two (2) public owned for each upazila and some private ones. Latrines are basically procured by individual households supported by the government subsidy: the current price of a latrine is Tk 750 per unit of which Tk 500 are subsidized by GOB and Tk 250 are borne by household. It is estimated that only 25% of the total household in the rural area can purchase latrines.

3.4.6 Electrification

(1) Current situations

Bangladesh Power Development Board (BPDB) of Ministry of Energy and Mineral Resources is responsible for construction, operation and management of power generation and transmission. To promote rural electrification, GOB established the Rural Electrification Board (REB) in 1977. The rural electrification programme is set up taking regional balance, population density, accessibility and electricity demand from irrigation sector into

consideration. The rural electrification rate in the nation is estimated to be 15% as of June 1989 and only 8% of total population is covered by the rural electrification programme.

For the smooth extension of rural electrification, the electricity consumers cooperatives called PBS (*Palli Bidut Samities*) have been established by REB. PBS aims at (i) extension of power distribution lines, (ii) buying-in electricity from BPDB and selling to consumers, and (iii) financial arrangement of credit borrowing and repayment. At present, 33 PBS cover 129 upazilas, out of 460 upazilas in the nation, covering six (6) upazilas and about 1,000 km^2 by one PBS.

In the study area, PBS covers Kachua and Debidwar Upazilas, while BPDB supplies electricity directly to Bancharampur and Nabinagar Upazilas. The rate of rural electrification of each Upazila is summarized below.

Unit: %

Upazila	Village (no.)		Electrification Rate
	Total	Electrified	
Kachua	241	37	15.4
Debidwar	202	72	35.6
Bancharampur	116	19	16.4
Nabinagar	210	39	18.6
Study Area	769	167	21.7
Bangladesh	86,170	13,018	15.1

Source: Upazila Nirbani Office "Upazila Profile, 1990" and FFYP

3.4.7 Communication

(1) Telecommunication

The Bangladesh Telegraph and Telephone Board (BTTB) of the Ministry of Communication executes a number of programmes to expand and develop the telecommunication system. The telephone density in the nation is one of the lowest in the world, i.e. only 2.1 units per 1,000 persons. Although telephones are installed in upazila offices, branch offices of central agencies, Growth Centers and some of important market centers, it is next to impossible to make connection through telephone from Dhaka. There exist three (3) telephone offices and four (4) telegraph offices in Kachua and Debidwar combined. According to the experiences of

the JICA Study Team, it is extremely difficult to communicate from Dhaka to both Nabinagar and Bancharampur.

(2) Postal Service

The postal service in the study area is also insufficient according to the standards of the Universal Postal Union (UPU). The average coverage of post offices in Bangladesh is 14,000 population, while 3,000 to 6,000 population in the UPU standard. Post offices are located in the Growth Centers and major markets in the study area. There are 59 post offices in Kachua and Debidwar combined. Their buildings and facilities are seriously poor and needs reconstruction as well as repair work.

3.4.8 Cluster Formation of Rural Housing

The cluster formation of rural housing programme is a nationwide programme, called "Operation *Thikana*", that was launched by GOB in 1988 aiming at (i) settlement of homeless and landless rural poor in cluster villages in the government land and (ii) supporting their income generating and welfare activities. The cluster formation of rural houses scattering over inaccessible areas is also expected to contribute to encourage the government services, i.e. agricultural extension, training, etc. It is reported that 568 cluster villages with 21,000 families have been settled in the nation by June 1990.

In the study area, there exists one cluster village in each upazila where about 15 households were settled in the government land with less 5 acre for each cluster family. Compared with a large number of homeless and landless families, i.e. 3,300 homeless and 48,600 landless accounting for 28% of the total households of the study area, the past performance is far below than the requirement.

3.5 Institution and Support

3.5.1 Administrative Organization

The organization of the Central Government is illustrated in Figure 3.4. The overall governmental structure for rural development is presented in Figure 3.5. Ministry of Local Government Rural Development & Cooperative (MLGRD&C) is responsible for rural development. BRDB, LGEB, and Directorate of Cooperative Societies (DOC) are the executing agencies of rural development under MLGRD&C. At local government level,

Upazila Parishad is owed to the central responsibilities for rural development. Their tasks are described below and their organizations are illustrated in Figures 3.6 to 3.9.

(1) Bangladesh Rural Development Board (BRDB)

- Promotion of village based primary cooperative societies and UCCAs to enabling them to be autonomous, self managed and financially viable
- Encouraging functional cooperatives for generating income employment of the rural poor
- Promoting intensive irrigated agriculture
- Utilization of institutional credit through cooperative to ensure production and promote members accumulation of shares and savings
- Encouraging marketing activities
- Arrangement for effective training of cooperative members
- Liaison of concerned ministries, department and agencies for mobilizing supplies, services and supports
- Promotion of district and national federations of UCCAs
- To delegate to officer to the Director General and any other officers of the Board appropriate authorities and responsibilities for the achievement of the objectives of the Board
- Submitting to government projects and their implementation
- Undertaking different Projects/programmes to promote and develop cooperative movement in the country

(2) Local Government Engineering Bureau (LGEB)

- Technical assistance to Upazila Parishad on the light of decentralization of administration
- Technical assistance to municipalities
- Technical assistance to district council
- Implementing of foreign aid projects
- Development of roads, bridges, culverts which connecting the growth centers under food for work programme financed by WFP.
- Technical, accounting and management training of engineers and other works
- All the administrative work of the engineers and officers of the LGEB
- Development and maintenance of Feeder Road Type - B under LGEB financed by foreign aid projects
- Any work imposed by the Government.

(3) Directorate of Cooperative Societies (DOC)

- Formulation, amendment (as and when necessary) and application of cooperations laws and rules and regulations
- Giving registration to the cooperative societies
- Supervising registration activities and their application
- Ensuring fund management and auditing and inspection of accounts.
- Mitigating dispute among different cooperatives, including members of cooperatives
- Promotion and development of cooperative movement in the country
- Arrange training on all about of cooperative for the people engaged in cooperative activities in the country

(4) Upazila Parishad

- All development activities for Upazila level development plan and programme and implementation and evaluation thereof
- Giving assistance and encouragement to Union Parishads in their activities
- Training of Chairman, members and Secretaries of Union Parishads
- Implementation of Government policies and programme within the Upazila
- Supervision, control and coordination of function of officer serving in Upazila, except Assistant Judges
- Plans and execution of all rural public works programme and assistance to District Parishad in development activities
- Promotion of socio-cultural, educational, vocational, health family planning and family welfares
- Promotion and encouragement of employment generating activities, extension of cooperative movements
- Promotion of agriculture activities, livestock, fisheries and forest
- Such other functions as may be specified by the Government from time to time
- Provision for management of environment

3.5.2 Agricultural Extension

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

- 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 members. Under the upazila extension office, Block Supervisors (BS) function as front-line extension workers who provide technical advice 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	Farmland/BS
	Seats	Posted	(households)	(acre)
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. 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 advice to general farmers.

3.5.3 Livestock Support

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

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

(1) Diseases control

The prevailing cattle diseases are represented by Foot and Mouth Disease (FMD), Hemmorrohagric Septicemia (HS), Anthrax, Black Quarter, diarrhoea, worms infection, and Rinder Pest. Upazila Livestock Officers deploy their support services of vaccination and treatment to local cattle. The medicines and other chemicals are provided by Directorate of Livestock without service charge. The performance in 1989/90 is summarized below.

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

3.5.4 Fishery Support

The Department of Fisheries (DOF), under the MOFL, has an official setup at each of the upazilas of the study area. The general provision for Fisheries manpower at upazila levels is five viz. one Upazila Fishery Officer, one Assistant Fishery Officer, one Field Assistant, one Typist-cum- clerk and a peon. But in most of the upazilas, out of five positions, one or two is always lying vacant.

The activities of the UFOs are mainly centered around impractical, less technical motivational aspects viz. giving advice and suggestion to fish farmers, implementing of Fish Act. and Pond Improvement Act., collection revenue from fishermen, etc. In addition, they are operating the upazila council pond as demonstration of pond fish culture. The UFOs do not conduct any training for fish farmers (they have no such programme). However, they present a lecture on fish culture once biweekly/monthly in BRDB's cooperators training. The UFOs also perform non- fisheries activities like relief operation, audit and inspection of other activities of upazila council under the direction of Upazila Chairman.

However, in Bancharampur, through a DOF Central Project, five private ponds are now being used for demonstration of fish culture by the upazila fishery staffs under the Integrated Fishery Development Project by DOF. The ponds were stocked with fingerlings in August-September'90 and have not yet been harvested, thus data on growth and production could not be given.

There are two DOF Fish Seed Multiplication Farms (FSMFs) in the study area, one in Kachua and the other one in Debidwar. Each of the farms has one hatchery and eight ponds (2 brood fish, 3 nursery and 3 rearing ponds) covering an area of 1.21 hectares.

The hatchery of Kachua FSMF is in operation and has a production target of 20 kg spawn, 200,000 fingerling, and 900 kg food fish for the year 1991. There is no well in the farms. The water source of the hatchery operation is the pond. The capacity of overhead water tank is too small to ensure continuous water flow in the spawning/incubation tanks during operation. There is one building in very bad condition for training purposes.

The hatchery at Debidwar FSMF is not in operation because of water problem and some faulty construction of hatchery units. This FSMF has the target of producing 300,000 fingerlings and 900 kg food fish for the year 1991. No target for spawn production has been kept this year. No training facilities in the farm.

Bancharampur has no hatchery but Nabinagar has one govt. hatchery which is not in operation.

The Rotary Foundation initiated in 1984 the Inland Fisheries Project, and this project is providing credit and support services for hatcheries and nurseries to fish farmers in Comilla District. By this project a number of private hatcheries has been established in Comilla and has steadily increased production of fry. The total amount of spawn produced in 1989/90 was 1660 kg.

3.6 Cooperatives

3.6.1 Organization

(1) Number of Cooperatives and Members

In accordance with the cooperative laws, village level cooperatives have been organized since 1904. In 1957, the Comilla Academy was established in Comilla as a research institute aimed at survey, research and training for rural development. With the leadership of the Academy, diffusion of two-tier cooperative systems, i.e. Upazila Central Cooperative Associations (UCCA) and primary societies, have been introduced. The promotion of two-tier cooperative systems is now transferred to BRDB, under which the following primary societies are organized.

- KSS Farmers' Cooperative (Krishak Samabaya Samity)
- BSS Landless Cooperative (Bhumiheen-Bityaheen Samabaya Samity)
- MSS Women's Cooperative (Mahila Samabaya Samity)
- MBSS Landless Women's Cooperative (Mahila Bhumiheen-Bityaheen Sambaya Samity)

In addition, the following cooperatives are also operated under DOC.

- Primary Land Mortgage Cooperative Society (PLMCS)
- Primary Sugarcane Growers Society (PSGCS)
- Union Cooperative Multipurpose Society (UCMPS, association of the societies)
- Businessmen Cooperative Society (BSS)
- Fisherman Cooperative Society (MJSS)
- Weavers Cooperative Society (TSS)
- Farmers Cooperative Society (KSS)

In the study area, the following numbers of primary societies are organized under four (4) UCCAs giving the average density of 20 in union and 1.6 in village.

Upazila/ Primary Society	Bancharampur		Nabinagar		Kachua		Debidwar	
	No. of cooperatives	No. of numbers	No. of cooperatives	No. of numbers	No. of cooperatives	No. of numbers	No. of cooperatives	No. of numbers
KSS	258	10,655	361	9,580	285	10,283	281	8,620
BSS	55	2,536	27	707	19	454	38	923
MSS	32	1,290	-	-	22	642	-	-
MBSS	-	-	10	170	-	-	45	1,050
Total	345	14,481	398	10,457	326	11,379	364	10,643

The numbers of cooperative members are 33 in average society in the study area. The farmers participation rates to the cooperatives are 39% and 7% in KSS/MSS and BSS/MBSS.

(2) Staff Structure of Cooperatives

Officers of UCCA are elected among officers of primary societies, while officers of primary societies are among cooperative members. Their salary is basically paid by cooperatrive members supported by the rural development projects under BRDB. UCCA and primary societies are managed by officers and staff mentioned below.

UCCA				Primary Society	
Officer		Staff		Officer	
Chairman	(1)	Manager	(1)	Chairman	(1)
Vice Chairman	(1)	Account Assistants	(2)	Vice Chairman	(1)
Directors	(10)	Loan Assistant	(1)	Manager	(1)
		Inspectors	(17)	Members	(3)
		Others	(5)		

3.6.2 Cooperative Activities

The economic activities of KSS are represented by irrigation management under IMP and credit operation. The assetless societies of BSS and MBSS operate diversity of income generation activities such as pond fisheries, net making, cattle rearing, handloom, bamboo work, jute work, paddy husking, tailoring, rickshaw pulling, etc. In this connection, BRDB has promoted the cottage crafts production linking with Karupari, which is sales-cum-display center of handicraft items established in Dhaka under BRDB-JOCV collaboration.

Capital formation is the main activity of primary societies aiming at generation of collateral. The average capital per member is as low as Tk 72 to 254 as follows.

(Unit: T.K./Person)

Primary Societies/ Upazila	KSS	BSS	MSS/MBSS	Average
Kachua	253	315	220	254
Nabinagar	168	195	152	170
Bancharampur	156	86	205	148
Debidwar	70	165	38	72

3.6.3 Rural Credit

(1) Institutions and Performance of Rural Credit

Bangladesh Bank (BB), i.e. the country's central bank, directs and coordinates the institutional credit channels through Bangladesh Krishi Bank (BKB), Rajshahi Krishi Unnayan Bank (RAKUB), National Commercial Bank (NCB), Bangladesh Samabaya (Cooperative) Bank Ltd. (BSBL). The credit services are also exerted by Non-Government Organization (NGO) such as Bangladesh Rural Advancement Committee (BRAC), PROSHIKA and Grameen Bank. BKB is the largest rural credit lender disbursing 56% of the total lending amount during 1987 to 1989 followed by NCBs (26%) and cooperative credit coordinated by BRDB (11%). These institutes deal with more than 90% of the government rural credit . The short term credits occupy 76% of the government rural credit disbursed mainly for procurement of fertilizers and other farm inputs. The conditions of credit are summarized below.

Institute	Type (Term)	Annual Interest Rate (%)	Loan Size (Tk'000)	
			Individual	Group
I. BKB / RKUB	Short	16.0	15-20	-
	Medium	16.0	50-200	-
	Long	16.0	200-500	-
II. NCBs	Short	17.5	50	-
	Medium	16.0	300	-
	Long	16.0	400-800	-
III. BSBL	Short	17.5	2	30
	Medium	16.0	4	60
	Long	16.0	6	100
IV. BRDB/UCCA	Short	17.5-19.5	2.0-3.5	20-60
	Medium	16.0	5.0-8.5	100-200
V. Grameen Bank	Short	16.0	30	350
	Medium to Long	16.0	8-35	240-450

Note : Short term ; less than one year or 9 - 18 months
Medium term ; one to two years
Long term ; above two years

(2) Cooperative Credit

For credit operation, administrative relations among UCCA, primary societies, BRDB and DOC organized as is shown in Figure 3.10. The total amount of cooperative credit in the study area accounts for Tk 12.26 million for 8,424 members in 1989/90 of which 42% were disbursed for irrigation equipment although number of borrowers are limited at 137 or 1.6% of the total borrowers. The loan amount is Tk 1,500 per member. Cooperative credit operation is summarized below (See Table 3.7).

Objective	Disbursement		No. of Borrower		Disbursement per Borrower (TK '000)
	(TK '000)	%	(1,000)	%	
1. Crop loan	4,700	38.4	8,128	96.5	0.6
2. Irrigation equipment	5,128	41.8	137	1.6	37.4
3. Pond fisheries	169	1.4	14	0.2	12.1
4. Draft animals	457	3.7	17	0.2	26.9
5. Small trading	1,546	12.6	124	1.5	12.5
6. Rural housing	255	2.1	4	-	63.8
Total	12,255	100.0	8,424	100.0	1.5

(3) Credit Operation in the Study Area

The formal credit activities have been the disbursement of BRDB fund by UCCA to the members of primary societies in the Study Area. In 1989, Grameen Bank started its activities in the Old Comilla District. Following the opening of Mogura Branch in Braman Baria District, its covering area was rapidly expanding southwards, and twenty branches were established in Comilla District since May, 1990. In the Study Area, including two Upazilas of the Phase I study, 10 branches were set up in Daudkandi, Homna and Debidwar Upazilas and disbursed to 1,703 households. Proshika is only one NGO observed in 4 studying Upazilas besides Grameen Bank. Its operating areas are Nabinagar and Bancharampur, and the target area is also expanding gradually. The allocation of branches of principal financing organizations is shown as follows:

Bank	Nabinagar	Bancharampur	Debidwar	Kachua
Bangladesh Krishi Bank (BKB)	5	4	2	1
Sonali Bank	3	3	3	3
Other National Commercial Banks	11	7	6	5
Upazila Central Cooperative Association (UCCA)	1	1	1	1
Grameen Bank	0	0	3	0
Proshika	3	2	0	0

Source: Upazila Bank Branches and Upazila Statistical Office

The disbursement amounts in the study area fluctuate year to year, and there is hardly recognized certain time serial rising or falling trend of disbursement. The disbursements to BSS in Kachua and Debidwar Upazilas, to MSS in Bancharampur, to MBSS in Debidwar are, however, notably increasing although those amounts are still very small. On the other hand, the disbursement to KSS in Debidwar Upazila is rapidly decreasing.

Around 81% of the cooperative credit was disbursed to KSS, 11% to BSS and 8% to MSS/MBSS during the period from 1987 to 1989. These proportions are dependent upon collateral security. The recovery rate varies by Upazila and society as below (See Table 3.8).

Upazila/ Primary Society	Bancharampur		Nabinagar		Kachua		Debidwar		Total
	Rate of Disburse-ment	Re-covery	Rate of Disburse-ment	Re-covery	Rate of Disburse-ment	Re-covery	Rate of Disburse-ment	Re-covery	Rate of Disburse-ment
KSS	74	67	92	68	88	68	66	51	81
BSS	12	65	6	72	10	75	23	87	12
MSS/MBSS	14	72	2	84	2	86	11	91	7
Total (%)	100	67	100	70	100	69	100	63	100
(TK. '000)	2,352	-	1,929	-	2,353	-	1,561	-	8,350

3.6.4 Training

(1) Training programmes of BRDB

The training programme is provided by BRDB to the two categories of trainees; (i) cooperative members and (ii) officers and staff of rural development projects and programmes. The training of cooperative members is provided mainly at Upazila Training and Development Centers (UTDC) through weekly training of managers (3 days), seasonal training of model farmers (4 days), and periodical training to chairman of KSS (3 days). At present, 449 UTDC are established in the nation. In 1988/89, total number of trainees were 185,000 managers, 7,000 model farmers, and 4,000 chairmen. The officers and staff training are given at various organizations and institutes through arrangement by BRDB. The major training institutes and number of trainees in 1988/89 are presented below.

Staff Training Institute	No. of trainees
Rural Development Training Institute (RDTI) at Sylhet	849
Rural Development Academy (RDA), Bogra	669
Bangladesh Academy for Rural Development (BRAD)	272
Cooperative College, Comilla	99
Rural Training Center (RTC), Dhaka	188
Others (temporary workshop in Dhaka)	29

Training programmes for the primary societies are prepared by the UCCA, and the training is carried out through lecturers from government organizations concerned at Upazila Training and Development Centers (UTDC). The training consists of (i) agricultural management, (ii) livestock, (iii) fisheries, (iv) operation and maintenance of irrigation facilities, (v) poverty