CHAPTER - 1

INTRODUCTION

The jute fibre has a long history. It was used for cordage and fabrics in pre-biblical times. In Bengal it formed the basis of a hand spinning and hand-weaving industry turning out not only ropes, screen and matting, but also some coarse gunny clothing for graments and bedding materials. It was also used for other diverse purposes including bags for packing grains and other agricultural produce, particularly during the sixteenth to the eighteenth centuries, for use within the country. In fact, jute clothing was a common attire of village folk. Almost every farming family in Bengal raised some jute on its land, and the sack-weaving caste was called 'Kapalis'. The processing of raw jute through the various stages at that time was the result of indigenous exploration. The growing of jute was not conducted on any organized commercial scale until late in the eighteenth century when due to the trading enterprise of the East India Company, possibilities both for the fibre and the fabric came to be known to the outside world.

The first steam-powered jute mill was set up at Dundee in Scotland in 1830. But the quantum of raw jute exports from India to Britain remained low for a number of years. This was so as attempts by the Company to utilize the jute fibre extensively in modern industry were thwarted by the technical difficulties of bleaching and dyeing. From the 1840 until about 1870 Dundee had a near-monopoly of the world's factory-made jute-cloth trade based on cheap Indian supplies of raw jute. Export of raw jute from Bengal which were not sizeable upto 1830, shot up particularly after 1849. The spurt in British India's jute export and production was the outcome of the Industrial Revolution and of the conscious British policy of stifling India's traditional crafts including jute processing, and encouraging large scale export of industrial raw materials of agricultural origin from India to Britain to feed British industries and to pay for India's 'Colonial obligations'. While the British jute manufacturing industry prospered, and the export of jute fibre from India to Britain

went up, the Indian jute handloom industry steadily declined. Machine-manufacture of jute textile based on steam power started in India under Scottish initiative in the mid-1855 when a small jute spinning mill was set up at Rishra near Serampore on the western Bank of the river Hooghly in Bengal by George Acland. Acland's unit was not materially successful. But it apparently showed enough promise to induce the Borneo Company, a trading enterprise in Calcutta with some idle capital, to start an integrated spinning and weaving mill based on steam-power in 1859. The history of Indian Jute Industry is narrated in detail separately in Chapter-2.

At the time of independence and the partition of the country the number of looms stood at 65,500 and the number of spindles at 1.09 million, and jute majufacturing remained the second leading industry in India (next only to cotton textiles) in terms of both value added (17.5 percent of the total) and value of output (14.7 percent of the total). The partition had grim consequences for the country's jute economy in so far as it saw about 75 per cent of the jute producing area, growing about 80 per cent of the total crop of undivided India going to erstwhile East Pakistan, whereas the jute mills were mostly situated in West Bengal. The industry having been deprived of its vital raw material, the number of jute mills came down from 111 in 1947 to 106 in 1948. Production of raw jute in 1947/48 was only 1.67 million bales as against the pre-partition output of 5.69 and 8.05 million bales in 1946/47 and 1945/46 respectively.

After the partition, a boost in raw jute production was the most vital imperative for meeting the fibre requirements of jute mills in the country, and the output of the fibre did witness a sharp rise in the immediate post-partition years. As a short-term measure, the Government of India encouraged a shift in acreage from 'aus' paddy to jute, deciding that any short fall in respect of the availability of the former would be met by allocation of grains to the jute-growing states.Futher,

stress was laid on the raising of mesta. This, alongside a buoyant global demand, led to a quick rise in jute area-about three fold in West Bengal, and about two fold in Assam and Bihar-over 1947 to 1956. Ever since, the government tried to expand jute acreage without reducing the area under 'aus' paddy, the aim being to encourage the culture of jute in mono-cropped land under 'aman' (Winter) paddy prior to the sowing of the latter. In 1984/85 production amounted to 6.68 million bales of jute and 1.30 million bales of mesta involving about four per cent of the contry's total acreage devoted to jute and paddy. In 1985-86 and 1986-87 the combined output of jute and mesta was respectively 12.73 and 7.00 million bales.

Raw jute production is characterised by significant year-to-year variations. For the country as a whole and over the period 1968-69 to 1984-85, the trends in jute production and acreage were not statistically significant. Reliable estimates of variety-wise and grade-wise output of jute in India are not yet available. The Report of Raw Jute prepared by the Technical Committee (1981) of the Jute Manufactures Development Council (J.M.D.C.) brought out that the average yearly output (excluding mesta) over the last five years of the decade of the 1970s was 5.5 million bales of white jute (capsularies) and tossa (olitorius) varieties. Of which the former accounted for roughly 1.65 million bales and the latter for 3.85 million bales, that is, in the proportion of 30:70. It was also shown that over the period the production of W/5 and TD/5 varieties of jute was the highest among all grades (about 36 per cent of the total). The superior grades (grade 4 and above) formed about 40 per cent of the total output with grades 1 and 2 accounting for only about 3 per cent of the total.

Jute is a commercial crop and about 95 per cent of its output may be regarded as marketable surplus, the balance being retained as seed and for village-level consumption. There are two species of jute, viz. corchorus capsularies and corchorus olitorius. The commercial names are white jute and Tossa jute respectively. Leaves of the white jute taste bitter but those of the Tossa jute do not taste so. The plant of the white jute generally produces white or cream coloured jute, the colour may be darker. The plant of the Tossa jute generally produces red or even dark grey jute. The fibre is finer and stronger than the other variety.

The pre requisites for a successful cultivations of jute are a suitable climate, good seeds and a good soil. Jute plants thrive well, when the temperature of the place ranges between 70°F and 100°F and relative humidity between 70% and 90% Therefore tolerable heat with dampness of air is the most suitable climatic condition. Moderate showers of rain are also favourable for their natural growth.

1. Raw Jute Cultivation : Technical Aspects :

The different stages of jute growing are as follows :-

(i) Sowing (ii) Weeding and thinning (iii) Cutting (iv) Steeping or retting (v) Stripping, washing and drying. Preparatory tillage of the land starts just after the first shower of rain is received during the latter part of February or the beginning of March. As the roots of jute plants are more than a foot in length, deep ploughing is necessary to remove the stubbles of the previous year. Jute seeds are very small and, therefore, the soil shoud be throughly pulberised and a seed-bed with a fine tilth obtained before sowing. In general, the soil is prepared by ploughing and cross-ploughing the land five to six times or more, until a fine seed-bed is obtained. After each of ploughing, a log of wood on ladder made of bamboo, about seven to eight feet long and weighted down by the cultivator standing on it,

is drawn over the ploughed surface. This process of 'laddering' levels the land, breaks up the clods of soil, loosens and collects the weeds and compresses the soil slightly. Clay soils usually require more ploughings.

Manuring of jute land is done differently in the different jute growing areas. Cow-dung, ashes and composted house-sweepings are usually used. Chemical manures are also used to some extent. As jute is a bast fibre crop, the yield of the fibre is dependent on the vegetative growth of the plant. Of the plant nutrients, nitrogen is the most important, and has been found to give the best response in increasing the yield of fibre. Ammonium sulphate among the inorganic nitrogenous fertilisers has so far given the best results.

Sowing : Seeds are usually sown broad cast at the rate of 10 lb per acre for corchorus capsularies and 6 lb per acre for corchorus olitorius. The seed rate, however, is variable. As the seeds are small, they are often mixed with a loose earth for the convenience of handling at the time of sowing. After sowing the land is harrowed and then laddered so that the seed is covered and comes in close contact with the moist soil which helps germination. In order to ensure uniform germination, the seeds should remain 1 to 1½ inches below the surface of the soil.

Weeding and thinning : Seeds with a germination percentage of about 80 produce about 1,089,600 potential plants per acre, whereas the final stand (number of plants) harvested in an acre usually ranges from 100,000 to 200,000. During the first two months of the crop, a large number of plants has to be thinned out gradually. When the plants are about three to nine inches high, a hand or bullock-drawn rake is drawn over the land to thin out the plants.

Weeding is important in jute cultivation. Jute fields should be kept free from weeds. Weeding is accompanied by thinning. The plants should be thinned out so as to leave a space of about five to six inches between them.

Growing jute as a row crop-Jute responds very effectively to the foregoing intercultural operations which should be carried out in time. If these are neglected, the crop will not grow properly, the out turn of fibre will be much less and the crop may even fail. In broadcast sowing the process of weeding and thinning operations are very expensive. Experiments conducted at the Jute Agricultural Research Institute have shown that the cost of production is considerably reduced, when jute is sown in rows (reduces the cost of production by 20 per cent). By this method, the yield of fibre in corchorus capsularies is increased by about 25 to 30 per cent and in corchorus olitorius by about 10 to 16 per cent over broad cast crops.

Rotational Cropping : Normally, annual crops cannot be produced economically as a single crop year after year on the same land, and, for this purpose, crop rotations are usually practised. Jute planted for fibre productions occupies the land only for about four months. It is possible to raise a second or sometimes even a third crop in the same land in the same year. Such a programme of double or tripple cropping is possible in low and mid lands where rains start early or where irrigation facilities exist. In such areas, capsularies jute is sown early and after the harvest of jute a crop of transplanted paddy, often followed by a third crop of ~~pluse~~ pulse etc. can be raised.

Harvesting : Jute plants may be cut at any time before they are dead ripe, but harvesting is not usually done before the fdowering stages. Jute is cut from the beginning of July to the end of October. The time of cutting may be divided into three stages as follows :

First stage - cutting in flower.
Second stage- cutting when fruits set.
Third stage - cutting when fruits fully develop.

If the plants are allowed to get dead ripe, the fibre becomes coarse in texture and dirty reddish in colour. The heaviest yield of fibre of quality is obtained when the plants are cut at the third stage.

In high lands, the harvested plants are left in groups at different places in the field for two to four days. After that the leaves shed, and the plants tied into bundles are taken for steeping in water. In low lands where jute plants may be standing in water, steeping is carried out immediately after harvest.

Retting : Jute fibre is contained in the bark of the plant. In the natural state, the fibre is associated with a kind of gum which must first be softened by fermentation and then removed by washing. The fermentation takes place when the plants are cut and kept under water. This is called steeping or retting. In other words, retting is a process by which the fibres in the bark get lossened and separated from the woody stalk due to the removal of pectins, gums and other mucilaginous substances. This is usually affected by the combined action of water and microorganisms.

The tied bundles of jute stems are taken to the nearest pool or ditch for retting. The bundles are laid flat in water at least two to three feet in depth, and arranged side by side so as to form a regular plat form, which is usually known as 'Jak'. Jute bundles have been found to ret better when steeped at a depth of six to nine inches in slow flowing, clear water. By using acquatic plants as covering material, the 'Jaks' may be weighted down by stones, bricks or dry logs etc.

To ensure a uniform retting of the whole plant, bundles of stems should be placed up right in about two feet of water initially for two to three days before they are completely steeped in water. The time required for retting depends upon several factors, such as the maturity of the plants and the temperature and other conditions of the water in which they are steeped. In the earlier part of the retting season the process may take only 8 to 10 days. As the season advances, the water becomes comparatively colder and retting may require three to five weeks after the end of September.

Stripping : Retting is complete when the bark separates out easily from the wood. Considerable experience, care and close watching are necessary to determine when retting is complete and the fibres are ready for extraction. Cultivators who produce best fibre examine the retted stems once a day when the plants approach the right stage for extraction. When the retting is complete fibre must be extracted as quickly as possible, otherwise the quality of the fibre will suffer. Fibre is extracted from the stalks of retted jute by hand.

The factors that prevented jute growers from exploiting the yield potential of their farms and of improved jute varieties may be categorized along conventional lines into two groups : (i) technological and (ii) structural or institutional (socio-economic). There are not mutually exclusive, there are organic inter actions between them.

The technological factors relate to (a) genetic potential and characteristics on one hand and (b) cultural practices on the other. As regards the former, the availability of improved or hybrid seed is stated to be an important limiting factor in increasing yields of jute. Whereas the availability of certified seeds of recommended improved varieties of jute is generally inadequate, that of capsularies is particularly meagre - only about five per cent of the total requirement. This is because capsularies are shy-yielders with high unit costs of production, and the seed producing agencies are reluctant to take up their production. Secondly, genetic improvements in regard to jute have not yet resulted in varieties which may cause jute to displace significantly other crops on rain-fed or irrigated land. As regards cultural practices, a chief difficulty concerns retting which exerts a potent influence on quality. The potential of communal retting facilities, and of mechanical and micro-biological retting techniques is almost totally unrealized. Jute area having line sowing are also very limited, and there is scarcely any use of seed drills, of even the hand-pushed, single row types. Jute and mesta growers still sow by adopting the age-old broadcasting method despite the acknowledged gains from line sowing.

Regarding institutional factors, it may be said that the importance of credit has been somewhat over-rated by many. But the fact is that credit requirements for jute by virtue of the high costs of jute growing are relatively high per hectare and the most common immediate source of it is indigenous. The major jute-growing states are in the eastern region where the scale of institutional finance in the agricultural sector is well below the average for the country. The 'dadan' (tied advances) system, deeply entrenched in undeveloped semi-feudal agriculture, has subjugated a vast section of impoverished jute growers as well.

II. Raw Jute : Marketing Aspects.

The incentive effect of marketing is vitiated by the allocative inefficiency and the inquitable features of the traditional jute marketing system. Monopsonistic functionaries, particularly the commission agents of mills appropriate a disproportionately large margin compared to the services they provide. Empirical studies on price spreads and structure of jute markets are incopious, but just to cite one broad instance, when in the 1980-81 season the TD/5 variety was sold at the farm level at around Rs. 120 per quintal, the price at the Calcutta terminal market ruled at about Rs. 220 per quintal. Because of the pronounced year to year fluctuations in output and supply, speculation enters into the price formation of jute in a big way. Private traders count upon a high trading margin to meet the risk of sharp, speculative price variations.

With a low procurement efficiency, the JCI has been unable to provide a viable alternative to the existing marketing options in jute available through the degenerate private channels. On the other hand, there has been a retrograde development in the form of the government's decision to do away with the statutory minimum prices of jute from the 1988/89 season. The existence of statutory minimum prices, even if they could not be enforced fully, had some sobering effect on jute price formation. The scrapping of statutory minimum price would be tantamount to unmitigated exploitation of the poor jute growers with the JCI unable to counter such tendencies because of its very restricted scale of operations.

The annual variations in raw jute prices have been closely fashioned by situations of scarcity and abundance. Thus the years of 'bumper crop' and 'crop failures' have generally been associated with slumps and upheavals of fibre prices respectively. To cite some recent instances, the bumper-crop years of 1967-68, 1969-70 and 1973-74 were all attached with strikingly low jute prices. Similarly, the poor crop years of 1968-69, 1970-71, 1974-75 and 1977-78 were all years of high jute prices. It appears therefore that changes in supply have been the outstanding factor in shaping variations in raw jute prices given the low short-run price-elasticity of demand for the commodity. In this context, it is worth nothing that raw jute prices have been found as sensitive to previous year's jute goods prices. The reasoning behind this is as follows : Raw jute is marketed by farmers and middlemen at a time when the prices of jute goods, that are to be made of the raw jute, are still unknown. Buyers of raw jute do not know for sure at what prices this can be sold to the mills. The middlemen make an expectation of the whole-sale price, based on previous year's prices of jute goods and previous year's mills consumption of raw jute: the higher both are, the higher is the current year's price, which of course is most of all influenced by the current year's supply of raw jute.

III. Jute Manufactures : We may now have a look at the situation of jute manufactures. Throughout the post-independence period production of jute goods in India did not reflect any statistically significant tendency, and was characterized by fairly pronounced inter year variations. These were governed mainly by (i) the supply of raw jute (ii) the state of industrial relations (iii) availability of power and (iv) vicissitudes of demand. Raw jute scarcities had a notable impact on output of jute textiles, in several years such as, 1970-71, 1972-73, 1974-75, 1982-83 and 1983-84. Labour unrest also had a depressing effect on production in a number of years, sepcially the jute-mill workers' strike in December, 1970, the 33 day strike in Jan-Feb 1974, the 50-day strike in Jan-Feb, 1979, and the 84-day strike in Jan-April 1984-the longest in the history of the industry. The problem of power shortage (particularly in West Bengal) assumed serious proportions from the early 1970's

and had a perceptible impact on the output of jute manufactures in several years, viz, 1970-71 to 1971-72, 1973-74 to 1974-75, and 1978-79. In very recent years many of the mills have turned to 'captive' power generation.

A jute mill may be considered as a maximiser of profit, created by positive margins between revenue and expenditure. This leads to a consideration of costs of production, profitability, investment, as well as the profit-investment relation in the industry. The major cost components of jute manufacturing are (i) raw jute cost (ii) cost of labour (wages and salaries) and (iii) other manufacturing expenses (e.g. cost of power, and fuel, stores and spares, repairs to assets, interest charges etc.) From the data published by the Reserve Bank of India it is observed that the share of raw-jute cost in the total declined from 70 per cent in 1960-61 to 46 per cent in 1981-82, while that of labour increased from 16 to 28 percent, and of manufacturing costs from 14 to 25 percent over the same period. Profits, as well as investment (taken as changes in gross fixed assets) at constant prices in the industry as per RBI data did not show up any definite statistical tendency over the period 1970-71 to 1982-83. Profit was marked by sharp year -to-year fluctuations, as in the case of jute goods production.

The prices of jute goods are determined by forces underlying their demand and supply, as well as by direct government intervention. On the demand side, there are both domestic and overseas elements. Among state control measures are Jute Licensing and control Order, 1961 under Essential Commodities Act which enable government to licence dealers in jute goods (and raw jute) with a view to enforcing both minimum and maximum prices. On the supply side, the most important factor affecting the prices of jute textile has been the level of their output. Particularly, the movements in raw jute prices influenced the price of jute manufactures

over the long run, the raw jute cost being the major element in the cost structure of jute goods.

Although there is a long range correspondence between prices of raw jute and of jute manufactures, demand factors did cause fibre and manufactures prices to move in opposite directions in short periods such as 1972-73 and 1978-79. This can be seen from the price index of raw jute and jute textiles as shown below :-

Year	Raw Jute Price index (1970-71=100)	Jute textiles price index (1970-71=100.)
1971-72	103	118
1972-73	120	108
1977-78	151	158
1978-79	138	179

(Source : Govt. of India, Economic Survey, 1987-88 P.S.-59). Moreover prices of jute manufactures have increased more than those of raw jute over the long run. A study by the Central Satisfical Organisation revealed that in the 16 year period between 1960 and 1976, barring the three years 1966-69, prices of jute manufactures rose % faster than those of raw jute. It is evident therefore that the industry gained from a relatively smaller increase in prices of raw materials compared to increase in prices of final goods, thereby increasing the value added. This leads to another notable factor in the price formation of jute goods. Historically, in years of abundant supply of raw jute, jute manufacturers have been unwilling to expand output upto the level that would fully utilise the available supply of fibre, in order to keep prices of jute goods as high as possible under conditions of restricted entry. That is to say, given the high concentration ratio and monopoly power in the industry, supply has often been purposely, if not overtly, regulated with a view to raising prices and profits.

The problem of ensuring an uninterrupted flow of fibre, the emergence of competition from jute mills in Pakistan and elseshere, the challenge of jute as a packing material because of the search for substitutes of jute products (e.g. paper) in packing, the development of bulk handling that was intensified during and after the second World War by the high prices of jute goods, and the setting up of jute mills in

several importing countries-all these factors created serious impediments to India's jute-goods exports in the period following independence. The problem was said to have been aggravated by the imposition of an export duty by Pakistan on its exports of raw jute to India. On the other hand, revenue considerations forced the Govt. of India to maintain export duties on jute manufactures till the mid-1955 which only encouraged Pakistan's exports.

Over the decade of the 1970's, the volume of India's jute-manufactures exports declined as a whole by an annual compound rate of about 3.5 per cent mainly as a result of the sharp decline in the exports of carpet backing and sacking. The declining tendency of the export quantum of jute goods has continued over the 1980s. Whereas exports had averaged over 500 thousand tonnes per year during the previous decade, they averaged 422 thousand tonnes during the first two years of 1980-81 and 1981-82. In 1982-83 it went down further to 330 thousand tonnes and the estimated level of exports in 1983-84 was only 234 thousand tonnes-an all time low. Exports picked up in 1984-85 to 291 thousand tonnes but were still below the 1982-83 level.

The factors which negatively influenced the world import demand for jute and jute goods over the past two decades or so and thereby impeded Indian exports are mainly four : (i) technological developments(e.g. emergence of paper sack, and bulk handling of commodities) and changes in consumer preference (e.g. retail packaging of groceries), (ii) the development of jute processing industries in several importing countries (iii) the challange from synthetic substitutes and (iv) recession-ahy conditions in the industrialized world.

IV. North Bengal : Some Geographical and Agricultural aspects

The present study relates to jute cultivation in North Bengal region of West Bengal. North Bengal is the name commonly attributed to the region which includes five districts of West Bengal, viz, Malda, West Dinajpur, Cooch Behar, Jalpaiguri and Darjeeling However, West Dinajpur district has been divided into North Dinajpur district and South Dinajpur district with effect from 1.4.92.

The total area of the districts are as follows :-

Districts	Area in sq.km.
Malda	3,713
West Dinajpur	5,206
Cooch Behar	3,386
Jalpaiguri	6,245
Darjeeling	3,075

An idea of the cultivated area of the districts can be had from the following table :-

Districts	Net cultivated area (in hectarea)
Malda	2,60,876
West Dinajpur	3,96,408
Cooch Behar	2,08,238
Jalpaiguri	1,86,895
Darjeeling	75,133

(Source : Agricultural census, 1976-77, West Bengal, published by, Board of Revenue and Directorate of Agriculture, Govt. of West Bengal).

Due to the agro-climatic situation of the region the whole area of North Bengal is suitable for cultivation of cash crops. The name Gour which denotes North Bengal at the moment is derived from the word 'Goor' which shows for thousand years or more Gour was very important place for sugarcane cultivation. Still further in History, North Bengal was known as Poundra Bardhan or Poundra Desh. The word Poundra means cultivation of cash crops like sugarcane. However, through the historical process cash crops are mainly cultivated now in the form of jute and tabacco. Jute cultivation was introduced in this area in the late 19th century with the growth of Jute mills around Calcutta. Initially the acreage of production was not very high. It is only after independence that jute cultivation increased in this area. Tobacco cultivation is mainly concentrated in Dinnata of Cooch Behar district. Tobacco, cultivation is

very old in this area and there are records that tabacco is cultivated for about 500 years in this area, if not more. Cash crop like pine-apple is of recent origin and is mainly concentrated in the Rajganj of Jalpaiguri area. However, we shall concentrate on the problems and prospects of Jute cultivation in North Bengal. Acreage under jute is subject to variations from year to year as will be evident from the following table:-

District wise area of cultivation of jute (In thousand hectares)

	1950-51	1960-61	1970-71	1980-81	1988-89
Jalpaiguri	13.9	35.5	42.1	55.5	45.1
Darjeeling	1.2	2.4	3.3	4.7	2.6
Malda	20.8	20.6	23.4	31.5	20.5
West Dinajpur	18.2	44.8	61.4	85.2	44.4
Cooch Behar	23.7	40.6	56.5	75.4	55.2

(Source : Statistical Abstract, West Bengal, 1989 published by Bureau of Applied Econs & Stats, Govt. of West Bengal).

problem we may have an idea about the

Before entering into the depth of the agricultural aspects of the districts.

(a) Cooch Behar : Agricultural Aspects- Cooch Behar is the North Eastern district of West Bengal. In 1981 the district recorded a population of 17,71,562. Having no big industries, the major population has to depend on agriculture. Out of the total 266 thousand farming families 78.38% have holding less than 2 hectares. Topographically, the district is a level plain with a gentle slope towards the South-East. A large network of rivers and rivulets traverse the district from the North-West to South-Easternly direction. Being very near the foot-hills, the rivers generally have a strong current and some of them often spill their banks after heavy shower in their catchment area, but the fall in the water level of the rivers is as shapp as that in the case of rise. The main rivers of the district are the Teesta, Mansai and Torsa.

The soil of the district is formed by alluvial deposition of the different river system. It is mainly sandy loam to loam and heavy soil is found in small pockets only. The moisture retentive capacity of land in the higher situation is low and as such less fertile. The lower situation is more fertile while in the middle order land multiple cropping has gained more popularity. With

assured irrigation facility these land can be better utilised for crop production. Out of the total cultivable land 5-7% is low land, 15% high land and the rest medium land.

Rainfall starts by the end of February, when sowing of jute and aus paddy commences, and the rainfall continues upto October. The total precipitation is not uniform throughout the district. It is highest in the eastern part and as one proceeds West ward it decreases, the croppóng pattern and time of sowing varies accordingly.

The district is divided into five civil sub-divisions, viz, Sadar, Tufanganj, Dinhata, Mathabhanga and Mekhliganj, but there are only four agricultural sub-divisions, i.e, Sadar and Tufanganj comprise one agricultural sub-division.

Marketing of agricultural produce is mainly controlled by private traders. There are 81 wholesale markets and quite a good number of retail markets scattered all over the district. Four markets have been brought under the provisions of the Agricultural Produce Marketing (Regulations) Act, 1972. Co-operative Marketing Societies, the Jute Corpn. of India, the State Seed Corpn. and some other functionaries have come forward for the marketing of agricultural produce and inputs.

The main crops of the district are aus paddy and jute in the pre-kharif season, amon paddy during khafif season and in the rabi season, tabacco, oilseeds, pulses like lentil and khesari and wheat are grown. During recent years the district has made remarkable progress in the cultivation of Winter vegetables.

By adopting multiple cropping aided by development of irrigation potential, increased use of improved seeds, fertilisers and adopting need based plant protection measures and backed by proper technical know-how, there is ample scope for increasing agricultural production.

(b) West Dinajpur :- Geographical and Agricultural Aspects :

The district of West Dinajpur came into existence in 1947 by carving out a portion of Dinajpur district of pre-partition Bengal and subsequently including part of Purnea district of Behar under the transfer of territories Act, 1956. The district is situated 15 metres above sea level. It was bounded by Darjeeling district on the North, Purnea district of Bihar and Malda district of West Bengal lies on the West. The Southern boundary of district is formed by Malda district of West Bengal and Rajshahi district of Bangladesh, while the entire Eastern boundary is formed by Dinajpur district of Bangladesh.

With its Head Quarters situated at Balurghat, the district had three sub-divisions viz. Balurghat, Raiganj and Islampur, There were 16 Panchayat Samities and 157 Gram Panchayats in this district with 3365 Mouzas. Balurghat and Raiganj were the two Municipal towns in this district.

The geographical area of the district was 5340.2 sq.km. With a total population of 24,02,763 as per 1981 census. The density of population, thus, comes to 462 per sq.km.

The district is rather peculiar in shape very much like the blade of scythe ; The flow of rivers show that the land is flat, sloping gently towards south. Old alluvium deposits are found on the south and on the west of the district. This characterizes the undulating topography interspersed with ravines. The ridges make considerable alteration in the appearance of the district, which is flat alluvial plain with scrab jungle and stunted trees. The ravines vary from shallow a strenches of low land to deeper depression like old riverbeds.

The rock is metamorphic which is found at a very very deep strata in the southern and middle parts of the district, but such rocks appear at lesser depth in the northern part. The underground water level is suitable for installation of shallow and deep tubewell throughout the district except some areas in Tapan Police Station.

The rivers of the district generally have the direction from north to south as a result of gentle slope of land in the same direction. Mahananda, Punarbhava, Nagar, Tangan and Atrai are the main rivers of the district. Among the large numbers of small rivers, mention may be made about the Suin, the Gamari, Chhiramati, Ichhamati, Kulik and Yamuna etc.

Road transport is the chief mode of transport in the district but it is at present not well served by roads. The total road length of the district was 1824.53 Kms. during 1974-75. Two National High Ways viz. N.H.-31 and N.H.-34 pass through Itahar, Rajganj, Karandighi, Islampur and Chopra Blocks covering 165 Kms. of road length in the district. Moreover, seven State High Ways and major district roads in the district covered a total length of 621 Kms. during 1971-72 after which very little improvement has been achieved.

The district is very deficient in respect of Rail communication. It has only 96 Km. of railways mainly in Islampur Sub-division. There is nor railway line in Balurghat Sub-division and West Dinajpur is one of those few districts in India where the district head quarters is not connected by railway route with the rest of the country. The district has in all 17 railway stations.

There are as many as 36 markets in this district where mainly agricultural marketing takes place. Among them 6 markets are quite large where the annual value of goods transacted totals more than Rs. 1.0 crore. The chief commodities transacted in these markets are paddy and Jute in Dalkhola, Bilaspur, Kanki and Panjipara hats in Islampur Sub-division, Chillies, Onion, Mustard, Paddy, Jute, Kalai and vegetables in Dhonkali hat in Raiganj Sub-division and Rice, Paddy, Jute and vegetables in Balurghat market.

The District Head quarter, all the Sub-divisional towns and the Block Head quarters in the district have been electrified, 72 nos. Deep Tube Wells and 1276 nos. Shallow Tube Wells have been energized and in all 1287 villages have so far been electrified. The total requirement of electricity for this district is about 10.5 Mega Watt per day.

The trend of progress in agriculture of the district since independence can be well perceived from the introduction of H.Y.V. seeds, creation of irrigation potential and increase in cropping intensity and fertiliser consumption. The achievements from 1951-52 to 1981-82 of the district with regard to H.Y..V. cultivation, fertiliser consumption and irrigation potentials created are given in the following table:-

	H.Y.V. Cultivation (hac)		Fartiliser use per hac (in Kg.)	Irrigation potential created (in hac)
	Rice	Wheat		
1951-52	Nil	Nil	Nil	Not available
1961-62	Nil	Nil	1.42	20,000
1971-72	16.606	17,822	2.46	25.880
1981-82	73,777	53,436	13.64	70,000

Source : Annual plan on Agriculture, West Dinajpur, 1986-87, published by Office of the Principal Agricultural Officer, West Dinajpur.

The above description will help to have an idea about the districts of North Dinajpur and South Dinajpur as these two are merely an administrative division of West Dinajpur district.

(c) **Jalpaiguri :** The district of Jalpaiguri extends over an area of 6,245 Sq. KMs. in the shape of an irregular rectangle lying length-wise East to West between longitudes 88°25' to 89°53' East and latitudes between 26°16' to 27°0' North. Jalpaiguri district is bounded by Darjeeling district and Bhutan in the North, Cooch Behar district and Bangladesh in the South, Assam in the East and Darjeeling and Bangladesh in the West. The river Mahananda keeps it's western boundary while the river sankosh keep it's east.

Besides seven main rivers, there are number of small and medium sized, mostly seasonal, streams which criss crossed the whole area. The majoar rivers are - (1) Teesta (2) Jaldhaka (3) Mahananda (4) Torsa (5) Raidak (6) Kaljani (7) Sankosh.

Their main flow is from North West to South East according to the topography of the land.

Contd.....20

The Northern part of the district which is adjacent to the Bhutan range is undulating and higher in altitude. This area is mostly covered with Forest and Tea gardens. The Southern part is slightly levelled and cultivable. Out of the total geographical area, about 36% of the land is cultivable, 24.4% is under forest, 19.5% is under plantation and the rest is under river, roads, buildings etc.

The district has a distinct ecological setting. Average annual rainfall is more than 3000 mm, 90% of which is received between April to September. Humidity is high. Due to heavy precipitation and sandy acidic soil the fertility status of the soil is very low.

Strategy has been adopted giving more emphasis on modern technology in agriculture and other allied fields. Many special programmes like Special Rice Production Programme, North Bengal and Terai Development projects are gaining momentum due to their successful achievements.

The district has a total population of 22,07,087 according to 1981 census. The number of agricultural families is 2,33,811, number of small farmers is 32,704 and that of marginal farmers is 86,682. The number of agricultural labours is 1,11,243.

The district has 13 blocks, 754 mouzas, 754 villages and 123 gram panchayats. The district has one District seed farm at Mohitnagar, one State seed farm at Maybnaguri and seven block seed farms.

The district achieved production of aus rice Of 121900 m.t., amon rice of 417200 m.t. and wheat of 53300 m.t. in the year 1984-85. (According to the statistical data published in Annual plan on Agriculture of Jalpaiguri District, 1986-87).

(D) **Darjeeling :** Darjeeling is the northern most district in the state of West Bengal. It lies between 26°31' and 27°13' North latitudes and between 87°59' and 88°53' East longitudes.

In shape it resembles an inverted triangle, the northern border line representing the base and the tapering Siliguri Sub-division representing the apex. It is bounded by Sikkim on the North, Bhutan on the North-East, Jalpaiguri district on the East and South, Bangladesh, West Dinajpur and Bihar on the South and Nepal on the West.

The terai and plains at the foot hills consists of almost horizontal layers of silt, sand, pebbles and gravels. The hills of south consists of unaltered sedimentary rocks and these of the north are made of different gravels of metamorphic rocks.

The soil in the terai is composed of alluvium, a high sandy loam being the most common. There are also considerable tracts of sandy or gravelly soils, not very suitable for cultivation.

Darjeeling hill soils are mostly categorised as brown forest soil. Most soils are reddish brown or brownish in colour. The surface layer consists of well decomposed humus which is reduced by continuous cultivation. Soil are mostly acidic and has high base exchange capacity. Soil depth is less.

Cultivaters recognise the soils of the hills as white, Red and Black. Of these, the black is the richest in plant nutrients, the white poorest and the red occupies the intermediate position.

Cultivaters on the higher hills do not depend so much on the type of the soil. Selection of crops and season of growth is under greater control of climate, as growing season shortens due to cold as we go higher.

The district consists of two distinct tracts-the hills and the plains.

The climate of the terai and the lower valleys resembles that of the adjoining plain district. Higher temperature in the plain occurs in May, reaching to about 33.5°C and mean daily maximum is 24.2° C.

In the hills both night and day temperatures are higher in the monsoon. Maximum temperature may reach 26°C to 27°C in

Darjeeling town and 30°C to 31°C in Kalimpong town. January is the coldest month when the mean daily minimum is 1.9°C and mean daily maximum is 8.6°C. Rar Frosts are common in Winter. During occasional cold wave temperature may go down to -1°C to -2°C.

On account of hilly nature of the terrain, there are sharp contract in the rainfall even between nearby stations. The rainfall is in general, heavier in the southern terai region and ridges and slopes near the plain. Kurseong in the southern slopes may get 4052 mm. while Kalimpong in the north gets 2254 mm. In 1960 Darjeeling got 2803 mm., Kalimpong 1702 mm., Mungpa 3236 mm. and Siliguri 3676 mm.

80% of the rain falls during Monsoon. July normally having the heariest, while the rest 20% falls during the other months. There are about 120 rainy days in a year.

Hill at-mosphere is highly humid (relative humidity 90-95%) while plains atmosphere is less humid. Sunlight hours are less in the hills as clouds and fogs cover the sky very often.

There are six main rivers, which are shallow and torrential. They are not navigable and can rarely be utilised for irrigation purpose within the district itself though many of them have prespect of hydro electricity generation. Each of the rivers are fed by a considerable number of perennial streams ('jhoras') throughout the year and thousands of seasonal (Monsoon) streams which cause frequent floods in the plains. The six main rivers are as follows :

1. Teesta - It rises from the Glaciers of North Sikkim at about 21000' altitude.
2. Greater Rangit - It comes down from Sikkim and joins Teesta. Its tributaries are Rammam, Little Rangit and Rangdu.
3. Jaldhaka - It is fed by catchment area lying in Sikkim and Bhutan.
4. Mahanadi - It originates in the mountain of Mahaldhiram in Kurseong.
5. Balasan - It rises in Lepchajagat on Ghoom-Simana ridge.

6. Mechi - It joins the western boundaries in Nepal.

The present area of the district is 3075.0 sq.km. comprised of 4 sub-divisions and 10 Blocks or panchayat samities as mentioned below.

Sub - Division	Block or Panchayat Samity
Darjeeling Sadar	1. Darjeeling-Pulbazar
	2. Rangli - Rangliot
	3. Jorebunglow- Sukhia Pokhri
Kalimpong	4. Kalimpong - I
	5. Kalimpong - II
	6. Gorubathan
Kurseong	7. Kurseong
	8. Mirik
Siliguri	9. Siliguri - Naxal-bari
	10. Kharibari - Phansidewa.

The Siliguri town is communicated to different parts of India by Railway and National highways and state highways. It also has an all weather airport at Bagdogra. Darjeeling is connected to Siliguri by narrow gauge Railway and all other sub-divisions have road connection with outside and each other.

There is hydro-electric project at Jaldhaka and one at Sidrapong (first hydro-electric project of India). Besides these two, one hydro electric project is coming up at Ramman.

Two C.A.D.C.s are functioning at Kalimpong-I and Siliguri-Naxalbari blocks. Recently the Mirik Primary Agricultural cooperative Marketing Society Ltd. has taken up a ambitions programme of marketing orange, ginger and vegetables produced in this district.

(e) MALDAH : Maldah is the southern most district of Jalpaiguri division and is more or less in the central position of West-Bengal. It is surrounded by West Dinajpur and Purnea district of Bihar in the north and West Dinajpur and Raj-shahi district in the east. The southern boundary of the district is marked

by the river Ganga which also marks its x western boundary. The southern part of the district is triangular in shape.

The area of the district is 3,713 sq.km. and the district is controlled by ten police station. In spite of significant ~~xxxxxx~~ increase in population, the number of police stations has not increased upto 1985. It may also be mentioned that Maldah is unique in having only one sub-division. The ten police stations are Englishbazar, Kaliachak, Maldah, Habibpur, Ratua, Manikchak, Kharba, Harischandrapur, Gajol and Bamangola.

The river Mahananda flows from north to south and divides the district in eastern and western part. The eastern part is known as Barinda region. This region is less fertile. But ~~x~~out of 29 thousand ponds of the district about 20 thousands are located in Barinda area. About 19 thousand ponds are from 400 to 2000 years old. So, Maldah is sometimes termed as "Lake District of Bengal".

The soil of western part of Mahananda may be divided into two areas from the point of quality of the soil. The river Kalindi comes out from Ganga and meets Mahananda and it flows from east to west. This Kalindi river divides the western part of Mahananda. The north of Kalindi is called 'Tal' and south of Kalindi is called 'Diara'. This 'Diara' region is the most fertile area of Maldah district. Three crops are grown in this area in a year. This region is also famous for production of silk.

After ~~I~~ndependence population of Maldah has increased significantly which will be evident from the following data:

Census	Population
1951	9,37,580
1961	12,21,923
1971	16,12,657
1981	20,35,009

The propertion of village in Malda is greater than other districts of West Bengal. The average for West Bengal is 755 villagers per thousand people, whereas the corresponding

figure for Maldah is 930 per thousand. Maldah lags behind in literacy programme. According to 1971 census only 17.61 percent of population is literate.

V. Objective of the study : In returning to jute again, I like to mention the objective of this study, which is to analyse the problems and prospects of jute cultivation in North-Bengal. The jute growers of the region are badly affected by fluctuations in price of raw jute. I have tried to trace the reasons behind such fluctuations. The price, however, is not sufficiently remunerative. The future of jute growers is linked with the jute industry which is undergoing some problems. I have attempted some suggestions to remove the impasse.

There is ample scope for major improvements in quality and yield of jute. Available findings of techno-economic research relating to jute indicate that a scope exists for increasing the profitability of jute along several genetic and agronomic fronts. As regards retting which vitally affects quality of fibre and is the life line of jute culture, piece meal measures involved excavation or re-excavation of individual retting tanks. This obviously is not the long-term solution to the problem in that, there is simply not enough land for new tanks particularly in areas like northern Bengal and Assam, and there is the understandable reluctance on the part of villagers to give up their agricultural land for developing retting tanks. Development of communal retting facilities and adoption of new techniques of retting, both mechanical and micro-biological is called for.

To be sure, state procurement and distribution of jute are calculated to (i) combat inter-year supply variations of the fibre and temper the magnitude of its price fluctuations (ii) ensure a steady flow of the fibre to the mills at fair prices, and (iii) promote a steady growth of supply of the fibre towards the level of self-sufficiency. Due to lack of adequate state machinery, the above objectives have not made much head way.

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