

THE PEOPLE'S REPUBLIC OF BANGLADESH

MODEL RURAL DEVELOPMENT PROJECT PLAN
FOR
HOMNA AND DAUDKANDI UPAZILA
COMILLA DISTRICT

FINAL REPORT

(MAIN REPORT)

NOVEMBER, 1989

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 Japanese Government decided to conduct a survey on Model Rural Development Project and has entrusted the survey to Japan International Cooperation Agency (JICA).

JICA sent to the People's Republic of Bangladesh a survey team headed by Mr. Toshihito Otani, Nippon Koei Co., Ltd. twice from October 20, 1988 to March 30, 1989.

The team held discussions with the officials concerned of the Government of the People's Republic of Bangladesh and conducted a field survey in Homna and Daudkandi Upazilas of the Comilla district. 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 development of the Project and to the promotion of friendly relations between our two countries.

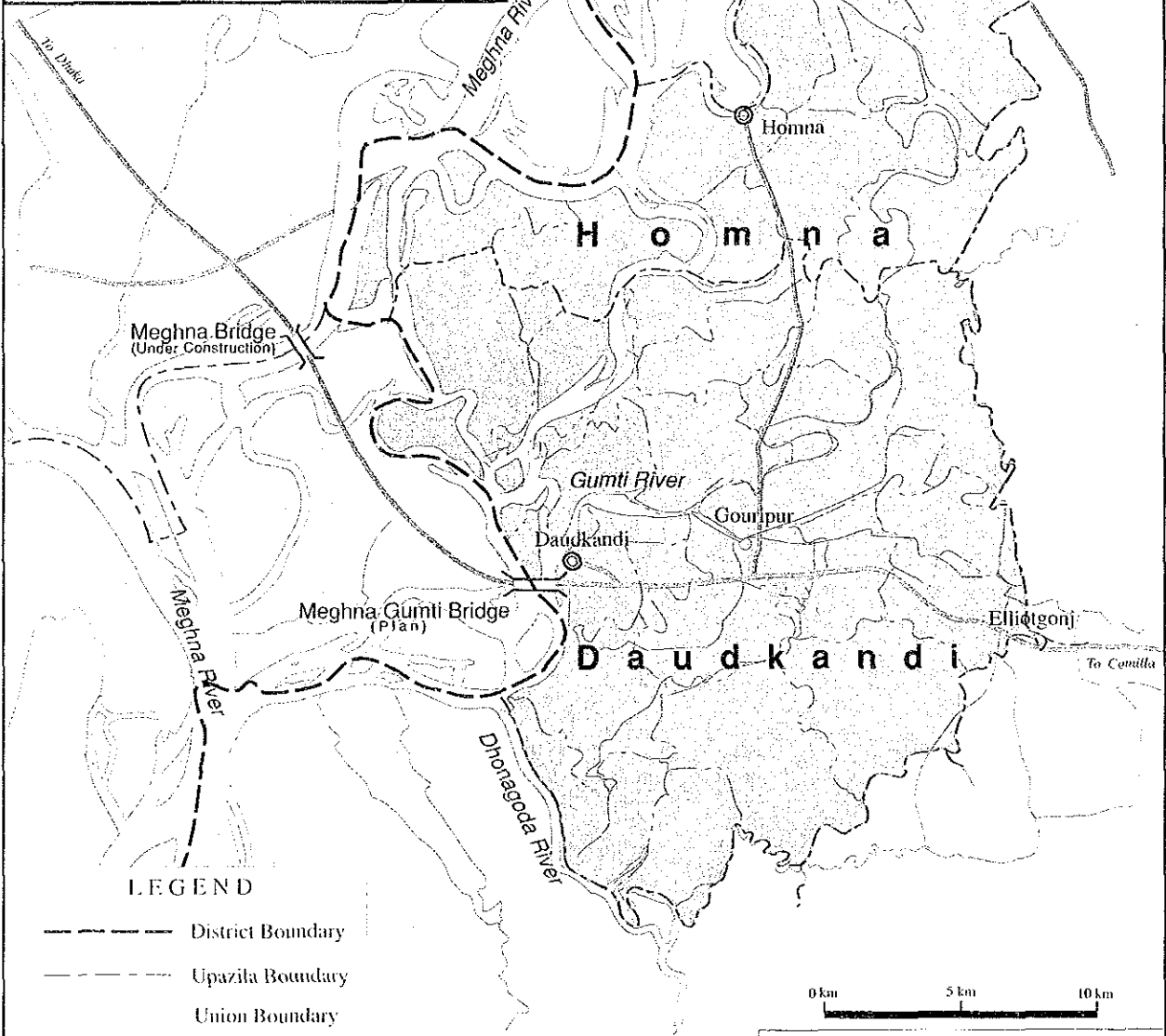
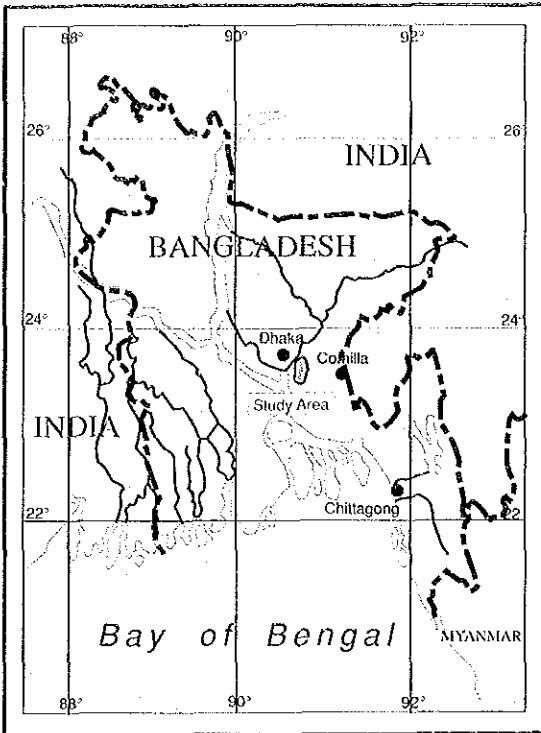
I wish to express my deep appreciation to the officials concerned of the Government of the People's Republic of Bangladesh for their close cooperation extended to the team.

November, 1989



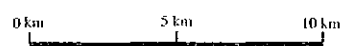
Kensuke Yanagiya
President

Japan International Cooperation Agency



LEGEND

- District Boundary
- Upazila Boundary
- Union Boundary
- Road
- River



Location Map

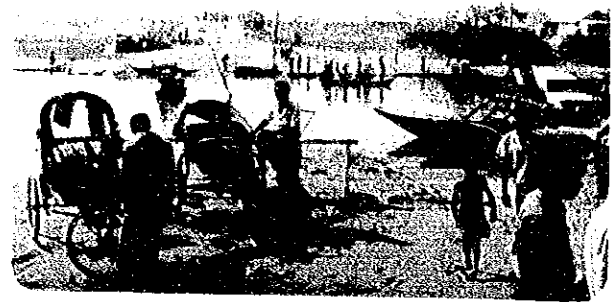
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SITE PICTURES

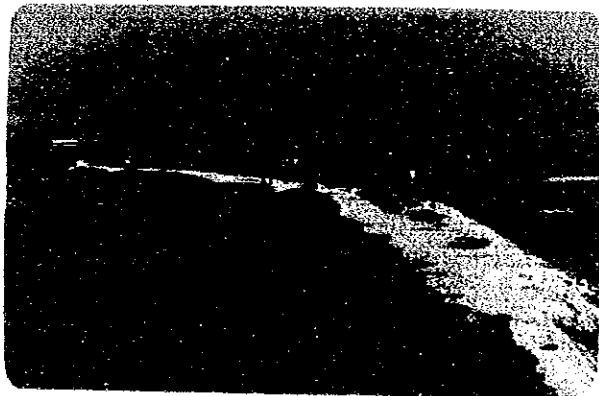
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Habitation



Transportation Means



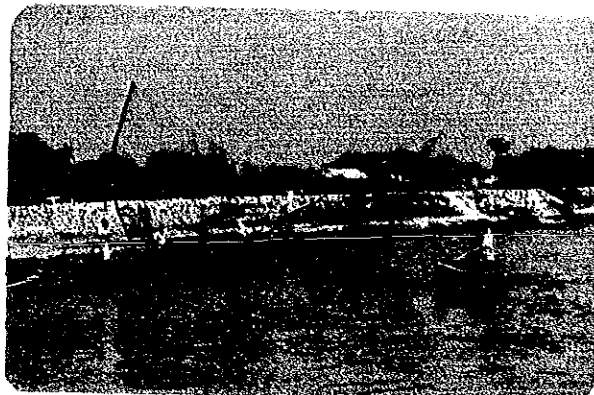
Roads and Bridges



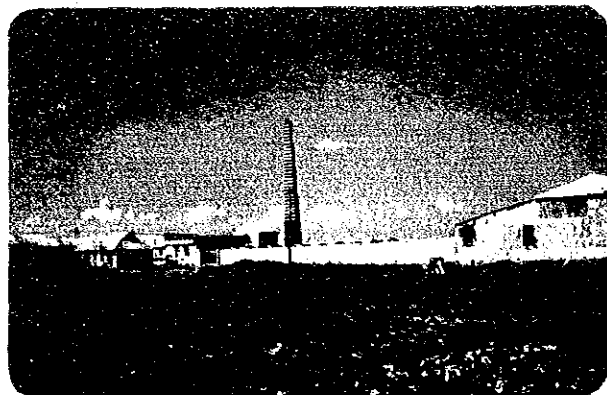
Marketing and Distribution

SITE PICTURES

(2)



Fisheries
(Inland Fishery and Open Fishery)



Rural Industries
(Rice Mills and Cold Storage, bottom-right)



Rural Business
(Bazaar and Growth Center)

AGRICULTURAL ASPECTS

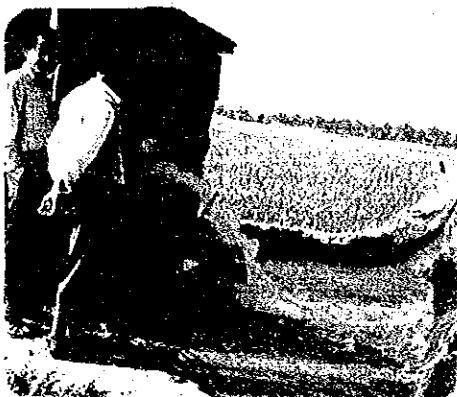
Irrigation



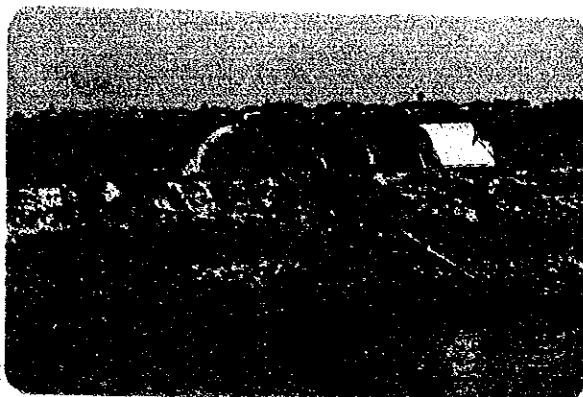
Swing Basket



Floating Pump



Irrigation Canal



Low Lift Pump

Farming Practices



Paddy Cultivation



Upland Agriculture

UCCA

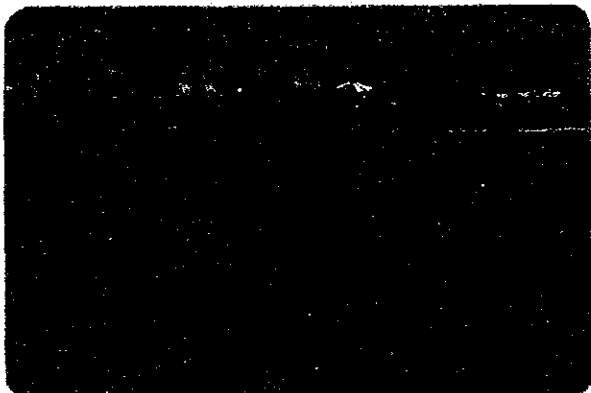
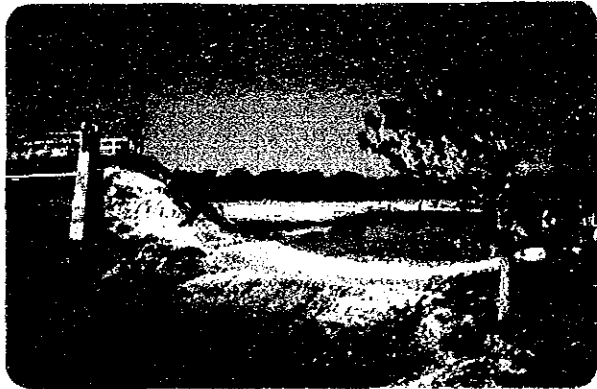
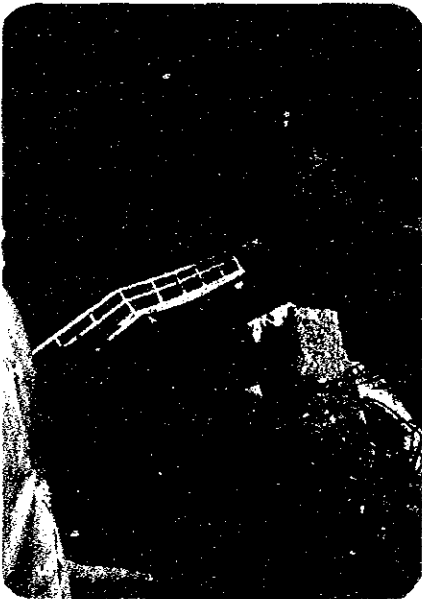
UCCA Office (Staff and Committee)

(वि.आर/डि.वि.)
महाराष्ट्र कृषि विद्यापीठ



UCCA Training Room

Flood Damages



SUMMARY

1. At the request of the Government of the People's Republic of Bangladesh, Japan International Cooperation Agency (JICA) conducted a study on the Model Rural Development Project Plan (MRDPP) for Homna and Daudkandi Upazila in Comilla District at master plan level from October 1988 to September 1989.

2. Bangladesh has 144,000 km² of land, 110 million of population increasing at 2.4% per annum and 760 persons/km² of population density. About 85% of population inhabits in rural areas. Agriculture contributes 50% of GDP, employs 2/3 of the labour force and produces 90% of export goods. The total cultivated areas are 8.6 million ha and the number of farm households is 10 million, of which 70% are small land holders of only 0.2 ha to 1.0 ha. About 45% of household in the rural area is landless and the percentage is increasing annually.

3. The Study Area is located 50 km east of Dhaka and is composed of 554 km² of flat lands extending along the Meghna river and its tributaries and suffering from annual floods. Population is estimated to be 735,000 and the population density is 1,330 persons/km², 1.8 times higher than the national average. Main industry is agriculture and major crops are paddy, wheat, potato, jute, vegetables, etc. About 29% of land is irrigated by low-lift pumps, shallow tubewells and deep tubewells. There are eight growth centres and 34 hat markets. They need rehabilitation and construction of more facilities. The road system consists of Feeder A, B and rural roads totalling 240 km. Number of bridges to be constructed is 144. The national highway Dhaka-Chittagong line passes through the center of Daudkandi Upazila. Communication with Dhaka will be greatly improved when the Meghna bridge (under construction) and the Meghna Gumti bridge (under planning) are constructed. According to the survey, per capita incomes of farm households are TK 6,500 and TK 4,500 and those of landless farmers household are TK 1,600 and TK 1,900 in Daudkandi and Homna respectively. There are 732 KSSs, 124 BSSs and 38 MBSSs organized in the Study Area, but the total number of membership is only 31,000 compared to the population of 735,000.

4. The Third Five Year Plan defines the objective of rural development is alleviation of rural poverty. It set up a three component programme consisting of (a) Physical infrastructures development, (b) Irrigated agriculture, drainage and minor flood control and (c) Production and employment programme for the rural poor. MRDPP

will be formulated within the framework of the said three components in principle and taking into due consideration the specific local conditions of the project area.

5. Strategy of MRDPP

In order to generate employment and income opportunities for the rural low income class, MRDPP has set up the basic strategy to expand the productive sectors such as agriculture, inland fishery and rural and cottage industries.

- (i) Agriculture is still remaining at low production level and has a large development potential. At the present production level, most produce is consumed domestically, but at a higher production level envisaged in MRDPP more marketable surplus will be created. Thus, for the transportation, storing, processing, wholesale and retailing of the surplus produce, economic activities will be stimulated and more employment opportunities will be generated. Taking advantage of better access to the Dhaka market after construction of bridges on the Meghna, cultivation of vegetables will be encouraged in the project area.
- (ii) Inland fishery also has a large development potential. MRDPP will encourage the inland fishery to create job opportunities and improve the nutrition of rural people.
- (iii) Agro-based rural and cottage industries should be developed utilizing the unemployed labour force and agricultural produce as raw material.

The expansion of above-mentioned three productive sectors will be materialized only if the following two conditions are satisfied.

- (i) Rehabilitation and construction of physical infrastructures in the project area such as roads, growth centres, hat markets, irrigation facilities, etc.
- (ii) Strengthening and modernization of farmers' organization. UCCA and affiliated village level cooperatives who will be trusted as the executive body of MRDPP together with Upazila parishad, should be adequately strengthened and modernized.

6. UCCAs are considered very important institutions for rural development. Unless UCCAs are adequately strengthened, they cannot serve the rural people through the affiliated village institutions, such as KSS, BSS, MSS and MBSS. In order that UCCAs become financially self-reliant, they should undertake diversified income-generating business activities, such as rice mill, food processing and other businesses as may be found feasible in the area. MRDPP proposes to establish 143 community center - godown - rice mill complexes (one in five villages or one in 4 km²) to undertake the sale and purchase businesses of paddy, wheat, agricultural inputs, necessities of life, etc. In addition, the community-centre will be used as branch office of UCCA to serve the rural people in the field of extension service, credit and insurance, employment promotion, training and education, and other cultural and entertainment activities. UCCA will also operate the agriculture modernization centre, the inland fish centre and the cold storage to be constructed under MRDPP.

7. Facilities and physical infrastructures to be constructed and rehabilitated by MRDPP are shown in table below.

	Unit	1st Stage			2nd Stage			3rd Stage			Total			
		D	H	T	D	H	T	D	H	T	D	H	T	
1. UCCA														
1.1	UCCA Building	place	1	1	2			0			0	1	1	2
1.2	AMC	place	1	1	2			0			0	1	1	2
1.3	Inland Fish Center	place	1	1	2			0			0	1	1	2
1.4	Community Center with godown and rice mill	place	31	16	47	33	15	48	33	15	48	97	46	143
2. Infrastructure Development														
2.1 Irrigation														
2.1.1	Irrigation Canal	km	125	18	143			0			0	125	18	143
2.1.2	Drainage Canal	km			0	15	15				0	0	15	15
2.1.3	Low Lift Pump	Nos.	138	203	341			0			0	138	203	341
2.1.4	Floating Pump	Nos.	3	2	5			0			0	3	2	5
2.1.5	Buried Pipeline	place	20	15	35	20	14	34			0	40	29	69
2.2 Road														
2.2.1 Feeder A														
1)	Road Body	km	13	5	18			0			0	13	5	18
2)	Bridge	Nos.	3		3			0			0	3	0	3
2.2.2 Feeder B														
1)	Road Body	km	35	26	61	42	7	49	30		30	107	33	140
2)	Bridge	Nos.	17	15	32	28	5	33	16		16	61	20	81
2.2.3 Rural Road														
1)	Road Body	km			0	12	32	44	23	16	39	35	48	83
2)	Bridge	Nos.			0	5	26	31	17	12	29	22	38	60
2.3	Growth Center	place	3	2	5	2	1	3			0	5	3	8
2.4	Hat Market	place	9	3	12	9	3	12	9	1	10	27	7	34
2.5	Fish Pond	place	330	170	500	1000	500	1500	1670	830	2500	3000	1500	4500
3. Others														
3.1	High School	place	9	6	15	10	6	16			0	19	12	31
3.2	Drinking Water Supply	place	238	100	338	238	100	338			0	476	200	676
3.3	UHC	lot	1	1	2			0			0	1	1	2

Note: D= Daudkandi H= Homna T= Tota
 AMC :Agriculture Modernization Center
 UHC: Upazila Health Center

The total construction cost estimated at 1989 prices is TK 3,847 million (US\$121 million) as shown in below.

(Unit: million TK)

Items	1st Stage	2nd Stage	3rd Stage	Total
1. Direct Construction Cost				
1. UCCA	350.1	257.8	257.8	865.7
1) UCCA	(36.8)	(0.0)	(0.0)	(36.8)
2) AMC	(48.8)	(0.0)	(0.0)	(48.8)
4) Inland Fish Center	(12.1)	(0.0)	(0.0)	(12.1)
3) Community Center with Godow and Rice Mill	(252.4)	(257.8)	(257.8)	(768.0)
2. Infrastructure Development	525.7	601.1	561.5	1,688.3
1) Irrigation	(102.7)	(12.5)	(0.0)	(115.2)
2) Road	(254.6)	(335.4)	(227.0)	(817.0)
3) Growth Center	(60.4)	(21.6)	(0.0)	(82.0)
4) Hat Market	(47.0)	(48.1)	(28.3)	(123.4)
5) Fish Pond	(61.0)	(183.5)	(306.2)	(550.7)
3. Others	96.6	97.2	0.0	193.8
1) High School	(75.0)	(80.0)		(155.0)
2) Drinking Water Supply	(17.2)	(17.2)		(34.4)
3) UHC	(4.4)	(0.0)		(4.4)
Sub-total	972.4	956.1	819.3	2,747.8
2. Land Acquisition	48.6	47.9	41.0	137.5
3. Administration	48.6	47.9	41.0	137.5
4. Physical Contingency	145.8	143.4	123.0	412.2
5. Engineering Services	145.8	143.4	123.0	412.2
Total	1,361.2	1,338.7	1,147.3	3,847.2
6. Price Contingency	268.5	819.7	1,318.0	2,406.2
Grand Total	1,629.7	2,158.4	2,465.3	6,253.4

8. MRDPP will be implemented in 10 years from 1990 to 1999 in three stages. Responsible agencies are the Local Government Engineering Bureau (LGEB) for civil engineering works and procurement of equipment, and the Bangladesh Rural Development Board (BRDB) for operation of the project.

9. MRDPP will generate 20 million man.days (80,000~persons) of incremental long-term employment and 3 million man.days (20,000 persons) per annum of additional temporary employment by civil works under the project as shown in following table. The employment ratio will increase from 41 % in 1988 to 63 % in 1999.

Item	1988			1999			Increment
	D	H	Total	D	H	Total	
1 Population (1,000 persons)	497	738	735	617	296	913	178
2 Total labor force (1,000 persons)	163	83	246	202	103	305	59
3 Total labor force (1,000 man.day)	40,750	20,750	61,500	50,500	25,750	76,250	14,750
	(100)	(100)	(100)	(100)	(100)	(100)	
4 Employment (1,000 man.day)							
4.1 Long Term Employment							
(1) Production sector							
1) Agriculture	9,951	3,807	13,158	12,729	6,230	18,959	5,801
2) Inland fishery	1,314	492	1,806	6,160	2,193	8,353	6,547
3) Livestock	-	-	-	103	56	159	159
4) Rural industry	1,231	3,511	4,742	2,650	5,050	7,700	2,958
5) Cottage industry	3,295	2,086	5,381	4,193	2,517	6,710	1,329
Sub total	15,191	9,896	25,087	25,835	15,946	41,781	16,694
(2) O & M of infrastructures							
Sub total	-	-	-	404	206	610	610
(3) UCCA related works							
1) Godown cum ricemill	-	-	-	1,572	745	2,317	2,317
2) Inland fishery center	-	-	-	118	38	156	156
Sub total	-	-	-	1,690	783	2,473	2,473
Total	15,191	9,896	25,087	27,929	16,935	44,864	19,777
	(37)	(48)	(41)	(55)	(66)	(59)	
4.2 Temporary Employment							
(1) Irrigation	-	-	-	988	152	1,140	1,140
(2) Road	-	-	-	1,848	1,002	2,850	2,850
(3) Fish pond	-	-	-	18,503	4,332	22,835	22,835
(4) Others	-	-	-	241	102	343	343
Total	-	-	-	21,580	5,588	27,168	27,168

No () indicates percentage to the total labor force

D: Daudkandi H: Homna

10. Economic evaluation of MRDPP indicates an economic internal rate of return of 20 %.

11. Recommendations

- (i) It is recommended that the Government of Bangladesh should implement MRDPP after making quick financial arrangements.
- (ii) It is recommended that the Government of Bangladesh should totally support the UCCA's activities and make ministerial arrangements so that

UCCA can easily handle the purchase and sale businesses of rice, wheat, fertilizers, etc.

- (iii) It is recommended that the Government of Bangladesh should employ technical assistance and periodical monitoring system from abroad, particularly for UCCA related activities.
- (iv) It is recommended that the Government of Bangladesh should invite the participation of international volunteer groups.
- (v) It is recommended that in order to explain the MRDPP a seminar should be conducted involving all concerned agencies and farmers representatives before commencement of the Project.

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ATTACHMENT

- Attachment 1 Scope of Work
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- Attachment 4 Minutes of Meeting on 25 September 1989

ABBREVIATIONS

AMC	Agricultural Modernization Center	IFAD	International Fund for Agricultural Development
ATI	Agricultural Training Institute	ILO	International Labour Organization
BADC	Bangladesh Agricultural Development Corporation	IMP	Irrigation Management Program
BARI	The Bangladesh Agricultural Research Institute	IRDP	Integrated Rural Development Program
BB	Bangladesh Bank	IRWP	Integrated Rural Works Program
BBS	Bangladesh Bureau of Statistics	JICA	Japan International Cooperation Agency
BBS	Bhumihcen-Bityaheen Samabaya Samity (Landless/Assetless Cooperative Society)	KSS	Krishak Samabaya Samity (Farmer's Cooperative Society)
BJC	Bangladesh Jute Corsonds	LGEB	Local Government Engineering Bureau
BJMC	Bangladesh Jute Mills Corsonds	LGRD	Local Government and Rural Development
BJRI	Bangladesh Jute Research Institute	LLP	Low-Lift Pump
BKB	Bangladesh Krishi Bank	LV	Local Variety
BRDB	Bangladesh Rural Development Board	MBSS	Mahila Bittohin Samabay Samity
BRRRI	Bangladesh Rice Research Institute	MLGRDC	Ministry of Local Government Rural Development and Cooperatives
BS	Block Supervisor	MOA	Ministry of Agriculture
BWDB	Bangladesh Water Development Board	MRDPP	Model Rural Development Project Plan
B.Aman	Broadcasted Aman	MSS	Mahila Samabaya Samity (Women's Cooperative Society)
CCA	Central Coperative Association	NCB	Nationalized Commercial Bank
CP	Comilla Proshika	NGOs	Non-governmental Organizations
DAE	Department of Agriculture Extension	OECF	Overseas Economic Corporation Fund
DC	Deputy Commissioner	PEC	Private Expart Company
DTW	Deep Tube-well	PER	Post-Flood Emergency Programme
EC	Eligible Couples	PWD	Public Works Department
FAO	Food and Agricultural Organization of the United Nations	RHD	Roads and Highways Department
FFW	Food-For-Work	RWP	Rural Work Program
FFYP	First Five Year Plan	SMO	Subject Matter Officer
FY	Fiscal Year	STW	Shallow Tube-well
GB	Gramcen Bank	S/W	Scope of Work
GDP	Government of Bangladesh	TCCA	Thana Central Co-operative Association
GNP	Gross National Product	TFYP	Third Five Year Plan
GOB	Government of Bangladesh	TK	Taka
HA	Hectare	T.Aman	Transplanted Aman
HQ	Head Quarters	UAO	Upazila Agricultural Officer
HYV	High-Yielding Variety	UCCA	Upazila Central Cooperative Association
		UNDP	The United Nations Development Program
		WFP	World Food Programme

ABBREVIATIONS OF MEASUREMENTS

Length

mm	=	millimeter	
cm	=	centimeter	
	=	0.39 in.	
m	=	meter	= 1.09 yd.
	=	3.28 ft.	
km	=	kilometer	= 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 centimetre	
m ²	=	square meter	
km ²	=	square kilometre	
	=	100 ha	
ha	=	hectare	= 0.01 km ²
	=	2.5 ac	
ac	=	acre	= 0.41 ha
	=	4,050 m ²	
ft ²	=	square feet	
	=	0.03 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
°C	=	degree in centigrade
crore	=	10 million
lakh	=	0.1 million

Volume

lit.	=	liter
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 = 88.05 m ³
ac-ft.	=	acre feet = 1,234 m ³

Weight

g	=	gram
kg	=	kilogram
t	=	metric ton = 1,000 kg
lb	=	pound = 375 g

Time

sec	=	second
min	=	minute = 60 seconds
hr	=	hour = 60 minuits
	=	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	=	Taka
US\$1=TK 31.9=¥ 127.6		

CHAPTER 1 INTRODUCTION

1.1 General

This is the Main Report of the Model Rural Development Project Plan for Homna and Daudkandi Upazila in Comilla District, the People's Republic of Bangladesh, conducted by Japan International Cooperation Agency (JICA) in October 1988 thru September 1989. Agencies involved with rural development in Bangladesh are the Bangladesh Rural Development Board (BRDB) and the Local Government Engineering Bureau (LGEB) under the Ministry of Local Government, Rural Development and Cooperatives (MLGRDC).

This study has been conducted at a master plan level in accordance with the Scope of Work agreed upon between JICA of the one part and BRDB and LGEB of the other part in February 1988. The report is in two volumes; the Main Report and the Annexes.

1.2 Background of the Study

Bangladesh, with a territory of 144,000 km² and a population of 110 million in 1989, is one of the most densely populated countries in the world. Its socio-economy has been characterized by the low-income of the majority, increasing landlessness, high illiteracy rate, malnutrition, vulnerability to natural disasters and overwhelming dependance of capital, food and raw materials from abroad. Since independence in 1971, the Government of Bangladesh has made every effort to develop its national economy and to promote social welfare under these difficult conditions. As 85% of the populace inhabits the rural areas, rural development has been the most important goal of Government policy.

In the First Five Year Plan (1973-78), the two-tier cooperative system of the Comilla Model was promoted as the most effective tool for rural development. The Rural Work Program (RWP) was also started to mobilize the local labour force for construction of physical infrastructures such as the roads, bridges, culverts, irrigation canals, and markets. Further, an agrarian reform law was promulgated to set a ceiling to land holding, to enforce the compulsory registration of tenancy and to improve the share cropping system. Taking the 1974 flood and famine as an opportunity, the Food for Work Program (FFW) was started and it has been expanded to reach the volume of 4.5 million tons after 10 years.

In the Second Five Year Plan (1980-85) emphasis was placed on positive participation of the rural low income class to productive activities, adequate distribution of income and resources, and strengthening of the organization of the rural low income class. In order to implement regional development projects, BRDB was organized from the former IRDP.

The Third Five Year Plan (1985-90) pursues employment-inducing development policies with emphasis on generation of productive employment for the rural low-income class, improvement of technical skills in both farming and non-farming sectors, and increase in investments.

Under the above-mentioned circumstances, in June 1986 the Government of Bangladesh requested the Government of Japan to undertake a study on the model rural development project plan for Comilla and Tangail Districts. In response to the request, the latter sent a Fact Finding Survey Team to Bangladesh in July 1987 and a Preliminary Survey Team in January 1988. Agreement was reached by both Governments that the Study Area should be Homna and Daudkandi Upazila in Comilla District and counterpart agencies should be BRDB and LGEB. The Scope of Work for the Study was signed by the Preliminary Survey Team, BRDB and LGEB on February 7, 1988. The Study was to be conducted in two stages; the first stage consisted of data collection, field reconnaissance, preliminary formulation of rural development plan and selection of priority projects and the second stage comprised supplementary field surveys and the finalization of Study.

1.3 Scope of Work

The Scope of Work (S/W) signed by the Bangladesh Rural Development Board (BRDB) and Local Government Engineering Bureau (LGEB) on the one part, and the Japan International Cooperation Agency (JICA) on the other part on February 7, 1988, is outlined hereunder. The whole text of S/W is attached in Attachment -1 of this volume.

(1) Objective of the Study

The objective of the Study is to formulate the Model Rural Development Project Plan for Homna and Daudkandi Upazila (hereinafter referred to as MRDPP).

(2) Study Area

The Study Area covers the total area of Homna and Daudkandi Upazila in Comilla District.

(3) The Study

The Study consists of two stages. In the first stage, preliminary formulation of MRDPP will be conducted. The second stage will embrace a detailed study mainly for selected project components to finalize the MRDPP.

(4) Reporting

JICA will prepare and submit the following reports in English to the Government of Bangladesh.

1) Inception Report

2) Progress Report

Twenty (20) copies at the end of the first stage field work.

3) Interim Report

Twenty (20) copies at the commencement of the second stage field work.

4) Draft Final Report

Twenty (20) copies within one (1) month after the end of the second stage home office work.

5) Final Report

Fifty (50) copies within two (2) months after receiving the comments on the Draft Final Report.

1.4 Outline of the Study

(1) Home office work in Japan (11 - 19 October, 1988)

The Inception Report including the Plan of Operation was prepared.

(2) First stage field work (20 October - 17 December, 1988)

Joint Meeting was held on 29 October 1988 chaired by the Secretary of MLGRDC and the Inception Report was discussed. The minutes of meeting are attached in Attachment-2 of this volume.

The first stage field work was carried out and at its end the Progress Report (1) was submitted to GOB.

(3) First stage home office work in Japan (18 December, 1988 - 29 January, 1989)

A preliminary MRDPP was formulated and compiled into the Interim Report.

(4) Second stage field work (30 January - 30 March, 1989)

Joint Meeting was held on 1st February, 1989 to discuss the Interim Report. The minutes of meeting are attached in Attachment-3 of this volume.

The second stage field work was carried out and the Progress Report (2) was prepared. A Joint Meeting was held on 28 March to discuss the Progress Report (2).

(5) Second stage home office work in Japan (19 June - 20 September, 1989)

Draft Final Report was prepared.

(6) Submission of the Draft Final Report (22 - 30 September, 1989)

The Draft Final Report was discussed on 25 September. The minutes of meeting are attached in Attachment-4 of this volume.

The Final Report will be made within two (2) months after receiving comments given by the Government of Bangladesh.

CHAPTER 2 PROJECT BACKGROUND

2.1 National Economy

Since its independence, Bangladesh has implemented successive mid-term development plans: First Five Year Plan (1973-78), Two Year Plan (1978-80), Second Five Year Plan (1980-85) and Third Five Year Plan (1985-90). GDP grew at annual rates of 6.1%, 3.5% and 3.8% during the periods of the First Five Year Plan, Two Year Plan and Second Five Year Plan, respectively. Annual growth rates and sectoral structure of GDP during the Second Five Year Plan are given below:

Item	Annual Growth Rate (%)	Share of GDP	
		1979/80	1984/85
Agriculture	3.5	51.6	51.0
Industries	4.8	8.2	8.7
Other Sectors	3.8	40.2	40.3
Total	3.8	100.0	100.0

Source : Third Five Year Plan; Planning Commission

Note : Fiscal Year is July 1 to June 30.

Agriculture contributes about a half of GDP. Per capita GDP is more or less US\$160.

The population of Bangladesh in 1985 was estimated to be 100.5 million with an annual growth rate of 2.4% and a population density of 700 persons/km². This high population density and growth rate affect adversely the economic development of the country. The ever increasing population has brought about a decrease in per capita arable land demanding a ceaseless increase in food production per unit area and has aggravated landlessness and low income in rural areas. Furthermore, the annual growth in the labour force of 1.5 million has made the unemployment problem more grave. In addition, the population structure with the below-15 age group occupying 46% of the total population has given rise to more consumption than production. Consequently, the majority of population have been enforced to live below the poverty line.

During the Second Five Year Plan, the commodity price index rose at an annual rate of 11.8%, while the wage increase was at 3.2% and the money supply was augmented at 19.5%. Foreign exchange rates were US\$1 = TK 15.5 in 1979/80, US\$1 = TK 26.0 in 1984/85 and US\$1 = TK 31.9 in 1988/89.

1. Agriculture

Agriculture contributes 50% of GDP, employs 2/3 of the labour force and produces 90% of commodities exported directly or indirectly. Bangladesh's major economic resources are fertile lands, abundant water resources and ample

labour force. But these have not been fully exploited. Cultivated lands are 8.6 million ha and farm households are 10 million, of which 70% holds less than 1 ha, 25% holds 1-3 ha and 5% holds more than 3 ha. It is said that 45% of rural households is landless (land holding less than 0.2 ha is defined to be landless). The main crop is paddy, but its yield is only 1.4 ton/crop/ha, which is half the average yield in Asia. Self-sufficiency in food grains is not achieved yet. Import of food grains from other countries has therefore been necessary. The government is encouraging farmers to increase production of paddy through the introduction of HYV, the application of fertilizers and irrigation. At the end of the Second Five Year Plan, 25% of the cultivated area was provided with irrigation. The agricultural sector is expected to continue to play the central role in the Bangladesh economy. It has to supply food and to provide employment and income to the nation. To this end, expansion of agricultural production is needed.

2. Manufacturing

The share of industries in GDP being approximately 10% implies that Bangladesh is in Phase 1 (below 12% of GDP) of industrial development.

Countries in Phase 1 of industrial development export mostly primary products such as agricultural products and import processed goods and machinery.

A new industrial policy was declared in 1982 and 1986 to promote the privatization of public enterprises, the simplification of private investment formalities, etc.

In Bangladesh, industries are classified into two types, large scale and small scale excluding mining, energy and construction aspects.

Regarding large-scale industries, there are petroleum and coal, equipment, chemicals, foods, machinery and textiles.

Regarding small-scale industries or cottage industries, there are foods, textiles, tobacco, wood & bamboo works, glass & ceramics, jute-carpets, weaving & tailoring, metalwork, leather work, jewelry & ornaments, etc.

For both types together, the recent share in GDP in 1986/87 has been only 9.5%.

3. Trade and Services

Trade and services in Bangladesh have a significant share in the GDP (35-39%) in which the ratio between trade and services is 1:3.

For export products, more than 40% of the export-value comes from jute and jute products and the rest is from weaving products, marine products, leather-goods and tea, which are almost raw or simply processing products.

Import products include, foods, oil, machinery, chemicals and construction-materials. More than a million tons of food grains per year have been imported in order to cover the population-growth and the deficit of major staples in the frame of consumption versus production.

Values of the export and import in 1985/86 were TK 27 billion and TK 63 billion showing a trade deficit as in past years.

Another aspect which should be considered in the trade of this country is the value of remittances from the Bengali labour force abroad, which amounts to approximately TK 19 billion (650 million US\$) per year.

2.2 Rural Development in Bangladesh

During the last two decades the Government of Bangladesh has adopted and experimented with a number of rural development programs.

The social sector problems are being handled by the respective ministries at a national level while programs in the economic sector have been the responsibility mainly of the Ministries of Local Government, Agriculture, Food, Relief and others.

Of the many programs planned and implemented for the economic sector in rural areas, the more important ones can be grouped under the following four major items:

- i. Rural Works Programme (RWP) introduced in the early sixties.
- ii. Food for Work Program (FFWP) introduced in the mid seventies.
- iii. Integrated Rural Development Programs (IRDP) introduced in 1971.
- iv. A number of credit programs for rural employment creation
 - a. Grameen Bank Prokalpa (GBP)
 - b. Swanirvar Bangladesh Credit Program
 - c. Rural Finance Experimental Project (late 70s)
 - d. ASARRD Project (1976)

In the above, the Food for Work Program financed by WFP (World Food Program) provides off time employment to the rural unemployed and also builds rural infrastructure. But the size of the project is so small that it can only provide employment to the unemployed for about 10 days.

In the following, the main programs are explained.

(1) Comilla approach

The basic approach to rural development currently in vogue is the Comilla approach developed in the 1960s. It has four components:

- a. Two-tier cooperatives - TCCA-KSS (now UCCA-KSS)
- b. Rural Works Program (RWP)
- c. Upazila Irrigation Plan (UIP)
- d. Upazila Training and Development Centers (UTDC)

The UCCA-KSS cooperative under the IRDP (presently BRDB) framework is the largest network of cooperative institutions in the country. It has to its credit the success of organizing farmers in the use of improved technology, inputs and credit.

In the background of development policies and strategies centering around growth and productivity, the Comilla cooperatives have adequate Governmental patronage and important roles to play. The cooperatives have developed around land and this has now been experienced as one of the basic limitations of the institution.

The annual allocation for the Rural Works Program is around TK 450 million. The allocation available for RWP is sufficient to provide employment to this labour force for about two days only in a year (assuming 250 working days in a year).

The programs provide temporary jobs to the low-income class but do not offer any scope for sustained or self employment in the present design resulting in continuous and absolute dependence of the low-income class on such programs. As the low-income class do not have access to the means of production, the long-term benefits of the physical infrastructure created out of these two programs go to those who have access to the means of production, further aggravating the relative position of the landless.

(2) Area development projects

The concept of planning for area development was first conceived in a comprehensive manner in the 1950s. As a formal project planning approach, however, it started in the late 70s with small projects for different locations.

This program of multi-sectoral development activities covers agriculture, irrigation, flood control. RWP, livestock, fisheries, health, education, family planning, etc. are undertaken through a single project.

BRDB provides the institutional support (UCCA-KSS) towards implementation of the production programs. Projects are mainly financed through external assistance.

The first project of this kind was the Rural Development Project (RD-1) which started in 1976-77 and continued up to 1982-83.

Serajganj Integrated Rural Development Program (SIRDP), the second area development project, was taken up in 1977-78. The project was scheduled to be completed by 1981-82 but is still continuing. The Asian Development Bank and UNICEF finance about 60% of the cost of the project.

Noakhali Integrated Rural Development Project (NIRDP), the third in the series, started in 1978-79. DANIDA finances about 90% of the total cost.

The main investments of the projects are on infrastructure, buildings and irrigated agriculture. For RD-1, it was 88%; for SIRDP, it has been 90%; and for NIRDP 65% (possibilities of irrigation being limited due to physical conditions). NIRDP, on the other hand, allocates 18% of its expenditure to social development (health, education and family planning). Production programs for the poor and landless are negligible and they are limited mainly to rural industries and pond fisheries.

(3) New IRD (Integrated Rural Development) projects

Two new projects namely South West Rural Development Project (SWRDP) and Intensive Rural Works Program (IRWP) have been take up. It is proposed that SWRDP should cover 44 Upazila in two districts namely Faridpur and Jessore, with programs like infrastructure development, irrigated agriculture, fisheries development, cooperatives (UCCA-KSS) and employment programs for the low-income class.

IRWP proposes to cover (as first phase) 40 Upazila in 8 districts and the programs are mainly development of infrastructure and drainage facilities. The project investment for SWRDP shows over 79% of investment for physical infrastructure work and irrigation, and 17% for overheads, transport, equipment, etc. Only 3% is for programs for the landless and low-income class on bee-keeping, pond fisheries, etc.

(4) Agricultural and rural credit programs

Credit programs for rural development can broadly be classified into two groups, one for the agricultural sector and the other for activities in the non-farm sector for the rural low income class. Credit in the agricultural sector is available from two sources; the institutional source, sponsored by the Government and refinanced by the Bangladesh Bank, and the non-institutional source or the age old private money lending source.

Normal program (NP) credit has increased from TK 830 million in 1977-78 to TK 3,550 million in 1981-82 and Special Agriculture Credit Program (SACP) credit from TK 620 million in 1977 to TK 840 million in 1980-81 but this came down to TK 680 million in 1981-82.

(5) Landless and small farmers credit project

In order to extend credit facilities to the landless and the low-income class, the by-passed group, a few credit projects have been developed in late 1970s. The credit agencies are, however, the same viz the BKB and the NCBs. They lend credit to the low-income groups organized under the projects. The projects are Grameen Bank Prokalpa, Swanirvar Credit Project, Small Farmers Credit Projects, Rural Finance Experimental Project and Bangladesh-Swiss Agricultural Project.

1) Grameen Bank Prokalpa (GBP)

The GBP started in late 1979 to provide loans to the landless and low-income class organized under it. The project is in operation in 59 unions in five districts, namely, Dhaka, Tangail, Chittagong, Rangpur and Patuakhali. The bank branches offer loans to the groups without collaterals.

Any person whose family owns less than 0.4 acre of cultivable land and the value of all assets owned does not exceed the market value of one acre of land is eligible to take loans from GBP for income generating activities. A group is organized with five persons either men or women. The group observes principles of group meetings, discussions, deposits, or savings, etc.

The GBP offers credit to the group for investment in a wide range of activities in both farm and non-farm activities. Loan repayment is high. An amount of about TK 110 million had been disbursed in Feb. 1983 of which TK 70 million has been repaid. The default rate on over due loans is around one percent. The loan giving agencies, NCBs and BKB, get 100% refinance facility from the Bangladesh Bank out of the Bank's funds and IFAD's fund on a 50:50 basis at a concessional rate of 4.5% per annum only. At the borrowers' level the rate of interest is 13% per annum.

2) Swanirvar Credit Project

The project was started in 1978 for providing loans to low-income women groups for Dheki (paddy husking) projects in 10 Upazila in 10 districts. It has now been extended to 70 Upazila under 19 districts.

A target group is organized with members who own no more than 0.40 acre of land or whose yearly income does not exceed TK 6,000. There are separate groups for the men and the women and a group is organized with 5 members.

The project has covered 12,540 groups of men and women in 2,644 villages in 30 Upazila. The NCBs and BKB advance loans in the project areas. They had disbursed TK 36 million to the target groups (Dec. 1982) out of which

TK 17.4 million was realized. The recovery was nearly 95% of the amount due.

3) Small Farmers Credit Scheme (GOB-IFAD)

The project for financing small farmers in the three districts of Jessore, Kushtia and Faridpur was started from early 1980. The project has a credit target of TK 100 billion under the refinance scheme of Bangladesh Bank against foreign exchange receivable by the Government as per credit agreement signed between the GOB and the IFAD. Refinance is allowed for full amount of loan disbursement on back-to-back basis at 6% interest per annum. NCBs and BKB provide loans.

The target groups of the project are different from those of others. They include the small farmers cultivating no more than three acres either irrigated or non-irrigated area.

The main emphasis of the project is on short-term production credit. Some other activities like pond fisheries, livestock and poultry farming, small cottage industries, purchase of agricultural machineries, etc. are also financed. About 38,000 members of 572 unions have been covered under the project and credit of TK 56.4 million (Dec. 1982) has been made available in the project area. Lending is made at 13% interest.

4) Small Farmers and Landless Project (ASARRD)

The Ministry of Local Government has sponsored the project. The project was first started in 1976 as an Action-cum-Research Project at a cost of TK 3.5 million. This was the outcome of a workshop on Asian Survey on Agrarian Reform and Rural Development (ASARRD) held in 1975 on small farmers. The initial project area was 12 villages in three districts namely Mymensing, Bogra and Comilla. The Rural Development Academies of Comilla and Bogra and the Bangladesh Agriculture University, Mymensing conducted the experimentation. During this phase 230 groups of landless and low-income class had been given TK 8.0 million as supervised credit. The experimental project being over, the project has now been taken up to cover 200 villages in four districts (the new district being Rangpur) with a cost of TK 27.5 million.

For this project farmers who have one acre of land are regarded as small farmers and those who have no land excepting homesteads are regarded as landless. The groups are organized with 10-12 members. The groups are provided with bank credit to undertake income generating activities in different fields. They include cattle fattening, milk cow rearing, rice processing and petty trade. Janata Bank provides the credit support for the project.

In addition to the above economic functions, the groups have other programs like family planning and child care, literacy, health, education and sanitation. It has, however, been found that to meet their pressing needs for economic survival the groups are more interested in economic activities than the social programs listed above.

Total loans disbursed amounted to TK 16.7 million of which TK 13.4 million has been recovered (Dec. 1982). The loans were given to 346 groups of borrowers in 46 villages.

5) Rural Finance Experimental Project (RFEP)

The RFEP was started in 1978 under an agreement signed between the Government of the U.S.A. and the Government of Bangladesh. The project aimed at experimenting with different ways of delivering and recovering credit as well as mobilizing savings from the rural low income class. The project was completed in 1972.

The villagers who were landless or who owned cultivable lands up to two acres or whose annual income did not exceed TK 6,000 and who had no outstanding loan with other credit agencies fell within criteria for the target population for the project.

The project provided production credit through NCBs, BKB and the cooperatives under different models of credit and savings designed by the institutions themselves. Loans were given without collaterals at experimental interest rates varying from 12% to 36% per annum. Similarly, interest was offered on savings at different varying rates from 11% to 15% per annum.

Field operation of the project ended in August, 1982 after making loan disbursement of TK 136 million to over 43,000 families. Savings amounted to about TK 10.3 million.

About 64% of the loans were allowed for crop production and other agricultural activities and the rest for off-farm income generating activities. The average recovery of loans was over 81% of the amount due.

6) Bangladesh Swiss Agricultural Project (BASWAP)

Under an agreement between the GOB and the Swiss Confederation in April, 1976 a project for post-harvest technology, storage facilities and marketing credit to small and medium farmers' was undertaken. The project covered only 1,500 target group farmers in two unions of Dinajpur district. The yearly loan was TK 600 per member.

(6) Analysis and findings

On the basis of discussions and descriptions made above on the existing situation and programs for rural development, the following analysis and findings are presented.

- 1) The Rural Works Program (RWP) and the Food for Work Program (FFWP) have tried and are trying to achieve two objectives simultaneously; a) to provide employment to the rural low-income class during loan months and b) to develop rural infrastructure. The success in developing infrastructure has been encouraging but because of their limited size and volume, the magnitude of relief to the unemployed has been low compared with the need. Even so the programs have been able to prevent disastrous situations at times. However, the long-term benefits of the programs have gone mainly to those who have access to the means of production.
- 2) The Area Development Projects under IRDP have attempted designs for integrated development of selected areas but with emphasis on agricultural development with provision for development of physical infrastructure and little in practice for the rural low income class. The programs have run into time overruns due mainly to difficulties in coordination among the various implementing agencies at the field level. Inadequacy in programs for the rural low-income class and more emphasis on agricultural development have not been able to change the lot of the rural low-income class for the better. The projects together have covered only 14 Upazila in more than five years. At this rate it will take a long time to cover the entire country for which the country can ill afford to wait. The program components are too many and unmanageable.
- 3) The first two groups of projects, the RWP, the FFWP and the Area Development Projects have attempted to provide physical infrastructure and to increase agricultural production but in the process the share of income for the rural low-income class has gone down as against higher income for the richer section.
- 4) There has been little planned effort for employment and production programs for the rural low-income class. The few isolated programs taken so far suffer from organizational deficiencies and weakness in developing an integrated package program for production, training and skill inputs and credit, and finally marketing. In the absence of such an integrated package program, activities and income can hardly be sustained.
- 5) Agricultural credit through institutional sources, on the other hand, has financed a diverse field of activities in both farm and non-farm sectors. But credit has been available mostly to groups or individuals who could offer collaterals and have assets and sources to use credit. This channel can hardly benefit those who

are absolutely landless or too low in revenues to offer collaterals or who have little or no assets to engage or to invest.

- 6) Some small credit projects like GBP, Swanirvar Credit Project, RFEP and others, have, however, been designed to offer credit to the poor and thus build up work opportunities for them. The success is encouraging. The participants can choose their own activities rather than being imposed upon. Credit use is highly supervised and loan repayment is also high. This brings out the fact that the poorer groups are quick to repay when their incomes rise. Credit for these low income class are mostly on a project basis, coverage of the projects is small and production activities are based on available skills. An institutionalized program is necessary for these groups on a wide range of activities based on higher technology, skills, adequate inputs and other material supports.
- 7) Agricultural credit offered so far through institutional means accounts for less than 20% of the need. Credit for the rural low-income class, on the other hand, could reach less than 2 (two) % of the people needing it. In addition to institutional sources, NGOs, however, have offered some credit to the low-income class.
- 8) There has been absence of effective local level participation and management in local planning and plan implementation. With decentralization of the administration process, the need for establishment of local institutions representing different social/economic strata is keenly felt.
- 9) The above brings out the inadequacy and deficiency of the RD programs so far implemented and necessity for a change in the policy for formulating projects.

2.3 Third Five Year Plan (1985-90)

The Third Five Year Plan was launched in 1985 as a national development plan taking into consideration reviews of previous three national development plans.

Objectives of the Third Five Years Plan are quoted as follows:

Given the prevailing socio-economic conditions, the poverty alleviation goal will have to continue as the primary objective of Third Plan. But its sheer magnitude and complexity require also taking a long-term view. Further poverty, unemployment, rapid population growth, malnutrition, and illiteracy are so interactive that they all need to be addressed simultaneously in the national plan to establish their relative priority critically in a broader and longer term perspective taking into consideration resource constraints, institutional capability and cultural characteristics of the society.

The main goals of the Plan are:

- (1) Reduction of population growth,
- (2) Expansion of productive employment,
- (3) Universal primary education and human resource development,
- (4) Development of a technological base for bringing about long structural change,
- (5) Food self-sufficiency
- (6) Satisfaction of minimum basic needs of people,
- (7) Acceleration of economic growth, and
- (8) Promotion of self-reliance.

As the ultimate goal of planned development is alleviation of poverty and all planned objectives emanate directly and indirectly from the goal of planned development they cannot be viewed as mutually exclusive. The Third Plan has to ensure proper and concurrent emphasis on individual objectives; that is, a minimum achievement in each of the areas of objectives will need to be ensured in the Third Plan. The Second feature of the Third Plan lies in its strategies. It is to emphasize that the critical difference between plans (in a low-income country like Bangladesh) does not lie in their objectives but in the strategies they adopt to achieve the objectives. The plan size of TFYP is TK 386,000 million.

The TFYP presents more definite goals as below:

- (1) Population control : bring down the population growth from around 2.4% to 2.0% for the plan period and to 1.8% in the terminal year of the Plan.
- (2) Employment Strategies : create further employment opportunities in agriculture through accelerated diffusion of modern agricultural technology create employment opportunities in cottage and rural industries with emphasis on technological improvement.
- (3) Education : develop education by increasing expenditures.
- (4) Food, Nutrition and basic needs : increase output of food grains from 16.1 million tons in 1984/85 to 20.7 million tons in 1989/90 to provide foundation for welfare program like FFWP, etc.
- (5) GDP growth rate : 5.4%
- (6) Resource Mobilization : external resource inflow TK 210,280 million (54.5%)
domestic resource TK 175,720 million (45.5%)

Table 2.3.1 shows the sectoral allocation during TFYP (1985-90). From the Table 2.3.1, it is recognized that the biggest share is in Agriculture, Water Resources and Rural Development

(30%) followed by Energy and Natural Resources (16%), Industries and Minerals (15%) and Transport and Communication (12%).

It is clearly recognized also that the basic theme of all the four national development plans is alleviation of poverty so as to achieve the benefit of planned development for the largest number of the population living in the rural areas.

Rural Development in the Third Five Year Plan

The Third Five Year Plan set up the program for rural development with three components as follows:

- (1) Physical infrastructures development
 - 1) Construction of 1,400 miles of Feeder Roads and 70,000 running feet of bridges and culverts on them to connect Growth Centers with the road system.
 - 2) Development of at least one Rural Growth Center in each Upazila to a minimum specified standard as an integrated service center-cum-market for their respective areas.
 - 3) Provision of electricity to the Growth Centers. (This will be done by the Rural Electrification Board outside R.D. Projects).
- (2) Irrigated agriculture, drainage and minor flood control
 - 1) Extension of irrigation through minor irrigation programs and quick yielding EIP-type projects to an additional area of 0.6 million acres of the total cultivable land of the country. This will be in addition to the other projects on irrigation taken up beyond RD projects and will include micro level drainage, flood protection and irrigation projects.
 - 2) Provision of production inputs like fertilizer, seeds, etc.
 - 3) Provision of adequate credit to the farmers.
- (3) Production and employment program for the rural poor

Creation of employment and job opportunities and increase of income for the rural poor to prevent further decrease in living standards and to bring at least 10 percent of them above the poverty line. Production and employment programs will have a compulsory marketing component along with training and other input supply which will gradually be developed. Training of women for gainful employment through MSSs will be given special importance.

The financial outlay for rural development in the Third Five Year Plan is shown below with a breakdown into sub-sectors in the public sector.

Public Sector Allocations by Sub-sector
(At 1984/85 Prices)

(Unit: TK in million)

Sub-sector	Allocation
1. Food & Agriculture	14,100
2. Water Resources	27,030
3. Livestock Development	2,450
4. Fisheries Development	3,500
5. Forestry Development	3,920
6. Rural Development	19,600
Total	70,600

CHAPTER 3 PROJECT AREA

3.1 Natural Conditions

3.1.1 Location and topography

The Study Area consists of two Upazila, Daudkandi and Homna. It is at the west end of Comilla District in Chittagong Division. Comilla, the District headquarters, is at a distance of 166 km by railway and 88 km by road from Dhaka.

Daudkandi Upazila is at a distance of about 45 km from Dhaka. It lies between 23°25' and 23°39' north latitudes and between 90°39' and 90°53' east longitudes. The Upazila is bordered by Batakandi Nadi to the north and Meghna and Dhanagoda rivers in the west. The total area of the Upazila is about 375 km² including an area of 49 km² of rivers which is more than 13 percent of the total area.

Homna Upazila lies between 23°37' and 23°45' north latitudes and 90°38' and 90°53' east longitudes. The Upazila is bordered by Titas Nadi in the north and Meghna river in the west. The total area is about 179 km² out of which 16 km² is rivers.

Comilla District including the Study Area slopes down gradually from the foot of Tippera Hills (India) towards the west. The slope is so gradual that it does not create any radical change on the continuous flat surface of the land. Most of the Study Area is flat plain intersected by many rivers and creeks.

The relationship between acreage and ground elevation in the Study Area is shown below.

(Unit: sq.km)

Ground Elevation (m in PWD)	Daudkandi		Homna		Total	
	Area	Accumulation	Area	Accumulation	Area	Accumulation
above 5.0	6 (1.6)	6 (1.6)	5 (2.8)	5 (2.8)	11 (2.0)	11 (2.0)
5.0 - 4.0	61 (16.3)	67 (17.9)	43 (24.0)	48 (26.8)	104 (18.8)	115 (20.8)
4.0 - 3.0	164 (43.7)	231 (61.6)	71 (39.7)	119 (66.5)	235 (42.4)	350 (63.2)
3.0 - 2.0	95 (25.3)	326 (86.9)	44 (24.6)	163 (91.1)	139 (25.1)	489 (88.3)
below 2.0	49 (13.1)	375 (100.0)	16 (8.9)	179 (100.0)	65 (11.7)	554 (100.0)

Note: Parenthesized figures indicate the percentage.

Source: Computed from the Contour Map (S = 1/15,840)

This table shows that 98 percent of the total area is below 5 m and about 80 percent of the area is below 4 m. Figure 3.1.1 shows the topographic features of the Study Area. (Remarks: PWD = Public Work Department)

3.1.2 Meteorology

The country has four distinct seasons, the winter (Dec-Feb.), summer or pre-monsoon (Mar-May), monsoon (Jun-Sept) and autumn (Oct-Nov). The summer is the transitional period from the dry to the wet season, sometimes lasting for several months. In the monsoon season, the number of rainy days on average exceeds the number of dry days, and autumn is the transitional period from the wet to the dry season. In winter temperature and humidity are low.

The mean temperature ranges from 19.0°C in January to 28.6°C in May. The mean annual rainfall in Comilla is about 2,200 mm and more than one half of the annual rainfall occurs in the monsoon season. Cyclones occur in May and September-November. The meteorology of Comilla is shown in Figure 3.1.2.

3.1.3 Hydrology

Bangladesh occupies a large part of the delta formed by the Ganges, Brahmaputra and Meghna rivers through which drain the rainfall and melted snow of the Himalayas into the Bay of Bengal. The Meghna river lies on the western border of the Study Area and drains waters from the Indian states of Meghalaya and Tripura, which are among the most intensive rainfall areas in the world. The river is called the Meghna from the confluence of the Surma and Kushiya rivers, 140 km northeast of Dhaka with a drainage basin of 60,700 km² at Bhairab.

The second largest river in the Study Area is the Gumti river which rises in India and enters Bangladesh at Katak Bazar, a few kilometers east of Comilla town. This river crosses Daudkandi Upazila from east to west and flows into the Meghna river just north of Daudkandi. The catchment area at the border between Bangladesh and India is approximately 2,150 km². The drainage area remains virtually unchanged between the border and Muradnagar, about 13 km upstream of the eastern border of the Study Area, as the river is embanked at both sides. In the Study Area the river is tidal, with maximum variations at Daudkandi of about 0.6 m in the dry season. The average river bed slope in the lower reaches of the river (the Study Area) is about 12 cm per km.

Floods submerge large parts of the Study Area every year. Normally the inundation occurs between June and October. As shown in Figure 3.1.3, more than 50 percent of the Study Area is inundated more than four and a half months (mid July to October) and 20 percent of the lower area is inundated for six months (mid May to Mid November) in average years.

The peak flood water level from the 10 day averages between 1960 and 1988 at Daudkandi station is 5.08 m (PWD) which occurs in August. The maximum peak flood level occurred in

September, 1988 which submerged about 84 percent of the national territory and nearly all of the Study Area. The peak flood water level in 1988 was 6.27 m (PWD). The variation of mean water level in the Meghna river from 1960 to 1988 and water level in 1988 at Daudkandi are shown in Figure 3.1.4.

3.1.4 Geology

Most of Bangladesh comprises a gently sloping surface formed by recent delta and alluvial plains of the Ganges, Brahmaputra and Meghna rivers. Bangladesh is covered almost completely by Quaternary sediments deposited less than 2.4 million years ago, but early Tertiary sediments occur along the northern border and in the late Tertiary sequence in the eastern folded belt.

The soil type in the Study Area is classified as Calcareous Dark Grey Floodplain Soils. These are seasonally flooded soils with a cambic B horizon which either is dominantly dark grey or has prominent dark grey gleyans or pressure faces and is calcareous within 125 cm from surface. Many basin soils have a neutral to acid topsoil and a near-neutral subsoil over a calcareous substratum at 40-60 cm (Land Resources Appraisal of Bangladesh for Agricultural Development, UNDP/FAO).

3.1.5 Groundwater

Groundwater is fundamental to the water resources of Bangladesh mainly both as drinking water and as irrigation water, and there is still a high potential for the groundwater development. However, according to the results concluded by BWDB, the Study Area is moderate to poor for further development for deep or shallow tubewell because of water quality and capacity of recharge.

3.1.6 Soil

The Calcareous Dark Grey Floodplain Soils types in the Project Area have been divided into two great group soils, i.e. Grey Floodplain soils and Noncalcareous Dark Grey Floodplain soils. According to the crop suitability classification, soils in the Study Area are suitable for both Aus and Aman paddy cultivation, and suitability for Boro is increased by the practice of irrigation.

3.2 Social Conditions

3.2.1 Population

According to the 1981 census, the population in the Study Area was 613,963 and the population density was 1,108 persons/km², 1.8 times higher than the national average. The number of households was 107,000 and family size per household was 5.7.

It is assumed, based on the 1981 census, that the population in 1999 in the Study Area will be 913,000 by applying the growth rates of 2.6% to the period of 1981 to 1988 and 2.0% to the period of 1989 to 1999. This population is 1.5 times higher than that of 1981 and the corresponding population density would become 1,648 persons/km². It is noted that the age groups below 14 years old occupy 46.6% of the total population.

Population

Item	Daudkandi	Homna	Total
Total population	414,860	199,103	613,963
Male	207,715	100,676	308,391
Female	207,145	98,427	305,572
Sex ratio	100	102	101
Households (units)	69,800	37,360	107,169
Persons per family	5.94	5.33	5.73
Population density (persons/km ²)	1,106	1,112	1,108

Population Growth

Item	Daudkandi	Homna	Total
Population in 1961	259,418	137,749	397,167
Population in 1974	346,196	169,263	515,459
Population in 1981	414,860	199,103	613,963
Estimated population in 1988	497,000	238,000	735,000
Estimated population in 1999	617,000	296,000	913,000
Annual growth rate (%)			
1961 - 74	2.2	1.6	2.0
1974 - 81	2.6	2.3	2.5
1974 - 81	2.4	1.9	2.2
1981 - 88	2.6	2.6	2.6
1989 - 99	2.0	2.0	2.0

Population by Age (1981)

(Unit: %)

Age Group	Male	Female	Total
0 - 4	16.6	17.4	17.0
5 - 9	16.0	16.5	16.2
10 - 14	13.2	12.9	13.4
15 - 24	16.4	17.4	17.1
25 - 34	12.8	18.4	13.2
35 - 44	9.5	9.1	9.3
45 - 59	8.7	7.7	8.2
60	6.1	5.1	5.6

Source : Bangladesh Population Census in 1981

3.2.2 Employment

Following figures show the present situation of employment for the labour force above 10 years old in the Study Area. Ratio of the employed is 79.5%, while that of the unemployed is 20.5%.

Item	Daudkandi	Homna	Total
Total Population	414,860	199,103	613,963
Active Population	269,421	130,051	399,472
Unemployment	57,653	24,417	82,070
(%)	(21.4)	(18.8)	(20.5)
Employed	211,768	105,634	317,402
(%)	(78.6)	(81.2)	(79.5)
Household	109,687	50,119	159,806
Cultivation	71,295	31,758	103,053
Manufacturing	2,116	1,321	3,437
Business	13,181	8,345	21,526
Others	15,489	14,091	29,580

Source: BBS File Service Comilla, 1989

From the above figures, the figure for "household employment" indicates underemployment of more than half of the employment figure. This type of employment which consists of jobs at home, including work in the kitchen garden, cottage industries, etc. is characteristic of the social structure in this country.

Also, according to the Labour Force Survey of 1983-84, the average figure of approximately six members per family is mentioned. This shows the crucial importance of family income to the economic situation of the whole family.

Other industries such as manufacturing, business, fishery, etc. are still at a small scale and cannot offer a significant number of job-opportunities. On this account the Study Area, as in the other parts of Bangladesh, faces the difficult joint problems of unemployment and underemployment.

3.3 Production Sectors

3.3.1 Agriculture

(1) Land use

In Bangladesh, factors such as hydrology, seasonal distribution of rainfall and soil characteristics largely determine land use including types of crops to be grown and the intensity of land use. The dominant factor in the Study Area is hydrological conditions which create five land types defined on the basis of flood depth as follows:

Land Type			Flood Depth
1.	Hill/Highland	(F0) ;	less than 0.3 m
2.	Medium Highland	(F1) ;	0.3 to 0.9 m
3.	Medium Lowland	(F2) ;	0.9 to 1.8 m
4.	Lowland	(F3) ;	more than 1.8 m
5.	Flooded land	(F4) ;	always submerged

Suitable rice for cultivation in Medium Highland (F1) is T. Aman, while in Medium Lowland (F2) and Lowland (F3), B. Aman is considered suitable.

Land use in Bangladesh, which is largely effected by flood conditions during the monsoon, therefore defines the annual cropping system with following characteristics:

Single, double and triple cropping of rice depends on these conditions.

In the Study Area, agricultural lands are mainly of 2 kinds, single with triple cropped land and single with some double cropped land. In Homna, the figure for single cropped land is higher than double cropped land, approximately 50%, resulting in a low intensity of 157%. In Daudkandi, however, the figure for double cropped land is higher with an intensity of 179%.

The land use situation in the Study Area is shown in Table 3.3.1. This table shows figures collected in the 1981 census and estimated figures for the present situation.

As the population increases, areas for homestead and infrastructure will continue to increase to some extent, resulting in a decrease in agriculture land. In 1988, agricultural land covered approximately 78% of the total land area in the Study Area.

(2) Crop season

As in the other areas of the country, there are three crop seasons in the Study Area. The crop seasons may be characterized mainly by temperature, rainfall and flood condition. Crops suitable to these physical conditions are grown in each crop season as described below:

1) Rabi season (October to March)

The features of the physical conditions in the Rabi season are low temperature, especially during December to February, little rainfall with much sunshine and no flooding. Rabi crops are grown in areas of various land types under no flood condition.

Boro rice and many kinds of non-rice crops such as wheat, potato, oil seed, pulses, winter vegetables, etc. are grown in this season. Although the kinds of rabi crops are the largest of the three crop season, their productivities are rather

low because of insufficient water supply which depends on residual soil moisture from flood and little rainfall. Therefore, boro rice and some non-rice crops are irrigated for greater yield.

2) Kharif-I season (April to June)

In this season, the temperature goes up rapidly, rainfall is heaviest in the year and floods come in the latter half of the season. The start of flooding varies according to the elevation of the land. In later flood land, Aus rice, jute, oil seed and vegetables are grown as Kharif-I crops, while on low-lying land where the flood comes earlier, Kharif-I crops are not cultivated. Kinds and cropped areas of Kharif-I crops are less than those of Rabi crops.

Some crops such as chilli, sesame and some of vegetables are grown both in Rabi and Kharif-I. B. Aman is sown in this season, more than one month before flood comes.

3) Kharif-II season (July to September)

The temperature is still high in this season like the previous season, but rainfall decreases gradually and the flood water level becomes the highest in the year. B. Aman (deep water rice) which was sown in Kharif-I season continues to grow under deep flood water in low-lying lands. T. Aman intolerant to deep flood is cultivated in this season only in medium high lands. As there is no high land in the Study Area, no upland crops are grown in this season except in homestead areas.

(3) Cropping pattern

Multiple cropping is prevalent in the Study Area due to the small farm holdings and low productivity of crops. Patterns of multiple cropping depend on flood duration and flood depth owing to the difference of elevation in land type as shown in the table below.

In the medium high land (F1) where the flood duration is short and flooding is shallow, triple cropping of Rabi crop with some T. Aman and Aus and double cropping of Rabi crops with Kharif-I crops are the main cropping patterns. On the low land (F3) with long flood duration and deep flood depth by contrast, single cropping of B. Aman, mixed cropping of Aus and Aman and double cropping of Rabi crops with B. Aman are predominant. On the medium low land (F2) with medium flood duration and flood depth, double croppings of Rabi crops with Kharif-I crops and Rabi crops with B. Aman (or mixed Aus & Aman) are predominant.

	Daudkandi	Homna
Medium High Land (F1)	Wheat - T. Aus - T. Aman Potato - Jute - T. Aman Winter Veg. - Jute	Boro - B. Aus Winter Veg. - Jute Chilli - Jute
Medium Low Land (F2)	Wheat - B. Aman Potato - Jute - Fallow Mustard/Boro - Fallow Potato/Boro - Fallow Mustard/Wheat - Mixed Aus & Aman Potato/Sesame - B. Aman Chilli - B. Aman	Wheat - B. Aus Sweet Potato - Jute Mustard - B. Aman Boro - B. Aus
Low Land	Wheat - B. Aman Boro - B. Aman Fallow - B. Aman Fallow - Mixed Aus & Aman	Boro - B. Aman Fallow - B. Aman

(4) Crop cultivation

Table 4.2.2 and Table 4.2.3 show the cropped area, yield and production of major crops averaged from 1985/86 to 1987/88 in Daudkandi and Homna, respectively. As for paddy rice in Homna, the cropped percentage of B. Aman is higher than in Daudkandi and that of Boro is lower, while Aus (HYV) and T. Aman are not cultivated. Comparing non-rice crops in Homna with those in Daudkandi, the area under potatoes is much smaller, and pulses, irrigated wheat and oilseed (HYV) are not cultivated.

HYV of Boro is prevalent in both Upazila and HYV of potatoes in Daudkandi. The other crops are predominant in LV. LV of Aus is usually broadcast, but HYV of Aus is transplanted under irrigated condition. Modern varieties of Aus recently developed for broadcasting are not yet cultivated in the Study Area. There is no HYV in B. Aman. Jute cultivated in the Study Area is mostly *Corchorous capsularis* which is tolerant to submergence but inferior in quality. The share of high quality species (*C. olitorious*) is very small. Boro rice is the main irrigated crop but some wheat, potato, chilli and winter vegetables are also irrigated.

The highest yield of rice is produced by HYV of Boro, followed by HYV of T. Aman and T. Aus. The yield of LV rice is far lower than HYV and the yield ranking of LV is the same as HYV in Daudkandi but different in Homna. Crop yields in Homna are lower than that in Daudkandi except for LV of some crops. This may be attributable to inferior soil condition and less intensive cultural practices in Homna.

(5) Extension service

The extension service is basically performed under the program of DAE (Department of Agricultural Extension) of the Ministry of Agriculture.

This program has its base in Upazila Parishad for extending to the grass root at Union level with the formation of blocks for this purpose.

Under this program, at Upazila level UAO (Upazila Agricultural Officer) and SMO (Subject Matter Officer) are responsible for implementing this program to BS (Block Supervisor) for transferring techniques to CF (Contact Farmer) for extending to NCF (Non-Contact-Farmer) at union level.

The Training & Visit (T&V) System for extension service which is widely applied in the north-west region of Great Rashjahi and Kotbari in Comilla District is not very familiar in the Study Area where some demonstration plots can be seen here and there, especially in Daudkandi.

This is due to the very insufficient agricultural inputs such as finance, materials, technical manpower, etc. for this program.

BRDB (Bangladesh Rural Development Board) under the Ministry of LGRD & Cooperatives has also conducted the program of cooperatives of Comilla model for financially supporting specific programs such as irrigation facilities for up-grading production techniques for higher productivity. These programs, however, are mainly aimed at the formation of cooperatives or the introduction of specific agricultural inputs such as irrigation pumps.

From this background, in order to improve the present situation of small scaled agriculture, the extension service with techniques for higher production including proper provision of finance, materials and technical manpower are basically considered to be very urgent needs.

3.3.2 Livestock

As shown in the following table, the situation of livestock development in the Study Area is only on a small scale due to chronic floods.

Also, almost all areas (more than 80 percent) in these two Upazila are used for crop fields and there are no areas for sizeable pastures for animals.

From the present condition of agricultural inputs in the Study Area and the advantages of an organic agriculture, proper livestock development combined with an adequate agricultural development is considered to be profitable in this situation.

Data on the livestock situation in the Study Area from the 1981 census is shown in Table 3.3.2.

From these data, more than 80 percent of livestock are located in farm holding households, in which large farms have a tendency to possess a higher number of animals than small and medium farms.

Homna shows the higher average number per household for cattle and poultry, but Daudkandi has the higher average number of goat and sheep per household.

Recent information on livestock from the two Upazila are as follows:

Item	Daudkandi	Homna	Total
Cattle	191,577	91,690	283,467
Goats and Sheep	92,543	37,922	130,467
Poultry	394,120	197,875	591,995

In comparison with data of 83-84, there are increases in numbers of cattle and goat-sheep but a significant decrease in poultry, probably as a result of the last flood.

Officers in the two Upazila Livestock Offices have pointed to the lack of funds for promoting raising poultry which is considered as a side-job in household-employment and for improved nutrition in daily meals.

Small animals (poultry, etc.) are not covered in the activities of Upazila Livestock Offices whose main recent work has been supporting the A.I. (Artificial Insemination) Center for cattle (two Taka per each A.I. implementation).

3.3.3 Forestry

The potentials for forestry in the Study Area is considered to be extremely limited due to its low-lying land and more than 80 percent of the area being paddy fields.

In Upazila Statistics of Bangladesh 1988, no figures are given for forest areas in the two Upazila of the Study Area.

From this background, wood materials used as home fuel and construction materials are reportedly insufficient.

From the natural conditions of these two Upazila, there would seem to be a need to develop forestry such as mangroves on the waterstreams, and planting trees along feeders and rural roads.

3.3.4 Inland fishery

(1) Existing conditions

Considering the natural conditions of the Study Area, fisheries could be expected to be an important income resource next to crop cultivation for both Upazila of Daudkandi and Homna, which are located by the large water bodies of the Meghna river, Kathalia river and

Titus river. There are also many sizable ponds available in the area which need to be properly used for developing fishery resources.

Varieties of fish culture are as follows:

a) Pond fishery

Carp, Catla, Rui, Mrigal, Calbaush, Silver carp, Grass carp, Mirror carp, Shrimp

b) Open water fishery

Hilsa, Cattle fish, Carp, Shrimp

Despite of the favorable natural conditions, fisheries are not well operated in comparison with the endowed conditions.

Table 3.3.3 shows existing fisheries conditions in both Upazila. From this table, it is found that there are only 3,066 professional fishermen supporting 15,004 family members by their incomes mainly from riverine fisheries. Furthermore, only 30% of ponds are used for fish nurseries.

(2) Major constraints

The main constraints are as follows:

1) Pond fisheries

- a) 95% of ponds are submerged during flood seasons. Fish fry will be purchased from a private fish company for release in ponds during March to May. After 3 or 4 months in the rainy season these ponds will be inundated by flooding and most of the fry will escape. This is the actual reason why pond fishing is not feasible and is not accepted by ponds owners.
- b) Most of the ponds are under multiple ownership. Due to internal conflicts, most of the ponds are being kept uncultivated.
- c) The source of fish stock, a primary need for fish culture, is far from the Study Area.
- d) The economic condition of most pond owners is poor and their investment capability is limited.
- e) Most of the pond owners do not have enough knowledge of modern technology in fish culture.

2) Open water fishery

- a) Unplanned fishing i.e., catching brood fishes, under sized fishes; etc.
- b) Over fishing, i.e., fishing done so abundantly that filling the gap of the existing crop becomes impossible.
- c) In open water, the fisheries resource is entirely natural. And due to unplanned and over fishing the grazing area of fishes is decreasing. Thus the total bulk of fishes is decreasing.
- d) The natural conditions of aquatic biology are also becoming harmful to fishes. The water depth is decreasing due to siltation and easy catching of fishes is decreasing due to installation of KATTA (made up of tree branches and water-hyacinth by which shrimps are being captured.) Recently it is being reported that polluted water due to agricultural chemicals and wastes of factories is decreasing fish resources.

3.3.5 Rural industry and cottage industry

(1) General

According to BRDB's strategy and employment program for the rural low income class, cottage and rural industries include the following:

Rural industry:

- a. Repair and maintenance of irrigation equipment, bicycles, tricycles, rickshaw vans, etc.
- b. Production of simple agricultural tools and machines
- c. Paddy husking
- d. Oil milling, etc.

Cottage industry:

- a. Weaving and printing
- b. Handicrafts
- c. Leather works
- d. Coil industry
- e. Cane and bamboo works
- f. Other depending on local potential

"Agro-industries" such as jute mills, rice mills, flour mills, sugarcane factories and other food processing industries as well as manure and pesticide industries are not included here. However, in the rural areas, there are many agro-industries which contribute to creating employment and which stimulate the rural economy.

(2) Rural and cottage industries in the Study Area

According to Upazila information, there are the following rural and cottage industries:

Rural industry:

In Daudkandi there are, 60 rice mills, 10 flour and oil mills, two jute mills but one is closed now. There are also four cold storages and 22 seed storages. In Homna, there is a hand loom factory, one bicycle repair factory, three saw mills, 45 rice and flour mills, three mustard oil mills, two printing presses and two ice cream factories.

Cottage industry:

In Daudkandi the main cottage industries are for bamboo and wood crafts as well cloth weaving, while in Homna, hand loom works are carried out in 20% of rural households, and bamboo crafts and cane processing works, manufacture of the parts of furniture and hand looms are there.

(3) Rural and cottage industry workers and production

With regard to introduction of rural and cottage industry, Homna Upazila seems to be more active and positive than Daudkandi, because there are plenty of people of rural low income class and landless farmers.

The workers who are engaged in rural industry and cottage industry are estimated at 20,000 in Daudkandi, and 15,900 in Homna. They are equivalent to 4.2% and 6.2% of all workers in the rural area.

As regards both industries production, Homna Upazila reported the following information for 1988:

	<u>Production in Value (TK)</u>	<u>%</u>
Rural industry	7,598,570	99.9
Cottage industry	6,300	0.1
Total	7,604,870	100.0

However, 7,598,570 Taka includes hand loom products produced in households. If this is transferred into cottage industry, the production of cottage industry in value would be greater than that of rural industry.

Anyhow, rural and cottage industries in Homna are significant in the sense that they can provide working opportunities outside the agricultural field.

(4) Future plan

As this project aims basically at the improvement of agriculture and fisheries, industries more related to farm products and fishing should be introduced to the area. And it is better to introduce labour intensive industries than factory industry to absorb more labour force.

The following rural industries might be introduced into the Study Area: 1) fish processing and cold storage for fish, 2) industry for fishing implements and fishing nets, 3) starch factory, 4) organic manure factory, 5) work shop center.

Furthermore, as regards oil mills and rice and flour mills existing in the Study Area, they should be increased or have expanded capacities.

3.4 Physical Infrastructures

3.4.1 Irrigation, drainage and minor flood control

A. Irrigation

The expansion of irrigated land will be one of the most important factors in sustaining growth in agricultural production especially the increasing use of high yielding varieties (HYVs), and there is a big potential for irrigation development in Bangladesh. Irrigation development in Bangladesh has proceeded since the 1950s in three main phases; surface water development by means of rented low lift pumps (LLPs), groundwater irrigation using deep tubewells (DTWs) and shallow tubewells (STWs).

In the Study Area, irrigation is being carried out by many farmers already using both traditional and modern irrigation methods. Normally, irrigation is practiced in the dry season (Dec.- Apr.) in the Study Area. The main constraint to irrigation development is the availability of water in the dry season though there are two water resources, surface water and groundwater. Gravity intake of water in the Study Area is not possible in the dry season for topographic reasons.

The irrigation methods which are being practiced in the Study Area are as follows:

1) Minor Irrigation Mode (Traditional method)

a. Dhoon

Dhoon is like a scoop in the shape of a boat made of wooden planks or the hollowed trunks of local trees. The design is simple and made by village carpenters. A scoop is attached to a cross beam with a counter

weight. This crossbeam rests on a support that acts as a fulcrum. The operator stands on a scaffolding made of bamboo from where he pulls the scoop down into the water. Lifting is assisted by the counterpoise beyond the fulcrum of the cross pole. The water is then discharged into the field as the scoop is raised. Dhoons normally irrigate 1.6 to 2 ha of Boro rice each.

b. Swing basket

The Swing basket is one of the simplest and most mobile irrigation techniques. Two men stand on either side of a water source holding ropes connected to a triangular shaped basket made of woven cane, plain sheet steel, or the flattened tin of a used container. In a rhythmic motion the basket is lowered into the water source, then by simultaneous pulling on the ropes the basket swings upward and at the moment of discharge a sharp tug on the rope connected to the bottom of the basket inverts it and discharges the water. Certain types of swing basket can be operated by one man where the lift does not exceed one meter. One swing basket can irrigate 1.5 ha of Boro rice.

2) Low Lift Pumps (LLP)

A small low-lift centrifugal pump of 15 to 30 HP with a nominal discharge capacity of 28 liters/sec (1 cusec) or 57 liters/sec (2 cusec) usually located on the bank of river, canal or water body, and discharging into an earthen channel or directly into a field. One LLP can typically irrigate about 16 ha (by 2 cusec).

3) Shallow Tubewell (STW)

A shallow tubewell (STW) uses a centrifugal pump, driven by a 5 HP diesel engine, located at the top of the well at the ground surface to lift groundwater by suction. The limited suction head of about seven meters restricts use of this mode to areas where the groundwater table does not drop below 7 m during the peak demand period. The delivery capacity of these diesel driven units averages about 14 liters/s with a typical command area of about 5 ha.

4) Deep Tubewell (DTW)

A deep tubewell (DTW) is a cased well, with the screen usually set at more than 25 m below surface and a 15-25 HP turbine pump set which is driven by a diesel engine or electric motor. DTW generally operate with a maximum pumping lift of 20 m, and a nominal discharge capacity of 57 liters/sec (2 cusec) with a typical command area of about 24 ha.

5) Hand Tubewell (HTW)

Hand tubewells have long been in use to lift groundwater for drinking. During recent years use of hand tubewells for irrigating small tracts of land have spread rapidly under the Manually Operated Shallow Tubewell Irrigation (MOSTI) program of the Bangladesh Rural Development Board (BRDB). This is a labour intensive mode using locally made pumps. The wells are shallow and drilled (jetted) by indigenous methods to about 20 m, with discharge capacities of 0.5 to 0.75 liters/sec and a suction limit of about 7 m. HTW can irrigate 0.2 to 0.25 ha of HYV rice.

Surface irrigation (Low Lift Pump, Traditional Methods, etc.) is carried out using water mainly from rivers and canals.

There are innumerable irrigation canals in the Study Area of which most were constructed by farmers. However, some canals are silted up and have less flow capacity due to lack of maintenance after sedimentation by floods. Landless farmers are cultivating the sedimented area and this also disturbs proper maintenance of the canals.

Present irrigation conditions in the Study Area under the above mentioned irrigation methods may summarized below:

Irrigation Method		Daudkandi	Homna	Total
Low Lift Pump	(No.)	455	76	531
	(ha)	7,154	707	7,861
	(ha/unit)	15.7	9.3	14.8
Deep Tubewell	(No.)	57	-	57
	(ha)	1,025	-	1,025
	(ha/unit)	18.0	-	18.0
Shallow Tubewell	(No.)	114	48	162
	(ha)	414	155	569
	(ha/unit)	3.6	3.2	3.5
Hand Tubewell	(No.)	764	2,750	3,514
	(ha)	195	356	551
	(ha/unit)	0.26	0.13	0.16
Others	(ha)	2,122	312	2,434
Total Area	(ha)	10,910	1,530	12,440

Source: Upazila Information, Feb. 1989

The total irrigated area in the Study Area is 12,440 ha and this is 28.7% of the net cultivated area (38.5% in Daudkandi Upazila and 10.2% in Homna Upazila). Percentages of irrigated area against the total area of each Upazila are 23.4% in Daudkandi and 6.8% in Homna. The percentage of Homna is very low compared with that of Daudkandi, though even that in Daudkandi is not high. The reason for less development of irrigation in Homna Upazila is assumed to be that the average ground elevation of Homna Upazila is higher than that of

Daudkandi Upazila, so higher lifts are required for irrigation. Besides which Homna is more isolated than Daudkandi for the development of industries including agriculture.

B. Drainage

The topographic features in the Study Area indicate a general slope toward the south and the west in the northern area and slope toward the west in the southern area of the Gumti river. Flood water is drained in these directions and finally flows into the Meghna river.

There are many drainage canals in the Study Area which are connected to the rivers. These have been constructed by farmers for acceleration of drainage of flooding into the rivers and prevention of water logging or ponding in the lower areas. Some drainage canals are also used as irrigation canals. Generally, and except for some canals maintenance work on the drainage canals in the Study Area is properly carried out by the farmers .

C. Flood Control

Though nearly all of the Study Area is inundated at the peak flood water period, there is no major flood control facility in the Study Area except for the road embankments. Inhabitants in the Study Area are trying to raise the road surface above the flood water level to ensure transportation in the flood season. Generally major roads have a higher elevation than others. Habitation areas are also raised to prevent flood damage. However, as the elevation is often not high enough the flood water sometimes overtops the road surface and habitation land.

3.4.2 Distribution facilities

(1) Growth centers

Growth Centers are rural business centers functioning as main facilities for distribution of materials, produce, goods, etc. in Upazila on the rural side, and especially the sale of local produce and distribution of industrial goods and imported items. The management of Growth Centers is carried out by the Upazila office which a management committee is chaired by the Upazila chairman. The centers' income will be applied to Upazila budget (70%), national taxes (5%) with 25% for management fees.

Daudkandi has five (5) such Growth Centers while Homna has three (3). Their activities are very animated but very inconvenient due to drains and inside passages are in inferior condition. There is also a significant lack of shop-roofs. In Homna there is no electricity.

The business in Growth Centers is carried out by shops owned by businessmen and people selling items such as rice, vegetables, cereals, etc. without shops.

The latter are composed of mostly poor landless people doing business by selling foodstuffs along road-sides.

There is a need to reserve business-places for these low-incomed landless people in the new system of Growth Centers.

A list of Growth Centers in the Study Area is given in Tables 3.4.1 and 3.4.2.

(2) Hat markets

In the Study Area, there are 27 Hat Markets in Daudkandi and 7 Hat Markets in Homna or 34 in total.

These Hat Markets play the role of small Growth Centers, supporting the life of inhabitants in the Study Area.

These Hat Markets combined with Growth Centers make a distribution network for supplying consumption goods and materials for production in the Study Area.

Management of these Hat Markets is carried out by Upazila parishad with a management committee chaired by the Upazila chairman.

Fish, meat, vegetables, and rice shops, etc. in these Hat Markets are also in poor conditions and requiring proper improvement.

(3) Godowns

The main godowns in the Study Area are food godowns, fertilizer godowns, seed storages and cold storages for potatoes and other agricultural produce.

Existing godowns may be summarized as follows:

Item	Capacity	Nos.	Location
Daudkandi Upazila			
Fertilizer godown	4,000	1	Daudkandi Growth Center
Food godown	1,000	1	Daudkandi Growth Center
Food godown	500	2	Daudkandi Growth Center
Food godown	250	2	Gouripur, Elliotgonj
Food godown	250	1	Batakandi
Cold storage (potato)	2,500-4,500	4	Daudkandi, Elliotgonj
Seed storage (paddy)	50-100	22	
Note: Cold storage are operated by private organizations.			
Homna Upazila			
Food godown	500	2	Homna Growth Center
Food godown	250	1	Dulapur
Food godown	250	1	Ramkrishnapur
Seed storage (paddy)	50	1	Homna H.Q.

The utilization of godowns has been observed very frequently.

In the two Upazila in the Study Area, foodgrain godowns have been used mainly for storage of rice and wheat brought from outside.

These food grains will be distributed to Hat Markets through the Growth Centers. Some construction works such as roads, etc. supported by some foreign sources, have been paid by wheat to workers.

According to the survey of 1988, the population in the Study Area was 735,000 inhabitants (Daudkandi: 497,000, Homna: 238,000). The annual of foodgrain requirement for this population would be 116,400 tons of rice. Present production in the Study Area is 66,600 tons or 57%, and the deficit has to be supplied from outside. The role of godowns will be very important for storage of foodgrains supplied from outside, especially for provision of foodstuffs during annual foods.

Another factor for this necessity is the population growth of 2.6% in the Study Area which requires the establishment of further godowns.

In Daudkandi, the cold storages are for potatoes produced in the Study Area. With this facility, potatoes have been exported to other countries, making a good business for the Study Area. From this background, the privatization of these cold storages is supported by the governmental policy.

In Homna, there is no cold storage. Consequently fresh foodstuffs are not available at all times during the year. There is a need to construct at least one (1) cold-storage. Due to the present poor economic conditions in Homna, the construction of a private cold storage is considered very difficult.

3.4.3 Feeders and rural roads

(1) Road system in Bangladesh

In Bangladesh the road system consists of 5 categories, namely National Highways, Regional Highways, District Roads, Feeder Roads and Rural Roads.

In the category of Feeder Roads there are two kinds, A and B. In the category of Rural Roads, however, there are three classes (1, 2 and 3).

Functions of the road system are as follows:

- National Highways : Communications between Dhaka Metropolitan and 4 Divisions
- District Roads/ Regional Highways : Communications between District Office and District Business Centers, connecting to National Highway(s)

- Feeders A (F.A) : Communications between Upazila Headquarters and National Highway(s)
- Feeders B (F.B) : Communications between Feeder(s) A/Upazila Headquarters and Growth Center(s)/Business Center(s)
- Rural 1 (R1) : Communications between Union Headquarters/Market(s) and Upazila Headquarters/Feeders
- Rural 2 (R2) : Communications between villages/farms with union parishad
- Rural 3 (R3) : other village roads

Standard structures of these road categories are determined by GOB.

Concerning the maintenance of roads, the Roads and Highways Department (RHD) is responsible for National Highways and Feeders A, while Feeders B and Rural Roads are the responsibility of LGEB and Upazila Parishad.

(2) Present situation of the road system

The present situation of roads in the Study Area is as follows: (refer to Figure 3.4.1)

Item	Daudkandi	Homna	Total
Paved Roads (km)	24.1	-	24.1
Partly Paved Roads (km)	9.7	-	9.7
Non-paved Roads (km)	558.4	310.6	869.0
Total (km)	592.2	310.6	902.8
Non-paved Ratio (%)	94.3	100.0	96.3
Road Density (km/km ²)	1.8	1.9	1.8

Source: BBS, Comilla District Statistics, 1983

Out of 903 km of road, about 260 km of major roads are planned to be improved by the Upazila parishad as shown below.

	Daudkandi			Homna			Total		
	No.	Distance (km)	Bridge	No.	Distance (km)	Bridge	No.	Distance (km)	Bridge
National Highways	1	18.5	5	-	-	-	1	18.5	5
Feeders A	1	13.3	14	1	5.0	9	1	18.3	23
Feeders B	2	19.5	7	2	16.6	10	4	36.1	17
Rural Roads	15	120.5	76	7	64.1	45	22	184.6	121
Total	19	171.8	102	10	85.7	64	28	257.5	166

According to 1983 statistics, road densities in Comilla District are as follows:

Daudkandi	:	1.8 km/km ²
Homna	:	1.9 km/km ²
Comilla	:	2.1 km/km ²
Bangladesh	:	1.2 km/km ²

The road network in the Study Area includes the National Highway Dhaka-Chittagong passing through Daudkandi. At Goripur, this National Highway is connected by a Feeder A directing to Homna in the North.

The National Highway and this Feeder A connect two Upazila parishads with Dhaka Metropolitan and District Office. They also connect to Chittagong, the industrial district and harbour for foreign trade.

The main road network in the Study Area centering on this National Highway and this Feeder A, consists of 17 roads (140 km) in Daudkandi and 9 roads (80.7 km) in Homna.

In the Study Area, due to annual floods, the water level of Meghna Gumiti River has risen, which requires the road surface to be made up 2-3 m higher than ground level.

In Daudkandi, in the 29 years period 1960-1988, there were 3 flood levels higher than 6 m. The water level of August 1988 flood in particular was 6.34 m (the highest in recent years), and caused damage to all roads and bridges in the area.

The national highway Dhaka-Chittagong crosses the Meghna and Meghna Gumti Rivers by two ferries at the entrance of Daudkandi. It takes approximately one hour for ferries to cross the two rivers. The Meghna bridge is under construction with grant aid from Japan to be completed in 1991 and Meghna Gumti bridge will be constructed in near future.

The Feeder A connects Homna to the National Highway, but its present condition, however, is so poor and with so much damage that only rickshaws can be used. As a result, the transportation of materials is mostly carried out by boat.

Furthermore, the damage to bridges and roads in the Study Area is so serious that the travel by cars is almost impossible. This is the result of annual floods, especially the last flood in 1988.

The road network in the Study Area should be urgently improved in order to provide the basic facilities for the development of the rural economy and the upgrading of people's living standards and welfare.

3.4.4 Electrification, tele-communications and water supply

A. Electrification

Electric power in the Study Area is supplied under the Upazila Electrification Program by the Comilla Rural Electrification Board-1 whose headquarters is located in Chandina Upazila.

The supply system is as follows:

Main line	132 KV and 230 KV
Secondary line	11 KV and 33K V
Power line	440 V
Domestic line	220 V

The main line was already established in both Upazila, Daudkandi and Homna, and a secondary line is under construction.

According to the electrification plan of this corporation, all parts in the Study Area will be covered by the electrification network by June 1992, except for the western part of Cataria.

Construction of tertiary lines depends on local needs. At present, 75% of areas in Daudkandi have been connected to the network but in Homna only the area of Upazila headquarters is connected.

House connections are carried out by this corporation upon request.

B. Tele-communications

Tele-communication facilities in the Study Area include post offices, telephone-boxes and telegram-boxes as shown in the following table.

Item	Daudkandi	Homna	Total
Post-Office (place)	37	14	51
Telephone Box (place)	2	1	3
Telegram Box (place)	2	1	3

With the economic development in future more facilities will be needed.

C. Drinking water system

The drinking water supply in the Study Area relies almost entirely on shallow wells with hand pumps. But, in remote villages even hand pumps are insufficient.

The sewerage system in the Study Area is very poor and contamination of drinking water is a very serious problem to local inhabitants.

Improvement of the drinking water supply is an urgent matter.

The drinking water supply to Upazila parishads, Growth Centers, Hat Markets, Schools, etc. should be made by deep tube wells and to village inhabitants by hand pumps.

D. High schools and colleges

In the Study Area, there are 31 high schools and two colleges in Daudkandi, and 12 high schools and one college in Homna.

These high schools need improvements to their buildings, drinking water supply and teaching materials.

3.5 Social Infrastructures

3.5.1 Administrative organization

The Study Area comprises two Upazila, Daudkandi and Homna, in District of Comilla, Chittagong Division. Since 1985, the Upazila (formerly Thana) has been the local government unit, covering all functions of government. Organization of Upazila Parishad is shown in Figure 3.5.1.

The sub-structure of the two Upazila is shown as follows:

Upazila	Union	Mauza	Villages
Daudkandi	22	273	476
Homna	10	97	200
Total	32	370	676

The union is the sub-unit of Upazila in the local governmental structure while mauzas and villages are traditional agglomerated units.

The present policy of democracy is to decentralize government down to Upazila of which the functional structure is called parishad.

The upazila chairman who is the head of this level of government is directly elected for a 5-year term, working with other upazila officers appointed by the central government.

The framework of rural development is organized by the Ministry of Local Government Development and Cooperatives at central level with two agencies, BRDB (Bangladesh Rural

Development Board) and LGEB (Local Government Engineering Bureau) of which local offices are in the upazila parishad.

Concerning allocations in annual budgets of both Daudkandi and Homna Upazila, data for the last 3 years (1986/87, 1987/88 and 1988/89) are given in Tables 3.5.1 and 3.5.2.

According to these data, the total budgets for both upazilas in 1986/87, 1987/88 and 1988/89 were TK 24.6 million, TK 18.6 million and TK 33.4 million respectively. In addition, the foreign assistance portion in the upazila budgets has been reportedly increased to 52% in 1986/87, 62% in 1987/88 and 90% in 1988/89, supported by WFP (World Food Program) of UN and CARE (an NGO agency) with provision of wheat and cash.

These programs are for the benefit of landless people in return for their labour in infrastructure repair.

A portion of wheat (3 kg), equivalent to TK 16.5 (5.5 TK/kg), is paid for one days labour per person.

3.5.2 Farmers' organization

(1) Comilla type of farmer's cooperatives

In 1957, Comilla academy was set up to promote rural development in Comilla district. At the same time Comilla type farmer's cooperatives were organized.

Comilla type farmer's cooperatives have aimed at multi-purpose activity for whole all farmers. Their ultimate objectives have been to increase agricultural production by diffusion of new technology through the farmer's cooperative organization, and to promote rural development programs. In 1960, a new Comilla type cooperative was set up in Kotbari Upazila and by 1965 they had spread over the whole of Comilla district.

Comilla type cooperatives are characterized by the two tier system: the primary cooperatives are at the village level with counterparts or unions at upazila level and called UCCAs. Their main activities at the farmers level are provision of new improved technology, agricultural inputs and credit, etc.

Comilla type cooperatives were started initially to assist all farmers and to help landless and petty farmers. However, the landless and petty farmers were discouraged because only large farmers were favoured by their activities.

Thus, the primary cooperatives were obliged to reorganize and now there are four kinds of cooperatives as follows:

KSS	Farmers' cooperatives
BSS	Landless' cooperatives

MBSS	Women's landless cooperatives
MSS	Women's cooperatives

The primary cooperative is operated under a managing committee consisting of six members elected by cooperative members.

Each enrolled member of the cooperative has to purchase stock and to pay an administration fee (2 Taka). Furthermore, the member should make a thrift deposit every week. The cooperatives at village level provide a farming loan facility to enrolled members. And the cooperative has responsibility for joint purchase of agricultural inputs and joint sale of the farm products. The cooperative can also set up projects for land consolidation of socio-economic development in the rural areas and organize group works.

A UCCA is located in each upazila. It is governed by a cooperative board consisting of a president and members. UCCA is operated by a managing committee comprising a chairman, vice-chairman and several managers. Each manager has own task. UCCA is supervised by BRDB. UCCA will organize, supervise and guide the primary cooperatives. Its main tasks are to train and educate the leaders and model farmers of village cooperatives. And it has responsibility for performing, financial transactions such as loans, credit dividends or interest payments and for providing agricultural inputs as well as for purchasing farm products from cooperatives.

(2) Farmer's cooperatives existing in the Study Area and their activities

KSS, BSS and BMSS have been organized in the Study Area, but no MSS as yet .

Table 3.5.3 illustrates the number of primary cooperatives, number of enrolled members, amount of deposits and credit in both upazilas, Daudkandi and Homna.

Daudkandi has 470 villages, but the number of registered KSSs is 410, while Homna has 200 villages and 221 registered KSSs. On the other hand, BSS accounts for 11% of the villages in Daudkandi and 35.5% in Homna. And MBSS numbers covered 4.7% of villages in Daudkandi, and 8% in Homna.

With regard to the enrolled member per cooperative, Daudkandi has 35 persons for KSS, 41 persons for BSS and 41 persons for BMSS while Homna has 56, 44 and 35 persons, respectively.

The amount of deposits is high in KSS followed by BSS and MBSS, which is generally proportional to the number of cooperatives and their members.

As for the credit facility, the short-term credit is overwhelmingly used. The long-term loan and the credit from the rural poor fund are only one twentieth of the short-term credit.

Proportions of overdue loan against the loan balance are:

	Short-term Credit	Long-term Loan	Rural Poor Fund
Daudkandi	6.4	8.7	11.5
Homna	2.1	0.3	1.5

The interest rate of the cooperative credit is somewhat lower than that of ordinary credit. But the interest is quite a burden for farmers and landless farmers. And collaterals are needed for borrowing.

The credit facility is provided by UCCA. Short-term credit facilities are offered to BSS and MBSS on the breeding beef cattle, purchase of rickshaws, rice mills, small businesses, repair of machinery, fish culture, breeding of cows, oil extraction mills, weaving, rattan and bamboo craft, poultry raising, bee keeping, fish-net making, carpentry, duck raising, tailoring and vegetable culture.

(3) Problems of cooperative activities

The Comilla type cooperative movement has built up four kinds of primary cooperative at the village level: KSS, BSS, MBSS and MSS. But the organization and activities of last three do not always proceeding smoothly. There are several reasons for this. For instance, in the case of BSS, if members are landless farmers and they may be of various occupations and class and living in scattered places. Therefore, BSS has difficulty in mutual understanding and lacks of initiative and leadership. KSS conducts its service activities with more emphasis on credit, deposits and training of members. And little attention has been paid to multipurpose activities of cooperatives such as the joint sale of produce, processing, storage, joint purchase of agricultural equipment. And also no attempt has been made for participation in overall rural development programs on a cooperative basis. These problems are caused by the fact that the cooperative has organizational weakness and that there is no full-time employee who is able to engage in operation of the cooperative.

Hence, the cooperatives in the Study Area urgently require a strengthening. Especially they need firm financial ground to facilitate various cooperative activities.

3.5.3 Rural credit

In Bangladesh, there were various types of rural credit in the early days, but a new credit system was introduced with the Comilla model since the 1960s.

Originally the credit program was mainly conducted by IRDP (Integrated Rural Development Program) but it was transferred to BRDB in 1975.

BRDB implements and controls the credit program through the cooperative organization.

BRDB provided credits with various subsidies at low interest rate mainly for purchase of irrigation equipment such as DTW, STW, LLP and later programs expanded for the landless or low-income people.

Also rural credit programs are undertaken by commercial banks other than BRDB and BBL but they require collateral.

In principle, there are two kinds of credit namely short-term loan (within one year) and mid-term loan (from two to six years). In the short-term loans, most purposes are for agricultural production inputs such as for fertilizer purchase, etc. The interest rate is 16% per annum in case of commercial banks with collateral of lands, and 19% through the cooperative system of UCCA-KSS/BSS/MBSS without collateral.

In case of purchase of irrigation pumps, however, the interest rate per annum through the cooperative system of UCCA-KSS/BSS/MBSS is only 16%.

But the penalty rate in case of overdue repayment is 22% for all kinds of loans whether short-term or mid-term and whether individual or group.

Besides, for special programs or projects of BRDB, lower interests of 14% for short-term loans and 12% for mid-term loans per annum have been offered to cooperative members through UCCA-KSS/BSS/MBSS.

Regarding credit, the realization of short-term loans and mid-term loans is 59% and 41%, respectively. This implies a higher percentage of short-term loans which is similar to the tendency for the whole country.

Approximately 76 percents of borrowers are landless people or small farmers holding less than 1.0 ha, whose share is 49% in terms of amount.

More than half the loans are categorized as small loans of below 3,000 Taka. These are mainly sought by landless people and small farmers.

3.5.4 Health and family planning

(1) Health

1) General

The Government health policy is aimed at achieving health for all by the year 2000. Since 85% of the population live in villages and as such providing health care to the rural areas has been given top priority. Health services infrastructures have accordingly been expanded down to upazila and union levels.

The country has at present 59 district hospitals, eight medical college hospitals, five post graduate institute hospitals and 22 specialized hospitals. There are also 397 upazila health complexes, 44 T.B. clinics and 35 urban dispensaries.

Following the adoption of the National Drug Policy in 1982 the country is now becoming self-sufficient in producing essential drugs.

The government has also committed itself to immunizing all children in Bangladesh by the year 1990.

As for sanitation, this subject is included in "Physical Planning Housing and Water Supply" in TFYP.

Rural water supply and sanitation programs will be promoted. The number of drinking water tubewells will be increased with greater emphasis on their repair and maintenance at local level. Use of water sealed pans in lavatories will be encouraged in rural areas along with their manufacture at district and upazila levels.

2) Study Area

Health

In every category, conditions of health care in the two upazilas are very poor compared with those of national level.

In particular, buildings and facilities of upazila health complexes (hospitals) and union Sub-Centers are quite inadequate both in quantity and quality.

It is recognized, however, a health officer was dispatched with some essential drugs in 1988 to each upazila which contributed much to the care of people who suffered from the flood.

Both upazilas requested the improvement of buildings of UHC and materials supply for health care and chemicals. In particular, an ambulance car and a jeep were strongly requested for improving the system of emergency-care.

Sanitation

In the Study Area, conditions of drinking water from hand-tubewells are not adequate either in quality or quantity. In particular, landless farmers get their water from hand-tubewells which belongs to neighboring farmers or from rivers and ponds.

As for conditions of sewage disposal, there are kacha latrines (holes in ground) under unhygienic conditions. Very few water sealed latrines and sanitary latrines flush toilets exist in public places such as upazila HQ, upazila Health Complex and schools.

Those poor facilities cause disease to people living in rural areas.

(2) Family planning

1) General Concepts

The Third Five Year Plan (1985-1990) aims at reducing the existing birth rate down to 1.8% by 1990. Extensive Family Planning Programs integrated with health services have been undertaken to achieve this target. A high powered National Council for Population Control (NCPC) headed by the President of the country has been constituted.

2) The Study Area

The population densities in the upazila of Daudkandi and Homna are rather higher than others upazilas in Comilla District. Therefore, the contraceptive practices should be aggressively promoted in the Study Area.

Some contraceptive methods are introduced and used by many eligible couples under the supervision of Health and Family Welfare Centers.

3.5.5 Education

(1) General concepts

The Government is keen to raise the rate of literacy and has accordingly put much emphasis on primary education. The country has at present 44,224 primary schools and a scheme has been launched to establish one primary school for every 2,000 people or 2 sq.km area. Highest priority for primary education has also been given in the on going Third Five Year Plan where 18.12% of the total allocation for education has been earmarked for this sector.

Primary education in Bangladesh requires five years of schooling after which comes secondary education requiring another five years. There are 9,857 secondary schools in the country providing secondary education. The new curricula and syllabi introduced since 1983 encourage technical and employment oriented education at the secondary level.

Colleges offering general education are 694 in number. The number of Technical Colleges and Vocational Institutes are 114, and 4,218 madrasha's provide Islamic education.

The country has seven Universities for higher education including one for Engineering and Ecology, one for Agriculture and another one for Islamic Education and Research. Two more universities will be set up in the country under the Third Five Year Plan. The country has also 8 medical colleges, one dental college, 15 colleges of nursing, an Institute of Post Graduate Medicine and Research and various specialized Medical Institutes.

Following table shows the literacy rate:

(Unit: percent)

Year	Total	Urban	Rural	Male	Female
1960	17.0	38.7	16.0	23.0	11.2
1981	19.0 ¹	35.0	17.0	26.0	13.2
1986	36.0 ²				

Note : ¹ : Literacy rate of 5 years old and over was estimated as 23.8.
² : Assumed figures (quoted from TFYP).

Source : TFYP (1985-1990)

(2) Study Area

Table 3.5.4 shows literacy rates for the age group 5 years and over and educational institution in the Study Area.

School attendance in the age group of 5-24 years is shown as follows:

(Unit: percent)

	Total	Male	Female	Remarks
Daudkandi	19.3	24.6	13.9	in 1981
Homna	15.4	20.4	10.2	in 1981

In the Study Area, facilities and equipment of primary and high schools are inadequate in terms of space, structures and materials such as desks, chairs and others. In particular, they are often closed during flood time due to inadequate access.

3.6 Agro-Economy

3.6.1 Land tenure

Based on 1983/84 Census data, Bangladesh has approximately 9,038,000 ha of owned land in which 8,062,000 ha (89.2%) is cultivated for agricultural crops and only 386,000 ha are used as homesteads. Therefore, land utilization for agriculture is very high in this country.

In the Study Area, Daudkandi has 32,600 ha and Homna has 15,000 ha of land holdings. Out of these, the cultivated land and homesteads are 88.6% and 3.5% in Daudkandi and 89.8% and 4.1% in Homna, respectively (see Table 3.6.1).

(1) Tenure status

Land tenure status in Bangladesh is classified into four types: owner-cultivator, owner-manager, owner cum tenant, and tenant.

Based on the land occupancy survey of Rural Bangladesh in 1977, owner-managers occupied the largest number and the largest operated land area. The next was the owner cum tenant while pure tenants were the least numbers and had the smallest operated land area.

Land Tenure Status in Bangladesh in 1977

Tenure Type	No. of Household (thousand)	Percent of Total (%)	Operating Land Area (thousand ha)			Percent of Total (%)
			Owned	Leased	Total	
Owner-cultivator	1,923.8	23.5	797.2	-	797.2	10.5
Owner-manager	3,082.0	37.7	3,309.4	-	3,309.4	43.5
Owner Cum Tenant	2,618.3	32.6	1,763.9	1,406.2	3,170.1	41.6
Tenant	559.5	6.2	-	334.5	334.5	4.4
Total	8,183.6	100.0	5,870.5	1,740.7	7,611.2	100.0

In the Study Area, 43.5% of land tenure is owner-manager type, and 41.6% is owner-cum-tenant. In terms of ownership 77% is owned land and 23% is leased land. Therefore, it seems that most of the agricultural land is cultivated by the land owners themselves. However, land operated by owner-managers having 43.5% share of the whole was cultivated actually by landless farmers and/or agricultural labours. On the other hand, the small share of lease-holders told us that most land owners prepare to manage rather than to rent out own land by giving contracts for farming practices to landless and/or agricultural labour households, because agricultural land is a significant factors of production in Bangladesh.

Regarding the land tenure status in the study area, a sampling survey conducted in the late 1988, indicated as follows:

Percentages of Farmer's Number of Land Ownership to Total

(Unit: %)

	Owner-cultivator*	Owner cum Tenant	Pure Tenant	Total
Daudkandi	60	33.9	6.1	100
Homna	76	21.3	2.7	100

Note: * Include owner-manager

Above data shows that the tenure status in Daudkandi is close to the national average, whereas in the case of Homna it is inclined rather to the owner-cultivator type.

The following table shows the share of owned and leased land in the Study Area.

(Unit: %)

	Owned	Leased	Total
Daudkandi	85.9	14.1	100.0
Homna	83.1	16.9	100.0

From above data it can be recognized that many land owners prepare to undertake their own land operations to renting out the land.

(2) Existing tenure custom

The leases relating to farm land in the Study Area retain the traditional share crop system.

In this system, the land owner and tenant in principle share equally the crops harvested on the operated land. However, inputs costs required for cultivation have first to be deducted from the production amount. This is counted as one third of the production amount which the land owner generally has to bear. Thus, the pure tenant only receives one third of amounts harvested.

In view of above land tenure system, the necessity for land reformation has been advocated for a long time.

In July 1982, the Government set up a Land Reform Committee, to identify the problems and constraints of the existing land system in realizing the optimum potential of the land to suggest reform measures in relation to ownership, management and utilization of land for increasing productivity and facilitating equitable distribution of wealth and income in the country. The Land Reforms Committee presented their report in January, 1983, and submitted detailed recommendations to the Government.

However, land reform measures have not been properly implemented in the Study Area. With the evaluation of land inheritance, fragmentation and scattering problems in land tenure status arise in the Study Area. This would be the same situation in the whole country, inquiring further studies for a proper solution.

(3) Land distribution

Census data indicate that the number of farm households in Bangladesh were about 10 million in total in which 70.6% of them were small farm households, 25% were middle size of farm households and 5% were large farm households. As compared with 1977 land distribution seems to have become non involved. The share of small farm households has become greater, being accompanied by a shrinkage in farming unit size.

(Unit: %)

	Total	Small Scale 0.5-2.49acre	Middle Scale 2.5-7.49acre	Large Scale over7.5acre
1977	100	50	41	9
1983/84	100	70	25	5

In the rural area Bangladesh provides a sort of credit to farm household through Banks and UCCA. When a farmer receives credit, he has to take out a mortgage on his land. If he can not pay back the credit, the mortgaged land will be confiscated. Landless farmers and rural low-income class households show a tendency to increase.

Regarding the land distribution in the Study Area, 1983/84 census reports give the following:

(Unit: %)

	Total	Small Scale 0.5-2.49 acre	Middle Scale 2.5-7.49 acre	Large Scale over 7.5 acre
Comilla District	100.0	84.5	14.5	1.0
Daudkandi	100.0	84.4	14.6	0.9
Homna	100.0	84.5	14.0	1.5

In the Study Area the share of small farm households was nearby 85% in 1983/84. And it was in the same level as Comilla district. As compared with the national average, the share of small farm households is too high. Consequently, it is clear that the Study Area has an above average share of rural low-income class.

Finally, the numbers of landless farmers in the Study Area can be estimated.

Based on the BRDB's definition, landless farm households in the Study area were calculated as below:

No. of Landless Households Estimated

(Unit: 1,000)

	Non-farm Households		Farm Households		Rural Households		Percentage of Landless to Total Rural Households D/Cx100%
	Total (A)	No Land	Total (B)	Less than 0.2 ha (B)*	Total (A)+(B) = C	Landlessness (A)+(B)* = D	
Comilla Dist.	16.5	36	974	356	1,139	521	45.7
Daudkandi	13.9	7.1	55.6	15.1	69.5	29.0	44.2
Homna	8.4	3.5	26.3	8.2	34.7	16.6	47.8

Source: 1983/84 Agricultural Census

The above data show that, Comilla district has 521 thousand landless households, corresponding to 45.7% of all rural households. As compared with the national average (44.8%), is rather high.

Meanwhile Daudkandi and Homna have respectively 290 thousand and 166 thousand landless households. The ratio of these to all rural households are 44.2% and 47.8% respectively. Thus Homna Upazila seems to have rather more landless households than Daudkandi.

The following conclusions can be drawn from the above.

- a. In land distribution, the Study Area has rather significant amounts of landless and low-income households.
- b. Most of land owners prepare to operate their own land, employing landless or agricultural labour as cultivators, rather than having a few low-income tenant.
- c. Therefore, in this new model rural development project, the strategies and targets should take the actual land tenure status into consideration.
- d. In the Project, the rural low-income class i.e. small farm households should be distinguished from landless, middle, and large farm households, because they are farmers yet have plenty of surplus labour.

3.6.2 Marketing

(1) Rural marketing organization

In the rural area of Bangladesh, markets are opened on specified days and villagers go there to purchase necessities and to sell their farm products. The extremity organization of the rural market in Bangladesh is called the "Hat". A bazaar is opened at a crossed road area, or large empty area, once or twice a month, its scale being rather bigger than a "Hat".

The terminal organization of the rural market in Bangladesh is the Growth Center. This market is open permanently and is playing the role of intermediate trade. It is always located in a significant place like near a port, terminal main road and Upazila office, etc. And it includes not only wholesalers and retailers, but also financial organizations, a post office, storage, slaughterhouse, etc.

As such a marketing organization is the usual system in Bangladesh, the Study Area also has one. In Daudkandi, there are now five Growth Centers and 27 Hats, while in Homna there are three Growth Centers and seven Hats. There are no data, however, on the number of Bazaars.

(2) Marketing system for farm products

Agriculture in Bangladesh is still in the under development and self-sufficiency stage. Most farmers, except large and middle scale farm households, have not much surplus of farm products. A small surplus of minor crops such as potato, pulses, mustard and vegetables cultivated by small farm households for self-consumption are sent to Hats, Bazaars and/or Growth Centers from time to time in order to raise money. However, they are still unmarketable. Consequently, agricultural marketing in the Study Area virtually stagnant.

Large and middle farm households, however, have plenty of surplus of production. They trade their own surplus through such a marketing channel as Middleman → Wholesaler → Retailer.

According to Upazila information, minor crops cultivated for the purpose of commercialization in the Study Area are potato, jute, pulses, chilli, oilseed of Rabi crops, but fruit and vegetables except water melon are not commercialized yet.

In Bangladesh, complete marketing systems provide channels only for rice and jute.

Figures 3.6.1 and 3.6.2, illustrate these two channels. The rice marketing channel has two different routes: the free marketing route, and the government regulated route.

In the former case, there are three activity stages, that is primary, secondary and terminal. At the primary stage, merchants and brokers or middle men purchase paddy from farmers and at the secondary stage the wholesalers treat the paddy. Rice millers are also concerned in paddy marketing.

In the latter case, the Ministry of Food arranges a campaign for paddy collection in the rice bowl area every harvesting season. Then not only paddy growers but also middle men, and rice millers can joint in the marketing. The paddy collected by the government is then stored after milling by a contract miller until sold to consumers through ration shops which have governmental cards or licenses.

Jute seems to be more simple than paddy and has only one marketing route. However, organizations such as BJC, BJMC, PEC, etc., also collect jute material, process it and export it overseas. Of course, only a few per cent of the jute production are consumed in the country.

The marketing channel for minor crops trading throughout the country is as follows:

Producer (grower) → middle men → Agent or wholesaler → Retailer or process
→ Consumers.

It is very strange that farmer's cooperatives do not participate in this or concern themselves in agricultural marketing activities at any stage.

(3) Marketing system for agricultural inputs

In rural areas of Bangladesh, the marketing of agricultural inputs is unexpectedly active. Farmers, especially large and middle farmers want to irrigate, supply fertilizer, control weeds, pest and diseases and are very interested in introduction of HYV.

Formerly, agricultural inputs (fertilizer, chemicals, irrigation and drainage equipment agricultural machinery and crop seeds, etc.) were delivered to the farmers through BADC and its office in Upazila and through farmer's cooperatives.

However, now BRDB has organized a new marketing system for agricultural inputs on the base of deep tube well. Every farmer can now purchase directly modern inputs like chemical fertilizer and pesticides, minor irrigation equipment and improved seeds, etc. from a merchant. Thus in the marketing for agricultural inputs, UCCA and farmer's cooperatives play no role as the supporting body for farmer's benefits.

(4) Marketing prices, distribution charges and marketing measures

Under the TFYP Government policies regarding market prices for agricultural outputs and inputs will directly promote efficient use of scarce resources to accelerate crop output. Table 3.6.2 shows the marketing prices for agricultural commodities by stage in the Study Area.

Regarding the prices at farm gate, Homna has rather higher prices than Daudkandi. This is caused, perhaps, by the bad agricultural conditions and small surplus. However, the distribution charges are almost the same.

In the Table 3.6.2 the main marketing measures working in the Study Area and their transportation fees shown. Even though the measures and the fees in each Upazila differ from each other, they are still poor and traditional. The rickshaw, boat, van car, pulling car, are the main measures. Along with the progress of agricultural production, marketing measures in the Study Area should be promoted for modernization.

In conclusion it is pointed out that the marketing and trading system in agricultural products and inputs are still under developed. This is caused mainly by the inadequate surplus in agricultural products. On the other hand the marketing organization, and marketing measures are themselves inadequate due to the rural road constraints and undeveloped transport equipment. Furthermore the farmer's cooperatives do not support and promote rural marketing activities.

3.6.3 Farm income

Bangladesh's per capita income is only US\$133 and income in rural area is even lower. Due to rural poverty more than 80% of rural residents have less than 2,100 calories intake, and more than a half of them cannot meet the basic needs of living. This comes from the density

of the population, lots of petty farmers and mainly low agricultural income due to low productivity. In addition they have no employment opportunities outside agriculture.

(1) Agricultural income and productivity

Agricultural income depends on receipts from agricultural products and productivity.

Table 3.6.3 shows the yield, production cost and net return of major agricultural crops in the whole country during recent three years. It indicates that Boro and T. Aman of paddy and wheat have rather high yields and same net return but Aus and jute are not such profitable crops in Bangladesh. The problem is that their yields and returns are unstable every year.

In the Study Area the paddy yield is lower than the national level, accordingly, returns are also lower than the national level. In particular, the returns of Aus and Aman in Daudkandi were negative and Boro's return in Homna was also negative in 1988.

Wheat in the Study Area has rather good yield and its return was positive. However, jute in Homna was not profitable. On the other hand vegetables in the Study Area seem to have very high level of return, but potato and chilli were not so profitable.

(2) Receipts and outlays of rural households

Based on the sampling survey carried out in 1988, the income sources of rural households in the Study Area were as follows:

(Unit: %)

	Agri-Culture	Fishery	Rural and Cottage Industry	Business	Daily Labour	Service	Others	Total
Daudkandi	71.4	2.7	2.3	-	17.7	4.1	1.8	100.0
Homna	62.4	5.0	4.9	3.0	18.8	4.0	2.0	100.0
Average	68.5	3.4	3.1	0.9	18.1	4.0	1.9	100.0

The most important income source of the households of course was agriculture in both Upazila, but daily labour is also a rather significant income source in the area.

Each Upazila has own character in regard to income sources. Thus Homna depends on more non-agricultural income source than Daudkandi. The rural households in Homna have a larger share of income from fishery, rural and cottage industry, business and daily labour than Daudkandi.

When planning a rural development project, the existing actual income sources of the households in the area should be taken into consideration.

During on income sources of households three kinds of rural households can be distinguished: namely agricultural households, fishery households and daily labour

households. Their character can be analyzed with their income outlay and labour force, etc. as follows:

a. Agricultural households

The Balance of Income and Outlay

Per Household

	Member of Family	Member of Force	Holdings (ha)	Household Income (Taka)	Agricultural Income (Taka)	Household Outlay (Taka)	Agricultural Income per Ha (Taka)	Per Capita Income (Taka)	Per Capita Outlay (Taka)
Daudkandi	7.8	3.5	1.6	50,566	31,187	35,470	19,492	6,482	4,547
Homna	7.3	3.0	1.7	31,184	15,908	29,908	9,358	4,545	4,097

While of the scale of family, labour force, and holdings are almost the same in both Upazila, household income, agriculture income and household outlay differ much. Agricultural households in Daudkandi seems to be more efficient than Homna due to high agricultural productivity.

Agricultural income of agricultural household by scale of holding are shown in the table below.

(Unit: TK)

Item	Less than 1 ha	1 - 3 ha	3 - 5 ha	5 ha and over
Daudkandi	16,448 (100)	27,883 (170)	61,238 (372)	161,223 (980)
Homna	12,550 (100)	18,497 (147)	46,331 (369)	-

Agricultural income of households in the Study area, and specially in Daudkandi Upazila thus increase with holding scale.

b. Fishery household

The income and outlay of the fishery households in the Study area are shown in the table below:

	Family Member (person)	Labour Force (person)	Income of Household (Taka)	Outlay of Household (Taka)	Per Capita Income (Taka)	Per Capita Outlay (Taka)
Daudkandi	9.5	5.0	95,117	63,590	10,012	6,693
Homna	5.8	1.8	41,570	19,764	7,167	3,407

Above data indicates that household income per capita of fishery households in the Study area is larger than agricultural households. Therefore fishing industry in the Study Area might be more beneficial than agriculture due to higher productivity.

c. Daily labour household

The income and outlay of daily labour households are indicated in the following statistics.

	Family Member (person)	Labour Force (person)	Income of Household (Taka)	Outlay of Household (Taka)	Income per Labour Force (Taka)	Per Capita	
						Income (Taka)	Outlay (Taka)
Daudkandi	6.1	1.8	9,678	23,352	5,377	1,586	3,828
Homna	5.9	2.2	10,941	19,829	4,973	1,854	3,361

Daily labour households in the Study Area have small families and labour forces. Thus household composition also is rather small. Nevertheless, they have a very low household income and outlay. Their household income in Daudkandi was less than 10 thousand TK in a year and it was only TK 1,586 (US\$50) per head of family equivalent to 38% of average national level. In Homna Upazila it was TK 1,854 (US\$58) and equivalent to 45% of national level. Even though the household outlay has also the lowest level in whole country, their income could not cover the outlay. Consequently, daily labourers are always obliged to rely on aid or debt always.

(3) Household income, and outlay of the landless

Landless farmer's income survey carried out by project team in March of 1989 reveals the following information:

Landless farmers in the Study Area mostly depend on such income sources as:

- Daudkandi : Agricultural labour
 Fishery
 Boat Operator
 Rickshaw
 Cottage industry
 Business trade
- Homna : Agricultural labour
 Fishery
 Cottage industry
 Daily labour