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STUDY REPORT ON JAMUNA BRIDGE PROJECT ECONOMIC AND

PEOPLE'S REPUBLIC OF BANGLADESH

STUDY REPORT

ON

JAMUNA RIVER BRIDGE CONSTRUCTION PROJECT

ECONOMIC AND TRAFFIC

(FIRST STAGE)

MARCH 1975

JAPAN INTERNATIONAL COOPERATION AGENCY

PACIFIC CONSULTANTS INTERNATIONAL

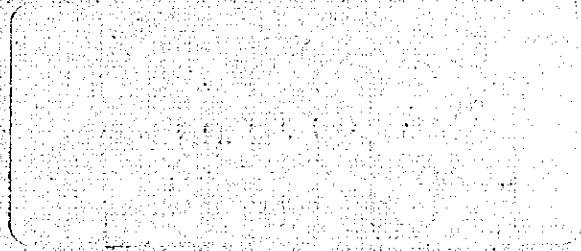
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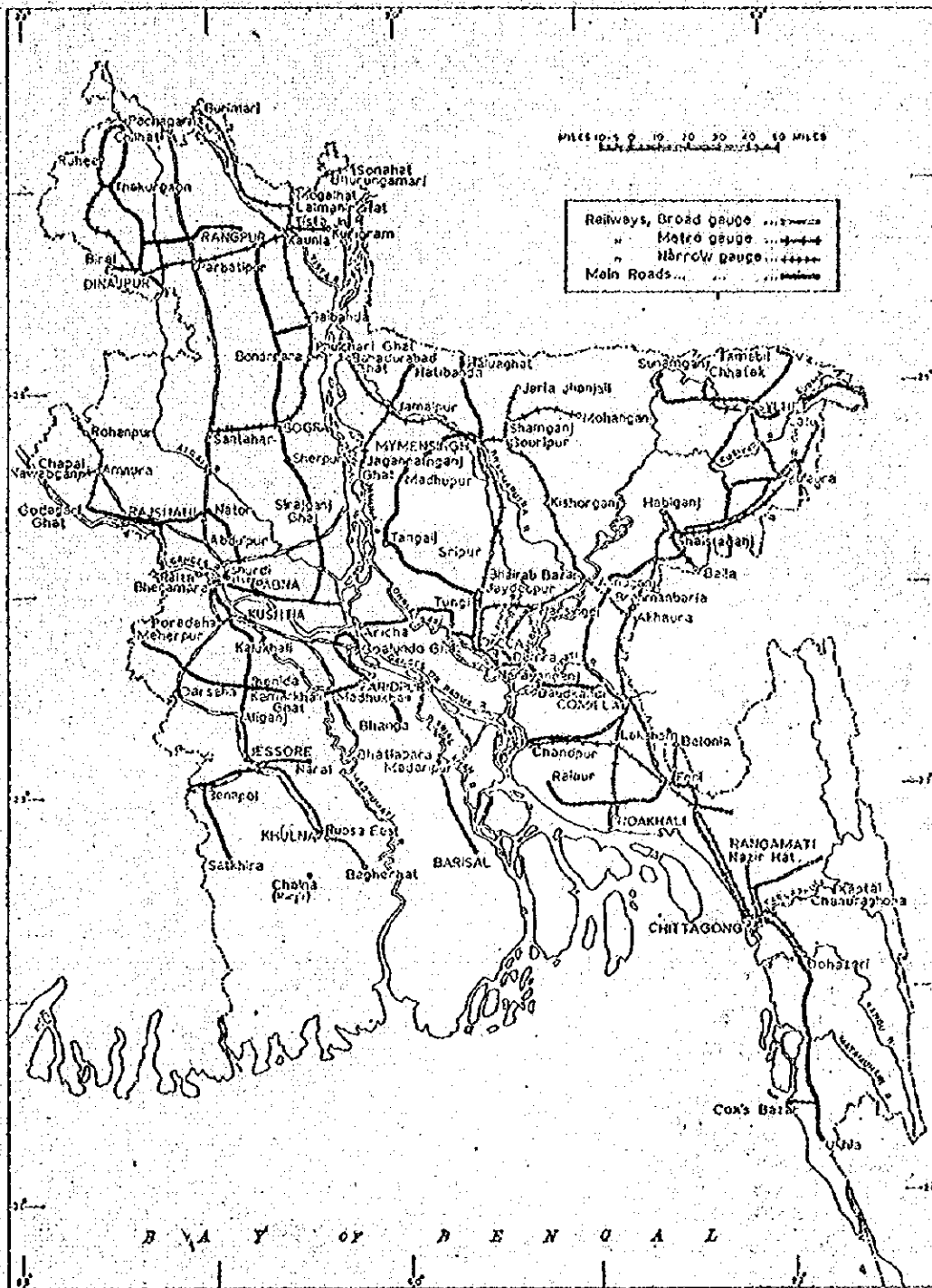
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SUMMARY OF ECONOMIC AND TRAFFIC

1. Preface.

The purpose of this report is to provide adequate data concerning the future transportation demand in order to assess the feasibility of the construction of the Jamuna Bridge. The economic and traffic team have done the study of the regional economy and traffic analysis to forecast the future traffic crossing Jamuna River.

2. Process and Method of Study

In order to forecast future traffic, passenger movements and goods flows crossing Jamuna River, analyses were made of the findings and information of the existing network of transportation facilities, the regional economy, the volume and the results of the site survey of traffic crossing Jamuna River and of the goods movements from and to existing factories almost all over the country to assess the present traffic volume crossing the river. On the basis of the above study results, a forecast of passenger movements and goods flows was made by taking into full consideration the future plans of Bangladesh, especially, the First Five-Year-Plan. From the forecast traffic, the future passenger movements and goods flows for all alternative bridge sites were estimated with factors relevant to each bridge site taken into consideration. Finally, the probable future traffic crossing Jamuna River was distributed among the competing modes of transport for each alternative route. Figures A-1 and A-2 attached to APPENDICES illustrate the forecasting

process of passenger movement and goods flow respectively.

Our study selects the year 1968/69 as its base year from the following points:-

- (a) The year 1973 does not present the normal transport activities owing to the aftermath of the war;
- (b) At the present time the Bangladesh Transport Survey is under way and we avoid our survey being overlapped by their survey;
- (c) The economic activities in 1968/69 was in a normal and the highest level;
- (d) The year 1968/69 is the only year that more detailed data is available about transportation of railway, highway and waterway; and
- (e) The year 1968/69 is the year that more comprehensive data are available about the indices of the regional economy.

For the lack of necessary data and information of the movement crossing Jamuna River, the economic and traffic team had done the origin-destination survey of passengers and vehicles crossing Jamuna River and the factory survey. These new data were incorporated into the movement study. The survey sheets used for those surveys are attached to APPENDICES.

3. Outline of Study Results

(1) Population

Bangladesh has an area of 142,708 sq. kilometers (approximately 35.3 million acres) with a population of 71,317 thousand (in 1974 census), and is one of the countries in the world that show the

highest figures in density as well as a rate of growth in population. The 1973/74 census shows that the density of population per square kilometer for the country averages 500. Not much difference in density of population can be seen among the districts, which can be classified as uniform distribution pattern. The movement of population from rural areas into urban in recent years has been in a low level, and the distribution of population in the country is considered to be in a pre-urbanization stage.

The estimated total population in 2003 is approximately 170 million, which is more than double the current population. However, no remarkable concentration of population to specific districts would be considered to occur in the near future.

(2) Economy

General -- This agriculture-oriented economic structure which has been and is now still the main feature would continue in the future, because the First Five-Year-Plan (1972/73 - 1977/78) establishes its targets of shares of agriculture and manufacturing at 55.1% and 11.2% of Gross National Production respectively at the end of the plan period. The country is not in the stage of heavy chemicals industry but remains in the stage of pre-industrialization.

The damage caused by the war is very large. The production of each industry is recovering at a high speed, but generally, industries have a low rate of operation. The Five-Year-Plan sets the target amount of production, aiming at restoring to the prewar level with

no special investment to new programmes.

The northwest region which produces a great agricultural surplus is in a very low position in industry: Rajshahi Division has an index of 5.7% in shipping value to the national whole. This division is an absolutely underdeveloped region that has no industrial centers as in the other divisions. The regional distribution of industries indicates a remarkable concentration in Chittagong, Dacca and Khulna. Chittagong and Khulna are the only two foreign trade port cities in Bangladesh, and are convenient both for the supply of imported materials and for the exports of products. Dacca, the capital of Bangladesh, has various urban functions so as to absorb various industries. On the contrary the industries such as sugar, tea, tobacco are to find their development in the areas where their materials are produced. However, jute industry, the material of which is also produced in the rural areas, is concentrated in the above three areas.

Mining --- Generally, mining resources are very scarce, and most of the resources that have been discovered are not feasible in terms of mining economy. Natural gas can eventually be of practical significance.

Agriculture -- The past production in agriculture increased at a rate of approximately 3% and that in foodgrains at a rate of 2.0% which were too low compared with the rate of growth of 3.0% in population. The unbalance between supply and demand of foodstuff has been increasing and the resulting increase of foodstuff imports has been accelerating.

Bangladesh has a cultivated area of 22.48 million acres (approximately 64% to the whole area) and climate and soils are suitable for cropping throughout the year. With a double cropping of the land, the total cropping area amounts to 31.5 million acres and almost all arable land is under utilization. Therefore, the improvement of productivity is the only approach to raise agricultural production.

Bangladesh agriculture consists mainly of crops production, and 78% of the total cropping land is utilized for the production of rice, staple of this country, which amounts to 28% of GDP. Other important crops are: jute, and rabi crops which present a variety of food and other produce including gram, pulses, wheat, barley, vegetables, mustard, oil-seeds, etc., and other crops such as tea, tobacco, sugar-cane, etc. The productivity and rate of growth in production of these crops are all very low. The Five-Year-Plan indicates that Bangladesh would attain self-supply of foodgrains, rice and wheat, at the end of its plan period.

Industries -- The industrial activities occupies only 10% of GDP in Bangladesh. The rate of growth in industry is relatively high, compared with that of other sectors. The recent high rate of growth was supported by the economic policies of West Pakistan, but it would be difficult to assume that Bangladesh would also have an industrialization at such a rate since the absolute economic level was extremely low. The characteristics of Bangladesh industries, in terms of industrial structure, consist of unfledged consumer industries and, in 1969/70 depended mainly upon jute processing, the only export industry.

Foreign Trade -- The balance of trade has been adverse and the excess of imports over exports has been in the increase. The export to Pakistan in 1968/69 made up 36% of the total exports in terms of quantity and the import for the same year from Pakistan came to 43% of the total imports. The trade with Pakistan has ceased and the trade with India which had ceased since 1965 has now been reopened. Therefore, the trade pattern based on the data up to now will change largely.

The import of the foodgrains in 1969/70 amounted to 1.55 million tons, which is the largest quantity of a single item. However, the five year plan has a target that self-supply of foodgrains would be attained by the end of the plan period, 1977/78.

With scarce resources and underdeveloped domestic industries, Bangladesh must import important goods such as foodgrains and fundamental raw materials and living necessities: foodgrains, machinery, medicines, iron and steel, petroleum, cement, coal, fertilizer, etc.

(3) Goods Movement

The main differences of goods movement between the periods before and after the war are:-

- a) a great decrease of goods movement by rail,
- b) a great increase of foodgrains movement by inland water transport, and
- c) a remarkable decrease of the movement of cement, coal and petroleum.

A comparison of inter-district movement in 1968/69 and 1972/73 shows some main tendencies:

- Movement among the three districts of Dacca, Chittagong and Khulna is remarkable both in 1968/69 and 1972/73,
- Districts of Comilla, Sylhet and Mymensingh have relatively large movement and that their movement has not greatly decreased even in 1972/73, and
- Districts in North Bengal had a considerable movement in 1968/69 but their movement in 1972/73 showed a great decrease.

Raw Jute --- Jute, the largest cash crop in Bangladesh, is by far the most important means of obtaining foreign exchange earnings. The productivity of jute is very low with only 2.9 bales per acre (0.52 ton per acre). With improved varieties, better sowing method and suitable use of fertilizer and insecticides, and improvement of its productivity will not be difficult. The competition of jute products in the world market has been on the increase. The natural conditions of cropping of jute is almost the same as that of Aus rice, and they are on competitive relations in terms of land use. Whether farmers produce rice or jute will depend upon the relative price of rice to that of jute.

Jute cultivation is concentrated around the banks of the Jamuna, the Pabna, the old Brahmaputra and the Meghna. The production of raw jute has been stagnant or in the decrease, although the farming area has been increasing.

The overall distribution pattern of inter-district movement does not show a great change between the past and the present. Generally, the movement of raw jute had no change in 1968/69 and 1972/73. The future movement pattern of raw jute might not change even if a change of the production of raw jute should occur. With the falling productivity of raw jute and the almost unchanged rate of regional production, the rate in the future would be almost the same as in the present. The movement of raw jute would be by inland water.

Jute Goods -- Jute industry is a sole representative industry in Bangladesh. Before the war, the trend of production of jute goods showed an increase but after the war it showed a decrease. The districts where jute factories are located are almost limited to Dacca, Chittagong, and Khulna, and the production other than these three districts is very small. Therefore, the inter-district movement of jute goods is very small. The movement of jute goods by IWT is very great. The main movement consists of the routes of Dacca → Khulna and Dacca → Chittagong.

Although there is a possibility of increasing production of jute goods in the future, its movement pattern will not change so greatly. The movement of jute goods would be by inland water.

Foodgrains -- The consumption of rice in Bangladesh amounts to 90% of the total foodgrains consumption and the remaining 10% is wheat. The annual rate of growth in rice production in the 1950's and 1960's were only 0.7% and 2.5% respectively, while the corresponding rates of growth in population were 2.8% and 3.0%

respectively. Since there is no possibility of enlarging farm land in Bangladesh, the increase of rice production must depend upon the increase of productivity of the area. The productivity by location is so deversed that production of each variety of rice varies with the location of its cropping area. As the rice cropping area of 25 million acres occupies 70% of the total area of the country, the low productivity of rice can not be overlooked.

The production of wheat has greatly increased by more than three times during the six year period from 1964/65 to 1970/71 as the result of the introduction of high yield varieties and enlargement of its cropping land. Wheat production is concentrated in Divisions of Khulna and Rajshahi. Districts of Faridpur, Rajshahi, Pabna and Kushtia produce more than half of the wheat in the country.

The total movement of the foodgrains is the largest among all the items. In 1972/73 with a huge amount of foodgrains imported from abroad owing to the unfavourable domestic production the movement showed a great increase and occupied 40% of the total movement.

The total movement by IWT and rail in 1968/69 respectively showed a decrease for almost all items except that of the foodgrains, the greatest among the items, which showed an increase. The movement pattern of imported foodgrains shows a uniform distribution with public transport all over the country to the low income people, while that of private transport to fill up the gap between deficit and surplus. Therefore, the interregional balance of supply and demand will not correspond to the interregional network of origin and destination.

The five year plan indicates the attainment of self-supply of foodgrains in 1977/78, which is thought to be a very difficult target. The movement of foodgrains after 1982/83 from surplus area to deficit area is allocated on the least distance basis. The movement of foodgrains would be by IWT.

Cement -- Cement is produced in Sylhet District, the production of which occupies only 10% of the total consumption, and the rest has to be imported. The movement of cement to Dacca in 1968/69 was great and that in 1972/73 was remarkably greater, while the movement to other areas made a remarkable decrease. The import of cement from India had been maintained until 1964, and have now been reopened, but the amount was not so great as that of coal. With the increased production capacity to be installed in the near future, the movement pattern of cement in the future will be different from that in 1968/69 and 1972/73.

The home production rate of 8% over the total cement consumption is used until 1982/83 and a lower rate of 6% after 1982/83. The regional demand is estimated by the use of the consumption pattern during the period January - March 1973. The movement across Jamuna River would be by railway.

Coal -- Coal is not produced in Bangladesh. The annual amount of coal imported from India amounted to 200,000 - 400,000 tons until 1963/64. Out of the total imported coal of 266,000 tons in 1972/73, 250,000 tons was from India. The interregional movement in 1972/73 differs much from that in 1968/69. Most of the movement in 1968/69 was from Chittagong to Dacca by IWT and from

Khulna to North Bengal by rail. Of the coal imported from Calcutta in 1972/73, 100,000 tons was transported to Chittagong and 42,000 tons to Dacca directly, both by IWT. The remaining 166,000 tons was transported to Khulna by rail and from there 75,000 tons redirected to Chittagong and 52,000 tons to Dacca directly by IWT. In the future with the coal import from India and from other foreign countries, the movement pattern will be different from that in 1968/69 and 1972/73.

Taking into account the industrialization in this country, the coal consumption will increase at an annual rate of increase of 8%. In the distant future the whole demand of coal will be fulfilled by the coal mining development in Bogra District. The movement from India to Chittagong and Dacca would be by rail and from Khulna to Dacca by IWT.

Petroleum -- Petroleum is not produced in the country. Both petroleum and crude oil are imported through the port of Chittagong and refined at Chittagong. Petroleum was transported mainly by rail and truck except for the interregional routes from Chittagong to Dacca, from Chittagong to Khulna, and from Chittagong to Barisal.

The demand of petroleum in 1974 is estimated to be 1.6 million tons. The five year plan estimates the demand in 1978 of 2.6 million tons, which corresponds to an annual rate of increase of 10%.

The reinforcing of refinery facilities in Chittagong and the new installation of a refinery at Khulna are planned in the future. The future pattern of the movement will not differ from that in 1968/69 and 1972/73.

An assumption is made in this study that petroleum will not be produced in 1982/83. A lower growth rate of 5% is used for the demand after 1983. The regional demand in 1983 is estimated on the basis of the pattern in 1969, and the movement of petroleum is allocated on the least distance basis and the demand in North Bengal is covered with the supply from Khulna. The movement would be by IWT.

Iron and Steel -- Iron and steel industry is concentrated in Chittagong and Dacca. The country must import all iron-ore and coal necessary for this industry. The interregional movement was maintained with the greatest amount from Chittagong to Dacca in 1968/69 and 1972/73, although its mode of transport was changed from rail to IWT. The movement except to Dacca was uniformly distributed over the country in 1968/69, but that in 1972/73 was limited only to the districts in the east.

The rate of increase of 10% is used for the demand of iron and steel in the future. Future movement will be from District of Chittagong, and the movement pattern will make no great change from that in 1968/69. The movement crossing Jamuna River would be by railway.

Fertilizer -- The Consumption of Fertilizer has already exceeded its prewar level. The import of fertilizer has not made a big change, while the production has decreased. There are several programmes of new fertilizer plants with the increasing domestic consumption demand.

With the increasing agricultural production required after 1977/78,

a rate of increase of 12.5% is assumed in this study. The future movement pattern will be different from the existing one. The movement of fertilizer crossing Jamuna River would be by IWF and railway.

Salt -- Crude salt is produced only in District of Chittagong and some amount of crude salt is imported. Salt manufacturing works are in Chittagong, Comilla, Dacca, Barisal, etc. The movement of salt forms two routes: one is from Chittagong to salt manufacturing works and the other from these works to consuming places. The movement of salt was mainly by country boat in 1968/69 and 1972/73.

The movement pattern in the future will not be changed greatly, as crude salt is not expected to be produced except in Chittagong. The annual rate of increase of 8% is used for the consumption of salt. The movement of salt across Jamuna River would be from Chittagong to North Bengal by railway and from Comilla to North Bengal by country boat or railway.

Sugar -- The farming of sugar-cane scatters almost all over the country. Divisions of Rajshahi and Khulna occupy two-thirds of the whole farming area. With the increased farming area during the period 1962/63 - 1969/70 the production increased from 470,000 to 740,000 tons. However, the productivity remained almost unchanged with 16 - 18 tons per acre.

The movement of imported sugar in 1972/73 amounted to more than 50,000 tons via Chittagong, while the domestic production of more than 100,000 tons was distributed. Most of the movement in 1968/69

was handled by rail, while in 1972/73 the movement was mostly by IWT.

The future demand is estimated on the basis of the population the distribution pattern of 1968/69 will be maintained in the future, although the import of sugar in the future will not be considered. The movement of sugar crossing Jamuna River would be by railway, truck and IWT.

Stone -- Stone is produced in the three districts of Sylhet, Dinajpur and Rangpur and its production amount is very small. The stone produced in District of Sylhet was transported by country boat. The movement pattern in 1972/73 is not different from that in 1968/69. The flow from North Bengal is supposed to increase in the future and the demand in Dacca will increase. The movement from North Bengal to Dacca will be the main flows, although the overall movement pattern will not change greatly.

The annual rate of increase of 8% is used for the demand of stone. The origin-destination of stone is allocated on the least distance basis. The movement of stone crossing Jamuna River would be from Rangpur/Dinajpur to Dacca/Mymensingh by railway.

Traffic with India -- Before 1965 there was annually more than one million tons of trade with India. The reopened trade with India since 1972 has reached a considerable high level. Bangladesh has the excess of imports over exports. The main import items are coal, refined petroleum, cement, etc., among which coal occupies a greater share, while jute is the only main export item. The main routes of trade are as follows:

- 1) Calcutta rail Khulna rail North Bengal,
- 2) Calcutta sea Chalna and Chittagong, and
- 3) Calcutta IWT Dacca and others.

Bangladesh is adjacent to India at most of her borderline. The north part of Bangladesh borders on the state of Assam which is located far from Calcutta. In the traffic with India the transit traffic of India -- Bangladesh -- India (Assam) will be an important factor. India is very keen on these transit traffic routes, having established several development programmes in her frontier where she tries to develop transport networks. However, it seems that the shortage of the transport capacity on the Indian side will last for a long period.

(4) Future Goods Traffic Crossing Jamuna River

The origin-destinations of the future goods movement has been estimated and the estimated traffic is all located by bridge site taking into account the change of rate of modal split together with the future change of transportation network.

The study results are shown in Table S - 1.

Table S-1 Estimated Goods Movement Crossing Jamuna River by Mode,
1982/83 and 1992/93

(Unit: 1,000 tons/year)

Site	Bahadurabad Gabargaon		Sirajganj		Nagarbari	
	1982/83	1992/93	1982/83	1992/93	1982/83	1992/93
Railway	762	1,815(1,189)	1,048 [71]	2,248(1,737)	1,149 [89]	2,393(1,915)
Highway	98	264(176)	84	273(165)	84	295(181)
Inland- Water	73 [178]	122	79 [107]	133	70 [89]	114
Country boat	92	153	105	177	[104]	171
Total	1,025 [178]	2,354(1,640)	1,316 [178]	2,831(2,212)	1,405 [178]	2,973(2,381)

- Note: 1) Figure in () shows the goods movement in the absence of coal mining project and cement project in Bogra District.
- 2) Figure in [] shows the goods movements with India.
- 3) The mining project in Bogra District is assumed to be in operation in 1990's.
- 4) Goods movement by inland-water between Khulna Division and Dacca and Chittagong Division is excluded.

(5) Future Passenger Traffic

Our study has estimated that the approximately four million passengers crossed Jamuna River in 1974. The origin-destination of the future passenger trips has been estimated. The estimated traffic is allocated by bridge site taking into account the change of modal split. The study results is shown in Table S-2.

(6) Traffic Crossing Jamuna Bridge

The estimated traffic by modes of overland transport crossing Jamuna River has been converted into respective modal capacity and the traffic in the presence of coal mining project and cement project in Bogra District has also been estimated as in Table S-3.

The proposed Jamuna Bridge with a sectional composition of a 2-lane highway and a single gage rail track would meet the increasing transportation demand for the distant future.

Chapter 1 deals with the regional economy of Bangladesh. In Chapter 2 are treated goods movement by item and the present and past traffic with India, and in Chapter 3 goods movement by item in the future are estimated by origin-destination. Passenger movement by mode of transport are discussed in Chapter 4. Finally, in Chapter 5 traffic crossing the proposed Jamuna bridge is estimated by bridge site.

Table S-2 Annual Passenger Trips Crossing Jamuna River, 1983 and 1993

(Unit: 10,000 persons/year)

Year	Site Mode	Bahadurabad Gabargaon	Sirajganj	Nagarbari
		1982/83	Rail	1,179.0
	Road	305.5	335.9	387.1
	IWT	507.3	563.8	734.7
	Total	1,991.8	2,176.8	2,477.9
1992/93	Rail	1,771.4	1,917.2	1,984.7
	Road	554.6	610.8	706.3
	IWT	809.0	896.0	1,199.0
	Total	3,135.0	3,424.0	3,890.0

Table S-3 Estimated Traffic Volumes Crossing Jamuna River by Rail and Road, 1982/83, 1992/93 and 2002/03

Site	Year	Railway (trains/day)			Highway (P.C.E. vehicles/day)		
		1982/83	1992/93	2002/03	1982/83	1992/93	2002/03
Bahadurabad Gabargaon		28	46 (44)	62 (59)	1,930	3,608 (3,488)	5,262 (4,938)
Sirajganj		30	46	62 (60)	2,058	4,006 (3,784)	5,762 (5,330)
Nagarbari		32	48	70 (68)	2,360	4,580 (4,346)	6,646 (6,118)

Figure in () indicates the traffic in the absence of development project in Bogra District.

CHAPTER 1 REGIONAL ECONOMY

1-1 Population

1-1-1 Data and Change of Population

Census had been conducted every ten years until 1961, and 1971 census did not take place due to the Liberation War. The first census after the war was conducted in February 1974. Taking account of the results of the latest census, predictions of population in 1983, 1993 and 2003 have been done through the following procedures.

- (1) Average annual rate of growth of population from 1961 through 1974 by subdivision, has been computed, based on "Preliminary Results of Census of 1974";
- (2) Assuming that the same rate of growth would continue, the populations of each subdivision in the study years, 1983, 1993 and 2003 have been estimated;
- (3) The percentage of the population of each subdivision in each study year to the whole national population in the same year has been computed; and
- (4) Multiplying the whole national populations in the study years shown in the World Bank report by these percentages, the population for each subdivision in each study year has been determined.

Note: (a) As for Dacca Paurashava only the rate of its population growth after 1983 has been assumed to decrease by half, e.g. 10.4% to 5.2%.

(b) The whole population in 1993 has been estimated from the predictions for 1983 and 2003 shown in the World Bank report.

It is to be emphasized in examining these predictions that there would be something to be discussed with the accuracy of the census, together with the outflow of the huge population to the adjacent country, the number of deaths, the movement of population due to the conflict and the complexities resulting from the change of the social structure after the independence and thus it is very difficult to predict the population.

Table 1-1-1-1 Trend and Prediction of Population of Bangladesh

Year	Population (1,000 persons)	Ratio of Rural Population to the total 3)	Average Annual rate of Increase(%)	Density of Population 2) (persons/km ²)
1) 1921	33,254		-	233
31	35,604		0.8	235
41	41,997		1.8	294
51	42,063			294
1) 60/61	50,840 (52,800)*	94.8	2.1	356 (370)
64/65	(59,110)*			414
70/71	(70,010)*		2.9 ***	491
72/73	(74,080)*	92.5		519
73/74	(76,200)* 71,317**			(534) 500
77/78	85,400		2.8	598
82/83	101,000	90.0	3.4	708
92/93	131,322			
2003	170,600	83.3	2.8	1,175

Note: 1) Figures for 1921, 31, 41, 51 and 60/61 from the census results.

* Figures from the First-Five-Year Plan.

** Figure from "Preliminary Results of Census of 1974".

*** Assumed that the rate of increase between 1960/61 and 1973/74 would be uniform.

Figure for 1977/78 from the First-Five-Year Plan.

Figures for 1982/83 and 2003 from estimated predictions by Japan International Development Center (IDC)

2) Area of Bangladesh is 142,700 km².

3) Estimated by IDC.

1-1-2 Distribution of Population

Bangladesh has shown a great increase in population since her first census in 1872, and is one of the countries in the world that shows the highest figures in density as well as rate of growth in population.

According to the 1973/74 census the density of population per square kilometer for the whole country averages 500. Taking account of forested areas in each district which are usually considered as scantily-populated, not much difference in density of population can be seen among the districts.

Within the country, by subdivisions, Dacca Sadar South has the highest density of population, with 2,698 persons to the square kilometer. It is followed by Sylhet Sadar with 2,427. Other subdivisions have no great difference from the national average of 500 persons to the square kilometer.

From the standpoint of the urban concentration of population, Dacca District is the highest with 15% of the whole population and followed by Khulna District with a little over 12%.

It can be said from the above brief that the distribution of population in Bangladesh would be in a pre-urbanization stage and accordingly it can be classified as uniform distribution pattern. This can be supported from the fact that Dacca, the capital of Bangladesh which has been naturally the largest city in the country had a small population of 550 thousand in 1961, the figure of which was equivalent to 1.05% of the whole population.

On the contrary, after the independence of the country the concentration of population into Dacca City has been making a remarkable progress. The 1974 census reveals a population of 1.63 million which is an increase of almost three times. However, a similar tendency has not been seen in other cities. This can be considered as a mere transition after the war.

Among the areas which have a higher density of population are Dacca District with 1,070 persons to a square kilometer, Gopalganj in Faridpur District with 570, Madarpur with 651, Comilla District with 865, Barisal Sadar South in Barisal District with 634, Kishoreganj in Mymensingh District with 616, Jamalpur with 605, Mymensingh Sadar South with 678, and Mymensingh Sadar North with 590, all of which are located along the Ganga, the Padma, the Ganges and the Jamuna. From this a strong historical connection between Bengalese and their rivers can be observed.

The lowest density is shown by Chittagong Hill Tracts District with only 39 persons to a square kilometer, which is an exceptionally low density figure. However, this district is the only extensively hilly area and more than ninety percent of the area is covered with forests. Taking into consideration the inhabitable area only, there is no difference from other districts in density of population. Similarly, the districts of Chittagong and Khulna have a smaller inhabitable area with a forested areas of 31% and 48%, respectively. These are also a factor to be considered in density of population.

The growth in population in the whole country from 1961 through 1974 came to 40.27%. Khulna District has the greatest growth with 61.36%, followed by Rajshahi District with 51.71%, Jessore District with 51.31% and Dinajpur District with 51.00%. These areas are located away from the above mentioned rivers. Densely populated areas are not necessarily areas with a greater increase in population in Bangladesh. This shows that urbanization has not come into existence.

Therefore, it can be said that the movement of population from rural areas into urban in recent years is in as low a level as in the decade 1951-1961.

1-1-3 Prediction of Population .

Future populations of Bangladesh have been estimated by IBRD and the figures of the prediction are shown in Table 1-1-1-1. The estimated total population in 2003 is approximately 170 million, which is more than double the current population, while an annual rate of growth in GNP is estimated at most 4-5%. The density of population in 2003 will be as high as 1,195 persons to a square kilometer.

The figures of future population by divisions and by districts which have been estimated by such method as described hereinbefore are shown in Table 1-1-3-1 and Table 1-1-3-2 shows the resulting density of population by divisions and by districts,

The districts of Chittagong, Dacca, Khulna, Jessore, Kushtia, Rajshahi, Pabna, Rangpur, Dinajpur are presumed to change their demographic structures in the future. However, the limit of their change would be so small that the ratio of the annual density of each district to that of the national average is less than two and a half to one, the figure of which is applied to Dacca being the highest. From this it can be considered that no remarkable concentration of population to specific districts would occur in the future.

Table I-1-3-I Population by District, Past, Present and Future

Division/ District	(census)				Rate of increase 1974/1961(%)	1983		(projection) 1993		2003	
	1960/61		1973/74			persons (1,000)	%	persons (1,000)	%	persons (1,000)	%
	persons (1,000)	%	persons (1,000)	%							
Chittagong	10,140	19.97	13,873	19.44	19,096	18.89	24,165	18.40	30,590	17.93	
Chittagong CTG. H. T.	2,983	5.87	4,325	6.05	6,197	6.14	8,109	6.17	10,820	6.34	
Noakhali	385	0.76	508	0.71	681	0.67	841	0.64	1,027	0.60	
Comilla	2,383	4.69	3,231	4.53	4,409	4.35	5,549	4.23	6,908	4.05	
	4,389	8.65	5,809	8.15	7,809	7.73	9,666	7.36	11,835	6.94	
Dacca	15,605	30.70	21,955	30.81	31,687	31.37	41,142	31.32	53,658	31.44	
Sylhet	3,490	6.87	4,713	6.61	6,402	6.34	8,020	6.11	9,939	5.82	
Dacca	5,095	10.03	7,608	10.68	12,008	11.89	16,228	12.34	22,453	13.16	
Mymensingh	5,533	10.88	7,562	10.61	10,390	10.28	13,177	10.04	16,536	9.67	
Tangail	1,487	2.92	2,072	2.91	2,887	2.86	3,717	2.83	4,730	2.77	
Khulna	13,246	26.04	18,190	25.50	25,282	25.05	32,632	24.85	42,009	24.62	
Khulna	2,449	4.81	3,552	4.98	5,107	5.06	6,848	5.21	9,136	5.36	
Patuakhali	1,193	2.34	1,489	2.09	1,191	1.90	2,267	1.73	2,649	1.56	
Barisal	3,068	6.03	3,906	5.48	5,119	5.07	6,161	4.69	7,338	4.30	
Faridpur	3,179	6.25	4,047	5.67	5,315	5.27	6,360	4.84	7,566	4.44	
Jessore	2,191	4.31	3,314	4.64	4,917	4.87	6,801	5.18	9,322	5.45	
Kushtia	1,166	2.30	1,882	2.64	2,905	2.88	4,195	3.20	5,998	3.51	
Rajshahi	11,849	23.29	17,299	24.25	24,935	24.69	33,383	25.43	44,343	26.01	
Rajshahi	2,811	5.52	4,265	5.98	6,314	6.25	8,711	6.64	11,904	6.99	
Pabna	1,958	3.85	2,809	3.94	3,995	3.96	5,293	4.01	6,856	4.02	
Sogra	1,574	3.09	2,224	3.12	3,178	3.12	4,130	3.15	5,458	3.20	
Xangpur	3,756	7.46	5,428	7.61	7,698	7.63	10,111	7.70	13,135	7.70	
Dinajpur	1,710	3.37	2,572	3.60	3,780	3.73	5,168	3.93	6,992	4.10	
Bangladesh Total	50,840	100.00	71,317	100.00	101,000	100.00	131,322	100.00	170,600	100.00	

Table 1-1-3-2 Population and Density by District, Past, Present and Future

Unit: 1,000 persons
Density: persons/km²

Division/ District	Area (km ²)	(census)						(projection)					
		1 9 6 1		1 9 7 4		1 9 8 3		1 9 9 3		2 0 0 3			
		persons (1,000)	density	persons (1,000)	density	persons (1,000)	density	persons (1,000)	density	persons (1,000)	density		
Chittagong Division	31,706	10,140	320	13,873	438	19,096	602	24,165	762	30,590	965		
Chittagong	7,003	2,983	426	4,325	618	6,197	885	8,109	1,158	10,820	1,545		
CIG. H. I.	13,185	385	29	508	39	681	52	841	64	1,027	78		
Noakhali	4,802	2,383	496	3,231	673	4,409	918	5,549	1,156	6,908	1,439		
Comilla	6,716	4,389	654	5,809	865	7,809	1,163	9,666	1,439	11,835	1,762		
Dacca Division	36,317	15,605	430	21,955	605	31,687	873	41,142	1,133	53,658	1,477		
Sylhet	12,388	3,490	282	4,713	380	6,402	517	8,020	647	9,939	802		
Dacca	7,461	5,095	678	7,608	1,020	12,008	1,609	16,228	2,175	22,453	3,009		
Mymensingh	13,098	5,533	422	7,562	577	10,390	793	13,177	1,006	16,536	1,262		
Tangail	3,370	1,487	441	2,072	624	2,887	857	3,717	1,103	4,730	1,404		
Khulna Division	40,137	13,246	330	18,190	453	25,282	630	32,632	813	42,009	1,047		
Khulna	12,043	2,449	203	3,552	295	5,107	424	6,843	569	9,136	759		
Patuakhali	3,834	1,193	311	1,489	388	1,919	501	2,267	591	2,849	691		
Barisal	7,143	3,068	430	3,906	547	5,119	717	6,161	863	7,338	1,027		
Fariapur	6,974	3,179	456	4,047	580	5,315	762	6,360	912	7,566	1,085		
Jessore	6,594	2,191	332	3,314	503	4,917	746	6,801	1,031	9,322	1,418		
Kushtia	3,549	1,166	329	1,882	530	2,905	808	4,195	1,167	5,998	1,690		
Rajshahi Division	34,548	11,849	343	17,299	501	24,935	722	33,383	966	44,343	1,284		
Rajshahi	9,460	2,811	297	4,266	451	6,314	667	8,711	921	11,904	1,258		
Rajshahi	4,858	1,958	403	2,809	578	3,995	822	5,263	1,083	6,856	1,411		
Bogra	3,888	1,574	405	2,224	572	3,148	810	4,130	1,062	5,456	1,403		
Rangpur	9,588	3,796	396	5,428	566	7,698	803	10,111	1,055	13,135	1,370		
Dinajpur	6,754	1,710	253	2,572	381	3,780	560	5,168	765	6,992	1,035		
Bangladesh Total	142,708	50,840	356	71,317	500	101,000	708	131,922	920	170,600	1,195		

1-2 Outline of Economy

1-2-1 General

No reliable data concerning GNP or GDP which shows a level of economic activities of the country have been found. In the East Pakistan period broad statistics of domestic production up to 1969/70 was published by the Central Bureau of Statistics, but its authenticity is questionable from the fact that there is found a probable overestimation in the statistics, compared with that estimated by the Planning Commission after the independence.

The estimate of the Planning Commission has revealed that GDP in 1969/70 was Taka 31.4 billion (approximately US\$4.3 billion at 1969/70 price), per capita GDP Taka 457 (approximately US\$63), and its average annual rate of growth remained as low as 4.4%. Due to the big blow by the war in 1972/73 GDP dropped by 10% of the 1969/70 GDP and currently it has not recovered to its prewar level.

In the structure of GDP the ratio of agricultural sector which is on the decrease to the whole economy occupied over 55% in 1969/70, while that of manufacturing 8.7%. However, the average annual rate of growth of the former was 3-3.3%, while that of the latter was recorded at 10.5% in 1964/65-1969/70. Especially the growth rate of large-scale industries is remarkable. This is because an investment allocation to East Pakistan was increased during the third plan period (1965-70). It can be said, however, that with the absolutely low economic level in considere-

tion, the economic structure by industries has not changed greatly as indicated in Table 1-2-1-1.

The structure which is so agriculture-oriented would continue in the future because the First-Five-Year Plan establishes its targets of agriculture and manufacturing at 55.1% and 11.2% of GNP respectively at the end of the plan period.

As shown in Table 1-2-1-1, the average annual rate of growth of GNP for the last decade has remained 4.4%. With consideration of the growth rate in population of 3%, the rate of per capita income amounts to slightly over 1%.

Under these circumstances the First-Five-Year Plan is established. The basic targets of the plan are as follows:

- 1) Through the increase of employment opportunities, to aim at eliminating poverty;
- 2) Recovery from the war damages. Especially in agricultural and manufacturing sectors to recover the production capacity to the 1969/70 level by 1973/74;
- 3) To attain an annual rate of growth in GNP of at least 5.5%, exceeding the rate of growth in population (approximately 3%), and to raise per capita income;
- 4) To secure basic consumer goods, such as foodstuff, clothes, edible oils, sugar, fuels, etc.;
- 5) To control the rising prices;
- 6) To set the lowest annual rate of growth in per capita income at 2.5%;

- 7) To secure benefits from socialization, enlarging gradually the scope of national participation and reforming the economic institutions according to the political and social change;
- 8) To decrease the dependency on the foreign aids by mobilizing and developing the national resources. To expedite an alternate import to get rid of dependency upon unreliable supply from foreign countries of, especially, fertilizer, cement, steel, etc.;
- 9) To attain self-sufficiency in foodstuff, avoiding an inflow of population to urban areas, by enlarging employment in rural areas and conducting institutional and technical reformation in agriculture;
- 10) To lower the rate of growth in population which threatens the national economic developments from 3% at the present level down to 2.8%;
- 11) To improve educational, hygienic, rural housing, water supply facilities in order to improve quality of labour force; and
- 12) To secure impartial allocation of income and employment opportunities. To expedite migration of labour force into the areas where employment opportunities are open.

In the First-Year-Plan the planned investment amounts to Taka 44.55 billion and its financial sources consisting of Taka 26.98 billion from the domestic savings and Taka 11.99 billion from foreign aids (which amounts to 40.4% of the total). The domestic savings consist of the surplus revenue, additional tax .

and tax increase of the Government and private savings. The total outlay of the Plan is estimated at an increase of 10% to the average per capita outlay during the period 1965-70. Table 1-2-1-2 shows the development expenditure and its revenue sources of the Five-Year Plan.

As for the sectoral investment allocation, 24% of the total outlay goes to agriculture and water resources (compared with 33.3% of the total investment for East Pakistan during the fourth Five-Year-Plan period of Pakistan) and 19.7% to manufacturing (compared with 10.7% during the same period). Although slightly more emphasis on manufacturing sector can be perceived, there would be no big change in industrial structure through the Plan as illustrated in Table 1-2-1-3.

According to the Plan, the annual rate of growth in GDP is 5.5% and the rate of growth in per capita GDP 2.5%. However, these rates are based on a level in a normal year before the war. To a level in 1972/73 after the war they go up to as high as 28.8% and 5.7% respectively. This comes from the assumption that the production would be restored by the year 1973/74, the initial year of the Plan. In this table the rate of growth in the primary industry is 4.6% which is a high rate compared with the past actual result of 3.0-3.3%.

Table 1-2-1-1 Components of Gross National Product 1959/60 - 1969/70

(Unit: Million rupee)

Sector	Year	1959/60	1964/65	1969/70	Rate of Growth per annum (%)	
					59/60 64/65	64/65 69/70
Agriculture		9,919(62.1)	11,481(58.1)	13,514(55.1)	3.0 %	3.3 %
Manufacturing		965(6.0)	1,293(6.5)	2,123(8.7)	6.0	10.5
Scale	Large	434(2.7)	679(3.4)	1,422(3.8)	9.3	16.1
	Small	531(3.3)	606(3.1)	691(2.9)	2.7	2.7
Construction		240(1.5)	954(4.8)	1,447(5.9)	32.0	8.7
Public Services		23(0.1)	123(0.6)	228(0.9)	41.0	11.2
Transportation		990(6.2)	1,268(6.4)	1,494(6.1)	5.1	3.3
Other Services		3,801(23.8)	4,653(23.5)	5,735(23.4)	4.1	4.3
Total		15,938 (100.0)	19,777 (100.0)	24,535 (100.0)	4.4	4.4

Source: Economic Survey of East Pakistan (1969/70), Planning Department,
Government of East Pakistan
Statistical Digest of Bangladesh (1970/71)

Table 1-2-1-2 Development Expenditure and Revenue Source

(Unit: TAKA 10 million)

	Monetary Expenditure	Non-monetary Expenditure
1. Developmental Expenditure		
Governmental	3,952	
(Investment)	(3,298)	
(Non-investment)	(654)	
Non-governmental	503	585
(Investment)	(471)	(585)
(Non-investment)	(32)	
Total Expenditure	4,455	585
(Investment)	(3,769)	(585)
(Non-investment)	(686)	
2. Domestic Savings		
(Government Savings)	2,698	
(Non-government savings and Bank loans)	(1,618)	
	(1,080)	(585)
3. Inflow of Foreign Capital	1,799	
Equivalent Domestic Resources	1,757	

Source: The First Five-Year Plan

Table 1-2-1-3 Gross Domestic Product and its Components

(Unit: 100,000 taka at 1972/73 prices)

	Benchmark GDP	Estimated actual GDP 1972/73	Projected GDP 1977/78	Annual percent- age rate of Growth over Benchmark GDP	Annual percent- age rate of Growth over Benchmark 1972/ 73 GDP
Agriculture, Live- Stock, Forestry and Fishery	2,883 (57.6)	2,407 (56.1)	3,602 (55.0)	4.6	8.4
Manufacturing	520 (10.4)	358 (8.3)	731 (11.2)	7.1	15.4
Construction	184 (3.7)	171 (4.0)	326 (5.0)	12.1	13.7
Power and Gas	15 (0.3)	15 (0.3)	25 (0.4)	11.0	11.0
Housing	236 (4.7)	236 (5.5)	288 (4.4)	4.1	4.1
Trade, Transport and other services	1,165 (23.3)	1,107 (25.8)	1,570 (24.0)	6.2	7.2
Total	5,003 (100.0)	4,294 (100.0)	6,542 (100.0)	5.5	6.8
per capita GDP (taka)	576	580	766	2.5	5.7

Source: The First Five Year Plan 1973-78

Note: Figure in () is percentage of total

1-2-2 Agriculture

(1) General

Agriculture is of basic importance to Bangladesh, occupying 55% of GDP. The past economy of Bangladesh was agriculture-oriented at the rates of growth of 3.0% for the whole agricultural products and of only 2.0% for foodgrains products, which were too low, compared with the rate of growth of 3.0% in population.

For this reason the unbalance between supply and demand of foodstuff has been increasing, and the resulting increase of foodstuff imports has been accelerating. The imports of foodstuff in 1969/70 amounted to 1.5 million tons, which is 13% of the production of rice and wheat and 29% of the total imports in the same year.

Bangladesh has been unable to maintain self-supply in foodgrains including rice although her economy is of an agriculture-oriented structure. This is the most fundamental problem for agriculture and eventually for the whole economy of the country, that is, without surplus of agricultural yield the growth in other sectors is obliged to be restrained, thus her economic take-off being hindered.

Although the agricultural development has been treated as top-priority since the East Pakistan period, the yield has not been so successful as intended. This may be due to

the following interrelated causes:

- 1) Absence of suitable policies of agricultural development;
- 2) Insufficient encouragement policies;
- 3) Technical handicaps;
- 4) Low level of investment;
- 5) Inefficient implementation of developmental programmes; and
- 6) Infrastructures which is ill-installed and unsuitable.

In addition to the above, there is another big factor that farmers have no ability to understand and accept new knowledge and improvement of techniques, with less than 20% of the spread of education.

In South East Asia in the 1960's there were some examples that great success was made in agricultural production increase by introducing new techniques and species improvement. In Bangladesh there has been a similar motivation in recent years, but no good results have come out.

Industrial development in Bangladesh being oriented traditionally to her agriculture, the main outputs, especially, rice crops of aus (summer harvested rice) and aman (winter harvested rice), and jute are subject to the climatic and physiographic conditions and the fluctuation of their annual production is great.

In the latter half of the 1960's varieties of high-yield rice were introduced throughout the country. However, due to scanty systems of irrigation facilities, which are indispensable for the spread of the species, and which occupy only 7% of the total cultivated acreage, farmers are obliged to depend upon the old low-yield species. The effect of the high-yield species is great, but its cropping acreage occupies only 5% of the total rice cropping area.

(2) Natural Conditions and Land Use

1) Natural Conditions

a. Topography

Bangladesh may be roughly divided into three main topographical divisions:

- i) Tertiary deposit (terrace)
- ii) Diluvial terrace, and
- iii) New alluvial plain

The agrarian economy of Bangladesh is in activity on the three areas of the new alluvial plain and on a part of the diluvial terrace.

The diluvial terrace which had been subject to past erosion and afterwards covered with deposits, filled with substance from its upstream and vicinity. On its surface additional deposits were made, thus forming the new alluvial plain where some terraces are recognized.

b. Rainfall Areas

Annual rainfall varies with the locations; Rajshahi in the northwest and Khulna receive the least rainfall with less than 60 inches (1,524 mm) and from there the rainfall increases radially to the east, reaching as much as 90 inches (2,286 mm) in the whole Sylhet district, the north of Rangpur and Dinajpur, and the coastal area of the Bay of Bengal.

On the basis of the seasonal variation of the rainfall, one year can be divided into three seasons:

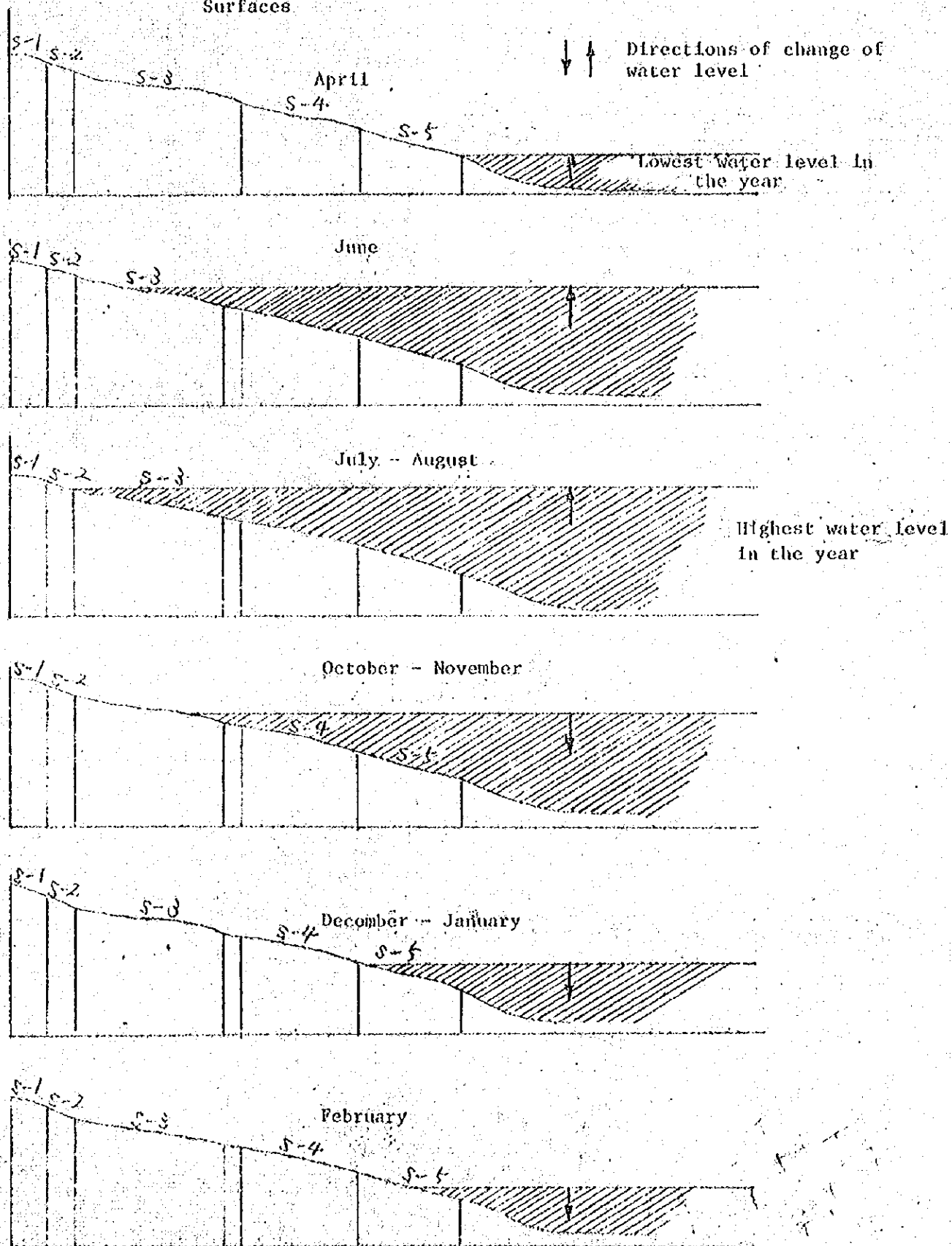
<u>Seasons</u>	<u>Period</u>	<u>Rainfall to the total by percentage</u>
i) Monsoon or rainy	June- October	78
ii) Dry or winter	November- February	3
iii) Nor'wester or summer	March- May	19

Such seasonal fluctuation of rainfall which fits in well with the low arable plains, have direct relation to a pondage for arable lands and exert a great influence on the use of arable lands and agricultural cropping.

c. Water Elevation of Arable Land

The distribution of the current agricultural products is considered to have a relation to the difference of

Figure 1-2-2-1 Seasonal Change of Water Table for Five Arable Land Surfaces



delicate relative height between cropping lands, and this relation seems to be at work as absolute relative height in some area according to the difference of its water utilization.

The arable lands of Bangladesh can, in terms of agricultural products, be divided into five terraces or slopes, which are of great importance. If they can be classified in the order of the higher relative height, they will be Surface-1, Surface-2, Surface-3, Surface-4 and Surface-5 (hereinafter called S-1, S-2, and S-5). These surfaces are not always connected with other surfaces with the difference of their relative height, but flushed with gentle slope.

Both S-1 and S-2 are mainly on the diluvial terrace including some higher portions covered with soil deposits. These two faces are free from the floods in the monsoon or rainy season and they will not have the same water level in their areas as that for the other surfaces, S-3 to S-5, that are lower than the first. Figure 1-2-2-1 shows the seasonal variation of the water level for the five cropping land surfaces.

The varieties of agricultural activities in Bangladesh consist of the different waterholding conditions of the cropping surfaces of different relative heights.

Innumerable natural canals (Khal) run through the plains, being serviceable for drainage purpose in the rainy season as well as for irrigation purpose of rice cultivation in the dry season.

Table 1-2-2-1 Five Arable Surfaces and Related Cultivated Crops

Farming Season	Surface S - 1	S - 2	S - 3	S - 4	S - 5
First April-August	Aus	Aus	Aus, Jute		
Second August-December	T.aman	T.aman	T.aman	B.aman	
Third December-April		Vegetables pulses	Oil seeds pulses Boro - 2	Sugarcane Boro - 2	Boro - 1

- Note:
- 1) Aus is a rice variety which is sensitive to temperature and flowers with integral temperature.
 - 2) Aman is a rice variety which is photosensitive and flowers with the reduction of time from sunrise to sunset.
 - 3) Boro is a kind of Aus which is cultivated in winter in the tropical regions.
 - 4) B. Aman = Broadcast Aman is the most important rice paddy which is cultivated from the second cropping season. It is sown broadcast as well as transplanted, though the latter method is more usual than the former: the reasonability of naming "broadcast" has recently been thinning out.
 - 5) Boro rice is divided into two types for the above tabulation: Boro-1 which is cultivated traditionally on lower land and Boro-2 which is cropped by means of artificial irrigation made in recent years.
 - 6) Sugarcane cultivation extends through the first, second and third cropping seasons.

2) Land Use

Bangladesh, with an area of 35.3 million acres (approximately 142.7 thousand square kilometers), has a cultivated area of 22.48 million acres (approximately 64% to the whole area) and climate and soils are suitable for cropping throughout the year.

With a cropping area of 31.53 million acres, the rate of double cropping land averages 48%. Therefore, almost all arable land is under utilization and enlargement of cultivated land is very difficult. From this fact it can be said that the improvement of productivity is the only approach to raise agricultural production.

As shown in Table 1-2-2-2, each district has a high rate of cultivated land and very little uncultivated land, and seems to have utilized every possible area. This rate has not have a big change in the historical trend.

The districts of Chittagong, Chittagong Hill Tracts and Khulna have a relatively low rate with a larger forested area. The divisions which have a higher rate are Dacca with 70.5% and Rajshahi with 72.6%. By districts, Comilla has the highest rate with 80.5%, followed by Noakhali with 76.8%, Bogra with 76.2%, Jessore with 75.0%, Dinajpur with 74.9% and Mymensingh with 74.2%. Almost all other districts have a high rate with over 60%.

As for the rate of double cropping land all districts

Table 1-2-2-2 Land Use by District in 1970/71

(Unit: acres)

DISTRICT	Area	Forested (Rate: %)	Uncultivable (Rate: %)	Uncultivated (%)	Suspended (%)	Cultivated (A)	No. of Crops a Year			Rate of Cropping (B/A: %)	Rate 1971/72 (%)	
							Single	Two	Three			
CHITTAGONG DIVISION	7,838	3.56 (4.5)	798 (10.2)	253 (3.2)	102 (1.3)	3179 (40.6)	1789	1207	183	4752	14.9	
CHITTAGONG	1,731	5.45 (31.5)	320 (18.5)	58 (3.3)	57 (3.2)	751 (43.4)	502	234	15	1015	13.5	43.1
CTG. H. T	3,259	3002 (921)	66 (2.1)	10 (0.3)	6 (0.2)	173 (5.3)	82	78	13	277	16.0	5.5
COMILLA	1,660	12 (0.7)	255 (15.4)	14 (0.8)	28 (1.7)	1344 (80.5)	638	593	113	2113	14.1	78.5
MOAKHALI	1,187	1 (0.1)	156 (13.1)	72 (6.1)	47 (4.0)	911 (76.8)	567	302	42	1297	14.2	80.0
DACCA DIVISION	8,978	450 (5.0)	1227 (13.6)	169 (1.9)	316 (3.5)	6056 (67.5)	3287	2517	251	7075	15.0	
SYLHET	3,062	205 (6.7)	225 (7.4)	39 (1.3)	8 (0.3)	1885 (61.6)	1289	530	66	2547	13.5	57.4
DACCA	1,844	64 (3.5)	396 (21.5)	8 (0.5)	127 (6.9)	1247 (67.6)	779	373	95	1211	14.5	58.0
MITHENSINGH	3,238	112 (3.5)	544 (16.8)	95 (2.9)	72 (2.2)	2403 (74.2)	932	1408	63	3939	16.4	71.2
TANGAIL	333	67 (20.2)	121 (36.3)	25 (7.5)	98 (29.4)	520 (156.5)	288	206	27	779	15.0	57.1
KHULNA DIVISION	9,923	1442 (14.5)	2124 (21.4)	21 (0.2)	354 (3.6)	5921 (59.2)	3865	1724	333	6311	14.0	56.5
BARISAL	1,669		447 (26.8)	26 (1.6)	30 (1.8)	1165 (69.9)	763	235	147	1734	14.9	48.0
TATKHALI	1,044	15 (1.5)	308 (29.5)	15 (1.4)	1 (0.1)	715 (67.5)	502	165	88	946	12.4	62.7
PARIDPUR	1,724		440 (25.6)	8 (0.5)	35 (2.0)	1190 (69.0)	512	604	74	1733	18.0	64.1
JESSORE	1,624		340 (20.9)	24 (1.5)	43 (2.7)	1222 (75.0)	690	289	43	1598	13.1	74.8
KHULNA	2,777	1425 (51.3)	426 (15.0)	6 (0.2)	104 (3.7)	915 (33.4)	753	242	—	1237	12.4	40.2
KUSHTIA	577		140 (24.3)	2 (0.3)	9 (1.6)	644 (111.1)	445	128	11	253	12.3	66.2
RAJSHAHI DIVISION	8,542	36 (0.4)	1756 (20.6)	236 (2.8)	307 (3.6)	6205 (72.6)	3407	2407	390	9392	15.1	66.6
BOGRA	961		214 (22.3)	2 (0.2)	13 (1.4)	732 (76.2)	323	295	54	1134	15.5	71.8
DINAJPUR	1,670	23 (1.4)	292 (17.5)	62 (4.0)	34 (2.1)	1250 (74.9)	628	327	95	1768	14.1	54.5
PAUNA	1,201		230 (19.2)	1 (0.1)	79 (6.6)	890 (74.1)	519	372	58	1317	14.8	73.3
RAJSHAHI	2,339	7 (0.3)	498 (21.3)	76 (3.2)	66 (2.8)	1671 (72.3)	1194	549	38	2226	13.2	68.1
RANGPUR	3,371	5 (0.2)	520 (15.4)	89 (2.6)	115 (3.4)	1641 (48.7)	432	1014	145	2945	17.9	68.1
Total	35,281	548 (1.6)	6565 (18.6)	739 (2.1)	1118 (3.2)	27361 (60.5)	12248	7855	1158	31531	14.8	57.8

Source: Agriculture Directorate

have over 120%. Especially, Rangpur, Faridpur, Comilla and Mymensingh show high figures.

In order to study the land use by regions in connection with its production and the nature, the country is to be divided into areas by the natural demarkations, the Jamuna, the Ganges and the Meguna, which almost agree to the current administrative divisions. Each region is as follows:

- 1) South-west (Khulna Division with an area of 9.92 million acres)

This includes six districts: Kushtia, Jessore, Khulna, Barisal, Patuakhali and Faridpur. The rate of cultivated land is 60.0% for the whole division and 70.9% if Khulna is excluded. The rate of double cropping land in Faridpur shows a remarkable figure of 163%.

This region is subject to large damage from high tide by seasonal cyclones. Especially area along the Bay of Bengal (Faridpur, Khulna and Barisal) which occupies approximately 3.0 million acres can, in the presence of salt damage, be utilized only around the beginning of the monsoon season and subsequently a single rice cultivation (aman) is to be kept all the year round.

The Coastal Embankment Project which lasted for the past 10 years has protected a cultivated land of 1.0 million acres, contributing to the increase of

T. Aman production. The remaining cultivated land that has no embankment suffers from great damage from the flooding.

Therefore, should irrigation facilities be provided the region would be free from the shortage of water before the harvest of aman with the subsequent increase of the rice production and with the possibility of cultivation of other crops in the dry season. Since the cultivated land of 2.0 million acres described above is subject to less salt damage, an irrigation project which is for the cropping in the dry season is of great importance with a secondary flood protection project.

In this region the prevention of the water invasion from the high tide is more important than that from heavy rainfall and river run-off. Portions of Faridpur and Barisal are subject to heavy damage resulting from the overflow of the Arikalkhan, a branch of the Pabna. On the contrary, the districts of Kushtia and Jessore are subject to heavier damage from droughts than floods.

- 2) South-east (Chittagong Division with an area of 7.84 million acres)

This includes four districts: Comilla, Noakhali,

Chittagong and Chittagong Hill Tracts. The rate of cultivated land is 42.5%, which is the lowest among the four divisions in the presence of large forested areas, as mentioned before. However, the rate for Comilla and Noakhali is approximately 80% and the rate of double cropping land in Comilla is over 160%.

The land of this region is subjected to salt damage from high tide, although it is protected with partial embankments.

The Megna and the Gumti bring flooding to most part of Noakhali and the whole of Comilla, and the Kanafuri and the Sanga will affect many areas of Chittagong Hill Tracts.

Some areas of Chittagong and Chittagong Hill Tracts are provided with flood protection facilities, but these areas will have a trouble of drought. Both of these districts have good sandy soils unlike areas of the other regions, and their yields of cotton, dry land rice and fruits are remarkable.

3) North-east (Dacca Division with an area of 8.98 million acres)

This includes four districts: Sylhet, Dacca, Mymensingh and Tangail. It has a higher rate of cultivated land with 67.5%. The rate of double cropping land in

Mymensingh is high with 164%.

This region has the worst conditions for cropping in Bangladesh in terms of terrain, climate and river networks. The main stream of the Brahmaputra is assumed to have run through the Sylhet basin by the 18th century, the ground of which is said to have subsided by from 30 to 40 feet during the past several hundred years. Currently it has a relative height of from 10 to 20 feet.

The plain in the region is too low to drain the flooding water resulting from the rainfall during the monsoon season.

- 4) North-west (Rajshahi Division with an area of 8.54 million acres)

This includes five divisions: Dinajpur, Rangpur, Bogra, Rajshahi and Pabna. It has a high rate of cultivated land with over 70% and also a high rate of double cropping land with 145%. This is the only region that can produce surplus food grains.

The region has great trouble of droughts during the dry season of 7-month duration, while the monsoon season is shorter. The cultivation of Boro rice is not possible except on some lower areas.

The region is protected with embankments on the right

banks of the Brahmaptra and the Jamuna, but subjected to the flooding from the Ganges and the Atrai. The southeast portion of Pabna will frequently be flooded from both the Ganges and the Brahmaptra.

(3) Agricultural Products

Bangladesh agriculture consists mainly of crops production, and 78% of the total cropping land is utilized for the production of rice, staple of this country, which amounts to 28% of GDP.

Other important crops are: jute which is the main cash crop, rabi crops which present a variety of food and other produce, including gram, pulses, wheat, barely, vegetables, mustard, oil-seeds, etc., and other cash or commercial crops such as tea, tobacco, sugar-cane, etc. Table 1-2-2-3 shows the yield of the main crops.

The productivity and rate of growth in production of these crops are all very low and among them rice, jute and sugar-cane, which are the three largest agricultural products, hang remarkably low.

The activities and characteristics of the regions in terms of main crops is to be discussed crop by crop below.

a) Rice

The consumption of rice in Bangladesh amounts to 90%

Table 1-2-2-3 Production Trends of Main Agricultural Products

(Unit: 1,000 tons)

Crops	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70	1970-71	Average Cropping Area 66/67-69/70 (100,000 acres)	Production per acre 66/67-69/70 tons/acre
Rice	10,337	10,333	9,424	10,995	11,160	11,816	10,968	239.00 (77.6%)	0.447
Wheat	34	35	58	58	92	103	110	2.15	0.320
Pulse	234	239	274	272	275	293	296	8.68	0.300
Edible Oil	124	133	152	188	203	207	210	8.15	0.320
Potato	395	486	591	701	786	857	849	1.80	3.640
Sugarcane	6,231	7,550	8,070	7,589	7,429	7,418	7,598	4.21	18.000
Jute (1,000 bales)	5,328	6,693	6,400	6,670	5,754	7,171	6,670	23.00	0.517
Mesta (1 million lbs)	N.A.	N.A.	N.A.	N.A.	N.A.	220	131		
Tea	63	60	63	65	62	67	69	0.99	0.293
Tabacco	61	83	83	86	86	85	86	1.12	0.296

Source: Directorate of Agriculture

Note: N.A. means not available.

of the total food grains consumption and the remaining 10% is wheat. The rice production is very important for the country from the point of its rate to GNP and to cropping area, since the increase of productivity of rice directly connects to growth in GDP and decrease of foodgrains import.

Although the production of rice has a great bearing on the national economy, it has shown little increase: the annual rate of growth in the 1950's and 1960's were only 0.7% and 2.5% respectively, while the corresponding rates of growth in population were 2.8% and 3.0% respectively.

Therefore the imports of foodgrains from foreign countries have been increasing steadily from 800 thousand tons in 1960 to 1.5 million tons in 1969/70, amounting to 2.5 million tons in the years after the war.

The rice cropping can be divided into three parts as shown in Table 1-2-2-1 according to the difference of their farming seasons. Figure 1-2-2-2 shows rough farming patterns of rice varieties. The production of Aus and Aman are rather affected largely by natural factors, while that of Boro depends upon enlargement of irrigation facilities and effective management thereof.

Table 1-2-2-4 shows cropping areas and production of rice by variety and by periods. The productivity of Boro rice is remarkably high, with 20% of the total rice production in spite of covering only 10% of the total area of rice planting.

Since there is no possibility of enlarging farm land in Bangladesh, the increase of rice production must depend upon the increase of productivity of the area. The productivities of Aus, Aman, and Boro are 0.35, 0.45 and 0.80 ton per acre respectively, which are all low compared with those in other countries.

The productivity by location is, as shown in Table 1-2-2-5, so sporadic that production of each variety of rice varies with the location of its cropping area. However, on the divisional base the productivity shows roughly similar figures. It is assumed from this fact that rice farming will depend much upon its natural conditions and be sensitive to the change of the conditions of the areas in which rice is cropped.

As the rice cropping areas of 25 million acres occupies 70% of the total area of the country, the low productivity of rice cannot be overlooked. The causes are supposed as follows:

- Influences of seasonal cyclones, consequent high

Figure 1-2-2-2 Farming Patterns of Rice in Bangladesh

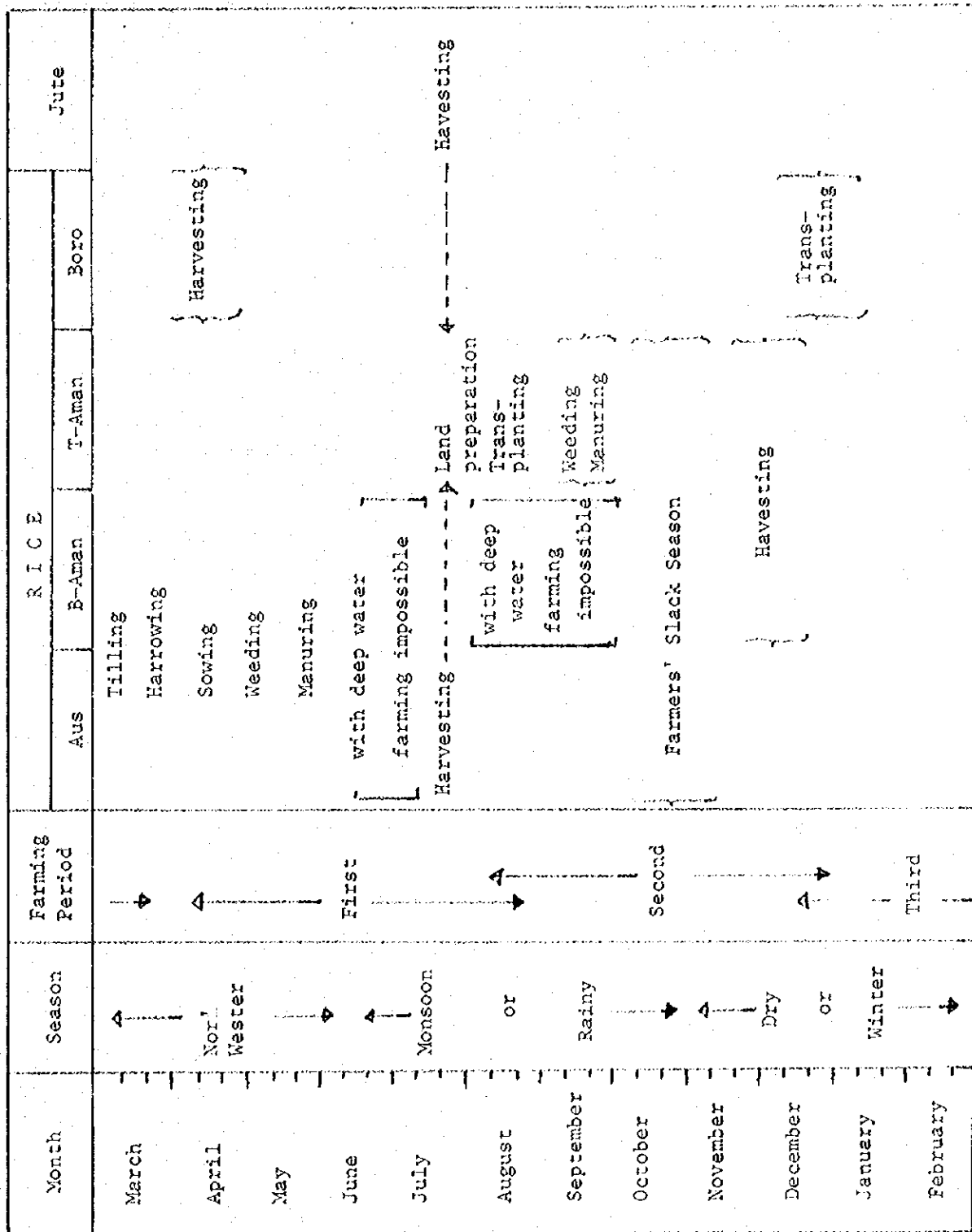


Table 1-2-2-4 Cropping Area, Production and Productivity of Rice by Variety

Variety Period	Aus			Aman			Boro			Total		
	Cropping area (million acres)	Production (million tons)	Production per acre (tons/acre)	Cropping area (million acres)	Production (million tons)	Production per acre (tons/acre)	Cropping area (million acres)	Production (million tons)	Production per acre (tons/acre)	Cropping area (million acres)	Production (million tons)	Production per acre (tons/acre)
1950/51 - 1954/55	5.71 (27.3)	1.83 (24.3)	0.32	14.34 (68.7)	5.35 (71.2)	0.37	0.83 (4.0)	0.34 (4.5)	0.41	20.88 (100)	7.51 (100)	0.36
1955/56 - 1959/60	5.84 (28.9)	1.94 (25.8)	0.33	13.48 (67.0)	5.23 (69.6)	0.39	0.79 (3.9)	0.34 (4.6)	0.43	20.11 (100)	7.51 (100)	0.37
1960/61 - 1964/65	6.32 (28.9)	2.44 (25.1)	0.34	14.52 (66.4)	6.76 (69.7)	0.47	1.04 (4.7)	0.50 (5.2)	0.48	21.88 (100)	9.70 (100)	0.44
1965/66 - 1969/70	7.72 (32.3)	2.86 (26.6)	0.37	14.53 (60.8)	6.67 (62.1)	0.46	1.65 (6.9)	1.21 (11.3)	0.73	23.90 (100)	10.74 (100)	0.45
1970/71 - 1971/72	7.63 (32.5)	2.60 (25.1)	0.34	13.59 (57.7)	5.78 (55.7)	0.43	2.31 (9.8)	1.99 (19.2)	0.86	23.55 (100)	10.37 (100)	0.44

Source: Directorate of Agriculture

Note : Figure indicates the average annual amount during each period.

Table 1-2-2-5 District-wise Cropping Area, Production and Productivity of Rice (1967/68)

DISTRICT	A U S		A m a n		B o r o		Total			
	Area (1,000 acres)	Production (1,000 t) per acre	Area (1,000 acres)	Production (1,000 t) per acre	Area (1,000 acres)	Production (1,000 t) per acre				
CHITTAGONG	337	151	0.48	0.95	304	0.61	92	80	0.82	545
CTE. H. T.	119	61	0.51	53	31	0.59	15	15	1.00	107
COMILLA	517	189	0.37	947	545	0.58	95	72	0.76	806
NOAKHALI	371	139	0.38	718	354	0.49	29	16	0.55	509
CHITTAGONG	1,344	550	0.41	2,214	1,234	0.56	237	123	0.77	1,967
SYLHET	367	168	0.46	1,256	699	0.56	523	322	0.62	1,127
DACCA	442	175	0.40	768	343	0.45	124	95	0.77	613
MYMENSINGH	1,361	424	0.31	1,870	727	0.39	474	392	0.83	1,543
TANGAIL										
DACCA	2,170	767	0.35	3,896	1,767	0.45	1,121	809	0.72	3,345
BARISAL	650	275	0.42	1,590	636	0.40	18	10	0.56	921
PATUAKHALI	607	177	0.29	806	290	0.36	19	12	0.63	479
FARIDPUR	610	243	0.41	598	258	0.45	7	8	1.14	514
JESSORE	122	57	0.47	1,030	604	0.59	26	17	0.65	678
KHULNA	597	152	0.38	113	56	0.56	3	3	1.00	221
KOSHTIA										
KHULNA	2,386	709	0.38	4,122	1,854	0.45	73	50	0.68	2,813
BOGRA	250	88	0.35	598	280	0.47	15	10	0.67	378
DINAJPUR	411	165	0.40	811	406	0.50	4	4	1.00	575
PABNA	318	83	0.26	577	195	0.34	9	7	0.78	285
RAJSHAHI	440	144	0.33	1,163	445	0.38	64	40	0.63	630
RANGPUR	902	361	0.40	1,301	630	0.48	12	10	0.83	1,001
RAJSHAHI	2,321	841	0.36	4,450	1,957	0.44	104	71	0.68	2,369
Total	8,221	3,067	0.37	14,682	6,814	0.46	1,535	1,113	0.75	10,994

- tide, floods and droughts;
- poor irrigation facilities through the whole year necessary for the cropping of high yield varieties (HYV);
- delay of the introduction of HYV to the irrigated areas;
- unimplemented agricultural projects resulting from the shortage of finance;
- delay of requests for foreign aids;
- execution of ineffective projects;
- lack of application of fertilizer and agricultural chemicals;
- unsuitable support; and
- administrative defects.

b) Rabi Crops

Rabi crops are cultivated mainly in the dry season and their productivity is very low, compared with that of rice crops. However, the production of rabi crops has remarkably increased with their enlarging cropping lands.

i) Wheat

The production of wheat has greatly increase by more than three times during the 6-year period from 1964/65 to 1970/71 as the results of the introduction of HYV and enlargement of

its cropping land, although a strong preference to rice is one of the causes that still hinder the farmers' will of increasing the production of wheat.

In the northwest, however, the merit of wheat is great because wheat replaces Boro rice for the winter cropping. Therefore irrigation systems by tube-wells have developed in this region. One tube-well can irrigate an area of only 60 - 80 acres for rice cropping but an area of approximately 200 acres for wheat cropping, which is almost triple. As West Bengal in India, where there has been no habit of living on rice, presently produces annually more than 1 million tons of wheat, wheat cropping in Bangladesh would be applicable in the future. Wheat production is concentrated in Divisions of Khulna and Rajshahi as shown in Table 1-2-2-6. Districts of Faridpur, Rajshahi, Pabna and Kushtia produce more than half of the wheat in the country.

ii) Potatoes

Potato cropping was begun in the 1930's and in 1965 there was a production of 350 thousand tons. Since the subsequent introduction of European varieties its production has rapidly

Table 1-2-2-6 District-wise Production of Main Rabi Crops
(Unit: 1,000 tons)

DIVISION	Wheat		Pulse		Vegetables		Fruits		Potato	
	1960-61 ~1964-65	1967-68	1960-61 ~1964-65	1967-68	1960-61 ~1964-65	1967-68	1960-61 ~1964-65	1967-68	1960-61 ~1964-65	1967-68
Chittagong Div	1.7	3.2	23.3	24.7	110.7	122.2	143.5	278.5	46.3	139.2
CHITTAGONG	0.1	0.1	7.2	11.7	31.5	42.7	47.7	99.2	17.6	45.8
CTG. H.T	—	—	0.8	0.5	7.8	7.3	15.5	70.7	1.9	5.5
COMILLA	1.4	3.0	10.4	8.2	63.8	63.5	48.0	54.8	14.7	86.8
NOAKHALI	0.2	0.1	4.9	4.2	7.6	8.6	33.3	53.7	12.1	21.1
Dacca Div.	4.7	7.2	60.4	49.6	150.2	185.7	283.9	419.7	101.1	259.5
SYLHET	0.1	0.1	1.2	0.9	21.4	22.1	99.1	142.0	24.1	36.7
DACCA	2.0	4.7	28.2	23.0	53.9	54.1	78.0	123.7	89.1	173.6
MYMENSINGH	2.6	2.4	31.0	25.7	74.7	109.5	106.8	150.9	37.9	47.2
TANGAIL	—	—	—	—	—	—	—	—	—	—
Khulna Div	11.4	21.3	86.4	89.7	196.3	269.3	325.8	350.7	33.7	53.6
BARISAL	0.0	0.2	19.4	14.9	62.9	95.0	55.7	107.5	5.4	14.7
DATUAKHALI	5.6	12.6	20.6	26.2	43.4	46.6	69.2	57.6	13.4	5.7
FARIDPUR	1.4	1.9	19.2	21.1	28.3	33.9	62.9	54.5	4.2	6.8
JESSORE	0.1	0.1	3.6	3.3	37.4	69.3	71.2	68.7	9.1	23.8
KHULNA	4.3	6.5	23.6	24.2	24.3	24.4	66.8	42.5	1.6	2.3
KUSHITIA	—	—	—	—	—	—	—	—	—	—
Rajshahi Div	19.1	26.2	85.0	82.4	257.6	242.4	548.8	549.7	167.0	250.6
BOGRA	0.8	1.7	9.9	8.8	70.6	57.0	72.3	86.0	43.3	63.8
DINAJPUR	1.2	1.6	5.1	5.0	39.8	46.6	90.5	92.4	37.9	52.3
PAONA	5.5	9.9	28.7	28.5	87.3	33.9	63.3	70.1	6.8	9.9
RAJSHAHI	6.8	8.9	28.7	28.2	57.3	57.7	226.8	199.0	32.1	42.3
RANGPUR	4.8	4.1	12.8	11.9	52.6	47.2	95.9	102.2	46.9	82.3
Total	36.9	57.9	255.1	246.5	714.8	819.5	1303.0	1599.0	348.0	700.9

increased to 700 thousand tons in 1967/68 and 850 thousand tons in 1970/71.

The First-Five-Year Plan aims at raising potato production up to 1.1 million tons without enlarging the cropping land but with spreading HYV varieties. The plan also shows the necessity of more fertilizer and of storage facilities necessary both for seed potatoes and potato for consumption. Districts of Dacca, Rajshahi, Comilla, Bogra, Dinajpur and Rangpur are the main cropping areas of potatoes.

iii) Vegetables and Fruits

Little change has been made during the last 20 years with farming area of 630 thousand acres as in 1970/71. The products of vegetables and fruits are 800 thousand tons and 1.6 million tons respectively, the productivity of which is very low. However, their per capita consumption has been decreasing with 1.33 ounces per day (approximately 12 kg per year).

Soils and climate are suitable for their cropping. And more production can be obtained by enlarging farming areas and improving their productivity. However, limitations which hinder the production

are supposed as follows:

- underdeveloped transportation systems;
- absence of systematic marketing;
- shortage of information on modern techniques;
- unsuitable facilities of warehousing, packing and storage; and
- shortage of human resources in terms of techniques.

Banana cropping scatters almost in the whole country, while vegetables are produced around larger communities. Relatively more production is made in the northwest.

iv) Pulse

The production of pulse was 290 thousand tons in 1972/73 with a cropping area of 920 million acres, the productivity of pulse cropping being 0.3 ton per acre. The cropping area of pulse occupies one quarter of that of rabi crops, and is the largest among all the rabi.

Pulse which are the material of bean soup indispensable for daily meals of low income earners are consumed at the rate of 8 g per day (2.9 kg per year) per capita, which is very far from a specified standard of nutrition of 29 g per day per capita.

With the spread of artificial irrigation facilities an annual production of 350 thousand tons in pulse which is the fixed target of the Five-Year-Plan is expected through improvement in productivity.

Pulse are mainly produced in Divisions of Khulna and Rajshahi and precisely in Districts of Mymensingh, Pabna, Rajshahi, Faridpur, Kushtia, Dacca and Jessore.

c) Jute

Jute, the largest cash crop in Bangladesh, is by far the most important means of obtaining the foreign exchange earnings. Since the Pakistan period, the amount of foreign currencies from export of allied jute products was a large 43% of the total exports during the period 1964-67 and after the independence the amount is estimated to have risen to more than 85%. With keen competition from other countries, Bangladesh's share of jute to the whole world went down to 35% in 1961 and have remained almost unchanged since then.

The statistics shows that the productivity of jute is very low with only 2.9 bales per acre (0.52 ton per acre). A pilot test for intensive farming in an area of 360 thousand acres conducted in 1970 showed

a good productivity of 4.0-4.5 bales per acre (0.73-0.82 ton per acre). With improved varieties, better sowing method and suitable use of fertilizer and insecticides, an improvement of its productivity will not be difficult.

The competition of jute products in the world market has been on the increase. Unless the range of use of jute increases, its consumption will be either on the decrease or remain on the same level as today's. Its future depends largely on a development of the new applications and on stable supply, both in volume and price.

The natural conditions of cropping of jute is almost the same as that of Aus rice except in high-flooding areas, and they are on competitive relations in terms of land use. Whether farmers produce rice or jute will depend upon the relative price of rice to that of jute. Because the price of rice is high recently due to its shortage, a priority seems to have been given to the cropping of profitable rice.

Jute cultivation is concentrated, as shown in Figure 1-2-2-3, around the banks of the Jamuna, the Padma, the old Brahmaputra and the Megna. By districts, Mymensingh has the highest production with more than 30% in 1963/64 and 25% in 1967/68 to the total production and is followed by Rangpur, Faridpur,

Dacca and Comilla. Table 1-2-2-7 shows the production and productivity of jute by district in 1968/69.

d) Other Agricultural Produce

i) Tea

The production in Sylhet District occupies 96.2% of the national total. The farming area is 280 thousand acres, out of which 110 thousand acres is under cultivation. The total production amounts to approximately 30 thousand tons with employees numbering approximately 140 thousand.

The tea exports occupied 10% of the total national export value before the war. After the war, however, owing to the loss of prewar sole markets of West Pakistan they have been exposed to severe international competition. Suitable counter-measures are required.

ii) Sugar-cane

The farming of sugar-cane scatters almost all over the country. Divisions of Rajshahi and Khulna occupy two-thirds of the whole farming area.

During the period 1962/63-1969/70 the farming area increased from 300 thousand to 400 thousand

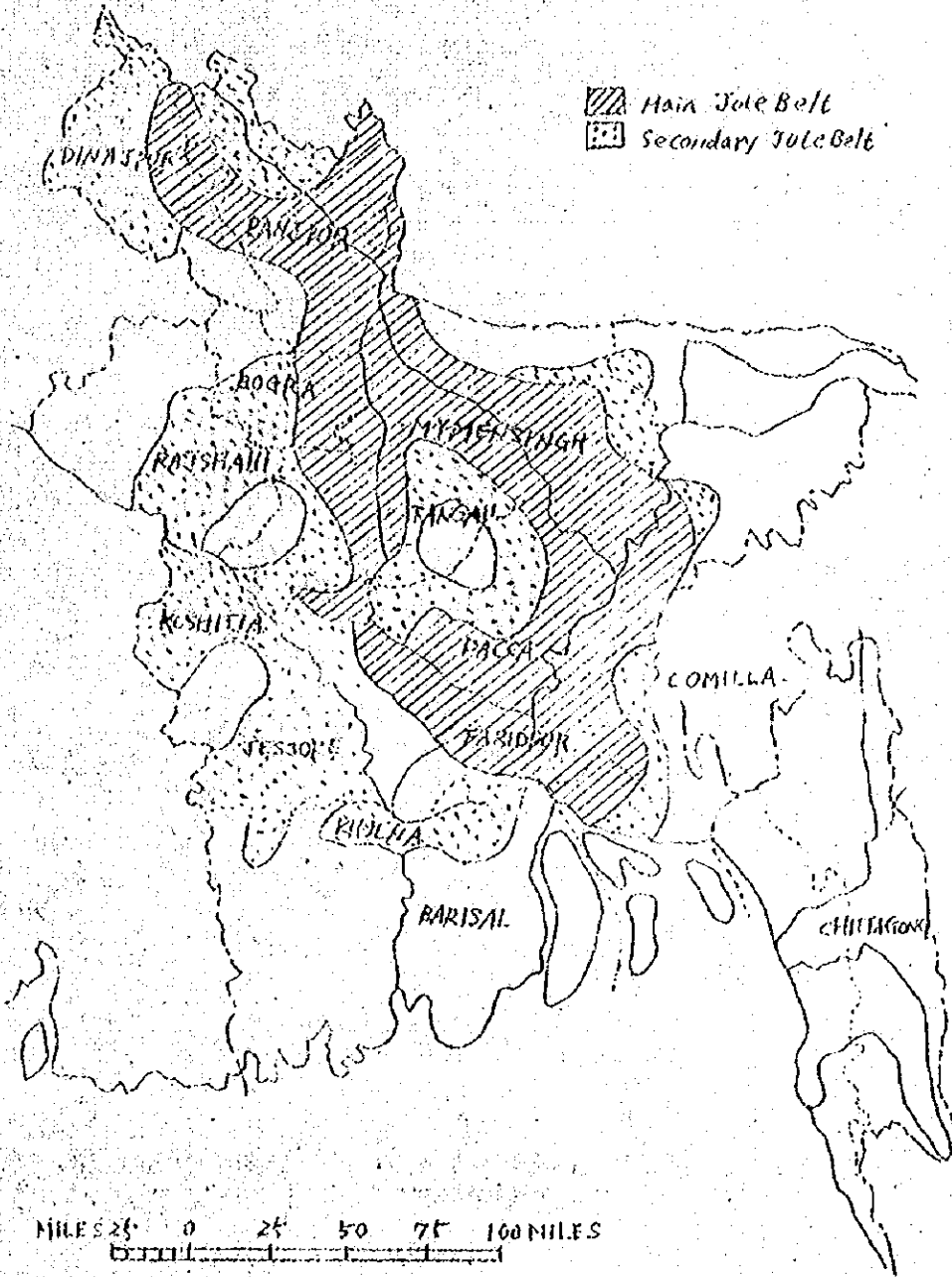
Table 1-2-2-7 Production and Productivity of Jute by District : 1968/69

District	Farming Area (1,000 acres)	Production (1,000 bales)	Production (1,000 tons)	Production per acre (bales/acre)	Rate of Production to Total (%)
Chittagong	0.6	2	0.36	3.33	0.03
Chittagong H. T.	0.3	1	0.11	2.00	0.01
Comilla	184	605	109.78	3.29	9.07
Noakhali	37	102	18.51	2.76	1.53
Chittagong	221.9	710	128.82	3.19	10.64
Sylhet	23	66	11.98	2.87	0.99
Dacca	200	648	117.57	3.24	9.72
Mymensingh, Tangail	581	1,622	294.30	2.77	24.32
Dacca	804	2,336	423.87	2.91	35.03
Barisal Patuakhali)	70	200	36.29	2.86	3.00
Faridpur	250	703	127.55	2.81	10.54
Jessore	120	392	71.12	3.27	5.88
Khulna	45	159	28.85	3.53	2.38
Kushtia	34	101	18.33	2.97	1.51
Khulna	519	1,555	282.14	3.00	23.31
Bogra	84	225	40.82	2.68	3.37
Dinajpur	136	350	63.50	2.57	5.25
Pabna	111	290	52.62	2.61	4.35
Rajshahi	104	248	45.00	2.38	3.72
Rangpur	355	956	173.46	2.69	14.33
Rajshahi	790	2,069	375.40	2.62	31.02
Total	2,355	6,670	1,210.21	2.86	100.00

Source: Agriculture Directorate

Note : 1 Bale = 0.18144 ton

Figure 1-2-2-3 Jute Belts (1963/64)



Source:
An Economic Geography of East Pakistan

acres, and the production also increased from 470 thousand to 740 thousand tons. However, the productivity remained almost unchanged with 16-18 tons per acre. Per capita consumptions were 3 pounds of sugar and 4 pounds of gur in 1962/63 but it increased to 4 and 7 pounds in 1969/70 respectively. The Five-Year-Plan shows the consumptions with 5 pounds of sugar and 8 pounds of gur in 1977/78. The national consumptions will amount to 2.8 million tons for sugar and 4.6 million tons for gur, totalling 7.4 million tons of sugar-cane. The planned productivity is 18-20 tons per acre.

iii) Cotton

The farming area of cotton is 35 thousand acres with a production of approximately 13 thousand bales. The main producing areas are almost in Chittagong Hill Tracts District. Currently the farming area and production of cotton are on the decrease. The currently required amount estimated in the Five-Year-Plan is 51 thousand bales in terms of cotton yarn with 2.4 pounds equivalent. Most of cotton consumed in this country must depend on its import. The Five-Year-Plan has a target to raise a production to 63 thousand bales from a farming area of 50 thousand acres.

Table 1-2-2-8 Other Main Agricultural Products

DISTRICT	Tea		Tobacco		Sugar-cane		Cotton	
	Production (tons)	Rate (%)	Production (tons)	Rate (%)	Production (1,000 t)	Rate (%)	Production (tons)	Rate (%)
CHITTAGONG	1,107	3.8	1,485	3.9	101	1.3		
CTG. H.T	18	0	455	1.2	14	0.1	14,529	99.8
COMILLA	9	0	1,470	3.8	87	1.1	2	0
NOAKHALI			40	0	63	0.8		
Sub-total	1,134	3.8	3,450	8.9	265	3.5	14,531	99.8
SYLHET	27,643	96.2	2,345	6.1				
DACCA			995	2.6	305	4.0		
MYMENSINGH			2,790	7.2	552	7.3	20	0.1
TANGAIL								
Sub-total	27,643	96.2	6,130	15.9	965	12.7	20	0.1
BARISAL			2,005	5.2	444	5.9		
PATUAKHALI								
FARIDPUR			1,560	4.0	647	8.5		
JESSORE			280	0.7	385	5.1		
KHULNA			500	1.3	90	1.2	3	0
KUSHTIA			320	0.8	681	9.0	4	0
Sub-total			4,665	12.1	2,247	29.6	7	0
BOGRA			235	0.6	391	5.2		
DINAJPUR			1,055	2.7	1,141	15.0		
PABNA			545	1.4	321	4.2		
RAJSHAHI			480	1.2	1,706	22.5		
RANGPUR			21,965	59.0	553	7.3	5	0
Sub-total			24,280	63.0	4,112	54.2	5	0
Total	28,777	100.00	58,525	100.00	7,589	100.00	14,563	100.00

Source: Agriculture Directorate

iv) Tobacco

From the latter half of the 1960's the farming area and production of tobacco have not changed so much with approximately 110 thousand acres and 86 million pounds (=39 thousand tons) respectively. The producing areas scatter generally all over the land, but the production in Rangpur District is remarkable with 60% to the national whole. The Five-Year-Plan shows a meager increase of production and a self-sufficiency in tobacco.

(4) Target Production of the Five-Year Plan

The Five-Year-Plan indicates that the fundamental strategies for the increase of agricultural production would consist in raising of production, bring about fully the potentials of each land by conducting more intensive farming with these countermeasures of 1) improvement of land productivity with introduction of high-yield varieties; 2) more use of chemical fertilizer; 3) control of epidemic; and 4) introduction of farming methods and irrigation facilities suitable for the locality, etc.

The target production of the main products of the Five-Year Plan is tabulated in Table 1-2-2-9. By far the most attractive is that Bangladesh would attain self-supply of foodgrains of rice and wheat by executing the Five-Year-Plan programmes.

Table 1-2-2-9

Production Targets of Main
Agricultural Products during
the Five-Year Plan Period

(Unit: 1,000 tons)

Item	Unit	Production		Rate of increase(%)
		Base Year	1977/78	
Rice		1,240	15,080	34.0
Wheat		90	360	300.0
Jute		666 (7,200) ¹⁾	9,100	37.0 (26.0)
Sugarcane		6,000	7,420	24.0
Potato		780	1,100	41.0
Edible oil		200	400	100.0
Pulse		290	350	21.0
Tabacco	1,000 lbs	87,000	147,500	69.0
Vegetables and Fruits	1,000 tons	4,200	4,700	12.0
Cotton	1,000 bales	1,300	6,300	38.0

Source: The First Five-Year Plan

Note: 1) Mesta is not included in Jute. Figure in ()
indicates the past peak production of Jute (1969/70).

Table 1-2-2-10

Supply and Demand of Foodgrains
in the Five-Year-Plan

(Unit: 1 million tons)

Year	Population (1 million persons)	Demand	Production	Supply 1)	Balance
1973/74	76.2	12.04	12.05	10.84	- 1.20
1974/75	78.5	12.39	13.22	11.90	- 0.49
1975/76	80.9	12.75	13.79	12.41	- 0.34
1976/77	83.1	13.11	14.41	12.97	- 0.14
1977/78	85.4	13.90	15.44	13.90	0

Source: The First Five-Year Plan

Note: 1) Supply is estimated by the subtraction of 10% from the
production for seed-rice and loss.

Table 1-2-2-10 shows annual targets to reach the self-supply, which are to be under several assumptions that suitable distributions of products as well as production under normal climates and natural conditions on the basis of per capita consumption of 16 ounces (454 g) per day.

(5) Supply and Demand of Food

1) Foodgrains

In Bangladesh the amount of imports of foodgrains has been on the increase, and the movement of foodgrains is also a main item in terms of transportation, in the presence of unbalance of supply and demand in each area.

The northwest is expected to be the greatest rice surplus region. A situation of supply-demand of foodgrains and a prospect thereof will have a great bearing on the future inter-regional movement of commodities. Brief discussion concerning a balance of foodgrains by regions is as follows:

a) Method of Estimate

An administrative district is used as one unit. Probable consumption in each district is to be computed by subtracting the district consumption and required amount for reproduction (usually equivalent to 10% of the total production) from the district production. The demand is taken from the product of per capita consumption and the district population. Thus the level

of a self-supplying capacity of a district can be estimated by comparing the above two figures.

Surplus or deficit amount = Production (of rice and wheat) x 0.9 - Population x per capita consumption

where: Population: $P_n = P_c (1 + 0.029)^n$

P_c = Population census in 1961

0.029 = 2.9%: Annual rate of growth in population

Per capita consumption:

Dr. S.R. Bose in his works "Foodgrain Availability and Possibilities of Famine in Bangladesh" states about levels of per capita consumption: 14 oz/day is the least possible amount with which a person is alive on the verge of starvation, which figure is very near to the actual amount in 1966/67, a lean year for the Aman rice crop; 15 oz/day is the average amount in the 1960's; and 15.3 oz/day is the average figure during the period 1962/63-1966/67. However, the figure of per capita consumption in this discussion is from the annual supply and import divided by the population. The Five-Year-Plan plans its per capita consumption as 16 oz/day at the end of the plan period.

b) Region-wise Supply-Demand of Foodgrains

The results of the estimates described herein are shown in Table 1-2-2-11, in which surplus areas (above the national average consumption) and deficit areas

Table 1-2-2-11 Demand and Supply of Foodgrains by District

(Unit: 1,000 tons)

District	1959/60		1964/65		1968/69		1969/70		1972/73	
	(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)
CHITAGONG DIVISION	-265 (D)		-250 (D)		-435 (D)		-440 (D)		-525 (D)	-730
CHITAGOING	+110 (D)		-50		-160 (D)		-120 (D)		-130 (D)	-190
CHG H.T.	+25 (S)		-15 (D)		+10 (S)		+30 (S)		-25 (D)	-30
COXILLA	-75 (D)		-125 (D)		-225 (D)		-165 (D)		-315 (D.D)	-405
NOAKHALI	-105 (S)		-55 (D)		-60		-40		-60 (D)	-105
DACCA DIVISION	-140		-265 (D)		-380 (D)		-70		-555 (D)	-875
SYLHET	+60		+155 (S)		+310 (S)		+365 (S)		+50	-20
DACCA	-295 (D.D)		-455 (D.D)		-555 (D.D)		-535 (D.D)		-585 (D.D)	-690
MYMENSINGH	+95 (S)		+35 (S)		-135		+100 (S)		+50	-65
TANCAIL									-70 (D)	-100
KETLNA DIVISION	-25		-135		-330		-455		-870 (S)	-1140
BARISAL	+70 (S)		+5 (S)		-100		-70		-90 (D)	-150
PATUAKHALI									+43 (S)	+20
FARIKUR	-80 (D)		-245 (D.D)		-250 (D)		-235 (D)		-320 (D)	-385
JESSORE	-5		+35 (S)		-15		-60		-130 (D)	-170
KHULNA	+10 (S)		+50 (S)		+80		-75 (D)		-260 (D.D)	-310
KISHILA	-20 (D)		+25 (S)		-50 (D)		-100 (D.D)		-115 (D.D)	-140
RAJSHAHI DIVISION	-185		+300		+30		+170		-215 (D)	-460
BOGRA	-10		+60 (S)		0		-70		+10 (S)	-25
DINAJPUR	+115 (S)		+145 (S)		+145 (S)		+165 (S)		+10 (S)	-25
PABNA	-90 (D)		-80 (D)		-160 (D)		-80 (D)		-175 (D.D)	-215
RAJSHAHI	-120 (D)		+110 (S)		-35		+95 (S)		-50 (D)	-105
RANGPUR	-80 (D)		+60 (S)		+80 (S)		+40 (S)		-10	-90
T o t a l	-610		-345		-1,115		-1,547		-2,081	-3,205
Per capita consumption (OZ/day)	15.5		15.8		16.1		17.4		14.7	16.0

Note: 1) Each figure that is calculated on the per capita consumption for the corresponding year on the bottom line indicates the surplus or deficit of the district.

2) S = surplus area, D = deficit area (where per capita consumption is less than 14^{oz}/day), and blank indicates balanced area.

3) For the figures for 1969/70 and 1972/73, (A) indicates actual amounts while (B) indicates the balance where the per capita consumption is assumed 16^{oz}/day.

(incapable of supplying the least amount of 14 oz/day and depending on the supply from other areas) are to be seen. Most districts have a considerable fluctuation by year, since their agricultural production is subject to the natural conditions. However, general characteristics are as follows:

- i) Division-wise there has been some constant surplus in Rajshahi, while Khulna Division had a heavy deficit in 1969/70 and its deficit is on the increase. In Dacca District the deficit has been growing yearly.
- ii) Per capita consumption rose up to 17.4 oz/day in 1969/70 with the imports of foodgrains of 1.55 million tons in the same year. If, with effective systems of inter-regional transportation, per capita consumption of 16 oz/day were able to be maintained, an import amount of 645 thousand tons would have been sufficient.
- iii) Per capita consumption in 1972/73 went down to only 14.7 oz/day with over 2 million tons of imports. At this rate imports of 3.2 million tons would be needed to maintain 16 oz/day.
- iv) Surplus/deficit areas by districts are as follows:

Absolute deficit: Dacca

Deficit:	Comilla, Chittagong, Tangail, Faridpur, Kushtia, Pabna, and Barisal.
Surplus:	Sylhet, Chittagong H.T., Mymensingh, Dinajpur, Rajshahi, Patuakhali, and Rangpur.
Balanced:	
Probable deficit:	Noakhali, and Jessore
Probable surplus:	Khulna, and Bogra

2) Other Foods

a) Pulse

Khulna Division (except Districts of Barisal and Khulna) and Rajshahi Division (except Rangpur District) are surplus areas. Districts which have a great surplus are Kushtia, Pabna and Rajshahi and those which have a great deficit are Comilla, Sylhet and Mymensingh.

b) Vegetables

Khulna Division (except Districts of Faridpur and Jessore), Rajshahi Division (except Rangpur District) and Chittagong Hill Tracts District are surplus areas. Districts which have a great surplus are Barisal, Patuakhali, Khulna and Bogra and those which have a great deficit are Noakhali, Sylhet and Dacca.

c) Fruits

Rajshahi Division is the only area that has a surplus

all over the division. Districts which have a surplus: Chittagong Hill Tracts, Sylhet, Khulna and Kushtia.

d) Potatoes

Rajshahi Division (except Pabna District) is the largest surplus area, followed by Dacca District in Dacca Division. Districts which have a great deficit are Mymensingh, Tangail, Barisal, Patuakhali, Faridpur and Pabna.

1-2-3 Industries

(1) General

The industrial activities occupies only 10% of GDP in Bangladesh although the rate of growth in industry, the figure of which the distribution of the investments to large-scale industries during the East Pakistan period brought about, is relatively high, compared with that of other sectors as shown in Table 1-2-3-1. On the contrary, the rate of growth in small-scale industries is still lower than that of any other sectors. By large-scale industry is meant an establishment of more than 10 employees in Bangladesh and a considerable number of small establishments are supposed to be included in the range of large-scale industries.

The recent high rate of growth was supported by the economic policies of West Pakistan, but it would be difficult to imagine that the new country would also have an industrialization at such a rate, since the absolute economic level was extremely low.

1) Classes of Industries

As of 1969/70 there were 3,134 registered factories (large-scale establishments with over 10 employees), over 20 thousand small-scale workshops, and more than 360 thousand workshops of cottage industry.

The difference in quality among these three classes of

establishments is great. Foods, textile, timber and bamboo process belongs to cottage industry or small-scale industry, most of which are very primitive. Management of these establishments of domestic or small-scale industry is one of the greatest problems that would prevent the country from industrialization.

As the statistics concerning domestic and small-scale industry is deficient and uncertain, consideration has been given only to reported factories out of large-scale industry about which statistics is published by area.

2) Composition of Industries

The 1969/70 industry census shows a composition of 3,130 registered factories as in Table 1-2-3-1. In the composition of the 1,491 factories that reported in the same year textile, chemicals, foods, etc. show a higher rate than others as is seen in Table 1-2-3-1, occupying approximately 60% of the whole.

The value of the products of foods, tobacco and textile shipped from the reported factories occupies approximately 70% to the total. Most of textile is of jute process. The ratio of metal products and machinery to the total is very small, in which steel and chemicals that belong to modern industry have a small ratio of 4.8% and 7.9% respectively.

The characteristics of Bangladesh industries, in terms of industrial structure, consist of unfledged consumer industries, especially in 1969/70, mainly depending upon the jute processing, the only export industry. This is not in the stage of heavy chemicals industry but in the stage of pre-industrialization. Table 1-2-3-2 shows the production of the prewar industries which are assumed to have been in normal operation.

(2) Current Status of Industries

The damage incurred by the independence was is very large. Among the direct damages there are losses of the fixed assets of Taka 291.5 million and of markets in West Pakistan, cessation of supply of fuel therefrom, destroyed transportation systems, outflow of managing and skilled persons, etc. all of which hinder the production of the country in various forms. However, the production of each items is recovering at a high speed, by means of establishing corporation of large factories (as of 30 June, 1973, 313 factories with their fixed capitals of Taka 570. million) and introducing technical aids from abroad.

Progress of restoration of the industries in public sector and their problems are as follows:-

- i) All production except for sugar, medicines, newspapers, cement, beverages and wooden products increased during the period from the first half through the latter half in 1972;

Table 1-2-3-1. Numbers of Registered Factories by Industry, 1969/79

Industry	No. of Factories	Rate to Total (%)
Textile	791	25.3
Chemicals	576	18.4
Foods	406	13.0
Metal	257	8.2
Shoes & Hides & Skins and their products	207	6.6
Others	149	4.8
	744	23.7
Total	3,130	100.0 (%)

Table 1-2-3-2. Production Trends of Main Industries

Unit	1962/63	1964/65	1966/67	1968/69	1969/70	1970/71
Textile						
Jute Products (1,000 tons)	298	289	404	518	593	470
Cotton Yarn (1 million lbs)	54	64	74	96	105	74 a)
Cotton Cloth (1 million yards)	55	49	55	61	59	48 a)
Rayon Cloth (100 sq yards)	0.2	0.1	1	6	5	3 a)
Foodstuff						
Sugar (1,000 tons)	75	77	113	57	88	72 a)
Tea (1 million lbs)	54	62	67	64	68	52 a)
Cigarette (1 billion pcs)	4	6	13	17	18	11 a)
Chemicals						
Fertilizer (Urea) (1,000 tons)	72	72	93	87	94	51
Tire-tube (1,000 ea)	29	65	166	328	336	239 a)
Cement (1,000 tons)	94	56	75	63	64	59
Iron Products (1,000 tons)			63	210	174	47 b)
Bicycle (1,000 tons)			43	26	18	
Paper (1,000 tons)	32	41	34	44	42	30 a)

Note: a) Production between July 1970 and March 1971.

b) Production between July 1970 and January 1971.

Source: Statistical Digest of Bangladesh 1970-71

- ii) The production of jute, cotton goods, steel products, foods, diesel engines, petroleum refined goods decreased between the latter half of 1972 through the first quarter of 1973;
- iii) The production of sugar, shipbuilding, fertilizer, medicines, chemicals, paper, newspapers, cement and gas increased during the same year as in ii); and
- iv) The production of fabrics, steel, shipbuilding, fertilizer, glass, soap, processed marine goods, beverages, cement, newspapers and gas recovered to or exceeded the prewar level.

If reconstruction is meant by the restoration to the prewar level, many items of industry can reach their target, but generally the speed of their restoration is still very low. The rate of factories in operation is also a great problem. In 1972/73 no items of industry existed that had a rate of operation of over 80%. Even in prewar days only the industries of paper, beverage and glasses had a rate of operation of over 90% while most of the others only 50 - 70%. The causes which seem to hinder their restoration and keep industries in low operation are as follows:-

- i) a paralysis of business activities resulting from a sudden increase of public sector;
- ii) outflow of skilled workers and top-level staff;
- iii) labour problems;
- iv) collapse of goods movement systems;

- v) shortage of electric power, medicines and consumer goods;
- vi) defective financial structure;
- vii) a reduction of markets;
- viii) defective transportation systems; and
- ix) shortage of imports

These are common problems in other fields as well as in industries and it is by far most important to get over these problems.

(3) Aspects in Industries in the Five-Year-Plan

For the future trend of industries and the future change of industrial structure, both short-range and long-range study will be required. In this stage, however, reference is to be made only to the First Five-Year-Plan, as a forecast in long-range future is very difficult and subsequent results may be inaccurate.

The Five-Year-Plan establishes a production target of each item up to 1977/78 which would be a key to the next development and proposes for various policies of investment programmes which are required for the above period.

The purposes for industrial investments are as follows:-

- i) increase of main investment to the agricultural sector,
- ii) utilization of domestic materials,
- iii) gradual upbringing of capital goods industries,

- iv) promotion of small-scale industry, cottage industry and rural industry to scatter establishments and to improve productivity of private sector,
- v) attainment of economic self-support by means of development of export-oriented industry and import-substitute industry, and
- vi) balanced allocation of industries for effective distribution of income and employment.

The strategies of enlarging industrial production are as follows:-

- i) review of problems from and systems of nationalized industries which occupy most of the main industries,
- ii) direct assistance and induction to private investments,
- iii) control of foreign investment,
- iv) establishment of industrial policies for the under-developed areas,
- v) selection of labour intensive techniques,
- vi) effective use of production capacity, and
- vii) growth through the interrelated effects among the industries.

Table 1-2-3-3 shows the target amount of production for the Five-Year-Plan, the figures of which are to be used in this study as the future values in the national level. The plan aims at restoring to the prewar level with no special investment to new programmes. Most of the investments are for continuing the projects under way by increasing the current operational

Table 1-2-3-3 Target Production of Industries - the First Five-Year Plan

Industry	Unit	Production Capacity						T o t a l	
		Public Sector			Private Sector			Target year	Increase
		Base year	Target year	Increase	Base year	Target year	Increase		
1. Jute	tons	587,000	766,000	179,000			766,000	179,000	
2. Textile									
(a) Yarn	10 million lbs	8,630	19,740	7,110	0.025	0.0075	0.005	0.005	
(b) Cloth	10 million yards	7,272	19,100	11,828	20,648	56,200	35,552	47,380	
(c) Ready-made Clothes	10 million yards				0.600	7,760	7,160	7,160	
3. Machinery	tons	5,555	33,800	28,245	106,655	391,300	284,645	312,890	
	TAKA 10 million	3,276	24,235	20,959	7,740	58,940	51,200	72,159	
4. Shipbuilding	TAKA 10 million	2,455	8,100	5,645			8,100	5,645	
5. Iron & Steel									
(a) Iron manufacture	100,000 tons	0.85	4.50	3.70			4.50	3.70	
(b) Others	100,000 tons	1.50	3.50	2.00	0.50	1.50	1.00	3.00	
6. Chemicals	tons	300,000	837,825	537,825	35,760	98,214	52,454	590,279	
	TAKA 10 million	60,275	71,000	4,775	18,098	56,196	38,098	42,873	
7. Oil & Petroleum	tons		388,000	388,000			388,000	388,000	
8. Pulp & Paper	tons	54,000	100,500	46,500	5,280	8,448	3,168	108,948	
	TAKA 10 million				7,140	10,944	3,804	10,944	
9. Lumber and allied products	tons	11,500	79,500	68,000	9,150	12,700	3,650	92,200	
	TAKA 10 million				1,260	4,674	3,414	4,674	
10. Mining & related works	tons	163,200	1,000,000	837,400	578,675	1,256,000	677,325	1,524,725	
	TAKA 10 million				1,400	5,720	4,320	4,320	
11. Sugar	tons	106,470	148,000	41,530			148,000	41,530	
12. Foods	tons	19,920	99,875	79,955	1,347,000	4,190,000	2,843,000	4,289,875	
	TAKA 10 million	3,903	9,018	5,615	20,533	99,375	78,375	108,393	
13. Leather	10 million sq. ft.	4,485	12,108	7,623	1,776	5,328	3,552	17,436	
	TAKA 10 million		1,580	1,580	8,920	30,310	21,396	31,890	
14. Other	tons				48,750	172,200	123,450	172,200	
	TAKA 10 million				1,941	11,130	9,18	11,130	
15. Service Facilities									
(a) Lodging	houses				34	39	5	39	
(b) Cinema	houses				120	220	100	220	

rate which is very low and by putting an emphasis on the effective use of the existing facilities. Brief description of the investments by industry is as follows:-

- i) investments in the industries of jute, paper, sugar, etc. which have a low operational rate are concentrated on the complete use of the existing facilities and investments in new industries are considered unnecessary.
- ii) for machinery industry, investments are successively made to Machine Tools Factory, General Electric Manufacturing Plant, etc.
- iii) for shipbuilding industry, a preference is given to Chittagong Dry Dock and Narayanganj Dry Dock, etc.
- iv) for medicines, cotton, paper, etc. investments are concentrated on the execution of the existing programmes.
- v) for textile, machinery, chemicals, food processing, etc. some new investments are contemplated.

(4) Regional Distribution of Industries

Any index based on the shipping values of all industries or per capita shipping values in industry indicates the heavy concentration of industries in the three districts of Chittagong, Dacca and Khulna with the percentages in terms of shipping values of 22.4%, 42.3% and 12.7% respectively.

To the contrary the northwest region which produces a great agricultural surplus is in a very low position in industry: Rajshahi Division has an index of 5.7% in shipping value to the whole. This division is an absolutely undeveloped region that has no industrial centers as in the other divisions.

The point of such regional difference in industry is taken up in the Five-Year-Plan. Although the great difference of various regional conditions will naturally produce locational advantages and disadvantages, it is presumed to continue for long time except for jute and sugar industries which are both material source oriented.

Table 1-2-3-4 and 1-2-3-5 show the shipping values of industries in 1968/69 and the ratios thereof to the whole country, from which the regional distributions by industry are considered as follows:-

Table I-2-3-4 Shipping Value of Industrial Goods by District in 1968/69 (1/3)

(Unit: Taka 1,000)

District	Cotton goods	Jute goods	Ferti-lizer	Cement	Pressed packed jute	Hand woven cloth	Rubber foot-wear	Pulb & board paper	News-paper	Books & magazines	Other paper products
Chittagong	73,683	160,846	834					470			
Chittagong, H.T.								91,855			
Comilla	35,420	43,756	537		5,811						
Noakhali	6,188										
Sub-total	115,291	204,602	1,371		5,811			92,325			
Sylhet				11,525							
Dacca	234,757	521,221			193,453		16,044	1,455	14,936	10,123	5,244
Mymensingh		13,201			40,299						
Tangail											
Sub-total	234,757	534,422		11,525	233,752		16,044	1,455	14,936	10,123	5,244
Barisal											
Patuakhali											
Faridpur	9,238				4,706						
Jessore	5,957	13,558									
Khulna	11,043	332,168	459		67,998			51,708			
Kushtia	2,367										
Sub-total	28,605	345,726	459		72,704			51,708			
Bogra	9,256										
Dinajpur					2,182						
Pabna	8,696	21,639			2,646	14,160					
Rajshahi					1,100						
Raugpur					46						
Sub-total	17,952	21,639			5,974	14,160					
Total	396,605	1,106,389	1,830	11,525	318,241	27,301	16,044	145,488	14,936	13,951	9,789
Rate to total (%)	(9.7)	(27.1)	(0)	(0.2)	(7.7)	(0.6)	(0.3)	(0.3)	(0.3)	(0.3)	(0.2)

Source: Statistical Digest of Bangladesh

Table I-2-3-4 Shipping Value of Industrial Goods by District in 1968/69 (2/3)

(Unit: TAKA 1,000)

District	Rice processing	Baking	Sugar	Edible Oil	Manu- factured tea	Pro- cessed tea	VANSPATI	Ciga- ret	Tabacco	Silk goods	Synthetic Fiber
Chittagong	1,987	2,391		58,487	6,066	83,293	31,039	172,354	64	22,006	61,096
Chittagong H.I.		228		786	139			39,715		76	
Comilla	115	220		12,284	102						
Noakhali											
Sub-Total	2,102	2,839		71,557	6,307	83,293	31,039	212,069	64	22,082	61,096
Sylhet	205	145		77	210,835						
Dacca	357	20,910		21,349			19,977	179,337	328	2,434	
Mymensingh		91	11,159								
Tangail											
Sub-Total	562	21,146	11,159	21,426	210,835		19,977	179,337	328	2,434	
Barisal	631							492			
Patuakhali											
Faridpur	247		2,101	1,194							
Jessore	1,107	221	21,150	4,445							
Khulna											
Kushtia											
Sub-Total	1,985	221	23,251	5,639				492			
Bogra	7,493	217	13,188	1,352				19,075			
Dinajpur	19,918		29,356	942							
Pabuna	84			184							
Rajshahi	1,025	487	26,126	699				330		1,510	
Rangpur	715		16,114	389				3,922	3,195		
Sub-Total	29,235	704	84,784	3,566				22,997	3,525	1,510	
Total	33,884	24,910	119,194	102,188	217,142	83,293	51,016	414,895	3,917	26,026	61,096
Rate to total (%)	(0.9)	(0.6)	(2.9)	(2.5)	(5.3)	(2.0)	(1.2)	(10.2)	(0.1)	(0.6)	(1.5)

Source: Statistical Digest of Bangladesh

Table 1-2-3-4 Shipping Value of Industrial Goods by District in 1968/69 (3/3) (Unit: TAKA 1,000)

District	Con- fection	Medicines	Soap & Cleanser	Match	Oil refining	Iron ore	Furni- ture	Other electric goods	Ship- building	Cotton spinning
Chittagong	39,521	28,852	34,258	9,525	16,405	60,240	3,922	4,741	847	3,158
Chittagong H.T.										
Comilla										
Noakhali										
Sub-Total	39,521	28,852	34,258	9,525	16,405	60,240	3,922	4,741	847	3,158
Sylhet										
Dacca	79,326	50,199	45,193	38,609		50,957	21,319	24,022	28,564	13,216
Mymensingh										
Tangail										
Sub-Total	79,326	50,199	45,193	38,609		50,957	21,319	24,022	28,564	13,216
Barisal										
Patuakali										
Faridpur										
Jessore				18,342		3,275				
Khulna										
Kushtia										
Sub-Total				18,342		3,275				
Bogra										
Dinajpur										
Pabna										
Rajshahi										
Rangpur										
Sub-Total										
Total	122,138	91,729	84,768	78,152	16,405	114,472	26,174	28,864	40,315	16,374
Rate to total (%)	(2.9)	(2.2)	(2.0)	(1.9)	(0.4)	(2.8)	(0.6)	(0.7)	(0.9)	(0.4)

Source: Statistical Digest of Bangladesh

Table 1-2-3-5 Rate of Shipping Value of Industrial Goods by District

(Unit: percent)

District	Cotton goods	Jute goods	Fertilizer	Cement	Pressed packed jute	Sugar	Cigarette	Tobacco	Manu- factured tea	Pressed tea manufact	Iron & Steel	Pulp & paper board	Total
Chittagong H.I.	18.57	14.54	45.6				41.54	1.49	2.79	100	52.6	0.3	22.4
Chittagong	8.93	3.95	29.3		1.83		9.57		0.06			63.1	4.9
Comilla	1.56								0.05				2.3
Noakhali													0.6
Sub-Total	29.07	18.49	74.9		1.83		51.11	1.49	2.90				30.2
Sylhet				100									5.5
Dacca	59.19	47.11			60.79		43.22	7.65	97.10		44.5	1.0	42.3
Mymensingh		1.19			12.66	9.36							1.7
Tangail													0.1
Sub-Total	59.19	48.30		100	73.45	9.36	43.22	7.65	97.10				49.6
Barisal							0.12						0.1
Patuakhali	2.33				1.48								0.4
Fatidpur	1.50	1.23				1.76							0.5
Jessore	2.78	30.02	25.08		21.37	17.74					2.8	35.5	12.7
Kaunia	0.60												0.8
Kushtia													
Sub-Total	7.21	31.25	25.08		23.85	19.50	0.12				2.8	35.5	14.6
Bogra	2.33				0.69	11.06	4.60						1.6
Dinaipur						24.63							1.3
Pabna	2.19	1.96			0.83								1.4
Rajshahi					0.35	21.92		16.31					0.8
Rangpur					0.01	13.52	0.95	74.55					0.6
Sub-Total	4.52	1.96			1.88	71.13	5.55	90.86					5.7
Shipping Value (TAKA 1,000)	396,605	1,106,389	1,830	11,525	318,241	119,194	414,895	4,286	217,142	83,293	114,472	145,488	4,081,543
(Rate to total: %)	(9.7)	(27.1)	(0)	(0.2)	(7.7)	(2.9)	(10.1)	(0.1)	(5.3)	(2.0)	(2.8)	(3.5)	

(a) Jute Industry

In the above two tables are two items of "Jute" and "Pressed Pack Jute" separately tabulated. This comes from the two processings of jute; one is pressing raw jute for easy transport and the other jute textile to make jute cloth for such items as jute bags.

However, all raw jute is not always processed by the above two methods but there are several routes of processing:

Route 1: raw material → pressing → export

Route 2: raw material → pressing → manufacturing → export

Route 3: raw material → manufacturing → export

Route 1 is for exporting the best quality of raw jute; Route 2 is a normal process of jute; and Route 3 is for manufacturing of jute goods by using raw jute which is produced around the jute factories.

Pressed pack jute is produced in Dacca with 60.8% of the total, Mymensingh with 12.7% and Khulna with 21.3%, and the production of these three districts occupies 94.8% of the national total. Jute goods is manufactured in Chittagong with 14.5% of the total, Dacca with 47.1% and Khulna with 30.0%, and the production of these three districts covers 91.6% of the whole.

Mymensingh District has jute pressing only and does not

make any jute goods. Jute pressed here is taken out to be exported or to be processed in the factories in other areas. On the contrary Chittagong District does only manufacturing and no pressing.

The above description indicates that the areas which have active jute manufacturing do not always agree to the cropping areas of raw jute. Locationally speaking, for the export of final processed goods of jute, jute allied factories might as well be located between cropping areas of raw jute and the ports for the export of final goods. There is no need that the cropping areas of raw materials be near the factories.

However; pressing process of raw jute can produce a saving of transport charge by reducing the volume to be transported. The location of pressing factories will be raw-material-oriented, and Mymensingh District which has jute pressing factories shows a good example.

Generally, except the pressing factories in Mymensingh District, the cropping areas of raw jute have no jute allied factories, which concentrate in Dacca which is neither the cropping area nor the port of export, and Chittagong and Khulna are under the same conditions. It can be considered that this is because each function of a large city would bring about great benefits.

The fact that an industry like jute industry, in which transport cost occupies a large part and which is a

typical location-oriented industry, has a remarkable concentration into large cities and has never developed in the northwest region can indicate the importance of various urban functions; benefits from intensive effects, external economy from transport systems, presence of labour force, etc.

(b) Cotton Industry

Products of cotton industry scatter in Chittagong with 18.6% of the total, Comilla with 8.9% and Dacca with 59.0%, and the production of these three districts occupies 86.7% of the whole. The reason why the concentration of cotton industry extends from Chittagong up to Dacca is that a major part of raw cotton amounting to 89% of the total is imported through Chittagong Port. This is a typical example of an industry, the raw material of which is import-oriented,

(c) Cement Industry

Cement industry exists only in Sylhet District, where limestone, the material of cement is produced.

(d) Tea Manufacturing

Tea manufacturing concentrates in Sylhet District, which is a large tea cropping area.

(e) Fertilizer Industry

Fertilizer industry concentrates in Chittagong with 49.6% of the total, Comilla with 29.3% and Khulna with 25.1%. (Ghorasal also has fertilizer industry, but the data used for this description do not include Ghorasal because the time of collecting the data was before the commencement of the operation of the factory.)

Arable lands, consuming fertilizers are distributed all over the country: from the point of transportation fertilizers flow from the above three areas to the whole country.

At the present time the pattern of fertilizer movement is as stated above because the material of fertilizer depends upon the import. However, if with the utilization of natural gas in the future a full supply of electric power is possible, the locations of fertilizer factories can be scattered in the rural areas.

Considering that effective demands of fertilizer are very great, fertilizer plants would be established in the northwest which has a vast arable land.

(f) Iron and Steel Industry

Iron and steel industry is concentrated in Chittagong and Dacca. The country must import all iron-ore and coal necessary for this industry. Locationally, Chittagong is a port city and has various industries in its hinterland. Dacca constitutes a great market

of iron and steel products under the concentration of industrial activities in Dacca.

(g) Sugar Manufacturing

Sugar manufacturing is located in Rajshahi Division (except Pabna District) and Districts of Kushtia and Mymensingh. This is because cropping lands of sugar-cane scatter in the above regions. The location of the industry which must handle the heavy weight of material is reasonable in this point.

(h) Tobacco Manufacturing

Tabacco manufacturing is concentrated in Districts of Rangpur and Rajshahi in Rajshahi Division and Dacca District. This is also because Rajshahi Division is the cropping area of tobacco.

The regional distribution of industries as described above indicates a remarkable concentration in Chittagong, Dacca and Khulna. Chittagong and Khulna are the only two foreign trade port cities in Bangladesh, and are convenient both for the supply of imported materials and for the export of products. Dacca as stated before has various urban functions so as to absorb various industries.

The concentration of modern industries such as iron and steel, fertilizer, chemicals and paper to the above three areas is remarkable and especially the industries the

materials of which depend upon import, have developed in the area extending from Chittagong to Dacca and in the Khulna area.

On the contrary the industries the materials of which are produced in the rural such as sugar, tea, tobacco are to find their development in the areas where their materials are produced. However, the jute industry, the material of which is also produced in the rural area is concentrated in the above three areas. This can be judged as an important strategy of the sole export industry, but principally the jute industry may as well be established in its material supply areas.

The concentration of the jute industry in Dacca, Chittagong, Khulna forms one of the characters in the regional distribution of Bangladesh industries. Rajshahi Division, the northwest of Bangladesh has only sugar and tobacco manufacturings to be noted, and the region can be said to be less-advanced in terms of industrialization.

(5) Estimate of Regional Products by Industry

For the purpose of a quantitative understanding, the characteristics of the regional structure in industry has been described from the standpoint of the shipping values of industrial products.

The final purpose of this report is to quantitatively estimate the production by region in order to find the

movement of the commodities as practical as possible.

However, the data of industries by region available so far is limited to their shipping values only and the value of products is of the national total. Therefore, the estimate of the regional production of the main goods having a bearing on commodities movement is made as follows:-

For the production of the national total goods for industry, the figures for 1968/69 in the "Statistic Digest of Bangladesh", page 94 are used. For the allotment of regional production by industry the equation below is used:

$$\text{Regional production by industry} = \text{National total production} \times \frac{\text{Regional shipping values}}{\text{National total shipping values}}$$

The results are tabulated in Table 1-2-3-6.

The figures in the table are to be used for the study in Chapter 2 "Goods Movement".

Table 1-2-3-6

Production of Main Industrial Goods by District (1968/69)

(Unit: 1,000 tons)

Item District	Jute Products	Cement	Sugar	Iron & Steel	Ferti- lizer (urea)	Paper 1)	Cotton	Tea	Remarks
Chittagong	75			110	40	0	8	5	1) Excludes News- paper
Chittagong H.T.	20				25	28	4	3	2) Equivalent to cotton yarn of 90 million lbs.
Comilla							1	0	
Noakhali									
Sub-Total	96			110	65	28	13	8	3) Equivalent to 64 million lbs.
Sylhet		63							
Dacca	244			93		0	25	17	
Mymensingh	6	5							
Tangail									
Sub-Total	250	63	5	93		0	25	17	
Barisal									
Patuakhali									
Faridpur	6		1				1	1	
Jessore	156		10	6	22	16	1	0	
Khulna							0		
Kushtia									
Sub-Total	162		11	6	22	16	3	2	
Bogra			6						
Dinajpur			14				1	1	
Pabna	10						1	1	
Rajshahi			12						
Rangpur			8						
Sub-Total	10		41				2	1	
Total	518	63	57	210	87	44	2) 43	3) 29	

1-2-4 Mining

The data and information of mining resources in Bangladesh are scarce and the potentials thereof have not yet been qualified in detail.

Generally mining resources are very scarce, and most of the resources that have been discovered are not feasible in terms of mining economy. Actually natural gas can be of practical significance. The outline of the prospective resources is as follows:-

(a) Coal at Jamalganj

Coal stratum of 140 feet thick at Jamalganj area between Bogra and Rajshahi Districts discovered in 1963 with estimated amount of deposits of more than 700 million tons; the depth of the deposits extends from 800 to 900 meters from the ground surface, to which many technical problems give rise, and there would be no feasibility in this development before 1980.

(b) Limestone at Jamalganj and Jaipurhat

The deposits were discovered in 1963 with an estimated amount of deposits of 200 million tons; the depth of the deposits is 500 meters below the ground surface with a layer of 80 feet. A plan for limestone development and the installation of cement plants has been prepared.

(c) Limestone of Takerghat and Sylhet

The deposits were discovered during the period 1950-1951 with an estimated amount of deposits quantity of 3 million tons: the annual exploitation of 130 thousand tons is for the use of Chattak Cement Factory.

(d) Limestone of St. Martin Isle, Chittagong

The deposits were discovered in 1960 with an estimated amount of 1.8 million tons. No development has been started.

(e) White Clay at Bijaipur and Mymensingh

The deposits were discovered in 1957 with an estimated amount of 200 thousand tons, which is used for ceramics.

(f) Glass Sand at Sylhet, Shajibuzar and Noyapara

The deposits were discovered in 1950 with an estimated amount of 400 thousand tons, which is used for glass manufacturing.

New deposits have recently been discovered in Districts of Sylhet and Chittagong.

(g) Hard Rock at Rangpur and Ranipukur

The deposits which are 150 meters below the surface ground were discovered in 1966. A survey for the feasibility of the exploitation for the supply to meet growing construction demands has been under way.

(h) Petroleum

In 1973 the Soviet Delegation reported of the possibility of the development of petroleum in the following areas:-

- (i) An area including parts of Barisal, Chandpur and Daudukandi with the Bengal lowland including parts of Khulna and Madupur is supposed to be prospective, but prospecting has not yet been started.
- (ii) A belt area extending from Calcutta via Pabna to Hajipur.
- (iii) An area including parts of Sylhet, Comilla, Noakhali and Chittagong. From this area natural gas has already been discovered.

(i) Natural Gas

Natural gas is very important not only to attain the self-supply in agriculture but to expedite the industrialization from the point of fuel, fertilizer and relevant materials.

The deposits at Sylhet, Chattack, Chitas and Habiganj have already been developed while those at Raacidpur, Kailas and Bagrabad have not yet been developed.

The estimated amount of these deposits amount to $8-9 \times 10^{12}$ cubic feet (or 17×10^{12} cubic feet with the potential amount) which would meet a 20 year demand with the planned 800 million cubic feet per day. A sufficient surplus will exist, compared with the current consumption of 90 million cubic feet per day.

(j) Petroleum Demand

As for petroleum Bangladesh depends upon import. In 1967 Eastern Refinery Limited was established in Chittagong for the purpose of oil refinery of an annual amount of 1.5 million tons. The operational rate of the plant after the war stands as low as 50%. The estimated total demand of Bangladesh of 1.6 million tons in 1974 would consist of the supply of 840 thousand tons from the plant and the import of petroleum products from abroad.

The Five-Year-Plan estimates the demand in 1978 of 2.6 million tons, which corresponds to an annual increase of 10%.

Table 1-2-4-1 Petroleum Demand (Unit: 1,000 tons)

	1969	1970	1971	1972	1973/74	1978
Crude Oil	965	894	795	820	841	
Products	913	818	746	732	733	
Total	1,878	1,712	1,541	1,552	1,574	2,590

Source: The First Five-Year-Plan.

1-2-5 Foreign Trade

The past Bangladesh trade had been in favorable balance but in 1968/69 the balance of trade turned to adverse and from then on the excess of imports over exports has been in the increase.

Bangladesh, which suffers from the lack of her natural resources is much behind other countries in the production of both capital and intermediate assets. Since the country must execute the various development programmes including her postwar reconstruction under these circumstances, a rapid increase of raw materials, capital and intermediate assets will directly occur.

Table 1-2-5-1 Historical Balance of Trade (Unit: US\$1 million)

Year	Exports			Imports			Balance		
	Foreign	Pakistan	Total	Foreign	Pakistan	Total	Foreign	Pakistan	Total
1965/66	318	119	437	279	205	484	39	86	-17
1966/67	331	140	471	329	215	544	2	-75	-73
1967/68	311	141	452	279	184	463	32	-43	-11
1968/69	324	156	480	389	211	600	65	-55	-120
1969/70	349	161	513	381	258	639	-32	-94	-126
1970/71	263	146	409	331	203	534	-68	-57	-125

Source: Bangladesh Economic Report 1972, by IBRD Mission.

Fundamental Survey of Bangladesh Economic Development Programmes, 1973, by International Development Center of Japan.

The trade with Pakistan was conducted both by air and sea, and the volume by air was much less than that by sea. The main export items by sea were tea, jute goods, paper, and matches, while cotton goods, raw cotton, tobacco, rape-seeds, mustard-oil, rice, machinery, cement, medicines were the main import items.

The export to Pakistan in 1968/69 made up 36% of the total exports in terms of quantity and import for the same period from Pakistan came to 43% of the total imports.

The trade with Pakistan has ceased and the trade with India which had ceased since 1965 has now been reopened. Therefore, the trade pattern based on the data up to now will change largely, but the description herein does not touch the above problem.

Table 1-2-5-2 and 1-2-5-3 show the main imports by item in 1969/70 and 1977/78 and the main exports by item in the same years respectively. The figures in 1977/78, the target year of the Five-Year-Plan are estimated in the Five-Year-Plan, in which foodgrains are not tabulated because of the vision that a self-supply of foodgrains would be attained by the end of the Five-Year-Plan period. In this connection the import of the foodgrains in 1969/70 for example, amounted to 1.55 million tons, which is the largest quantity of a single item.

With scarce resources and undeveloped domestic industries Bangladesh must import important goods such as foodgrains and fundamental raw materials and living necessities: foodgrains, machinery, medicines, iron and steel, etc. in terms of currency and

foodgrains, petroleum, cement, coal, fertilizer and iron and steel, etc. in terms of weight.

The trade to/from Bangladesh is made through the two ports of Chittagong and Chalna. Table 1-2-5-4 shows the fluctuation of the goods handled at the two ports. The quantities handled by either port have been in the increase. During the decade 1959/60 - 1969/70 an increase is recorded: 1.8 times for Chittagong and 2.3 for Chalna. Figure 1-2-5-1 shows the historical trend of imports and exports through the ports of Chittagong and Chalna.

However, it is characteristic that the ratio of imports over exports ranges from 1.3 to 3.5 with an annual increase of imports. This tendency will worsen the balance of the loading of the goods to and from the hinterland. Especially the goods movement to and from Chittagong shows a remarkable sign. For this reason the enlargement of the capacity of the Chalna port is under way. However, the Five-Year-Plan is likely to reduce the scope of the enlargement of said port because the depth of Port of Chalna is not sufficient for the ocean-goers, which would give rise to a great problem in the future.

The exports by item as shown in Table 1-2-5-5 include raw jute and jute goods with 64% of the total exports in 1968/69. Most of the tea, paper and match produced in East Pakistan were sent exclusively to West Pakistan.

Out of the exported raw jute and jute goods 85-90% thereof was to foreign countries other than West Pakistan and approximately

30% thereof was dispatched from Chalna Port.

With scarce resources and undeveloped domestic industries Bangladesh must import important goods such as foodgrains and fundamental raw materials and living necessities: foodgrains, machinery, medicines, iron and steel, etc. in terms of currency and foodgrains, petroleum, cement, coal, fertilizer and iron and steel, etc. in terms of weight.

Table 1-2-5-2

Main Items of Imports
(Exclude Foodgrains)

Item	1969/70		1977/78	
	Unit (1,000 tons)	Value (TAKA 1 million)	Unit (1,000 tons)	Value (TAKA 1 million)
Edible Oil		265		385
Cement	439	81	790	170
Sugar	20	16	71	141
Raw cotton	366	160	208	290
Cotton cloth	91	104	56	80
Textile		242		16
Tabacco	27	103	28	79
Machinery		843		2,329
Iron & Steel		287	426	426
Coal		45	76	76
Other metal & metal products	N.A.	N.A.		229
Transport machinery		143		596
Medicines		478		204
Other chemical products				650
Oil & petroleum		86		538
Total		2,853		6,209

Source: The First Five-Year Plan

Table 1-2-5-3

Main Items of Exports

Item	1969/70		1977/78	
	Unit (1,000 tons)	Value (TAKA 1 million)	Unit (1,000 tons)	Value (TAKA 1 million)
Raw Jute	626	1,280	892	1,930
Jute products	572	1,450	694	2,250
Fishery products	N.A.	30	N.A.	190
Hide & skins their products	N.A.	90	N.A.	200
Tea		24	60 million lbs.	12
Others	N.A.	60	N.A.	60
Total		3,690		5,290

Source: The First Five-Year Plan

Table 1-2-5-4 Import and Export by Port
Chittagong (Unit: 1,000 tons) Chalna

Year	Import	Export	Total	Year	Import	Export	Total
1950-51	1,207	423	1,630	1950-51	8	69	77
1951-52	1,321	400	1,721	1951-52	192	210	402
1954-55	902	490	1,392	1954-55	88	392	480
1955-56	1,086	524	1,610	1955-56	78	478	556
1959-60	2,147	497	2,644	1959-60	259	627	886
1960-61	2,222	396	2,618	1960-61	374	480	854
1961-62	2,454	442	2,896	1961-62	325	677	1002
1962-63	2,714	507	3,221	1962-63	799	769	1568
1963-64	3,300	563	3,863	1963-64	861	800	1,661
1964-65	2,863	425	3,288	1964-65	293	707	1000
1965-66	3,098	543	3,641	1965-66	618	872	1490
1966-67	3,823	503	4,326	1966-67	988	863	1,851
1967-68	3,539	516	4,055	1967-68	710	970	1,680
1968-69	4,401	484	4,885	1968-69	1,080	947	2,027
1969-70	4,177	574	4,751	1969-70	1,039	1,004	2,043
1970-71	1,861	731	2,592	1970-71	1,333	361	1,694

Source: Statistical Digest of Bangladesh

Note: Figure for 1970-71 indicates cargo handled between July and December.

Figure 1-2-5-1. Historical Trend of Import and Export
1,000 tons (handled by Chittagong and Chalna combined)

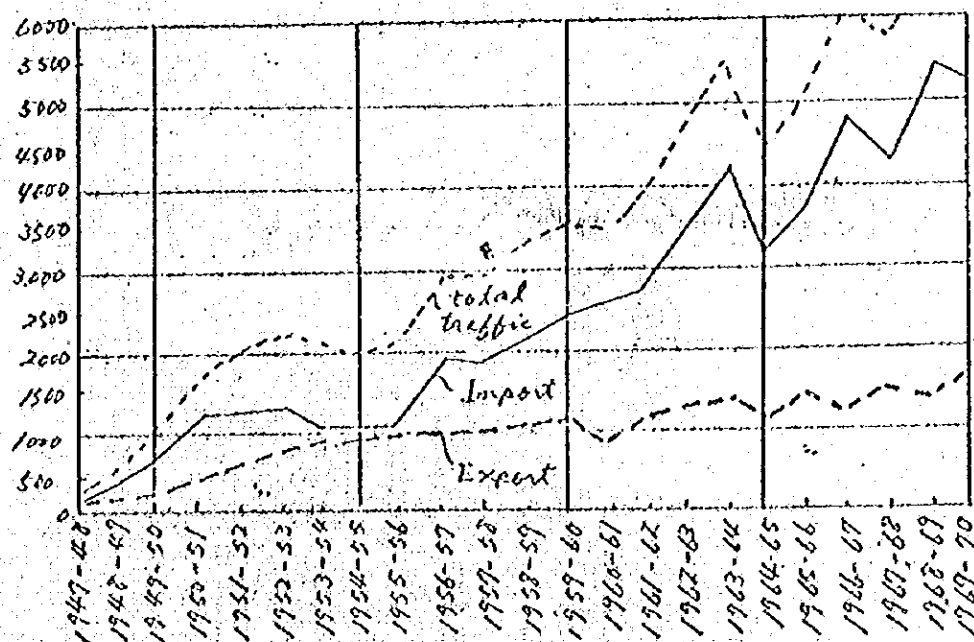


Table 1-2-5-5 Imports and Exports by Goods in 1968/69

- IMPORTS -

- EXPORTS -

Item	Value of Imports (100,000 rupee) (%)		Amount of Imports (1,000 tons)		Item	Value of Exports (100,000 rupee) (%)		Amount of Exports (1,000 tons)		
	Chittagong (%)	Chaina (%)	Chittagong (%)	Total (%)		Chittagong (%)	Chaina (%)	Chittagong (%)	Total (%)	
Foodgrains										
Rice	1428(4.4)		722(17.9)	1182(22.5)	Raw Jute	7307(30.3)		110(22.7)	503(53.0)	614(42.9)
Wheat	3293(10.3)				Jute Products	8142(33.8)		149(30.7)	370(39.0)	519(36.2)
Oil (bulk)	} 78(0.2)		1276(31.6)	1276(24.3)	Tea	2571(10.7)		33(6.8)		33(2.3)
Oil (drum)			42(1.0)	42(0.8)	Paper	1096(4.5)		14(2.8)		14(1.0)
Cement	844(2.6)		552(13.7)	765(14.6)	Iron & Steel			8		8
Coal	480(1.5)		267(6.6)	617(11.8)	Match	427(1.8)		6(1.2)		6(0.4)
Fertilizer			175(4.3)	238(4.5)	Hide & Skins	1048(4.3)		0		0
Iron & Steel	3506(10.9)		158(3.9)	158(3.0)	Fishery Products	149(0.6)				0
Machinery	4938(15.4)		39(3.2)	39(0.7)						
Cotton	4362(13.6)		23(0.6)	26(0.5)						
Total (Rate to total: %)	32087(59%)		4041(79%)	5245(82%)	Total (Rate to total: %)	24112(85%)		484(63%)	948(92%)	1432(83%)

Source: Statistical Digest of Bangladesh 1970/71

Note: Figure includes imports and exports with Pakistan.

CHAPTER 2 GOODS MOVEMENT

2-1 Current Status of Goods Movement

2-1-1 Data Source and Method of Study

Reliable data and information concerning goods movement are very scarce and especially for the relation among modes of transport there is none that might be collectively comparable. The First Five-Year Plan puts an emphasis on the necessity to establish the transportation plan on the basis of a collective transport survey.

For this purpose the Bangladesh Transport Survey (B.T.S.) has been started since the year 1972 and now it is nearing its final stage. With the completed results of this survey, the transport sector of the five year plan will be revised.

The B.T.S. has already been completed in most of all the parts, some portions of which are to be incorporated into our survey as the newest, presentation of the status of transport after the war. Its results will not only have a strong, direct influence on the current five year plan but also produce important data for the Jamuna Bridge Survey.

Our survey selects the year 1968/69 as in its base year from the following points:-

- (a) The year 1973 does not present the normalized transport activities owing to the aftermath of the war: the

regional economy has not fully recovered its production capacity, with innumerable destructions of transport systems, forming bottlenecks in many places.

- (b) At the present time the B.T.S. is under way and we avoid our survey being overlapped by their survey. Therefore, our field survey has been conducted for passengers and goods crossing the Jamuna with the intention to supplement the B.T.S.
- (c) The economic activities in 1968/69 was in a normal and the highest level.
- (d) The year 1968/69 is the only year that more detailed data is available about transportation of railway, highway and waterway.
- (e) The year 1968/69 is the year that more comprehensive data are available about the indices of the regional economy.

Among these data the following are used in this study especially about goods movement.

Railway: Interzonal Statistics, Bangladesh Railway Board, 1969

Highway: Traffic Survey Results, Roads & Highways Directorate, 1968.

Waterway: Annual Traffic Report, Inland Water Transport Authority, 1968/69.

The above data are adjusted and coordinated in some parts, e.g., as the weight of regional movement by rail in the above data covers only 50% of the actual total movement, considerable

modification is made by item, and the goods for study by item as shown in Table 2-2-1-1 are limited to the main goods that were carried with an amount of over 100 thousand tons either in 1968/69 or 1972/73.

2-2 Present Goods Movement by Item

2-2-1 Total Goods Movement

The main differences of goods movement between the periods before and after the war are: (1) a great decrease of goods movement by rail, (2) a great increase of foodgrains movement by Inland Water Transport (IWT) and (3) a remarkable decrease of the movement of cement, coal and petroleum.

Table 2-2-1-1 shows the total movement by the 13 main goods before and after the war. The reasons for the above tendencies are: for item (1) above, the drop of the rail transport capacity owing to for example the destroyed bridges by the war with the resulting transport time between Santahar and Chittagong taking approximately 30 days in 1972/73, while only 7 - 10 days in 1968/69, for item (2) above, similarly, the drop of the rail transport capacity, and for item (3) above, the industrial activities had not reached the prewar level.

Table 2-2-1-2 shows the ratio of modal transports to the total movement, in which the movements by country-boat and truck in 1972/73 occupy a considerable share and are not negligible. The transport pattern in 1968/69 is incomplete with the absence

of the distribution of movements by either of the above two modes.

A comparison of inter-district movements in 1968/69 and 1972/73 shows some main tendencies. Movement among three districts, Dacca, Chittagong and Khulna, is remarkable both in 1968/69 and 1972/73. This is accounted by the fact that Dacca is the capital, and Chittagong and Khulna have foreign trade ports respectively.

Districts of Comilla, Sylhet, and Mymensingh have more movement and that their movement has not greatly decreased even in 1972/73.

Districts in North Bengal such as Rangpur and Bogra had a considerable movement in 1968/69 but their movement in 1972/73 showed a great decrease. Interregionally their movement with Chittagong showed a remarkable decrease, while the one with Dacca showed only a small decrease and the one with Khulna little decrease. This is due to the fact that the areas in North Bengal are subject to the direct influence of fall in efficiency over the railway systems.

Such situations as in 1968/69 was maintained in 1972/73 that in Faridpur, and Kushtia cargo was moved mainly by rail while in Barisal and Patuakhali mainly by inland water transport.

Table 2-2-1-1. Interregional Movement of Main Goods by Mode, 1968/69 and 1972/73

(Unit: 1,000 tons)

Item	Year Mode	1968/69				1972/73				
		Rail	IWT	Road	Total	Rail	IWT	Road	Country boat	Total
Raw jute		605	268	NA	873	350	363	293	323	1309
Jute goods		46	124	NA	170	24	176	0	0	200
Foodgrains		909	166	NA	1075	697	1491	571	473	3232
Oil & Petroleum		365	376	NA	741	139	585	123	23	870
Cement		262	155	NA	417	44	194	71	16	325
Coal		191	193	NA	384	20	147	21	0	188
Fertilizer		92	25	NA	117	101	183	50	5	339
Iron & Steel		188	19	NA	207	13	49	62	0	124
Salt		123	16	NA	139	23	30	77	524	654
Sugar		92	1	NA	93	39	53	9	0	101
Hard rock		175	12	NA	187	108	135	2	159	404
Lumber		46	0	NA	46	5	18	42	114	179
Pulse		48	0	NA	48	15	93	44	111	263
Total		3142	1355	(808)	4497	1578	3517	1345	1748	7188
Other items		-	-	-	-	80	340	139	344	903
Movement with India		NE	NE	NE	NE	345	71	0	0	297

Note: 1) Excludes intra-regional movement.

2) 808,000 tons of interregional movement was observed in the survey by Roads & Highways Directorate in 1968/69 although its data were not itemized as above.

Table 2-2-1-2 Share of Interregional Movement by Mode of Transport

(Unit: %)

Mode	Year	
	1968/69	1972/73
Railway	58.1	24.1 1) 18.9 2)
Highway	15.0	20.6 16.0
Inland water	26.9	55.3 43.4
Country boat	NA	- 21.7
Total (1,000 tons)	5,395	6,574 9,091

Note: 1) Share in the absence of country boat.

2) Share in the presence of country boat.

Table 2-2-1-4 Interregional O-D Movement of Total Main Goods, 1972/73

O	(Unit: 1,000 tons)													TOTAL								
	1	2	3	4	5	6	7	8	9	10	11	12	13									
D	1	2	3	4	5	6	7	8	9	10	11	12	13									
1. GUNTA	40	42	33	131	167	386	180	3	10	5	2	6	1	91	112	50	117	391				
2. CHITTAURGH																						
3. NAWALGI	9		3		1													13				
4. LONKILA	38		10	2	56	6	6	20										164				
5. SILHET	95		39	17	65	21	20	7	6	5	3	2	13	13	13	3	270					
6. DACLA	111		1	2	4	6	13	1						2	24		30					
7. MURSHIDABAD	106		9	9	1	112	20	1						2		2	385					
8. TANGAIL																		260				
9. RAJSHAHI	4		16		44			6	1	15	1	146	28	32	87	4	146	57	7	521		
10. BARISAL																					187	
11. FARIDPUR	3		1		2	1	7	2	44					12	6						4	
12. Jessore																					58	
13. KUSHTIA																					10	
14. RAJSHAHI	4		1	1	11			14						4	10	1					57	
15. PABNA																					47	
16. MEGHNA	11		1	3	41	8		2	43					17	7	14	6	3	11	7	2	
17. FARIDPUR	22		1	1	1	58	3	1	70					18	3	7	1				173	
18. MURSHIDABAD	17		1	1	33	1		10						3	1	9	7				220	
TOTAL	489	72	32	167	278	652	251	293	230	52	19	110	3	262	238	72					2277	
Legend:																						1972

Note:
 * includes intra-regional movement
 ** excludes intra-regional movement

Legend:
 Road Rail
 Country
 IMI
 Boat

2-2-2 Raw Jute and Jute Goods

(1) Raw Jute

Table 2-2-2-1 and 2-2-2-2 show the production of raw jute in the past and in the period before and after the war. The tables indicate only small fluctuation both in the total production and the district-wise production as far as raw jute is concerned, except the postwar decrease in Dinajpur and the postwar increase in Kushtia.

The overall distribution pattern of interdistrict movement does not show a great change between in the past and the present except the movement to Chittagong in 1972/73 which revealed a decrease due to the loss of efficiency in rail systems.

The characteristics of the movement of raw jute from the main jute cropping areas are as follows:

1) North Bengal

Approximately 100,000 tons of raw jute is transported to Dacca by rail and by country boat. A considerable amount of raw jute used to be transported down to Chittagong by rail but in 1972/73 the movement was reduced to about half the amount in 1968/69.

2) Mymensingh and Tangail

In contrast to the movement from North Bengal most raw jute is transported to Chittagong and Khulna. In 1968/69

approximately 100,000 tons of raw jute was transported to the above destinations, but in 1972/73 the movement to Dacca increased, which might be accounted for by the rail inefficiency.

3) Faridpur, Jessore and Kushtia

Most of raw jute is transported to Khulna which is locationally favourable. In 1972/73 more than 50,000 tons of raw jute was transported to Dacca by country boat, which is not to be compared in the absence of the data for 1968/69. However, judging from the fact that transportation by country boat is well developed around Faridpur, a considerable amount of raw jute was supposed to be transported to Dacca also in 1968/69. Transportation by truck plays a considerable role in Jessore and Kushtia.

4) Comilla

The movement of raw jute to Chittagong is predominant. Especially the postwar movement has made a great increase. This is not because the production has increased, but because Chandpur has been used as a transit terminal.

5) Dacca

The movement, both inflow and outflow, to and from Dacca is tremendously great. This is because in Dacca area there exists a transit terminal in Narayanganj, and jute industry is developed all around Dacca. The movement to Chittagong

has decreased after the war and the transport by inland water has been predominant over the one by rail.

Generally the movement of raw jute had no great change in 1968/69 and 1972/73 as stated above. The future movement pattern of raw jute might not change even if a change of the production of raw jute should occur.

Table 2-2-2-1 Production of Raw Jute

(Unit: 1,000 tons)

Year	1967	1968	1969	1970	1971	1972	1973
Raw Jute	6,400	6,850	5,754	7,171	6,670	4,193	6,514

Table 2-2-2-2 Jute Production by District (includes MBSTA)

(Unit: 1,000 tons)

District	Year	1968/71 (average)	1972/73
Dacca		112	110
Mymensingh		} 311	248
Tangail			
Faridpur		131	146
Chittagong		0	0
Chittagong H.T.		0	0
Naokhali		16	11
Comilla		91	96
Sylhet		13	9
Rajshahi		38	38
Dinajpur		50	27
Rangpur		199	201
Bogra		33	22
Pabna		66	51
Khulna		24	16
Barisal		} 17	13
Patuakhali			
Jessore		85	87
Kushtia		28	49
T o t a l		1,214	1,201

Source: Agricultural Directorate

Table 2-2-2-3 Interregional O-D Movement of Raw Jute, 1968/69

(Unit: 1,000 tons)

O	D													TOTAL				
	1	2	3	4	5	6	7	8	9	10	11	12	13					
	CHITTAGONG	CHITTAGONG	NOVAPALI	COMILLA	SILHET	DACKA	MINERANG	TANGAIL	BARISAL	FARIJUR	BESSORE	MUSHTA	RAJSHAH	PABNA	BOGRA	RAJSHAH	CHITTAGONG	TOTAL
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
TOTAL	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234

Note:

- * includes intra-regional movement
- ** excludes intra-regional movement

Legend:

Road	Rail
Country	Country
INTL	INTL
Boat	Boat

(2) Jute Goods

Jute industry is a sole representative industry in Bangladesh. Table 2-2-2-5 shows the production of jute goods. Before the war the trend of production showed an increase but after the war it showed a decrease.

The districts where jute factories are located are Dacca, Chittagong, Khulna, etc., the production except in these three districts is very small. Therefore, the interdistrict movement of jute goods is very small. The difference in transporting jute goods from other items is that the share of inland water transport (IWT) is very great. The main movement consists of the routes from Dacca to Khulna and from Dacca to Chittagong. The movement by the former route was twice as much as the one by the latter before the war and after the war the former movement has risen up to six times. It seems that the rail movement from Dacca to Chittagong has been substituted by the IWT movement from Dacca to Khulna. The truck movement in Chittagong District will not be negligible.

Although there is a possibility of increasing production of jute goods in the future, its movement pattern will not change so greatly.

Table 2-2-2-5 Production of Jute Goods (Unit: 1,000 tons)

Year	1960/61	68/69	69/70	70/71	71/72	72/73
Jute goods	249	519	588	440	314	446

Table 2-2-2-6 Interregional O-D Movement of Jute Goods, 1968/69

(Unit: 1,000 tons)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	TOTAL	
	CHITTAGONG	COX'S BAZAR	COMILLA	RAJSHAHI	NETAJI	BARISAL	CHANDERNAGH	RAJSHAHI	RAJSHAHI	RAJSHAHI	RAJSHAHI	RAJSHAHI	RAJSHAHI	RAJSHAHI	RAJSHAHI	RAJSHAHI	RAJSHAHI	RAJSHAHI	RAJSHAHI	RAJSHAHI	RAJSHAHI	RAJSHAHI
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18																						
19																						
20																						
TOTAL																						

Note:
 * includes intra-regional movement
 ** excludes intra-regional movement

Legend:

Road	Rail
Country	Sea
TOTAL	TOTAL

Table 2-2-2-7 Interregional O-D Movement of Jute Goods, 1972/73. (Unit: 1,000 tons)

O	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	TOTAL
1																					
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18																					
19																					
20																					
TOTAL																					
INTRA																					

Note:
 * includes intra-regional movement
 ** excludes intra-regional movement

Legend:

Road Rail
Intr Country
Intr boat

2-2-3 Foodgrains

(1) Outline

The total movement of the foodgrains is the largest among all the items. In 1972/73 with a huge amount of foodgrains import from abroad owing to the unfavourable domestic production the movement showed a great increase, occupying 40% of the movement of all items. As is seen in Table 2-2-1-1, the total movement by IWT and rail in 1968/69 respectively shows a decrease for almost all items except that of the foodgrains, the greatest among the items, which shows an increase.

Table 2-2-3-1 shows annual import of foodgrains and Table 2-2-3-2 indicates domestic production of foodgrains. The statistic available concerning foodgrains are recorded separately as rice and wheat, and the IWIA data in 1968/69 concerning interregional movement integrated as foodgrains, while the data from Railway Board in 1969 classified as rice, paddy and wheat. The data in 1972/73 available recorded as imported foodgrains and domestically produced foodgrains: all source of data should a lack in uniformity in classification. Therefore, for the discussion of the interregional movement they are unified to one item, foodgrains.

(2) Balance of Supply and Demand

The balance of supply and demand of the foodgrains which has an decisive influence on the interregional movement of the foodgrains was discussed in detail in Chapter 1.

Table 2-2-3-1 Imports of Foodgrains

(Unit: 1,000 tons)

Year	Rice	Wheat	Total
1961	464	243	698
1962	206	202	408
1963	542	894	1,436
1964	346	656	1,002
1965	95	250	345
1966	360	529	889
1967	432	647	1,079
1968	308	712	1,020
1969	236	844	1,120
1970	502	1,045	1,547
1971	381	898	1,279
1972	658	1,068	1,726 1)
1973	N.A.	N.A.	2,720

Note: 1) estimated figure

Table 2-2-3-2 Production of Foodgrains by variety

Year	R I C E				W H E A T		
	Production (1,000 tons)				Cropping Area (1 million acres)	ton/acre	Production (1,000 tons)
	Aus	Aman	Boro	Total			
1951-55 (average)	1,829	5,345	334	7,509	20.9	0.36	23
1956-60 (average)	1,939	5,231	334	7,514	20.1	0.37	24
1961	2,497	6,574	448	9,519	21.9	0.43	32
1962	2,329	6,655	486	9,470	21.0	0.45	39
1963	2,203	6,047	481	8,731	21.5	0.41	44
1964	2,655	7,291	512	10,458	22.3	0.47	34
1965	2,502	7,263	575	10,340	22.8	0.45	34
1961-65 (average)	2,437	6,766	500	9,704	21.9	0.44	37
1966	2,918	6,799	619	10,336	23.1	0.45	35
1967	2,674	5,917	839	9,430	22.5	0.42	50
1968	3,067	6,814	1,113	10,994	24.4	0.45	58
1969	2,681	6,870	1,613	11,164	24.1	0.46	92
1970	2,960	6,949	1,904	11,813	25.6	0.46	103
1966-70 (average)	2,860	6,670	1,218	10,747	23.9	0.45	69
1971	2,860	5,910	2,190	10,963	24.5	0.45	110
1972	2,341	5,695	1,738	9,775	23.0	0.42	113
1973	2,273	5,587	2,070	9,930	23.8	0.42	89
Rate of Increase (%)							
1966-70/1951-55	+56	+27	+265	+43	+14	+25	+200
1966-70/1961-65	+17	-1	+144	+11	+9	+2	+86

Source: Agricultural Directorate

(3) Interregional Movement

It is to be noted that the movement pattern of imported foodgrains shows a great difference from that of domestically produced foodgrains. The former pattern is a uniform distribution with public transport all over the country to the low income people, while the foodgrains produced in the country are transported with private transport to fill up the gap between deficit and surplus.

Therefore, the interregional balance of supply and demand will not correspond to the interregional network of Origin-Destination. Table 2-2-3-3 and 2-2-3-4 show interregional Origin-Destination of foodgrains in 1968/69 and 1972/73 respectively. The main points of interregional movement of foodgrains are as follows:

- The share by rail transport made a great decrease, and that by IWT made an increase by about 10 times;
- The movement of outflow from Dacca increased;
- The movement of outflow from North Bengal decreased to half and the inflow showed a slight decrease; and
- Inflow to Noakhali, Comilla, Dacca, and Barisal made a great increase.

The above tendencies are considered to have occurred as the results of the decrease in domestic production and of the increased imports.

1) Chittagong

Chittagong having a foreign trade port has the greatest outflow of foodgrains, most of which are transported to eastern districts: Comilla, Noakhali, Dacca, etc., but which also contain a considerable amount to North Bengal. In 1968/69 the foodgrains were transported to North Bengal directly by rail, however, in 1972/73 the foodgrains were transported to the same area via Khulna. Similarly, the foodgrains to Mymensingh in 1968/69 was carried directly by rail, but in 1972/73 via Dacca.

2) Khulna

A great amount of foodgrains was transported to Khulna Division and North Bengal in 1968/69 and 1972/73. Except that the movement by rail to Faridpur decreased, no remarkable changes were to be seen. As in the case of the other items, the rail movement of foodgrains to North Bengal did not decrease.

3) Dacca

The greatest amount of foodgrains was transported to Dacca in 1968/69 and 1972/73 as this area lacked a great amount of food. Dacca, being a sole consuming place in 1968/69, served as a transit terminal to Mymensingh, Tangail, and North Bengal as stated before. The movement from North Bengal to Dacca and from Sylhet to Dacca which is considerably great in amount forms one of the main flows

of foodgrains produced in the country.

4) North Bengal, Mymensingh, Sylhet and Barisal

Districts in these areas have surplus foodgrains which are transported to Districts of Dacca and Comilla, and Khulna Division. However, a considerable amount of imported foodgrains via Chittagong and Khulna was transported to these areas in 1968/69 and 1972/73.

The main flows of the foodgrains are from North Bengal to Dacca, from North Bengal to Khulna Division, from Sylhet to Dacca, and from Barisal and Patuakhali to Dacca. The movement of foodgrains from Mymensingh is not so great as it is supposed to have a great surplus. There are other flows which are in a reverse direction from Chittagong to Sylhet, from Khulna to Barisal from Chittagong to North Bengal, and from Khulna to North Bengal.

As stated before the balance of supply and demand of foodgrains only will not account for its interregional movement in estimating their future movement.

2-2-4 Cement

Cement is produced in Sylhet District, the production of which occupies only 10% of the total consumption, and the rest has to be imported. Table 2-2-4-1 shows the production of cement during the past six years and Table 2-2-4-2 the imported cement during the same years.

The production of cement in 1972/73 did not recover to the prewar level and both the production and the import of cement in 1972/73 are only approximately 50% of the production and the import in 1968/69 respectively.

Table 2-2-4-3 and 2-2-4-4 show the interregional movement of cement in 1968/69 and 1972/73 respectively. The movement to Dacca in 1968/69 was great and the one in 1972/73 was remarkably great, while the movement to other areas made a remarkable decrease.

(1) Chittagong

In 1968/69 much of cement was transported to Comilla, Sylhet, Dacca, Mymensingh and North Bengal by rail, but in 1972/73 cement to North Bengal did not appear and cement to other districts decreased. This is due to the low efficiency of rail systems. Cement to Dacca by IWT was the greatest, amounting to more than 100,000 tons both in 1968/69 and 1972/73. The difference of cement between imported one at Chittagong Port and transported one from Chittagong can be estimated as consumed cement in Chittagong District.

(2) Khulna

The cement imported from Khulna amounted to below half the amount handled at Chittagong Port. The movement to North Bengal, Jessore, Kushtia, Faridpur, etc. was great before the war, but after the war it decreased, while the movement to Dacca by IWT increased.

(3) Sylhet

Both in 1968/69 and 1972/73 cement was transported to Dacca by 20,000 tons.

(4) Movement with India

The movement to North Bengal amounted to 10,000 tons in 1972/73. The import of cement from India had been maintained until 1964, the amount of which was not so great as that of coal. The future import of cement from India is presumed not to exceed the amount in 1972/73.

With the increased production capacity of the existing Chattak cement factory, and the installation of cement factories in Chittagong, Joipurhat, the movement pattern of cement in the future will be different from that in 1968/69 and 1972/73.

Table 2-2-4-1. Cement Production

(Unit: 1,000 tons)

1967/68	1968/69	1969/70	1970/71	1971/72	1972/73
82	64	53	66	24	29

Table 2-2-4-2. Import of Cement

(Unit: 1,000 tons)

Channel	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73
Chittagong	494	552	453	286	40	245
Chalna	83	213	138	139	19	94
By Rail from India	-	-	-	-	-	35
T o t a l	577	765	591	425	59	375

Table 2-2-4-4 Interregional O-D Movement of Cement, 1972/73

(Unit: 1,000 tons)

	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱	⑲	⑳	TOTAL	
	CHITTAGONG	COX'S BAZAR	COMILLA	DHAKA	BARISAL	RAJSHAHI	BRAHMANBARIA	CHANDERNAGOR	MEERUT	MOULTAJI	RAJSHAHI	ROSAHAT	SHARIKAT	SHAHJHANPUR	SIKHA	SONARHAT	TRIPURA	WADDIA	WADDIA	WADDIA	TOTAL	
① CHITTAGONG	3	1	5	6	13	10	5														27	
② COX'S BAZAR																						14
③ COMILLA																						27
④ DHAKA																						20
⑤ BARISAL																						26
⑥ RAJSHAHI																						26
⑦ BRAHMANBARIA																						20
⑧ CHANDERNAGOR																						26
⑨ MEERUT																						26
⑩ MOULTAJI																						26
⑪ RAJSHAHI																						26
⑫ ROSAHT																						26
⑬ SHARIKAT																						26
⑭ SHAHJHANPUR																						26
⑮ SIKHA																						26
⑯ SONARHAT																						26
⑰ TRIPURA																						26
⑱ WADDIA																						26
TOTAL	3	1	5	6	13	10	5															27
INTRA																						10

Note:

* includes intra-regional movement

** excludes intra-regional movement

Legend:

Road	Rail
INT	Country boat

2-2-5 Coal

Table 2-2-5-1 shows the import vs. consumption of coal from 1965/66 through 1972/73. The annual amount of coal imported from India amounted to 200,000 - 400,000 tons until 1963/64. Out of the total imported coal of 266,000 tons in 1972/73, 250,000 tons, which is equivalent to over 90%, was from India (Calcutta). Therefore, the interregional movement in 1972/73 differs much from the one in 1968/69.

Most of the movement in 1968/69 was from Chittagong to Dacca by IWT and from Khulna to North Bengal by rail. There were other movements by rail from Comilla to Sylhet and from Dacca to Mymensingh and Rangpur. Out of the total quantity of coal of 250,000 tons from India in 1972/73, 100,000 tons was transported to Chittagong and 42,000 tons to Dacca directly, both by IWT. The remaining 166,000 tons was transported to Khulna by rail and from there 75,000 tons was transported to Chittagong and 52,000 tons to Dacca directly by IWT. In short, the movement from Calcutta to Chittagong amounted to 85,000 tons and the one from Calcutta to Dacca to 96,000 tons. Additional coal of over 30,000 tons was imported from India to some districts in North Bengal.

In future with the coal import from India and from other foreign countries, which is to be handled through the ports of Chittagong and Khulna, the movement pattern will be different from that in 1968/69 and 1972/73.

Table 2-2-5-1 Import and Consumption of Coal

(Unit: 1,000 tons)

Import

Year	1965/66	66/67	67/68	68/69	69/70	70/71	71/72	72/73
Coal	575	737	283	670	310	306	105	266

Consumption

Coal	485	557	520	576	347	286	135	367
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Table 2-2-5-2 Interregional O-D Movement of Coal, 1963/69

(Unit: 1,000 tons)

O	D													TOTAL										
	1	2	3	4	5	6	7	8	9	10	11	12	13											
	CHITTAGONG	CHITTAGONG PORT	NOAMALI	SONAILA	SILHET	DAKKA	MHENSINGH	TANGAI	RAJSHA	RAJSHAHI	BARISAL	BARIDPUR	BESSORE	CHUSTIA	RAJSHAHI	PANNA	BOARA	HANGUR	DINAUR	TOTAL	TOTAL			
1	1	3	2	1/2	3	2																113	112	
2																								
3																							46	46
4																								
5																							32	32
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
TOTAL	1	3	2	1/2	3	2																		
INDIA (CALCUTTA)																								

Note:

* includes intra-regional movement

** excludes intra-regional movement

Legend:

Road	Rail
WT	COUNTRY
boat	

Table 2-2-5-3 Interregional O-D Movement of Coal, 1972/73

(Unit: 1,000 tons)

O	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	TOTAL
O	CHITTAGONG	CHITTAGONG	CHITTAGONG	CHITTAGONG	CHITTAGONG	CHITTAGONG	CHITTAGONG	CHITTAGONG	CHITTAGONG	CHITTAGONG	CHITTAGONG	CHITTAGONG	CHITTAGONG	CHITTAGONG	CHITTAGONG	CHITTAGONG	CHITTAGONG	CHITTAGONG	CHITTAGONG	CHITTAGONG	CHITTAGONG
1	1																				1
2		1																			
3			1																		
4				1																	
5					1																
6						1															
7							1														
8								1													
9									1												
10										1											
11											1										
12												1									
13													1								
14														1							
15															1						
16																1					
17																	1				
18																		1			
19																			1		
20																				1	
TOTAL	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20
INDIA																					10
PAKISTAN																					10

Note:

* includes intra-regional movement

** excludes intra-regional movement

Legend:

Road	Rail
INT	Country
boat	

2-2-6 Petroleum

Petroleum, as in the case of coal, is not produced in the country, and its consumption depends upon the import. The annual import of petroleum is tabulated in Table 2-2-6-1, the amount of which is not always equal to the annual consumption.

Both petroleum and crude oil are imported through the port of Chittagong and refined at Chittagong. The movement of petroleum is from Chittagong District.

The interregional distribution is to be divided into two major flows: one is from Chittagong to districts in the east, Dacca and part of North Bengal, and the other from Khulna to the southwest and districts in North Bengal. For the latter flow Khulna served as a transit terminal from Chittagong.

The data in 1972/73 show some movements starting from Chandpur and Dacca, which was done by country boat and truck, while the data in 1968/69 left no marks of such movement. Petroleum was transported mainly by rail and truck except for the interregional routes from Chittagong to Dacca, from Chittagong to Khulna, and from Chittagong to Barisal.

1) Chittagong

The movement to Dacca and Khulna was of the greatest amount, and in 1972/73 it almost doubled the movement by rail decreased in 1972/73 as in the case of other items, this tendency was specially remarkable for the movement to North Bengal. The movement in short distance was done by truck.

Table 2-2-6-1 Import of Petroleum

(Unit: 1,000 tons)

	1969	1970	1971	1972	1973
Crude Oil	965	894	794	777	547
Petroleum products	205	448	124	122	580
Total	1,170	1,342	918	899	1,127

2) Khulna

Land transport was used for the movement from Khulna both in 1968/69 and 1972/73. The movement by rail to North Bengal, like the one from Chittagong showed a remarkable decrease in 1972/73.

The reinforcing of refinery facilities in Chittagong, and the new installation of a refinery at Khulna are planned in the future. The future pattern of the movement will not differ from the one in 1968/69 and 1972/73.

2-2-7 Iron and Steel

The steel mill in Chittagong is the only one in the country. Table 2-2-7-1 shows the production in the recent years. Mills for rolling and casting are located in Chittagong, Dacca, and Khulna, but the production in Khulna occupies only several per cent of the total, and the remaining is produced in Chittagong and Dacca as shown in Table 2-2-7-3.

The unbalance is met through import. The amount of import in 1972/73 was reduced by half as shown in Table 2-2-7-2. The movement in 1968/69 was mainly by rail, while the total movement in 1972/73 made a great decrease, leaving a big change with a tremendous drop by rail but with an increasing share by IWT.

The interregional movement was maintained with the greatest amount from Chittagong to Dacca both in 1968/69 and 1972/73, although its mode of transport was changed from rail to IWT. The movement except to Dacca was uniformly distributed over the country in 1968/69, but the one in 1972/73 was limited only to the districts in the east.

Since steel mill industry has a close bearing on the development of manufacturing, the main production and consumption will be made in Dacca and Chittagong. There is no near prospect that steel mills other than the existing one in Chittagong will be provided in the future. The future movement will be from District of Chittagong. Similarly, industry of steel rolling and casting will be maintained by the existing establishments. Therefore, the movement pattern will make no great change from that in 1968/69.

Table 2-2-7-1 Production of Iron and Steel in Chittagong

(Unit: 1,000 tons)

1967/68	1968/69	1969/70	1970/71	1971/72	1972/73
40	43	43	43	41	52

Source: Chittagong Steel Mill

Table 2-2-7-2 Import of Iron and Steel by Port

(Unit: 1,000 tons)

Port	Chittagong		Chalna		Sub-total		Total
	Iron & steel	Cast iron sheet	Iron & steel	Cast iron sheet	Iron & steel	Cast iron sheet	All steel
1968/69	158	32	--	--	158	32	190
1970/71	45	5	N.A.	N.A.	45	5	50
1972/73	47	29	1	21	48	50	78

Source: Chittagong Port Trust

Table 2-2-7-3 Production Capacity of Casting and Rolling Mills in Operation, 1967/68

(Unit: 1,000 tons)

Dacca	37,800
Khulna	8,100
Chittagong	46,300
T o t a l	92,200

Table 2-2-7-5 Interregional O-D Movement of Iron and Steel, 1972/73.

(Unit: 1,000 tons)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	TOTAL				
	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	TOTAL			
	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	INDONESIA	TOTAL			
1	8	1	9	2	3	7	2														55	12	55	12	
2																									47
3																									
4																									
5																									
6																									
7																									
8																									
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15																									
16																									
17																									
18																									
19																									
20																									
TOTAL																									
INDONESIA																									
INDONESIA																									

Note:

* includes intra-regional movement

** excludes intra-regional movement

Legend:

Road	Rail
INT	Country-boat

2-2-8 Fertilizer

The consumption of fertilizer which has already exceeded its prewar level is shown in Table 2-2-8-1. Table 2-2-8-2 shows the import of fertilizer and Table 2-2-8-3 the total production at Panchuganj in Sylhet District. The import of fertilizer has not made a big change, while the production has decreased. The production at Gorasal Factory in Dacca District amounted to 195,000 tons in 1972/73 which met the increasing demand.

As the Gorasal Factory was not in operation in 1968/69, the movement pattern in 1972/73 is different from the one in 1968/69.

1) Chittagong.

The movement to districts in the east and to Khulna forms the main flows, and the movement pattern in 1972/73 was not different from that in 1968/69, but the amount in 1972/73 increased in every route.

2) Khulna

Generally, fertilizer is transported from Khulna by rail. The movement from Khulna did not play a great role in 1968/69, but that to North Bengal, Kushtia, Jessore, and Faridpur came to a considerable amount. This substituted the movement from Sylhet.

3) Sylhet

The production in the District of Sylhet made a great decrease

after the war as shown in Table 2-2-8-3. The movement in 1968/69 was uniform to every district in the country but in 1972/73 the movement was only to Comilla, which is at a short distance from Sylhet. This may be due to the lowered production and the deteriorated efficiency by rail.

4) Dacca

The movement appeared only in 1972/73. The movement except in Dacca itself was remarkable only to Khulna, which may be accounted for by the fact that fertilizer was transported to North Bengal via Khulna. The movement to adjacent districts, such as Barisal and Mymensingh was recognized. Data have not been available so as to analyze the movement of fertilizer by kind (urea, TSP and MP). There are several programmes of new fertilizer plants with the increasing domestic consumption demand. The future movement pattern will be different from the existing one.

Table 2-2-8-1 Consumption of Fertilizer

(Unit: 1,000 tons)

1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73
101	129	176	190	235	277	306	244	378

Source: Bangladesh Agricultural Development Corporation

Table 2-2-8-2 Import of Fertilizer by Port

(Unit: 1,000 tons)

	Chittagong	Chalna	Total
1968/69	175	63	238
1970/71	199	55	254
1972/73	229	21	250

Source: Chittagong Port Trust
Chalna Port Directorate

Table 2-2-8-3 Production of Fenchuganj Fertilizer Factory

(Unit: 1,000 tons)

1966/67	95
1968/69	88
1970/71	108
1972/73	39

Source: Bangladesh Chemical Fertilizer and Pharmaceutical Corporation (BCFPC)

