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**MINISTRY OF LOCAL GOVERNMENT
RURAL DEVELOPMENT AND CO-OPERATIVES**

**RURAL ROADS STUDY
(US AID GRANT 388-0031)**

VOLUME III

**PHASE I REPORT
DISTRICT PROFILE : PATUAKHALI
JULY 1978
DRAFT**

**LOUIS BERGER INTERNATIONAL INC.
EAST ORANGE, NEW JERSEY**

**RAHMAN & ASSOCIATES LTD.
DACCA**

GOVERNMENT
OF
THE PEOPLE'S REPUBLIC OF BANGLADESH

MINISTRY OF LOCAL GOVERNMENT
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VOLUME III : PATUAKHALI

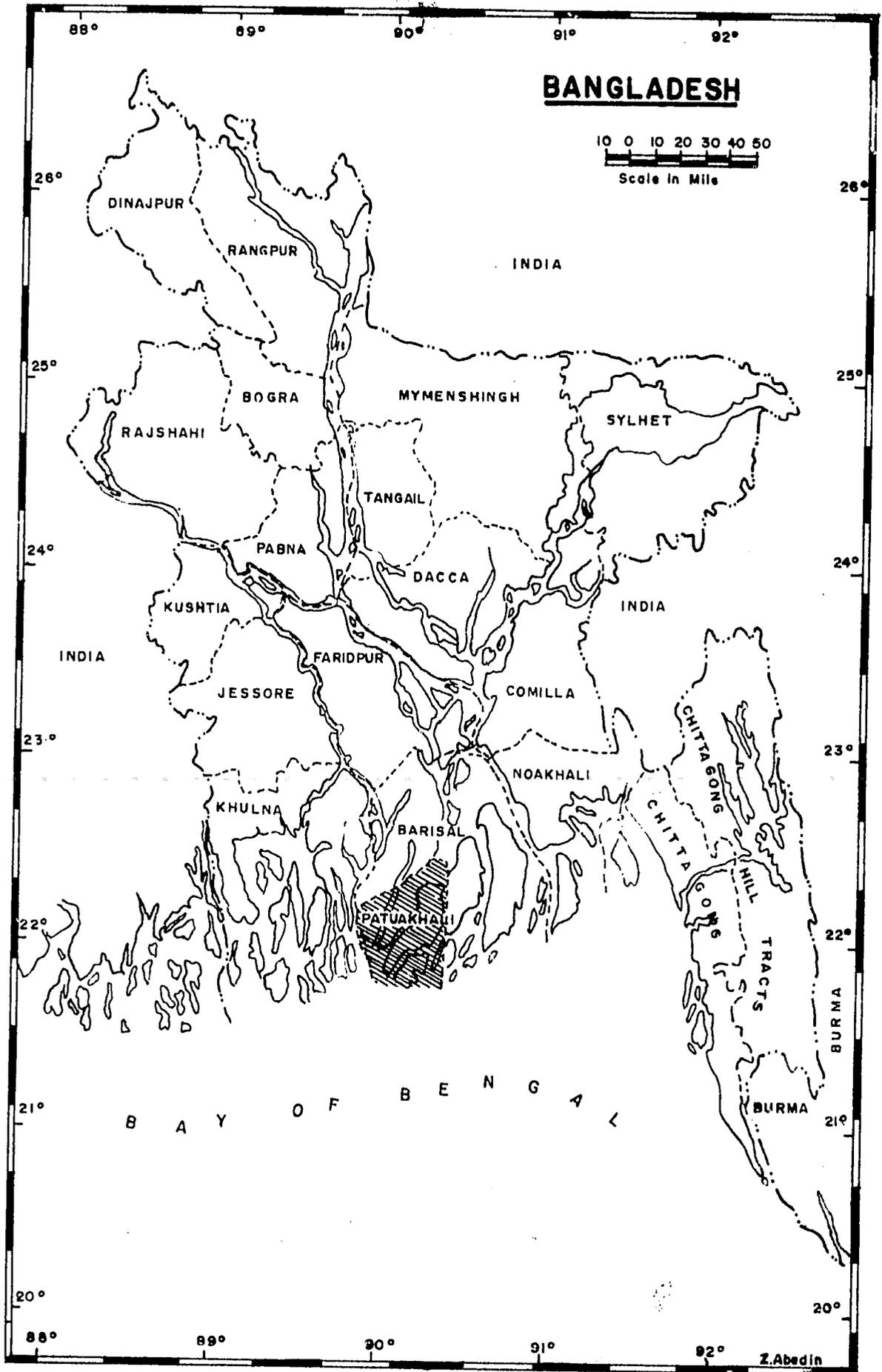
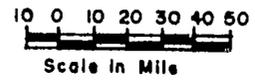
JULY 1978

D R A F T

Rahman and Associates Ltd.
Dacca Bangladesh

Louis Berger International Inc.
East Orange New Jersey

BANGLADESH



PREFACE

In accordance with the terms of the contract under which this study is being conducted, this volume presents the district profile and our recommended rural road network for Patuakhali District. Its organization and contents reflect the view of the consultant that the planning of rural roads must be considered as an integral part of a comprehensive rural development program.

Thus the volume starts with an examination of Patuakhali's existing transportation network and deficiencies and proceeds to present a detailed profile of the physical, environmental, economic and social aspects of the district.

The concluding sections of the volume describe the consultant's approach in developing a rural road network including the initial road screening and the priority ranking of the roads. The volume ends with the presentation of the recommended rural road network for Patuakhali under this project.

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I. TRANSPORTATION NETWORK

A. External Communication

Patuakhali is connected to other districts by two modes of transportation, water and road. (See Figure 1). Water transport is by far the most important mode and launch service connects Patuakhali with the districts of Barisal, Comilla and Dacca. Patuakhali is also linked to Barisal District by a new Roads and Highways Directorate (R&H) road.

Patuakhali has no direct connection with its neighbouring district in the west, Khulna. Launch traffic to Khulna first proceeds north to Barisal before going west to Khulna.

B. Internal Communication

Transport connections within Patuakhali are even more limited than external communications. There are only about 46 miles of all weather roads, mainly herring bone brick, in the district and approximately 30% of these are in Patuakhali thana. There is no road connection between Barguna, the subdivision headquarters, and Patuakhali Town. Currently the journey is made by a combination of rickshaw, baby taxi and launch and takes about six hours. A detailed transport profile for each of the thanas in Patuakhali is presented by subdivision in Table 1. An abbreviated subdivision summary is shown in Table 2.

2A

22°
30'

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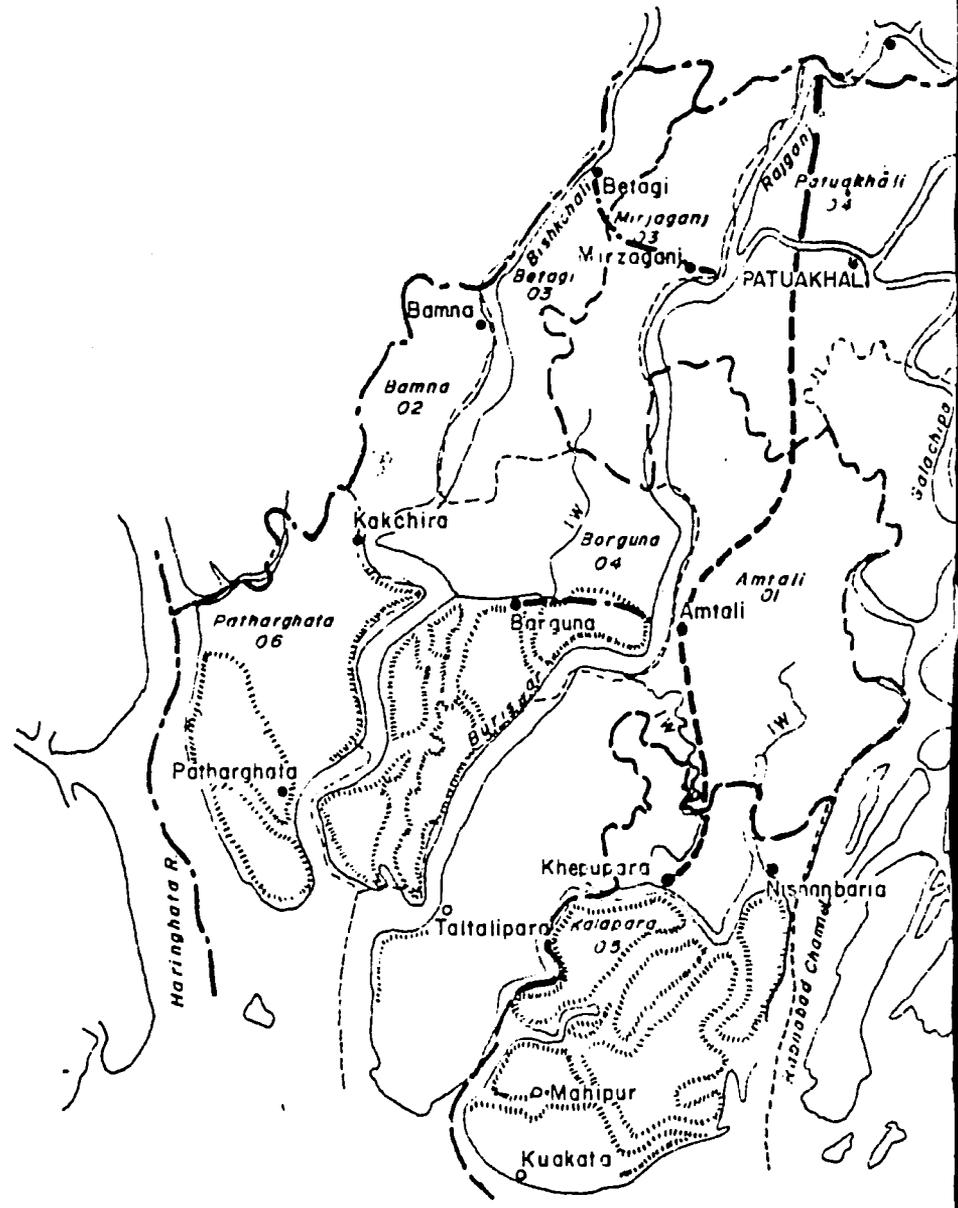
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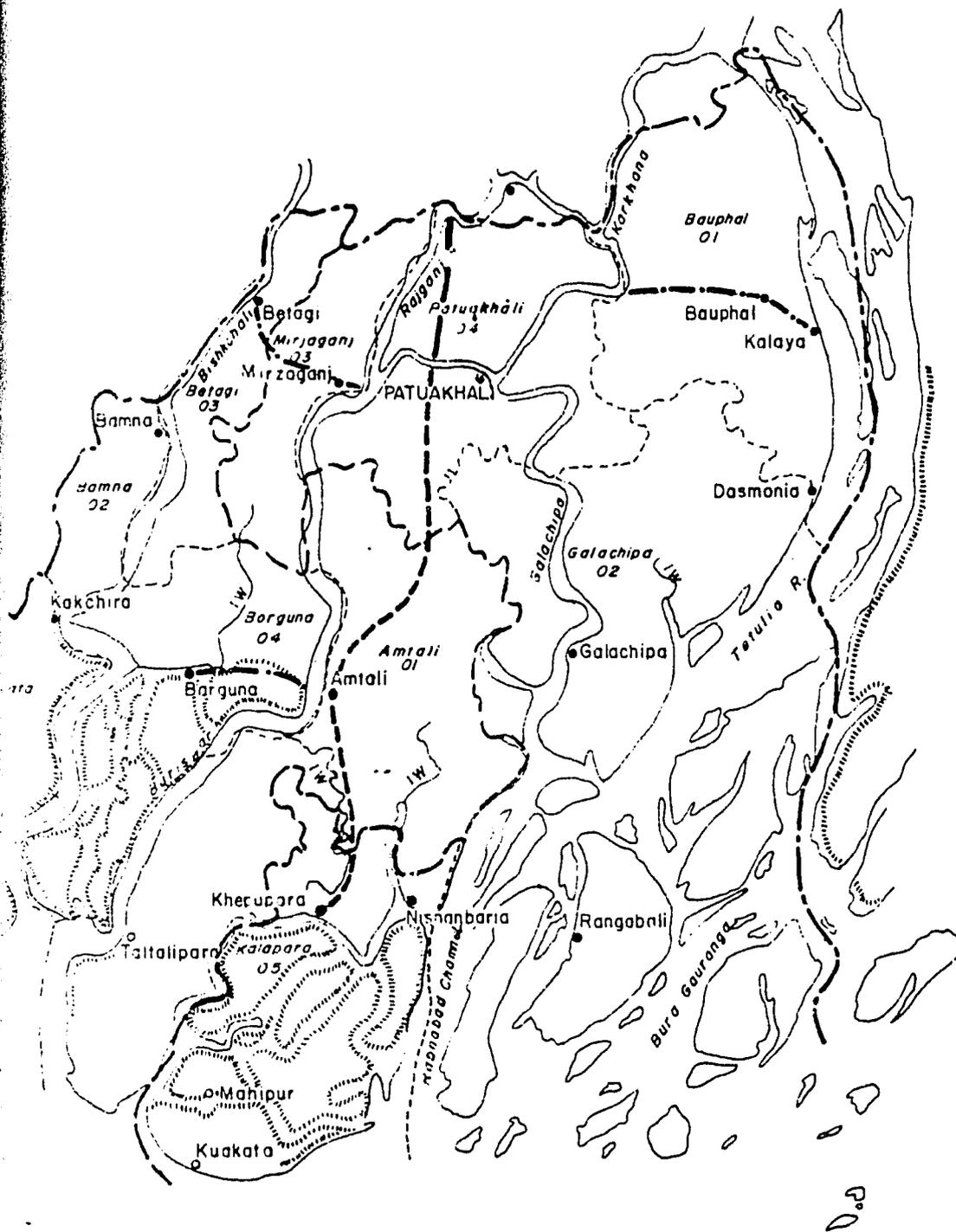
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2 B



B A Y O F B E N G A L

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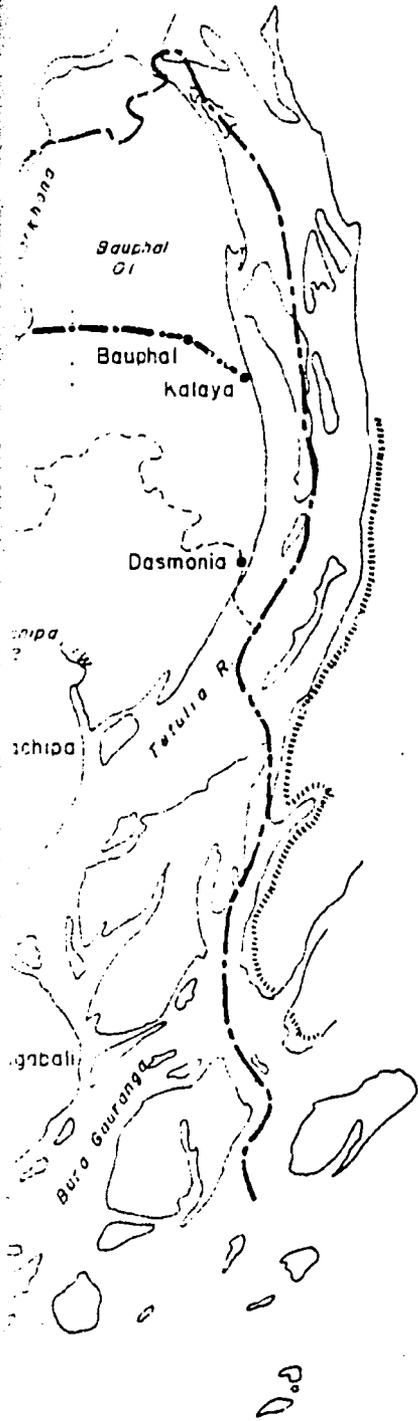
90°15'

90°30'

90°30'

2C

DIST. PATUAKHALI



22°
30'

22°
15'

LEGEND :

- ROADS (R & H, Paved) ...
- RAILROADS ...
- WATERWAYS ...
- PROPOSED ROADS (R & H) ...
- ALL WEATHER ROAD ...
- LAUNCH GHAT ...

22°
00'

21°
45'

Scale : 1 Inch = 8 Miles (Approx)



GOVERNMENT OF
THE PEOPLE'S REPUBLIC OF BANGLADESH

RURAL ROADS STUDY

TRANSPORTATION

LOUIS BERGER INTERNATIONAL INC. AND
RAHMAN & ASSOCIATES LTD.

PREPARED: Z. Abedin RECOMMENDED

CHECKED: APPROVED:

DATE: DRG. NO:

30°30'

TABLE 1
 THANA TRANSPORT PROFILE
 DISTRICT - PATUAKHALI
 SUBDIVISION - SADAR

THANA	APPROX. MILES OF ALL WEATHER ROAD (HEB & POCJA)	VEHICLE ACCESS FROM THANA HQ TO R&H NETWORK	NUMBER OF REGULAR LAUNCH OR STEAMER ROUTES	OTHER WATER TRANSPORT WITHIN THANA	MODE OF TRANSPORT TO SUB-DIVISION HQS.	MODE OF TRANSPORT TO DISTRICT HQ.
KALAPARA	1 Mile	None	1	Country Boats	Launch or Steamer 8 hours	By Launch or Steamer 8 hours
GALACHHA	4 Miles	None	5	Country Boats	Launch 3 hours	Launch 3 hours
BAUPHAL	34 Miles	None	3	Country Boats	Baby Taxi and Steamer or Launch 3 hours	Baby Taxi and Steamer or Launch 3 hours
PATUAKHALI	13 Miles	R&H Barisal - Patuakhali Road	7	Country Boats	-	-
MIRZAGANG	1 Mile	None	3	Country Boats	Boats - 3 hours or Launch - 1½ hours	Boats - 3 hours or Launch - 1½ hours

Table continued on next page

- 3 -

TABLE 1

THANA TRANSPORT PROFILE (CONTINUED)

DISTRICT - PATUAKHALI
SUBDIVISION - BARGUNA

THANA	APPROX. MILES OF ALL WEATHER ROAD (HBB & PUGGA)	VEHICLE ACCESS FROM THANA HQ TO R&H NETWORK	NUMBER OF REGULAR LAUNCH OR STEAMER ROUTES	OTHER WATER TRANSPORT WITHIN THANA	MODE OF TRANSPORT TO SUB-DIVISION HQS.	MODE OF TRANSPORT TO DISTRICT HQS.
AMTALI	1 Mile	None	3	Country Boats	Boat, Baby Taxi & Rickshaw 1½ hours	Launch 5 hours
BARGUNA	7 Miles	None	4	Country Boats	-	Rickshaw Baby Taxi Launch 6 hours
BETAGI	6 Miles	None	2	Country Boats	Launch 5 hours	Foot and Launch 3½ hours
BAMNA	1 Mile	None	3	Country Boats	Launch 3½ hours	Launch 6 hours
PATHARGATA	3 Miles	None	1	Country Boats	Launch 3 hours	Rickshaw, Baby Taxi & Launch 8 hours

TABLE 2
SUBDIVISION TRANSPORT SUMMARY

Subdivision	Area in Square miles	Approximate miles all weather roads.	# of Regular Launch Routes	# of Rail Stations
Sadar	1,010	53	19	0
Barguna	622	18	13	0
Total:	1,632	71	32	0

Obviously, the transportation infrastructure is very poor in both of these subdivisions and almost all of the thanas are inaccessible except by water. Hence boats are the primary mode of transportation in the district but during the monsoon some of the rivers are not navigable because the current is too swift and the water becomes choppy. During this period thanas such as Kalapara, Galachipa, Pathargata become completely isolated. In the dry season when the waters recede it is the people who live away from the main waterways that are left stranded.

C. Roads

1. Number and Type.

There is only one Roads and Highways Directorate road in the district and that is the recently constructed north-south connection between Barisal and Patuakhali. Approximately 7.5 miles of this road are within Patuakhali District. The district Council has approximately 196 miles of road under its jurisdiction of which about 38 miles are all weather (herring-bone brick). The paved surface on these roads is between 8 to 10 feet wide and has varying shoulder widths. The earth roads have a nominal crest-width of 10 feet.

Nationally Patuakhali ranks last in paved road mileage. The district only has 2.7 miles of paved road per 100 square miles and 3.1 miles of paved road per 100,000 persons. These rank far below the national averages of 9.2 miles per 100 square miles and 7.9 miles per 100,000 persons.

In the thanas no road system exists, the links between the villages and markets are for the most part foot paths along narrow irrigation embankment.

2. Major Routes

There is only one major road route in Patuakhali, the recently constructed R&H road north from Patuakhali Town to Barisal. This road is presently ^{of} crushed brick and surfacing remains to be done but it is now open to light traffic. A narrow bridge near Patuakhali Town prevents trucks from entering the town. This road provides access to the following villages, Lebukhali, Kartikaasha, Wadaipur, Telikhali, Maukaram and Lawkhali. In the preliminary planning stage is a route going south from Patuakhali through Amtali to Khepupara but no date has been established to begin construction.

3. Ferry System

There are two major vehicle ferried crossings on the road from Patuakhali to Barisal that are run by the R&H Directorate. In addition, there are numerous passenger ferries throughout the district run by the District Council.

4. Sources of Traffic

According to the Ministry of Railways, Roads, Highways and Road Transport there are no motor vehicles registered in Patuakhali. There are however, six government vehicles assigned to the district.

D. Rail

There is no railway in Patuakhali.

E. Waterway

1. Waterway Network

From the map in Figure I it is readily seen why the waterways provide the main mode of transportation in Patuakhali. The district is located in the delta region of the Baleswar and Tetulia Rivers and is crisscrossed by innumerable smaller rivers and canals. The main waterways in Patuakhali, as classified by the Bangladesh Inland Waterway Transport Authority, are shown in Table 3.

TABLE 3
CLASSIFICATION OF INLAND WATERWAYS

Class	Name of Waterway	Maximum vessel draught at low water
I	Baleswar River	12'
III	Khairabad River	6'
III	Tetulia River	3'
III	Galachina River	6'
III	Buriswar River	6'
III	Bishkali River	9'

2. Major Routes

The Class I Baloswar River is not utilized by steamers from Patuakhali because the draughts on the connecting rivers are too shallow. Therefore the important launch routes in Patuakhali follow the Class III waterways listed in Table 2.

These rivers are navigable year round but many of the smaller rivers and canals are used only by country boats and pirogues during the dry season.

A list of the major launch routes and the number of launch ghats along these routes is given in Table 4

TABLE 4
MAJOR LAUNCH ROUTES

Route	# of Launch Ghats served	Total time Required
Patuakhali - Bhola	1	6 Hours
Patuakhali - Mohinur	2	12 "
Patuakhali - Barguna	1	6 "
Patuakhali - Charbisas	1	7 "
Patuakhali - Ularria	2	6 "
Patuakhali - Amtali	1	6 "
Patuakhali - Kasupatia	2	6 "
Kheopara - Barisal	4	12 "
Mohinur - Barisal	4	11 "
Taltali - Barisal	4	12 "
Barguna - Barisal	8	5 "

In addition to these there are scheduled launch services connecting Patuakhali Town to Barisal, Chandour and Dacca via Boga.

4. Launch Ghats

The major launch ghats in Patuakhali are Patuakhali Town, Boga, Galachipa, Antali, Khepupara, Kharizama, Meranj, Ulari, Kalapara and Kuakata. These serve as the main transshipment points for passengers and commodities.

F. Air

There is no commercial air service in Patuakhali.

II. GENERAL BACKGROUND

A. History

Patuakhali has been recently established as a new district, carved out of Bakerganj. Bakerganj constituted the southernmost district of the Dacca Division bordering the Bay of Bengal. Now the southern part of this southernmost old district of Bakerganj has been set up as the new district of Patuakhali, while the northern part has been named as the district of Barisal; and both now belong to the Khulna Division. The history of Patuakhali is thus that of Bakerganj until the creation of the new district in

Bakerganj was named after Aga Baker Khan, (Governor of the Chittagong Region during the late Moughul period) who was asked by Murshid Kuli Khan to reclaim the Sundarban area for the purpose of organising better revenue collection. The original name of the region was Bakla which was changed into Chandradwipa by the Hindu rulers and was renamed by the Moughul conquerors into Ismailpur.

In the 14th century, a Hindu Kingdom is known to have been established here on the bank of the Tetulia river near Kachua. In 1586, traveller Ralph Fitch visited Bakla. And according to his writings, the country was great and fruitful and had store of rice, cotton cloth and silk textiles.

The region of Bakerganj came under Muslim rule by the middle of the 15th century; and the final complete conquest by Emperor Akbar took place in the middle of the 16th century. Bakla was mentioned by Abul Fazal in his renowned 'Aini Akbari as a country of 4 Parganas (i.e. Provinces), and a very important

salt-manufacturing region. But the region was suffering from the piracy of the Arakanese Maghs until they were finally suppressed by Shaista Khan around 1666 A.D. However, progress and prosperity could not be maintained because of the confusions following the fall of the Nawab of Murshidabad, the assassination of Aga Baker and seizure of power by Raja Raj Ballav. He permitted a Christian mission to be started in Shibpur (Padrishibpur is still bearing testimony to the past with a Roman Catholic Mission along with an 18th century church built by the Portugese) as a check against increasing Muslim cultural expansion in the area. Later Raj Ballav and his son Kishen Das were arrested and drowned in the Ganges by Nawab Mir Kashem.

The district attracted the attention of the British on account of its fabulous production of rice and salt. A Commissioner of the Sundarbans was appointed by the British in 1784 for suppressing dacoits, while a Civil Judge with magisterial powers was located in Nalchiti as early as 1781. Bakerganj as a separate district came into being with its headquarters at the present location of Barisal only in 1801, although the district was constituted by regulation in 1797.

With permanent settlement, the British administration created a new loyal class of landlords who managed revenue collection with oppression. This led to serious discontent amongst inhabitants. The farmers (Muslims and low-caste Hindus) eventually organised a popular Movement, entitled Praja Movement, under the dynamic leadership of A.K.Fazlul Haq who is now revered as Shere-Bangla (i.e. Tiger of Bengal). This turned into a successful political movement to resist British rule and to win positive benefits for farmers of the country as a whole through various types of legislation and reform including abolition of zamindari.

B. District Administration

As in other districts, Patuakhali's civil administration is headed by the Deputy Commission. He combines the functions of the District Magistrate, and the Collector of revenues, of maintenance of law and order and of coordination of all developmental activities. He is assisted by one Additional Deputy Commissioner. In the subdivisions, the Deputy Commissioner is supported by the Subdivisional Officers who coordinate all activities with some Sub-division level officers of general and professional nature. The Thana level activities of development character are supervised by the Circle Officer (Development). The Sub-division-based and Thana-based officers undertaking developmental activities belong to and are controlled by their relevant Ministries, Departments or Agencies. Patuakhali has only two subdivisions (Barguna, Patuakhali) with five thanas in each. The Patuakhali subdivision has 40 Unions and 443 villages; and Barguna subdivision has 59 Unions and 593 villages.

C. Demography

Patuakhali has an area of 1,675 square miles. And because of the confluence of some major rivers meeting the Bay of Bengal falling within the district, actual land area is much less. Density of population per square mile (including rivers) has been estimated at 895 in 1974. Excluding rivers, density will come to per square mile.

The population of the district, according to the Census of 1974, is 1.50 million. Of this, the major share of 0.91 million is in the Patuakhali subdivision while the remainder of 0.59 million is in the Barguna subdivision. The district has over 4,000 people of Burmese origin (Maghs all in thana.

The two subdivisions together have 285,667 households; these are distributed as: Patuakhali Sadar 170,529 and Barguna 115,138, indicating a slightly higher ratio of members per household in Patuakhali Sadar than in Barguna subdivision. The district has only about 2% of urban population, although the growth of urban population between 1961 and 1974 has been over 200%.

In the Patuakhali subdivision, the populous thanas are Patuakhali, Bauphal and Galachipa with population ranging between 221,000 and 254,000, while the population of the two remaining thanas (Mirzaganj and Kalapara) ranges between 88,000 and 93,000 only. These latter two thanas have Unions numbering six and seven respectively while the other 3 thanas have 13 to 17 unions.

In the Barguna subdivision, the most populous thana is Amtali with the population of over 182,000. This is followed by Barguna with 163,000 population. The least populated thana is Damna with 52,000 only. The two other thanas (Betagi and Pathar ghata) fall in the middle with the population size of 94,000 and 97,000 respectively. Thana population figures are approximate rounded ones.

The district is damp in all times of the year and has an equable temperature. The cold season starts in the month of November and lasts till the end of February. In winter, nights are foggy till sea breeze begins to blow in March. The past seasonal pattern of maximum mean and minimum temperature for the combined districts of Barisal and Patuakhali, recorded in the District Census Report of 1961 is as follows:

Season	Maximum Mean	Minimum Mean
Dry Summer (March to May)	90.5° F	74.8° F
Monsoon (June to Oct.)	87.5° F	77.5° F
Winter (Nov to Feb.)	80.3° F	59.4° F

Source: Regional Meteorological Center, Chittagong.

Squalls and cyclonic storms often hit the areas of the district in the months of May, June, September and October; and the worst impact results when these are accompanied by tidal bore.

Generally, monsoon sets in about the middle of June; and compared to other districts of the Khulna Division, this district receives a high rainfall, especially in the coastal areas. The average annual rainfall for the decade (1950-59) for the combined district of Bakerganj has been recorded as 86.6".

Cyclones and tidal bores are more frequently experienced in this district than in others on the coastline. Devastating cyclones with tidal bore occurred in 1957, 1958, 1960 (twice in this year), 1961 and more recently in 1970 and 1974.

III. PHYSICAL AND ENVIRONMENTAL FEATURES

A. Physical Geography

1. Location

Patuakhali District is located on the south-central coast of the country. With an area of 1,688 square miles, it is by far the smallest of the four selected districts. It is bordered by Barisal District on the north, west, and east, by Khulna on the extreme southwest and by the Bay of Bengal on the south. It lies approximately between $21^{\circ} 40'$ and $22^{\circ} 35'$ north latitude and $89^{\circ} 50'$ and $90^{\circ} 40'$ east longitude.

2. Topography

The entire district is a recent alluvial deposit and, hence, is a low elevation, uniform area incised by many rivers and water courses which act as a constraint to road development. Chars are formed and destroyed, especially in the lower Tetulia estuary where tidal influences combine with heavy freshwater flows to create difficulties. Coastal embankments, especially in Patuakhali Subdivision, arrest the natural process of erosion and encourage alluvial formation to a limited extent.

3. Geology and Soils

a. District Geology

The district is comprised entirely of recent alluvium from the combined flows of the Ganges, Brahmaputra and Meghna Rivers.

b. Soils

Essentially only two soil units are present in the district. The southern two-thirds of the district is mostly grey floodplain soils (saline phase) and the remaining area is grey floodplain soils (nonsaline phase). The chars in the lower reaches of the Tetulia River are calcareous alluvium. District soil mapping units are shown in Figure

B. Hydrology

1. Climate

Because of its coastal location, Patuakhali is influenced by both maritime and continental airmasses. During much of the year, continental airmasses dominate the district but as the sun begins its climb toward the Tropic of Cancer, maritime influences are felt, especially between March and July. Patuakhali is subject to the ravages of violent weather, having been struck most recently by cyclones or tornadoes accompanied by tidal waves in 1960, 1961, 1963, 1965, 1966 and 1970.

Temperatures within Patuakhali District are mostly uniform and are similar to Faridpur District in terms of average daily maximum and minimum for the summer, monsoon and winter seasons. The annual mean daily temperature range for most of the district is only 12 or 13 degrees Fahrenheit, the lowest of the four districts.

Rainfall in the district is heavy, averaging about 115 inches per year, most of which falls during the period from June to November.

MAP INDEXSOIL UNIT
NUMBERD E S C R I P T I O N

- | | |
|----|---|
| 1 | Calcareous silts and sands on charland. |
| 6 | Mainly heavy clay; loams on ridges. |
| 7 | Mainly heavy clays; loams on narrow ridges. Soils slightly to moderately saline in dry season (Except in completed coastal embankment polders). |
| 9 | Mainly silty calcareous alluvium. Some silty Grey Floodplain Soils on islands. Saline in dry season. |
| 10 | Acid sulphate soils, mainly clays. |



50° 00' 50° 15' 50° 30'

90° 00'

90

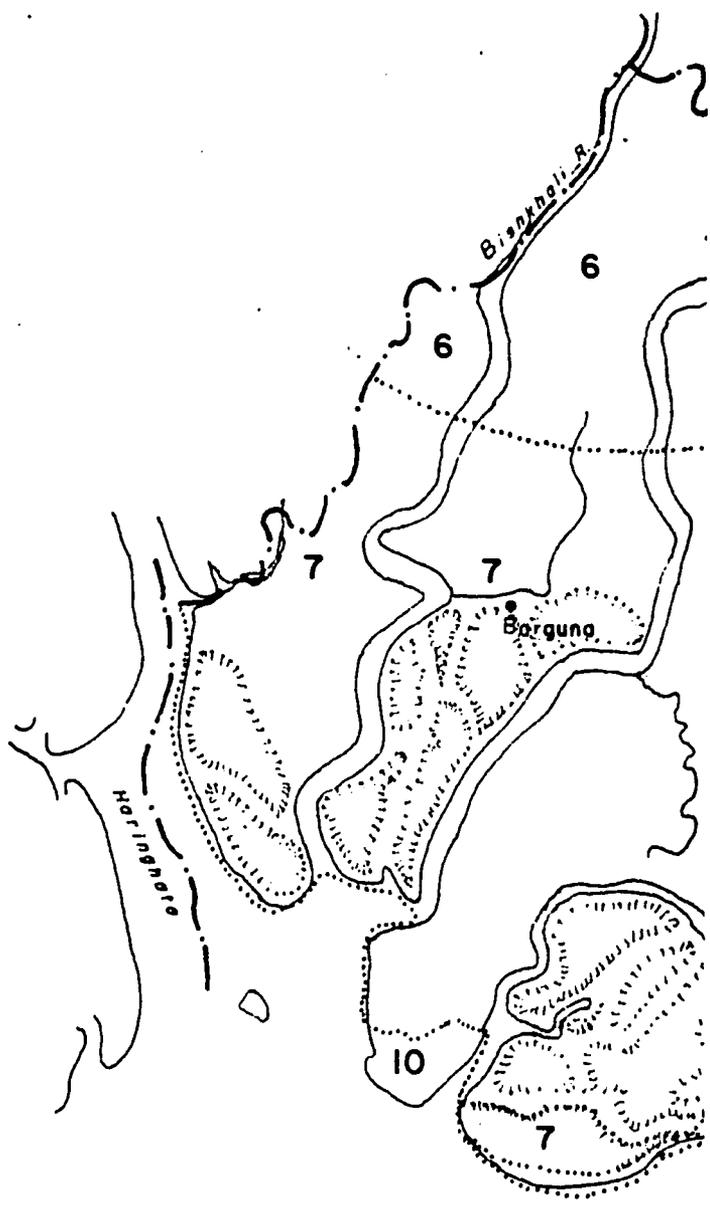
18 C

22° 30'

22° 15'

22° 00'

21° 45'



B A Y O F

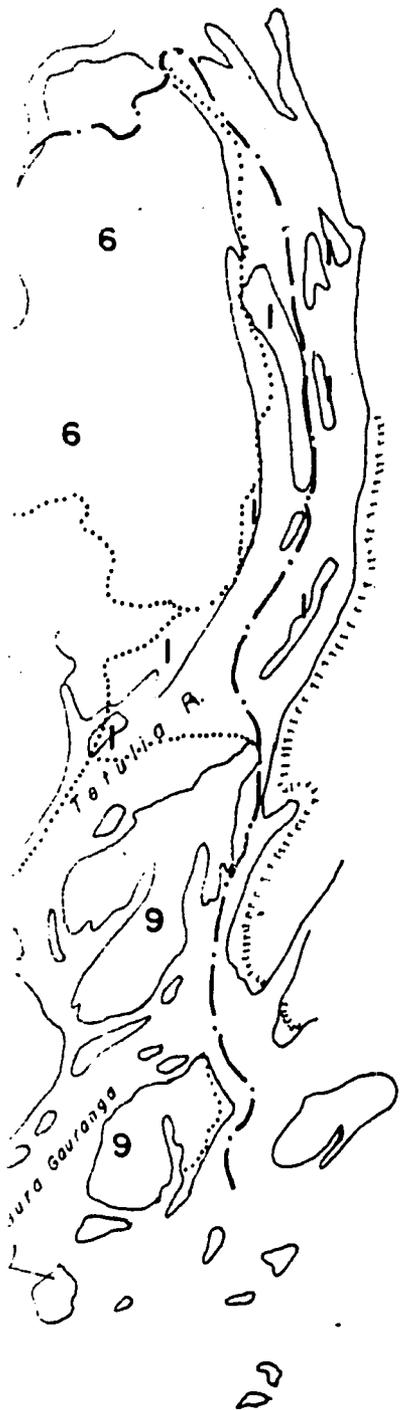
90° 00'

90°

90°30'

18 D

DIST. PATUAKHALI



BENGAL

22°
30'

LEGEND:

22°
15'

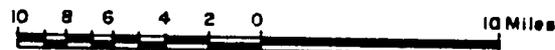
- Division Boundary - - - - -
- Dist. Boundary - - - - -
- Dist. Head Quarter ⊙
- Sub-Division Head Quarter •
- Rivers
- Embankment
- Soil Unit Boundary - - - - -
- Soil Unit Number 7

22°
00'

Sources : IBRD , 1972
UNDP , 1971

21°
45'

Scale : 1 Inch = 8 Miles (Approx.)



GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH	
RURAL ROADS STUDY	
SOILS	
LOUIS BERGER INTERNATIONAL INC. AND RAHMAN & ASSOCIATES LTD.	
PREPARED: Raihan	RECOMMENDED:
CHECKED: <i>RB</i>	APPROVED:
DATE:	ORG. NO.:

90°30'

2. Surface Water

Rivers and coast dominate the boundaries of Patuakhali District with the Tetulia River forming the eastern boundary and portions of the Haringhata and Biskhali Rivers lining much of the western boundary. The Bay of Bengal lies directly to the south. Other rivers which flow through the district are generally north-south flows of offshoots of the Lower Meghna River. They include the Rajganj, Buriswar, Karkhana and Galachipa Rivers. Flooding is normally not a problem in the district.

The southern two-thirds of the district is considered saline land which is part saline only in the dry season. The northern third is mainly seasonally wet or shallowly flooded land.

3. Ground Water

The entire district of Patuakhali is located in the coastal hydrogeologic region. For reasons of salinity and other hydrogeologic factors, required tubewell depth is estimated at between 600 to 1,200 feet for an estimated potential flow of 0.5 to 1.0 cubic feet per second (4" dia). Suitability for tubewell development is considered poor.

C. Environmental Features

1. Flora

Due to relatively homogenous soil, climatic, and topographic conditions, the flora of Patuakhali are somewhat uniform. With the exception of the relatively small area of coastal

20 A

MAP INDEX

DRAINAGE UNIT
NUMBER

DESCRIPTION OF LAND LEVELS
IN RELATION TO FLOODING

IV

Mainly seasonally wet or
shallowly flooded land

VII

Saline land, part saline
only in dry season

20B



90°00'

90°15'

90°30'

120

120

110

100

20 C

90° 00'

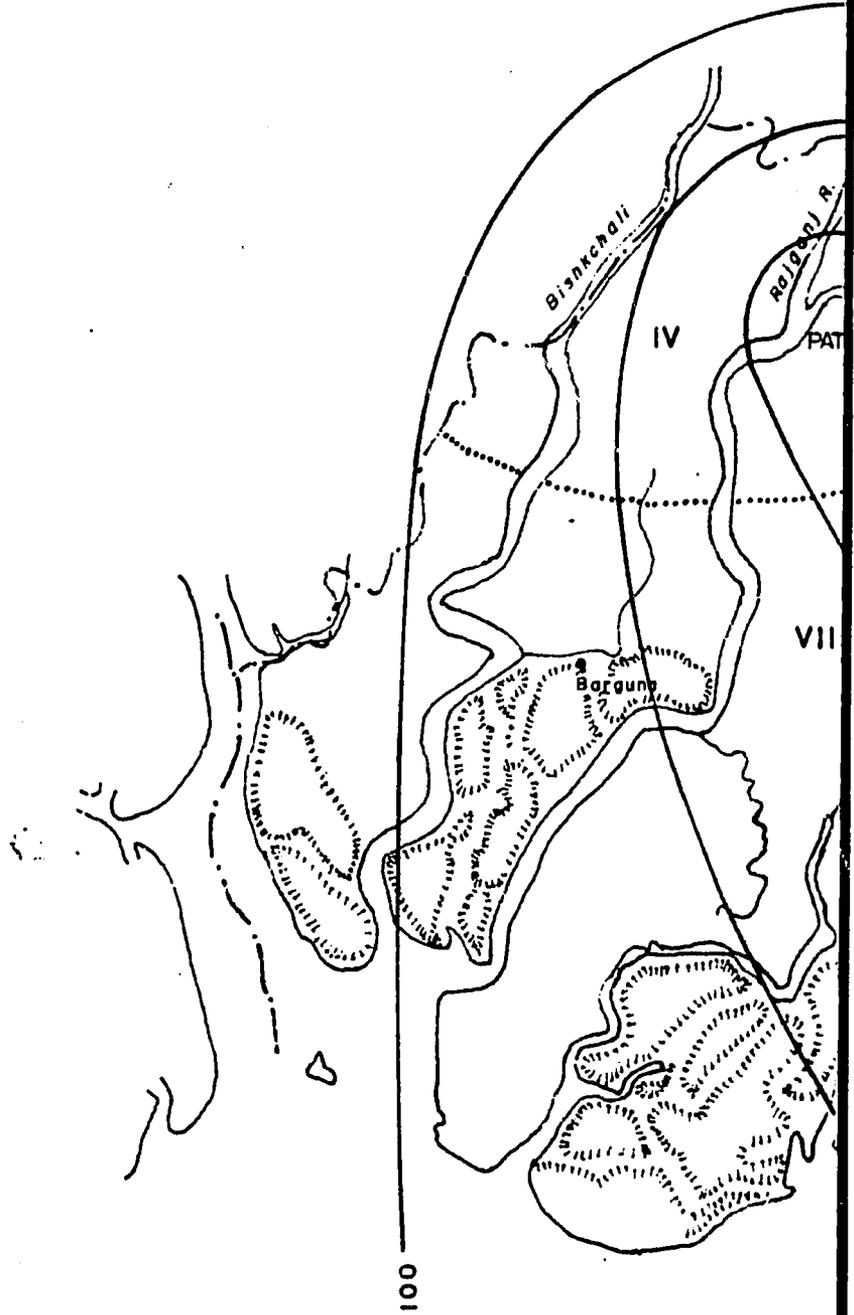
90° 15'

22°
30'

22°
15'

22°
00'

21°
45'



100

B A Y O F B

90° 00'

90° 15'

90°15'

90°30'

20 D



B A Y O F B E N G A L

90°15'

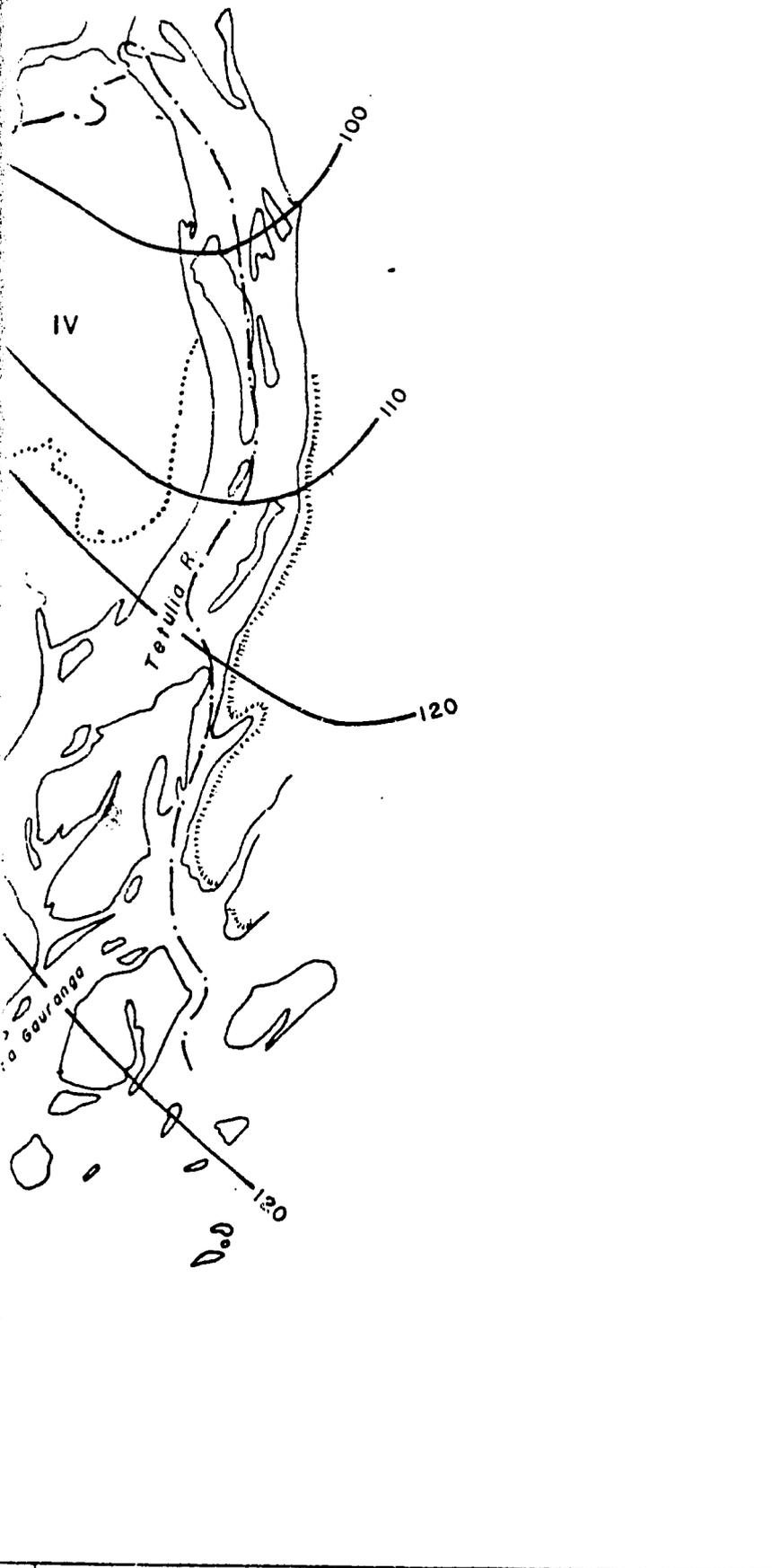
90°30'

From the ...

90° 30'

20 E

DIST. PATUAKHALI



22°
30'

22°
15'

LEGEND:

- Division Boundary
- Dist. Boundary
- Dist. Head Quarter
- Sub-Division Head Quarter
- Rivers
- Embankment
- Drainage Unit Boundary
- Drainage Unit Number **VII**
- Rainfall Isohyet in Mean Annual Inches . . . 110 — 110

22°
00'

Source : I B R D , 1972

21°
45'

Scale : 1 Inch = 6 Miles (Approx.)



GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH	
RURAL ROADS STUDY	
DRAINAGE WITH RAINFALL	
LOUIS BERGER INTERNATIONAL INC. AND RAHMAN & ASSOCIATES LTD.	
PREPARED: Z. Abedin	RECOMMENDED:
CHECKED: <i>Q/LB</i>	APPROVED:
DATE:	DRG. NO.

90° 30'

forest in the extreme south of the district, most plants in the district are aquatic or water related varieties including water lilies, reeds, grasses and related vegetation. As with most of Bangladesh, population and cultivation have severely depleted the natural flora of the district and weedy types indicative of disturbance are evident throughout the district.

The limited forested area of the district is tidal or mangrove forest called Sunderbans. The main species found are Amoor, Bain, Bhundal, Gewa, Gorla, Goran, Golpata, Keora, Kankra, Passur and Sundri. Bamboos are generally absent. Approximately 30 sq. mi. of tidal forest is considered Reserved Forest and is owned and managed by the government. A list of flora is included in the Summary Volume Annex.

2. Fauna

Due to the presence of a limited amount of forested area, fauna in the district are relatively diverse. Frogs, snakes, lizards and other reptiles and amphibians are abundant. Bats and rodents are also numerous. Because of the relative proximity of the district to the vast Sundarbans area of Khulna, many fauna are likely to utilize portions of Patuakhali as temporary habitat areas. This is particularly true of birds and, to a lesser extent, carnivores.

A total of 562 bird species are listed as resident, seasonal visitor or likely to be in the district (Rashid 1967). Families represented include grebes, petrels, pelicans, boobies, herons, storks, ibises, flamingo, ducks, geese,

eagles, hawks, partridge, quail, pheasant, sandpipers, gulls, owls, cuckoos, swifts, woodpeckers, larks, swallows, drongos, babblers and many others. A complete list of birds is included in the Summary Volume Annex. In addition on, lists of mammals, reptiles and amphibians are given in the same Annex.

The abundance of water courses and marine coast provide habitat for a wealth of fish species, especially marine and estuarine varieties. Due to considerable seasonal variation in freshwater flow through the district, seasonal variation in fish habitat area is also substantial. A list of fishes present or likely to be present is included in the Summary Volume Annex.

IV. AGRICULTURE

A. Land Utilization

Approximately 713,000 acres of land in Patuakhali are cultivable of which 650,000 acres were used to raise crops in 1976. The ratio of cultivated land to cultivable land (cultivation intensity ratio) in Patuakhali is 91.2% which is above the national average of 88.9%. The cropping intensity ratio, which is an indication of the average number of crops grown annually per acre is only 1.24 and on this basis Patuakhali ranks next to last among the districts of Bangladesh.

The district's very low cropping intensity ratio is explained by the fact that 77% of the cultivated acreage is single cropped, 22% is double cropped and only 1% is triple cropped. The most prevalent cropping pattern is Transplanted Aman followed by follow on the single cropped lands and Aus followed by T. Aman and rabi crops on the double and triple cropped land.

B. Major Crops

Rice is the major crop grown in the district and it is grown for subsistence and export. In 1975-76 rice was grown on 746,000 acres or roughly 92% of the district's total cropped acreage. Thus rice is in reality the only major crop in Patuakhali. The rice crop consists of the three main groups typical of Bangladesh and we classified by seasonal characteristics, i.e. Aus (autumn rice), Aman (winter rice) and Boro (spring rice).

The Aman crop is by far the most important rice crop in the district and in 1976-77 it was planted on 610,000 acres or 82% of the total rice acreage. (see Table 5) .

TABLE 5
PATUAKHALI DISTRICT ACREAGE AND PRODUCTION OF RICE
CROPS 1975-76 AND 1976-77

Crop	No. of acres sown (000)		Production Tons(000)		% of District Rice Production	
	1975-76	1976-77	1975-76	1976-77	1975-76	1976-77
Local Aus	105	105	30	32	8	9
HYV	8	20	7	17	2	5
Total	113	125	37	49	10	14
Local Trans-planted Aman	590	601	284	296	74	81
HYV	17	9	15	8	4	2
Total	607	610	299	304	78	83
Local Broad-cast Aman	0	0	0	0	0	0
HYV	0	0	0	0	0	0
Total	0	0	0	0	0	0
Local Boro	5	5	2	2	1	1
HYV	37	7	41	7	11	2
Total	42	12	43	9	12	3
Total	762	747	379	362	100	100

Source: Bangladesh Bureau of Statistics

The entire Aman crop in Patuakhali is transplanted. The crop is planted in the traditional way and the seeds are sown broadcast into prepared beds in May and June, transplanted during the rainy season in July and August and harvested in November and December.

The average yield for the T. Aman crop is 13.8 maunds per acre (See Table 5). This low yield is due to the fact that 99% of the crop is planted in local varieties. On the 9,000 acres that are planted in HYVs, the average yield is 24.7 maunds per acre .

District officials expressed some possible explanations for the small percentage of HYV adoption for T. Aman: (1) the stem of the T. Aman HYV is too short to withstand rapid flooding; (2) the correct HYV seeds have not been identified; (3) the hazardous weather conditions in the district makes investments in HYV crops too risky for the small farmer; and (4) the large absentee landowners in the southern part of the district are satisfied with the current yields and have little incentive to adopt HYVs.

The Aus crop is principally planted on the double and triple cropped land in the northern thanas of Patuakhali. It is usually grown in rotation with T. Aman and rabi crops. In 1976-77 Aus was grown on 125,000 acres and had an average yield of 10.9 maunds per acre. HYV Aus yields averaged 23.6 maunds per acre but the HYVs. accounted for only 16% of the total Aus crop. It should be noted though, that the HYV Aus acreage in 1976-77 increased dramatically the previous years average of 5%.

Conflicting statistics were received from the Ministry of Agriculture and the Bangladesh Bureau of Statistics about the acreage under the Boro crop in Patuakhali for the period 1975-77. However, it appears that the Boro crop accounts for approximately 4%-8% of the total rice acreage in Patuakhali. Almost all of the Boro crop is planted in HYV, and the average yield is 23 maunds per acre.

There is tremendous potential for increasing the HYV Boro acreage in the district particularly in the thanas of Bauphal, Patuakhali, Galachipa, Amtali, Barguna and Begagi. Under the proposed Patuakhali-Barisal Project an additional 130,000 acres are to be planted in HYV Boro by 1985.

Since rice is grown on 92% of the total cropped acreage in Patuakhali no other major crops are grown in the district. (see Table 6). However, there are crops grown that are important to specific thanas. Sugarcane for example is grown in sections of Bauphal, Amtali, Galachipa and Patuakhali thanas where it is locally manufactured into gur(indigenous sugar).

TABLE 6
PATUAKHALI DISTRICT ACREAGE AND
PRODUCTION OF CROPS 1974 - 75

Crop	No. of acres sown (000)	Production tons(000)
Rice	749	294
Jute	1	2*
Sugar Cane	2	20
Pulses	4	1
Fruits	9	23
Oilseeds	1	.2
Tobacco	1	.2

* Jute Production in Bales

Source: Bangladesh Agricultural Development Corporation.

Other crops grown in the district include: oilseeds and pulses, which are grown throughout Patuakhali Sadar Sub-division; chilies and spices which are grown throughout the district on small plots; betel leaves, which are grown in Bauphal and Patuakhali thanas; and betelnut which is grown in the thanas of Betari; Mirzaganj, Amtali and Bamna.

Fruits are grown on 9,000 acres of land in the district but there is no widespread cultivation. The fruits include coconuts, dates, melons, mangoes and some jackfruit,

C. Marketing

The hats and bazars in Bangladesh are probably the most important institutions in the country. For the rural farmer they are the means and often only source of consumer goods, agricultural inputs and outside information. In addition, the markets are the main centers of local, commercial and social interaction.

In Patuakhali there are approximately 84 hats and bazars. These are categorized into three classes and summarized by subdivision in Table 7. The two major market classes (A&B) are also shown on the map in Figure 4. The numerous smaller hats and bazars (Class C) have been omitted from this map.

TABLE 7
SYNOPSIS OF HATS AND BAZARS IN PATUAKHALI DISTRICT

Name of Sub-division	Total No. of "A" Class Hats	Total No. of "B" Class Hats	Total No. of "C" Class Hats	District Total
Patuakhali Sadar	9.05	1	39	45
Barguna	1	0	34	39
Total	10	1	73	84

However, as indicated in Table 7, the smaller hats and bazars are an important part of the marketing system. This is particularly so in Patuakhali because of the lack of transportation facilities the small farmers are not able to reach the larger markets.

29 A

22°
30'

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00'

22°
00'

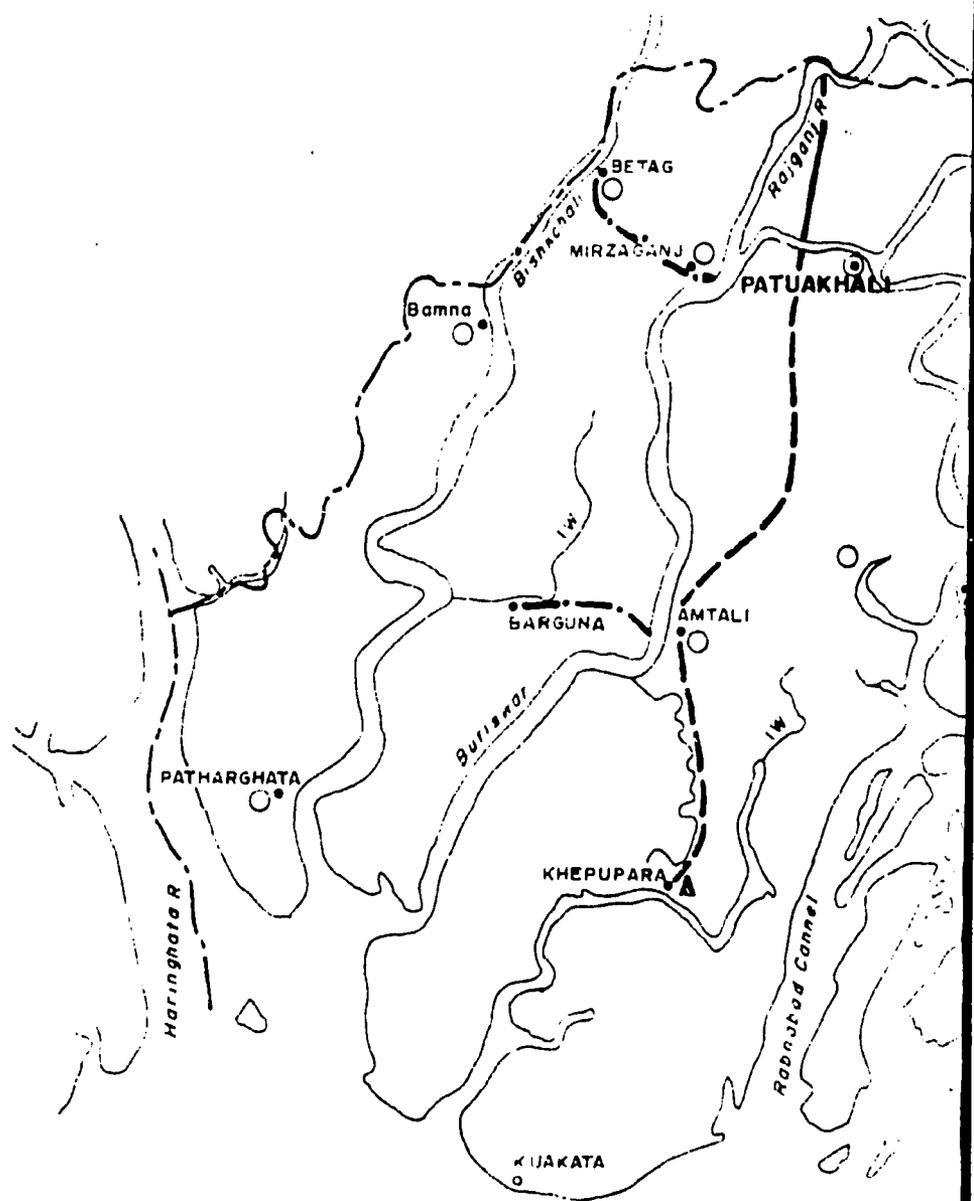
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90° 15'



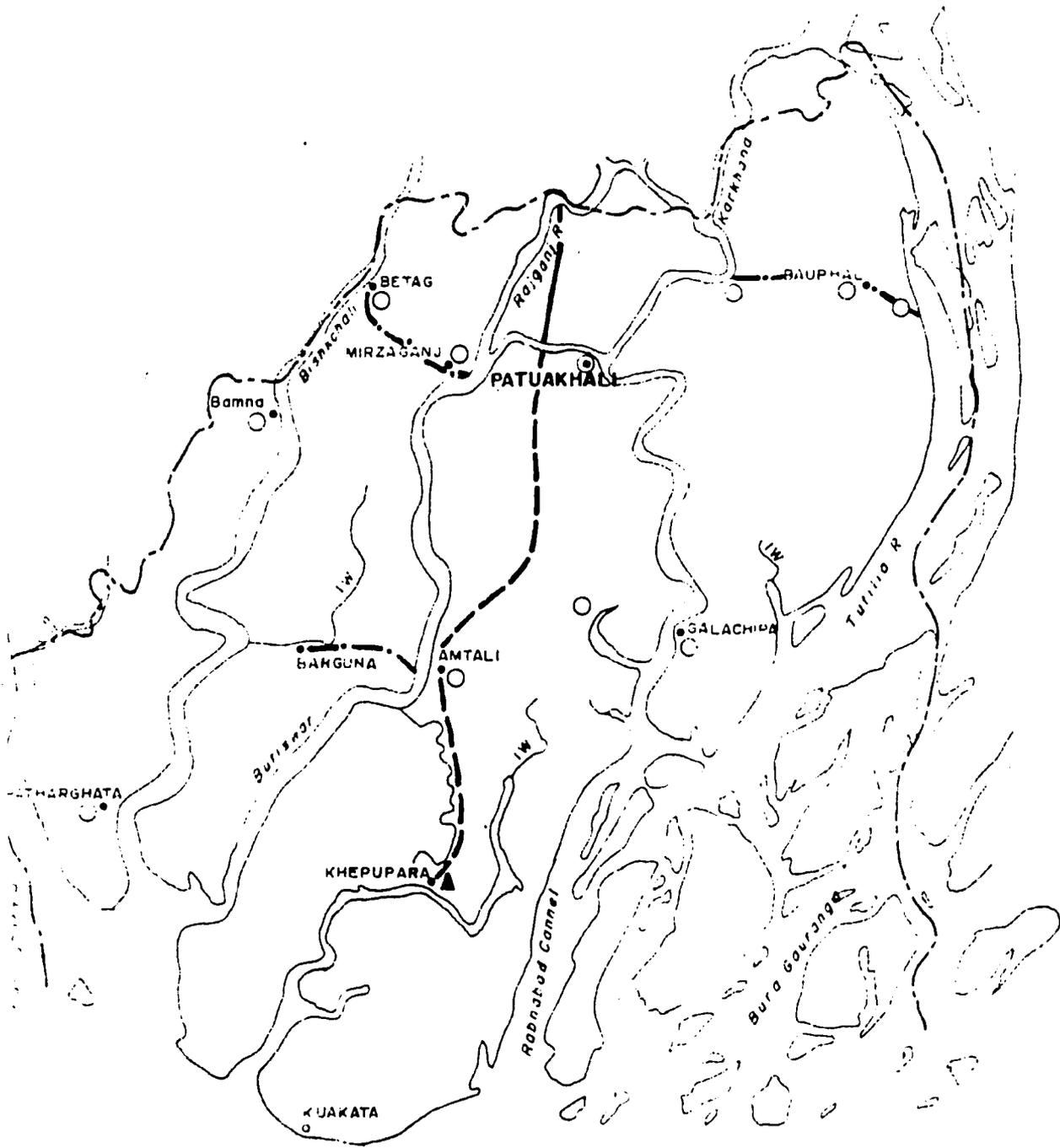
B A Y O F B E N G

90° 00'

90° 15'

90° 30'

29 B



B A Y O F B E N G A L

90° 00'

90° 15'

90° 30'

90° 30'

DIST. PATUAKHALI

29 C



22°
30'

LEGEND

22°
15'

- Roads (R & H Paved)
- All Weather Roads
- Proposed Roads (R & H)
- Waterways
- Primary Market (A)
- Secondary Market (B)
- Dist Head Quarter
- Thana Head Quarter

22°
00'

Scale 1 Inch = 8 Miles (Approx)

21°
45'



GOVERNMENT OF
THE PEOPLE'S REPUBLIC OF BANGLADESH
RURAL ROADS STUDY

PRIM. & SEC. MARKETS

LOUIS BERGER INTERNATIONAL INC. AND
RAHMAN & ASSOCIATES LTD.

PREPARED: Raihan

RECOMMENDED

CHECKED

APPROVED

DATE

ORG NO

90° 30'

Generally these hats are small and sit twice a week on the bank of a river or under a cluster of trees. The population served by these local markets is limited, usually within a radius of a few miles and the produce is carried to market by head load or boat. The farmers marketable surplus is then bought by regional traders (beparis and farias) many of whom come from Dacca, Comilla and Barisal. The traders then bring the produce to a major market (Class A or B) by country boat, head load or shoulder sling.

These major markets shown in Figure 4 are owned by the Government Revenue Department and leased out to Izaradars, who collect market tolls. The markets vary in size but can cover large areas of land and include permanent stalls, and godowns. Other institutional facilities such as, Post Office, Bank and Police Station are also generally available. Some of the major markets specialize in particular commodities. Boga for example, is the largest rice paddy market in the district. A detailed description of each of the markets in Patuakhali is given in Table 8

The bulk of the commodities in the major markets are collected by the beparis and farias and sold to wholesalers. In addition though, the major markets operate as small retail markets on non hat days. On hat days as many as 10,000 or more people may visit the market to sell their produce and buy agricultural inputs and consumer goods.

TABLE 8.
MAJOR MARKETS, COMMUNICATIONS AND PRODUCTS

Name of Markets	Class	Communication Facilities	Product
Boga	A	Connected by Earth Road and River	Rice, Paddy, Pulses, Cow, Goat, Buffallo, Spices, Garlic, Onion, Vegetable & Chillies, Betal Leaves
Bauphal	A	Connected by Road and River	Rice, Meat, Fish Vegetáble
Kalaia Hat (Bauphal)	A	Connected by Earth Road and River	Rice, Paddy, Pulses, <u>Gur</u> , Chillies, Cow, Goat, Buffallo, Jute, Vegetable, Onion, Garlic, Fish, Betel Leaves, Betelnut
Galachina	A	Connected by River	Rice, Paddy, Betalnut, Coconut, Chillies, Poultry.
Kalapara	B	Connected by Road & River	Rice, Paddy, Pulses, Cow, Betelnut, Vegetables.
Betagi	A	Connected by River	Rice, Paddy, <u>Betelnut</u> , Poultry, Coconut, Fish
Banna	A	Connected by River	Rice, Paddy, <u>Betelnut</u> , Chillies, Coconut and Pulses.
Amtali	A	Connected by River	Rice, Paddy, <u>Gur</u> , <u>Betelnut</u> , Fish and Vegetable
Gazipur	A	Connected by River	Rice, Fish, Paddy, Onion, Chillies, Fish & Poultry
Pathargata	A	Connected by Road & River	Rice, Paddy, <u>Betelnut</u> , Chillies, Tobacco, Vegetable, Garlic and Cattle

From the major markets wholesalers arrange to transport the paddy to Barisal, Khulna, Comilla and Dacca. Shipment of paddy is done exclusively by water transport, mostly country boat.

A non-traditional marketing outlet has developed in Patuakhali under the Ministry of Food's rice procurement program. Since 1974 the Ministry of Food has purchased increasing amounts of Patuakhali's Aman. Last year's procurement represented 23% of the district's total Aman crop. This percentage is expected to be even higher in the future as more godowns are constructed and more acreage is planted in HYV Boro.

The lack of internal road network seriously hampers the marketing process in Patuakhali and forces all produce to be transported by country boat. Journeys by boat on the rivers like the Paira, Bishkali, Tetulia and Arunmukha are hazardous from May to mid-October and the thanas served by these rivers become virtually isolated. From Table 11 and the map in Figure 4 it can be observed that only three of the major markets in Patuakhali are served by paved road.

D. Agricultural Inputs

1. Irrigation and Flood Protection

Water control is a particular problem for Patuakhali, especially in the southernmost thanas which directly face the Bay of Bengal. In this area major embankments called polders have been constructed in the thanas of Khepunara, Kuakata, Mahipur, Taltalipara and Barguna. These folders are designed to protect the land from flooding and to keep the fresh water from becoming saline. Additionally, the folders are used as a

source of irrigation but the present utilization is far below the potential capacity. According to 1975-76 statistics, only 45,850 acres of land are irrigated in Patuakhali. This figure represents only 7% of the net cultivated acreage of the district, and is one of the lowest percentages in Bangladesh.

Low lift pumps have supplied the bulk of the irrigation development with the thanas of Amtali, Galachipa and Bauphal having the most pumps. (See Figure 5 and Table 19.). The reported average acreage irrigated per pump is estimated to be about 25 acres. There is reason to believe that this figure may be overstated as much of the soil is sandy.

TABLE 19
INSTALLATION OF POWER PUMPS, DEEP TUBEWELLS
AND SHALLOW TUBEWELLS AS ON 30-6-78

Thana	Power Pump Allotted	Power Pump in use	Deep Tubewells	Shallow Tubewells
<u>Sadar</u> <u>Subdivision</u>				
Kotwali	125	100	-	-
Galachipa	385	318	-	-
Bauphal	450	345	-	-
Mirzagani	122	85	-	-
Kalapara	69	69	-	-
Sub-total	1151	917	-	-
<u>Barguna</u> <u>Subdivision</u>				
Barguna	325	252	-	-
Patharghata	200	192	-	-
Bamna	220	192	-	-
Amtali	465	408	-	-
Betagi	225	408	-	-
Sub-total	1435	1176	-	-
Dist.Total	2586	2093	-	-

Source: Thana Agricultural Officers

90° 00'

90° 15'

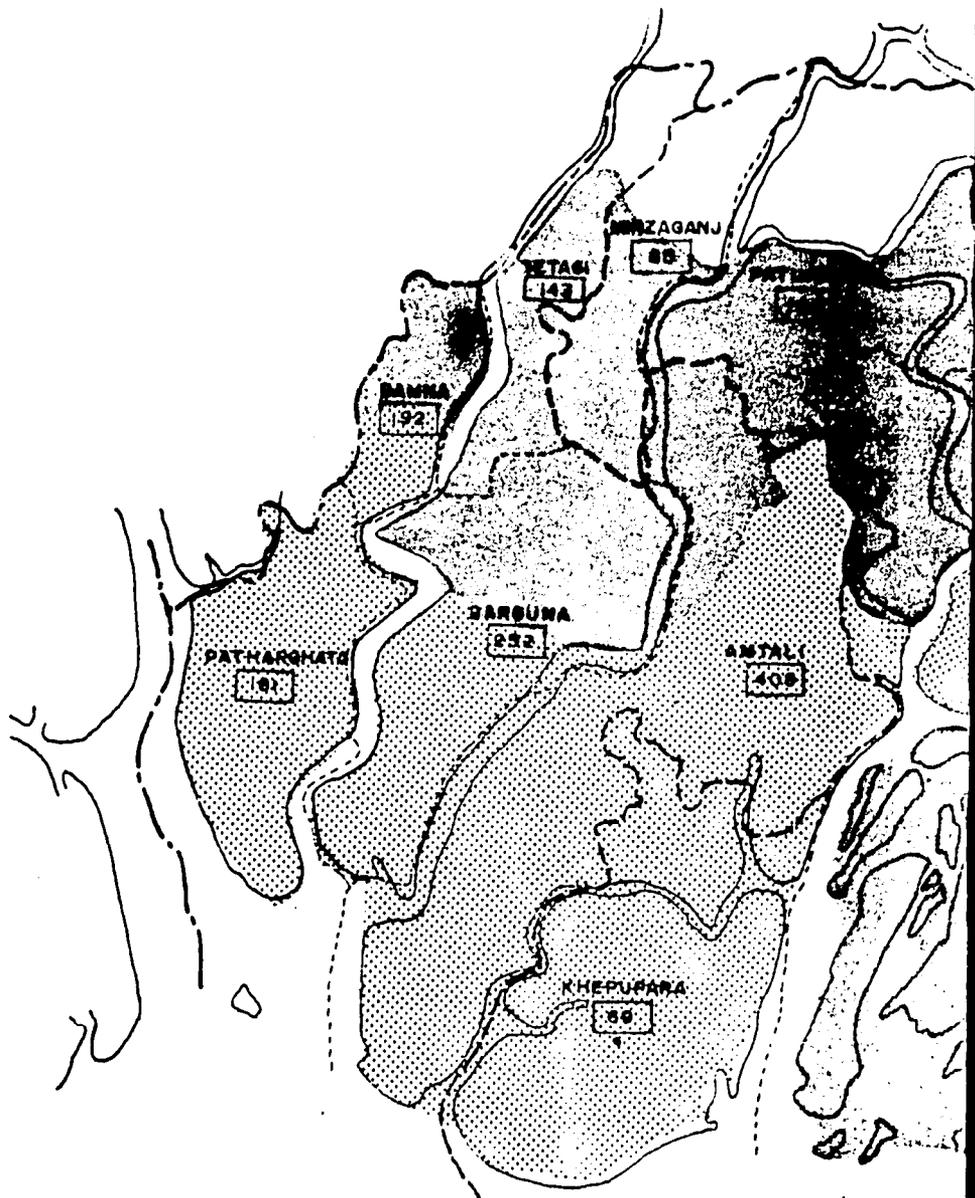
34 A

22°
30'

22°
15'

22°
00'

21°
45'



B A Y O F B E N G A L

90° 00'

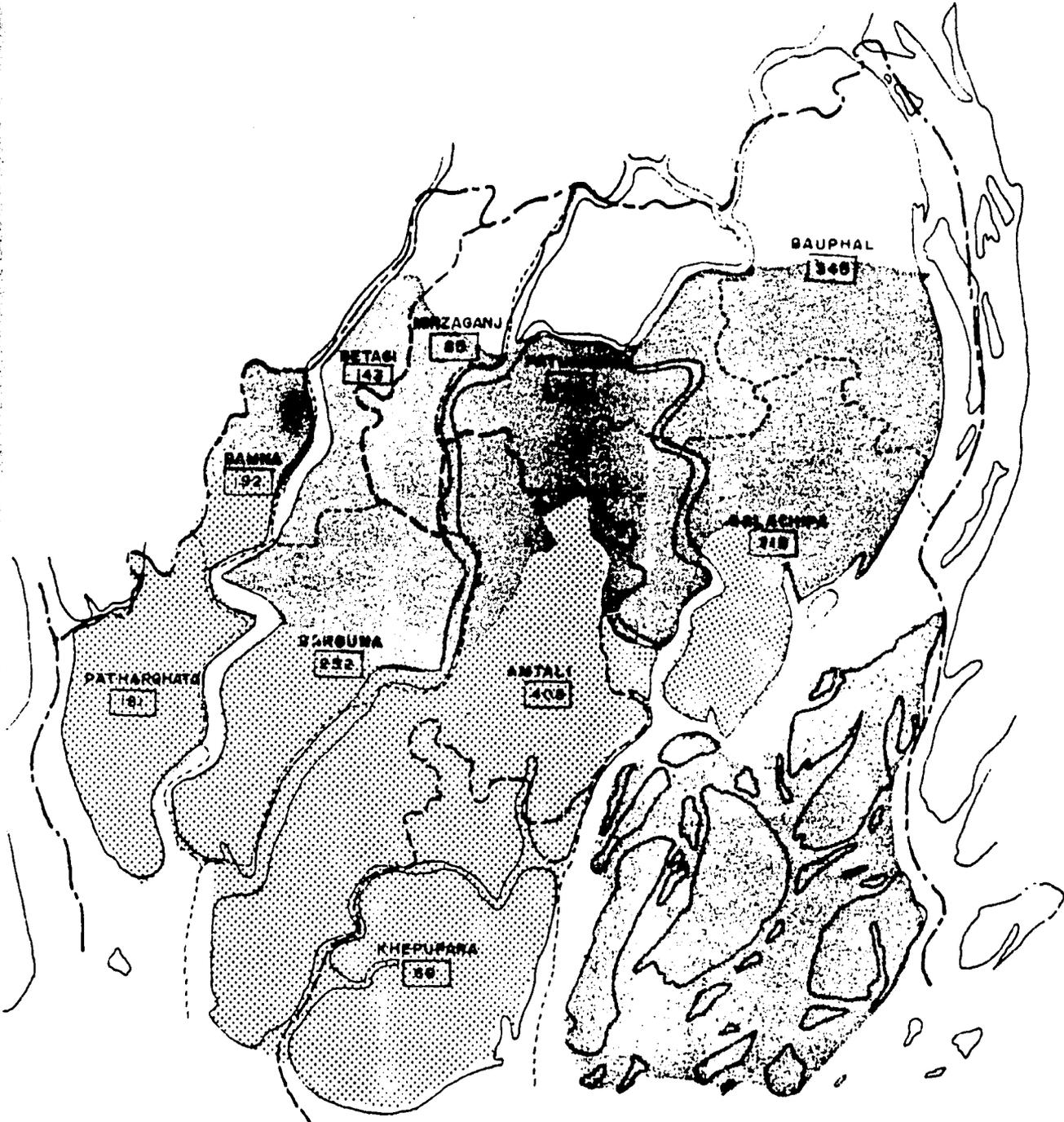
90° 15'

90° 00'

90° 15'

90° 30'

34 B



B A Y O F B E N G A L

90° 00'

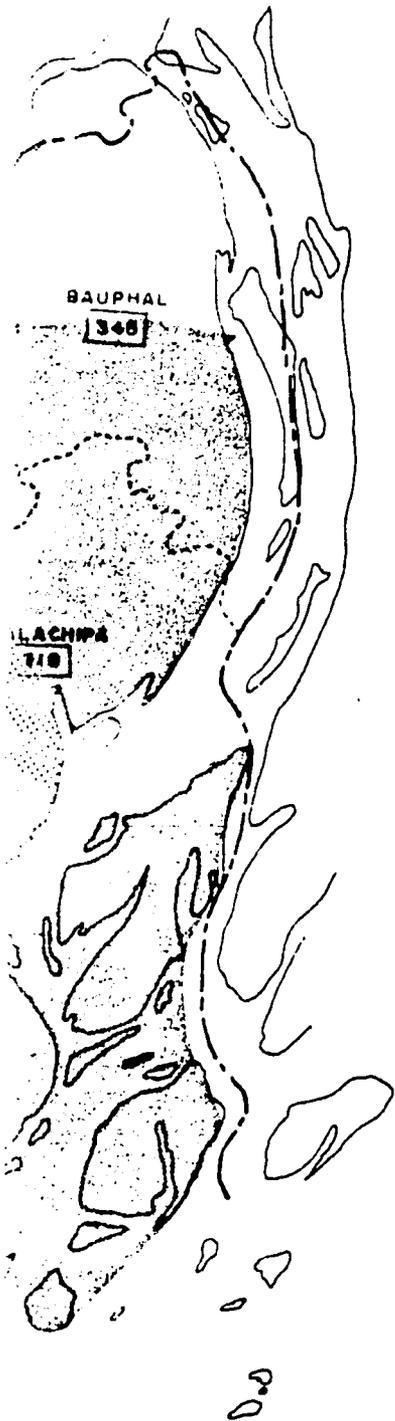
90° 15'

90° 30'

90° 30'

34 C

DIST. PATUAKHALI



22°
30'

LEGEND:

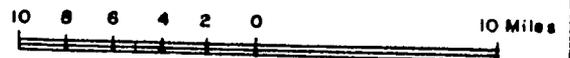
- Dist. Boundary
- Sub-Division Boundary
- Thana Boundary
- Power Pump
- Proposed Irrigation & Flood Development Project
- On Going Irrigation & Flood Development Project

22°
18'

22°
00'

21°
48'

Scale : 1 inch = 8 Miles



GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH	
RURAL ROADS STUDY	
IRRIGATION & FLOOD CONTROL PROJECT	
LOUIS BERGER INTERNATIONAL INC. AND RAHMAN & ASSOCIATES LTD.	
PREPARED: Raihan	RECOMMENDED:
CHECKED:	APPROVED:
DATE:	DRG. NO.:

90° 30'

There are no deep or shallow tubewells in Patuakhali as the water is too saline.

BADC officials state that there are great difficulties in transporting the pumps to the rural areas as it has to be done entirely by boat.

2. Fertilizer

Patuakhali has one of the lowest per acre use of fertilizer among the districts of Bangladesh. In 1975-76 the district had an average of only 16 lbs. used per crop acre as compared to the national district average of 36 lbs per acre. In total, Patuakhali used only 1% of the country's fertilizer consumption.

Since there is no fertilizer factory in Patuakhali, all of the district's fertilizer requirements must be imported. The majority of the fertilizer is shipped from Chalna and then distributed to the thanas by boat. The fertilizer distribution figures for 1973-74, 1974-75 and 1977-78 for each thana are shown in Table 10.

TABLE 10
DISTRIBUTION OF FERTILIZER (TONS)

Name of Thana	1973-74	1974-75	1977-78
<u>Subdiv: Barguna</u>			
1. Betagi	470	250	365
2. Bamna	386	347	385
3. Patharghata	346	183	283
4. Barguna	953	568	1125
5. Amtali	789	606	510
Sub-total	2,944	1,954	2,668
<u>Subdiv: Patuakhali</u>			
1. Mirzaganj	395	74	225
2. Patuakhali	654	386	435
3. Baunhal	712	150	1155
4. Galachipa	406	23	365
5. Kalanara	62	65	252
Sub:total	2229	698	2432
District Total	5,173	2,652	5,100

Note: The 1977-78 statistics only cover nine month period.

Source: a) Statistics of Bangladesh Agriculture, 1975
b) BADC Fertilizer Officer, Patuakhali District

3
Table 10 indicates that there has been very little increase in fertilizer consumption over the past four year period. This is a result of a combination of constraints that include: serious flooding, absentee landholding, poor transportation, and a fragmented distribution system.

3. Credit

Agricultural credit is available to farmers in Patuakhali from both official and unofficial sources. The unofficial sources are the local money lenders. The official sources are: (1) the Bangladesh Jatiya Samabaya Bank (BJSB); (2) the Bangladesh Krishi Bank (BKB); (3) the Integrated Rural Development Program (IRDP); and (4) recently the Nationalized Commercial Banks (Sonali, Janata, Agrani, Rupali, Pubali and Uttara).

The government is committed to make a strong effort to provide institutional credit to farmers. The Bangladesh Jatiya Samabaya Bank and its affiliated cooperative banks disburse credit through a large network of cooperative organizations including Thana Central Cooperative Associations and Fishermen's Societies. District disbursement figures are not available for Patuakhali but the bank is an important source of credit.

The Bangladesh Krishi Bank has five branch offices located in Patuakhali, Galachipa, Bauphal, Barguna and Kalapara. (See Figure 6). All of these branches are unprofitable and cannot even cover their operating expenses. A summary of their loan activity for 1973-74 and 1974-75 is given in Table 11.

38 A

22°
30'

22°
15'

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00'

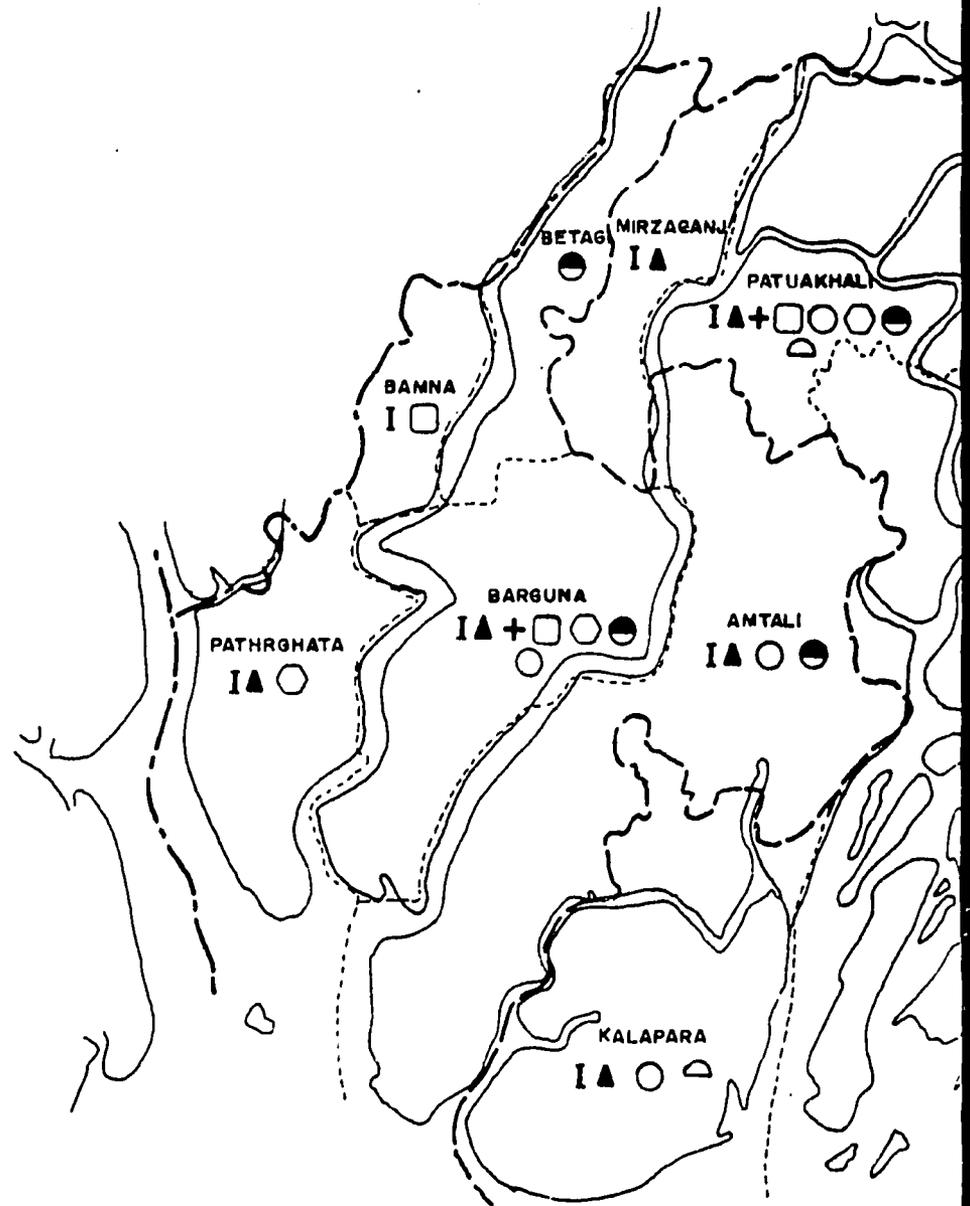
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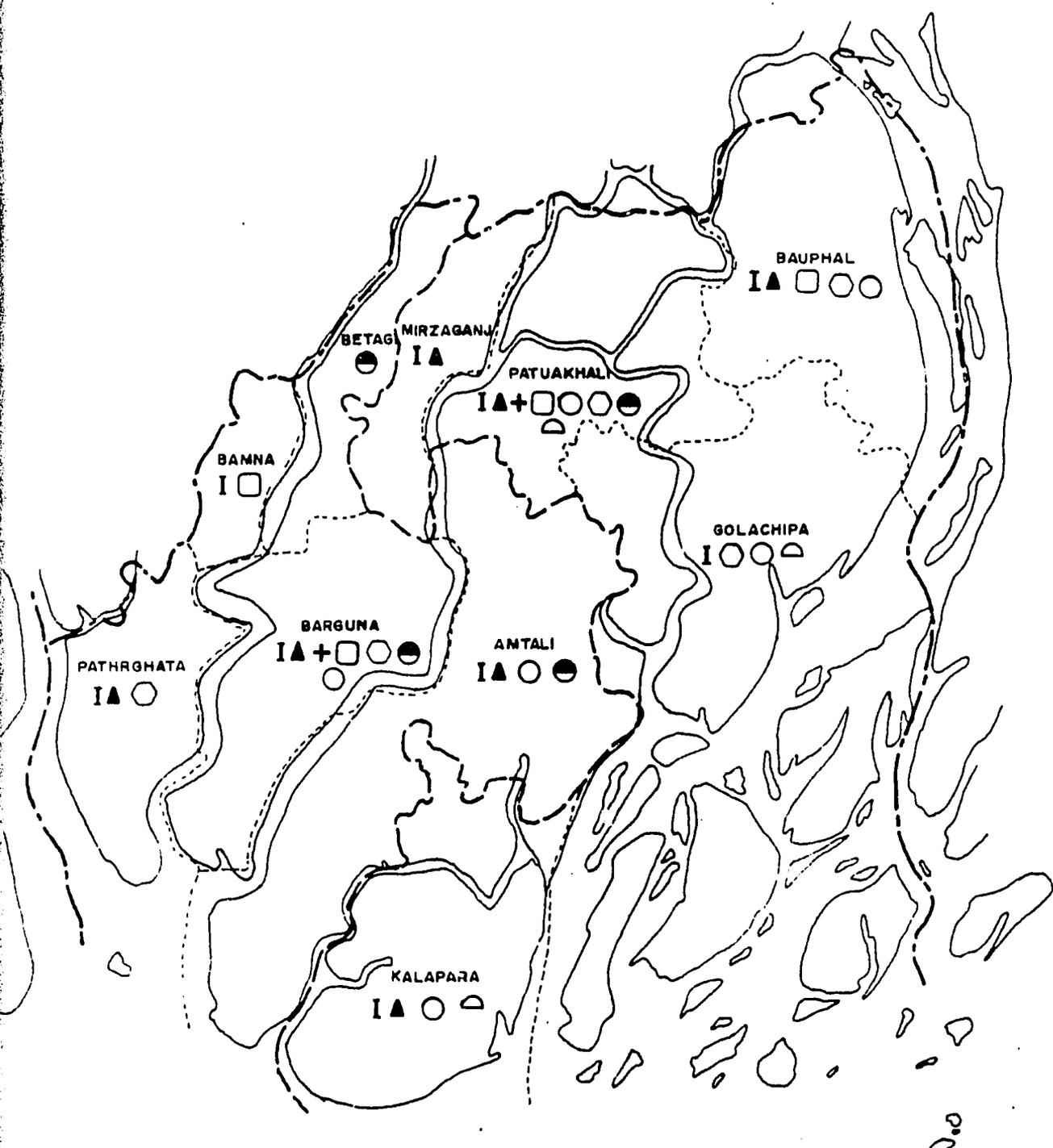


90°00'

90°15'

90°30'

38 B



90°00'

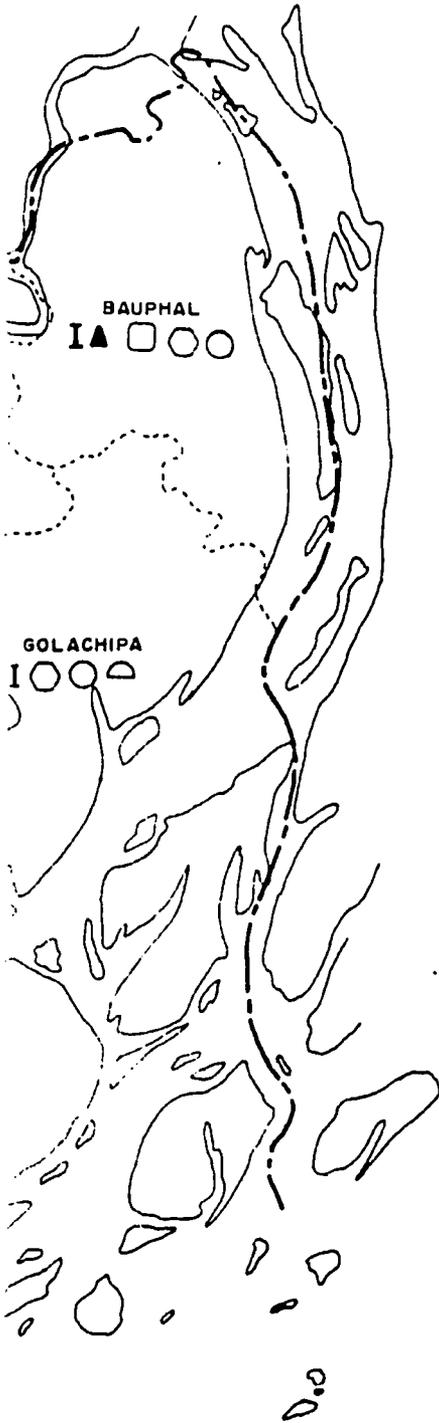
90°15'

90°30'

90° 30'

38 C

DIST. PATUAKHALI



22° 30'

LEGEND:

- Dist. Boundary
- Sub-Division Boundary
- Thana Boundary
- I.R.D.P.
- Sonali Bank
- Agrani Bank
- Janata Bank
- Rupali Bank
- Uttara Bank
- Pubali Bank
- Kristi Bank

22° 15'

22° 00'

Scale. 1 inch = 4 Miles (Approx.)



90° 30'

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH	
RURAL ROADS STUDY	
CREDIT OUTLETS	
LOUIS BERGER INTERNATIONAL INC. AND RAHMAN & ASSOCIATES LTD.	
PREPARED: Rajan	RECOMMENDED:
CHECKED:	APPROVED:
DATE:	DRG. NO.:

TABLE 11
LOAN DISTRIBUTED BY BANGLADESH KRISHI BANK

Branch	1973-74			1974-75		
	No. of Loans	Amount	Amount Out-standing	No. of Loans	Amount	Amount out-standing
Patuakhali	364	335	3,789	459	460	2,886
Galachina	452	487	3,147	485	467	4,300
Bauphal	186	168	291	386	330	1,614
Barguna	837	815	4,981	831	892	6,488
Kalapara	203	241	1,738	314	324	2,145
Total	2,052	2,046	13,946	2,475	2,473	17,433

Source: Bangladesh Krishi Bank.

The BKB traditionally has given medium and long term investment loans to large farmers and although no specific information is available, it is assumed that the great majority of the above loans were to large farmers.

There are Integrated Rural Development Programs in eight thanas of Patuakhali: (See Figure 6). The IRDP's provide short term crop loans to their members to rent or purchase inputs such as pumps, seeds and fertilizer. Table 12 shows the amount of money loaned by each IRDP for specific crops.

TABLE 12
STATISTICAL PROGRESS REPORT OF IRDP IN PATUAKHALI
DISTRICT UPTO 15th MAY 1978

Name of thana	No. of Members	T.I.P. Loans disbursed (Boro numms)	T.Amon Loans Disbursed	Aus Loans Disbursed
Bauphal	4,216	12,62,500	3,00,000	-
Galachipa	4,013	6,86,500	5,87,000	-
Kalapara	3,816	5,10,000	8,36,500	-
Amtali	3,525	15,05,000	16,08,000	-
Barguna	2,942	14,75,000	14,16,569	
Patharghata	5,310	11,82,200	10,16,200	10,00,000
Bamna	1,326	9,44,600	8,03,650	-
Mirzagonj	1,929	5,59,200	9,42,600	-
Total:	27,077	81,25,000	75,10,519	10,00,000

As can be seen from the table the loans were fairly equally spread between the Boro crop, for low lift pump rentals, and the Transplanted Aman crop, for seeds and fertilizer. Only a small percentage was lent for the Aus crop and all of that was in Patherghata.

What is not shown, however, is the default rate on these loans, which averaged 7% for the Thana Irrigation Project loans, 18% on the T. Aman loans and a staggering 45% on the Aus loans. These loans rates are not peculiar to Patuakhali or the IRDP but are a reflection of the long standing default problem that has plagued institutional lending in Bangladesh as in other developing countries.

The latest government push to make credit available to the small farmer is the 100 Crore Agricultural Credit Program which was established in February 1977. The Bangladesh Krishi Bank and the Nationalized Commercial Banks were assigned specific unions in each district and were requested to disburse short term loans to small farmers at 11% interest.

No official results have been made available yet but unofficial reports indicate that there are tremendous agricultural problems in actually lending the money to the small farmers. Part of this stems from the excessive documentation that is required of the farmer and the rest is the result of an over-extended and undertrained bank staff.

In spite of these problems the government has decided to increase the program to 150 Crore annually. Unless these constraints are removed, though, only a small percentage of these funds will even reach the small farmers.

E. Agricultural Potential

A district's potential for increasing agricultural production is largely a function of:

- (1) increasing the area under cultivation;
- (2) increasing the intensity of cropping, that is, the number of crops per year; and
- (3) increasing crop yields through the use of inputs such as fertilizer, irrigation, HYV seeds and credit.

As noted in section A, the cultivation intensity ratio in Patuakhali is 91.2% and is above the average in Bangladesh. Therefore, there is little possibility of improving agricultural production by increasing the acreage under cultivation.

As also noted earlier, the cropping intensity ratio of the district is only 124 (1.24 crops per acre) and this is the next to lowest in the country. There is great potential for increasing agricultural production in this already foodgrain surplus district, but there are serious obstacles which must be overcome .

The Patuakhali-Barisal Integrated Agricultural Project proposes to increase HYV cropped acreage in the district by 200,000 acres over a seven year period. This consists of adding 50,000 acres under Aman, 130,000 acres under and 20,000 acres under Aus.

To attain these targets enormous amounts of agricultural inputs including seeds, fertilizer, insecticides, low lift pumps and credit will be required. Although it is a large undertaking these inputs can be supplied but the two major constraints to increased production are the land ownership pattern and the inadequate road network.

Patuakhali has a large number of absentee landlords, who live in Dacca and Barisal and have no interest in improving the production of the land. Many of these own more than the legal limit of 100 bighas and rent the land out to tenants (bargadars) who only get one third of the production. Since the landlords are not interested in supply the inputs and the tenants cannot afford to, HYVs are not adopted.

The other major problem is transportation. As mentioned before transport communication in Patuakhali is in a primitive condition, with water transport the only mode available. This severely curtails any meaningful agricultural extension program as well as the marketing options of many farmers.

Because of these serious constraints it is doubtful whether Patuakhali will be able to reach its HYV adoption target. It is expected that agricultural production will increase as more HYV Boro is adopted and the cropping intensity improves but this will be at a slower pace than is projected.

V. OTHER ECONOMIC ACTIVITIES

A. Fisheries

The Patuakhali District, because of its prominent natural landmarks in rivers, canals, estuaries and coasts, is rich in fish resources - both inland sweet water fish and marine fish resources. Since the district is new, the development activities for exploiting the potential of these resources are also in their initial stage of planning and execution. The Fisheries Directorate, located in Dacca, had been devoting some attention on the fisheries problems in the region. But such attention, both because of distance and of administrative exigencies, had been clearly inadequate. The Consultant's field survey, on the basis of contact with the new district's relevant officials, could obtain only limited information on the fisheries.

Three kinds of activities can be identified on the basis of our information:

First, fish fry production and distribution lead to increased productivity in relatively short periods of time. One instance is the Fish Seed Multiplication Farm operating in _____ . This has the potential of producing 5 lakh fry per year. But the choice of breeding is only once a year while nilotica/telapia of foreign type can be bred 4 or 5 times a year. There is however, a question of relative popularity of the taste of the carp variety (i.e. Rui, Katla, Mrigel, Kalibhaus) vis-a-vis that of the nilotica/telapia.

Second, programs of re-excavation of derelict tanks/ponds are also quite important from the point of view of producing an immediate impact on productivity. In Patuakhali, such activities of re-excavation of unproductive derelict tanks/ponds have been only limited, especially because of inaccessibility and deficiencies in modes of transportation. Under the Development and Management Scheme in progress, an water area of about 225 acres (covered by ponds, ditches and polders) is being developed with re-excavation, and construction for the purpose of fish-production. During the current year, (which is also the commencing year), an estimated volume of 75 maunds of fish is known to have been produced upto May, 1978 and a total amount of 600 maunds was expected for the whole year. But the project requires additional funds for ensuring a better pace of construction, fry production, and fish production, as envisaged by the district and lower level officers concerned.

Third, fish exports from the district constitute a significant source of income and economic activity. Transport and marketing problems pose serious barriers to optimisation of these valuable economic opportunities. Two important types of fish-exports are prawn and hilsa. Out of these, the former is the major export to foreign countries through Chittagong; (earning foreign exchange for the country), and the latter is exported to other districts. The exports also indicate the potential of substantial expansion in the production and marketing of the appropriate types of fish. The Rural Roads Project is likely to contribute considerably towards the achievement of that objective. The Fisheries Development Corporation, mostly operating in Chittagong, can coordinate with the Fisheries Directorate and the District authorities

for a successful pursuit of the common objective of fuller exploitation of the potential fish exports.

The Fisheries Development Corporation is currently known to be engaged in providing limited services on marketing and credit. Quick marketing is aimed, with provision of mechanised transport and ice plant at certain points like Khenupara in Barisal and Patharghata in Patuakhali. Credit is provided for purchases of nets and boats on instalment plans. Development of rural roads will enable the Corporation to establish many more points of marketing, especially for exports, and also to expand credit supply considered essential for the progressive expansion in fish production and fish marketing.

Based on field observation, the Consultant can point to a number of problems which deserve priority attention. These are:

1. Fish Fry Multiplication

For the popular carp varieties, there is no place in the district for spawning. As a result, fish-eggs are to be brought from some areas in Faridpur. Poor road system not only hinders that critically important operation of transfer of fish-eggs from distant areas but also causes damage and death to much of these in the process of transportation.

2. Technical Assistance to Private Ponds

There are numerous potentially productive ponds under private ownership. But the owners are unable to re-excavate them for economic exploitation of opportunities in fish development.

Suitable credit arrangements are necessary for supporting such re-excavation work as well as for extensive fish fry supplies. One credit program has been just introduced on instalment basis (3 instalments) for fish fry production only. If the credit of Taka 5 lakh is fully used with supervision, it is estimated that a target of 50 lakh fry production can be achieved as against the present level of only 5 lakh fry production. To support such expansions, however, higher breeding and imports of fish-eggs from Fish Research Stations (Chandpur and Comilla) will be essential. The present source of production (fry and fish) is known to be 8 tanks measuring about 3.3 acres: 5 tanks as nurseries and 3 as stocking tanks.

3. Fishery Cooperatives

There are 5 Central and 128 Primary Cooperatives working in the district. One of the Central Societies is being supported by government for construction and distribution of mechanised fishing boats to fishermen. The society was expected to complete this program of construction and distribution of 17 mechanised fishing boats within the current financial year. Under another scheme, the National Fishermen's Cooperative Society (Bangladesh Jatiya Matsyajibi Samabay Samiti) is now constructing an Ice-Plant at Kalaya Bunder in the subdivision of Bauphal, which will directly benefit 3,000 to 4,000 fishermen. Cooperatives have also been formed for re-excavation of derelict tanks and for fish farming; their number is 27 and 2 respectively. Thus obviously cooperatives are not playing a significant role in these two types of activity. In particular, expansion of activity in fish farming need serious attention.

4. Fry/Small Fish Protection

There is legal provision for conservation and protection of (fry and small) fish under the Conservation and Protection of Fish Act. The enforcement of the legal provision is only nominal, depending as it does on an extremely limited number of Fisheries Department employees. The situation needs close attention of the Ministry of Local Government with a view to using the new rural institutions (Thana Council, Union Council and Village Government) towards ensuring reasonably effective enforcement of the law so that the potential of increased fish production does not go waste.

3. Livestock and Animal Husbandry

Agricultural Census Statistics on cattle and other domestic animals as well as on poultry are not available. District and local officers of the concerned government Departments could not also provide any useful data in this field (which is certainly an essential and important subsector in Agriculture). The new consciousness about the priority of rural development should draw much closer attention to the planning of this subsector at local levels along with agricultural and other rural development planning. The problems of such planning for a newly-created district like Patuakhali are naturally large, both because of deficiencies in administrative preparedness and also because of the general deficiencies of motivation in the farming community of a remote food-surplus district.

On the basis of the data available in the Barisal-Patuakhali Integrated Agriculture Project, proposed by the Deputy Commissioner

of Patuakhali, covering 2 lakh acres of land (as against the net cropped area of 686,000 acres in the Patuakhali District), we may derive an estimate of bullocks existing and required on a pro rata calculation:

	<u>B.P. Project Data</u>	<u>Possible Estimate for Patukhali</u>
	<u>No. of bullocks</u>	<u>No. of bullocks</u>
Existing	74,000	256,000
Required	<u>1,02,000</u>	<u>353,000</u>
Deficiency	28,000	97,000

The above estimate relates to only bullocks. Our field survey team could obtain an aggregate figure of 9 lakh cattle and buffalo to be existing in the district. However, the estimates at least point to the need for intensification of the programs of livestock breeding and imports in the district as a complement to input programs for increased agricultural productivity and increasing the size of surplus (food-grains and other food stuff). At present, one Livestock Officer is attending to the problems of livestock in each thana in the district. At the thana level, veterinary services are also available; but these are aimed to provide protection against contagious diseases only. The problems noticed by field observation are:

1. Breeding

There is one Livestock Breeding Scheme located in Patuakhali. Under the scheme, land has been acquired for setting up one Artificial Insemination Center. The Center is soon to start

operation. But problems of distance and lack of roads as well as means of communication will naturally stand in the way of using the stud bulls effectively. Nor can the process of preservation and transportation of semen for productive use be well-maintained under existing conditions.

2. Veterinary Services

Veterinary services need be expanded to take care of non-contagious diseases and also qualitative improvement of cattle, goats and other domestic animals.

3. Grazing

Grazing land is deficient and the problem needs serious attention when cropping patterns are to be influenced and planned for the purpose of increased agricultural productivity. Cropped land receives priority of attention for IRRI, Boro or Aman crops. Feeding livestock usually receives little attention. In Patuakhali, neglect of grazing land can be avoided considerably with an integrated approach to crop development. At the same time, adequate attention is also called for in organising balanced feeding for livestock so that milk supply can be increased and quality as well as quantity of meat can be improved.

C. Natural Resources

Natural Resources of the district originate mostly from the types of soil and their quality for agricultural productivity, from the flora and fauna significant for the region. Geologically the soil in most places is sandy loam or still clay. In

some tracts of land, there are traces of decayed vegetable matter. But more importantly, a tropical tidal forest (a part of the Sundarbans) presents a magnificent coastline of colourful vegetation. The major segment of the Sundarbans forest is of course in the Khulna District as an extension of the same vegetation along the coastline. While Khulna District has a forest area of 1,426,000 acres, Patuakhali has only 26,000 acres of forest area. This region of Patuakhali Sundarbans lie between the Baleswar on the west and the Meghna on the east.

The historic name of the Sundarbans is known to have originated from the Sundari tree which grows abundantly in the region. From the north, the forest area has been subjected to a rapid process of reclamation for agricultural use. The timber and grass resources of the forest area provide a good base for industrial and construction activities.

On the other hand, the water areas provide productive sources of both sweet water and saline water varieties of fish resources. Salt-water fishes like hilsa, bhetki, bhol etc. sweet water fishes like rui, katla, pangas, chital etc. and swamp fishes like kai, magur, singi etc. represent tremendous resources for development and exploitation. In addition, the coastal waters remain an almost inexhaustible source of supply of marine fish, including prawn and shrimp, for domestic and foreign markets.

D. Industry

Patuakhali District cannot claim anything but an extremely low level of industrial development from the point of view of

modern manufacturing industry. There is no large industrial enterprise, either of the Public Sector or of the Private Sector. Evidence of industrial activity is visible only in the form of a few small and cottage industries based on natural and forest resources.

One Survey Report indicates that there is a limited number of small and cottage industries existing in the district. These are mentioned below:

- a. Small Industry: Rice-mills, ice-plant, match factory, soap-making factory etc.
- b. Cottage Industry: Handlooms, fishing net-making, boat-making, wooden furniture-making, oil-crushing(ghani), handicrafts based on bamboo and cane, earthenware, smithies, goldsmith, mat-making etc.

The detailed picture of small industry and cottage industry obtained by our field survey indicates the Thana-wise position as given in the Table 13 .

TABLE 13
COTTAGE AND PROCESSING INDUSTRIES

Name of Thana		Types of industry/ craft and Number of Unit	
1.	Barguna	Weaving	- 5
		Rice Mill	- 22
		Wheat Mill	- 14
2.	Betagi	Weaving	- 2200
		Rice Mill	- 14
		Wheat Mill	- 14
3.	Patharghata	Wheat Mill	- 11
4.	Amtali	Weaving	- 4
		Rice Mill cum Wheat Mill	- 10
5.	Patuakhali Sadar	Weaving	- 151
		Rice Mill	- 39
		Wheat Mill	- 30
6.	Galachina	Pottery	- 2
		Handloom	- 25
		Rice Mill	- 40
		Wheat Mill	- 10
		Oil Crushing	- 15
		Poultry	- 1
7.	Bauphal	Pottery	- 50
		Weaving	- 10
		Rice Mill	- 14
		Wheat Mill	- 14
8.	Bamna	Rice Mill	- 11
		Wheat Mill	- 11
9.	Mirzaganj	Rice Mill	- 14
		Wheat Mill	- 14
10.	Kalapara	Rice Mill	- 36
		Wheat Mill	- 35
		Oil Crushing	- 1

In addition to the above, one BADC repair workshop is known to be operating in each Thana.

Any assessment of the natural resources of the district will suggest a tremendous potential for the development of small and cottage industries in the various regions of the district. The new areas of activity which need attention for planning and execution at local levels can be : fish-processing, salt production and refining, leather and shoe-making, printing press, bakeries, clothing factories, light engineering workshops, and production of agricultural implements. The Khulna Division Development Board can actively assist in the process of accelerating the development of the potential industries with necessary planning and financial support. The efforts of the Khulna Board may, indeed, be strengthened by the Offshore Island Development Board (for initiating new activity in the islands) and by the National Women's Association (for creating the enthusiasm of women in the setting up of women's cooperatives in the relevant activities).

E. Development Programs

Development planning, in this country, remains predominantly centralised in character. The pattern and pace of development of Patuakhali seem to point to the regional imbalances which result from the centralised approaches. The development effort so far executed, especially in the non-agricultural sectors, presents a picture of excessive modesty and inadequacy in the background of immense potentialities.

The new national emphasis on rural development, if properly designed in terms of decentralised processes of planning and execution, may eventually correct the existing imbalances.

District based planning with participation of all local levels (including those of Thana Council, Union Council and Village Government) is likely to broaden the base and increase the pace of development quite significantly. The proposed road network emerging out of the Rural Roads Project will contribute positively and substantially to such results. But the pre-requisites of the necessary local institutional changes to ensure participation and partnership in the process of development are yet to be fully and consistently organised for the achievement of the objective.

As we noted in the Faridpur Profile, the planned effort of the country, as is functioning now, does not lend itself to adequate identification of the district program, not to say anything about the programs lower down by subdivisions and thanas. The process of decentralisation may, in due course, introduce the necessary institutional changes for local level planning with identification of programs and delegation of responsibilities for the tasks of planning, implementation and supervision.

For Patuakhali, it is even hard to guess if some of the general programs of development activity by thanas and subdivisions will positively and appreciably benefit some of its thanas and subdivisions. If at all, such benefit is not likely to be more than marginal in areas of activity like Thana Veterinary services and expansion of poultry farms. One does not know, for sure, if the new program of organising Village Committees as a means of stimulating increased food production has touched the villages in any area of this remote district.

The identifiable part of the development activities, included in the Two Year Plan, relate to administrative buildings (for district headquarters and Barguna subdivision headquarters), construction of multi-storied flats for the low-income group, establishment of fire-stations (land and river), establishment of hospitals (for the district and for Barguna subdivision) and establishment of polytechnic institute (in Patuakhali). Projects in the productive sectors seem to be conspicuous by their absence in the listing of programs prepared by the Planning Commission.

In fact, even the most essential infra-structure facilities of power generation and distribution are known to be extremely limited. That situation itself must have worked as a retarding factor against industrial and agricultural expansion. At present, along with the district town of Patuakhali, the only places that have received the blessings of electrification are the thana headquarters of Barguna and Kalapara. Electrification must be provided, on a priority basis, to all the thanas and to selected trade centers and villages, if a reasonably rapid pace of development of resources of the district towards contribution to national economic benefit is to be realised.

VI. SOCIO-ECONOMIC CHARACTERISTICS

A. Occupational Distribution

The population of Patuakhali is predominately rural (97.5%) and is mainly involved in agriculture.

Of all employed population over age 10, 87% were employed in agriculture according to the 1974 Census. The next largest employment categories were "production and transport", employing 6.9%, and "Sales" employing 2.9%. Even smaller percentages are found in the other categories reported by the census: services, clerical, administrative/management and professional/technical.

This occupational distribution is similar to that of Bangladesh as a whole. However, as in the other three districts studied in this project, the percent employed in agriculture is higher than the national average (79.1%). And the percent employed in "production and transport" is considerably lower than the national average (11.2%). Probably this statistic reflects both the low industrial development of the district (there are no major factories), and the poor development of transportation infrastructure in Patuakhali.

The census breakdown shows that only 2% of the persons engaged in employment for pay are women. However, the economic contribution of women, particularly in the processing of the agricultural harvest, is considerable, though not reflected in the census.

B. Agricultural Employment

The 1974 Census further breaks down the agriculturally employed population. These are shown in Table 14 comparing Patuakhali with the rest of Bangladesh.

TABLE 14
DISTRIBUTION OF AGRICULTURALLY
EMPLOYED PERSONS OVER AGE 10

	Patuakhali	Bangladesh
Owner Cultivators	25.9%	31.1%
Owner-Sharecroppers	20.8%	13.1%
Sharecroppers	2.5%	3.5%
Agricultural Labor	29.5%	24.8%
Unpaid Family Helpers	21.1%	27.4%

There is some difference in the two distributions. Particularly the number of owner-cultivators (that is, those who own and cultivate only their own land) is slightly lower in Patuakhali than in Bangladesh as a whole. The inverse of this is that a slightly larger portion of the agriculturally employed persons partly or solely work^{on} land they do not own, either as sharecroppers, agricultural or day laborers, or unpaid family helpers.

The unpublished breakdown of these statistics by subdivision is also examined in Table 15 . The differences between the two subdivisions are not as striking as in some other

districts, most categories differing by only one or two percent.

However, the percentage of agricultural laborers in Barguna Subdivision is five percent higher than in Patuakhali Sadar.

TABLE 15
DISTRIBUTION OF AGRICULTURALLY EMPLOYED PERSONS
OVER AGE 10 BY SUBDIVISIONS

AGRICULTURAL EMPLOYMENT CATEGORY		PATUAKHALI SADAR	BARGUNA
Owner-Cultivators	(n)	57,287	36,601
	(%)	27%	25%
Owner-Sharecroppers	(n)	44,634	29,027
	(%)	21%	20%
Sharecroppers	(n)	5,613	3,313
	(%)	3%	2%
Agricultural Labor	(n)	56,447	46,663
	(%)	27%	32%
Unpaid Family Helper	(n)	46,771	29,946
	(%)	22%	21%
TOTAL	(n)	210,752	145,550
	(%)	100%	100%

C. Level of Unemployment

The 1974 Census published a statistical category showing those "looking for work". To construct an unemployment indicator, this figure was converted into a percentage of the total employed persons.

The result was a very low 1.8% of persons unemployed in Patuakhali, compared with 2.5% in Bangladesh as a whole, also an unbelievably low estimate. 1

The unpublished statistics at the subdivision level were also obtained. They showed a somewhat higher level of unemployment in Patuakhali Sadar Subdivision (2.5%) than in Barguna Subdivision (1.1%).

Unfortunately, these statistics have such serious problems of definition that they cannot be taken as reliable indicators of unemployment. The census was taken at a time of great economic distress in Bangladesh when much higher unemployment levels would be expected. Probably the main problem with the statistics is that they greatly understate underemployment. A very large portion of the agricultural labor force may be seasonally employed, working only 40%, 50%, or 80% of the days. The number of "full-time jobs" is few.

However, it is possible that the small differences in the statistics indicate relative differences in unemployment, and thus that Patuakhali has a lower level of unemployment. This would be consistent with other information obtained in the district.

In general the man/land ratio in Patuakhali is more favourable than much of the rest of the country. Most families that are not landowners appear to have access to sufficient land by sharecropping or farming others' land to sustain them through the year, barring a natural calamity. Thus even in the slack seasons, sharecroppers or agricultural laborers who would usually migrate for work from other districts might not do so from Patuakhali. Furthermore, there is a substantial seasonal labor immigration to Patuakhali at times of peak labor demand.

D. Land Ownership Patterns

A recent national survey, Report on the Hierarchy of Interests in Land in Bangladesh, has given the most reliable national picture to date of landholding and tenancy distribution. It shows a high degree of land polarization in the country. About 60% of the cultivable land area is owned by only 20% of the rural population. As much as 60-90% of the land is worked by persons other than the owner.

Unfortunately, these data are not available at the district level. Within several months, however, the first district level reports of the national agricultural census taken in 1977 will be published giving similar information. In the absence of other data, the informal observations of district and thana officials on landholding may be relied on for the time being.

It appears that in Patuakhali there is a concentration of very large landholders such as is found in only a few parts of Bangladesh. These persons may own or control far more land than the legal limit of 33 acres. The land is often held in the names of their relatives or bargadars, though there is no question who has control over the land. The phenomenon is primarily found in the southern and eastern portions of the district where new char land is being formed by deposits of silt carried down the rivers, in Galachipa and Kalapara Thanas particularly.

These large landlords are somehow able to seize control of land emerging from the river or seas, using their lathials, or hired strongmen, to drive away others who may have tried to farm and gain possession of the new land. Partly because

of the isolation of these areas, particularly in times of high water which are dangerous for small boats, the police are helpless to protect other legitimate contestants for the land from being driven away or killed.*

The large landlords in turn either hire labor to till their land or sharecrop the land out. The portion of the produce retained by the sharecropper is among the lowest in the country, one-third, though the landlord provides the inputs.

This existence of large landholdings and also a substantial amount of absentee landownership in the district are regarded by district officials as a major obstacle to the agricultural development of the district. The district is already surplus in foodgrain and exports much to other districts. And the potential for additional production-increases using HYV's is great. But land tenure factors minimize the incentive to adopt the HYV's.

The large landowners who farm their land with hired labor find it more profitable and less risky to maximize the area under their control using traditional varieties, rather than adopt the more labor-intensive HYV practices. And sharecroppers who retain only one-third of their produce would not receive enough to pay for their investment in inputs.

A recent report originating from the Patuakhali D.C.'s office suggests that only a very vigorous land reform would remove this impediment to development.

* The most recent incidents in char Jubilee and char Clark are concrete instances.

E. Famine Prone Areas

It has previously been noted that all of Patuakhali is particularly vulnerable to the country's occasional cyclones. It also occasionally experiences severe flooding either from simultaneous high water flows of the several major rivers feeding the Bangladesh delta or from tidal bores. These disasters may either be very widespread in the district or they may be somewhat localized. In a very brief period of time, many persons may be killed, homes and villages badly damaged, and crops and animals destroyed.

The very poor transportation and communication system of the district and the weakness of local government and administration make these situations much worse and sometimes turn initial disasters into serious famines.

First, the extent of damage and the location of the worst affected areas are not communicated quickly to officials able to respond. At the time of disaster, many islands or villages may be isolated from the thana headquarters, which have the only radio-telephonic communication with the district headquarters. So even thana officials may not be aware of the extent of damage in their area for several days. Furthermore, the communication of the district headquarters with the rest of the country by telephone and telegraph, which is normally tenuous, is particularly subject to disruption at times of disaster. Thus, there may be a delay of five to ten days before it becomes clear whether and how much outside assistance is required.

Second, there is often an additional delay before emergency medical and food assistance can reach the most severely affected areas. Even assuming that the rivers are calm enough to be navigable the lack of roads to the interior of islands may considerably delay the movement of relief personnel and goods. During this delay, which may amount to five or ten days, cholera epidemics often claim many additional victims due to the pollution of normally safe water sources.

Third, famine grows more slowly after the immediate emergency has subsided. It is likely to be most severe in the more isolated areas and among the poorest sections of the populations. Not only are crops likely to have been destroyed, but supplies of grain kept as seed for the next season are often destroyed due to the lack of safe storage places. Serious malnutrition sets in among the poorer families as their reserves of food and money are depleted. Land changes hands as families are forced to sell their possessions at below normal prices to buy food or repay crop loans. Thus further concentration of land in the hands of larger landowners of the district is likely during disasters.

Although virtually all of Patuakhali District is vulnerable to these calamities, the southernmost and easternmost areas usually appear to be most severely affected. As these are also most poorly communicated parts of the district, they are also the most vulnerable to famine. It may be further noted that these are the same areas where there is already very high degree of land concentration in the hands of very large landlords. The thanas referred to are primarily Galachipa Thana and Kalapara Thana.

There is a degree of organization and preparation for such disasters in the district. Throughout the district there are eighty designated cyclone shelters, of which 46 are in Galachipa Thana and 18 are in Kalapara Thana. Some of these are three or four storied reinforced concrete structures on stilts which can apparently hold 1000 to 2000 people. However, most appear to be schools, colleges, or other pucca structures located on high ground and able to withstand the floods and cyclonic winds.

There are also Thana Relief Committees chaired by the Circle Officers and Union Relief Committees chaired by the Union Paishad Chairman. It is their duty to do a quick survey of damage. After a calamity, they are in charge of distributing foodgrain from the government godowns.

The number of designated cyclone shelters is presented by thana in Table 16.

TABLE 16
CYCLONE SHELTERS IN PATUAKHALI

Thana	No. of Shelters
Galachipa P.S.	48
Patuakhali P.S.	1
Bauphal P.S.	5
Mirzaganj P.S.	1
Betagi P.S.	2
Amtali P.S.	4
Kalapara P.S.	19
Barguna P.S.	1
Pathargata P.S.	1
Total ;	80

VII. SOCIAL SERVICES

A. Health Care/Medical Facilities

There are two broad types of medical services found in Patuakhali District and throughout most of Bangladesh. First, the medical treatment most commonly used in the rural areas consists of many private practitioners scattered throughout the villages and markets. These are persons of very diverse education, training, and skills and medical traditions. They include "quack doctors", homeopathic doctors, kairaj and hakim (practicing a traditional medicine of the subcontinent), compounders, and medicine shop owners. Many of them practice only part-time. Relatively few of the doctors who have received the M.B.B.S. degree from the medical colleges of Bangladesh enter such private practice in rural areas; most either enter salaried government service in one of the institutions discussed below or private practice in urban areas.

Second, there are various government medical facilities which will be reported here.

The Civil Surgeon is the central government officer posted to supervise the government medical services and facilities in the district. He is normally not a native of the district and is posted for a maximum term of three years after which he is transferred to another district.

The number of medical facilities in Patuakhali is not large. The major facilities are centralized in the district or subdivision headquarters. But because of poor communication, even many of the decentralized facilities are fairly remote from the population they are intended to serve.

The government medical facilities are primarily of three types: (1) Hospitals located in the administrative headquarters towns; (2) thana level health facilities located near thana administrative centers; and (3) a few sub-thana facilities. These are enumerated below.

First, the district has two hospitals with a total of 80 beds, with an additional 100 bed hospital to be opened in July 1978. The 50 bed modernized district hospital is located in Patuakhali town. Until three years ago, it was not electrified and even now the water supply is not fully reliable. It will shortly be supplemented by the new 100 bed unit.

The only subdivision hospital is an "unmodernized" 30-bed tin-shed hospital in Barguna, established two years ago.

Because of limitations in staff and facilities, more serious cases must be referred to Barisal Medical College, about six hours away by launch or steamer. Many patients die enroute.

Second, Thana Health Complexes are functioning in four thanas (Mirzaganj, Galachipa, Amtali, and Patharghata). THC's are under construction, but not yet functioning in four other thanas (Bauphal, Kalanara, Bamna, and Betagi).

The third category of facility is the sub-thana centers of which there are several types. Each of the thanas having a functioning Thana Health Complex has three sub-centers as well. In the remaining thanas, there are a total of nine Rural Dispensaries, each staffed by a medical officer, a compounder, and a peon, and offering only outdoor services.

The government has recently decided to further decentralize health service and integrate it with family planning services by establishing Mother-child Health Care Centers (MCH). Over a five year period, one is to be started in each union.

Two MCH are now under construction in Patuakhali. One at Kalupara Union in Bauphal P.S., and one in Kaunia Union in Betagi P.S. Thirteen more have been sanctioned and will be set up using existing buildings.

In addition to the above medical facilities, the district has one District Maternity Center and ten family planning Clinics staffed by Lady Family Planning Visitors.

Transportation difficulties and the centralization of services present very serious problems of accessibility to medical care in Patuakhali. This situation is most acute from May to September when the main north-south rivers of the district are often not navigable by small craft.

The problem is one both for the users of medical care and the trained staff of the Civil Surgeon. The user may have serious problems in reaching even the thana or union based services particularly in southern Galachipa, Kalupara, Amtali, and Barguna thanas where some islands are often separated from their thana headquarters by turbulent waters. Many potential users

have insurmountable problems in reaching the special services that may be required in Patuakhali or Barisal. The Civil Surgeon is greatly restricted in his ability to supervise or support the thana or union facilities due to the very large amounts of time required (in some cases more than one-day under favourable weather and water conditions) to reach these facilities. This is especially a problem for Galachipa, Kalanara, Barguna, and Patharghata.

As the Patuakhali Civil Surgeon told the consultant, "In time of calamity, the doctor cannot reach the people, and neither can the people reach the doctor. Many people die for want of simple medical care."

This also affects the adoption of Family Planning devices which must be fitted by a doctor. The time involved in travelling to and receiving this service may be three days even if the service is available in the same thana. Few can afford the time or expense involved.

B. Education

The educational system of the district consists of "government schools" financially supported by the national government and "non-government schools" organized and supported locally. The non-government schools receive only small annual grants-in-aid from the government to subsidize teachers' salaries. The presumption generally is that the quality of the government schools is better than the non-government schools, because of the greater reliability of financial support and closer supervision.

The summary statistics of these facilities for Patuakhali District are shown in Table 17.

TABLE 17
SUMMARY STATISTICS OF PRIMARY AND SECONDARY
SCHOOLS IN PATUKHALI, 1978

	Primary(Classes 1-5)		Secondary(Classes 6-10)	
	Govt.	Non-Govt.	Govt.	Non-Govt.
No. of Institutions	920	N.A.	4	249
No. of Teachers	4076	N.A.	92	2211
No. of Students	227726	N.A.	49,468*	

* Secondary student total includes both government and non-government schools.

Table 18 presents the distribution of institutions and students by thana.

TABLE 18
DISTRIBUTION OF PRIMARY AND SECONDARY SCHOOLS
AND STUDENTS BY THANA IN PATUAKHALI DISTRICT

Thana	Primary		Secondary		Total Students
	No. of Govt. Schools	No. of Students	No. of Govt. Schools	No. of Non-Govt. Schools	
<u>Sadar Subdivision</u>					
Patuakhali	134	30,181	2	30	6,401
Bauphal	130	42,623	-	44	9,285
Galachipa	150	37,808	-	40	7,140
Mirzapanj	59	18,188	-	17	3,266
Kolepara	63	10,435	-	14	2,691
<u>Barguna Subdivision</u>					
Barguna	105	21,139	2	30	5,635
Amtali	119	31,916	-	32	5,549
Betagi	69	17,447	-	19	4,624
Banna	34	6,324	-	9	2,814
Patharshata	57	11,465	-	14	2,814
Totals:	920	2,27,726	4	249	49,468

Sources: District Education Officer(Patuakhali)
District Inspector of Schools(Patuakhali)

Note: Data on the non-government primary schools was not available.

According to the 1974 Census, the literacy rates for Patuakhali (24.8%) are somewhat above the national literacy rates (20.2%). The district ranks fourth among the districts of Bangladesh. This is somewhat of an improvement over the 1961 Census, when Patuakhali would have ranked 11th if the present district boundaries had existed. In 1961, the literacy rate for Patuakhali was 14.6%, somewhat below the provincial average of 16.3%.

Table 19 shows the literacy rate by age groups and sex. By looking at the different age groups, we have a picture of the change in literacy rates in Patuakhali over time. Thus, among the men age 55-64 who would have received most of their formal education during the years of 1914-34, 36% are literate. Those in the 15-19 year age group, who have been educated between the years of 1959 and 1974 have a literacy rate of 55%.

TABLE 19
PERCENT OF LITERACY IN PATUAKHALI DISTRICT
BY AGE AND SEX; ALL PERSONS OVER 5 YEARS
(1974 CENSUS)

Age Group	Percent Literate	
	Male	Female
5 - 9 years	17%	15%
10 - 14 years	52%	39%
15 - 19 years	55%	32%
20 - 24 years	49%	24%
25 - 34 years	45%	17%
35 - 44 years	42%	11%
45 - 54 years	39%	6%
55 - 64 years	36%	3%
65 years & over	34%	3%
Total over 5 years	40%	20%

By comparing men and women within each of the age groups, it can also be seen that there is a substantially larger percentage of literate men than women in all age groups, except the youngest, who were only beginning their formal education at the time of the last Census. However, the gap in the literacy rates between men and women has been gradually declining. In the 55-64 year age group, the literacy of men is 12 times that of women. In the 15-19 year age group it is 1.3 times that of women.

Unpublished census statistics show little difference among the subdivisions in the level of literacy. In Patuakhali Salar Subdivision the literacy rates of males and females over 5 years were respectively 40.0% and 18.5%. For Barguna Subdivision, rates were respectively 39.7% and 21.6%.

The current differences in enrollment of boys and girls in the primary and secondary schools are shown in Table 20. In the government primary schools, though 29% of the district-wide enrollment is made up of girls, there is considerable variation by thana, from the low of 11% in Bauphal to 48% in Kalapara.

TABLE 20
PERCENTAGE DISTRIBUTION OF STUDENTS
BY SEX AND THANA

Name of Thana	Government		All	
	Primary Schools		Secondary Schools	
	Male	Female	Male	Female
<u>Salar Subdivision</u>				
Patuakhali	63%	37%	83%	17%
Baunhal	89%	11%	84%	16%
Galachina	73%	27%	86%	14%
Mirzaganj	74%	26%	86%	14%
Kalabara	52%	48%	84%	16%
<u>Barguna Subdivision</u>				
Barguna	59%	41%	82%	18%
Amtali	76%	24%	85%	15%
Betagi	64%	34%	86%	14%
Bamna	56%	44%	84%	16%
Patharghata	58%	42%	84%	16%
Totals:	71%	29%	84%	16%

Source: Based on data provided by the Patuakhali District Education Officer and District Inspector of Schools, May 1978.

C. Food Procurement and Rationing

Patuakhali is a foodgrain surplus district. Because of this the operation of the official distribution system of the Food Ministry in Patuakhali takes on significance for other parts of the country. This system has two parts: Procurement and Rationing.

The rationing system operates primarily to assure a steady supply of foodgrains and other basic foodstuffs (especially salt and edible oils) to urban residents and certain categories of persons living in rural areas who are entitled to purchase the rations at subsidized rates. One of the major categories includes government employees, including teachers in government schools. The other category includes 10-15% of very poor persons. These persons purchase their rations monthly from designated union ration dealers. The ration dealers in turn lift their allotment from Local Storage Depots, or LSD's, located in different parts of the district. The rice or paddy has been procured within the district. Other foodstuffs (oils, sugar, flour, wheat) have been brought by barge by private contractors from Khulna, Chandpur, or Narayanganj, having either been procured from other parts of Bangladesh or imported from abroad.

The system of LSD's operated by the Food Ministry also supplies the grain used as payment in Food-for-Work Programs and grain distributed as relief in times of disaster.

The district does not have any large Central Storage Depots. However, there are 17 LSD's, consisting of 35 bucca godowns and 20 tin shed godowns with a total storage capacity of 618,750 maunds or 22,500 tons. These are listed by LSD and thana in Table 21.

TABLE 2
NUMBER AND CAPACITY OF FOOD STORAGE GODOWNS

Subdivision/ Thana	Location	No. of Godowns		Total Capacity (Tons)
		Pucca	Tin Shell	
<u>Patuakhali Sadar</u>				
Patuakhali	Patuakhali	5	-	2,500
Bauphal	Boga	5	-	2,500
Bauphal	Kalaiya	4	-	2,000
Galachipa	Galachipa	4	-	2,000
Galachipa	Rangabali	2	4	2,000
Galachipa	Rangonaldi	-	4	1,000
Galachipa	Char Kazal	-	4	1,000
Galachipa	Barabaisdia	-	2	500
Galachipa	Char Montaz	-	2	500
Kalapara	Khepurara	3	-	1,500
Kalapara	Mohipur	-	2	500
<u>Barguna Subdivision</u>				
Barguna	Barguna	2	-	1,000
Barguna	Kuljhuri	2	-	1,000
Amtali	Amtali	1	-	500
Amtali	Taltali	3	2	2,000
Betagi	Betagi	3	-	1,500
Patharghata	Patharghata	1	-	500
Total		35	20	22,500

During the last procurement period, there was a considerable increase in the quantity of paddy procured and a decentralization of the procurement process using 15 Temporary Procurement Centres. Thus it was necessary to take over 90 buildings (usually schools, madrasahs, training halls in the Thana Training and Development Centers or private godowns) to have sufficient storage space for the procurement. This additional temporary capacity was 329,900 maunds or 12,000 tons. Understandably, the district officials are urging the construction of additional food godowns for the district and the replacement of the unsatisfactory tin shed godowns. An Asian Development Bank team has recently evaluated this need in detail for possible funding.

The increase in procurement for Patuakhali is seen in Table 22, covering the past five years.

TABLE 22
FIVE YEAR PROCUREMENT OF PADDY IN PATUAKHALI
BY DISTRICT CONTROLLER OF FOOD

Year	Tons of Paddy	Maunds of Paddy
1973-74	9,000	246,125
1974-75	8,000	211,971
1975-76	40,000	1,046,377
1976-77	22,600	616,347
1977-78	84,000	2,284,678

VIII. SOCIAL DEVELOPMENT CONSIDERATIONS

A. Character and Role of Local Leadership

According to government policy the thana or police station, is the primary development unit. However, the organizational structure of government development activity has for several years left only limited opportunities for the development of local leadership at the thana level. The present government has been trying to reverse this trend. Several types of local leadership will be noted.

At the village level, there are usually one or more councils comprised of several village leaders. The name and structure of these groups varies from place to place. They have no legal standing. But in many villages they carry out important functions of a traditional nature. For example, they settle local disputes, including sensitive land disputes, enforce behavioral rules, build and care for the mosque or other religious institutions, and organize village defense committees. Generally they do not take on the organisation of development tasks.

In some villages, these local leaders have very strong authority over their villages; in other villages, the "traditional" institutions have become weak and unimportant. The leaders often acquire their position partly by inheritance; but respected

characters, education and changes in wealth are factors which may also enter into their gaining or losing the position.

One development-oriented form of leadership at the village level is through agricultural cooperatives. Particularly in those thanas which have an Integrated Rural Development Program, there is an organizational structure designed for training cooperative leaders and providing them contact with the thana government officers representing different development agencies.

However, it has become a matter of national concern that a disproportionate number of leaders of village cooperatives seems to be from the surplus and large farmer groups.

Subsidized benefits intended to benefit primarily small farmers easily become diverted. There are about 1400 village agricultural cooperatives in Patuakhali District affiliated with Central Cooperative Banks and 988 villages cooperatives affiliated with the Integrated Rural Development Program.

Some experimentation is now underway in Patuakhali with an institution known as gram sarker (village government) as a vehicle for village development in the Swanirbhar (self-reliance) Movement. Details on the functioning and performance of this institution in Patuakhali were not available.

The union level is the only level where there has remained a locally elected government, the union parishad. The union parishads are under the supervision of the Circle Officer (Development).

In the early 1960's, the union parishads were responsible for much local infrastructure development. Many of the existing thana rural roads were planned and built during a three to four year period by the union councils. The funds were allotted to the union (and thana)councils by the central government under the Rural Works Program, with payments for earth work often made through U.S. P.L. 480 grain funds.

Since that time the responsibilities, resources and powers of the union councils have suffered from decay until the recent revitalization. Even now they have only very minor power to tax their residents and are dependent almost completely on the changing policies and funds of the central government for their ability to engage in significant development works. Some funds for earthwork now come through the Food for Works Program. The Ministry of Local Government, Rural Development and Cooperatives is also again building up the Rural Works Program and it may include funds for structures other than earthwork. Since the U.P. elections

in 1977, the government has attempted to train many U.P. members, often by sending them to other Asian countries for short observation periods.

At the thana level there is no elected local government body. However, in the past few years, thana councils have often informally operated. The thana councils are to be formally reconstituted in July 1978 and may eventually be directly elected. The details of their new responsibilities are not yet clear, but it is expected that they will again be in-charge for various types of local public works such as feeder road construction. Though the councils will work closely with the various appointed government development officers at the thana level, it is unlikely that any real power over those officers would be handed over to the local councils.

The implementation of some of the roads in the proposed rural roads projects in this district will involve dealing with these separate councils who will have ultimate responsibility for the maintenance of the roads, especially the Class V roads.

One indicator of the degree of activity of the union and thana councils is whether or not they have prepared the thana and union plan book sent by the Ministry of L.G., R.D., and

Another indicator of the activity of the local bodies is the extent to which they have carried out various types of infrastructural works. In Patuakhali, the projects reported by Circle Officers as having been undertaken in the past two years include the following :types: road, embankment, bridge, sluice gates;godown construction;road reconstruction and canal reexcavation. Funds or grain for these projects have been received under the Food for Works Program, the Thana Irrigation Program, the Rural Works Program, and from other sources of the Ministry of Local Government, Rural Development and Cooperatives.

At the thana level, the primary responsibility for development matters is given to the officers posted at the thana level by different development ministries. These include the responsibilities for the development of agriculture, irrigation, education, health facilities, and cooperatives in the thana.

To a large degree, these officers are the powerful people in the thana. However, they are not local leaders in the sense that they are not permanent residents of the thana in which they serve. They are not really accountable to or responsible to the people of that thana. Their tenure in any thana is limited to three years, and often they are transferred to another thana long before that period ends. Their main

Cooperatives last year. The system of thana plans, which was very important in the early 1960's, had fallen into disuse. The present government is trying to revive the plans alongwith a renewed emphasis on local government. The information received by the consultant on the status of the thana and union plans is shown in Table 23 for each thana.

TABLE 23
STATUS OF THANA AND UNION PLANS

THANA	Thana Plan	Union Plan
<u>SADAR SUBDIVISION:</u>		
KALAPARA	5% Completed	Two Unions completed Union Plan Book
BAUPHAL	15% Completed	None
MIRZAGANJ	70% Completed	Three Unions Completed
GALACHIPA	75% Completed	Ten Unions Completed
PATUAKHALI	Thana Planbook completed	None
<u>BARGUNA SUBDIVISION</u>		
BESAGI	40% Completed	Union Planbook being prepared
PATHARGHATA	Not yet received	Just Started
AMTALI	100% Completed	8 Unions Completed
BARGUNA	Received New Plan Book	None
BAMNA	50% Completed	One Union Completed

responsibility and accountability are to the various government agencies which appoint them, control their budgets and programs, and transfer them.

At the thana level two other types of leadership should be noted. First, in the thanas where IRDP cooperatives are organized, the village cooperatives are federated at the thana level. Thus thana-wide annual elections are held for the three years posts on the managing committee of the TCCA (Thana Central Cooperative Association).

In Patuakhali IRDP cooperative systems have been arranged eight thanas in the past five years. These are: Bauphal, Galachipa, Kalapara, Amtali, Barguna, Patharghata, Bamna and Mirzaganj.

The second type of thana-wide leadership that should be noted is the Member of Parliament. At present parliament is inactive and the M.P.'s are not a force to consider. But elections are planned for Date 1978. The M.P.'s may represent more than one thana, but in that area they and their associates are usually powerful people. This is primarily because they are virtually the only local persons who may have the power to intervene at higher levels of government to influence decisions about the thana.

In summary, local leadership may now be in an important transition stage. The longstanding gaps in institutions representing the people at different levels will not be quickly filled. Leaders of the new or revitalized institutions will not automatically have an awareness of development possibilities and needs. And it remains to be seen whether sufficient independent resources will be developed to make them important local forces for development. But the government has taken the first steps in this direction.

B. Role of Women

In much of rural Bangladesh, the practice of purdah considerably restricts the social and economic roles of women. Though the purdah system is breaking down in much of the country, some of the district officials felt that it is being discontinued as much as Patuakhali as elsewhere.

The maintenance of purdah involves considerable expense. Thus it is practiced primarily by well-to-do households, for whom it is a matter of prestige. Poor or landless rural households usually can not afford the compound walls, separate guest rooms, household help, and other facilities required to maintain purdah.

Earlier, it was noted that the literacy rates for women are considerably lower than for men. In the past it was generally considered a poor investment for a family to send daughters to school, unless all the sons had been educated. It was

thought that sending (Muslim) girls to the Madrasha or Maktab for Islamic education was a better preparation for marriage than the secular schools. But today, more girls are being sent to Primary schools and even high schools.

The economic role of the large majority of rural women has been primarily in or near the home. Except for destitute or very poor women, village women do not visit the hats and bazars. Few women have remunerative work outside the home. Very few are registered as job-seekers or included in the estimates of the economically active population or labor force.

However, in addition to child rearing, cooking, cleaning, finding fuel, and other household tasks, there are a number of productive economic activities carried out by women. Perhaps most significant is the processing of foodgrain, which is done in or near the compound by women of all rural classes. In some villages, women have other remunerative activities, such as growing vegetables, selling eggs,

tending cows and selling milk, weaving mats or baskets, and working in other household-based cottage industries. Among the very small landholding or tenant families who do not practice purdah, women also work in the fields at the time of peak labor requirements.

During the past several years, there has been a national movement to enlist the participation of women in rural development efforts. Expanded remunerative activities, such as making handicrafts, poultry farming and pisciculture have been actively promoted. Vegetable growing has been encouraged both to increase income and to improve the family diet. In many areas women's cooperatives have been organized to achieve this.

However, such efforts seem to have been very limited in Patuakhali. The cooperative registrar's staff has registered twenty-nine women's cooperatives in the district and formed one Central Association for them. However, they seem to suffer from the lack of any clear guidance or direction. IRDP has also organized women's societies, but details were not available.

In the past two years, women of other districts have also been actively recruited in some of the mass mobilization efforts under the Food for Work (FWP) and Swanirbhar (self-reliance) Programs. Before then, the earthworks involved in those programs were almost totally done by men.

In Patuakhali, women receive a higher rate of payment for earthwork (3 seers of wheat per 50 CFT) than men (3 seers per 70 CFT). In spite of this, not many women work in the Food for Work projects.

Regarding health, the life span is considerably shorter for women than men. This may reflect a number of cultural factors:

1. Women often rise earlier and go to bed later than men.
2. Their diet is generally worse, because of the cultural tendency for women to wait to eat until their husband, children and dependents have been fed.
3. The average marriage age of women is very young, the youngest in Asia, and the first children are often born at an early age.

4. The method of cooking in rural areas forces women to spend considerable time breathing smoke from chula fires every day.
5. The reluctance to take women far from the village implies that medical care for more serious illness or injury may not be sought or availed of as quickly as for men.

It is not expected that the construction of the proposed roads in Patuakhali District will have a major immediate impact on these aspects of the lives of women. But there are a number of areas where an impact will be felt over time.

New roads will increase the mobility of people into and out of areas now somewhat isolated. Even granting that mostly men will travel at first, this movement of people involves the dissemination of ideas as well. One of the urban ideas which has been noted to accompany new roads in other countries is a more favourable attitude towards the education of women.

To the extent that new roads improve the local agricultural economy and open up more marketing options for farmers, it may be expected that women will benefit alongwith their families. Roads will open up new opportunities for establishing women's organizations and economic activities. But such benefits will not be automatic. They will occur

only if the opportunities are actually taken.

The construction of the proposed road network will make travel within the district considerably easier, as transportation services improve. Though undoubtedly men will continue to use those facilities more than women for some time, the inconveniences that are now obstacles to women travelling in rural areas will have been reduced.

Finally, the roads will not directly change most of the factors that affect the health of women. However, they will make many areas more accessible to the hospital facilities and family planning services of the district. And opportunities will be greater for women to use existing and expanding facilities for improved health and efficiency.

IX. DEVELOPMENT OF ROAD NETWORK

A. Introduction

The development of a road network in the rural areas of Patuakhali, was carried out in five distinct steps:

1. establishing road and bridge design criteria;
2. soliciting road nominations from local officials;
3. preliminary screening of the nominated roads;
4. priority ranking of individual road segments; and
5. recommending integrated road networks for each district.

These steps are explained in detail in the Summary, Volume I of this report and only a brief synopsis is given in this volume.

B. Design Criteria

The design criteria for the class, section and geometric standards for the rural roads were adopted from the recommendations prepared by an ad hoc government committee for the Transport Survey Section of the Planning Commission of the Government. The roads classes selected for rural road construction by the Planning Commission are Class IV and Class V. These are defined as follows:

- Class IV - Paved roads connecting subdivisional and thana headquarters and other principal growth centers.
- Class V - Earth roads connecting thana and union headquarters with secondary growth centers. Approximate two-way hourly traffic within 10 years of 20 passenger car equivalents.

C. Road Nomination by Local Officials

The consultant's team discussed rural road requirements of the district with local officials in Patuakhali. A large meeting was held at the Circuit House with the Deputy Commissioner, Subdivision Officers and district officers of government ministries.

Subsequent individual meetings were held with district officials of most development ministries or agencies. Several meetings were held with the Deputy Commissioner, the Additional Deputy Commissioner (Development) and the District Engineer.

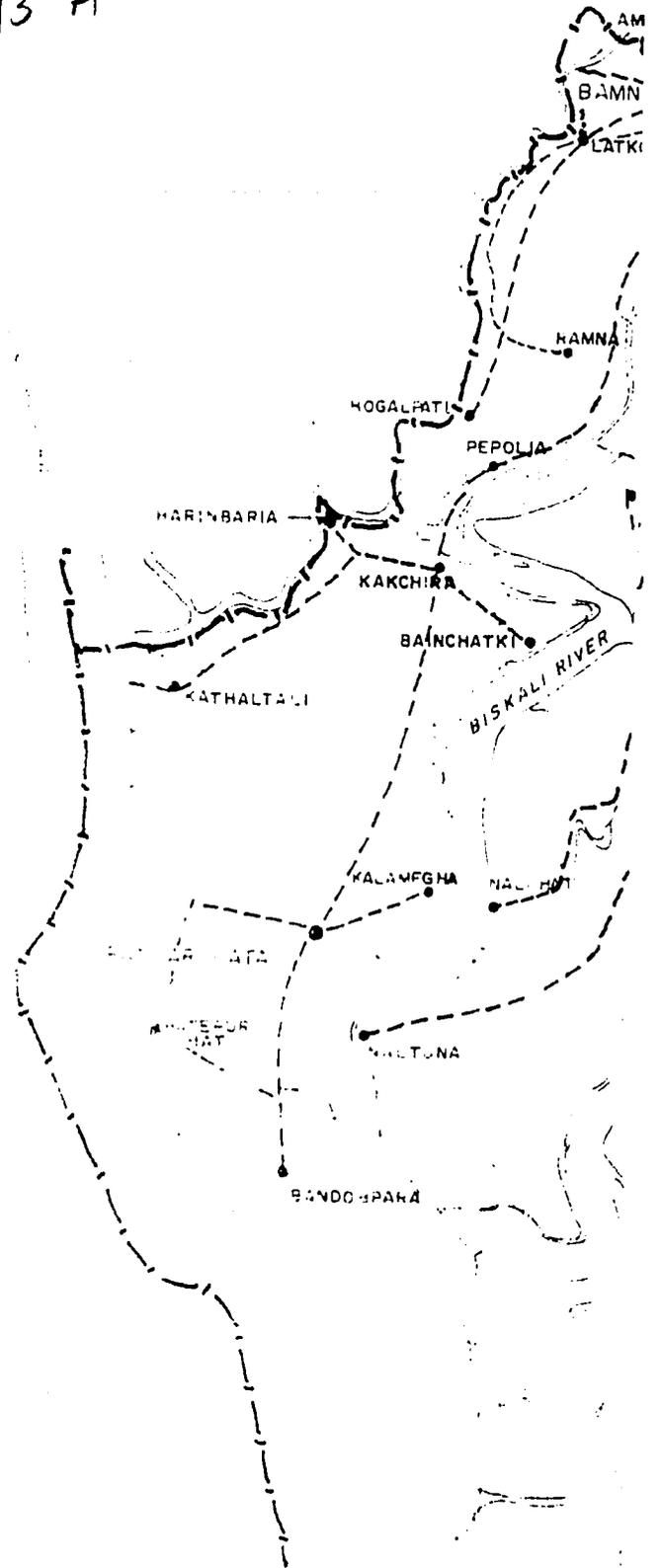
A subdivision meeting was held in Patuakhali Sadar with the S.D.O., thana Circle Officers (Development) and Thana Agricultural Officers to review the project. The consultant also explained the questionnaires developed to obtain road nominations and engineering, economic and agricultural data.

Because of the impending presidential election and the imminent district visit of the President, the meeting planned for Bagura Subdivision could not be held. Therefore, one of the consultant's experienced field staff visited each thana to explain the project and to collect the necessary road nominations and data. In Patuakhali District 495 miles of roads were nominated for rural road construction. These are listed in Table 24 and shown in Figure 7.

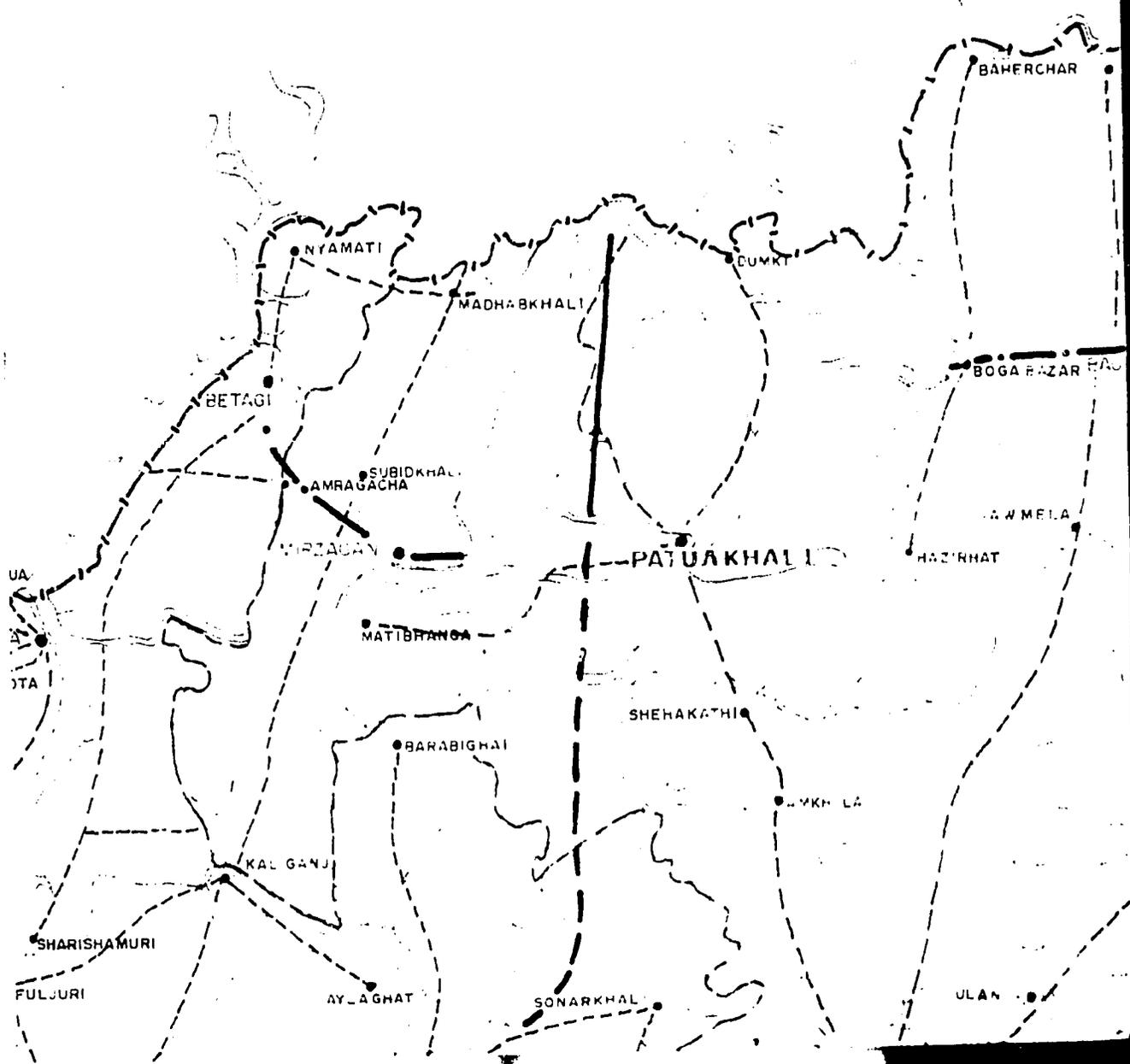
D. Preliminary Road Screening

A screening process was applied to these roads to select the more important segments for final priority ranking.

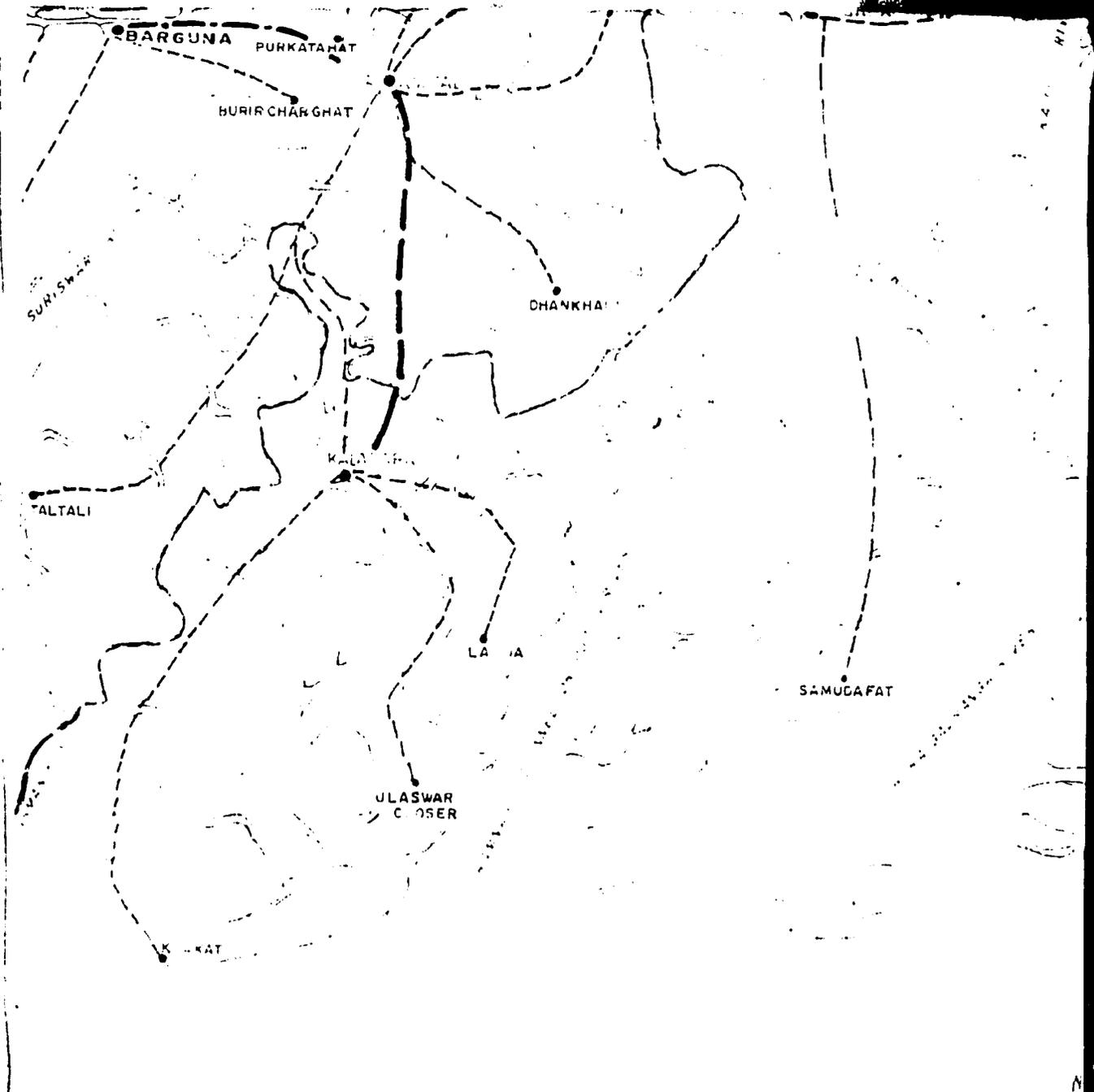
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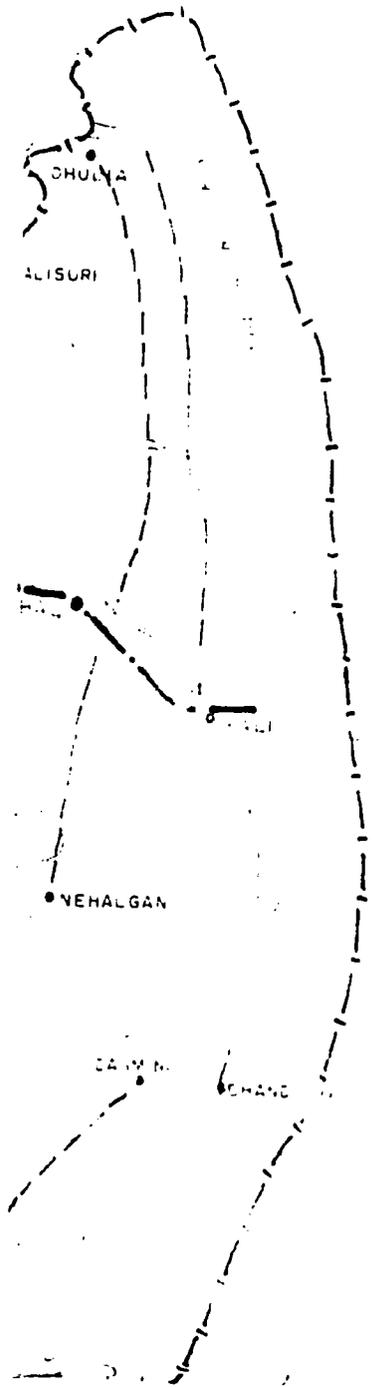


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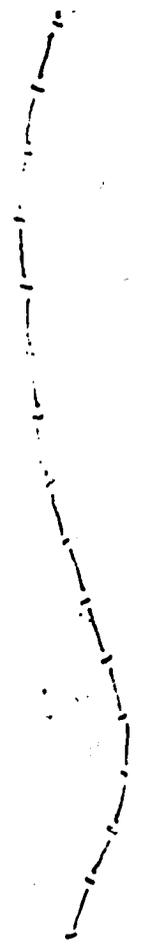


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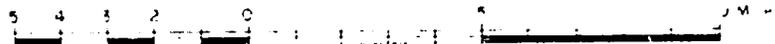
DIST. PATUAKHALI

LEGEND

Roads (R B H, Paved)	
Rail Roads	
Water ways	
Ma or Airport	
Nominate Roads	
All Weather Roads	

G

SCALE 1 inch = 4 Miles



GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH	
RURAL ROADS STUDY	
PRIORITY ROAD NOMINATIONS	
LOUIS BERGER INTERNATIONAL INC. AND RAHMAN & ASSOCIATES LTD.	
PREPARED BY Z. Abedin	RECOMMENDED
CHECKED <i>[Signature]</i>	APPROVED
DATE	DRG. NO.

TABLE 24
NOMINATED ROADS

SUB: SADAR

THANA	PRIORITY ROADS		MILES	NO. OF PROPOSED BRIDGES	INITIAL SELECTION
	FROM	TO			
PATUAKHALI SADAR	1. Patuakhali	Dumki	9½	0	No
	2. Patuakhali	Matibhanga	7½	10	Yes
	3. Patuakhali	Patbunia	8½	3	No
	4. Patuakhali	Algi	10½	8	No
BAUPHAL	1. Dhulia	Nehalganj	20	10	Yes
	2. Baher Char	Hazirhat	12½	18	Yes 7 Miles
	3. Kalisuri *	Nawmala	14½	11	Yes 8 Miles
	4. Dhulia Hat	Dhandania	21	7	No
GALACHIPA	1. Galachipa *	Shehakathi	14	N.S.	Yes
	2. Galachipa	Betagi Sankipur	17	2	Yes
	3. Galachipa *	Dasmina	17	N.S.	Yes
	4. Galachipa	Samudafat	19	N.S.	Yes 4.5 miles
MIRZAGANJ	1. Subidkhali *	Kaliganj (Khakdon River)	10	3	Yes
	2. Subidkhali	Madhabkhali	10	7	Yes
	3. Mirzaganj	Galisha Bazar	4½	1	Yes
	4. Amragacha	Bikakhali	7	2	No

Table continued on next page

SUB: SADAR					
THANA	PRIORITY ROADS		MILES	NO. OF PROPOSED BRIDGES	INITIAL SELECTION
	FROM	TO			
KALAPARA	1. Kalapara	N. Chakama	11	2	Yes
	2. Nilganj	Kaukata	16½	N.S.	Yes
	3. M.B. College	Dulaswar	9	N.S.	No.
	4. Teakhali	Lalua	5	N.S.	No.
<u>SUB: BARGUNA</u>					
BAMNA	1. Amua-Bamna *	Kakchira	14	4	Yes
	2. Bamna	Hogalpathi	15	10	Yes
	3. Bamna	Bukabunia	3½	3	No
	4. Amua-Bamna	Ramna	15	9	No
BITAGI	1. Bibichini *	Sharisamuri	21	30	Yes
	2. Betagi L.S *	Basunda Bridge	2	0	Yes
	3. Dadnikhali	Baidyapasa	4	5	No.
	4. Mokamia Ghat	Galisha Bazar	5	13	No
PI THARGHATA	1. Harin Baria *	Bandop Para	22	14	Yes 10 Miles
	2. Kathaltali	Bainchatki WAPDA	10	6	Yes
	3. Kakchira	Pepolia	2½	3	Yes
	4. Patharghata	Kalamegha L.S.	18	5	No

Table continued on next page

SUB: BARGUNA

THANA	PRIORITY ROADS		MILES	NO. OF PROPOSED BRIDGES	INITIAL SELECTION
	FROM	TO			
AMTALI	1. Taltali	Barabighai	29	7	Yes
	2. Amtali	Dhankhali	15	7	Yes
	3. Amtali *	Sonakhali	13	5	Yes
	4. Ghatkhali	Sonakhali	8	3	No.
BARGUNA	1. Nishanbaria*	Chandkhali	22	15	Yes 18 Miles
	2. Nali Bandar	Fuljuri Hat	13	4	Yes 4 Miles
	3. Fuljuri Hat	Ayla L.S.	10	7	No.
	4. Barguna	Burir Char	8	2	No

* Proposed by Subdivision or District Officials

The screening process used four criteria which are outlined below:

1. Dual Nomination
2. Parallel Roads
3. Nonconnecting Roads
4. Economic or Social Benefit

After the initial screening of all nominated roads and the adjustment of the road network, the mileage for the preliminary network was reduced to 294 miles. These roads are shown on the map in Figure 8 and listed in Table 24.

E. Priority Road Ranking

For ranking the screened roads the consultant devised a system that consisted of identifying and weighting selected benefit factors for each road and then comparing them to the estimated per mile cost for each road. This gives an artificial benefit/cost ratio that can easily be ranked, road by road. It should be stressed that this ratio does not give a true benefit/cost ratio and does not indicate feasibility.

Because many proposed roads are dependent upon the construction of other proposed roads, some additions and deletions of road segments were made. These adjustments were necessary to ensure accessibility and present an integrated rural road network.

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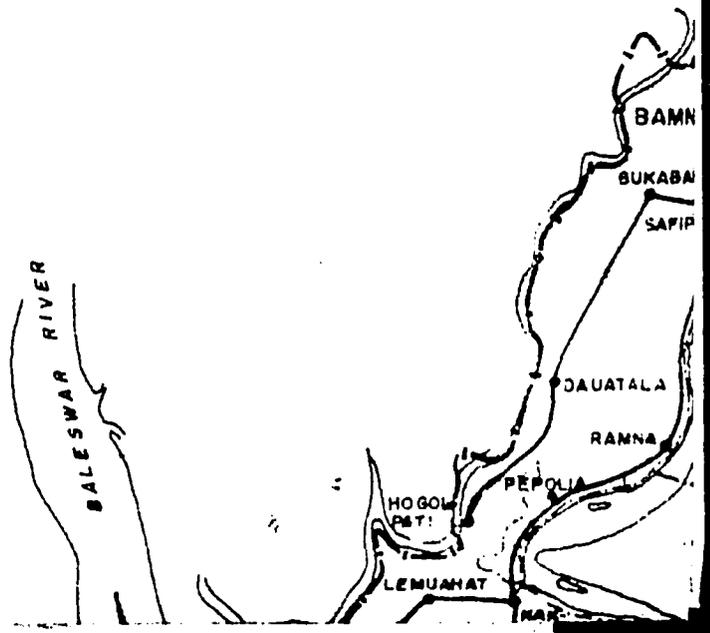
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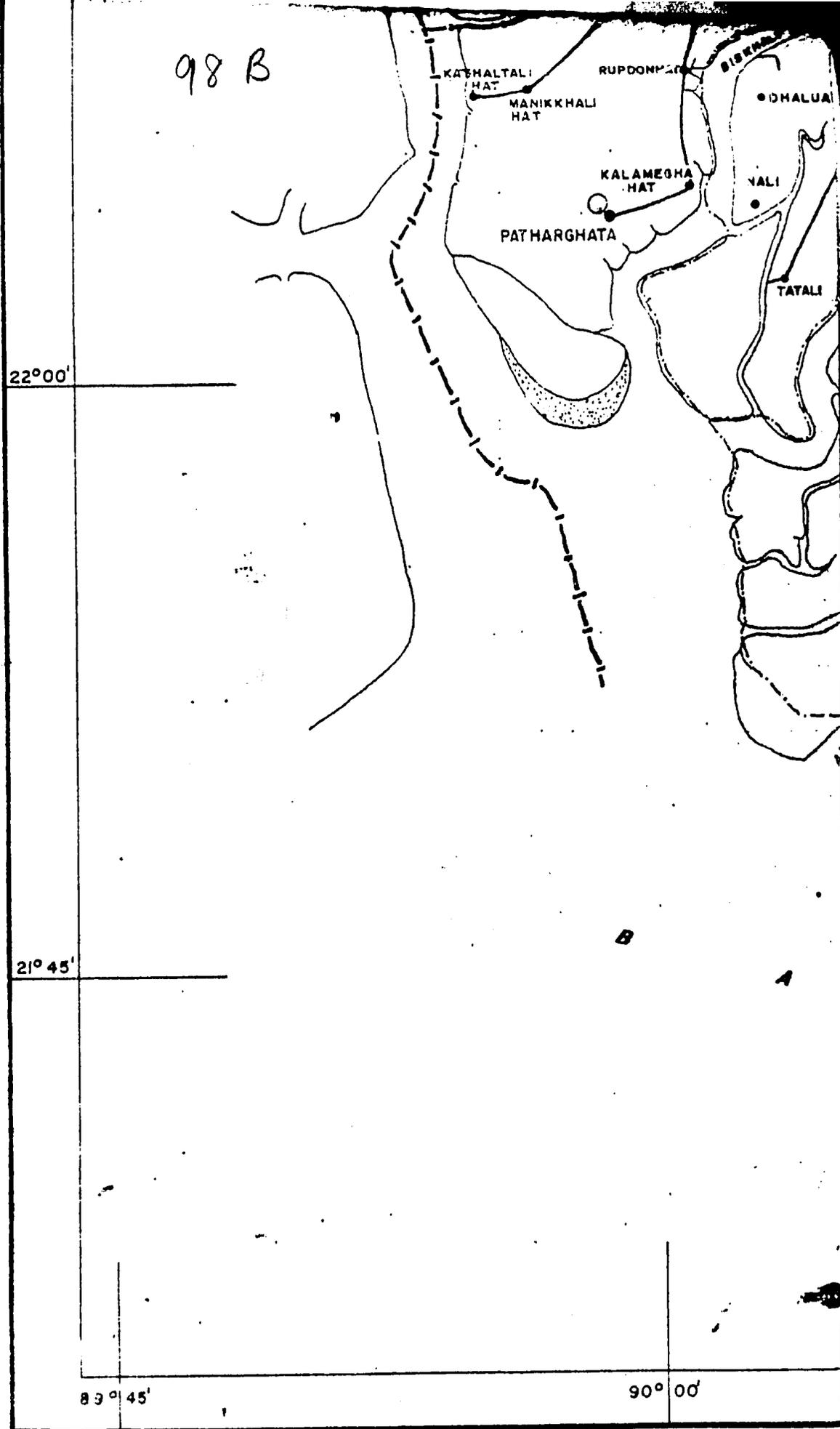
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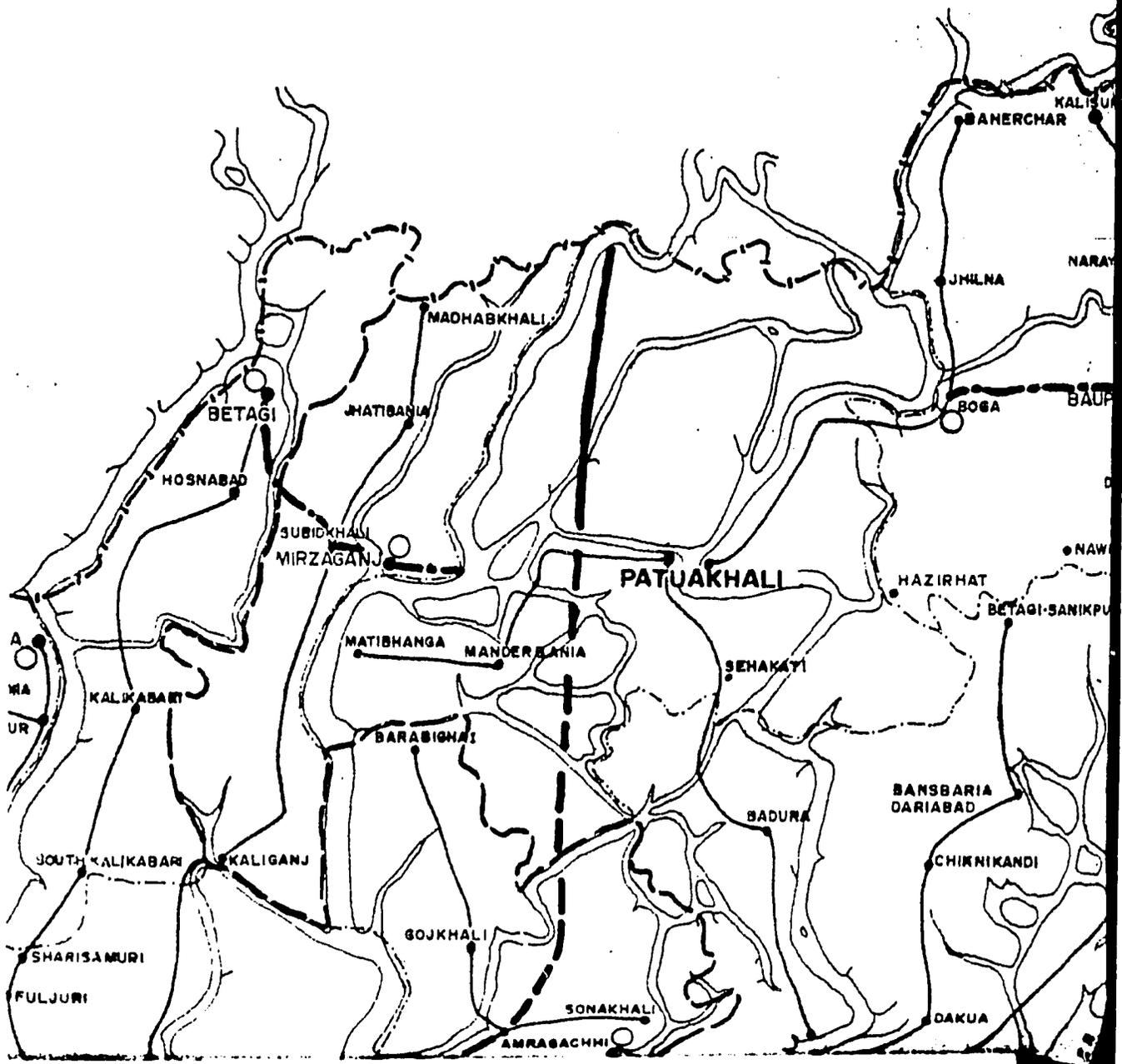
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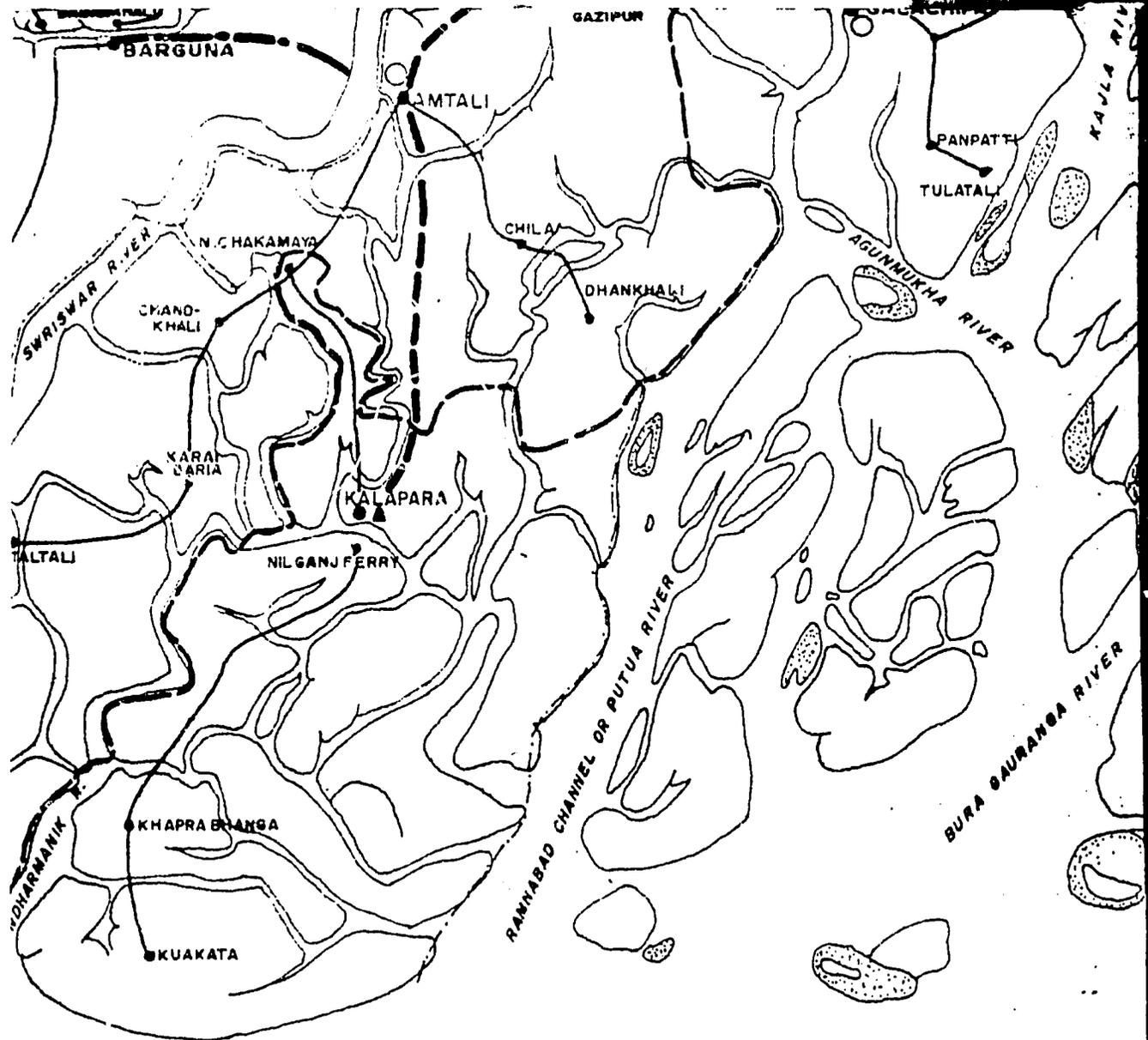
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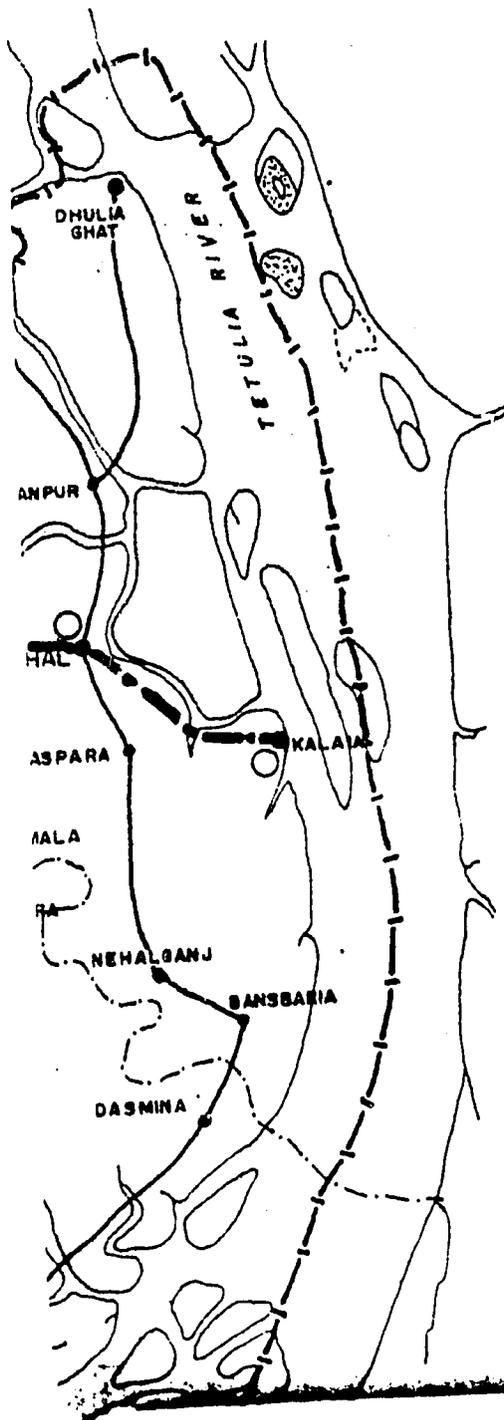
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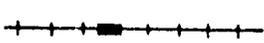
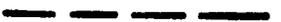
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DIST. PATUAKHALI



LEGEND :

Roads (R & H, Paved)	
Rail Roads	
Water ways	
Major Airport	
Prim. Market (A)	
Sec. Market. (B)	
Proposed Roads (R & H)	
Preliminary Road Network	

H

SCALE (Inch = 4 Miles)



GOVERNMENT OF
THE PEOPLE'S REPUBLIC OF BANGLADESH

RURAL ROADS STUDY

SCREENED ROAD NETWORK

LOUIS BERGER INTERNATIONAL INC. AND
RAHMAN & ASSOCIATES LTD.

PREPARED BY : Raihan

RECOMMENDED :

CHECKED

APPROVED :

DATE

ORG. NO.

F. Data Problems

All of the basic data used in estimating costs and benefits for the road ranking system were supplied by district and thana officials. For some thanas the economic, agricultural and engineering data received by the consultant were either not carefully prepared or incomplete. In many instances data were available from alternate sources but in others they were not and unfortunately this adversely affected the priority ranking of individual roads.

X. RECOMMENDED ROAD NETWORK

A. Network

As shown on the map in Figure 9 the rural road network recommended for Patuakhali consists of 14 road segments totalling 151 miles. Nine of these recommended roads are class IV roads with a total length of 94.5 miles. The remaining 5 roads of 56.5 miles are class V roads. The estimated network cost is \$ 25.4 million, which averages out to approximately \$ 163 thousand per mile. The roads and mileage are distributed by subdivision as follows.

TABLE 25
PATUAKHALI: ROADS BY SUBDIVISION

Subdivision	Class	No. of Roads	Total Mileage
Sadar	IV	5	49.5
	V	2	21.5
Total:		7	71
Barguna	IV	4	45
	V	3	35
Total:		7	80

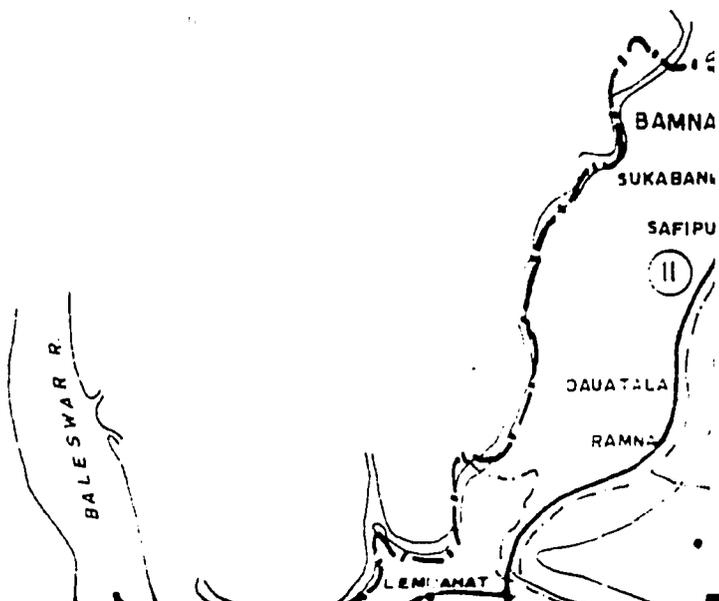
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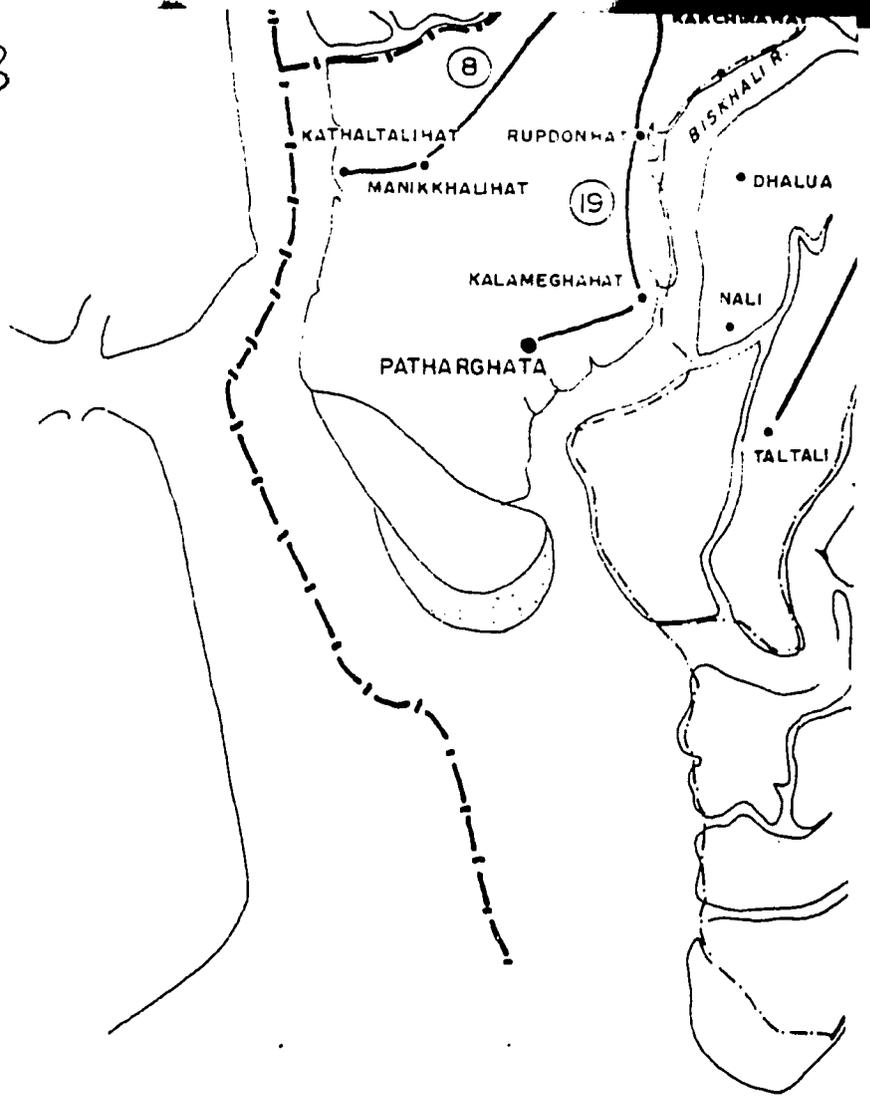
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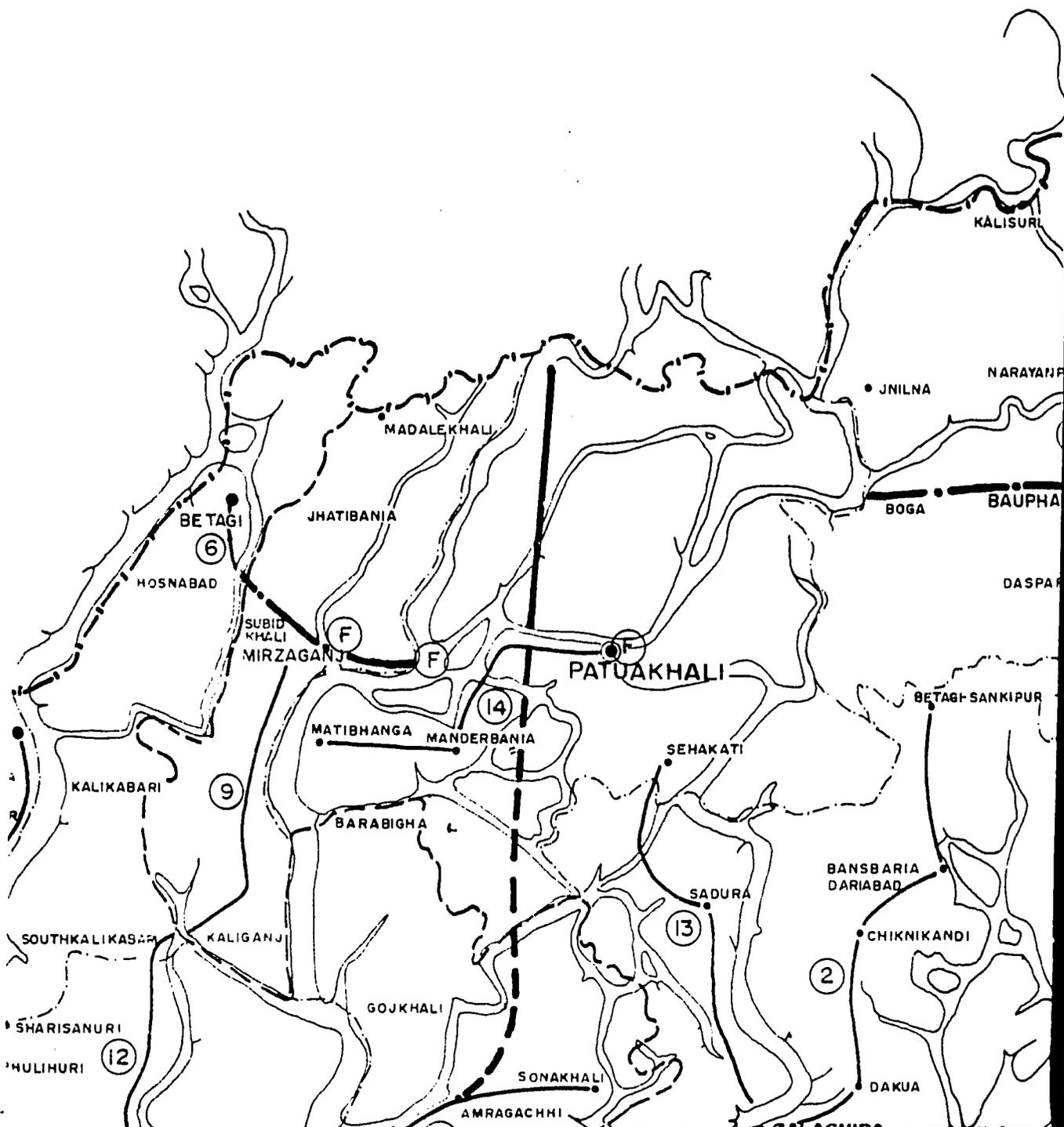
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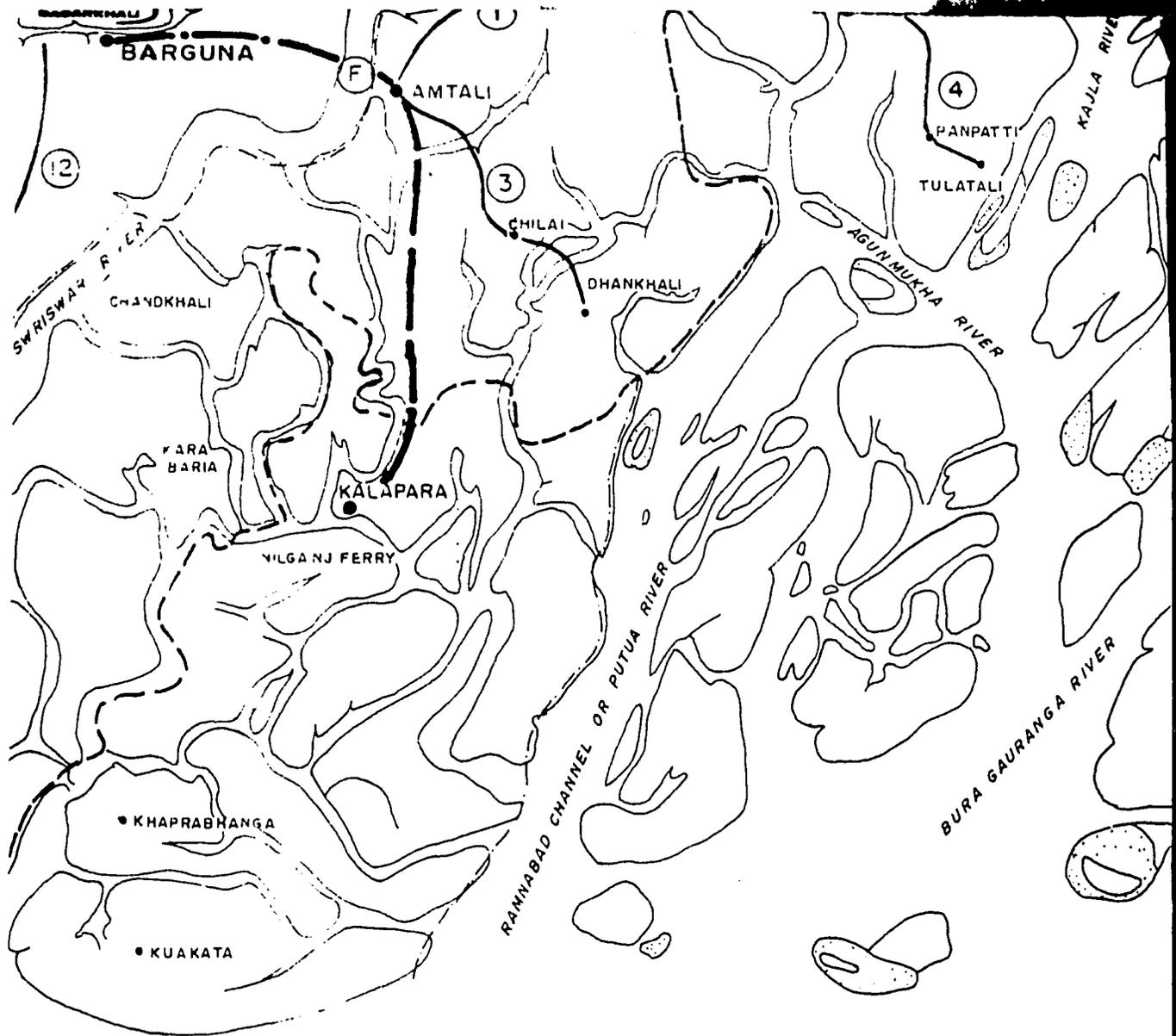


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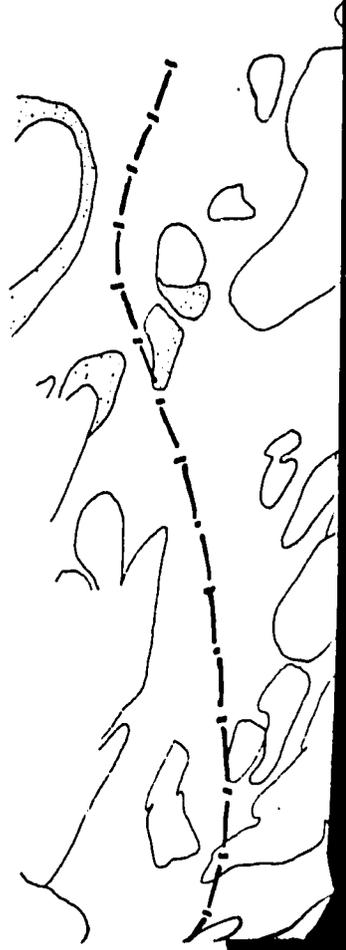


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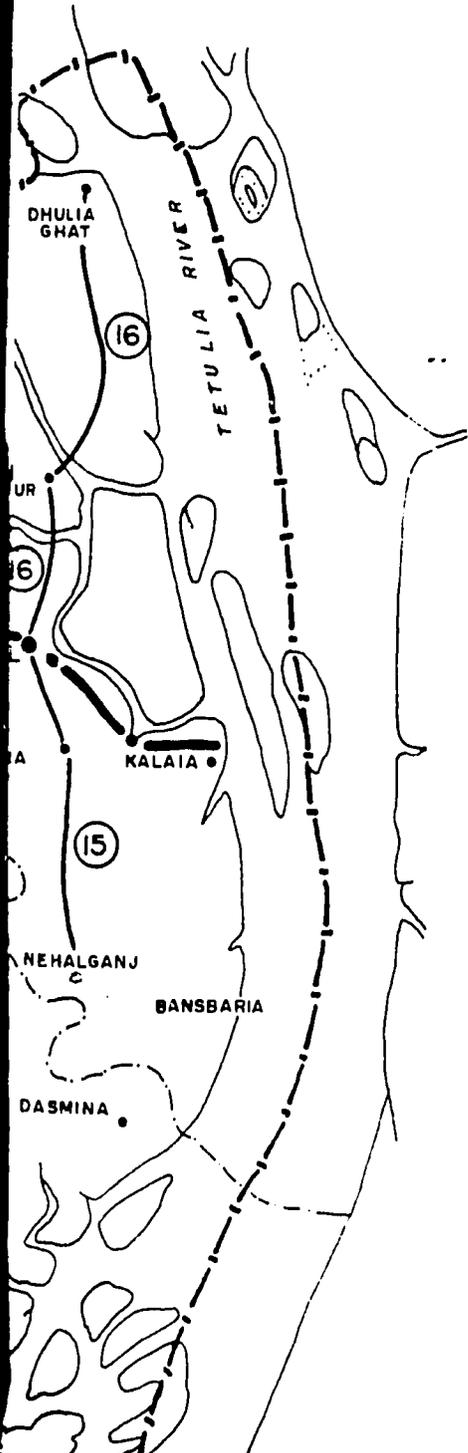
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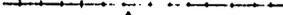
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DIST. PATUAKHALI

LEGEND

ROADS (R & H, PAVED)	
PROPOSED ROADS (R & H)	
WATERWAYS	
RAIL ROADS	
MAJOR AIRPORT	
RECOMMENDED ROAD NETWORK	
MOTORIZED FERRY (REQUIRED)	
ALL WEATHER ROADS	

H

SCALE 1 inch = 4 Miles



GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH	
RURAL ROADS STUDY	
RECOMMENDED ROAD NETWORK	
LOUIS BERGER INTERNATIONAL INC. AND RAHMAN & ASSOCIATES LTD.	
PREPARED BY S. ISLAM	RECOMMENDED <i>M. Waed</i>
CHECKED <i>A. Rahman</i>	APPROVED <i>E. Prantica</i>
DATE 10. 7. 78	DRG. NO.

As shown in Table 25, the number of roads and the road mileage is almost equally divided between the two subdivisions. The recommended network will include roads in eight out of the ten thanas in the district and provide the thanas of Galachipa, Amtali, Barguna, Pathargata, Bamna and Mirzaganj with important roads to supplement their existing river transportation. Interior areas of some islands would be connected with major ghats.

In general the network proposed for Patuakhali will provide north/south roads throughout the district between the four main north/south river channels. However, construction of the recommended roads alone will fall short of providing a completely integrated network for the district. All thanas would still not be linked with district and subdivision headquarters.

However, in conjunction with the proposed R&H road from Patuakhali town via Amtali to Kalanara, the recommended roads will establish a skeletal road network linked with water transport.

In this district several mechanized ferries have been proposed at key points to provide east-west crossings of the major rivers. Country ferries will be used for crossing the smaller rivers.

A summary of the salient facts concerning the recommended network follows:

Mileage of all roads	151
Estimated network cost (US \$)	25.4 million
Number of all roads	14
Average per mile cost (US \$)	168 million
Number of Class IV Roads	9
Mileage of Class IV Roads	94.5
Number of Class V Roads	5
Mileage of Class V Roads	56.5
Shortest road segment	3 miles
Longest road segment	18 miles

Table 31 lists each road included in the recommended network by priority ranking together with the thanas and subdivisions served, class of road, length and estimated cost.

Table 32 gives the priority values and other data for the remainder of the 25 screened roads not included in the recommended network.

B. Cost Estimate Constraints

The costs presented road by road in these tables are economic costs, that is, after all taxes and duties have been deducted. They do not include costs of any land acquisition for right-of-way. They are based upon estimates supplied by local and district officials for road mileages bridge lengths and have not been checked by the consultant. It should be noted that local officials do not have access to any distance measuring

TABLE 26
RECOMMENDED ROAD NETWORK

ROAD	THANA	CLASS	MILES	COST(M \$)	PRIORITY VALUE	RANK	REMARKS
AMTALI- SONAKHALI	AMTALI	V	10	.412	1.45	1	
GALACHIPA-BETAGI-SANKIPUR	GALACHIPA	V	17	.901	0.56	2	
AMTALI-DHANKHALI	AMTALI	V	15	.805	0.53	3	
GALACHIPA-AMODAFAT (TULATALI)	GALACHIPA	V	4.5	.568	0.52	4	
BETAGIGHAT-BASHUNDA BRIDGE	BETAGI	IV	3	.394	0.42	6	
KATHALTALI-LEFNAHAT- KAKCHIRAHAT	PATMARGHATA	V	10	1.006	0.38	8	
SUBIDKHALI-KALIGANJ	MIRZAGANJ	IV	10	1.563	0.32	9	
AMUA(BAMNA)-KAKCHIRA	BAMNA	IV	14	2.373	0.25	11	
TALTALI-BARGUNA- BADARKHALI-KALIGANJ	BARGUNA	IV	18	3.337	0.24	12	
GALACHIPA-SHEHAKHATI	GALACHIPA	IV	14	2.366	0.23	13	
PATUAKHALI-MAPIBEANGA	PATUAKHALI	IV	7.5	1.700	0.22	14	
BAUPHAL-NEHALGANJ	BAUPHAL	IV	7	1.103	0.22	15	

Table continues on following page

ROAD	THANA	CLASS	MILES	COSTS(M \$)	PRIORITY VALUE	RANK	REMARKS
DHULIA-BAUPHAL	BAUPHAL	IV	11	1.754	0.22	16	
PATHARGHATA-KALAMEGHA HAT-KAKCHIRA HAT	PATHARGHATA	IV	10	2.688	0.20	19	
FIVE(5)MOTORIZED FERRIES	-	-	-	.782	-	-	

TABLE 27
PRIORITY VALUES FOR SCREENED ROADS
NOT INCLUDED IN NETWORK

ROADS	THANA	CLASS	MILES	COST(M \$)	PRIORITY VALUES	RANK	REMARKS
BAMNA-HOGOLPATHI	BAMNA	V	15	.994	0.46	5	
KALISURI-NARAYANPUR	BAUPHAL	V	5	.625	0.39	7	
BADARKHALI-SHARISAMURI	BARGUNA	IV	4	.897	0.28	10	
TALTALI-BARABIGHAT	AMTALI	IV	29	6.152	0.21	17	
KALAPALA-N.CHAKARAYA	KALAPARA	IV	11	1.425	0.21	18	
SUBIDKHALI-MADHABKHALI	MIRZAGANJ	IV	10	2.029	0.20	20	
BETAGI-SHARISAMURI	BETAGI	IV	18	5.710	0.17	21	
NILGANJHAT-KUAKATA	KALAPARA	IV	13.5	2.040	0.17	22	
GALACHIPA-BASMINA-BANSEARI	GALACHIPA	IV	17	3.669	0.16	23	
KAKCHIRA-PEPOLIA	PATHARGHATA	IV	2.5	.983	0.15	24	
BAHERCHARHAT-BOGA VIA JHILNA	BAUPHAL	V	7	1.549	0.15	25	

equipment, and the consultant has been faced with many data inconsistencies in the course of study.

Table 28 gives the estimated costs separated into local currency and foreign exchange components for each of the 14 road segments in the recommended network. US dollar equivalents for each segment are included in the table.

TABLE 28
COSTS BY RECOMMENDED ROAD SEGMENT

TAKA 16 = US \$ 1.00

RANK	ROAD	SUBDIVISION	MILES	CLASS	COSTS (000)		
					TAKA AND US \$ EQUIV.	US \$	TOTAL US \$
1	AMTALI-SONAKHALI	BARGUNA	10	V	TK. 4,750 US 298	114	412
2	GALACHIPA-BETAGI SANKIFUR	PATUAKHALI	17	V	TK. 9,872 US 617	284	901
3	AMTALI-DHANKHALI	BARGUNA	15	V	TK. 9,155 US 572	233	805
4	GALACHIPA-TULATALI	PATUAKHALI	4.5	V	TK. 5,948 US 372	196	568
6	BETAGI LAUNCH GHAT BASHANLA BRIDGE	BARGUNA	3	IV	TK. 4,048 US 253	141	394
8	KATHALTALI-LEMUA HAT-KAKCHIRA	BARGUNA	10	V	TK. 11,042 US 690	316	1,006
9	SUBIDKHALI-KALIGANJ	PATUAKHALI	10	IV	TK. 16,472 US 1,030	533	1,563
11	BAMNA-KAKCHIRA	BARGUNA	14	IV	TK. 25,345 US 1,584	789	2,373
12	TALTALI-BARGUNA- BADARKHALI-KALIGANJ	BARGUNA	18	IV	TK. 35,756 US 2,235	1,102	3,337
13	SHEHA KHATHI- GALACHIPA	PATUAKHALI	14	IV	TK. 25,067 US 1,567	799	2,366
14	PATUAKHALI- MATI BHANGA	PATUAKHALI	7.5	IV	TK. 18,358 US 1,147	553	1,700

RANK	ROAD	SUBDIVISION	MILES	CLASS	COSTS (000)		
					TAKA AND US \$ EQUIV.	US \$	TOTAL US \$
15	BAUPHAL-NEHALGANJ	PATUAKHALI	7	IV	TK.11,593 US 724	379	1,103
16	DHULIA-BAUPHAL	PATUAKHALI	11	IV	TK.18,218 US 1,139	595	1,734
19	PATHARGHATA- KAIAMEGHA HAT- KAKCHIRA HAT	BARGUNA	10	IV	TK.28,684 US 1,793	895	2,688

XI. ENGINEERING AND CONSTRUCTION PLANNING

A. Construction Season

The Construction Season in Patuakhali is somewhat shorter than in other less riverine districts and normally lasts five months, from mid-December to mid-June. Bridge construction, with proper cover for work and material storage areas, however, could continue for an additional month.

B. Equipment and Material Availability

Although the Roads and Highways Directorate is currently constructing the Barisal-Patuakhali road, none of their equipment would be available for rural road construction. The District Council and Subdivision Offices do not have any road construction equipment. The major materials requirements, brick, filling sand and earth are available in Patuakhali; however, due to the salinity of the local sand it can not be used in making concrete. Stone and concrete sand would have to be brought into the district from Dacca and Sylhet. Other materials such as cement, mild steel and coal for firing bricks must be brought in from Chittagong or Khulna Ports after being imported into the country.

C. Contracting and Labor Availability

There are no local contractors for road and bridge works in the district. There are skilled laborers, such as masons and carpenters and their availability would depend on current local demand. Unskilled laborers are available from the unemployed or under-employed agricultural labor force and should be present in adequate numbers during the construction season.

D. Special Problems

The construction of bridges will present some serious problems in this delta district, which is subject to swift river currents and tidal flows and occasional cyclones.

Construction of floating pontoons with steel access ramps for ferry landings between the islands will also present special problems and additional costs will be required for concrete-pile mooring anchors.

E. Network Construction Schedule

Table 29 presents detailed construction planning requirements for each road segment covering manpower, equipment and materials. It also gives an estimate of the construction time required to complete each road in the recommended network.

S - STONE (1000 CF)
 CE- CEMENT (TONS)
 ST- STEEL (CWT)
 BR- BRICKS (1000)
 SA- SAND (1000 CF)
 BI- BITUMEN (TON)

TABLE 29
 CONSTRUCTION PLANNING BY
 RECOMMENDED ROADS

S = SKILLED
 L = UNSKILLED
 TS= TRACTOR/SHEEPFOOT
 ROLLER
 R = 3 WHEEL ROLLER

RANK	ROAD	CLASS	SUBDIVISION	MILES	PERIOD MONTHS	REQUIREMENTS		
						MANPOWER	EQUIPMENT	MATERIALS
1	ANRAGACHA SONAKHALI	V	BARGUNA	10	5	S - 80 L - 620	TS-1 R -1	CE - 208 ST - 3520 SA - 10 S - 20
2	GALACHIPA BETAGI SANKIPUR	V	PATUAKHALI	17	2 Yrs 10	S- 122 L- 712	TS- 1 R - 1	CE - 635 ST -10,740 SA - 30 S - 61
3	AMTALI DHANKHALI	V	BARGUNA	15	5	S- 206 L- 970	TS- 2 R - 1	CE - 536 ST - 9064 SA- 26 S - 52
4	GALACHIPA TULATALI	V	PATUAKHALI	4.5	5	S- 216 L- 680	TS- 1 R - 1	CE - 562 ST - 9504 SA - 27 S - 54
6	BETAGI GHAT BASHANDA BRIDGE	IV	BARGUNA	3	5	S- 58 L- 415	TS -1 R -1	CE - 63 ST - 1056 BR - 2040 SA - 213 BI - 85 S - 6

RANK	ROAD	CLASS	SUBDIVISION	MILES	PERIOD MONTHS	REQUIREMENTS		
						MANPOWER	EQUIPMENT	MATERIALS
8	KATHATALI LEMUA HAT KAKCHIRA	V	BARGUNA	10	5	S- 312 L- 875	TS -1 R -1	CE- 905 ST- 15140 SA- 43 S - 86
9	SUBIDKHALI KALIGANJ	IV	PATUAKHALI	10	5	S- 221 L-1656	TS- 1 R - 1	CE- 330 ST- 5460 BR- 6800 SA- 720 BI- 280 S - 30
11	BAMNA KAKCHIRA	IV	BARGUNA	14	2 Yrs 10	S- 150 L- 1550	TS- 1 R - 1	CE - 360 ST- 6072 BR- 9520 SA- 1000 BI 397 S - 35
12	TALTALI BARGUNA BADARKHALI KALIGANJ	IV	BARGUNA	18	2 Yrs 10	S- 270 L- 1650	TS- 1 R- 1	CE- 968 ST-16490 BR-12240 SA- 1310 BI- 510 S- 92
13	GALACHIPA SHEHAKHATHI	IV	PATUAKHALI	14	2 Yrs 10	S- 145 L- 1691	TS- 1 R - 1	CE- 350 ST- 5810 BR- 9520 SA- 1000 BI- 396 S - 33

RANK	ROAD	CLASS	SUBDIVISION	MILES	PERIOD MONTHS	REQUIREMENT		
						MANPOWER	EQUIPMENT	MATERIALS
14	PATUAKHALI MATIBHANGA	IV	PATUAKHALI	7.5	5	L- 350 S- 1550	TS-1 R -1	CE- 690 ST-11020 BR- 5100 SA- 560 BI- 215 S- 66
15	BAUPHAL NEHALGANJ	IV	PATUAKHALI	7	5	L-1058 S-180	TS-1 R- 1	CE- 560 ST- 9400 BR- 9520 SA- 1030 PI - 400 S- 50
16	DHULIA BAUPHAL	IV	PATUAKHALI	11	5	L-1662 S- 284	TS-1 R- 1	S- 90 CE- 880 ST-14760 BR-14960 SA- 1613 BI- 623
19	PATHARGHAT- KALAMEGHAHAT KAKCHIRA HAT	IV	BAKGUNA i	10	5	S- 665 L-1992	TS-1 R -1	CE- 1570 ST-26,310 ER- 6,800 SA- 780 BI- 280 S- 150