ECONOMIC DETERMINANTS OF JUTE PRODUCTION AND TRADE IN NEPAL

Ph.D.

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"ECONOMIC DETERMINANTS OF JUTE PRODUCTION AND TRADE IN NEPAL"

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Submitted in Fulfilment of The Requirements
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(Management)

TILAK RAWAL

December 1988

DEDICATED TO MY FATHER

SHRI TEK BAHADUR RAWAL

Without whose constant urging I may have dropped the idea of doing Ph. D.

CERTIFICATE

This is to certify that the present research work has been carried out under my supervision in the Department of Management, for the degree of Ph. D. of Dhaka University. It is further certified that the work presented here is an original work and has not been submitted for any other degree, or diploma in any other University or Institution.

27/11/88

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PREFACE

The present research work has been carried out under the supervision of Dr Shahid Uddin Ahmed, Professor Department of Management, Dhaka University. At the very outset I must admit that without his encouragement and help it would not have been possible for me to embark on a Ph. D programme in Bangladesh. Despite his busy schedule, he was always available for advice and assistance. His expert guidance has enormously contributed towards the completion of this research endeavour.

A number of people have helped me generously in my academic endeavour. I am thankful to my friend Mr K M Gantam of the Agricultural Projects Services Centre (Nepal), who helped me with data and other materials whenever requested. But for his cooperation, it would have been very difficult to accomplish the research on time and in a desired manner. I am also deeply indebted to my friend Dr I R Denton of the International Jute Organisation for his helpful comments and suggestions on each chapter of the study. I must take this opportunity to express my sincere gratitude to my friend Dr Saleh Ahmed Chowdhury for his assistance in organising computer facilities and for making very helpful comments on the analytical part of the study. I am also thankful to Dr M K Mujeri for his suggestions/comments on the supply model. I also had the opportunity to discuss my research work with two learned scholars of Bangladesh - Professors Abdullah Farouk of the Department of Marketing, Dhaka University and Muzaffer Ahmed of the Institute of Business Administration, Dhaka University both of whom made a number of useful suggestions in regard to my research.

I would like to put on record my appreciation of the skilled typing of this thesis by Mr Sk Jamal. Despite being heavily loaded with regular work, Mr Jamal found time to finish this job in an efficient manner. I must also express my thanks to Mrs S Dawla for patiently doing initial draft of this work. Thanks are also due to Mr F Rozario for his valuable inputs in regard to preparation of this report.

Finally, special thanks are due to my wife, Rita, who has been most encouraging and supportive of my academic persuit. She did her best to give me as much time as possible for my research work by assuming the total responsibility of guiding our two sons - Binay and Bibek (Babloo). Babloo now feels good that I have been able to write a book as thick as most of the books he used to see spread around me.

ABSTRACT

This study is designed to look into factors that explain the prevailing situation in the field of jute in Nepal, which is far from being satisfactory. Basically, the need for the study arose as a result of observation of the overall jute scenario which is characterised by low yields, high cost of production, unremunerative output prices and declining export of jute.

The main objective of this research is to examine factors that influence acreage, yield and export of jute from Nepal. To fulfil the objective of this study, heavy reliance has been placed on time series information (1970/71 - 1986/87) collected from the Jute Development and Trading Corporation (Nepal) and other allied agencies in the country. Quantitative techniques have been used to ascertain the influence exerted by different explanatory variables on acreage, yield and export of jute from Nepal.

The estimated acreage response functions reveal that while lagged jute prices have a positive impact on jute acreage, there is an inverse relationship between lagged rice (a substitute for jute) price and the acreage planted with jute. The analysis of yield behaviour shows a gently declining trend. The analysis also reveals a lack of technological development in jute agriculture. The analysis of raw jute export establishes, among other things, that internal supply constraints inhibit export growth.

Wherever possible, the study has also made a comparative analysis of cultivation practices followed by farmers in the major jute producing countries (Bangladesh, China, India, Nepal and Thailand). The farm budget analysis reveals that, with the sole exception of China, jute farmers in the remaining four countries are incurring substantial losses on every tonne of fibre produced. This unpleasant situation is blamed on the high cost of jute cultivation, rocketting input prices, unsatisfactory jute yields and unremunerative output (jute) prices.

In the light of the findings of the research, the study has made a number of suggestions, which may have policy implications, on different dimensions of jute.

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LIST OF ABBREVIATIONS AND ACRONYMS USED

ADB/N	-	Agricultural Development Bank, Nepal
AIC	-	Agricultural Inputs Corporation
AMC	-	Agricultural Marketing Corporation
ATF	-	Agricultural Tools Factory
BJC	-	Bangladesh Jute Corporation
BADC	-	Bangladesh Agricultural Development Corporation
BJMC	-	Bangladesh Jute Mills Corporation
BJM	-	Biratnagar Jute Mills
BJRI	-	Bangladesh Jute Research Institute
DER	-	The Dual Exchange Rate System
DCs	-	Developed Countries
DJD	-	Directorate of Jute Development
EEE	-	Export's Exchange Entitlement
EEC	-	European Economic Community
EPZ	-	Export Promotion Zone
FMC	-	Food Management Corporation
FYM	-	Farm Yard Manure
GDP	-	Gross Domestic Product
ha	-	Hectare
HMG/N	-	His Majesty's Government, Nepal
IJO	-	International Jute Organisation
IJCS	-	Intensive Jute Cultivation Scheme
IRD	-	Integrated Rural Development
IRRI	-	International Rice Research Institute

JRC	-	Jute Research Centre
JDTC	-	Jute Development and Trading Corporation
JARI	-	Jute Agricultural Research Institute of India
JTRL	-	Jute Technological Research Laboratory
JTAs	-	Junior Technical Assistants
JCI	-	Jute Corporation of India
LDCs	-	Least Developed Countries
MOA	-	Ministry of Agriculture
MOC	-	Ministry of Commerce
mt	-	Metric Tone
NFC	-	Nepal Food Corporation
NIDC	-	Nepal Industrial Development Corporation
NJDB	-	Nepal Jute Development Board
NPC	-	National Planning Commission
NR	-	Nepalese Rupees
NSC	-	National Seed Corporation
RECs	-	Rice Export Companies
RJM	-	Raghupati Jute Mills
R and D	-	Research and Development
RPDP	-	Retting Pond Development Programme
SFDP	-	Small Farmers Development Programme
TPC	-	Trade Promotion Centre
T and V	-	Training and Visit

INTRODUCTION

THE PROBLEM

Jute has been a major source of foreign exchange and employment opportunities in a large part of South Asia, viz. Bangladesh, India and Nepal, which together account for a major proportion of total world jute production. Its importance in the producing countries in terms of its foreign exchange earning and employment generating capability, and in the consuming countries both in the form of jute goods and raw fibre to feed their jute goods manufacturing units, made it a commodity of global importance. A retrospective view however, reveals that jute is slowly losing its position as a strong commodity in the world market due mainly to competition from synthetic substitutes, which compete with jute in all end-uses. Therefore, despite reduction in real prices, consumption of jute and jute goods is in a decline, more specifically so in the developed countries of the West.

The world jute scenario in recent years has been characterized by sharp aberration in prices, production and supply of jute and jute goods and it can be very conveniently argued that these fluctuations have weakened the position of jute vis-a-vis other competing crops, e.g., maize and paddy in the producing countries against its synthetic substitutes in the world market. Such uncertainties have resulted in adverses consequences for those economies that depend heavily on jute as a major source of foreign exchange.

One of the notable developments that took place in the last 15 years or so in the agriculture sector of Asian countries is the development of High Yielding Varieties (HYV) of different crops and of improved cultural practices. These have been widely publicized. Although regional disparties in the adoption of HYV seeds and associated improved agricultural practices do still prevail, adoption of improved seeds in combination with other supplementary inputs have performed very well throughout tropical Asia. Rice and wheat are often cited as example to illustrate the positive impact on crop productivity of improved agricultural technology. Like the inter-country disparity in the adoption of improved technology, its distribution between crops within countries has also been highly uneven. The stagnant yields and poor crop management practices which prevail in jute cultivation reveal that jute farmers have been unable to take advantage of improved practices generated by innovations in crop science. The failure of jute farmers to adopt improved practices may, among other factors, be attributed to a lack of readily available beneficial technology.

The livelihood of a vast majority of small and marginal farmers in Bangladesh, India and Nepal depends to a large extent on jute. In India, about four million families are engaged in bast fibre production, while about three million farmers in Bangladesh and about 0.1 million farm families in Nepal are so engaged. Despite the high socio-economic importance of jute therein, none of these countries has succeeded in bringing about the much needed breakthrough in jute agriculture. It may be argued that the unsatisfactory performance of jute demands more attention in terms of research and development activities than is currently accorded to this crop.

Jute in Nepal is still grown under primitive conditions. Both India and Bangladesh appear to have an edge over Nepal in the adoption of improved cultural practices and the resultant increase in yield. Planned development efforts, initiated with the establishment in 1970 of Nepal Jute Development Board (NJDB) and its subsequent upgrading to Jute Development and Trading Corporation (JDTC) in 1974, have not resulted in enhanced jute yields. This is despite a significant improvement in the area planted to improved jute varieties distributed to farmers by JDTC. Jute is no longer the profitable enterprise that it was before. Whenever possible, farmers are rapidly changing to the substitute crops (early paddy and maize). As a result, the acreage under jute has declined, with the exception of a few years, and has followed a highly unstable trend (Table 1.1).

The unremunerative price of jute and high cost of production are often cited as examples that deny farmers sufficient incentive to allocate more land to jute and manage the crop with proper care in order to improve the yield.

Though grown in a limited area in the eastern Terai, jute is one of the major among cash crops in Nepal and has the highest contribution in industrial output. Since there has been no substantial progress in the non-agriculture sector to bring about structural changes in the economy, agriculture is bound to remain the major employer of the Nepalese labour force and the most significant contributor to GDP for years to come. Viewed in this context, no crops of economic importance deserve lesser attention, let alone jute which supports such a large number of farm families and industrial labour.

During the Sixth Plan period, the increase in exports fell below desirable levels. Agricultural goods have dominated export composition and there are no indications that this situation will change in the near future. However, being faced with the pressing need to provide food to an ever-expanding population (increasing at 2.66 percent per annum), the export of foodgrains (mainly rice) has dwindled. Internal demand for consumable goods has increased significantly with an increase in population. While exports from Nepal have more or less stagnated in the last ten years (1975-1985), various development projects have increased the importance of the necessary capital and construction materials, further accentuating the problem of trade deficits. In order to avoid heavy dependence on external resources, the gap between foreign exchange requirement to finance import and export earnings needs to be narrowed down. This can be achieved by enhancing exports, which is a strong medium for economic development in that it helps procure the required capital goods which are so essential for development activities.

FIGURE 1: JUTE ACREAGE AND PRODUCTION TREND IN NEPAL

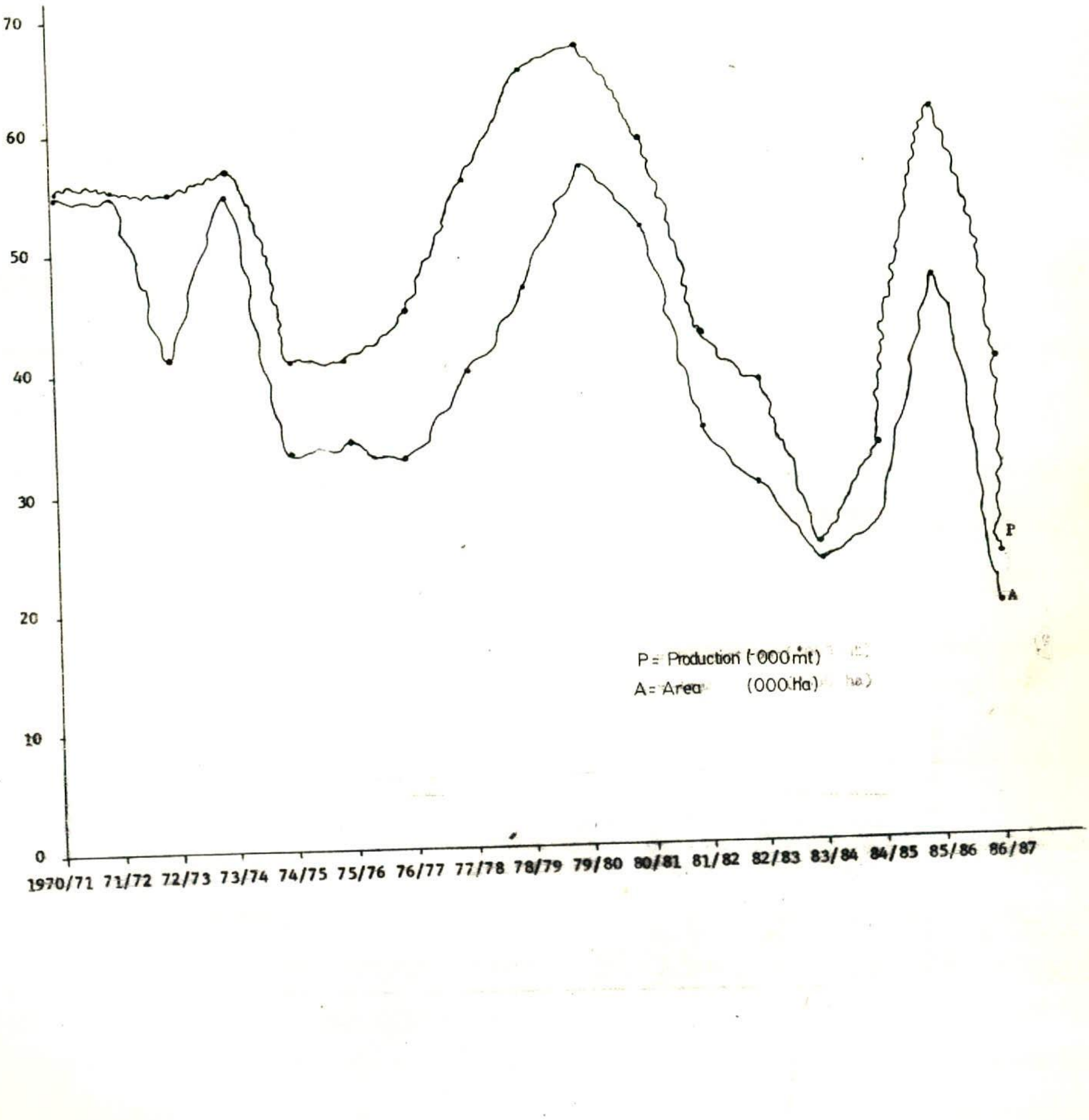

Table I.I

Jute Production in Nepal 1971-1987

(Area in ha; Production in mt)

Year	Area	Production
1971-72	54873	55000
1972-73	41477	54898
1973-74	55070	57121
1974-75	33131	40718
1975-76	34218	41351
1976-77	33055	44920
1977-78	39965	55801
1978-79	46853	65551
1979-80	56714	67514
1980-81	51959	59284
1981-82	35320	42663
1982-83	30400	39039
1983-84	23666	25043
1984-85	27200	33124
1985-86	47191	61102
1986-87	19840	23452

Source: JDTC

In the light of the growing internal demnd for foodgrains, Nepal is not likely to regain its position as a major grain (mainly rice) exporter. Moreover, with significant improvements in the food situation in India, a traditional market for Nepalese rice, traders in Nepal are finding it increasingly difficult to export rice there. In these changed circumstances, jute, a non-food crop with the highest contribution to Nepal's hard currency earnings from overseas exports in the recent past, is bound to play a significant role in reducing the trade gap, which is a joint product of accelerating imports and stagnant exports from Nepal.

JUSTIFICATION

The preceding discussion has adequately elucidated the weakening position of jute, both in the major producing countries and in the international market, which is basically a result of competition from substitute crops in the producing countries and synthetic rivals in the world market. Further reduction in jute production and export of jute and jute goods may adversely affect the Nepalese economy which is likely to depend more heavily on exports of agricultural commodities, specifically non-food crops, to accelerate the pace of economic development. This requires a strengthening of the position of jute, which is possible through improvement in yield per unit of land, reduced cost of production and improved trading practices to maintain a stable supply of jute and jute goods both in the national and international market.

Understandably, a diversion of cereal land to jute cultivation is not possible at a time when food production has to be increased, which has been possible in Nepal only through an expansion of acreage under food crops. Therefore, any drastic reducton in area under cereals may seriously jeopardize the food security of the whole nation. Consequently, the only viable alternative is to increase the yield and reduce the cost of jute cultivation through a systematic diffusion of "land augmenting" technology. This would enable jute to effectively compete in price terms whith its substitutes.

Improved crop management practices can increase yields and reduce the cost of cultivation. Similarly, improved marketing and trade arrangements can enhance the competitiveness of jute/goods both in the internal and external market.

In relation to the existing situation described above, this study aims at analysing in greater detail different aspects of jute, from production to internal marketing and export trade.

OBJECTIVE

The broad objective of this study is to examine different factors that influence yield, acreage under cultivation and export of jute from Nepal and thereby to suggest policy measures, the adoption of which may contribute towards evolving a "virtuous circle" of rising efficiency (yield) and falling costs and enhanced competitiveness of jute.

More specifically, the study is aimed at:

(1) Effecting a detailed analysis of jute production practices in Nepal and comparing the same, as far as possible, with practices followed in other jute producing countries, e.g., Bangladesh, China, India and Thailand.

(2) Estimating cost of cultivation of jute and comparing it with the cost of production of substitute crops.

(3) Analysing the components of the current competition between jute and other synthetic products in the world market.

(4) Estimating econometric models to examine factors that exert influence on acreage under jute and export of jute in a given year.

METHODOLOGY

The approach taken to fulfil the objectives of the study has been empirical. To examine the supply side two separate equations (a) acreage and (b) yield have been estimated. Similarly, on the trade side, an export supply model for Nepalese raw jute has been estimated to analyse factors that exert influence on export of raw jute from Nepal.*

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* A detailed discussion on the quantitative tools used is presented in Chapter V and Chapter VII.

To estimate the aforesaid models, time series data from the following sources have been collected:

1. JDTC

2. Department of Food and Agriculture Marketing Services (DFAMS).
3. Trade Promotion Centre
4. Biratnagar Jute Mills Ltd.
5. Raghupati Jute Mills Ltd.
6. Morang Merchant Association.

Considerable use of data obtained from JDTC has been made to undertake gross margin analysis for jute.

For inter-country comparison of experiences with regard to jute cultivation, reliance has been placed on information available with the International Jute Organisation (IJO) Secretariat in Dhaka, Bangladesh.

Knowledgeable public servants, businessmen and some farmers have been interviewed to solicit information, mostly non-quantitative, on production, marketing and export of jute and the policy of His Majesty's Government (HMG/N) in these areas.

II

JUTE PRODUCTION

ORIGIN AND PATTERN OF CULTIVATION

There are about 40 recognised species of *Corchorus* of which only two, namely *Corchorus capsularis* (white jute) and *Corchorus olitorius* (tossa jute) are of commercial use. Some experts believed *C. olitorius* to have reached the Indian Sub-continent from the Mediterranean region. The latest theory, however, suggests that the primary centre of origin of *C. olitorius* is tropical Africa. Many early botanists regarded South China as the origin of *C. capsularis*. However, botanists in more recent times believe that the primary centre of origin of *C. capsularis* may be in Southeast Asia (Year Book on Jute, 1967-68).

Jute was grown in India well before 1993 when the first despatch of jute fibre left the country for commercial use abroad. According to a map of jute area published by the Surveyor General's Office in Calcutta in 1874, jute was grown in large tracts in North Bengal, on narrow strips on either side of the Brahmaputra river in Rangpur, Bogra, Jamalpore and Kishoreganj districts and on the flood plains of the Meghna river in Dhaka and Comilla districts (Ghosh, 1983). As jute gradually gained in importance as a commercial crop, its cultivation extended to southern Bengal, Assam and the eastern Tarai low land (plain area) of Nepal. In Burma, jute cultivation started with the arrival of Indian migrants; the Burmese Government recognized it as an important crop only in 1953. Jute, both white and tossa, was grown in Thailand since long ago mainly for domestic use. Production of mesta on a commercial scale started only in 1958.*

China is said to have a long history of jute cultivation. The history of kenaf (Hibiscus Cannabinus) however, is much shorter. Kenaf was introduced from India in the experiment station of Taiwan in 1908, from where it found its way to mainland China (Zhejiang province) in 1943. Kenaf was introduced in the northern part of China from the Soviet Union in 1927 (Ali, 1986).

Jute is also cultivated in Peru, Brazil, Kampuchea, Vietnam and Indonesia. Brazil is the only country which has successfully grown jute in the equatorial zone. Some farmers in Taiwan raise jute in a nursery for 40-50 days and then transplant the jute in the paddy field. Paddy is harvested followed by the jute in right time to allow cultivation of a second paddy crop (Dempsey, 1975). Thus two normal crops of paddy are grown with an additional crop of jute sandwhiched between the two. In southern Taiwan, farmers grow jute in the nursery under irrigation.

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* In Nepal, jute is produced in six eastern Tarai districts (Morang, Sunsari, Jhapa, Siraha, Saptari and Udayapur), (Figure 2), in India it is grown in the eastern region comprising the states of West Bengal, Bihar, Assam, Orissa, Uttar Pradesh, Tripura and Meghalaya (Figure 3), in Bangladesh jute is grown in 51 out of 64 districts (Figure 4) and in mesta is gown in 17 provinces of Northeast Thailand (Figure 5). Mesta occupies more than 90 percent of the combined jute/mesta in Thailand, it is 30 percent in India (mostly in Andhra Pradesh), negligible in Bangladesh (0.5 percent) and Nepal does not produce any mesta.

FIGURE 2 : JUTE GROWING AREAS IN NEPAL

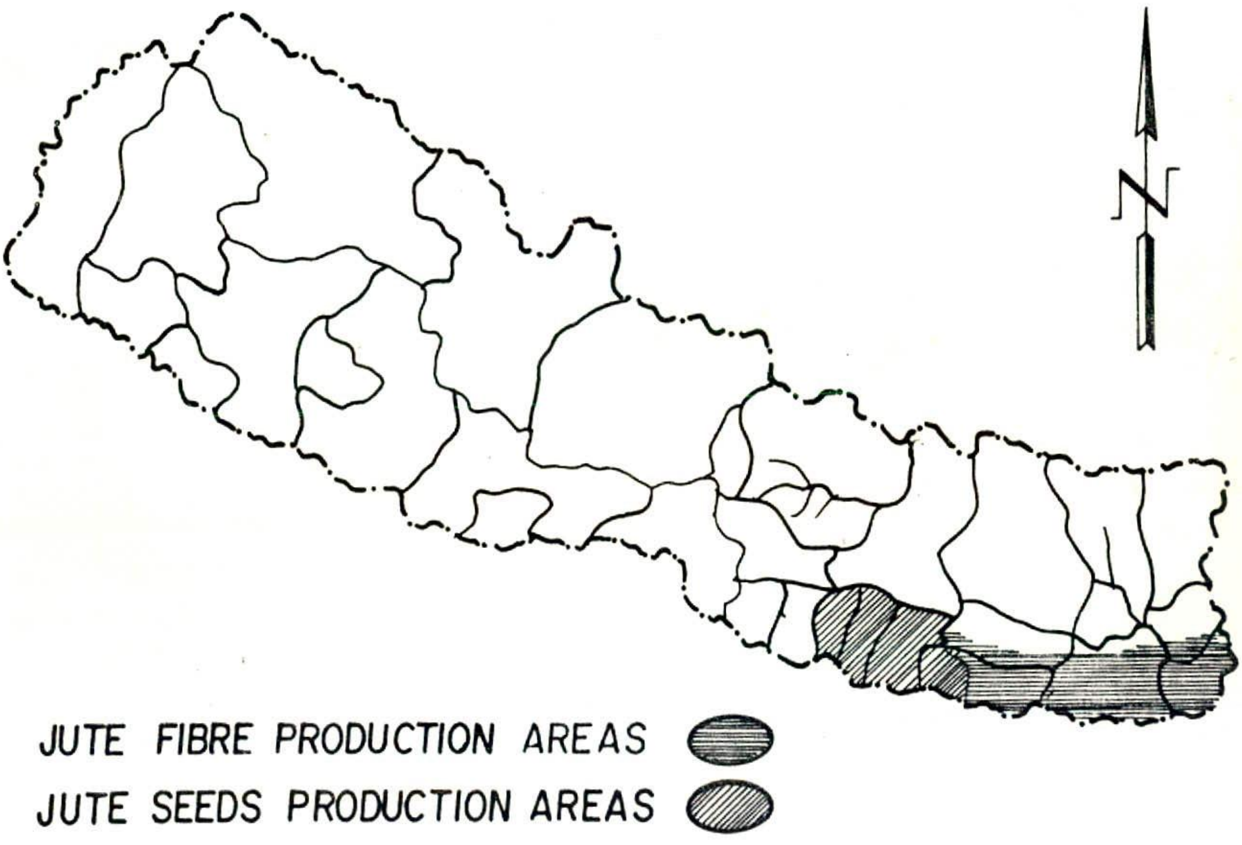
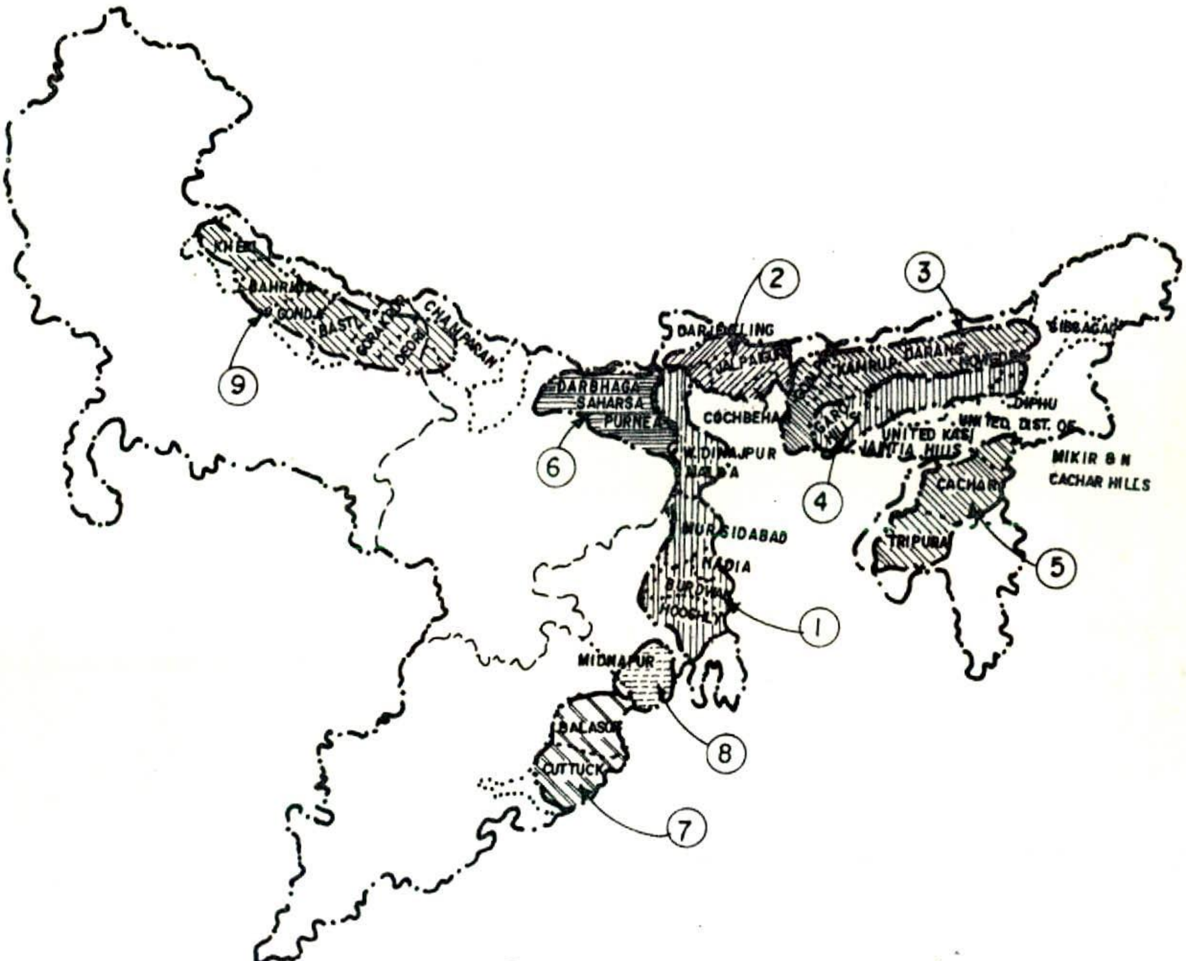


FIGURE 3 : JUTE BELTS OF INDIA



(1) GANGETIC WEST BENGAL
(2) TEESTA MAHANANDA REGION
(3) UPPER ASSAM
(4) LOWER ASSAM & MEGHALYA
(5) TRIPURA-CACHAR-SURMA VALLEY
(6) COSHI COMMAND AREA
(7) MAHANADI DELTA
(8) MIDNAPORE
(9) NORTH WEST BIHAR U.P.

FIGURE 4: AREAS OF JUTE CULTIVATION IN BANGLADESH

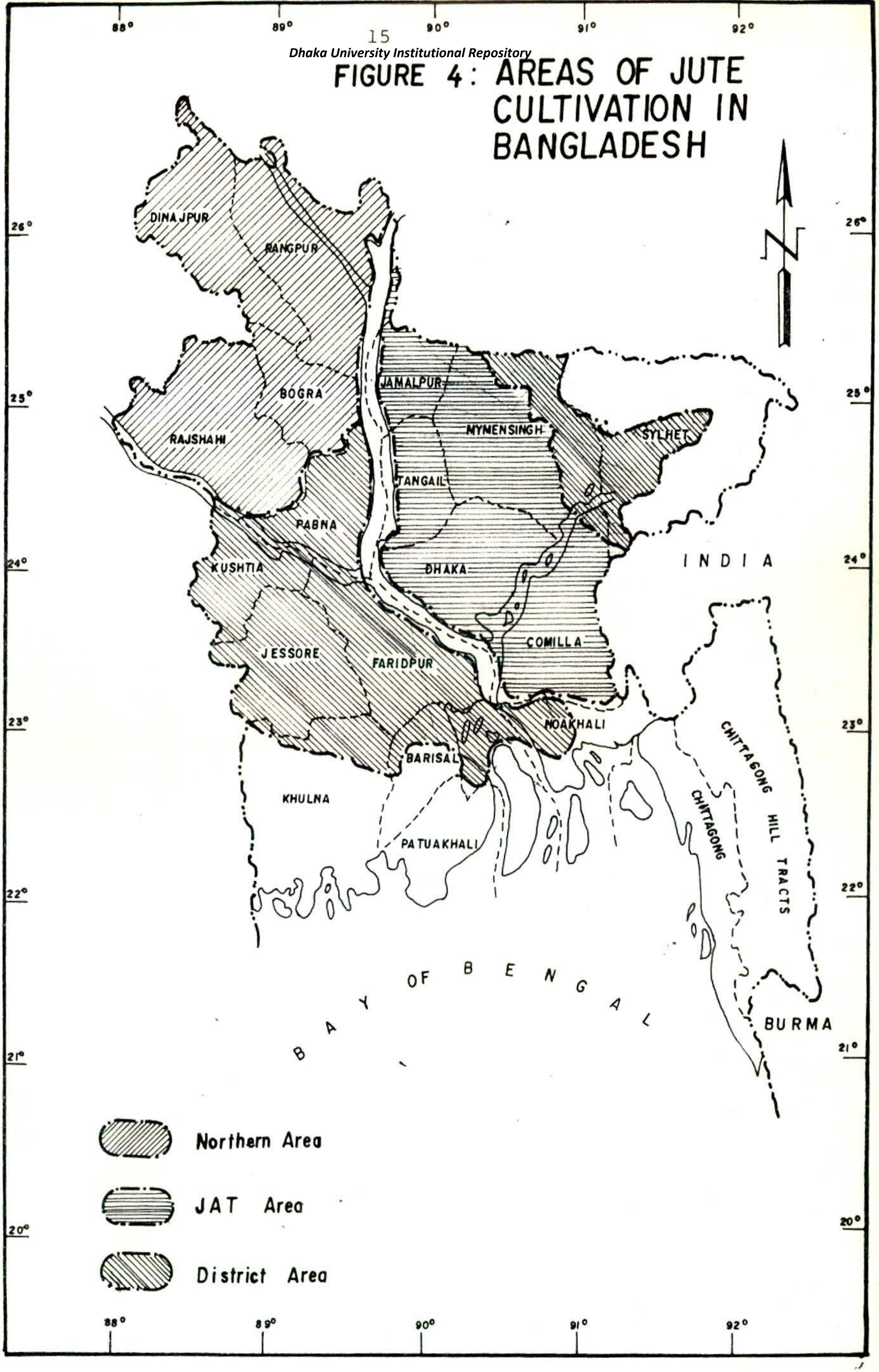
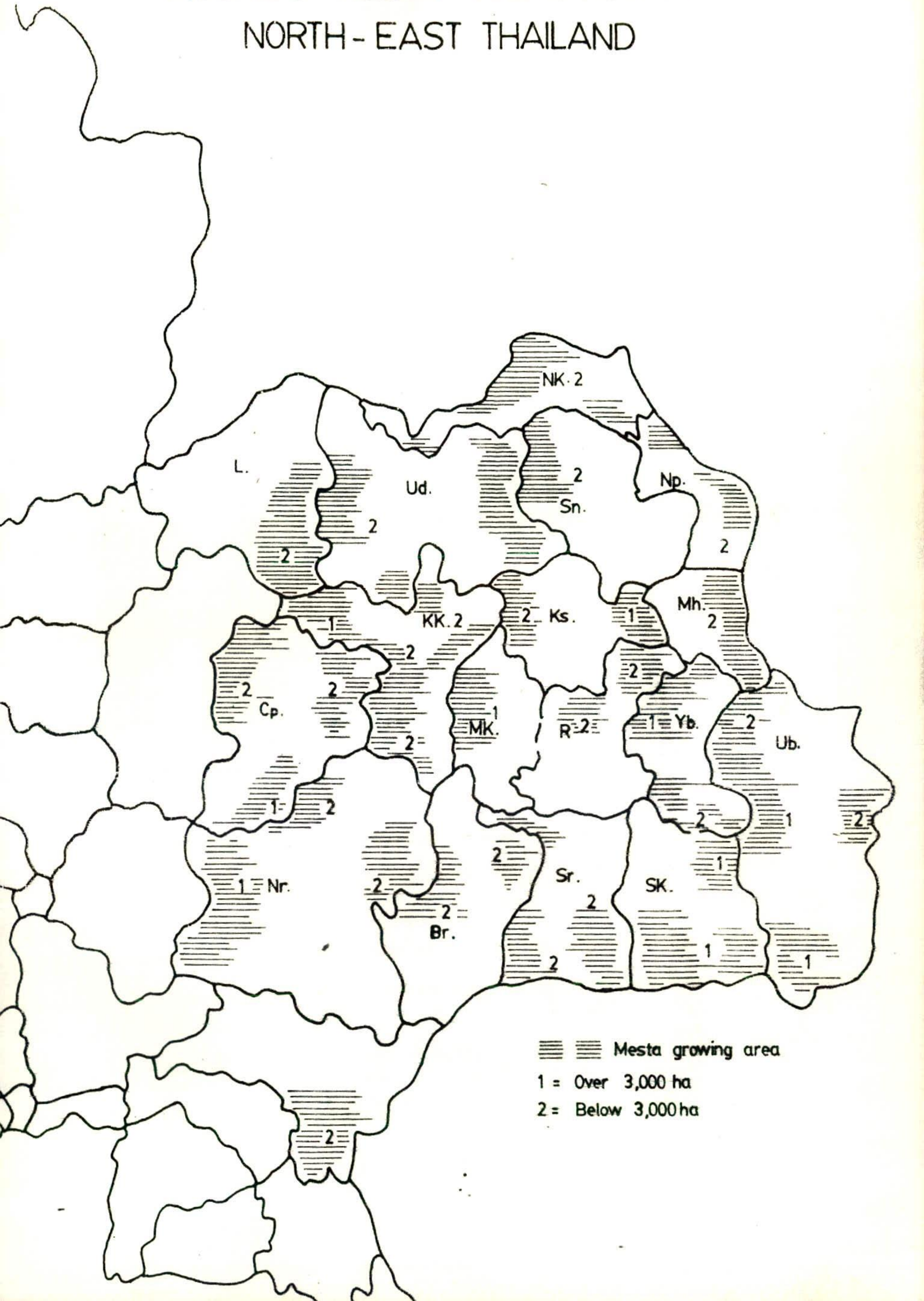


FIGURE 5 : MESTA CULTIVATION IN NORTH-EAST THAILAND



The most important factor responsible for expanson of jute cultivation on a commercial scale in the Indian sub-continent was the introduction and growth of jute mills. From their establishment in Dundee, Scotland, jute mills gradually spread to other parts of the world, notably in and around Calcutta, India.

Other associated factors that led to the expansion of both production and demand for jute include the following:

(1) The decision of the Dutch Government in 1938 to pack coffee beans in jute bags, which strengthened the foundation of the Dundee jute industry.

(2) The Crimean War of 1854-56 encouraged the Europeans to find a substitute for Russian flax. Indian jute, having been found less expensive and a better material for packaging purposes, displaced flax from the world market.

(3) The American Civil War of 1860-65, which made import of cotton from America difficult. The Franco-Prussian War of 1870-71, which proved that war materials could be transported in jute bags. Significant increase in prices of jute/kenaf during the Korean War (1950-53) also helped achieve a significant position in world trade.

MAJOR PRODUCERS OF JUTE AND JUTE GOODS

A retrospective view of the world production of jute and allied fibres reveals a highly fluctuating trend which has resulted in high degree of supply volatility. Much of the expansion in world jute production occured before the early 1960's. From then onwards the increase has not been very encouraging. In recent times, the world production of jute and allied fibres has fluctuated between 3164 thousand mt in 1983/84 to 6054 thousand mt in 1985/86. These sharp aberrations in production have resulted in unstable supply and prices of both jute and jute goods. There have also been changes in the share of jute producing countries in total world producton.

The most important producers of jute and allied fibres are India, China and Bangladesh. These three countries, together with Nepal and Thailand, constitute more than 90 percent of the world production of jute and allied fibres (Table 1.2 and 1.3).

The creation of Pakistan in 1947 marked a significant point, not only in the history of jute production and trade in India, but also in the world jute industry and trade in jute and jute goods. Partition of India in 1947 left the country with the full complement of the manufacturing units (108 mills) of an undivided India but with very little fibre production to feed them. On the other hand, the main jute growing districts fell in East Pakistan (now Bangladesh).

Since it was startegically important for India not to rely heavily on Pakistan for import of raw jute, the Government of India adopted the following measures to enhance production of jute within its territory:

1. Relaxation of all restrictions on jute cultivation;
2. Diversion of cereal (mainly paddy) land to jute cultivation;
3. Distribution of seeds and chemical fertilizer at highly subsdized rates; and
4. Experiments on jute cultivation in new areas and reclaimation of waste land for jute cultivation.

In addition, efforts were made to encourage production of mesta and other bast fibres and their use by mills. As a result of these concerted efforts, India reached near self-sufficient in terms of fibre availability and requirement by the end of the 1950's. The share of Pakistan (East Pakistan) declined sharply in the 1950's to between 44-48 percent of world jute production. A further drop was registered in 1960's, but it was not drastic and the share stabilized around 40 percent.

The emergence in 1971 of Bangladesh (formerly East Pakistan) left Pakistan (formerly West Pakistan) with no internal source of jute fibre to feed its mills. Since, then, Pakistan has relied on import of jute from other countries, mainly Bangladesh, to meet the demand of its mills. Until the 1950's about 90 percent of the world jute production was accounted for by India and East Pakistan (now Bangladesh). Since then it has decreased slightly, with India being the principal contributor to the combined world production of jute and allied fibres. In recent years India has been producing between 36 to 38 percent of the world output of jute and allied fibres and the share of Bangladesh has fluctuated between 25 to 30 percent.

In Thailand production of mesta on a commercial basis started in 1950 when 5000 ha was planted with the crop. Thailand emerged as a major producer in the 1960's, its share in world production reaching 20 percent in 1966-67. However, its share has stablized around 6 percent since the 1970's.

China produced, on average, 3500 mt of raw fibre between 1946-49. This rose to 330,000 mt in 1959-60 and had trebled by 1975-76. In recent years, China's production has fluctuated between 14 to 21 percent of world production. In 1985-86, production of jute kenaf and allied fibres constituted 34 percent of the world output.

The developments in the production of kenaf/mesta in China have been spectacular. From an average of 137,000 mt during 1948-52, the out put increased to 1,048,000 mt during 1968-70 (Mujeri, 1978). In 1985-86, the production of mesta and kenaf exceeded 2 million mt (FAO).

Table 1.2

World Acreage and Production of Jute and Allied Fibres

(Area in 000ha; Production in 000mt)

Year	Acreage	Production
1970-71	2565	3350
1971-72	2473	3042
1972-73	2576	3461
1973-74	2785	3890
1974-75	2185	3109
1975-76	1964	2823
1976-77	2143	3036
1977-78	2384	3303
1978-79	2693	3993
1979-80	2882	3906
1980-81	2702	3452
1981-82	2381	3395
1982-83	2334	3283
1983-84	2256	3377
1984-85	2474	3591
1985-86	3850	6493
1986-87	2349	3657

Source: FAO

FIGURE 6 : WORLD JUTE ACREAGE AND PRODUCTION TREND

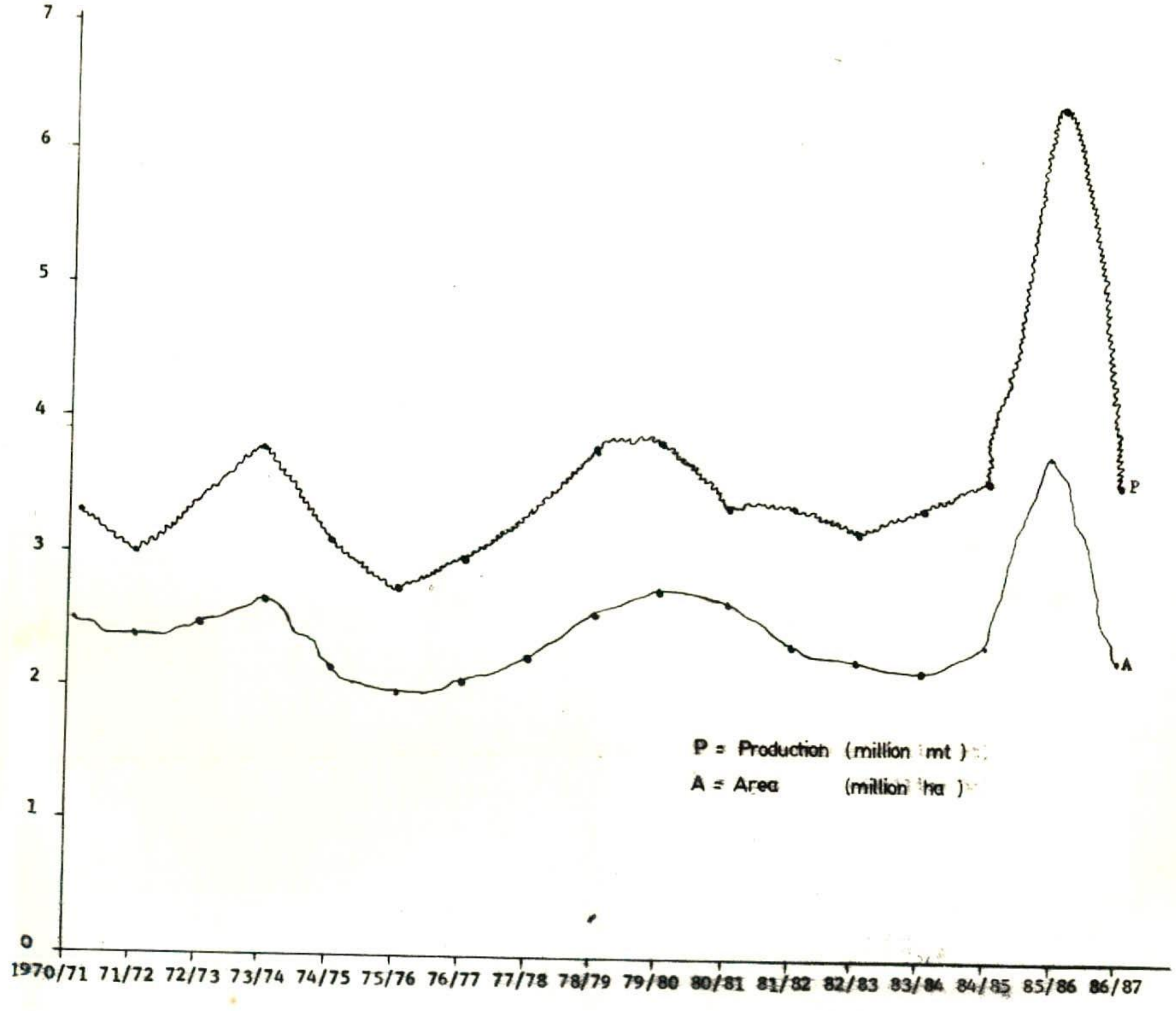


Table 1.3

SHARE OF MAJOR PRODUCING COUNTRIES IN WORLD PRODUCTION OF JUTE, KENAF AND ALLIED FIBRES*

(...........000 mt ....)

Year	Bangladesh	China	India	Nepal	Thailand	Burma
1978-79	1219 (30.50)	544 (13.62)	1500 (37.56)	66 (1.65)	358 (8.97)	96 (2.40)
1979-80	1313 (33.61)	545 (13.95)	1433 (36.68)	67 (1.71)	245 (6.27)	97 (2.48)
1980-81	868 (25.14)	549 (15.90)	1469 (42.55)	59 (1.71)	209 (6.05)	75 (2.17)
1981-82	783 (23.06)	630 (18.56)	1507 (44.39)	43 (1.27)	213 (6.27)	20 (0.59)
1982-83	993 (30.25)	530 (16.15)	1291 (39.33)	39 (1.18)	199 (6.06)	41 (1.25)
1983-84	956 (28.31)	509 (15.07)	1390 (41.16)	25 (0.74)	247 (7.31)	37 (1.09)
1984-85	922 (25.67)	746 (20.77)	1436 (39.98)	33 (0.92)	197 (5.48)	52 (1.45)
1985-86	1548 (24.04)	2060 (31.99)	2207 (34.27)	61 (0.95)	266 (5.15)	60 (4.13)
1986-87	983 (26.88)	710 (19.41)	1440 (39.38)	23 (0.63)	240 (6.56)	50 (1.37)

Source: FAO

* Figures in brackets show respective percentage share in world production.

Unlike the production of jute fibre, the world distribution of jute manufacturing industry is fairly widely spread. It is not concentrated only in areas where the fibre is produced, but also in countries where jute is not grown at all.

Hessain, sacking, carpet backing and gunny are the important jute manufactures produced in the major producing countries. India is the largest producer of jute manufactures, with a production of 1,539,000 mt in 1986, followed by China (748,000 mt) and Bangladesh (504,000 mt) in the same year. Besides these countries, jute goods are produced in Western European countries and in North America. Among the developed non-jute producing countries, Western European countries have occuped an important position in the production of jute manufactures. However, there has been a steady decline in the production of jute goods in these countries : from over 20 percent of the world output in the early 1960's to about 3 percent in 1980-81. The share of developed countries in the world production of jute goods stood at little over 5 percent in 1986, while Eastern Europe and USSR accounted for about 3 percent of the world output in that year (Table 1.4). Japan is another developed country which imports jute for processing into jute manufactures for internal use.

While production of jute goods in the jute producing countries, especially Bangladesh and India, is export oriented, production in most other countries is geared to meeting domestic requirements. In the Western countries, raw jute is imported to produce specialised products such as jute yarn and hessian cloth for carpet backing for domestic consumption. Similarly, Pakistan imports raw jute to meet its domestic requirement for jute goods.

Table 1.4

Producition of Jute Goods

(000 mt)

	1983	1984	1985	1986
World	3532	3273	3435	3617
Bangladesh	587	569	566	504
Burma	25	37	42	25
India	1431	1217	1377	1539
Nepal	22	23	18	20
Pakistan	67	80	92	111
Thailand	186	206	168	212
China	707	703	716	748
North America	15	13	15	14
Western Europe	52	57	48	47
Eastern Europes and USSR	137	90	102	107
Japan	13	14	10	10
Latin America	88	91	97	99
Africa	63	45	50	45

Source : FAO

III

PLANNED AGRICULTURAL DEVELOPMENT IN NEPAL

HISTORICAL PERSPECTIVE

Significant development in Nepal began in 1951 when the country emerged from a century long period of self imposed isolation. The first effort at rural progress was made in 1952 with the implementation of the Tribhuvan Village Development Programme. The establishment of the Co-operative Department in 1954 was another important measure aimed at institutionalising village co-operatives. These measures, however, were inadequate and it was recognised that efforts initiated in a sporadic and uncoordinated manner would not bring about the desired development in agriculture. To date agriculture supports the livelihood of 91 percent of Nepal's population of 17 million and contributes significantly to both gross domestic product (59.6 percent) and exports (75 percent).

The necessity for attaining self sufficiency and making Nepal a welfare state resulted in the First Plan (1956-61). The First Plan aimed at creating co-operative societies throughout Nepal, but achievement in this area as well as many other areas fell short of targets. Due to paucity of information on important sectors of the economy, the plan documents could not adequately reflect the reality of the Nepalese economy.

The Second Plan, launched in July 1962, after a lapse of one year, during which projects were implemented on an ad hoc basis, concentrated on collection of data and information on the economy. Both the Second and Third Plans contained institutionalised measures to improve the standard of living of the farming populace through provision of agricultural inputs.

Up to the Fourth Plan, the emphasis was on building transport and communication infrastructures with a view to a) make a significant impact on the production base of the economy, and b) consolidate the economic unification of the country. With the exception of the Second Plan, transport and communication continued to receive the highest priority in terms of allocation of resources, up to the Fourth Plan. The later development plans, however, allotted first priority to agriculture (Table 1.5)

The Fourth Plan (1970-75) adopted a strategy of "corridor development" to integrate the Terai with the Hills and the Mountains with a view to minimising disparities in the development of the three geographical regions.* The Fifth Plan (1975-80) accorded priority to people-oriented production and maximum utilisation of manpower and favoured fast yielding and labour intensive projects in agriculture.

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* Agro-climatically, Nepal is divided into three regions : the Mountains which remain under snow during winter, the Hills, within which lie some of the most fertile valleys, and the Terai, the northern fringe of the Gangetic plains. Additional information on Nepal is furnished in Annex I.

The thrust of agricultural development as outlined in the Fourth and Fifth Plans was to promote livestock in the Mountains, horticulture in the Hills, and cereal and cash crops in the Terai. The idea was to exploit the comparative advantage of these regions.

This strategy, which envisaged increased regional interdependence and greater inter-regional trade, could best be taken as a long term approach, especially in view of the uncommercialised nature of Nepalese agriculture and poor communications (Yadav, Rawal, 1981). It should, however, be admitted that this approach would best suit Nepal in future when one region would be linked with another by motorable road and agriculture be further commercialised.

During the Fifth Plan period (1975-80), the production of cash crops increased by 1.60 percent while that of foodgrains decreased by 2.80 percent, resulting in a net decline in the production of major crops. In 1979-80, the final year of the Fifth Plan, production of foodgrains registered a decline of 12.90 percent and that of cash crops 8.20 percent due to adverse climatic conditions that year.

Table 1.5

Percentage Allocation of Development Expenditure by Sector

Plans Sectors	First 1956/57-60/61	Second 1962/63-69/70	Third 1965/66-69/70	Fourth 1970/71-74/75	Fifth 1975/76-80/81	Sixth 1980/81-84/85	Seventh 1985/86-89/90
Transport and Communication	33,8	23.9	26.8	35.4	27.5	21.4	15.4
Agriculture, Forest, Irrigation and Land Reform	31.4	13.6	25.9	33.1	33.4	33.2	31.9
Industry, Commerce, Mining and Power	16.7	32.2	27.9	20.3	19.6	24.6	22.5
Social Services	17.1	17.1	16.6	10.8	18.5	20.8	30.2
Miscellaneous	1.0	13.2	2.8	14.7	-	-	-
Total Plan Outlay (Rs Millions)	300.0	600.0	2500.0	3540.0	9170.0	22300.0	54110.0

Source : Various Plan Documents, National Planning Comission, Nepal

Nepal's Sixth Plan (1980-85), conceived around the framework of basic needs, accorded the highest priority to productive investment in agriculture to increase crop yield and employment through multicrop programmes and improvement in the farming system. It recognised that transportation links between the three regions referred to earlier were not adequate enough to fully exploit their comparative advantages. The Plan, therefore, emphasised foodgrain production both in the Hills and in the Tarai. Agriculture was allotted little more than 30 percent of total development expenditure under the Sixth Plan, which is higher than for any previous plans under which the allocations for agriculture average 20 percent of actual development expenditure (Seventh Plan, 1985-86). The Sixth Plan gave emphasis to formulation of special programmes to enhance production of cash crops both for export and supply to industries. The plan set clear targets, but it failed to specify the detailed means required to achieve those sub-sector targets.

The production of major foodgrains and cash crops was expected to increase annually by 2.80 and 3.00 percent, respectively, during the Sixth Plan period. With the exception of the years 1982-83 and 1984-85, production of foodgrains exceeded the targetted annual growth rate. A sharp decline (10.20 percent) in the production of foodgrains in 1982-83 is attributed to the late arrival and insufficiency of monsoon rainfall. Likewise, the decline in paddy production, from 2,804 thousand mt. in 1985/86 to 2,372 thousand mt in 1986/87, is blamed on the late arrival of the monsoon, which reduced acreage under paddy by 4.2 and yield by 11.9 percent respectively in 1986/87 (Economic Survey, 1986/87). This clearly shows that the irrigation facilities created so far have been inadequate to counter the adverse affect of irregular monsoon rains.

During the first four years of the Sixth Plan, the production of paddy exceeded the target and that of wheat was much above the set target. However, the production of maize, millet and barley fell short of the target. The overall production of major foodgrains in the fourth year of the plan achieved only 91.50 percent of the target (Table 1.6).

The production of major cash crops during the first four years of the Sixth Plan remained unsatisfactory. The overall production of major cash crops in the fourth year of the Sixth Plan constituted 73 percent of the respective target, the most disappointing performance being that of jute (29 percent).

An analysis of the overall productivity situation during the Sixth Plan reveals that it had fallen short of the target. However, compared to the yer preceding the commencement of the Plan, productivity of paddy, wheat and barley increased slightly, while yield of jute decreased during the period (Table 1.7). The decline both in production and productivity of jute can be attributed to the depressed prices of jute and jute goods in the international market and the lack of remunerative prices for jute growers in the internal market.

The actual annual growth rate (4.7 percent) achieved in agriculture during the Sixth Plan is attributed to a combination of poor wheather at the beginning of the plan and favourable wheather at the end.

The sales and distribution of yield enhancing agricultural inputs fell far below the plan target. The production inputs and services did not reach the growers on time. The distribution of improved seeds of major cereals(paddy, maize and wheat) reached only 45 percent and that of chemical fertilizers (N.P and K) only 42.66 percent of the plan target.

Table 1.6

Production of Major Cereal and Cash Crops during 1980/81-1983/84

(000 mt.)

	Paddy	Maize	Wheat	Millet	Oilseeds	Jute
Situation of (final year of Fifth Plan)	2060	554	440	119	62	67
Six Plan Target Progress in	2740	849	579	151	104	85
1980/81	2464	743	477	121	77	59
1981/82	2560	751	526	122	79	43
1982/83	1833	718	657	121	69	39
1983/84	2757	761	634	115	73	25
1984/85 target	2885	888	693	156	98	40
Fourth year's progress (percentage) against the plan target	101	89	109	76	70	29

Source : Seventh Plan, National Planning Commission, Nepal

Table 1.7

Crop Productivity Situation in the First Four Years of the Sixth Plan

(Expressed as average yield in mt/ha)

Crops	Situation of 1979/80	1980/81	1981/82	1982/83	1983/84
Paddy	1.64	1.93	1.93	1.45	2.07
Maize	1.28	1.62	1.58	1.41	1.51
Wheat	1.20	1.22	1.32	1.36	1.34
Potatoes	5.42	5.55	6.15	6.30	6.49
Oilseeds	0.53	0.63	0.69	0.63	0.66
Jute	1.50	1.14	1.21	1.28	1.04
Sugarcane	16.63	20.02	23.44	24.23	22.13
Tobacco	0.73	0.76	0.70	0.74	0.78

Source : The Seventh Plan Document, HMG/N

The performance in real terms, of the agriculture sector during the Sixth Plan period can be attributed to :

1) inadequate supply and use of agricultural inputs;
2) unavailability of adequate irrigation water;
3) unavailability of an appropriate technology for hill crops;
4) lack of a wide-spread extension network; and
5) ineffectiveness of arrangements for procuring farm produce at remunerative prices.

The Seventh Plan (1985-90) has the objective of increasing production of food on a steady basis. It aims to increase GDP by 4.5 percent per annum, which would be effected through a 3.5 percent growth in agriculture and a 5.7 percent per year growth in the non-farm sector. Foodgrain production is envisaged to increase by 4.1 percent and cash crops by 5.2 percent. The plan also aims at increasing earnings and employment opportunities by increasing the production of goods that are export-oriented, and to increase the production of agro-based industrial raw material. Functionally, the Seventh Plan embraces the same objective as in the Sixth Plan, i.e., fulfilling the minimum basic needs of the people and increasing opportunities for productive employment.

The Seventh Plan Policy envisages crop-specific development programmes. The plan has also provided for adequate measures to ensure timely availability of production inputs through services centres and for expanding irrigation facilities and coverage of the national extension network. The distribution of production inputs such as chemical fertilizers, seeds, insecticides and agricultural loans has been linked with the production programme and will be carried on under the following classifications; a) special areas (large zones with irrigation facilities) b) pocket areas (small and scattered areas with irrigation facilities), c) general regions (areas without irrigation and dependent on monsson but with potential for increased production), and d) other regions (areas that can not be directly served under the programme).

Different production and productivity targets for each major cereal and cash crop to be grown under the above mentioned areas have been set. The plan has a target of providing irrigation facilities to an additional 235,493 ha of land (which would increase the total irrigated area to 574,165 ha by 1989/90), distribute 37,450 mt of improved seeds and 396,050 mt (nutrient) of chemical fertilizers. The production target for jute in 1988-89 is fixed at 45000 mt, which will require an annual growth rate of 6.40 percent.

Development approaches followed in Nepal have undergone considerable changes over time. There has, however, been an underlying trend toward decentralization of rural development activities. Various programmes initiated over time such as the Village Development Programme, integrated rural development project (IRD) and the small farmer development programme (SFDP) aim at achieving greater participation from the rural masses. A host of institutions such as the Agricultural Development Bank (ADB/N), the Agricultural Inputs Corporation and the Sajhas (cooperatives) have been created to provide credit and production inputs to farmers. Moreover, nearly 200 projects currently being implemented under the aegis of the Ministry of Agriculture (MOA) aim at increasing both the irrigated and cropped areas, and utilizing improved production inputs to boost agricultural productivity and production. Despite noble objectives and ambitious targets, the development efforts have not been able to generate real gross domestic products (GDP) substantial enough to ensure a fair standard of living to the people.

Nepal has not been able to augment its food production to keep pace with its ever-expanding population growing at 2.6 percent per year. Production of major foodgrains increased by less than 12 percent during 1971-81 while population increased by nearly 30 percent during the same period.

During the period 1964-65 to 1981-82, the Nepalese economy appears to have grown, in real terms, at 2.5 percent annually (Poudyal, 1986). The growth, however, has not been uniform and the change in GDP is largely explained by aberrations in crop output. For example, the relatively high GDP growth rate achieved in 1965-66, 1973-74 and 1980-81 was due mainly to favourable agricultural production resulting from favourable weather conditions in those years. This shows the predominance of agriculture in the Nepalese economy and the need for initiating concerted action to improve the production and productivity of major crops.

INSTITUTIONAL ARRANGEMENTS FOR JUTE DEVELOPMENT

Despite jute being the major and consistent source of foreign exchange earnings and a principal industrial crop accounting for employment of a large number of farm families and industrial labour, no public sector efforts were made for its development prior to 1970. Planned development efforts with regard to research and development and marketing of jute can be traced to the creation of NJDB which carried out research and development activities and executed a programme to modernize two jute mills in Nepal.

NJDB was upgrated to the level of a corporation (JDTC) in 1974, mainly to strengthen the marketing activities and to effectively execute programmes related to jute research and development. More specifically, the major objectives behind the creation of JDTC were to :

1. Increase production of quality jute through an expansion in area under jute cultivation, increasing the availability of implements and the establishment of research centres.

2. Procure jute from farmers, cooperatives and jute traders.

3. Stabilize prices of jute and jute products.

4. Regulate export trade of jute and jute products.

Currently, JDTC, with its well spread Seed Multiplication Centres/Sub-Centres and jute Development Centres/Sub-Centres conducts the following programmes on a regular basis (Jute Agriculture Diary, 1985-86):

1. Improved Seed Multiplication Programme. Under this the following activities are carried out :

   a) Production and procurement of seeds of improved jute varieties (Registered Seed Growers)

b) Processing and packaging of seed of improved jute varieties

c) Production tirals on seed of improved jute varieties.

2. Improved Jute Fibre Production Programme. This comprises the following activities :

   a) Distribution and sale of seeds of improved jute varieties
   b) Demonstration of improved jute technology
   c) Upgrading of the quality of jute fibre
   d) Improved jute fibre production

3. Jute Agriculture Research Programme. Different activities carried out under this are :

   a) Trials and experiments (adaptive research on jute)
   b) Production of stock and foundation seeds

4. Collection, Analysis, Evaluation of Statistical Data on Jute and Jute Products and Publication Programme. The specific activities under this programme are :

   a) Collection, analysis, evaluation of statistical data

   b) Appraisal report of market research on domestic and external market of jute and jute products

c) Publication of information materials on jute and jute products.

5. Survey Programme, covering

a) Survey on domestic jute cultivation
b) Survey on domestic markets
c) Project survey and feasibility survey

6. Training/Seminar/Conference Programmes, consisting of

a) Training on jute agriculture
b) Training on jute and jute products
c) International conferences, training, etc.

7. Inspection, Control and Promotion of Trade of jute and jute products programme. Specifically, two activities are carried out under this programme

a) Distribution of licenses for traders and exporters of jute and jute industries
b) Inspection, control and promotion of trade

With the sole exception of a significant achievement in jute acreage covered by improved seeds, the tireless efforts of JDTC have not resulted in matching returns in terms of enhanced production and productivity of jute. Yields have stagnated and acreage under jute has sharply fluctuated over time.

IV

JUTE PRODUCTION IN NEPAL

AREA OF JUTE CULTIVATION

Jute was a natural jungle grown fibre found in the eastern Terai of Nepal. Gradually over time, farmers started growing it for domestic consumption. Establishment of jute mills in Calcutta and later in Biratnagar itself provided the required impetus to undertake jute cultivation on a commercial basis.

Although the production of jute is scattered between the Kamala river in the West and the Mechi river in the east, a large part of the total jute production in Nepal is accounted for by Morang, Sunsari and Jhapa districts (Figure 2).

A suitable climate, fertile soil, sufficient retting water and skilled labourers jointly make up the environment in which jute can be produced in a desired manner. Jute does well on loam and sandy loam soils, requires a temperature of between 20^{O}C and 37^{O}C, a humidity of between 70 and 90 percent and a day length in excess of 12 hours (Jute Industry of Nepal, 1983). Pre-monsoonal showers for land preparation, intermittent precipitation during the early stage of growth and monsoonal showers with warm humid atmosphere facilitate vigorous growth of jute plants.

The jute growing area of Nepal has a sub-tropical climate characterised by seasonal rainfall associated with the south-west winds, heavy monsoonal downpour during June-September and practically a rainfree winter.

A soil survey conducted in the main jute growing area (Morang, Sunsari and Jhapa) reveals that 80 percent of the area is composed of sandy loam type soils, both suitable for jute cultivation (Pant, 1984). In addition, no acute scarcity of retting water is reported in the area. Conditions that favour jute cultivation do on the whole, prevail in the jute growing area of Nepal.

TYPE OF JUTE GROWN IN NEPAL

Two varieties of jute : Corchorus olitorius and Corchorus capsularis are extensively grown in Morang, Sunsari, and Jhapa. While capsularis accounts for a large chunk of jute land, mostly low land in Jhapa district, tossa is much preferred by farmers in Morang and Sunsari district. Jhapa district is known to produce the best quality jute in Nepal.

Tossa is higher yielding (1.36 mt/ha) than capsularis (1.08 mt/ha) and is considered superior for commercial use. Until recently, capsularis varieties were the most popular and they embraced about 80 percent of the combined total land area planted to jute. Despite slightly higher yields and better fibre quality, tossa jute could not occupy large areas due mainly to its inability to withstand water-logging and the necessity for late sowing (mid-April - mid-May). Thus leaving very little time for farmers to raise another crop on the same land in a given crop year. However, the position of tossa in terms of area has drastically increased in recent years. The increase in tossa acreage can be attributed to the public sector endeavour to bring more land under tossa cultivation and to the development by the Jute Agriculture Research Institute of India (JARI) of a new tossa variety that can be sown as early as mid March.

The current capsularis/tossa ratios in Bangladesh, India and Nepal stand at 60:40, 40:60 and 38:62 respectively. Given the upward trend in fertilizer prices, the fertilizer responsiveness of the two varieties (80 kg.N/ha for white and 40 kg N/ha for tossa) and the advent of a new tossa variety that can be sown early, it is likely that capsularis will be further displaced by tossa in the future.

A wide range of jute varieties are cultivated in Nepal. Prior to 1970, farmers used only local varieties. With the creation of NJDB, a programme was launched to supply seeds of improved white and tossa varieties imported from India. Since the source of seeds has been India, the same varieties are used both in India and Nepal. Farmers in Bangladesh use different varieties (Table 1.8) developed by the Bangladesh Jute Research Institute (BJRI).

SEED MULTIPLICATION PROGRAMME

The Seed Multiplication Centres/Sub-Centres of JDTC have been producing, procuring, processing, packaging and conducting production trials on improved jute seeds.

Foundation Seeds are grown on the JDTC farm at Ithari near Biratnagar where the Jute Research Centre (JRC) of JDTC is located. JDTC selects farmers for the seed multiplication programme on the basis of their performance and past experience. So as to avoid mixing of varieties, a particular farmer receives only one variety and farmers from one particular place are not given foundation seeds of different types. Morever, to maintain purity of the seeds procured from farmers, quantitative restrictions are imposed according to which not more than 0.45 mt of jute seeds per ha is accepted by JDTC. Prior to procurement, seed samples are forwarded to JRC to ensure that the moisture content does not exceed 10 percent and seeds have at last 80 percent germinability.

In 1984/85, 585 ha of land and 400 farmrs were covered under the Seed Multiplication Programme. In 1983/84, 556 ha was used for seed production. In view of the growing demand for tossa seeds, about 60 percent of land under seed production each year is assigned to tossa seeds, which has resulted in enhanced production and distribution of these seeds by JDTC over the years (Table 1.9).

Table 1.8

PARTICULARS OF POPULAR JUTE AND MESTA VARIETIES

Seed type	Bangladesh	India	Nepal
CAPSULARIS	D-154	JRC-321	JRC-321
	CVL-1	JRC-212	JRC-212
	CVE-3	JRC-7447	JRC-7447
OLITORIUS	0-4	JRO-524	JRO-524
		JRO-7835	JRO-7835
		JRO-878	JRO-878
		JRO-632	JRO-632
MESTA	C-2	H.C.583	No
	S-24	H.S.4288	No
		H.S.7910	No

Source : BJRI, JARI and JDTC

Table 1.9

PRODUCTION OF IMPROVED JUTE SEEDS

(mt)

Years	Capsularis	Olitorius
1971-72	15.00*	13.00
1972-73	35.60	31.27
1973-74	102.50	108.40
1974-75	82.70	82.00
1975-76	73.90	78.13
1976-77	151.10	162.14
1977-78	100.80	58.8+8.10*
1978-79	125.20	93.80
1979-80	105.30	153.40
1980-81	102.80	151.20
1981-82	46.20	74.00
1982-83	30.02	46.6+31.20*
1983-84	46+10*	92+15*
1984-85	90.00	157.00
1985-86	145.00	180.00
1986-87	1.20	1.40

Source : JDTC

*Imported from India

While most of the seed requirement is met by seeds produced under JDTC supervision in areas outside of the main jute growing districts, a few farmers grow their own seed and at times, JDTC has imported seed from the National Seed Corporation (NSC) of India. There also appears to be a small cross-border movements of seeds, depending on the prevailing price and supply situation.

Research conducted by JDTC in 1981 revealed that seed production costs between tossa and capsularis are not significantly different: Nepalese Rupees (NR) 1211/bigha (0.68/ha) for capsularis and NR 1206/bigha for tossa. With an average yield of 450 kg/ha and a prevailing price of NR 7/kg, seed grown on 0.68 ha yielded a net return of little over NR 2000 in both cases (Table 2.0).

Although the procurement price of tossa seeds remained higher (NR 10/kg) than that for capsularis seeds (NR 7.5/kg) for quite some time, between 1977/78 - 1981/82 the price paid by JDTC for both seed type remained static at NR 7/kg. The selling price of tossa seeds, however, has always been somewhat higher than that of capsularis.

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* Production of seed is not allowed in fibre growing areas by HMG as the length of time for maturity prevents cultivation of other crops.

In view of the difficulty of following tossa by another crop (wheat) in a given crop year and the greater demand for tossa jute by mills (and hence the need to bring more acreage under tossa cultivation), it was not justifiable to fix the same procurement price for both tossa and capsularis seeds. There was a suggestion that the procurement price of tossa seeds should be increased by NRI/kg and its selling price by NR3/kg (Jute Industry of Nepal, 1983).

Table 2.0

COST OF PRODUCTION OF IMPROVED JUTE SEEDS

(NRS/0.68 ha)

Costs	Capsularis	Tossa
Seed cost	32.0	27.0
Manure/fertilizer	180.0	180.0
Land preparation	250.0	250.0
Interculture operation and rouging	315.0	315.0
Detopping and Roguing	70.0	70.0
Harvesting	154.0	154.0
Threshing	42.0	42.0
Cleaning	42.0	42.0
Land revenue	26.0	26.0
Miscellaneous	100.0	100.00
	1211.0	1206.0

Revenue

450 kgxNRS7	=	3150.0
Income from jute sticks	=	160.0
Total revenue	=	3310.0

Net return

(cost revenue) = 2099.0

Source: JDTC

In view of the lower seed requirement for tossa and slightly higher prices of tossa jute, this arrangement should not have any adverse affect on tossa production in Nepal. JDTC, of late has revised prices, both procurement and sales, of jute seeds, which is somewhat in confirmity with the aforestated recommendation (Table 2.1)

Although Nepal is annually producing about 150-250 mt of certified seeds from Indian cultivars to cover its jute area, the existing varieties have narrow genetic bases, low adaptability to agro-ecological settings, susceptibility to diseases and high photoperiod sensitivity. Moreover, due to ever increasing need for growing more cereal crops, jute cannot afford to remain a mono crop system and must find a place under the multiple cropping system.

To remove the constraints of the currently grown varieties, efforts should concentrate on developing varieties that would posses the following qualities :

a) photoperiod insensitivity;
b) tolerance to problem soils, low temperature; drought and flooding;
c) resistance to diseases and pests;
d) cylindrical stem; and
e) higher yields with improved fibre quality.

Table - 2.1

PROCUREMENT AND SELLING PRICES OF IMPROVED SEEDS

(NRS/Kg)

Year	Procurement Price		Selling Price	
	Tossa	Capsularis	Tossa	Capsularis
1971-72	5.50	5.50	6.00	5.50
1972-73	10.0	7.00	5.50	4.00
1973-74	10.00	7.00	6.50	5.00
1974-75	10.00	7.50	6.50	5.00
1975-76	10.00	7.50	6.00	4.50
1976-77	10.00	7.50	6.00	4.50
1977-78	7.00	7.00	7.00	7.00
1978-79	7.00	7.00	9.00	8.00
1979-80	7.00	7.00	9.00	8.00
1980-81	7.00	7.00	9.00	8.00
1981-82	7.00	7.00	9.00	8.00
1982-83	8.00	8.00	11.00	10.00
1983-84	12.00	10.00	16.00	15.00
1984-85	13.20	11.00	20.00	19.00
1985-86	13.20	11.00	20.00	19.00
1986-87			16.00	15.00

Source: JDTC

The Seed Multiplication Programme executed by JDTC does not appear to be in a position to develop a variety with the aforestated qualities. The seed programme is still in a state of underdevelopment as its activities are concentrated on multiplying jute seeds of Indian cultivars and then distributing the same to registered seed growers who multiply them further. There is no Seed Law and no seed certification is practised.

Bangladesh, producing about 150mt of certified jute seeds annually, has a Seed Law. The country also has a policy for the development of a seed programme and to operate activities related to production quality control, certification and marketing. Although the seed programme in Bangladesh is at a much advanced stage compared to that in Nepal, limited processing and laboratory facilities act as a constraint to smooth functioning of the programme. With seed distribution activities assigned to BADC, earlier handled by BJRI, it is apprehended that the seed distribution programme in Bangladesh may suffer a set back.

Among the three jute producing countries (Bangladesh, India and Nepal), India represents the highest stage in seed programme development. There is a strong national seed policy and a parastatal body (NSC) to look after seed production and marketing. There are separate agencies for seed testing and certification. Retailing of seed is carried out by private dealers and a proper link is maintained between seed production agencies, both in the public and private sector, who coordinate with NSC in target setting and stocking arrangements.

While efforts of JDTC to test and control quality are commendable, there is need for arrangements to control standards and maintain quality. There is no seed certification agency in Nepal and seeds of other crops handled by Agriculture Inputs Corporation (AIC) are not certified. Establishment of an independent regulatory body for seeds of all crops may prove beneficial in this context. Moreover, the experiences of Bangladesh and India with regard to control and maintenance of standards could provide useful lessons for Nepal.

CROPPING PATTERN AND JUTE YIELD

In the five jute growing districts, rice is clearly the most important crop both from the stand point of its contribution to farm income and total occupied area; jute is ranked second and wheat third (Rawal,1979). Of late, however, as indicated earlier, the importance of jute in the area is in decline and paddy and maize have emerged as a strong replacement of jute. Wheat and mustard are among the dominant winter crops, while rice, maize and jute, mostly cultivated before the onset of the monsoon, are the major summer crops.

In large parts of the areas under tossa cultivation, no ohter crops can be grown. However, in the case of farmers with irrigation facilities and other resources, tossa may be followed by wheat. Being very much subsistence oriented, small farmers grow staple crops such as maize and wheat. A part of the land under tossa is also cultivated after jute harvest with mustard and/or winter maize, depending upon farmer's necessity, price factors, etc.*

While late paddy can be planted after jute, more so in case of capsularis, the growing period of maize and early paddy concides with that of jute (Figure 7). However, with th envisaged enhanced adoption of a tossa variety that can be sown early and harvested by end July, it is thought that a second crop (late paddy) can conveniently follow tossa jute on the same plot of land. Some progressive farmers have already tried this cropping pattern and found it feasible.

The yield of jute is rather unsatisfactory in the whole region, although inter-country disparity does exist (1.4 to 1.6 mt/ha in India and Bangladesh and about 1.25 mt/ha in Nepal). As the jute area is spread over a vast area in India, a significant inter-state variation in yield of jute is noticed (1.6 mt/ha in West Bengal and 1.05 mt/ha in Bihar). In the case of Nepal, however, no significant differences in jute yield between districts is reported, although there has always been an apparent difference in the quality of jute grown in different districts. Likewise, no significant inter-district differences in jute yield are noticed in Bangladesh. Quality differences, however, do exist. Yield of mesta in Thailand is reported at 1.10 mt/ha.

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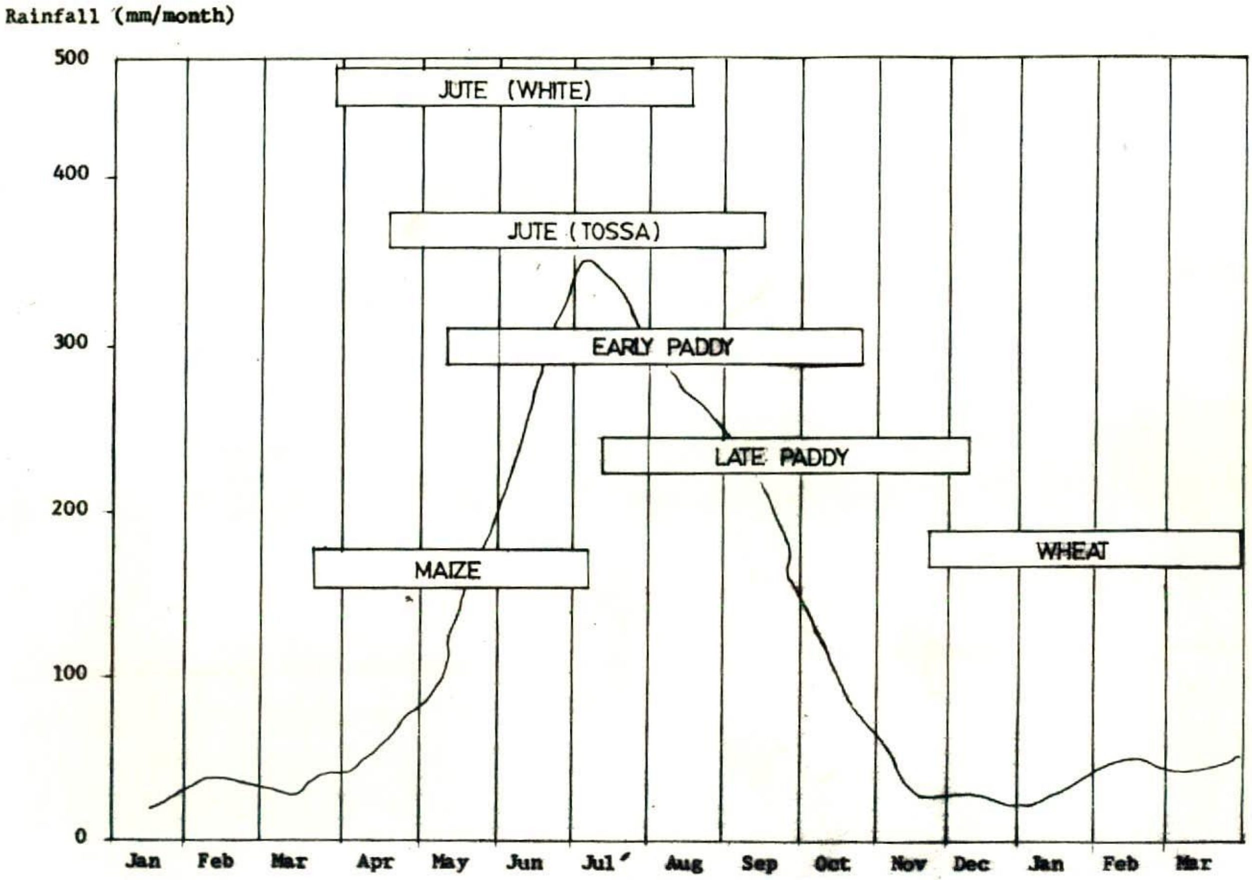
*Both Aus (early) paddy and late (transplant) paddy compete with Jute in India and Bangladesh, while Cassava has encroached on mesta area in Thailand.

FIGURE 7 : GROWTH PERIODS FOR JUTE AND OTHER CROPS AS RELATED TO RAINFALL DISTRIBUTION

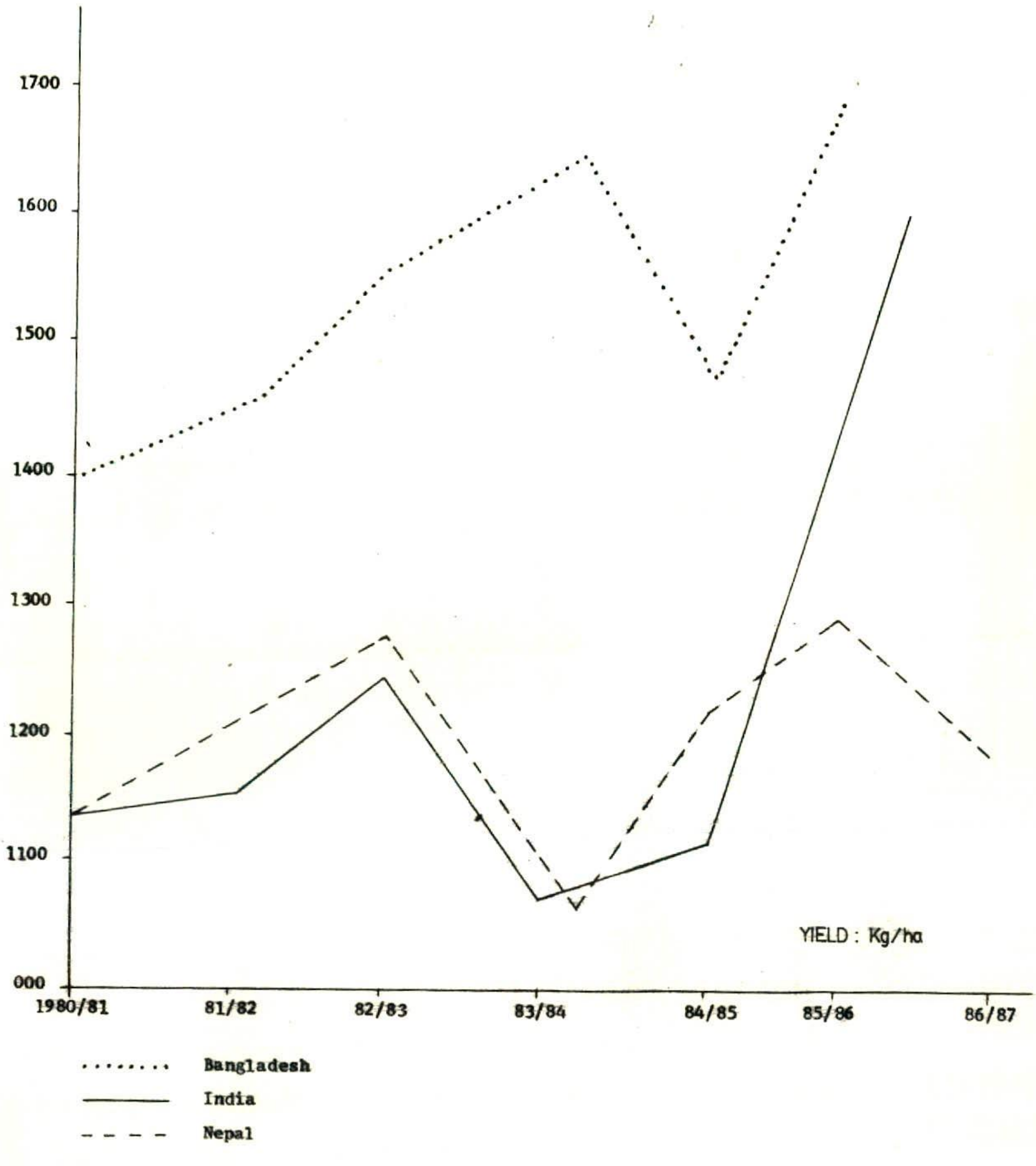


Among major jute producing countries, China (PROC) is reported (by FAO) to be producing the highest yield (4.0mt/ha). The latest publications of the Ministry of Agriculture, PROC, report yields of between 4.3mt/ha. It is understood, however, that yield figures as presented in those official bulletins are based on ribbon weight, which in the form of dry fibre after processing, weighs between 49-56 percent of the ribbon weight (Ali,1985). Undoubtedly, China is ahead of other countries in every aspect of jute production and offers a good scope for sharing the successful experiences of one country with another.

The yield of jute is not at all satisfactory in Nepal. It is preplexing that, despite the adoption of relatively better agricultural practices in India and Bangladesh, jute yields have not improved much over time (Figure 8). One of the reasons often cited to explain low yields in the Indo-Bangla-Nepal jute belt is that farmers are cutting the duration of jute to accommodate transplant paddy.

It is also reported that paddy transplanted late after tossa harvest does not give satisfactory yields. Farmers, always wanting to be assured of a minimum level of staple crop, find it reasonable to harvest jute early so as to grow paddy on the same land. This leads to reduced productivity as there is a positive relationship between yield and age of the plant. Research and development activities carried out in the region have not so far produced a variety with improved yield and the ability to fit into a multicrop system.

FIGURE 8: JUTE YIELD IN NEPAL, INDIA AND BANGLADESH



JUTE RESEARCH AND EXTENSION

Jute research in Nepal is still in its infancy. Although some positive developments in jute research took place with the establishment of JRC in 1977, technical staff and equipment remain acutely inadequate to carry out substantive research activities. Focus has been given to programmes of adaptive, rather than, basic research.

JDTC has charged JRC with the responsibility of executing its jute research programme. In addition to agronomic and varietal trials, JRC is producing breeder seed and foundation seed for the seed multiplication programme.

The various research trials of JRC can be grouped under four heads:

i) crop improvement; ii) agronomy; iii) plant protection; and iv) farm management.

Generally, JRC conducts the following research activities:

- Multiplication varietal trials
- Effect of date of sowing on fibre - quantity/quality
- Effect of date of sowing on seed production
- Intercropping and fibre production.
- Seed production from different locations
- Multiple cropping rotations-irrigated.

- Multiple cropping rotations-rainfed
- Varietal trials on kenaf/mesta
- Herbicidal trials on jute cultivation
- Varietal characteristics of jute and production of breeder seed
- Effect of soil pH on growth, yield and incidence of disease.

A FAO mission (Jute Industry of Nepal, 1983) suggested that the research programme in Nepal could be strengthened with a slight increase in staff and the regrouping of research components into three major sections:

1. Crop Improvement and Physiology Section

2. Agronomy, Soil and Farm Management Section

3. Plant Protection and Retting Improvement Section.

Lack of research scientists is reported to be a serious constraint in the execution of research activities. There is not a single entomologist or pathologist on JDTC staff. Likewise, there is a lack of laboratory equipment such as research microscopes and stereoscopic microscopes to make effective use of the small laboratory located at JRC. Technical expertise on the installation and operation of research equipment is also required.

JRC needs to be strengthened both in terms of manpower and equipment to facilitate basic research in addition to ongoing adaptive research. Moreover, JRC should maintain closer liaison with both BJRI (Bangladesh) and JARI (India) to benefit from their experience.

With the establishment, in 1984, of the Internaitonal Jute Organisation (IJO)* in Dhaka, the prospect for sharing of knowledge and exchange of information among jute producing countries has greatly increased.

Jute extension work is carried out by JDTC, which formulates detailed extension programmes in coordination with the agriculture extension wing of the Department of Agriculture. JDTC carries out its extension programme through its four Jute Development Centres, each managed by a Section Officer, and twenty sub-centres, each manned with one Junior Technician.

To educate farmers on different aspects of jute cultivation, JDTC relies on method demonstration, the distribution of pamphlets and farmers' gatherings (farmers' day). The extension wing of JDTC is also responsible for conducting a) the Production Trial Programme; b) the Small Jute Farmers Package Programme; and c) the Retting Pond Development Programme.

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*Information on IJO is given in Annex-II.

Low adoption of improved agricultural practices and the resultant unsatisfactory yield level is often blamed on the poor linkage between the agricultural research and extension mechanism in most of the developing countries. What is produced as a result of research efforts has to be disseminated in a convincing way to ensure effective adoption by the farmers. A proper linkage between research, extension and the farmer facilitates both the smooth flow and adoption of new ideas. A tripartite kind of arrangement is, therefore, essential, not only for dissemination of findings from the research units, but also to enable the flow of information from the farmer to the researcher, which, in turn, gives researchers a chance to undertake problem-oriented research activities.

In Bangladesh, the direct attention that jute production received under the former Intensive Jute Cultivation Scheme (IJCS) reduced drastically after 1982 when IJCS was merged with the National Training and Visit (T&V) system. Extension agents of the Department of Agricultural Extension are charged with the responsibility of disseminating information to jute farmers, while the division most concerned in a technical role is the Cash Crop Division. Moreover, both of these wings have to concentrate on other crops, besides jute. The present situation calls for the development and strengthening of linkages between the research activities of BJRI and the jute extension mechanism.

In India, within the framework of T&V system, extension work remains the responsibility of each state. Linkage with research is established through the Indian Council of Agricultural Research (ICAR), a body responsible for agricultural research and education. Jute and mesta do not feature prominently in the national extension programme. Within the Directorate of Extension, training in jute cultivation is covered during the pre-season workshop or during the specialized Subject Matter Specialist (SMS) training conducted by the Agricultural Universities in respective states. The Directorate of Jute Development (DJD), plays an effective role in linking, with the help of the extension mechanism of State Governments, the research of JARI and that of the Jute Technological Research Laboratories (JTRL) in Calcutta. DJD does not appear fully equiped to effectively play its extension and liaison role between jute research and extension in India.

As far as jute is concerned, the problem of linkage and coordination between research and extension has not yet surfaced in Nepal. This can be attributed to the very limited on-going jute research in Nepal and to the fact that both research and extension fall under the perview of JDTC.

Jute extension work is basically carried out by Junior Technical Assistants (JTAs) who cover 129 panchayats involving about 100,000 households. There is a need for providing adequate training opportunities for these agents and arranging adequate training support material. On the whole, the extension wing of JDTC has performed quite well over the years and appears capable of disseminating to farmers technical knowhow once it is made available to it. The urgent need, therefore, is to strengthen JRC, through staff development programmes and provision of equipment, for generation of research output to be disseminated by the extension network of JDTC.

CULTIVATION PRACTICES AND COST OF JUTE CULTIVATION

SOWING

The date of sowing is highly influenced by pre-monsoon showers and moisture content of the soil. Depending on these two factors, land preparation starts from mid-February to early March for early varieties (white) and from late March till early April for late (tossa) varieties.

Land is ploughed, using a wooden plough drawn by animals, and cross ploughed five to six times before sowing. The implements used for land preparation are simple and within the reach of small jute farmers in Nepal. Both the small size and scattered nature of holdings and the farmers' inability to invest in capital equipment has inhibited the wide adoption of tractors in Bangladesh, India and Nepal. In Burma, however, mechanized land preparation is becoming increasingly popular as such services are provided by the state. In Thailand, buffaloes are being increasingly replaced by power tiller to prepare the land.

Jute farmers are always tempted to take advantage of the onset of rains and, thus, hurriedly prepare land for sowing. As a result, capsularis is sometimes sown as early as February and tossa in early March. In view of the prevailing climatic conditions (patterns of rainfall, temperature and daylength), it is advisable not to grow capsularis before late March and tossa before early April in Nepal. The highest number of ploughings and the earliest sowing is done in Jhapa, followed by Morang district.

In the northern, hemisphere, mid-March sowing is optimal for all capsularis varieties and some tossa varieties (JRO-524, JRO-88 and JRO-7835), while mid-April is suited for JRO-632 and other olitorius varieties (Ghosh, 1983). Although, sowing of jute may stretch from late February to May, it should be remembered that sowing done earlier or later than the usual time results in premature blooming and, therefore, reduction in yield . This is because the initiation of flowering of both the species of jute is highly sensitive to photo period.

Sowing is mostly done by hand and the seed rate is reported to be 6 kg/ha for tossa and 9 kg/ha for capsularis. The major source of seed supply is JDTC, however, quite a large number of jute farmers also retain seeds from the preceding crop. After sowing in properly prepared seed-beds, laddering is done to cover the seeds and compress the soil. Under favourable conditions the seeds germinate within 4 days.

Among the major jute producing countries, China is reported to be following better cultural practices. Sometimes in the middle of April, kenaf and jute are sown either by hand or by seed drill on raised seed beds with small canals on either side for irrigating the crop and drainage of excess water.

Despite the higher yield and reduced cost of cultivation associated with line sowing (Chowdhury, Ali 1962), the majority of jute farmers (90,95 and 100 percent in India, Bangladesh and Nepal, respectively) broadcast jute seeds. Several causes are often cited against the use by farmers of seed drills. Row sowing by drill requires thorough land preparation to produce a fine tilth, which is both time consuming and costly. Moreover, since pre-monsoon showers arrive suddenly, farmers are eager to take advantage of them and find bradcast sowing much more convenient as it permits hurried land preparation and sowing. In addition, falling returns from jute severely restrict adoption of methods/ techniques that require substantial cash inputs. Resource poor jute farmers cannot afford to bear a high fixed cost per unit area of jute sown, as would be the case in the possession of a seeder that would be used about one day every year for jute.

In view of the case for land preparation by the broadcast method and the sharp decline that jute prices have taken in recent years, it is unlikely that Nepalese jute farmers will adopt row sowing on a massive scale in the near future. The development of an efficient and economical seed drill either in Bangladesh or India may, however, induce farmers to switch over to row sowing. Efforts made in this direction both in Bangladesh and India have not so far resulted in the development of a suitable seed drill. The Agricultural Tools Factory (ATF) in Nepal could initiate programmes in this area in cooperation with BJRI, JARI, JTRL and the International Rice Research Institute (IRRI), which had developed a power tiller, an intermediate technology implement for land preparation in rice.

It had been stated that row sowing could reduce the cost of jute production/ha by NR 150 and increase revenue by NR 500 through enhanced yields (the jute Industry of Nepal,1983). These gains would definitely support the adoption of row sowing by jute farmers. In this context, Nepalese jute farmers may be encouraged to practice row sowing by hand. The Department of Agriculture in Thailand advises jute/kenaf farmers to sow in rows with a gap of 30 cm. between rows. Many progressive farmers row sow in furrows made by a wooden rake used in harrowing the land. In China, kenaf and jute seeds are also sown in rows either by hand or seed drill. A similar practice may prove beneficial to improve both the productivity and quality of fibre in Nepal. Trials on spacing carried out at JRC reveal that a gap of 25 cm. between rows and 10 cm. between plants produces optimum results.

WEEDING AND THINNING

In order to obtain sizable production of good quality fibre, the jute crop has to be carefully weeded. This is simultaneously carried out with the thinning operation. The benefits of fertile soil, use of improved seeds and other complementary inputs do not suffice to produce desired results if timely weeding is not practiced. The jute plants in excess of the reasonable stand should also be thinned out.

In broadcast sown plots, the seeding rate is much in excess of the required stand density. It is estimated that if 95 percent of the broadcast sown seeds germinate, about 84 percent of the seedlings will have to be removed (Ghosh, 1983). In a broadcast plot, the seedlings should be thinned out to a space of 5 cm. between plants within the first month. Experiences in jute producing countries reveal that the excess seed sown uder broadcast method serve two purposes: i) a number of seed placed together generate enough force, which may not be possible in case of a single seed placed too deep in the soil, to effect germination; and ii) the excess seedlings suppress weed growth in the initial stage. In a broadcast plot, if seedlings are too crowded, light raking is done prior to manual thinning. It should, however, be noted that raking is never done in wet soil or when the seedlings are well spaced. The first thinning is done when seedlings are about 20 days old and about 10 cm. tall. The second thinning should be done when plants are about 30 days old. In the broadcast system, a spacing of 10 to 15 cm. between plants is maintained. In fertile soil, close spacing should be avoided as far as possible because the resultant canopy tends to check the growth of shaded plants.

Jute normally requires two weedings after which plants grow fast and the crown leaves form a continuous canopy, denying sun light to the weeds below. Only in some cases is a third weeding required. It is advisable to complete the first and second weeding prior to the onset of monsoon.

From the foregoing, weeding and thinning practices followed by jute farmers in Nepal are below the recommended standards. Jute in Nepal is weeded once or twice. One weeding, 15-20 days after sowing, is quite common. The "Khurpi" is widely used for weeding. Despite reduction in cost that would result from the use of a wheel-hoe for weeding, farmers have to solely rely on "Khurpi" as the entire jute crop is broadcast sown. It is clear that a substantial reduction in labour input requirement for weeding could be effected through row sowing and the consequential adoption of improved methods of weeding in which weeds within rows are removed by hand and weeds between rows are removed by a wheel-hoe.

Jute is weeded one to two times in Nepal and two to three times in Bangladesh and India. In Nepal, about 34 labourers/ha are required for the first weeding and forty-four for the second weeding (White Gold of Nepal, 1984). Despite improvement both in fibre quality and quantity that would result from proper weeding, it is ironical that some farmers in Nepal do not weed jute even once. Rising wages of hired labour and falling jute prices often obstruct adoption of better practices by jute farmers.

In China, weeding and thinning are done by hand. No labour is hired to undertake these operations. Since the fields are cultivated round the year, not many weeds occur. Small implements, similar to "Khurpi", for weeding and loosening the soil are used.

In Thailand, about 31 species of weeds are found in upland crops, which compete with fibre plants for nutrients, light and water (Anonymous, 1984). A few herbicides are officially recommended to control weeds, but farmers find them too expensive. Many farmers do not weed the crop even once.

In view of the problem caused by weeds and, the farmers' inability to procure herbicides, research work on biological weed control should be encouraged. As most farmers are not properly educated, any developed control measure, besides being economical, should be simple enough to be easily adopted at the farm level.

FERTILIZING

Experimental results reveal that use of Nitrogenous(N) fertilizers increase yield. The use of improved varieties, supplemented by the application of chemical fertilizer and appropriate plant protection measures, has produced higher yields even under rainfed conditions. Nitrogen, phosphate and potash are important nutrients in stimulating yield of jute fibre. Under the government sponsored intensive jute cultivation schemes both in India and Bangladesh, jute yields increased by 0.31mt/ha, with the application of fertilizer and other inputs (Ghosh, 1983). The jute consultant to HMG/N demonstrated in 1977 that, with an application of NPK at a ratio of 60:30:30 kg/ha, yield increased by o.32 mt/ha.

Tossa is said to be a more efficient user of nitrogen than white jute.

Despite the effectiveness of chemical fertilizers in increasing yield, their application in jute cultivation is almost absent in Nepal. Since most of the households have a number of cattle, resource poor smallholders rely on farm yard manure (FYM) as a source of plant nutrients.

Prior to land preparation, 6-8 mt (20-25 cartloads) of FYM/ha and some ash is applied. Use of dung as FYM on crops has decreased and is bound to decline further as farmers are compelled to use dung for cooking and heating purposes in the absence of fuel wood. Only a few progressive farmers use fertilizer (N60, K30 and P30/ha).

In Bangladesh, not all jute farmers use chemical fertilizer. Wherever applied, doses of plant nutrients are similar to those applied in Nepal. In India, approximately 50 percent of jute is fertilized at the rate of 15 kg N/ha. Nitrogenous fertilizer is used in two applications after the first and second weeding. Phosphatic and potassic fertilizer are also used in some cases as a basal application at the time of final land preparation. Some N is also used as a basal dose with potash and phosphorus in soils which have low fertility status. In addition to chemical fertilizer, jute fields are manured with FYM at the time of land preparation both in Bangladesh and India.

Compared to Bangladesh and Nepal, a few jute farmers in India are applying substantial doses of fertilizers to jute. However, the average dose (15kgN/ha) is far below the recommended dose of 40-60 N/ha in India.

In China, specially in Hunan and Shejiang areas, farmers use heavy doses of chemical fertilizer: 300 kg urea and 75 kg phosphorus/ha and 150 kg of ash as a substitute of potash. The high dose of chemical fertilizer is reported to have positively influenced both yield and quality of fibre in China.

It is widely known that seeds of modern varieties (MV) of most crops perform better when complemented by associated inputs such as chemical fertilizer. Most jute farmers are aware that use of chemical fertilizers has a positive impact on yield but many are ignorant about how to use this input with maximum efficiency. Many farmers also share a common belief that the prolonged use of chemical fertilizer results in reduction in the inherent soil fertility level, rendering the land unable to produce crops without the application of fertilizer.

Although a host of factors such as physical/biological and institutional (Rawal, 1979) are thought to be exerting influence on the use of chemical fertilizer, the most important factor has been the unfavourable jute/fertilizer price ratio. Farmers, being risk averse, find use of expensive chemical fertilizer too risky a venture at a time when they remain uncertain both about price and yield of the crop in a given season. Announcement and effective executioin through open market operation of remunertive support prices could induce jute farmers towards using fertilizer and, thus, achieve higher yields.

WATER MANAGEMENT

A positive association exists between crop yield and the timely availability of adequate irrigation water. Equally important is the drainage of excess water from the field. Modern varieties of different crops perform better only when supplemented by other allied inputs such as chemical fertilizer and irrigation water. The poor yield of jute in this region can be explained largely by a more or less total absence of application of chemical fertilizer and unavailability of water to irrigate the crop.

Jute in Nepal is entirely grown under rainfed conditions. Irrigation water is available only to about 2500 ha of jute land. Only a few resourceful and progressive farmers irrigate jute land to ensure timely sowing and maturity of the crop and to enable the release of the land for another crop. However, a major chunk of the jute crop grown on upland areas has to depend on rainfall as it does not have easy access to sources of irrigation.

As in Nepal, the entire jute crop in Bangladesh is also grown under rainfed conditions. In India, about 10 percent of the land under jute has access to assured supply of irrigation water. In the absence of irrigation, germinability of seed in these countries suffers badly in years when there is no rain at all between pre-monsoon showers and the onset of the monsoon proper.

Most of the kenaf and jute fields in China have fair access to irrigation water. The ditches or canals on either side of the raised seed beds carry irrigation water as well as help drain away excess water. About 60 percent of jute/kenaf fields are irrigated. Jute farmers in Nepal could learn a lot from water management practices followed by their Chinese counterparts.

PEST AND DISEASE MANAGEMENT

Insects pests negatively affect both yield and fibre quality, likewise, damage by disease organisms results in crop losses or irregular and stunted stands. FAO estimates put overall production losses of jute in Bangladesh, China, India, Nepal and Thailand at 12 percent by insects and 10 percents by diseases. At present, about 15 percent of the jute crop in Bangladesh, India and Nepal is covered by plant protection measures.

Jute in Nepal is attacked by a host of pests and diseases. Although an authentic estimate of production loss as a result of pest and disease attack is not available, crude estimates by JDTC put it at 10 percent of the total.

Insect pests and diseases which infest jute every year in Nepal are:

INSECT PESTS

1. Semilooper
2. Hairy caterpillar
3. Yellow Mite
4. Indigo caterpillar
5. Red mite
6. Stem Weevil
7. Nematode

DISEASES

1. Stem-rot
2. Root-rot
3. Seedling blight
4. Leaf mosaic
5. Soft-rot
6. Die-back

To save the crop from insect pests, spraying of insectides is recommended, while for disease control, seed dressing with fungicides, liming of soil, good drainage, clean cultivation practices, crop rotation and use of copper oxychloride are recommended by JDTC.

In practice, however, jute farmers rarely follow the recommended practices. Only when the crop is badly infested by pest, do farmers spray insecticides once or twice. Ignorance, unavailability at the required time and uneconomical reasons are some of the factors that explain low adoption by farmers of improved management practices to control insect pests and diseases.

Some of the recommended pesticides for controlling pests and diseases of jute are:

A. For leaf eating insects of jute:

1.	Thiodon	35% E.C.
2.	Endrin	20% E.C.
3.	Nuvacron	40% E.C.

B. For Stem Borer:

1.	Thiodon	35% E.C.
2.	Endrin	20% E.C.
3.	Nuvacron	40% E.C.

C. For sucking insects of jute:

1.	Thiodon	35% E.C.

D. Fungicides (for jute seed dressing):

1. Thiram @ 3gm/kg seed
2. Seedtox @ 5gm/kg seed

E. For foliar spraying

1. Bavistin 50% W.P. 0.1%
2. Copper oxychloride 0.75%

Heavy promotion of chemical control methods may not serve the purpose of benefitting a large majority of resource poor farmers. Improved cultural practices, on the other hand, may prove effective as they do not require much cash expenses and are thus more acceptable to farmers.

In Nepal, hand picking of the attacked leaves when the larvae are small and clustered is the only cultural practice adopted by farmers.

Both Bangladesh and India are ahead of Nepal in terms of adoption of cultural practices to control pest and diseases of jute. In Bangladesh, practices such as dragging kerosene soaked rope over the affected plants, hand picking of egg masses, bamboo perching for insectivorous birds, removal and destruction of infested plants and shifting of sowing time beyond April, to control spiral-borer, are recommended and practiced. Similarly, seed treatment, roguing, crop rotation, eradication of alternate hosts and weeds and use of resistant varieties are followed to check jute diseases.

In India, cultural practices recommended to minimize pest and disease attack are:

A. PRE-CROP SEASON

1. Deep ploughing of land 2-3 times and keeping land fallow for atleast 2 days after each ploughing to reduce the population of insects pests and pathogens harboured in the soil.

2. Removal of weeds and other plants, flooding of field in termite and burrowing-cricket affected areas.

3. Amelioration of soil pH with lime and application of potash in potash deficient soil

4. Sowing the tolerant jute variety (JRO-524) in yellow-mite, root-rot and stem-rot affected areas.

B. CROP SEASON

Removal of insect pest and disease damaged plants, removal and destruction of hairy caterpillar infested leaves.

C. POST-CROP SEASON

Removal and destruction of stubbles, removal of "Bon Okra" and other shrubs and bushes in and around the field, which harbour Apion during winter and healthy crop rotation (jute and paddy + paddy or jute + paddy + wheat) for minimization of most of the pests and diseases of jute.

In Thailand, early planting of crop (kenaf) in April or May is recommended to allow the plant to become established and so be less affected during the out-break of pests in June, July and August. For disease control, good drainage, use of the less susceptible variety Non Soong 2 and crop rotation are recommended.

In China, moth killing with light traps and trapping and killing with poison bait are the two cultural practices recommended and widely practiced by the majority of farmers for controlling pests such as Semilooper, Yellow cotton moth and Black cutworm. For disease control, seed treatment, use of resistant varieties and crop rotation are widely practised.

There is, indeed, a need for more research work on integrated pest management strategies to develop a cost-effective and acceptable method of managing insect pests and diseases of jute. Nepal, at the present juncture, is not in a position to take the lead in this area. These kinds of initiatives will have to be definitely taken in other countries and the technical knowhow generated can then be disseminated through the creation of a network mechanism to other countries.

HARVESTING

Jute is harvested after about 120 days after seeding. Sickless are used to cut the plants an inch or two above the ground. Jute harvesting in Nepal begins in July (white) and continues till September (tossa). The harvested plants are left on the field for several days to effect defoliation. The stems, devoid of leaves, are then tied into bundles.

Normally, most crops are harvested when they are mature. In the case of jute, however, it is difficult to tell pricisely when it matures even after flowering. An early harvest leads to reduction in yield, while plants kept too long on the field may produce coarse, brittle and low quality fibre. Experimental data available show that fibre quality and plant age display an inverse relationship. Tossa jute harvested at 90 days produces good quality fibre but inferior quality if harvested at 130 days. However, capsularis varieties, harvested even at 90 days crop age, have not produced good quality fibre (Ghosh,1983).

Farmers, being aware of the positive correlation between age of the plant and fibre yield, tend to harvest jute well beyond 100 days despite the fact that plants harvested at 100 days crop age ret quicker and produce high quality fibre. At the same time, some farmers, pressed with the urgency to meet cash requirements, harvest the plant well before 100 days, which leads to a reduction in yield and deterioration in quality.

The difference in yield between pre-bud, bud and flower stage is too significant to ignore. The industry wants quality fibre, which can be possible only when jute is harvested early (100 days crop age). The jute farmer is also aware that the premium atached to quality fibre hardly compensates for the loss in production as a result of early harvest. In order to achieve a balance between quality and yield, harvesting jute at flowering stage is often recommended.

In the Indo-Bngladesh-Nepal jute belt, no mechanical harvesting of jute is practised. Except in Andra Pradesh State of India where mesta plants are up-rooted, harvesting by sickle is the most common method followed in these countries.

Uprooting of plants by hand is the commonly practised method of harvesting jute/kenaf plants in China. This method is said to have several advantages over the conventional method, cutting of plants at the base. When uprooted, no tap-roots are left in the soil and the soil is loosened and ready for sowing immediately. This type of harvesting requires less labour and helps reduce labour input requirement for land preparation. JDTC may study this method and, if found feasible, may advocate its adoption by Nepalese jute farmers.

RETTING

As far as quality of fibre is concerned, no other single factor is more important than the process of retting. Faulty retting techniques can completely outweigh the positive contribution of other inputs to fibre quality.

Retting is the process of separting fibre from the stem through partial decomposition by immersion in water. A complex enzyme action by microbes present in retting water facilities the retting of stems.

The jute bundles are placed side by side with bottoms facing one direction and two to three layers are placed above the first layer with bottom facing the opposite direction. To avoid the bundles drifting away, they are weighted down with logs, water hyacinths, rice straw and bamboo. Since a jute field produces plants of different sizes which ret at different rates, a bundle should consist of plants of uniform size. This avoids under-retting or over-retting of jute plants.

Retting is best done in clear, slow-flowing water. Tanks, ditches or ponds with a depth of at least 1.8m can be used for retting. The following conditions are a pre-requisite to proper retting and production of quality fibre:

1. The water should not be saline or dirty;

2. The volume of water should be enough to allow the bundle to float;

3. The immersed bundles should not touch the bottom; and

4. The same tank or ditch may not be used repeatedly, specially when the water becomes too dirty.

Abundant availability of retting water is a must for good retting. In Nepal, retting water is unevenly distributed. While abundant clean water is available in the vicinity of the Kosi River and irrigantion canals, the northern part of the jute belt faces a scarcity of retting water.

With the aim of improving retting facilities, JDTC launched the Retting Pond Development Programme (RPDP) in 1979/80. Under RPDP, farmers were broadly categorized, based on their size of land holdings, into four groups and subsidy was granted for construction of retting ponds. The "small farmer" group receiving the highest percentage of subsidy. So far, 4283 retting ponds of different sizes have been constructed under RPDP.

According to information obtained from JDTC, almost 60 percent of total fibre production is retted in ponds and about 25 percent is retted in roadside ditches.

While there is not an immediate need for excavation of more retting ponds in the near future, the ponds already constructed need maintenance. The floors of the ponds have to be covered and lining the sides is essential.

Soil in the jute area of Nepal being rich in iron, the fibre produced is generally of grey colour. Improvement in the condition of retting ponds can help improve the colour of the fibre. In addition, treating stalks of jute with urea prior to retting can improve the colour as it accelerates bacterial action, softens the bark and accelerates decomposition. Use of urea has produced good results in other countries and should be tried in Nepal.

Scarcity of retting water is a common problem faced by farmers in Bangladesh, India and Nepal. Non-availability of land for pond excavation and poor maintenance of constructed ponds have impeded the smooth implementation of the government sponsored programme in Bangladesh and India. Development of a viable ribboner, would contribute towards producing quality fibre at low cost. Such research is being carried out in Bangladesh and India.

Ribonning machines that are capable of producing ribbons in large quantities within a very short time are available. But these machines break the jute sticks, which cannot be used by the growers for various utilitarian purposes. Extraction of fibre from the jute plants by hand ribboning and mechanical ribboning ease the problem of retting water, vastly improves the quality and thus ensures higher returns to the growers. A careful examination of different aspects of ribboning such as commercial viability of the ribboning machines, marketability of broken jute sticks and the possibility of modifying the machine to ribbon jute without breaking the stick, will have to be made. Introducing some mechanization in the hand ribboning technique, a time consuming process, may reduce the labour input requirement and thus tempt farmers into accepting this method.

In Nepal, farmers are aware of the fact that better retting facilities are instrumental in producing quality fibre, which command premium prices in the market. Any method which is economically viable and technically feasible is thus sure to get farmers' acceptance as they are enthusiastic about producing better quality fibre, through improved retting practices, for securing higher prices. JDTC will have to maintain close links with BJRI, JARI and other allied agencies in Bangladesh and India for the development of a suitable ribboning machine/method.

FIBRE EXTRACTION

Fibre extraction is a strenuous job entirely done by hand in Nepal. In most cases skilled labourers from adjoining states of Bihar and West Bengal are hired for this purpose. Two methods of fibre extraction are widely practised in Nepal.

1. SINGLE REED METHOD

The operator takes about 4-5 retted stems of jute from an untied bundle. Starting from the bottom, the fibre of each of the stems is slipped out free from it up to 8-10 cm, then the stems are held together and the fibre is pulled out together slowly from the rest of the stems. When extraction is completed for the whole bundle, the wet strips of fibre are rolled into coils.

2. BEAT-BREAK-JERK-METHOD

In this method the bottom part of a bundle is lifted above water and hit with a mallet to loosen the fibre. The loosened fibre at the broken point are firmly held to shake the bundle vigorously to and fro in the water. The broken sticks slip out and the strips of wet fibre are thoroughly washed.

The single reed method is considered superior in that it gives fibres free from broken sticks because the jute sticks are left intact. This method is becoming increasingly popular in Nepal.

Due to the colour drawback, Nepalese jute is not usually classified into higher grades such as First and Lightings or Dundee Tossa 4 and Outport Tossa 2/3 (Jute Industry of Nepal, 1983). The situation could easily be ameliorated through improvement in retting facilities and methods.

Retting practices followed by jute farmers in Bangladesh and India are the same as those followed in Nepal. In some parts of Bangladesh where there is scarcity of retting water, the fibre (ribbon) is extracted from individual plants directly by hand. While the single reed method is advocated for obtaining quality fibre and keeping intact the sticks, some farmers in Bangladesh and India find it an expensive method as the labour input requirement in this method is much higher than that for beat-break-jerk method. Ribbon retting is at an experimental stage in these countries as a feasible machine has yet to be developed for large scale adoption.

In China, the leaves of harvested plants are removed by hand and the tips of plants (6-10 cm) are broken. Three methods of fibre extraction are followed in China:

1. Retting the whole plant in water;

2. retting the ribbons extracted by hand from green plants; and

3. retting the dry ribbons extracted earlier by hand and stored for a few days.

Methods 1 and 2 are extensively practised for fibre extraction in China. Of late, however, method 2 is gaining popularity as carrying ribbon to the site of retting is easier and the ribbons require less water and time for retting.

Undoubtedly, the RPDP, which subsidised as much as 90 percent of the cost of excavation of small retting ponds in Nepal has contributed immensely towards improving the quality of fibre over time. A lot more, however, is yet to be done to improve the quality of Nepalese jute so that it can meet the standard of jute fibre produced in other countries. Initiation of collaborative research and development activities between Nepal and other major jute producing countries would prove beneficial to all. As compared to fibre quality in other producing countries, Chinese fibre quality(bright, white and dirt-free) is considered superior, which can be attributed to the better retting and stripping process followed by the Chinese farmers. Nepal could benefit herself by sharing Chinese experience in this regard.

Washing of fibre in clean water is equally important to produce quality jute free from gum, dirt, etc. Due to scarcity of clean water, washing is not done and even when done is carried out in the same tank/ponds used for retting. To achieve quality, fibre extracted from stems should be washed well by swinging in clean water until the fibre is devoid of foreign material. Only a few farmers in Bangladesh, India and Nepal strictly adhere to this process. It is only in China that farmers make a point to wash the fibre in clean water.

DRYING

Drying is the final stage in making the produce marketable. In most cases, wet fibre is rinsed overnight. Straight drying gives more strength to the fibre while overnight storage of wet fibre gives better colour to the fibre. It is said that exposure under strong sunlight makes the fibre rough and, therefore, drying under mild sun is advisable to achieve desired results. For drying, the fibre is spread over bamboo rafters to prevent it from getting in contact with dust. However, only a small proportion of jute farmers follow this method. The process of drying may take 2-3 days depending on water.

COST OF PRODUCTION

Different elements that contribute to the total cost of production of jute/ha can be conveniently grouped into two heads: 1) labour costs; and 2) non-labour costs such as expenses incurred by the farm operator on seed, fertilizer and other associated inputs. Of the cost items, the cost of human input is very significant and accounts for a large part of the total cost of jute production.

Among different operations, thinning and weeding requires the highest human input (60 man-days/ha), followed by harvesting and retting (50 man-days/ha) and land prepartion (39 man-days/ha). Both in Bangladesh and India weeding and thinning requires much greater labour inputs than in Nepal. This is a vivid manifestation of the better cultural practices followed by jute farmers in these countries as compared to their counterparts in Nepal (Table 2.2).

Bullock labour is another constitutent of cost as the use of tractors for land preparation is insignificant in the area. The bullock power requirement (animal pair per 8 hours) is estimated at 39 for Nepal, which is not very different from the bullock power requirement in India (46) and Bangladesh (44).

The human inputs mostly comprise the farm operator, his family, hired labour and labour employed on an exchange basis among fellow cultivators. It has also been noticed that farm size and use of hired labour display a positive relationship (Maharjan, Hagnan, 1971).

Slight inter-district variations in the use of different inputs and the resultant costs do exist, but the variations are not significant enough to require separte reporting. The wage rate for human labour differs slightly between operations. A higher rate, for example, is charged for fibre extraction, which requires skilled labourers.

A study (Maharjan, Hagnan) conducted in 1971 estimated the cost of jute cultivation in Nepal at NR 1324/ha and the net return at NR 108/ha. Another estimate (Shrestha, 1972) showed NR 1044 and 509 as the total respective costs of cultivation and profit per ha of jute land. This level of profit may be slightly on the high side, as some of the cost items which must be met irrespective of the production systems have not been included in the estimate.

A comparative analysis, based on JDTC data, of cost of production of jute, early paddy and maize reveals that jute has the highest cost of production and the highest percent of paid-out cost to total cost of cultivation (Table 2.3). While paddy and maize cultivation do not require any skill, certain operations in fibre production such as fibre extraction and retting require some skill on the part of the labourer. This increases the dependence of a jute farmer on hired labour and thereby substantially increases the proportion of paid-out cost to total cost of cultivation.

The JDTC cost items (Table 2.4) do not include imputed costs such as land rental and the level of profit calculated, therefore, does not appear very realistic. Moreover,the product price (NR343/40kg) used to calculate returns is far from what farmers are actually getting for their product during years of normal jute production. A price this high would prevail in the market only in abnormal years such as in 1984/85 when exceptionally low level of jute proudction in the major jute producing countries (Bangladesh, Burma, China, India, Nepal and Thailand) escalated the prices of jute and jute goods both in the national and international market.

In view of the above deficiencies in the cost estimates, the present study makes an attempt to calculate the cost of jute cultivation, taking into account some omitted cost items and a more realistic product price (three years average). The cost estimate is based on information provided by JDTC and interviews with growers and knowledgeable people in the jute growing area.

Gross return/ha is not as high (Table 2.5) as is reported by JDTC, which is basically due to the lower product price used for calculating return in the study. Net return is negative (USD98.49/ha). Jute would give a positive return (about USD3.0/ha) only if the family labour and bullocks, assumed to constitute about 50 percent of their respective total, are not assigned a monetary value. The level of loss would increase if jute sticks are not assigned a monetary value of about USD29.0*.

Among the three jute producing countries (Nepal, India and Bangladesh) cost of cultivation is reported to be the highest in India (USD417/ha), followed by USD390/ha in Bangladesh. As in Nepal, net return is also negative in Bangladesh and India. In Thailand, mesta farmers are incurring a loss of USD40 on every ha of land allocated to mesta cultivation (IJO,1988).

Jute in Nepal is losing its ground as a profitable crop. Except in abnormal years characterized by scarcity of raw jute, farmers do not seem to be receiving remunerative prices for their produce. Moreover, most of the benefit arising out of increased prices during lean years is manipulated by the market intermediaries. Although the support price of jute is announced, financial constraints do not allow JDTC to procure jute on a large scale directly from the growers. Jute farmers in Nepal can break-even only if they receive the announced support price for their produce and only if a downward adjustment of 50 percent is made in calculating costs of human and bullock inputs.

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* Returns from jute sticks are estimated at NRS600/ha in Nepal and slighly higher in India and Bangladesh.

Despite the losses incurred in jute cultivation, farmers still allocate some land to jute every year. A number of factors have contributed to the survival of jute. Some of them are:

When gross returns from jute are examined only against paid-out cost, jute does not appear unremunerative. It should be mentioned that jute farmers, mostly small-holders, do not take into account cost of family labour and other inputs which do not require cost expenditure.

Many jute farmers also believe that jute improves the fertility of soil, whereas continuous cultivation of early paddy is believed to have deleterious effects on the soil.

While cereals produced by subsistence-oriented farmers is consumed domestically, jute is produced for the market and provides a farmer with much needed cash income. Despite the net loss, therefore, a small farmer is compelled to grow some jute every year.

Table - 2.2

Human and Bullock Labour Requirement by Operation in Nepal, Bangladesh and India.

(man-days/ha, bullock-days/ha)

Operations	Bangladesh		India		Nepal	
	Bullock	Human	Bullock	Human	Bullock	Human
Land preparation	44	44	40	53	39	39
Sowing	-	3	6	6	-	3
Fertilizing/ manuring	-	5	-	5	-	3
Thinning and wedding	-	100	-	133	-	60
Harvesting and washing	-	46	-	35	-	30
Drying and storing	-	5	-	5	-	4
Total:	44	258	46	276	39	189

Source: Department of Agriculture Extension (Bangladesh), DJD (India) and JDTC (Nepal).

Table - 2.3

Comparative Analysis of Costs and Returns of Jute, early paddy and maize in Nepal. (in NR).

	Jute	Paddy	Maize
1. Total cost of production	3995	3226	2703
	(189.79)	(153.25)	(128.42)
2. Paid-out cost	2556	1380	485
	(121.44)	(65.57)	(23.04)
3. Proportion of paid-out cost to total cost	64%	43%	18%
4. Average price/40kg	343	86	64
	(16.29)	(4.08)	(3.04)
5. Total return	10894	4431	3340
	(517.53)	(210.48)	(158.66)
6. Net profit	6899	1205	637
	(327.74)	(57.24)	(30.26)
7. Profit on the basis of	8338	3051	2855
paid-out cost	(396.10)	(144.94)	(135.63)

Source: JDTC

Figures in brackets are equivalents in USD

Exchange rate: 1 USD = NR 21.05

Table - 2.4

JDTC Estimate of Cost of Jute Cultivation (NR/ha)

Items of cost		Expenses incurred
1. Seed	....	132 (6.28)
2. Compost	....	507 (24.09)
3. Land preparation	....	845 (40.14)
4. Weeding	....	529 (25.14)
5. Harvesting	....	848 (40.29)
6. Other expenses (drying, steeping, land tax, etc.	....	514.5 (24.44)
Total Cost	....	3992 (189.64)
Gross return (1.23mt/haxNR354.30/40kg)		10894 (517.53)
Net Profit (10894 - 3992)		6902 (327.88)

Figures in brackets are corresponding amounts in USD

Exchange rate: 1 USD = NR 21.05

Table : 2.5

Estimated Average Cost of Production of Jute per ha in Nepal

A. Operational Cost			
Human labour		Value	(NRS)
1. Land preparation	...	702	(33.35)
2. Sowing	...	54	(2.56)
3. Fertilizing/manuring	...	54	(2.56)
4. Weeding/thinning	...	1080	(51.31)
5. Harvesting/retting	...	900	(42.75)
6. Extracting/washing	...	540	(25.65)
7. Drying and storing	...	72	(3.42)
8. Bullock labour	...	780	(37.05)
Sub-total	...	4182	(198.65)
B. Other paid-out cost			
1. Seed	...	145	(6.89)
2. Fertilizer/manure	...	628	(29.83)
3. Pesticides	...	38	(1.80)
4. Land revenue	...	28	(1.33)
Sub-total	...	839	(39.85)
C. Imputed cost			
1. Interest on cash investment	...	92	(4.37)
2. Rental value of owned land	...	800	(38.00)
3. Miscellaneous charges	...	90	(4.27)
Sub-total	...	982	(46.64)
TOTAL COST (A+B+C)	...	6003	(285.14)
D. Gross return			
1. Main produce	...	3950	(186.65)
2. By-product (sticks)	...	600	(29.00)
E. NET RETURN	...	-1453	(-69.49

Source: Data collected from JDTC and other sources.
Figures in brackets represent corresponding amount in USD
Exchange rate: 1 USD = MRS 21.05

V

ANALYSIS OF JUTE SUPPLY RESPONSE

INTRODUCTION

This chapter is devoted to an indepth analysis of jute supply response in Nepal. Econometric techniques have been used to estimate two behavioural equations (1) acreage, and (2) Yield. Time series data (1970/71-1985/86) were used for estimating the equations. Paucity of systematically recorded data for an extended period left us with no choice but to base our analysis on this limited set of data with some advantage of having no serious problems for price conceptualization.

The nature of commodity supply is much more diverse than the nature of commodity demand. Broadly, commodities can be grouped under four categories that reflect different conditions surrounding their production: (1) commodities of regular supply such as those which are mined or forested; (2) commodities which are characterized by annual fluctuation in supply such as vegetables or cereals; (3) commodities whose supply originates from perennial crops such as cocoa or coffee; and (4) commodities whose supply fluctuates cyclically such as hogs and cattle.

As far as the question of an agricultural commodity is concerned, its supply rests on the mico-relationships within agriculture. However, the production of a commodity by a farmer and the factor inputs to be used by him during any specified period of time are influenced by a number of elements such as (1) farmers' economic goals; (2) capital position; (3) investment in fixed inputs; (4) price expectation; and (5) risk aversion. The important supply information that would facilitate formulation of national agricultural policies must come in micro form. Novertheless, an analysis of individual relationships and decisions are needed for understanding the supply phenomenon.

Theoretically, the supply function of a commodity can be obtained by three methods: (1) production function approach; (2) budgeting and programming technique; (3) regression analysis of the time series data on supply (Heady,1961). The presence of uncertainty in regard to so many variables, nonmonetary goals and other measurement difficulties make derivation of supply function through the production function approach a difficult task. The second approach referred to earlier also requires the pure goal of profit maximization and perfect knowledge with regard to production and price parameters (Adams, Behrman, 1976). The third approach, however, is not based on the assumption of profit maximization or the knowldge of production function. The important object here is to specify the variables that are expected to exert influence on farmer's decision to produce a particular output. As far as perdicting the future time path of some variable is concerned, estimate based on past response can be taken as adequate, provided the exogenous variables and their relationship with the dependent variable follow the same pattern in the future as they did in the past. The choice of these explanatory variables and their quantification, however, have always been a difficult job. Moreover, it may not always be desirable to extrapolate past trends into the future. This kind of analysis is tied to the past and is a reflection of historic relationship. Since production decisions are made at the farm level, estimation of aggregate supply function itself involves translation from micro to approximately equivalent macro relationships. Another problem associated with the estimation of aggregate supply model is the necessity of confining to a few explanatory variables due basically to limited number of observations.

In the backdrop of the above, time series data have been used in the present study to estimate the supply function as this technique is believed to have an edge over the programming budgeting technique and the production function approach.

THEORETICAL FRAMEWORK

Although no proper econometric work on jute acreage response has been carried out in Nepal, in the last couple of decades a number of emperical investigations have been made into the responsiveness of jute producers in India, Bangladesh and elsehwere. Most of these studies conducted along the line of Nerlove's adoptive expectation model have recognized the price responsiveness of jute farmers, although the magnitude of price responsiveness has been found to be varying both among countries and over time.

In line with Nerlove's formulation, the present research aims at ascertaining the influence exerted by various explanatory variables on the planned production of jute. Since no time series information of jute in Nepal is readily available, a proxy variable to adequately reflect this variable has to be taken into account. Several options have to be carefully looked into.

Actual production of jute may be taken as the dependent variable. However, inclusion of this variable may result in misleading results as actual production sometimes may significantly vary from planned production due to factors which are external to the grower and beyond his control. Another alternative which has been extensively used by researchers in estimating supply response of jute is the area under jute. The actual area under a crop is thought to be under greater control of the grower than actual production and, therefore, is considered a better proxy for planned production. Therefore, on the assumption that farmers have control over area, the planned acreage under jute cultivation can be assumed to be equal to the actual area under jute. It can also be expected that the elasticities calculated from the model using area under jute cultivation as the dependent variable will be close to the desired elasticities of planned production. The annual actual acreage under jute, therefore, has been chosen as the dependent (proxy) variable.

EXPLANATORY VARIABLES

A proper estimation of the desired relationship involves a number of steps such as specification of the model and a systematic quantification of both dependent and independent variables. Having resolved the question of dependent variable, the discussion now concentrates on different explanatory variables that are believed to fit well in a supply model. These variables believed to influence supply of an agricultural commodity fall under five broad heads (1) economic; (2) ecological; (3) technological; (4) institutional; and (5) uncertainty [Labys, 1973].

Jute in Nepal is grown in the area which is also a predominantly rice growing area and jute competes with rice for acreage. In the jute belt of Nepal, early paddy (Bhadiya) is the main competitive crop as the growing period of these two crops coincide. Late paddy competes with jute in an indirect way as jute farmers do not hesitate to harvest the crop (jute) a bit early, which results in yield reduction, to facilitate cultivation of transplant (late) paddy within July. So as to ensure cultivation of late paddy, farmers in some cases do not grow jute prior to rice on the same plot of land. In Nepal, rice can be grown on all land where jute is grown. The competition between rice and jute for land is a widely observed phenomenon in the Indo-Bangla-Nepal jute belt. Unlike in India and Bangladesh, there is no hard core jute land on which rice cannot be grown. From this angel, therefore, the competition between jute and rice for land can be considered to be more severe in Nepal than the other two countries.*

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* In the jute growing areas of Nepal, area under rice has increased more rapidly than the area planted with jute. In the three major jute growing districts (Morang, Sunsari and Jhapa) area allocated to rice has increased by about 100 thousand ha during 1970/71 - 1985/86. With the increase in irrigation facilities a further diversion of jute acreage to paddy cultivation is apprehended.

In recent years, maize is also emerging as one of the competitors of jute. Maize cultivation is gaining popularity in the jute belt of Nepal especially with the influx into these pockets of people from the adjoining hill districts who, being involved in subsistence farming, attach great importance to cereal cultivatin.* However, if a choice has to be made between rice and maize as a substitute crop to be pluged into the supply model, rice certainly merits prime attention. A study (ESCAP, 1986) also finds maize as not being that effective a substitute of jute. It is true that a large number of indigenous Terai dwellers attach very little importance to maize cultivation. In view of this reality and also considering the fact that number of parameters to be estimated relative to sample size is an important consideration in time series analysis, price of coarse rice which is grown and consumed by jute farmers, most of whom are small-holders, is taken into account.

The preceding discussion has adequately reflected the fact that in Nepal rice is practically the only alternative to jute cultivation. Moreover, the cultivation practices of the two crops are so similar that the resources required for their production are easily interchangeable. In fact for most farmers the cultivation of jute is primarily a choice between a cash crop and the staple food crop (Mujeri, 1978). In the jute growing belt of Nepal, rice prices to a large extent explain the opportunity cost for jute production. When a cultivatior is given a choice between rice and jute, the price expected by him for each of them is expected to influence his

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* In the three major jute growing districts, area under maize cultivation has increased from 8300ha in 1970/71 to 1400ha in 1985/86.

decision regarding allocation of acreage to the respective crops. A cultivator is believed to have a wide range of production possibilities and his choice of combination of the area devoted to rice and to jute will be influenced by his assessment of the probabilities of different price situation. Acreage under jute in a particular year is influenced by the prices of rice and jute in the preceding year (Rabbani,1965).

A lagged jute rice ratio has often been used in jute acreage response model, to reflect the competition between rice and jute (Rahman, 1982). The assertion in this regard is that the acreage under jute and jute rice price ratio possess a positive relationship. While the exact size of the ratio required in any given year to maintain the area under jute in equilibrium with that under rice will be determined by costs of production and yields of the two crops, a close relationship between changing jute-rice price ratio and fluctuating acreage under jute can be observed.

The price responsiveness of jute farmers has been recognized for a very long time (Sinha,Guhathak,1934). It is also argued that a correct specification of the acreage function should include the price of rice separately as it is a separate influence. This logic requires inclusion into the suppply model of rice and jute prices as two separate variables rather than as a single variable in the form of price ratio. The argument in favour of price ratio, however, suggests that such a formulation saves one degree of freedom and also solves the problem of finding a suitable deflator. The use of jute-rice price ratio as a single independent variable rather than the prices of two crops separately is based on the hypothesis that the effect on jute acreage of a percentage change in the price of rice is the same as that of an equal change in the price of jute. Morever, it assumes that absolute level of jute and rice prices are unimportant. It is, however, not realistic to force any conclusion prior to a proper analysis of data. It is, however, certain that analysis carried out in the framework of the Nerlove adaptive expectation model have found jute producers to be strongly reacting to changing observed, or real or relative price of jute (World Bank, 1980).

It should be mentioned here that while the analysis of historical relationship between jute area and jute-rice prices are important, any estimation of the jute supply model should consider the relative costs of production and yield to get some idea of net returns.

In a supply model, the cost of production of a crop should also find an adequate place. However, lack of time series data on cost of jute cultivation does not permit the inclusion of this variable in the supply model to be estimated for Nepal. It is understandable that costs of production of both jute and rice have increased over time, but the difference in the costs of production of jute and rice under traditional method of cultivation, which is widely prevalent in Nepal, is believed to be not significantly different and, therefore, the expected price of the crops can be considered as depicting fairly net returns. In the emperical estimation of the supply response function, the ratio of jute yield to rice yield lagged one year is used as a proxy for expected relative yield.

The problem regarding inclusion of prices of inputs and competing products in a commodity model has always been a difficult issue to resolve. Various alternative such as whether to include individual prices or indexes involving several commodities and whether to include prices linearly or in a nonlinear manner need a careful treatment. It should, however, not be forgetten that prices of more than one competing product may create the problem of multicollinearity in addition to the inherent problem of degrees of freedom associated with supply model based on a limited number of observations. A large number of studies done in India (Basil,1971) and Bangladesh have, therefore, used a lagged jute rice price ratio as the explanatory variable. As stated earlier, this kind of formulation not only saves one degree of freedom but also serves as a deflator in the supply model. It should be mentioned here that in the jute growing areas of Nepal, which are predominantly rural, expenses incurred by a family on rice account for a large proportion of the total household expenditures and, thus, can be taken as a cost of living index, which is often used as a proxy for cost of production index (a better deflator in a supply response model) when information on it is not available.

It is also argued that any change in jute-fertilizer price ratio is bound to influence the acreage under jute (APROSC, 1981). This assertion is probably made on the belief that a considerable amount of chemical fertilizers is applied to jute. It should be noted that jute growers do not find use of fertilizers a feasible proposition at a time when returns from the crop are in decline.* Moreover, jute farmers, most of whom are small holders, find FYM a better substitute for cash requiring chemical fertilizers.

As stated earlier, a lot of quantitative work on jute acreage response has been done in Bangladesh and India. The models estimated are either simple cobweb or adaptive expectations type. A major drawback of these supply model is that risk has not been included in analysing producer behaviour. A few studies such as Mujere (1979), IBRD (1978), Ahmed (1980) and Rahman (1981), however, have included producer's responsiveness to changing risk. The uncertainty in regard to yield and output prices are likely to influence acreage allocated to a particular crop. Variability in both yield and price influences farm-level decision making. It is argued that in subsistence economies where the penalty for realized value below expected values is extremely severe, the possible reward for returns above expected values in most cases cannot compensate for the financial disaster in the event of returns below expected values (Falcon, 1962). Since jute competes with rice, the staple crop in Neapl, the penalty is likely to be even worse. As proxy variably are intended to be included to represent risk in the supply model, different approaches, mainly two, to risk are briefly discussed.

Defining risk is more than a sematic problem (Roumasset, 1976). The question of how to model decision making under uncertainty relies heavily on its definition. Researchers at different period

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* Except in years charactrized by acute scarcity of raw fibre, jute farmers often get so low prices that it is hard for them to break-even (See Table-2.5).

of time have treated risk in several ways. Behrman (1958) included both price and yield risk in acreage response model. Just (1974) came up with a slightly modified approach to risk. While Behrman used respective moving standard deviations of yield and price to measure the risk factor, just postulated a theory for the subjective evaluation of the mean squared error of adaptive expectations. His framework for the subjective variance is similar to that of expected price formation. In the adaptive expectations model, values of all expected uncertain variables are assumed to be a geometric lag of past values. In our model, the vector of uncertain variables include price and yield variables. Just further postulated that expectations for risk are formed by geometrically weighting past observations on risk. Behrman's moving standard deviation of price and yield are based on three previous years. The basic model used by both is the same, the only difference being in the manner in which the distribution of weighting parameters are postulated. Since Just's approach is not significantly different from Behrman's and the former approach being computationally difficult, the latter's approach is widely used in analysis of supply response. For example, both Mujeri and Rahman in their treatment of risk factor relied on Behrman's approach. The only difference in their appraoch is that while Mujeri used a moving standard deviation based on three preceding years, Rahman measured price and yield risk as the moving standard deviation of the previous seven years' prices and yield. Despite commputational complexity, some studies (Ahmed, 1980 and Anderson et al, 1980) have relied on Just's approach in their treatment of risk. For example, Ahmed (1980) in his work included risk factor by way of adding the second moment (variance) of the explanatory variables to the first moment (expected value) that features in the adaptive expectation model. In his model, first moment or subjective expected value of farmgate jute and rice prices depend upon fixed adjustment parameters and have been regarded as geometrically weighted sums of past observations on variables, price of jute and price of rice, respectively. Despite differences in computational technique, all the studies referred to earlier assume that farmers are risk averse and it is felt that larger the variance of jute price the more reluctant the farmers would become in cultivating jute instead of rice. In the present study, however, limited sample data has forced the researcher to use the moving standard deviation of the ratio of previous three years' jute/rice acreage.

Weather variation and extent of irrigation could be other two explanatory variables in acreage response equation (Akiyama, 1985). Changes in the weather affect jute acreage in two main ways (1) water availability during sowing time, (2) and damage caused by flood at a later stage. Timely occurence of rain in adequate quantity has special significance in a country like Nepal where the entire jute crop is grown under rainfed conditions. Although it is a well known fact that inadequate rainfall during the sowing time adversely affects both yield and acreage, lack of time series data on the amount and distribution pattern of rainfall acts as an obstacle to an analysis of the impact of weather on jute production. Likewise, there is no recorded information on the extent of crop damage by flood. It is, therefore, not possible to include these variables as reliable and continuous information on these are not available. Similarly, input prices and technology will be ignored due to lack of information. These variables can be excluded on the assumption that jute is still grown using traditional methods of cultivation and no technological breakthrough in jute agriculture has taken place in Nepal. However, to account for changes in technology and other institutional factors such as better irrigation facilities and availability of institutional credit, a time variable may be used. The inclusion of this variable is expected to account for shifting effects not adequately accounted for by other variables in the equation.

FORMULATION OF ACREAGE RESPONSE FUNCTION

Acreage reponse model in jute can have the following form

$$A_t^* = \alpha_0 + \alpha_1 P_t^* + \alpha_2 Z_t \qquad (1)$$

Where :

A_t^* = desired acreage at time t

P_t^* = expected price level at time t

Z_t = a surrogate for non-price variables, and

0... 2 = the parameters to be estimated

The conventinal short run supply model assumes that farmers fully adjust to the intended acreage each year as per the price of the crop in the preceding year. According to this assumption, therefore, $A_t* = At$ (actual area under the crop) and $P_t* = P_{t-1}$(price of the crop in the preceding year). It is, however, argued that this model fails to adequately explain farmers' supply response as the very assumption that $P_t* = Pt$ is far from reality. Prices of farm product fluctuate significantly from year to year around a long term trend. Growers' expectations of future prices are likely to be influenced not just by immediate past prices but a number of years' price. Moreover, farming being characterized by "asset fixity" on the input side, growers cannot easily adjust to price changes in the short run (Day, 1961). It may also be argued, howerver, that the problem of "asset fixity" may not be that serious in a country like Nepal where inputs and other resources are readily interchangeable between rice and jute. In this context, therefore, it may not be that unrealistic to assume that farmers fully adjust their jute area each year to the intended level.

When only the price variable is taken into account and A_t* is assumed to be equal to A_t, equation (1) can be expressed as the general distributed lag model of the following form:

$$A_t = \sum_{S=O}^{k} \phi \; P_t-s-1 \qquad (2)$$

Where $\phi = \sum_{i=1}^{n} \alpha i$

It should be noted, however, that estimation problems require restricting the lag distribution (Dhrymes, 1971).

Nerlove, using the notion of adaptive expectations, highlighted that current expected price differs from the past expected price by an amount proportional to the previous forecast error. This means the difference in prices of jute expected in period t and t-1, which is the revision of last year's expected price, is proportional to the error made in forecasting last season's (t-1) price. In the form of an equation this would look like

$$P_t^* - P_{t-1}^* = B\,[P_{t-1} - P_{t-1}^*] \qquad (3)$$

B in equation (3) is the "coefficient to expectations". The expected price relationship embodies the hypothesis that each year growers revise their notion of "normal" price. If B is found to be equal to 0, then the actual value of past prices have no effect on expected prices, whereas if B=1, then the actual value of price in year t-1 is projected as the forecast price in year t, which would mean that expectations are "naive".

Assuming $A_t^* = A_t$. equation (3) can be substituted in equation (1) to get a model of the following form:

$$A_t = \alpha 0 B + \alpha 1\, B P_{t-1} + (1-B)\, A_{t-1} + \alpha 2\, Zt + (B-1)\, \alpha 2\, Zt-1 \quad (4)$$

or,

$$A_t = AO + a1\, P_{t-1} + a2\, A_{t-1} + a3\, Zt + a4\, Zt-1 \qquad (5)$$

It should be noted here that equation (5) allows simultaneous estimate for both short run and the long run prices elasticities of supply. Equation (5) is derived on the assumption that $At^{*} = At$. However, the underlying assumption that jute growers adjust their jute acreage each year to their desired level may not always hold good. It is, therefore, essential to build into the acreage equation the essential dynamic aspect that the growers cannot adjust the area under jute in the short run in response to varying economic conditions. In line with this argument, this study aims at testing the lagged adjustment hypothesis in acreage response function. This hypothesis is chosen basically on the ground that it may be difficult for growers to fully adjust acreage in the short run, more so because the competing crop (rice) is the main staple whose acreage is not that sensitive, atleast in the short run, to changes in its own price. Therefore, it can be very logically argued that the jute growers can increase the area under the crop in any given year only to the extent of a fraction of the difference between the area they would like to plant and the acreage they actually planted in the preceding year. The adjustment lag in the form of an equation may be specified as

$$A_t - A_{t-1} = [A_t^* - At-1], \quad 0 \angle \lambda \angle 1 \qquad (6)$$

(a constant) in the above equation is an indication of the rate with which actual acreage adjusts in response to factors influencing desired acreage. The "coefficient of adjustment" (λ) is influenced by the institutional, behavioural and technological rigidities.

Assuming $P_t^* = P_{t-1}$ and substituting equation (6) into equation (1), a model similar to the adaptive expectation model (equation 5) can be obtained, with Z_{t-1} excluded. This is known as the partial adjustment model. Such a model, with Z_t and Z_{t-1} excluded, is open to dual interpretation, depending on whether it is assumed that $0 \leq B \leq 1$ and $A_t^* = A_t$, so that $\lambda = 1$ (adaptive expectations), or $0 \leq \lambda \leq 1$ and $P_t^* = P_{t-1}$, so that B=1 (partial adjustment) (Mujeri, 1978).

As far as partial adjustment model is concerned, other forms of price expectations, besides the "naive" expectations are also considered. For example, Goodwin (1948) used a one year lag between expectation formation and the realization of actual prices. According to this formulation, expected price is determined by previous actual price plus or minus a fraction of the previous price change.

Equationally

$$P_t^* = P_{t-1} + [P_{t-1} - P_{t-2}],\ -1 \leq \nu \leq 1 \qquad (7)$$

Assuming $\Delta P_{t-1} = P_{t-1} - P_{t-2}$ and substituting equations (7) and (6) into equation (1), the following model will result.

$$At = \lambda\alpha_0 + (1-\lambda)\, At\text{-}1 + \lambda\alpha_1\, Pt\text{-}1 + \lambda\alpha_1 \nu \Delta\, Pt\text{-}1 + \lambda\alpha_2\, Zt \qquad (8)$$

It should be noted that $\nu=0$ in equation (8) would yield the case of naive expectation, while $\nu=1$ would mean that the price change in year t-1 is extrapolated, unadjusted to the present. It should, however, be mentioned that the limited length of time series data restricts us to a few simple formulations. In view of this reality, therefore, model (5) is chosen to form the basis of the estimated acreage equation of jute for Nepal.

Model (5) continues to be widely used in estimating acreage response equation. The wide adoption of this model is attributed to the simple estimation technique, i.e. ordinary least squares (OLS), which is used to estimate the model. It has, however, some built-in estimating problems. This is because the model contains a lagged dependent variable as an explanatory variable and the error term is likely to be autocorrelated.

Significant coefficient are usually obtained by introducing the irrelevant variable (A_{t-1}) with reduced serial correlation in the estimated residuals of the equation. This may be due to A_{t-1} acting as a surrogate for the disturbance. Therefore, estimated coefficient of A_{t-1} may be significant and positive even though the model is wrongly specified. Moreover, the Durbin-Watson (DW) test for serial correlation is considered inappropriate for models containing a lagged dependent variable as an explanatory variable on the right hand side.

Due to simple estimating technique involved, reliance is placed on OLS method for estimating supply equations and the question of estimating the models by another procedure would arise only when DW statistic is found to be exceptionally high or low. Moreover, it should be noted that OLS may remain a consistent (robust) estimator in small sample situation and use of more elaborate estimators may not be required (Dhrymes, 1971).

ESTIMATED ACREAGE EQUATIONS

The choice of other exogenous variables, besides prices of jute and rice, is a difficult task. Moreover, due to data limitations and multicollinearity problems, it is impossible to use too many variables in estimating jute acreage equation. Therefore, it has been endeavoured to include conceptually reasonable variables in the model. Thus, the desired acreage equation (1) is respecified to include yield levels, time trend and risk factors in addition to price variables as follows:

$$A_t{}^* = \alpha 0 + \alpha 1\ P_t{}^* + \alpha 2\ RY^* + \alpha 3av + \alpha 4T + \quad Ut \qquad (9)$$

A number of equations with different combination of variables have been estimated. The price variable ($P_t{}^*$) has been used both in the form of a ratio (jute/paddy) and as two separate influences. The relative yield (jute yield/rice yield) lagged one year has been used as the expected yield rate i.e. $RY_t{}^* = RY_{t-1}$. The coefficient of this variable is expected to have a positive sign as increase in the expected yield (RY^*), assuming other variables to remain constant, would tempt growers to allocate more area to jute cultivation. The actual standard deviation of the ratios of jute/rice acres in the preceding three years is included to take care (proxy) of the subjective probability distribution. The coefficient of this parameter is expected to be negative as increased standard deviation would make jute cultivation less attractive to risk averse farmers. A time trend variable (T) is included to capture the effect of variables such as technological and institutional changes not accounted for by other independent variables.

Inclusion of a dummy variable to show the effect of government policies on acreage was seriously considered. This idea, however, was dropped on the ground that the minimum support prices periodically fixed are not effectively executed, due to lack of adequate funds with JDTC, to cause any significant distortion in market price signals.*

Several supply response equations, both linear and log linear, were estimated. Since a number of equations were found unsatisfactory in terms of their explanatory power, only those showing a good fit and those considered relevant from the standpoint of interpretation of results have been reported. Acreage response functions with national acreage data as well as jute area in the three major jute growing districts (Jhapa, Morang and Sunsari) as separate dependent variables were estimated.

* The JDTC constrained by financial and other physical facilities, finds it difficult to execute the mandatory support price programme through open market operations during the years of bumber corp.

NATIONAL LEVEL

$$(1.1)\quad A_t = \underset{(-.27)}{-6738.3} + \underset{(3.11)}{264.23\ PJB_{-1}} - \underset{(-.11)}{36.25\ PR_{-1}} + \underset{(1.94)}{45683.8\ JRY_{-1}}$$

$\bar{R}^2$ = .41

DW = .96

F = (3.11) = 4.21

Equation (1) was estimated without lagged acreage as an explanatory variable. Other dependent variables used include (1) lagged price of jute (PJB), during the months of Bhadra/Aswin (September/October), deflated by the consumer price index, (2) lagged price of rice (PR) deflated by the consumer price index, and (3) lagged jute/rice yield ratio (JRY).

Although the signs on all estimated coefficients conform to a prior expactation, in terms of overall fitness, equation (1) could not be considered a robust one. Therefore, another equation (2) was estimated with lagged acreage appearing as an explanatory variable.

$$(2.1)\quad A_t = \underset{(-1.02)}{-17165} + \underset{(5.11)}{289.80\ PJB_{-1}} - \underset{(-1.711)}{416.86\ PR_{-1}} + \underset{(3.02)}{47186.4\ JRY_{-1}}$$

$$+ \underset{(3.88)}{At_{-1}.58}$$

$\bar{R}^2$ = .74 F(4,10) = 10.96

DW = 2.71

Figures in brackets in the above and the following equations represent t-statistics.

Expectedly, the explanatory power of the model increased substantially with the inclusion of lagged acreage as an explanatory variable. Lagged price of jute and lagged jute/rice yield were found to be statistically significant and with expected signs. The statistically significant coefficient and the sign on the lagged rice price variable showed the existence of an inverse relationship between jute acreage and rice prices, i.e. higher the rice prices lower the area allocated to jute.

One more model, with time trend (T) included as one of the independent variables, was specified, the estimation of which resulted in the following equation.

$$(3.1)\ A_t = \underset{(.51)}{14309} + \underset{(5.19)}{283.04}\ PJB_{-1} - \underset{(-2.22)}{788.56}\ PR_{-1} + \underset{(2.52)}{39957.6}\ JRY_{-1} + \underset{(3.23)}{.50}\ A_{t-1} - \underset{(-1.39)}{873.45}\ T$$

$$\bar{R}^2 = .76$$

$$DW = 2.78$$

$$F\ (5,9) = 9.96$$

With the inclusion of the time trend variable (T), the fitness of the model improves slightly. The signs of the explanatory variables remained the same and the coefficients were statistically significant. The constant term had a positive sign on it, but was statistically insignificant. The negative secular trent (T) signifies absence of any technological advancement in jute agriculture.

To have an idea about the risk aversion behaviour of jute growers, a risk variable (SD) was included and equation (4.1) estimated

$$(4.1)\ At = -13345 + 284.15\ PJB_{-1} - 470.04\ PR_{-1} + 43867.9\ JRY_{-1}$$
$$(-.50)\quad (3.27)\qquad (-1.52)\qquad (2.41)$$
$$-\ 10443\ SD + .6166\ At_{-1}$$
$$(-067)\qquad (3.42)$$

$\bar{R}^2 = .69$

$DW = 2.60$

$F(5,7) = 6.49$

Although the risk variable came out with an expected sign, it was statistically insiginficant. The trend variable was dropped because of suspected high multi-collinearity between it and other exogenous variables in the equation. The overall fitness of the model was also not satisfactory compared to equation (3.1). The lagged jute and rice prices as two separate influences were included as they proved to be exerting more influence on jute acreage than the lagged jute/rice price ratio.

DISTRICT LEVEL

As stated earlier, the three districts - Morang, Sunsari and Jhapa - account for a major portion of total jute production in Nepal. In fact in the event of nonavailability of reliable national level jute acreage figures, the jute area in these three district could proxy for the aggregate (national) data. To have a comparative analysis, therefore, jute acreage functions for the three districts have been estimated.

The possibility of estimating district specific acreage response function was also looked into, but was not found feasible. In Nepal, district specific acreage data are available, but recorded yield and price data are not available. When each district is faced with the same price, the district specific response function can easily be aggregated into one estimate. Therefore, response functions for the country as a whole and for the three districts together were considered instead of disaggregated acreage response estimates.

$$(5.1)\quad A_t = \underset{(.58)}{12910} + \underset{(5.75)}{252.40\ PJB_{-1}} - \underset{(-2.87)}{810.42\ PR_{-1}} + \underset{(3.07)}{38435.10\ JRY_{-1}}$$

$$\underset{(4.62)}{.59\ At_{-1}} - \underset{(-1.63)}{810.99\ T}$$

$\bar{R}^2 = .82$

$DW = 2.45$

$F(5,9) = 13.89$

Equation (5.1) is an improvement over equation (3.1) both in terms of overall fitness of the model and the statistical significance of various explanatory variables. The logical explanation behind improved fitness of the model could be that jute being a major cash crop in the three districts the acreage is more sensitive to changing economic and noneconomic factors than the national level acreage.

Model(5.1) was further modified by including a risk variable(SD) and dropping the time trend(T).

$$(6.1)\ A_t = -\ 18086 + 280.94\ PJB_{-1} - 401\ PR_1 + 40897.6\ JRY_{-1}$$
$$(-.52) \qquad (3.69) \qquad (-1.54) \qquad (2.63)$$

$$-\ 2555.20\ SD + .70\ A_{t-1}$$
$$(-.02) \qquad (4.45)$$

$\bar{R}^2 = .76$

$DW = 2.24$

$F(5,7) = 8.48$

From the standpoint of overall fitness of the model and the significance of other independent variables equation (3.1) and equation (5.1) should be chosen as the best approximation of the true acreage response behaviour at the national and district (three districts) level, respectively. These two equations are the emperical counterpart of equation (5) derived theoretically earlier. All estimated coefficients of the equations were significant at 1 percent and less error probability level. Our interpretation of the result is in terms of adaptive price expectation model that results in partial adjustments. The presence of naive expectations in acreage allocation may be seen as the growers' inability to learn from experience. Another pertinent explanation of the price cobweb is a lack of information machinery to disseminate market (price) information at the time of sowing. Farmers have no way of knowing the market conditions expected to prevail during the crop year. In the absence of such information to form expectations, a grower has no choice but to take the preceding season's price as an approximation for the next year's price. The significantly positive coefficient on lagged jute price (September/ October) variable conform the prior expectation that the jute farmers in Nepal, most of whom are small holders, sell their produce immediately after harvest and therefore, are more sensitive to this price than the annual average jute price or the relative price. It should be noted that as most of the jute growers do not have the capacity to retain their produce, they sell their produce soon after harvest to meet immediate cash requirements. The risk aversion behaviour of the growers was quite in accordance with the theory(6.1). The coefficient, however, was statistically insignificant. This may be because a proper representation of the risk variable may not have been made as risk was measured as a moving standard deviation of the past three years jute/rice acreage ratios and the sample size was too small. Price of rice (equation 3.1) has a negative influence on jute acreage. The estimated short run and long run cross elasticities of jute acreage to the price of rice are -0.88 and -1.76 respectively. Acreage elasticity with respect to its own price is calculated at 0.48 (short run) and 0.96 (long run). The own price elasticity implied by equation (3.1) compares favourably with other econometric estimates. Ahmed (1980) found long run price elasticity of jute acreage with respect to its own price in Bangladesh to be 1.57 while Mujeri (1978) and Rahman (1981) found the short run elasticities to be 0.37 and 0.31, respectively. The negative coefficient of the time trend variable and the statistically insignificant intercept are an indication of declining acreage and more or less stagnant state of technology in jute agriculture. This coroborates the hypothesis that no technological breakthrough in jute agriculture has taken place in Nepal.

Except in one case (equation 1.1) whose D.W. statistics falls in the inconclusive region auto correlation problem was not encountered. Reestimation of the equation by the Cochrane - Orcutt iterative procedure did not produce conclusive results. The original equation was, therefore, kept intact. The estimated coefficients of adjustment values of 0.50 (equation (3.1) and 0.41 (equation 5.1) show rigidities in the relationship. While significant lags are found, the lag is relatively shorter in Nepal as compared to Bangladesh. This may be because in Nepal there are no hard core jute land where rice cannot be grown and farmers, therefore, respond fairly quickly in response to changing exogenous factors. In conformity with lagged adjustment hypothesis, Mujeri calculated coefficients of adjustment at 0.43 and 0.45 for two separate models, while Rahman (1981), quite interestingly, found complete adjustment (0.95) within a year. These significantly different findings may be attributed to slightly different technique of estimates used by the two researchers. It should, however, be noted that in Bangladesh where there are hard core jute land and where jute cultivation has become a traditional way of life, the adjustment lag is bound to be relatively longer than in Nepal.

ANALYSIS OF YIELD BEHAVIOUR

Yield response function for jute provides an important link in the supply model. It has been argued that separate modelling of acreage and yield is the best specification of a risky supply function (Hazell and Scandizzo, 1977). In addition, it is equally important to model yield separately when it is found to be unresponsive to economic factors, which leads to a case where elasticity of supply is nothing but acreage elasticity with respect to price.

Crop yield is generally expected to be influenced by weather and use of inputs in addition to price of the crop. As stated earlier, use of modern inputs such as chemical fertilizers, pesticides, etc. to jute is almost nonexistent in Nepal. Moreover, time series data on crop-wise application of fertilizers are not available. The yield rate, therefore, is subject to weather induced random fluctuations. Although very relevant in the analysis of yield behaviour, the weather related variables are difficult to quantify.

Yield per ha of jute is defined to be a linear function of the following form

$$YJ = a_o + b_2 \; At + C_2T + d_2T^2 + ut \qquad (7.1)$$

As stated earlier, weather may be an important variable in explaining yield, but a suitable proxy for it could not be used due to lack of information on important factors that could together represent weather conditions over time. Information on amount and timing of the rainfall and the amount of sunshine, required to construct a comprehensive weather index, is not available. The acreage variable is introduced to test the hypothesis that yield/ha tends to rise when area under the crop is reduced, because only the most productive land is brought under cultivation, which can be better managed by the farm family.

The inlclusion of time trend in an econometric model is often questionedaas this does not serve any useful purpose beside improving the overall fitness of the estimated equation. In this research, however, time trend is included as a proxy for secular trends. It is a fact that jute in Nepal is still produced using the traditional methods, with little capital and modern inputs, so that the growers have very little control over yield. Nevertheless, some secular trends in yield might have occured due to change in soil fertility level, inproved extension work and distribution of improved seeds. If farmers have observed such secular trend in yield, it can be assumed that they might expect them to continue in future. The time trend variable is, therefore, included as proxies for such secular trends. The variable T^2 is added in the model to take into account the possibility of nonlinear relationship between yield and time. Acreage variable showed a negative but highly insignificant relationship with yield (equation 8.1). Another yield function, without acreage as a dependent variable, was estimated to have an idea about aggregate relationship between jute yield and time variable that could be used for predicting jute yield in the immediate future.

(8.1) $YJ = 1.07 - 0000023\ At + .066T - 0035\ T^2$

$(5.34) \quad (-.70) \quad (2.27) \quad (-2.1)$

$\bar{R}^2 = .21$

$DW = 1.95$

$F(3,12) = 2.37$

(9.1) $YJ = .95 + .07T - .0036T^2$

$\bar{R}^2 = .24$

$DW = 2.08$

$F(2,13) = 3.44$

Although the explanatory power of the equation is not that satisfactory, the yield function (9.1) can be taken as the best approximation of a gently declining curvilinear trend.

The estimated acreage equations multiplied by the corresponding yield functions will provide a measure of total jute production in Nepal.

Equationally

(10.1) $J_p = (A_t)\ (Y_j)$

Where :

Jp = total jute production in mt

At = acreage in ha

Yj = yield of jute (mt/ha)

Among the three South Asian countries, viz. Nepal, Bangladesh and India, the most significant fluctuation in jute acreage between 1970/71 - 1986/87 ha taken place in Nepal. The glut production of jute in 1985/86 and a sharp decline in both area and production of jute in 1986/87 are attributed to sharp swing that jute prices took in 1984/85 and 1985/86, respectively.

The findings of the econometric models estimated have also shown the importance of both lagged jute and rice prices in explaining the annual variation in jute acreage. A sharp rise in the price of one crop in a particular year may jeopardise the production of another crop in the following year. To avoid the occurrence of this unpleasant situation, fixation and timely announcement of minimum support price of atleast one crop, preferably jute as it is highly price sensitive, by policy makers appears a must to strike a balance between production of the two crops.

VARIABLES USED

A. DEPENDENT VARIABLES

1. At = Total jute acreage (ha)
2. YJ = Yield of jute (mt/ha)

B. EXPLANATORY VARIABLES

3. PJB-1 = Deflated, by consumer index, lagged Bhadra/Ashwin jute (September/October) price (NR/40 kg).

4. PR-l = Deflated annual average price of coarse rice (NR/40kg)

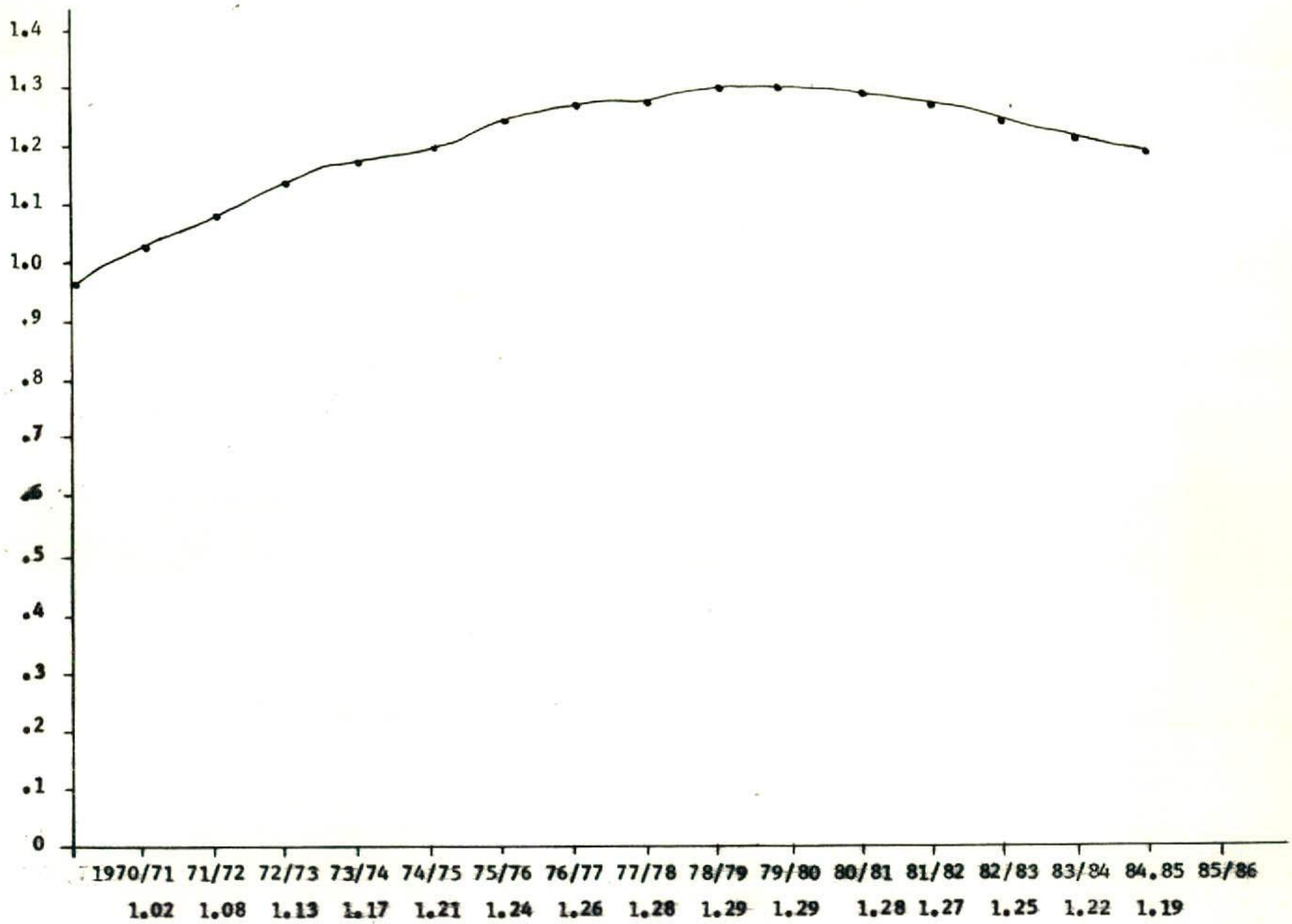
5. JRY-l = Lagged jute/paddy yield ratio

6. SDa = Standrd deviation of three years jute/paddy acreage ratio.

7. T = Time trend (1970/71 - 1985/86)

8. At-l = Lagged acreage (ha)

FIGURE 9 : YIELD TREND



$YIELD = \cdot 95 + \cdot 07\ Time - \cdot 0036\ Time^2$

VI

MARKETING OF JUTE

INTRODUCTION

This chapter begins with a discussion of overall agricultural marketing, mainly of foodgrains, in Nepal prior to an elaborate analysis of jute marketing.

In the context of Nepal, it is not that easy to describe the market hierarchy in usual terms of small, medium and large markets, or in the form of primary, secondary and wholesale markets. Likewise, market organisation in the hills and Terai also differ considerably. In the Terai belt of Nepal, a three tier foodgrain market is in existence. The primary level market consists of village markets and primary assembly markets. At this level, itinearant traders, local shopkeepers and local marchants operate. Small holders with meagre production and no transportion facilities of their own find the village markets a convenient place to sale their commodities. Primary assembly markets include roadside trade shops, haat bazars and primary wholesalers. While mill owners are the main functionaries in the secondary level market, wholesalers and retailers operate in the terminal market (Foodgrain Marketing and Price Policy Study, 1982).

The structure of the hill market is somewhat different. Three tier market primary assembly level, secondary level and the terminal level - exists here. At the village level no trading in the real sense takes place. However, transactions between fellow villagers takes place to meet domestic requirements.

Two-thirds of Nepal's population living in the hills have to eke out their living from one-third of the total agricultural land in Nepal. On the other hand, the Terai region, encompassing nearly two-thirds of the total agricultural land, has only one-third of Nepal's population. Initially, the hill and mountain regions produced adequate foodgrains to feed the local population. Occasional shortages were staved off by exchanging livestock and dairy products from the hills for foodgrains from the Terai through a rudimentary inter-regional exchange system. With rapid population growth over time and the inability of food production to increase at an equal pace in the hills, the traditional arrangement for supply of grains from the Terai to the hills was rendered grossly inadequate and ineffective. By 1946, the government had to establish a Food Commission to plan and supervise public procurement of grains from Terai and their distribution to civil servants and the armed forces in the hills at reasonable prices.

The problem of food deficiency in the hills and mountains has taken an alarming proportions in more recent times. This is attributed to a declining production of grains by about 1.09 percent per annum during 1971-81 and to an increase in population of 1.6 percent per annum during the same period (Sharma, 1986). In the light of these realities, therefore, it has not been possible for the public sector to withdraw competely from foodgrain trading. On the contrary, the public sector has experimented with different agencies over time to regulate procurement and distributioin of grains, especially rice.

PUBLIC POLICY

A retrospective view of the public sector involvement in agricultural marketing reveals that the object of government intervention has been to feed army, police and civilians in the Kathmandu Valley. Although some sort of public sector involvement in marketing of grains existed even prior to the dawn of democracy in 1951, the formation of the Food Management Committee (FMC) in 1962 is cited as the beginning of a systematic public sector approach in grain trading (Rawal, Hamal, 1985). Although the FMC was created to achieve balanced and stabilized distribution of foodgrains in Nepal, its activities were mainly geared toward stabilizing rice prices in the Kathmandu Valley (Rawal, 1986). The isolated hilly areas were totally neglected.

The Agriculture Marketing Corporation (AMC) was created in 1971 to deal with both agricultural inputs and output. It was definitely an improvement over FMC which did not have a network of dispersing the grain in 1971 when a famine caused the government to seek external food assistance.

The AMC purchased rice from channels such as the fertilizer food exchange programme, rice millers and the open market. Although AMC performed relatively well, it could not do full justice to its functions of procuring and distributing grains as well as agricultural inputs. The AMC had most often to divert its entire resources to combat a problem of serious magnitude in one sector, in most cases at the expense of the other sector. Moreover, the serious food deficits in the hills and the need for a wider diffusion of improved agricultural inputs paved the way for the separtion in 1974 of AMC into the Nepal Food Corporation (NFC), and the Agricultural Inputs Corporation (AIC). Side by side with the creation of NFC, the Food Policy Coordination Committee was formed and the government later created Rice Export Companies (RECs) in the Terai to :

a) regularize the export,

b) provide incentive prices to growers,

c) diversify the export market, and

d) increase revenue of the government by checking illegal trade.

The RECs, bestowed with the monopoly to rice export, procured a total of 182,84 mt of paddy and 584,593 mt of rice. The RECs had permanent and temporary procurement depots and 300-400 Sajha (cooperatives) employees working as procurement agents. During the same period, RECs exported 472,409 mt of rice to different countries such as India, Bangladesh, Singapore and Mauritius (Rawal, 1983). The RECs also provided in the form of levy 20-30 percent of their total rice export to NFC*. The impact of the RECs procurement activities was positively felt in the relatively less developed far-western Terai where farmgate price of paddy remained depressed due to less competition among traders.

* NFC executes government-mandated subsidized foodgrain distribution programme in the food deficit regions. The government provides a subsidy on the transport of foodgrains to maintain price stability and to relieve food deficit in the hills. NFC now has to rely on open market purchase of rice, wheat and maize as levy procurement has no longer remained a major source of grain supply.

Unfortunately, this encouraging trend did not continue for long. A decline in marketable surplus, loss of traditional export market (India) as a result of improvement in food production there, and serious cash flow problems faced by the RECs paved the way for relaxation of restrictions on export of rice by private traders in July,1979 and their subsequent dissolution in July,1980.

Currently, the NFC is the sole agency charged with the responsibility of executing government mandated foodgrain distribution programme and that of protecting the interest of farmers. While NFC's distribution programme can be characterised as a mixture of failure and success, it has perceptibly lagged behind in protecting the interest of producers. Despite the government's noble desire to benefit the growers through effective intervention, different agencies created at different periods of time have nothing but a story of failure to reveal in this regard.

As stated earlier, the 1960's and 1970's witnessed considerable government intervention in the marketing sector. Basically, the product market segmentation has led to government intervention in the form of redistributing food from the Terai to the hills and mountains (Svejnaret, Thorbeck, 1986). On the whole, the domain of agricultural marketing has remained the monopoly of private traders who advance money to growers for the produce to be collected later at a price negotiated at the time of lending. Except for a few large farmers who can afford to retain their produce for some time in order to obtain better prices, a large majority of farmers dispose of their produce immediately after harvest to meet obligations of varied nature. Although the government seems to have intervened in the marketing of different crops to do way with the alleged exploitative behaviour of private traders, the public initiatives have failed to protect the interest of growers. Undoubtedly, jute growers are not an exception to this.

INTERNAL MARKETING

As jute production in Nepal is concentrated in a few eastern districts, internal marketing of jute is also confined to these districts. Jute fibre, whether sold for internal consumption or export, generally passes through a number of middle-men. The jute market of Nepal consists of three tiers - 1) primary (village level) market, 2) secondary (assembly) market, and 3) terminal market. The fibre producers sell their produce to primary (haat) markets, from where it moves on to secondary market and from secondary market to the terminal market. A precise note on each tier of the jute market in Nepal is given below:

PRIMARY MARKET

At suitable points along the road side, village markets or "haats" are held once a week. Farmers sell their produce in these markets and proceeds from the sale are used to buy other essential items such as salt, clothes, kerosene and other items. The itinerant dealers visit these markets where transaction among farmers and traders (itinerant dealers and agents of wholesaler) is effected.

ASSEMBLY MARKET

At a few points in each jute growing district, jute trade continues throughout the season. These secondary markets are frequented by the agents of large jute traders. The JDTC and the two jute mills (Raghupati and Biratnagar Jute Mill) also open their procurement depots at major village centres. Well established wholesaters buy jute from traders and itinerant dealers and sell it to wholesalers/stockist or jute mills at the terminal market. Wholesalers/stockists dealing in termainl market also operate in this market.

TERMINAL MARKET

Biratnagar is the main terminal market from where most of the jute and jute goods are exported. Another terminal market is Bhadrapur from where pressed raw jute is exported. The jute fibre assembled from secondary markets is brought to these two markets. The important industrial and commercial centre of Nepal, Biratnagar, is well connected with Calcutta (India) by rail and road. Its proximity to Calcutta and concentration of jute mills and allied activities have made it the most important outlet for jute and jute goods.

As stated earlier, growers usually sell their jute to farias at their home. The big farmers with sizeable production deal with wholesalers and jute mills in the terminal market. The traders (beparis) from the assembly markets deliver jute to kutcha balers or to the jute mills in Biratnagar. The pucca balers either export jute themselves or sell it to other exporters or jute mills. It is estimated that over 95 percent of the crop passes at least once through the hands of middle men and quite often it changes ownership several times before it reaches the terminal market (The Jute Industry,1983).

Important Marketing Channels for Jute and Jute Goods are:

I. Producer - Itinerant trader - Wholesaler - JDTC - Export.

II. Producer - Wholesaler - JDTC - Export

III. Producer - JDTC - Export

IV. Producer - Itinerant trader - Wholesaler - Export

V. Producer - Wholesaler - Export

VI. Producer - Itinerant trader - Wholesaler - Mills - Trader Export/Consumer

VII. Producer - Wholesaler - Mills - Trader - Export/Consumer

VIII. Producer - Mills - Trader - Export/Consumer

IX. Producer - Mills - Export/Consumer

ROLE OF TRADERS

A number of intermediaries are involved in effecting transmission of jute from producers to consumers. The major intermediaries who perform important functions in marketing jute are as follows:-

FARIAS

These are small dealers who buy directly from farmers and sell to other agents or to mills. They advance money to growers on the condition of collecting the crop after harvest at a price negotiated at the time of lending. Mostly these traders work with their own finance and sometimes borrow from merchants. Farias arrange their own transport for the onward movement of jute to assembly markets or mills.

BEPARIS

Beparis deal in jute as well as a host of other agricultural commodities such as paddy, maize, wheat, mustard seed. These traders buy jute from farias as well as large farmers. With adequate financial resources, these traders concentrate in assembly (secondary) markets where they maintain godowns for jute storage. These traders, who can afford to retain the fibre procured for some time in anticipation of price increases, organize their own transport from the assembly markets to the kutcha balers and jute mills.

DALLALS

These people broker the deal between buyers and sellers. Dallals get a brokerage fee of 9.75 percent of the value of jute transacted (The Jute Industry, 1983).

KUTCHA AND PUCCA BALERS

Kutcha balers buy jute from farmers and beparis, process the unassorted fibre and sell the bales to pucca balers or to mills. Pucca balers buy jute from kutcha balers and other sources and process the fibre into high density bales for export by themselves or by other exporters.

EXPORTERS

Agencies which export jute to India and overseas countries can be grouped under two heads: 1) processor/exporter; and 2) exporters. While exporters under category (1) process their own fibre, place their mark on the bales and either export or sell the fibre domestically, the exporters falling under (2) above purchase processed bales, put their own marks on the bales and export. Raw jute from all the assembly markets (about 17) in the jute producing areas flows to the Biratnagar terminal market, while Bhadrapur terminal market receives jute from 7 assembly markets located in Jhapa district. As per the flow of jute goods, local traders and consumers (industries and general public) can avail goods directly from mills. Local traders and the mills are also involved in export trade of jute goods in addition to their supply of goods to local consumers.

The preceding discussion shows that a number of market intermediaries perform various functions in accomplishing the marketing process (Fig 10). Following Kohls and Uhl (1985) these functions may be classified as:-

A) Exchange function (buying, selling)

B) Physical function (storage, transportation, processing)

C) Facilitating function (standardization, financing, risk bearing, market intelligence)

The above mentioned functions are performed by middle-men either as individual or business concerns to move jute from producers to consumers. The middle-men of particular interest in jute marketing can be classified as follows:

A) Merchant middle-men (retailers, wholesalers)

B) Agent middle-men (brokers, commission men)

C) Speculative middle-men

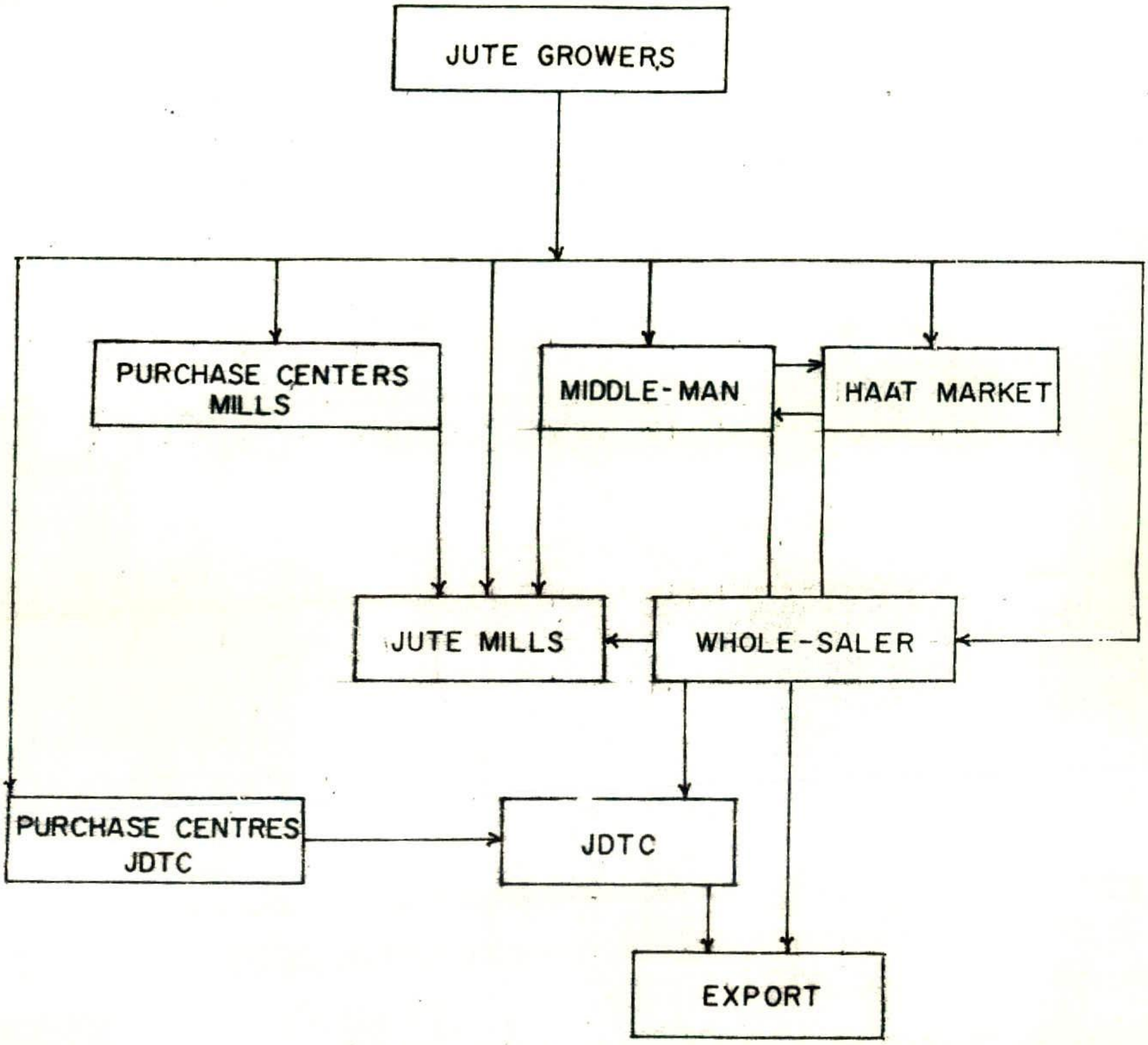
D) Processor and manufacturers

E) Facilitative organisations.

The above classification of middle-men clearly shows that the term middle-men not only covers the people who buy jute from farmers at low price and sell the produce at a higher price, but also other market agents as described above.

Prior to the establishment of JDB in 1970, there was no licensing or registration system and, thus, anybody could trade in jute as desired. Since 1971, however, registration has been made

FIGURE 10: JUTE FLOW CHART



compulsory for exporters, pucca bale pressers and jute mills. The data on the number of different market functionaries reveal that while the number of jute mills and pucca bale pressers have doubled, the number of exporters, pucca balers and kutcha balers remained almost unchanged. The number of traders operating at the grass-root level decreased substantially (Table 2.6).

Table 2.6 : NUMBER OF MIDDLE-MEN IN JUTE TRADING

Market Functionaries	1968	1983	1988
Farias	325	193	250
Beparis	175	32	125
Dallals	30	17	40
Kutcha balers	72	75	60
Pucca balers	20	21	-
Pucca bales press houses	2	4	4
Exporters	25	27	27
Jute Mills	2	4	4

Source : JDTC

The reduction in the number of farias, beparis and dallals during 1968-1983 suggests that the dealers who took to jute trade in the initial boom in anticipation of easy and high profits, subsequently opted out leaving only experienced traders in jute marketing.

Different agents involved in jute marketing are rendering useful functions. They are rendering their services in making the product available at the right place at the right time and in the right form. Development of a competitive environment would lead to a reduction in cost of transportation, storage and conversion, which, according to Shepherd and Futrill (1982), would benefit producers, distributors and consumers in the long run.

MODE OF TRANSPORT AND MARKET INTEGRATION

An efficient transportation network integrates segmented markets and, thus, is a prerequisite to the development of an efficient marketing system. In the absence of navigable waterways and railways in the jute growing areas, both inter and intra-district movement of jute is effected using pack animals, carts trucks and tractors. In addition to these modes of transport, a significant proportion reaches primary markets in head loads. Important modes of transport and their timing of use is given below:

HEAD LOADS

Approximately 20 percent of the crop arrives at the markets in head loads. Labourers hired for retting and fibre extraction who receive wages in the form of jute fibre carry their share to the market for sale. In addition, farmers willing to sell only a small proportion of their output to meet immediate cash requirements also carry their jute this way.

PACK ANIMALS

During the whole of September until the first part of October, when the muddy tracks are impassable even to animal carts, ponies are used for jute transport.

CARTS

Carts drawn by animals (bullocks/he buffaloes) are extensively used in carrying jute from producers to the market place and for effecting its onward movement between markets. This mode of transport is also used in transporting jute and jute goods from press houses and godowns to the railway station in Joghbani, India.

TRUCKS AND TRACTORS

The above mentioned modes of transport are used for short distance transportion of jute. For long distance transport, however, trucks and tractors are mostly used. With improvement in the condition of roads in the jute growing areas, these modes of transport are relied upon even for short-distance movement of jute.

The Indian railway is sometimes used to transport jute from Bhadrapur area to Biratnagar. The quantum of jute moved using the Indian railway has decreased significantly after the completion of the eastern sector of the Mahendra Raj Marg (East-West Highway).

MARKET INTEGRATION

Although farmers still face problems to move jute from their farms up until the first week of October when the tracks leading to the market places are still impassable by trucks and animal-drawn carts, completion of the 264 Km East-West Highway has made important contributions in linking all jute growing districts and lowering transportion costs leading to an integration of market.

While discussing the question of market integration, it would be quite relevant to discuss the Terai paddy market in Nepal which is segmented into three natural markets 1) eastern, 2) central, and 3) western Terai. Each market has its distinct area of operation determined by the surrounding topography and transportion facilities. A study (Johl, 1981) reveals that the price spread between these natural markets are significantly higher than what is justified by transportion costs. This may be due to some serious bottlenecks that may have been impeding a smooth flow of commodities and market information. The same study suggests that the domination of a few large traders in each market and their virtual control of existing processing facilities provide the structural conditions for oligopsonistic power of the paddy market. Another study (Rawal,1983) revealed that the price paid by a middle-man and the margin of profit differed from one market to the other, the lowest price paid to a farmer and the highest level of profit made being in the western Terai markets. These markets are seemingly sensitive to Indian border prices and, in general, are more integrated with the Indian border markets than with each other.

Although prices of jute in India, especially Calcutta, influence prices of jute in Nepal, jute production is not disintegrated into different markets. This is attributed to the production of jute being concentrated in a relatively small area and the linking with each other of jute producing areas by motorable roads. An attempt here is made to calculate price spreads between two points where transaction of jute takes place. The two markets considered for this purpose are Biratnagar and Rajbiraj and the formula used for calculating the price spread is*

$$AiJ = Pi - [TCJi + CJi + MJi + SJi]$$

Where :

AiJ = Parity price per mt of jute between ith market (Biratnagar) and Jth market (Rajbiraj).

Pi = Price Rs/mt of jute fibre in Biratnagar market.

Tcji= cost of transporting a mt of jute from Rajbiraj to Biratnagar.

Cji = customs between the two markets.

MJi = taxes between the two markets.

SIc = sundry expenses

Assigning values (1968 costs and prices) to above symbols:

$$Aij = 2250-(87.08+0+20.09+13.40)$$

The parity price calculated for jute fibre stands at Rs.2129.43/mt for Rajbiraj market.

* The research (Rawal,1983) calculated price spread for rice between different markets using the same technique.

As Rs.1950 was the price prevailing in Rajbiraj market, the price spread (2129.43 - 1950) between the two markets in 1968 was a positive Rs.179.43. This positive element encouraged movement of jute from Rajbiraj to Biratnagar. This is also true of other assembly (secondary) markets from where jute moves to Biratnagar. Fox example, the price spread between Inarwa and Biratnagar market in 1968 was a positive Rs.125/mt or Rs.0.12/kg of jute fibre.

To examine the integration of markets over time, the 1987/88 data supplied by JDTC were used to calculate the price spread between Lahan* and Biratnagar market. Substituting the symbols in the above equation by data, the parity price calculated for jute fibre stands at Rs.3030/mt for Lahan market. Since average market price at Lahan in 1987 is reported to be Rs.3000/mt, the price spread between the two markets is a positive Rs.30/mt or Rs.0.03/kg (3030-3000).

The above calculations show that there has been a decline in price spread between different markets over the time. This could be taken as the indication of a gradually developing competitive marketing environment in jute, which could have been infused by the development of physical infrastructures and other facilities in this relatively developed area of Nepal. Public sector intervention may also have contributed in this direction through the participation of JDTC in procurement and export of jute and jute goods. A retrospective analysis of public sector intervention in jute marketing is given below:

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* Cost/mt of moving jute from Lahan to Biratnagar = Rs.220/-

PUBLIC SECTOR INTERVENTION

As stated earlier, jute trading was controlled by a few business magnates prior to the establishment of JDTC and JDB prior to 1974. The fixation of procurement price was done on an ad hoc basis to meet the exigencies of a period rather than as the start of a long term rational pricing policy.

The war of independence in Bangladesh (then East Pakistan) led to a preciptious decline in the supply of both jute and jute goods leading to their price hike in the international market. Nepalese jute traders reaped the benefit of this abnormal situation. This situation, however, did not last long as the production and export of jute from Bangladesh stabilized to pre-war levels resulting in a decline in prices of jute goods. Nepalese traders, having been used to a high level of profit margin in the lucrative jute export business, sought subsidy from the government to combat the seemingly unfavourable situation in the world market. The governmnt, instead of complying with their demand, vested jute export business in the National Trading Ltd. (NTL), a state trading agency. The NTL with limited godown facilities (1000mt) in Biratnagar and also having to carry on with its regular activities found it virtually impossible to cope with procurement of jute.

The fixation of procurement price did not serve any useful purpose as far as protecting the interest of farmers was concerned. For example, the first procurement price was announced in October,1973 when most of the small holders had already sold their proudce. It should be mentioned that about 60 percent of the crop output in a year is sold by end - October. Likewise, the announcement of support price in 1974/75 and 1975/76 was also ill-timed (Arjyal, Paudyal, 1982).

Starting from 1976/77, the government has been fixing minimum prices for Morangisada Gathsath jute at the Zonal level*. The fixation of the minimum price for Gathsath forms the basis of fixing minimum price for different types (grades). The main elements taken into account while fixing the minimum price of jute are:

1. Cost of production;
2. Jute production (availability);
3. Indian boarder market prices;
4. Prices in Calcutta market;
5. Intrnational movement in jute prices;
6. Market price in Biratnagar;
7. Transportation costs from the major producing areas to the boarder markets and other marketing costs; and
8. Minimum support price in India.

Apparently, the fixation of minimum support price on the basis of above mentioned points intends to benefit farmers through the provision of remunerative prices. In practice, however, the announcement is most often ill-timed and the minimum prices are below the market price requiring no public sector intervention.

\+ Gathsath jute is defined as unassorted jute comprising 90 percent fibre of overseas exportable quality and 10 percent of middle grade.

Minimum prices were announced before sowing season in 1976/77 and 1977/78,but there was no agency to execute this policy through massive procurement of jute directly from farmers as JDTC was not allowed to procure jute during those two years. To the solac of government, market prices of jute remained well above the announced minimum support prices during that period.

In 1980/81, the minimum support price fixed by the government was higher than the prevailing market price by US$18.10/mt. In such a situation, the public sector agency is expected to rescue farmers through open market operations. Contrary to the expectation, however, the JDTC, constrained by financial resources, could not stop distress selling of jute by farmers. On government's instruction, the JDTC procured some jute using its development fund. In JDTC's existence of about a decade-and-a half, unpleasant situations of this kind have occurred time and again and concerted efforts are severely lacking to avoid their recurrence.

JUTE PROCUREMENT BY JDTC

As stated earlier, after fixing minimum price of Morang Gathsath, the government forms a committee headed by the Zonal Commissioner, Koshi zone to determine minimum prices for different (three to four) grades of jute. The Price Fixation Committees are also formed in other jute growing zones (Mechi and Sagarmatha). Prices fixed by the Committees can be changed only under exceptional circumstances by the JDTC Board of Directors.

The JDTC works as government's agent to execute its minimum support price programme. JDTC buys jute through its procurement centres set up during the post harvest season. The number of procurement centres in a particular year is determined by the procurement target of the Corporation. In addition, JDTC buys jute from primary market through mobile teams.

Each procurement centre is manned with seven to eight people including a grader to judge the quality of jute. Grading is done on the basis of visual observation of colour, lustre strength, fineness, cuttings, cleanliness and reed length. Moisture meters and other equipment at the disposal of the centres are hardly made use of. Most of the jute bought by JDTC comes from farmers themselves. However, traders, are not discriminated against in procuring jute. Subject to availability of finance, JDTC's procurement of jute has varied over the years (Table 2.7). Above 60 percent of the procurement consists of jute directly bought from the growers.

JDTC relies on government grants and government guaranteed loans for procurement of jute. Except for a few years, JDTC has always incurred heavy losses on jute trading and the losses have been financed by borrowing from commercial banks against government guarantee. Although JDTC may have been able to infuse a sense of competitiveness in jute marketing/trading, it has not been able to do full justice to its procurement function due mainly to lack of financial resources.

Source : JDTC

Table 2.7

Jute Purchase by JDTC

(mt)

Years	Pucca bales	Loose jute	Total
1974/75	2761.53	14631.51	17393.04
1975/76	11538.10	9003.80	20541.90
1976/77	6816.51	-	-
1977/78	413.90	-	-
1978/79	-	1114.10	1114.10
1979/80	-	532.80	532.80
1980/81	54.43	5437.87	5492.30
1981/82	-	1748.40	1748.40
1982/83	-	-	-
1983/84	-	2935.00	2935.00
1984/85	-	16000.00	16000.00
1985/86	-	16000.00	16000.00

Source : JDTC

The two jute mills in Nepal are also guided by government in regard to prices and procurement of jute. For a number of years these mills procured jute directly from farmers through their procurement centres located at different points in the jute producing area in addition to purchase of jute, mostly from middle-men, at their gate. In 1977/78, their combined procurement from farmers constituted more than 35 percent of the total purchase. Their purchase of raw jute from farmers has drastically declined due to loss of foreign market for jute manufactures and the problem of spot payment while buying jute from farmers. On the whole, the impact of their procurement activities has been minuscule as far as enhancing grower's price is concerned.

EXPERIENCE IN OTHER COUNTRIES

As far as procurement of jute by public agencies is concerned, the situation is not very different in Bangladesh. Two public sector agencies 1) The Bangladesh Jute Mills Corporation (BJMC) and 2) The Bangladesh Jute Corporation (BJC) with 151 and 200 procurement centres, respectively, are expected to play a major role in procuring jute directly from farmers. During the last two years, 1986/87 - 1987/88, BJMC bought an average 1.2 million bales per year while BJC's purchase was 0.9 million in 1986/87 and 0.7 million in 1987/88. It is often argued that the public sector agencies in Bangladesh have not been able to serve the interest of growers as these agencies are said to have been buying a large part of their total purchase from traders.

The procurement system of India seems to have an edge over those of Bangladesh and Nepal. With its headquarters in Calcutta, The Jute Corporation of India (JCI) has 15 Regional Offices (ROs) spread all over the jute producing States. Under the ROs are the departmental purchase centres and sub-centres to purchase jute. In addition to procurement of jute through its purchase centres and sub-centres, cooperatives are employed on a commission basis to buy jute for JCI. Although the cooperatives have their own line of finance, the JCI provides them initial capital on State Government's guarantee. On average, 15 to 20 percent of the crop output is purchased by JCI, 33 percent of which is through cooperatives. The JCI, being relatively better positioned in terms of financial resources and other facilities, has done justice to its role as the sole price executing agency of the Government of India. The purchase of raw jute by JCI increased from 86,000 bales in 1972/73 to 1.75 million bales in 1981/82 (Jute Industry in India, 1982).

PROBLEMS OF JDTC

The procurement target fixed by JDTC on the basis of production and export opportunities has to be approved by the Ministry of Commerce (MOC) and the National Planning Commission (NPC). The budget for procurement being provided by the government as loan or grant, the volume of procurement is dependent on government's decision. The JDTC is often instructed to procure jute when the profit margin in export of jute is very low. When private traders reap benefit from good prospects in export market, JDTC has to remain a silent spectator. Moreover, since the procurement target is announced only after June by the government, JDTC finds itself in a difficult position to execute the programme. After the announcement, the procurement centres are established at several points in the area depending on resources to procure jute and availability of manpower to operate these centres. Due to financial constraints the JDTC had to close its procurement centres to the utter disappointment of farmers.

Ideally, support price should be announced well before sowing time to allow producers enough time to make crucial farm management decisions in regard to the crops to be grown and how much land to allocate to each crop. This has to be followed by a well-planned procurement mechanism to prevent crashing of market prices below the announced minimum prices. JDTC, however, has very little influence in these areas as major decisions in this regard are made by agencies that are external to its management.

Lack of perspective planning with clear cut policies/programmes and means to execute the programmes has been the major impediment obstructing satisfactory performance of JDTC. In fact, it was only the Third Plan (1965-66 - 1969/70) which merely acknowledged the need for a well conceived price policy. The Fourth and Fifth Plan (1970/71 - 1979/80) emphasized the stabilization of consumer prices. The Sixth Plan (1980/81 - 1984/85) envisioned a policy of free inter-district movement of goods to mitigate regional price variations and develop and expand Integrated National Market. The Seventh Plan (1985/86 - 1989/90) seeks to give fair prices and market for the agricultural goods. It further specifies that proper price and marketing will be guaranteed for 15 percent of the total marketable quantity of the major agricultural products every year through setting up of a committee charged with the responsibility of fixing prices of all agricultural products,assigning a responsible central institution to buy the agricultural products at the approved price, encouraging development of haat - markets, encouraging participation of private sector in agriculture markets, etc. The Plan also states that cash crops will not be allowed to be purchased from the haat and wholesale market below the approved price. Further more, for the movement of agricultural produce the whole market of the country will be assumed as one single market and no restriction will be applied in the inter-district movement of agricultural produce.

In the backdrop of problems faced by JDTC in executing the procurement programme to benefit growers, the Seventh Plan seems to have taken an appropriate approach to ensure procurement of cash crops at announced prices. Necessary means, however, will have to be arranged to actualize this programme.

As per the overall question of the desirability of public sector intervention, it may be argued along the line of Cornelisse (1974) that since non-intervention often gives rise to severe misallocation of resources or hardships to society or to certain groups, direct price setting and procurement which may lead to a situation of non-equilibrium is justified. Moreover, public sector intervention may be justified when it is noticed that the imperfect market conditions in the developing economies do not allow an automatic solution of three basic market problems as outlined by Shepherd and Futsell (1982). The three marketing problems can be elucidated as follows:

1. Keeping abreast of changes in demand

   A large share of agricultural marketing problem arises because the right variety of crop was not grown or because the right quantity was not produced. The total demand for food does not change because of the fundamental inelasticity of human stomach. However, the demands for products such as jute fluctuates over time. The farmers are found to be having an attitude, "Here is the stuff, we have produced. Now help us market".

2. Reflecting consumer's demand to producers

   Consumer's demand is the guide to producers as they chalk out their production and marketing plans. The major means of transmitting consumer's demnd to producer is the system of market prices that reaches all the way from retail shops to the farmer's local market. In developing countries, however, this system does not work properly to let farmers know what consumers want, when they want and in what form they want a commodity.

3. Getting the goods from Producers to consumers

   The third agricultural marketing problem is getting the goods from producers to consumers at the lowest cost permitted by existing technology. Underdeveloped transport network and other facilities, however, obstruct timely flow of goods from farms to consumers at reasonable prices.

In view of the above mentioned problems, it is difficult to agree totally with Bardhan (1977, 1979) who states that the personalised character of transaction in informal markets referred to as "interlocking markets" in agriculture often renders public sector measures ineffective. To support his argument Bardhan states that a landlord and a share cropper may engage in several transactions where one may be a condition for the other.

Likewise, a village merchant and a farmer may engage in a number of transactions. Complications, therefore, may arise from the nature of interlocking markets with their interdependencies on the micro-level. It can, however, be argued that a persistent public policy with an effective procurement mechanism can lure away producers from landlords and village merchants.

In view of the marketing problems discussed above and the need for providing reasonable prices to jute growers, the intervention by JDTC in jute marketing should not be stopped. Emergence of JDTC as a competitor buyer of jute would ensure an environment of healthy competition and lead to integration of markets on a wider scale. The JDTC should be able to perform this function, provided adequate funds are arranged. It may also be suggested that either JDTC should be allowed to operate on a commercial basis, within the frame work of the government price policy, irrespective of the annual variation in jute production, or its function be limited to that of a price watcher intervening only in abnormal situations as is the case now. But in either case JDTC would have to be provided with financial resources on time to effectively intervene in the market.

VII

EXPORT TRADE

INTRODUCTION

This chapter begins with a brief account of the foreign trade of Nepal, followed by an analysis of different policies adopted by the public sector in regard to export promotion. The concluding section of the chapter will concentrate on an analysis of jute and jute goods exports from Nepal and factors exerting influence on the annual supply of raw jute from the country.

Nepal's trade sector is characterized by a wide discrepancy between exports and imports. There has always been a huge and growing deficit on the visible trade account. The rate of increase in exports has not only been low but also highly fluctuating, the fluctuation being explained mostly by abberations in annual agricultural production. For example, the sudden rise in exports in 1980/81 is attributed to the favourable agricultural production that year as compared to the previous year. Likewise, unsatisfactory crop production in the succeeding two years led exports to decline by 7 and 24 percent in 1981/82 and 1982/83 respectively (Poudyal, 1986). On the other hand, imports have been increasing throughout at different rates (Table - 2.8).

Table - 2.8

Nepal's Foreign Trade

(million Rs)

	EXPORTS			IMPORTS		
Years	Total	India	Overseas	Total	India	Overseas
1970/71	400.6	310.2	90.4	699.1	616.8	82.3
1971/72	519.8	333.8	186.0	888.3	808.7	79.6
1972/73	631.5	496.4	135.1	983.8	872.0	111.8
1973/74	685.6	513.3	172.3	1163.3	976.9	186.4
1974/75	889.6	746.8	142.8	1814.6	1475.7	338.9
1975/76	1185.8	893.7	291.1	1981.7	1227.1	754.6
1976/77	1164.8	779.6	385.2	2008.0	1343.5	664.5
1977/78	1046.1	498.0	548.1	2469.7	1534.1	935.6
1978/79	1296.8	650.1	646.7	2884.7	1581.7	1303.0
1979/80	1150.5	520.9	629.6	3480.1	1786.4	1693.7
1980/81	1608.6	992.4	616.2	4428.2	2179.0	2249.2
1981/82	1491.5	994.4	497.1	4930.2	2280.9	2649.3
1982/83	1132.0	843.3	288.7	6113.9	2499.6	3814.3
1983/84	1703.9	1160.7	543.2	6514.3	3058.0	3456.3
1984/85	2740.6	1601.7	1138.9	7742.1	3895.8	3846.3
1985/86	3078.0	1241.1	1836.9	9341.2	3970.9	5370.3

Source : Quarterly Economic Bulletins of Nepal Rastra Bank

The rupee value of exports increased by nearly 14 times from Rs.95.472 million in 1956/57 to Rs.1296.823 million in 1978/79. During the same period, the rupee value of total imports increased by 17 times from Rs.169.891 million to Rs.2884.709 million. The trade deficit increased by more than 21 times during the period (Reejal, 1982).

Two semi-log linear trend equations estimated for the period 1970/71 - 1985/86 to examine the growth trend of total exports and imports also corroborated the above findings. The estimated equations reveal that while the growth trend of total exports during the period had been 10 percent, it was 17 percent in the case of total imports.

$$(11.1)\ \text{In TE} = 6.115 + .107\ \text{time}$$
$$(.001)$$
$$\bar{R}^2 = .87$$
$$D.F = 14$$

$$(12.1)\ \text{LnTI} = 6.454 + .17\ \text{time}$$
$$(.004)$$
$$\bar{R}^2 = .99$$
$$D.F = 14$$

where :

TE = total exports (million Rs)

TI = total imports (million Rs)

Figures in brackets show the standard error of coefficients.

COMPOSITION OF EXPORTS AND IMPORTS

Nepal's exports consists mainly of primary products e.g. raw jute, jute goods, rice, hides and skins, woollen carpets, handicrafts, medicinal herbs, spices, etc. Jute, jute goods and rice are regarded as the bread and butter exports of Nepal (Kaphley, 1984). Their exports in recent times have dropped due mainly to crop failures. Primary products have accounted for over 80 percent of total exports throughout. Nevertheless, a few non-primary exports such as woollen carpets, readymade garmets and handicrafts have registered satisfactory growth in recent years. The quantity of these items exported, however, is insignificant; rice, raw jute, jute goods, pulses, clarified butter, carpets, hides and skins and timber continue to dominate the exports of Nepal. The percentage share of these commodities to total exports remained above 65 percent of total exports up to 1979/80 and have declined thereafter. With the exception of woollen carpets, the export earnings from which have continuously increased over the years, earnings from other items have fluctuated.

Nepal's imports consist of a wide range of commodities. The share of consumer goods imports has accounted for over two-thirds of total imports. The share of investment goods has fluctuated from 7.4 percent during 1965/66 - 1969/70 to 20 percent during 1975/76 - 1979/80. However, in recent years its share has slightly declined.

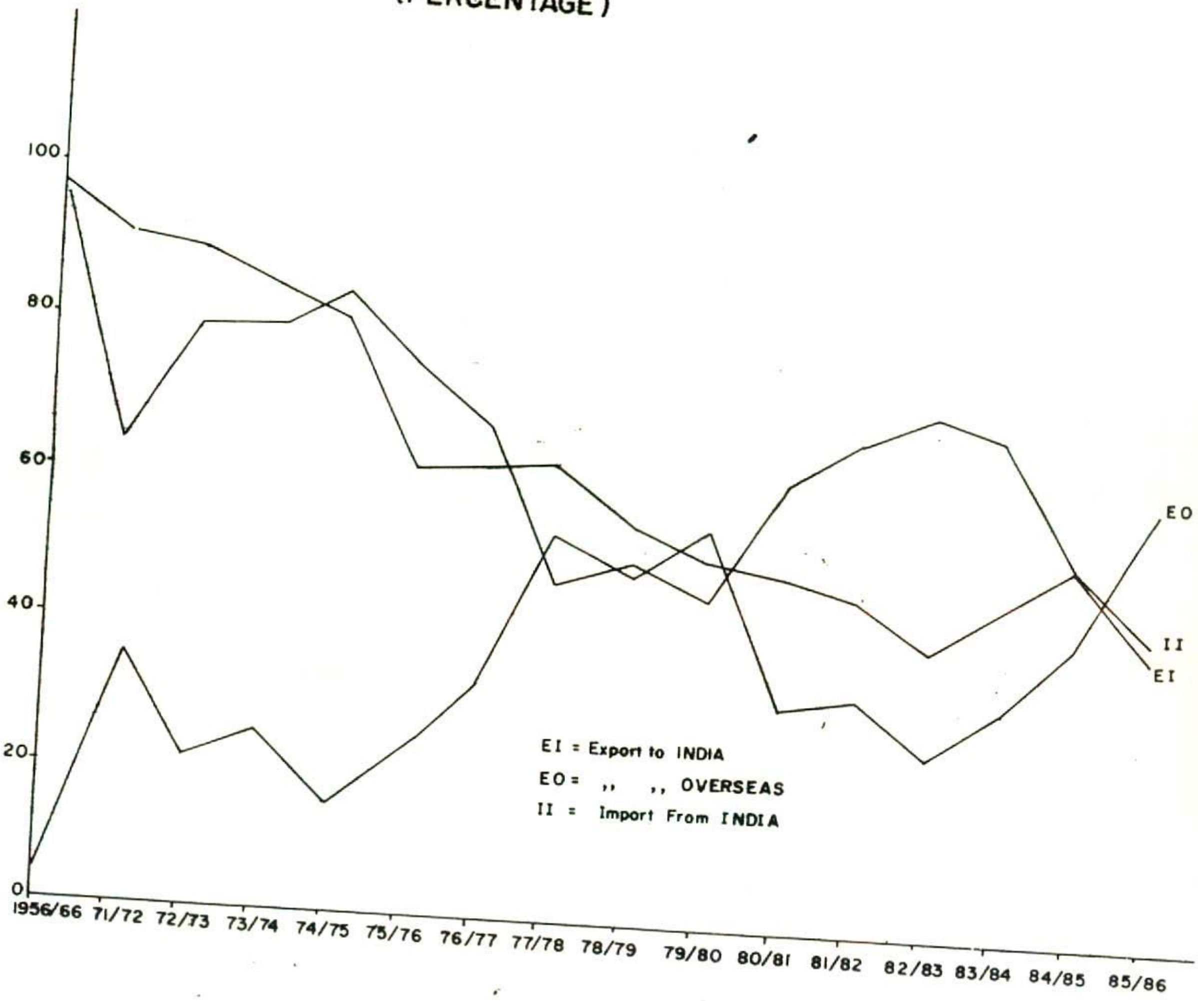
Imports from India consist of manufactured goods, food and live animals, machinery and transport, and chemicals and drugs. Imports from overseas include textiles, pertroleum products, textiles, machinery and parts, transport equipment, cement and fertilizers.

DIRECTION OF TRADE

Nepal's International trade can broadly be grouped under two heads: 1) trade with India, and 2) trade with the rest of the world (overseas trade). For various reasons, which will be discussed later, Nepal's foreign trade is heavily concentrated in India. As late as 1970/71, 99 percent of total exports and 88 percent of total imports were confined to India. Prior to 1960, Tibet was the only trading partner in the Overseas category; this accounted for a negligible proportion of total trade. However, with the initiation of policy measures aimed at diversifying Nepal's foreign trade, the percentages of both exports and import trade with India have declined substantially (Figure 11). In recent years, however, the share of exports to India to total exports has risen again, while imports from India have failed to increase substantially.

Although Nepal's trading pattern as observed in term of trading partners has undergone changes over the years, it has not been able to make a significant shift away from India especially in the case of export trade. Nepal's trade with India has always remained quite voluminous and regular. Furthermore, it is also reported that one-third to one-half of trade with India is unrecorded (Challenge for Nepal, 1974). The actual volume of trade with India is, therefore, far greater than what official figures would suggest.

FIGURE 11: NEPAL'S FOREIGN TRADE (PERCENTAGE)



To examine the influence exerted by export and import from India on total exports and imports of Nepal, two simple equations are estimated. The estimated equations reveal that while 1 Re. increase in exports to India will lead to an increase in total exports by Rs. 1.68, the same proportion of increase in imports from India will increase total imports by Rs. 2.05. This finding lends support to our earlier statement that India still accounts for a large part of Nepalese exports.

(13.1) $TE = 1.68\ EI$

$(.09)$

$\bar{R}^2 = .88$

$D.F = 15$

(1970/71 - 1985/86)

(14.1) $TI = 2.05\ II$

$(.08)$

$\bar{R}^2 = .75$

$D.F = 15$

(1970/71 - 1985/86)

Where :

TE = total exports (million Rs)

EI = exports to India (million Rs)

TI = total imports (million Rs)

II = Imports from India (million Rs)

Figures in brackets show the standard error of coefficients.

Researchers on the foreign trade of Nepal have listed the following factors that hinder diversification of Nepal's export and import trade:

1. Nepal, a land-locked country, is surrounded by Indian territory on three sides and by China to the north. Nepal has access to the sea only through the port at Calcutta, which itself is about 1000 km. away. Nepal has, therefore, to depend on the willingness of India to co-operate in her efforts to expand the export and import trade.

2. Many problems such as loading and unloading in the bordering Indian railway stations, gauge change of railways, unavailability of railway wagons, checking by Indian authorities and the functional problem at Calcutta port, are associated with transit through India. An estimate made in 1971 (The Challenge for Nepal, 1974) showed that at least 50 percent of transit costs on exports and perhaps a slightly lower percentage on imports were unjustified.

3. Despite the construction of Kodari Raj Marg connecting kathmandu Valley with the Tibetan border, it is more profitable for commercial traffic between Nepal and China to pass through the Indian port at Calcutta. Moreover, very little mutually beneficial exchange could take place between Tibet and the northern region of Nepal.

4. The overland transit facility between Nepal and Bangladesh and from Bangladesh to other countries was made available to Nepal by India only in March, 1978. However, the points of entry and exit granted have proved unsuitable for commercial tariff as they pass through dense forest and difficult terrain.

5. Nepal receives a large proportion of foreign aid in Indian currency. Moreover, payments between India and Nepal are settled in Indian currency.

6. The Treaty of Trade and Commerce of 1950 and the Treaty of Trade and Transit of 1960 signed between India and Nepal had elements included to check diversification of Nepal's trade. It was felt that India controlled Nepal's trade and tariff policy through the commercial treaty of 1950 (Sha,1973). It is still felt that facilities provided by India through subsequent treaties have been less than adequate in view of the growing volume of trade between Nepal and overseas countries.

7. Nepal's open border with India and unrestricted movement of people across the border nullifies the impact of policy measures aimed at trade diversification.

8. The high transport costs associated with importing bulky construction materials from overseas countries also acts as a deterrent for significant diversification of foreign trade. The problem, therefore, should not be seen solely in terms of the transit granting country. The structure of Nepal's economy also reinforces this limitation (Bista, 1981). As requested by Nepal, India supplies certain construction materials at subsidized rates in the sense that Indian central excise levied on these items is refunded to Nepal. This system has contributed in easing shortages of construction material within the country and has also led to a concentration of import trade with India.

9. Nepal's rugged terrain causes serious problems for intra-regional trade. The nation is segmented into several natural markets. Quite often it is seen that a region is exporting a certain commodity to India, while at the same time another region is importing the same commodity from India.

DIVERSIFICATION MEASURES.

The public policies in relation to export trade have emphasized promotion and diversification of exports. The preceding discussion clearly states that Nepal's foreign trade is heavily concentrated with India. More specifically, prior to 1960 Nepal had virtually no trade with other countries, the only exception being Tibet with which a small quantity of goods were transacted. The reasons for the heavy concentration of trade with India, especially prior to 1960, have already been discussed.

Since the early 1960's the political and economic vulnerability of the heavy concentration of trade with India began to be felt in Nepal. The fluctuations in demand or price in India of Nepalese exports dictated total changes in quantities of exports and the consequential revenue. Moreover, India's inability to fully meet Nepal's import demand for construction material led Nepal to seek alternative sources of supply of these materials. While Nepalese exporters received payment in non-convertible currencies for their exports to India, imports of materials from overseas countries required payment in hard currency which could be earned only through exports of Nepalese goods to countries other than India. Various policies adopted throughout the 1960's and 1970's by Nepal were geared towards:

- expanding exports to enhance the country's capacity to import goods needed for development;

- diversifying foreign trade commodity-wise (by encouraging exports of processed products) as well as country-wise to reduce overdependence on a single country; and

- reducing the disadvantage resulting from landlockedness in the process of export augmentation and industrialization of the country.

Various measures aimed at broadening the export market are discussed below :

THE EXPORTER'S EXCHANGE ENTITLEMENT SCHEME (EEE)

This scheme, introduced in 1962, was the first comprehensive measure aimed at export diversification. The scheme was designed to :

- raise the reserve of hard currencies;
- diversify the trade and help finance the import of goods which were not available in India or were available only at high cost;
- subsidize the cost of transportation to Calcutta; and
- achieve economic independence through trade diversification.

Under the scheme, an exporter to overseas countries, on submission of his export receipts to the Nepal Rastra Bank, was entitled to a percentage of his export earnings which could be used to import otherwise restricted semi-luxury and lusury goods from third countries. The ratio of entitlement of export earnings varied over time and from export commodity to commodity.

Before 1964, only one entitlement ratio existed, ranging betwen 60 to 85 percent of exporter's exchange earnings. Major modifications introduced in 1964 related entitlement ratios to commodities exported instead of export proceeds. Moreover, a distinction was made between industrialists and traders and a higher ratio was accorded to industrialists. Industries incurring heavy foreign exchange costs were entitled to special ratios. As the scheme aimed at compensating the losses that exporters may suffer in their exports to overseas countries instead of India and as the losses varied from commodity to commodity, the number of entitlement ratios could be as many as the export commodities themselves. In view of these anomolies, in 1971 the distinction between industrialists and traders was eliminated. The policy of according higher entitlement ratios to industries incurring heavy foreign exchange was also abandoned. In April,1975 the number of entitlement ratios totalling nine (from 20 percent for jute to 90 percent for stainless steel products) was reduced to three (60, 75 and 90 percent). Export of raw jute was no longer eligible for exchange entitlement. In December,1975 both the number and percentage of ratios were reduced (45 and 60 percent) and raw jute was again assigned an entitlement ratio of 45 percent.

As to the use of entitlements, the government wanted a part of it to be used in importing development-oriented goods; for example, a provision in 1969 required all exporters whose annual entitlement exceeded Rs.10,000 to spend 15 percent of their entitlement on the importation of specified development goods. Another provision in 1973 required exporters receiving more than Rs.25,000 in entitlements per annum to spend not less than 25 percent of their entitlement on the importation of development goods, capital equipment, transport equipment, spare parts and raw material.

The introduction of the EEC scheme was followed by a significant increase in Nepal's exports to countries other than India. The heavy dependence of Nepal's foreign trade with India drastically declined. As a result of export diversification, total receipts of foreign exchange increased substantially.

Despite an increase in the official convertible currency reserve, which can be attributed to the scheme, the scheme did not contribute towards creating a viable and strong export sector. The geographical diversification of Nepalese exports was not accompanied by greater product diversification. Many primary commodities such as rice and raw jute which could be profitably exported to India were also diverted to overseas countries under the lure of foreign exchange entitlements. This lure also gave rise to a tendency of over-invoicing exports.

The scheme encouraged the influx of luxery items from abroad. As there was no restriction on the use of entitlements not exceeding Rs.25,000 per annum, unscrupulous exporters made arrangements to break their total exports into smaller exports, registered in different names, to ensure that the entire entitlement was used in importing luxury items. The scheme also brought about serious distortions in resource allocation in that it helped the growth of industries such as stainless steel and synthetic textiles whose contribution in terms of income and employment generation was quite minimal. The diversification of the export trade gave rise to a serious shortage of Indian currency to pay for imports from India. Nepal had to sell convertible currencies to buy Indian currency, which was tantamount to exporting commodities to India, but at a higher cost to Nepal.

The ultimate outlet for the luxury items imported under the scheme was the Indian markets where prices of these items were very high due to restrictions imposed on their import by the Government of India. This illegal influx into India of luxury items imported by Nepal was undersirable to India and the scheme, therefore, remained a bone of contention in trade relations between India and Nepal. In view of these problems the EEE scheme was abolished in March,1978.

THE DUAL EXCHANGE RATE SYSTEM (DER)

The EEE scheme was replaced in March,1978 by a dual exchange rate system. The basic exchange rate was fixed at Rs.12 per US$ and this rate was applied to the import of specified development goods and essential commodities. A second rate was fixed at Rs.16 per US$ for trade purposes. This rate was applied for imports of all goods except those qualifying for the basic rate and for all overseas exports. Exporters, on surrendering their foreign exchange receipts from overseas, were to receive their earnings in Nepalese currency at the depreciated rate of Rs.16/dollar.

The introduction of the DER scheme separated export and import trade into two tight compartments. Unlike under the EEE scheme, exporters were not automatically entitled to foreign exchange for importing lusury items. While foreign exchange was made at the official rate for importing specified construction and development goods, the second rate was applied for the import of luxurious items. Except 17 commodities of luxurious nature which were subject to quantitative restrictions, the remainder could be imported at the depreciated rate (Rs.16/dollar).

Under the DER scheme unnecessary imports were discouraged and as every exportable commodity enjoyed the same benefit, the mushrooming of useless industries that promised quick profit was checked.

Despite several advantages of the DER scheme, it was unable to check the practice of over-invoicing in exports. Realising this, the Government readjusted, on 20 February 1980, the second rate at Rs.14 per US$, thus reducing cash incentives to exporters from 33 percent to 16.8 percent. This change also did not produce the desired results and finally, in September 1981, this system was abolished in favour of a uniform buying and selling rate of Rs.13.10 and Rs.13.30 per dollar, respectively.

In addition to the policies listed above, the Government of Nepal over time has initiated different measures which aim at augmenting exports irrespective of their destination. These measures include:

i) fiscal measures allowing either total exemption of export commodities, mainly processed, from export duty or only a nominal rate of duties;

ii) arrangements for financing by the two commercial banks of the country both for export as well as production purposes;

iii) establishment of the Trade Promotion Centre (TPC) in 1970 to coordinate and vitalize all export-related activities of the Government; and

iv) significant simplification of the procedures required for export transaction e.g. application for export licences, application for exchange control, customs declaration, invoice, etc.

Some measures which have been initiated in recent years include:

Enactment of the Industrial Enterprise ACT (IEA) and a Foreign Investment and Technology ACT (FITA) to encourage internal as well as external investment in manufacturing and export-oriented industries through provision of income tax holidays and 5-10 years rfund of almost all import duties and excise and sales taxes levied during the course of production;

Initiation of efforts to set up an Export Promotion Zone (EPZ) to provide special incentives to such enterprises that would have a domestic value added component of over 20 percent and export its entire output;

Announcement of a new trade policy in 1982 to expand the export trade and increase the level of foreign exchange earnings, income and job opportunities;

Announcement in November 1983 of a nine-point export promotion programme to promote exports on a dynamic and sustained basis* through provision of cash incentives in hard currency worth 10 percent of FOB value of export earnings for items other than leather and leather goods, reducing customs duties on export items, granting of pre-export loans, provision of granting 15 percent of total export earnings in foreign exchange for import of raw material and manufacture goods, making it obligatory for the Nepal Industrial Development Corporation (NIDC) to channel at least 10 percent of its total annual credit towards export oriented industries, establishment of special units for dealing with export activities in the chemical banks located at Kathmandu, Biratnagar, Birgunj and Bhairawa and provision of loans for export purposes at lower than prevailing lending rates for the first one month.

Different measures adopted by the Government over time have emphasized the need to further organize, consolidate and systematize trade in the private sector. Only a few areas of operation, particularly in the import and distribution of essential consumer goods and construction materials, are left to the public sector enterprises without any monopoly over import of these items. It should be noted that private sector trade has yet to be well developed and many of the public trade and commerce

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* Under this programme a 15-member Export Product Development and Promotion Council, under the Chairmanship of the Prime Minister and another body, the Export Trade Development and Management Committee, under the Chairmanship of the Commerce Minister, were formed.

institutions, although very inefficient themselves, have been created because of the prominent deficiencies in the performance of the private trade sector. A new sense of partnership between the public and private trade sector may pave the way for vigorous trade expansion (Promoting Development, 1986).

POSITION OF PRIMARY EXPORTS

Exports of Primary products, constituting a major portion to total exports from Nepal, is largely determined by their availability and surplus of proudction. Manufactured products are yet to emerge as major export items. In line with Linder (1961), therefore, it can be argued that manufacturing proudcts have no prospects of findings markets abroad unless industrialization attains maturity. Despite a shift in the content of exports from intensity in raw labour and resource base towards processes which require skills, the position of primary products in the Nepalese export sector has been very significant.

In fact, in most developing economies of the world, primary products have a key role in generating employment and in earning foreign exchange through exports. To the utter disappointment of these economies, however, the prices of primary proudcts have fluctuated sharply over time and have tken a downward trend resulting in a deterioration in the terms of trade of of the Least Developed Countries (LDCs). This is often blamed on the structural differences between the Developed Countries (DCs), major producers of manufactured goods, and LDCs, producing mainly primary products.

The prices of commodity exports of developing countries declined sharply with the onset of the recession, at a rate of about 15 percent annually during 1980-82. Despite a mild recovery in 1983-84, primary products experienced a further decline in prices during 1985-86. By end-1986 prices had fallen by about one-third from the 1980 level (UNCTAD,1987). Expectedly, many economies of Southeast Asia were adversely affected by the slow down in the world economy and the sharper deceleration in growth in world trade (ESCAP,1985).

The developing economies, mostly non-OPEC countries, experienced various external shocks after 1973. The quadrupling of petroleum prices during 1973-78 produced major external shocks (OECD,1981). Moreoever, the introduction of advanced agricultural technologies and pressures for increased protection in the developed countries led to a massive over-expansion of their agricultural outputs and severe restriction into their markets of primary commodities from the developing countries. Their surplus production of primary commodities has been released in the international market at highly subsidized prices to compete with the traditional exporters. Further, innovations of material saving technologies and development of synthetic substitutes for natural products reduced the demand for a number of agricultural raw materials such as jute. Prices of commodities like jute have fluctuated in response to short-term variations in demand and supply influenced by the level of activity in the importing countries and variations in climatic conditions in the major producing countries.

The following section is devoted to discussing production, consumption and export of jute goods and jute fibre, which until recently accounted for a large part of the total annual foreign exchange earnings in Nepal. This is followed by an econometric analysis of factors affecting the export of jute fibre from Nepal to her major market in India.

PRODUCTION AND TRADE OF JUTE GOODS IN NEPAL

Hessian, sacking and twine are the major jute products produced by two jute mills and two twine mills. Biratnagar Jute Mills (BJM), the bigger of the two jute mills, was established in 1936. BJM employs about 252 technicians and clerical persons and its daily production of jute goods average 37 mt. Raghupati Jute Mills (RJM), established in 1946, employs 151 technicians and clerical staff. Current production of jute goods by RJM averages 26 mt/day.

Modernization of both mills started in 1964/65 with loans received from Nepal Industrial Development Corporation (NIDC). Further modernization was done in 1974/75 with loan assistance from the Asian Development Bank. Efficiency is still very low in every sector of both mills, both in terms of man/machine ratio and output per machine. This has resulted in a high ratio of man-days/mt of jute goods produced. It may also be noted that a weaver in these jute mills is operating only one loom as against two looms operated by an average worker in Indian jute mills.

Two jute twine mills have been established using replaced equipment of BJM and RJM. With an average production of about 2 mt/day each, the two mills employ about 350 workers. The entire production of these mills is sold in the Indian market.

The two jute mills of the country require 17 to 18 thousand mt of raw jute per annum when they operate at the average capacity utilization of 77 percent; another 5 thousand mt is required for non-mill domestic consumption (IDS,1983). The fibre consumption of the two jute mills along with the two twine mills was highest (22,816 mt) in 1983/84.

Production of jute goods over the period 1970/71 - 1986/87 fluctuated between 13,644 mt in 1970/71 to 20,026 mt in 1984/85. Among different products, sacking has registered a significant increase over the period, while hessian production has failed to increase (Table 2.9). A study (ESCAP,1986) showed that the quantity of hessian and sacking produced in Nepal are highly influenced by lagged production of the items and the margin between product price and jute cost. The report also reveals that hessian and sacking are to some extent substitutable in that a relative price increase in on product tends to increase its production at the cost of the other.*

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* High quality fibre is woven into hessian cloth. Hessian cloth is packed in iron-bound bales, which are fully pressed, containing 2000 yards of the cloth. Sizes of hessian cloth produced and exported from Nepal are 1) 40"x40", 2) 45"x40", 3) 48"x40" and 4) 32"x40". Sacks available are 1) hessian bags (44"x27/6") and 2) HY Cees (43"x29"). Nepali Jute Mills produce 4-ply twine and is exported by weight.

Table 2.9

Export And Production Of Jute Goods

(mt)

YEARS	EXPORTS			PRODUCTION		
	Hessian	Sacking	Twine	Hessian	Sacking	Twine
1970/71	-	-	-	5,658	7,291	695
1971/72	-	-	-	5,358	6,981	641
1972/73	5,315	3,536	937	5,467	7,162	692
1973/74	4,267	4,413	249	4,991	7,266	632
1974/75	19,120	3,315	244	4,784	6,579	514
1975/76	48,433	971	370	6,345	8,514	803
1976/77	55,366	548	55	7,370	8,491	608
1977/78	6,187	2,232	72	8,313	8,106	340
1978/79	7,892	6,952	209	7,389	8,836	368
1979/80	5,381	5,248	134	6,950	8,450	484
1980/81	1,617	3,336	106	6,701	8,802	402
1981-82	3,257	7,275	712	4,825	10,223	454
1982/83	7,548	11,624	1,776	3,060	14,764	1,795
1983/84	6,022	8,761	2,942	4,909	13,287	3,127
1984/85	4,990	5,190	2,994	6,155	10,250	3,621
1985/86	4,345	4,696	2,902	4,878	8,900	3,398
1986/87	4,841	3,723	3,364	5,586	10,054	3,435

Source : JDTC

Production of twine has remained above 3,000 mt from 1983/84 onwards. A large part of the increase in the production of sacking over time seems to have been observed internally as available data do not show a corresponding increase in exports of sacking. Internal consumption of sacking is expected to increase further as the packaging requirement of the cement and sugar industries is likely to increase with the expected installation of additional capacities in these areas. The internal consumption of jute goods accounted for about 35 percent (6005) of total jute goods production in 1985/86. The demand for sacking is likely to increase dramatically in India with the introduction of legislation making it obligatory for certain industries (e.g. fertilizer) to use only jute as the packaging maerial. This may positively influence the Indian demand for Nepalese sacking, thus increasing both production as well as its export from Nepal.

The jute mills are involved in the export of jute goods. Contracts are made for supply by the mills for forward delivery at the contract day's spot prices instead of at a premium price to bear the cost of holding the goods. The mills, therefore, bear the entire cost of holding the finished goods. It is reported that in making sales contracts at premium prices, the mills are losing 2 percent for every month of forward delivery.

India has been a traditional market for Nepalese jute products. Prior to the 1960's, almost the entire production of jute goods was exported to India. Policies of the Government of Nepal adopted since the Third Plan (1965-70) aimed at reducing the excessive concentration of Nepalese trade with India. As stated earlier, measures such as EEE introduced in 1961 and the Dual Exchange Rate System introduced in March,1978 were instrumental in diversifying Nepalese foreign trade away from India. Expectedly, there was no export of jute goods to India during the period 1970/71 - 1978/79. Exports of jute goods to India started picking up again from 1981-82 with the cessation in 1981 of export diversifying measures. In recent years, the entire export of jute goods has been absorbed by India (Table 3.0).

EXPORT OF JUTE FIBRE

Annual production of jute fibre and factors affecting its supply has been elaborately discussed in Chapter IV and Chapter V. This section, therefore, focusses mainly on the mechanism for jute exports, its trend and factors explaining the quantities of jute fibre exported annually.

Although the jute export trade has traditionally remained the domain of the private sector, the Government has used a series of measures to intervene in the market. From October,1972 until end-1976, the industry was nationalised. The JDTC procured jute from farmers and exported jute fibre to different countries. In 1975-76, the export of jute fibre by JDTC constituted 79.69 percent of total exports. Substantial losses suffered by JDTC in

Table 3.0

Internal Consumption And Exports Of Jute Goods To India And Overseas

(mt)

YEARS	IC	EI	EO
1970/71	938	-	-
1971/72		-	-
1972/73		0	10,587
1973/74		0	9,363
1974/75		0	6,251
1975/76		0	8,362
1976/77		0	8,466
1977/78	4,862	0	8,537
1978/79	3,841	95	15,746
1979/80	3,102	469	10,442
1980/81	4,612	1,844	4,183
1981-82	4,086	12,052	184
1982/83	4,125	21,835	0
1983/84	3,948	18,121	161
1984/85	2,223	13,521	14
1985/86	6,005	13,138	0
1986/87	5,368	12,333	0

IC = Internal consumption

EI = Export to India

EO = Export overseas

internal marketing of jute significantly reduced the Corporation's involvement in fibre export, paving the way for increased private sector participation in export trade. A description of marketing systems for exporting jute is given below:

About 100 registered private firms are entitled to export raw jute, but less than 20 account for most of the country's export. All these firms are located in Biratnagar, a major commercial centre in the eastern Terai of Nepal. This is the closest point to road and rail links in India for shipping to the port of Calcutta, through which Nepal's jute destined for overseas market passes. Because of grave trnsport problems, Nepalese exporters find it difficult to sell jute in the overseas market. Most often Nepalese jute is sold at discounted prices compared to similar qualities of other exporting countries. Their sales are negotiated by agents in Calcutta. A small quantity is sold directly to the international traders and the Indian traders in Calcutta, who, in turn, sell to traders abroad. Different policy measures referred to in the earlier section of this chapter substantially diverted exports of jute away from India during the 1970's (Table 3.1).

Concentrated efforts are lacking to develop markets for Nepalese jute. Nepalese jute exporters complain of the lack of a market intelligence system to assist their trading activities. For the sake of comparison, the mechanism of jute export in Bangladesh and India is briefly introduced here.

Table 3.1

Export Of Jute And Cuttings

(mt)

YEARS	TE	EI	EO
1970/71	-		-
1971/72	-		-
1972/73	14,754	284	14,470
1973/74	19,997	-	19,997
1974/75	20,515	-	20,515
1975/76	25,455	-	25,455
1976/77	35,826	-	35,826
1977/78	40,770	6,802	33,968
1978/79	33,714	1,191	32,523
1979/80	33,871	7,147	26,724
1980/81	51,158	24,926	26,232
1981-82	44,381	24,720	19,661
1982/83	23,763	19,752	4,011
1983/84	6,902	6,902	-
1984/85	4,860	4,860	-
1985/86	4,569	527	3,997
1986/87	7,063	3,564	3,499

TE = Total Export

EI = Exports to India

EO = Exports overseas

The Shippers of Bangladesh transact business in much the same way as the exporters in Nepal. About 200 firms in Bangladesh are entitled to export jute. In addition to these shippers accounting for about 66 to 80 percent of total annual jute exports, the Bangladesh Jute Export Corporation, a public sector undertaking, negotiates deals in the remaining portion. Bangladeshi shippers deal with traders overseas by telex, telegram and telephone. Some of the major international traders have agents in Bangladesh. The shippers usually make an offer of sale of jute of a particular grade at a particular price for delivery within three months. The shippers are not allowed to sell forward more than three months, with a possible extension of two months and ten days. This is done to check speculation abroad. Shippers sell both directly to users abroad and to traders.

The JCI is solely charged with the responsibility of exporting raw jute. Since a large proportion of the jute produced is consumed internally by the manufacturing units, exports of fibre from India have been very small. In the past, only lower grade jute was exported with a view to ensuring adequate availability of higher grade jute for use by domestic mills. The ample production of jute has led to a relaxation of both quantitative and qualitative restrictions in recent years. The falling world market prices have made it difficult for JCI, which buys jute at the statutory minimum price, to cover the procurement cost.

In the absence of artificial measures to discourage the export of jute fibre to India, the Indian market has again become dominant (Figure 12). In addition, the general situation of over-supply in the world jute market and the increasing transportation costs for fibre from Nepal has caused this shift in export destinations.

Some success has been achieved in selling to countries suchas Romania through bilateral trade. But Nepal's obligation to buy some goods in return for their pruchase of jute has posed problems for the narrowly based agricultural economy of Nepal, which may not need many of the commodities exported by countries like Romania.

Fibre requirement by major end-users is likely to remain well below present fibre production levels in Nepal and, therefore, surplus fibre will have to be exported. As in the past, India is expected to be a major market for Nepalese fibre. In view of the dominant position of the Indian market in the export of raw jute from Nepal, an attempt is made in the following section to make an analysis of different factors that explain annual variations in raw jute supply to India.*

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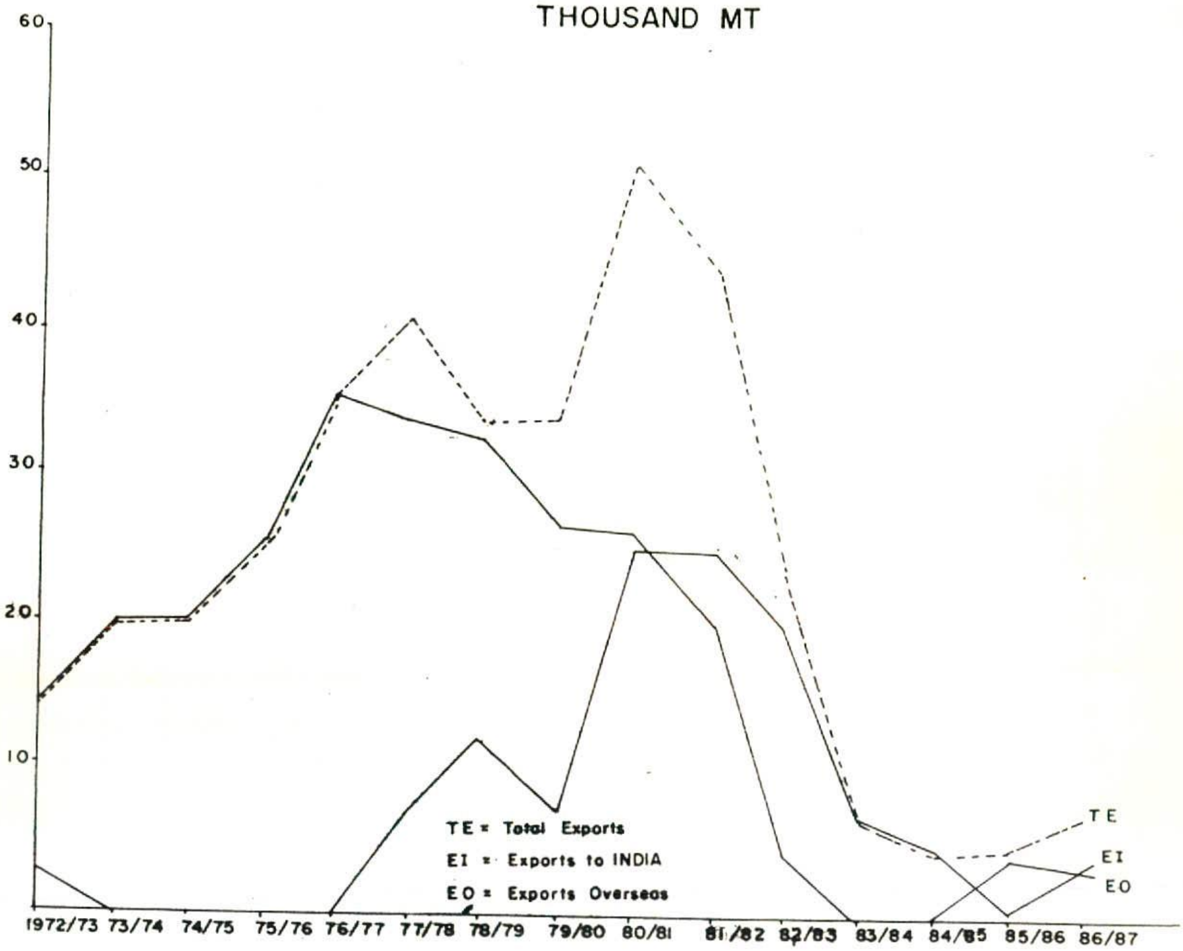
* Raw jute is exported in rope bound bales. The fully pressed weight is 180 kg/bale. Export Hearts, Export First and Export Lightening, from white jute; and Dundee-4, Output tossa-2/3 and Output tossa-4, from tossa jute, are the type of assortment.

FIGURE 12 : EXPORTS OF RAW JUTE AND CUTTINGS THOUSAND MT



ECONOMETRIC ANALYSIS OF RAW JUTE EXPORT

The falling trend in raw jute exports is not easy to explain because a host of factors are involved. The declining volume of exports may be presumed to be a result of the greater profitability of selling at home rather than exporting abroad. Indeed, an inherent problem of economic development is that the internal demand supported by development activities might exacerbate the foreign exchange bottlenecks by diverting exportable products to the internal market.

A decline in Nepal's export of raw fibre along with an increase in internal consumption could have lent support to this hypothesis. In the case of Nepal, however, no such marked increase in the internal consumption of raw jute has taken place. Moreover, it may not be appropriate to consider an observed increase in the domestic consumption of an exportable commodity as necessarily the cause of the simultaneously observed decline in the export of that commodity (Peera,1978). As to the question of the relative profitability hypothesis, a lack of serial information makes testing of this hypothesis quite impossible.

Some other factors which could affect the supply of fibre for export from Nepal may include:

a) tecnological development;

b) the challenge from synthetics; and

c) the recessionary condition in the world market.

The above-listed external factors may not be particularly significant in Nepal's case because the position of Nepal in the world jute trade is almost negligible. Therefore, even if there are fluctuations in external demand, Nepal's exports would hardly be affected. Moreover, income elasticity of demand for primary products such as raw jute is relatively stable and inelastic. Therefore, fluctuation in the national income of major jute importing countries or global recession will have very little effect on the demand for Nepalese exports.

Two opposing arguments are often forwarded to explain the inability of developing countries to expand exports. While the first view states that the chief factor inhibiting exports of LDCs is the difficult condition in export markets due to protectionist policies followed by the developed countries, the second view blames the poor export performance on the structural conditions in the developing countries themselves. Internal competition from other substitute crops, procurement prices, risk factors and the state of crop technology may significantly influence annual crop production and,therefore, the supply. Since a number of these variables have already been formed to be statistically significant in explaining the annual variations in jute acreage and production, any further discussion on this subject would be redundant. Since no quantifiable information on protectionist measures folled by the developing countries is available and since the major market for Nepal's raw jute is India, a developing country, the export functions estimated here focus on testing the hypothesis that rigidities in internal supply explain the export of raw jute to India. Further, raw jute for internal consumption by mills, storage and carry-over stocks also greatly influence availability of raw jute in a particular year. However, the possibility of these variables being used in the supply model is precluded by a lack of authentic time series information on these variables.

In the backdrop of the above discussion, a linear equation of the following shape is estimated to access the influence of various explanatory variables assumed to exert influence on the export supply of Nepalese raw fibre to India.

(15.1) $Y = a + b + c + e$

where :

Y = dependent variable

b = constant

a, b & c = explanatory variables

e = error term

Regressing the annual export of jute and cuttings from Nepal to India on three explanatory variables (two continuous and one binary) the following results were obtained:

$$(16.1)\ EJIQ = -20626.8 + 13017.21\ AJPN - 14451.7\ EDP + 0.411307\ JPN$$
$$(4454.6)\quad (7734.58)\qquad (4315.77)\qquad (0.12)$$

$\bar{R}^2 = 83$

$DF = 9$

Where:

EJIQ = annual exports of jute and cuttings to India (mt).

AJPN = ratio of calcutta price to farm gate (Sept/Oct) price in Nepal. Since Calcutta prices are in terms of 100 kg and in Indian rupees, annual Calcutta prices have been multiplied by 0.4 (Nepalese prices being reported in terms of 40kg) and the exchange rate to convert prices in terms of Nepalese rupees/40kg. This divided by Sept/Oct farm gate price results in AJPN.*

EDP = a dummy variable, which takes a value of 1 in those years when export diversification measures existed and 0 otherwise.

JPN = annual jute production in Nepal (mt).

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* Calcutta market price is taken as the ultimate price received by Nepalese jute exporters.

All the coefficients have expected signs and are highly significant. The positive sign on the price variable (AJPN) indicates that the higher the difference between Calcutta price, which represents the export price for Nepalese exporters, and the procurement price, the more will be the export of jute to India. The negative sign on the dummy variable reveals that export of jute to India declined significantly during the period when different policy measures were introduced to diversify Nepalese exports.* The highly significant positive coefficient on the JPN variable (internal production of jute) reveals that the export of raw fibre from Nepal is highly influenced by the internal supply position within the country itself. This finding also corroborates our earlier assertion that internal supply constraints inhibit export growth.

The inclusion of time as one of the explanatory variables tends to increase the overall fitness of the model:

$$\begin{aligned}(17.1)\ \ EJIQ = {} & \underset{(4109.1)}{-16903.6} + \underset{(7552.86)}{16996.06}\ AJPN - \underset{(5009.12)}{19332.4}\ EDP + \underset{(0.11)}{0.428572} \\ & JPN - \underset{(604.39)}{970.27}\ time\end{aligned}$$

$$\bar{R}^2 = .87$$

$$DF = 8$$

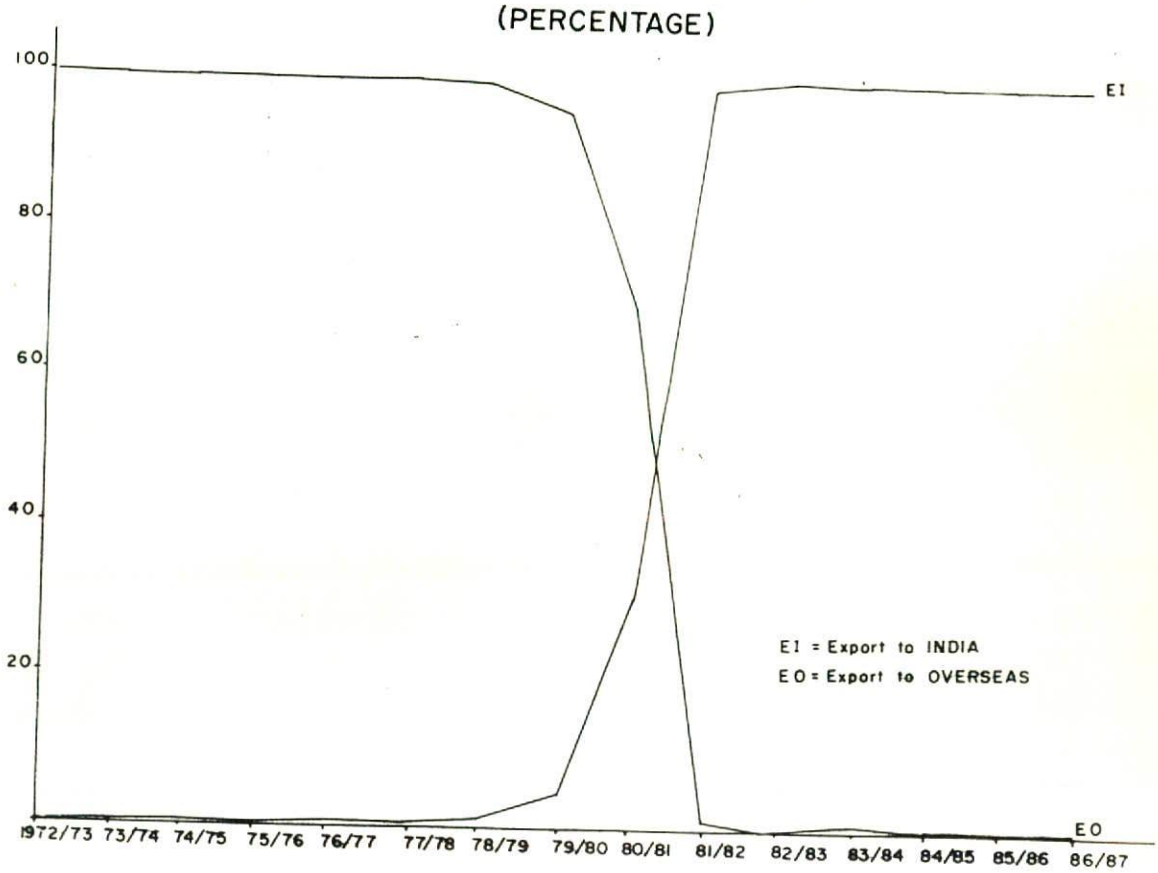
---

* Exports of jute goods to India also declined significantly during the period (Fig. 13).

The negative coefficient on the time variable (t=1,2,3.....) shows that the export of jute from Nepal has followed a declining trend with time. This decline, as indicated earlier, is ascribable, among others, to internal structural rigidities. This is true of countries like India also where poor export performance is attributed to certain rigidities, lags and other structural conditions. As to the influence of export price as a determinant of export supply, it has been found to be a statistically significant variable by several researchers in Bangladesh - the largest exporter of raw jute in the world.

Since import of Nepalese raw jute by India are indentical to exports of raw jute there by Nepal, efforts were made to estimate a demand/supply equilibrium model with Indian GDP and the annual production of jute in India as two variables to represent demand side. This effort, however, had to be abandoned as the signs on the coefficients were unexpected and statistically insignificant. The logical explantion of this could be that, since export of jute from Nepal constitutes a negligible portion of the total fibre consumption in India, fluctuations in macro-economic parameters there are not likely to influence the export of raw jute from Nepal. In other words, Indian demand for Nepalese raw jute will not change significantly despite fluctuations in economic conditions in India.

FIGURE 13 : EXPORT OF JUTE PRODUCTS (PERCENTAGE)



VIII

GLOBAL PROSPECTS FOR JUTE

INTRODUCTION:

This chapter is devoted to discussing trends in global consumption of jute and jute goods and competition faced by them from substitutes. In discussing global trends in consumption, analyses of consumption patterns in major markets are made. Extensive use of information published in different statistical bulletins/documents of FAO is made. The market analysis is preceded by a precise discussion on the marketing procedure followed in import of jute and jute goods by the traders and buyers in the consuming countries.

The import of raw jute is dictated by requirements of spinners and mills to meet orders for their products. Excess quantity may also be bought for future use when prices are very low. Most often sellers and the consumers (spinners and millers) are separated by international traders, who purchase on f.o.b. terms and sell to consumer on c.i.f. terms. The traders use their knowledge of the jute market and arrange purchases/sales, and bear the risk associated with timely delivery and the desired qualities. Most often, the traders are rewarded with a margin adequate enough to cover costs and retain profits. Although direct sales are increasing, more than 60 percent of world trade in raw jute is marketed through international traders (UNCTAD, 1984). London is the centre for trading activities in jute. Quite a number of traders involved in international trading are members of the London Jute Assocation.

A large number of countries buy jute, whose systems for importing jute and its purchase by mills differs from country to country. While in Western European countries importing and marketing are handled by private firms, in the Socialist countries and in some developing countries, public sector enterprises are involved in these kinds of operations. For example, Iraq's National State Textile Establishment imports jute for its mills and Algeria's SONITEX has the monopoly over jute import and plans production of jute goods by the country's two jute mills. Many developing countries such as Morocco, Tunisia, Kenya, Egypt, Nigeria, Ghana, Ivory Coast, Senegal, Mali, Iraq and Algeria have jute mills, which import jute directly for home consumption.

The importing and marketing system in Japan elucidates the complexity of business arrangements and interests involved in the importing of raw jute and manufacture of jute products in industrialized countries. Jute in Japan is imported mainly by 10 importers on the basis of orders received from the four main spinners. These four firms control 80-85 percent of the jute trade in Japan. These firms are also involved with importers in marketing of jute goods and also handled other fibres, including synthetics. The various commercial interests of the four spinners give them flexibility in decisions concerning which products to market. This flexibility lessens their dependence on import of jute and jute goods.

The marketing system of jute in countries such as United Kingdom, France and Belgium bear some similarities to that of Japan. In the United Kingdom, jute is imported almost entirely by the members of the Jute Importers' Association. The spinning of raw jute and production of jute goods is carried out by the members of the Association of Jute Spinners and Manufacturers, and some of the members are also involved in the production of polypropylene.

A number of the most important traders belong to the European Association for the Trade in Jute Products. Some Japanese firms e.g., Itoh and Marubine are engaged in international trade in jute products. At the international level, the traders have the important functions of providing sellers with contacts with the buyers, providing information and advice on products, prices, delivery dates to the buyers and timely delivery. They also arrange finance for the interim period between their payment to sellers and the time they receive payment from the importers.

The following methods are followed by the consuming countries to import jute goods:

1. The sellers sometimes initiate dealing by contacting prospective buyers and sometimes the buyers abroad send enquiries to the exporters, who respond with offers. Offers are binding for a stipulated period of time and puchases are mostly arranged by cables/telex.

2. Some countries in the Middle East and Africa such as Egypt and Syrian Republic float global tenders to purchase jute goods. Tunisia's annual purchase of jute bags and sacks is an example of trade by tender. The Department of Cereals in Tunisia is responsible for purchasing jute bags and sacks, which floats the tenders specifying delivery schedules, prices to be on C & F basis and penalties for late delivery.

3. Some importing countries enter into barter agreements with the producing countries, involving trade in jute goods. Exports of jute goods are valued at the market prices and are used in importing industrial and other goods by the exporting countries without payment in foreign exchange. Mainly Socialist countries have this kind of arrangement with some of the producing countries. In addition to barter agreement, bilateral arrangements are also made for import of jute goods. The USSR's purchase of jute goods from India is an example of trade in jute goods through bilaterial agreements. Under this kind of agreement, the USSR can buy from any seller in India. Purchases are made at the prevailing market prices, the payment being made in Indian rupees.

Demand for jute in Major Markets:

The war orders for jute goods took the jute industry out of an acute depression of 1938. By the beginning of 1939, the jute industry was looking forward to boom conditions (Ahmed,R.1966).

World consumption of jute rose rapidly during the post World War II period. During mid-sixties, however, it registered a slight decline. Between 1969/70 - 1970/71, consumption dropped by one-third, the largest decrease being in North America and Western Europe where the volume consumed declined by 50 percent. World demand for jute increased from about 3.3 million mt. in 1969/70 - 1970/71 to 3.6 million mt. in 1979/80 - 1980/81. This situation is definitely an improvement over the preceding decade when world demand for jute stagnated at about 3.1 - 3.2 million mt. consumption patterns, however, have varied substantially between developed and developing countries and also between fibre producing and non-producing countries.

In developing countries, consumption of fibre rose more rapidly during the seventies than in the previous decade. By 1979/80 - 1980/81 apparent consumption amounted to 70 percent of the world total. Three-fourths of the rise in the Far East was accounted for by increase in India, Bangladesh and Thailand. China also experienced considerable increase in consumption following increasing domestic production of the fibre.

The growth of output and trade of agricultural products and other packagable commodities such as cement and fertilizers constituted a major strength to jutes' market development. In the jute producing countries, increased production and trade of packagable comodities were responsible for the rise in consumption. Moreover, imposition of restrictions on use of synthetics in certain sectors through legislative measures also contributed to market expansion in these countries.

In the industrialized jute consuming countries, three main factors tended to shift the demand away from jute in packaging:

1. the extension of bulk handling facilities at ports and railheads, and containerisation because of rising labour costs in handling and transportation of commodities;

2. the increasing use of multi-wall paper sacks, especially in the distribution of cement and fertilizers in addition to the competition from traditional rivals e.g. cotton and hard fibre; and

3. the widespread prepackaging of groceries due to the boom of supermarkets leading to a decline in the need for bags and sacks in the transportation of groceries from the wholesale to the retail level.

The development of bulk handling was intensified during and after the Second World War by the high prices of jute goods (Sarkar, 1981). In addition to the above mentioned development that led to a decline in the use of jute, supply shortages and the consequential unstable prices of jute and jute goods facilitated encroachment on jute's territory by substitute products. Total consumption fell in the early 1980's as a result of the world economic recession which affected uses such as carpet backing and other application in housing and construction. Finally, the acute shortage of jute in 1984/85 led to exceptionally high prices of jute and jute products leading to a substantial loss of market in industrialized countries.

High operating costs of manufacturing units in the consuming countries has encouraged them to buy jute manufactures instead of jute fibre. In Japan as well as in Western Europe there has been a substantial decline in local production of jute goods, which is attributed among others to rapid dismantling of the jute manufacturing industry there, especially in Western Europe. In some of the developing countries limited supplies of domestically produced fibre and higher processing costs faced by the local manufacturing units compared to those of countries which are major exporters of jute goods, have led to imposition of high tariff rates on import of both jute and jute goods. These efforts aimed at protecting the inefficient domestic industries have not only checked further expansion of the jute industry but also facilitated substitution of high-priced locally produced jute goods by synthetic substitutes.

An analysis of usages of jute and prospects for jute in some of the major markets of the world is presented here:

Western Europe:

As stated earlier, the quantity of jute fibre consumed in Western Europe has declined over time. During 1969-71 to 1979-81, the volume of jute absorbed in Western Europe fell by about 50 percent, which is attributed to rapid dismantling of jute mills as well as their conversion into polypropylene manufacturing units. The West European jute sector in the 1970's experienced a rapid decline in manufacturing capacity and the accompanying fall in raw jute purchase. Although increased net imports of jute fabrics and sacks offset some of the decline in local production, their availability in 1983 was about 55 percent lower than in 1971.

Basically, two major factors are responsible for preference given to jute goods by European importers.

I. increasing loss of competitiveness in manufacturing basic jute goods in Western Europe compared to their manufacture in the jute producing countries.

II. gradual reduction and elemination of tariffs and quotas on jute goods imported into the EEC.

From the beginning of 1977 all jute goods from the major exporters (Bangladesh, India and Thailand) have been trated under the general system of preference. From the beginning of 1981 the EEC suspended duties on imports of jute goods from these countries, provided the exporting countries restrict the export of certain items to levels fixed by bilateral agreements. The EEC relaxed quota restrictions on all products after the expiry of bilaterial agreement in December,1983.

Sacks and bags provided the largest market for jute goods in Western Europe. A substantial portion of the requirement is met through import. Although reliable data on production of jute bags and sacks in Western Europe are not available, it seems that output of these items has declined sharply since the mid-seventies. There is little sacking production (2000-3000 mt/annum) in Europe. Some hessian cloth is made into bags at times of tight supply conditions. The entire apparent consumption is, therefore, met through import of bags and sacks from the producing countries.

Imports of jute bags and sacks into EEC more than doubled from about 37,000 mt. in 1975 to 99,000 mt. in 1980. Along with an increase in import, export of bags also increased which is attributed to growing intra-trade among EEC members countries. Net imports of jute bags and sacks approximated 60,000 mt. by the early 1980's. This amounted to about 25 percent of total apparent consumption of all jute products (FAO,1986).

Consumption of jute bags in Western Europe is explained by the demand for agricultural exports for the region. EEC account for nearly all imports of the region. The use of jute packaging material is confined to packaging, storage and transportation of agricultural commodities. Moreover, jute packaging material is almost entirely used in exporting agricultural commodities as jute bags for packaging agricultural commodities for the internal market has been displaced in its entirity by bulk handling and synthetic packaging material. Currently, jute bags are used for packaging export agricultural commodities such as sugar, potatoes, flour and to a limited extent, seed grains.

Sugar exports account for a large part of jute used in the agricultural sector. France is the largest exporter of sugar, followed by Belgium, the Fedral Republic of Germany, the Netherlands and the United Kingdom. The use of jute bags for sugar is exclusively confined to export markets. Because of reusability of jute bags and hooking facilities, use of jute bags to package sugar for exports is prefered by some recipient countries.

In 1981, the annual requirement of sugar bags in France was estimated at 25-30 million sugar bags. About 46 million jute bags were needed in Western Europe for packaging sugar exports to overseas countries. The volume of exports of refined sugar from Western Europe has fluctuated between 4 to 5 million mt. Using 50 kg jute bags, about 40 million jute bags would be required to package sugar exports of about 5 million mt.

Jute bags are also used in packaging flour exports. Among Western European countries, France and Italy are the major exporters of flour. A significant portion of the demand for jute bags stems from food aid programmes under which the aid receiving countries can mention their packaging preferences. Exports of flour from Western Europe stands at about 4 million mt. and considering the use of substitute packaging materials (cotton, polypropylene bags), current demand is estimated at 30 million jute bags of 50 kg size.

In Western Europe, potatoes were mainly packed in jute bags of 50 kg capacity. In recent times, however, paper bags (25 kg and smaller) are being increasingly used for bagging potatoes. Jute bags, however, are still being substantially used in packaging seed potatoes both for internal consumption and exports. Bagging of seed potatoes in jute bags is attributed to the breathing properties of jute and also to avoid lucration of potato skins during handling.

The Netherlands is the most important exporter of seed potatoes. Although exports of potato seeds from the Netherlands have increased in recent times, there has not been a proportionate increase in the use of jute bags due mainly to inroads made by synthetic substitutes during periods of bag shortages. FAO estimates annual requirement of bags for packaging potatoes in Western Europe at 23 million pieces.

Packaging of various other agricultural exports such as onions, rice and grain seeds require about 10 million bags per annum in Western Europe.

Demand for jute bags in Western Europe is influenced by the regulations for packaging agricultural comodites prescribed by the national authorities. In addition to national Governments, the European Economic Community (EEC) also prescribes mode of packaging, particularly for its food aid programme. Since 1985 the option of utilizing synthetic bags has been offered in a limited manner in EEC regulations governing food aid. It is estimated that the community aid shipments would require about 20 million bags per annum.

Use of jute bags in the non-agricultural sector is confined to packaging of coal and chemicals and for defense purposes. In recent years the use of jute in the non-agricultural sector is estimated at 15,000 mt. per annum in Western Europe, a sharp decline from a high of 32,000 mt. in 1977.

Jute carpet yarns have been the preferred weft yarn for making woven carpets. The consumption of jute carpet yarns in Western Europe has substantially decreased due to decline in the production of woven carpet and increasing substitution of jute yarns by fibrillated polypropylene in woven carpets. Similarly, jute backings have averaged less than 2 percent of the market in recent years. The primary carpet backing for tufted carpets in Western Europe has been filled by polypropylene or polyster woven and non-woven backings since the early 1970's. Jute's position in the Western European secondary carpet backing deteriorated rapidly in 1970's as a result of rise in cost of domestic jute manufactures and imposition of import barriers on purchase of jute cloth from the low-cost producers. Greater penetration into carpet backing market by substitutes since then has drastically reduced the share of cloth. The growth of tufted carpet production, which increased at three times the rate of income growth during the 1970's in Western Europe, is posing a great threat to jute secondary carpet backing manufacturers.

FUTURE PROSPECTS

Packaging remains the largest market for jute goods in Western Europe. Belgium, France, the Federal Republic of Germany (FRG), Italy, the Netherlands and the United Kingdom account for more than 80 percent of apparent consumption of jute bags in Western Europe. In FRG demands for jute bags was severely affected by competition from synthetic and paper bags. The Netherlands is still an important market for bags and sacks with annual apparent consumption estimated at 10,000 mt. Packaging remains the largest end-uses of jute in Italy. The Government of Italy has enacted a law which would restrict use of synthetic substitutes in certain end-uses after 1990. In Belgium demand for jute bags has declined. Similar is the case in UK where chemicals and fertilizers are shipped in polyethylene film and woven polypropylene sacks and potatoes and sugar are packed in paper bags.

An FAO estimate (1986) predicts that demand for jute bags in the period to 1990 would rise by nearly 2 percent annually from the reduced 1983/85 level. This prediction is based on the assumption that exports of sugar and wheat flour would register a moderate growth and that no substantial changes would take place in the packaging regulations. Consumption of jute bags is expected to be at 60,000 mt. in 1990.

Another promising area for increased consumption in Western Europe is in secondary backing cloth for tufted carpets. Jute manufacturers have a good opportunity to penetrate this market at a time when the production of these carpets is in increase and consumers do not seem to be happy with the foam backings. Consumption of jute in the carpet backing could reach between 50 to 80 thousand mt. by the end of the decade. A lot, however, depends on the successful management of the market promotion effort.

Jute consumption in carpet yarn is expected to decline during the 1990's.

On the whole jute consumption in Western Europe by 1990 is expected to be between 190,000 - 220,000 mt. (World Bank,1987).

NORTH AMERICA

Jute is not produced in North America and production of jute is limited to a few specialized yarn spinning and bag sewing operations. Carpet backing cloth and burlap account for about 80 percent of imports of jute fibre and jute goods.

The demand for carpet backing cloth is derived from the demand for broadloom tufted carpets. The rapid rise in real income in the 1960's led to a phenomenal growth in broadloom carpet shipments in the United States. A decline in average real income growth in 1970's, however, caused significant decline in broadloom carpet shipment. Jute carper backing cloth has to compete with synthetic substitutes both in terms of price and technical competitiveness.

Consumption of jute goods in North America declined during the 1970's and early 1980's. Jute secondary carpet backing cloth was also adversely affected by uncompetitive prices in 1984/85. Except the secondary carpet backing cloth, aggregate jute consumption in all other uses declined by 11 percent per annum in North America during the period 1968-83.

The consumption of jute primary carpet backing in the United States reduced sharply after 1970 due to higher prices and technical disadvantages. In case of secondary carpet backing, however, jute maintained price competitiveness until adversely affected by supply shortages in 1979/80 and 1984/85. High prices during these years and economic recession in the early 1980's, which adversely affected carpet production, contributed to a drastic reduction in consumption of jute backing.

In Canada, consumption of jute backing cloth declined by about 19 million square yards between 1971 and 1979. Jute primary backing is said to have lost its price competitiveness and all its market during the 1970's.

Jute burlap imports into North America declined by 132,000 mt. between 1970 and 1983. The sharp decline in burlap consumption is attributed to a decline in jute bag market. The jute bag market declined along with the total bag market due to bulk handling of agricultural products and other materials. Jute's share in the total bag market was further damaged by increasing use of synthetic bags which were priced below heavy jute bags throughout the 1970's. Potato bags made from tight weight hessian were able to maintain a greater share of the market than the synthetics. Paper bags, however, have made substantial inroads into potato packaging in smaller size bags.

Bag manufacturing remained the largest user of jute cloth in Canada, but synthetic fibre fabrics made considerable in-roads in the 1970's. Between 1971 and 1979 use of man-made fibre in bag manufacturing increased by 500 percent. Potato packaging is the largest use for jute bags in Canada accounting for about 30 percent of the potato packaging market.

The US cotton bale wrap market required 70-79 million square yards of the material in the early 1970's. However, lighter weight bale wraps made considerable in-roads over time. The woven polypropylene bale wrap has been accepted as the technically suitable and economically reasonable material for wrapping cloth.

FUTURE PROSPECTS

Secondary carpet backing is the only jute product whose prospects in the North American Market does not look bleak. Jute secondary carpet backing demand is determined by the volume of production of broadloom tufted carpets and jute's share of the secondary backing for those carpets. Jute's annual share of the secondary backing market for broadloom tufted carpets in the United States varied between 53.5 percent and 68.7 percent during the 1970-83 period. This market share, however, declined sharply in 1984/85 due to supply constraints following the flooding in Bangladesh and India and the resulting high price of jute fibre and goods. According to FAO/World Bank, 840 million square yards of jute secondary carpet backing would be consumed in 1990 in the US, provided the 1980-83 level of competitiveness is maintained. A 50 percent market share would require 750 million square yards (117,000 mt.) in 1990.

Prospects for other conventional jute products in the North American Market are less promising, more specifically for sacks where cost competition is strongest. Agreegate consumption of jute products, secondary carpet backing excluded, is expected to decline to around 60,000 mt. by 1990 in North America.

JAPAN

During the 1970's, production of jute goods in Japan declined at a much faster rate than the consumption of jute goods. While the use of jute bags declined, demand for jute carpet backing increased, thereby holding up total consumption of jute goods fairly well. High labour wages have led to reduced manufacturing activity as a result of which raw jute imports into Japan declined from 103,700 mt. in 1970 to 7,700 mt in 1984, while imports of jute goods increased by 50,300 mt. during the same period.

Rapid expansion of Japanese jute industry in 1960's is attributed to the use of jute bags, which substituted traditional straw bags, for packaging foodgrains. During the 1970's, paper and synthetic bags gained significance as rice packaging material mainly due to their price competitiveness vis-a-vis jute bags. The use of jute bags declined by 54 percent. The following factors seem to have adversely affected the demand for bags for pckaging and storage of foodgrains:

1. Government subsidies to farmers to reduce rice acreage that led to a decline in domestic production; and
2. Development of bulk handling for imported grains.

During most of the 1970's the price of jute primary carpet backing was 30 to 100 percent higher than the polypropylene substitute fabric. However, jute was competitive in terms of price in lighter weight fabrics used as a secondary backing for tufted carpets as a result of which imports of primary and secondary jute carpet backing cloth remained at a fairly high level.

Jute industry in Japan has suffered considrable losses. This declining trend can be offset only if new products are developed. In addition to maintaining quality, jute producers and manufacturers will have to control costs.

AUSTRALIA:

Hessian cloth, corn and flour sacks and wool packs constituted 95 percent of jute goods imports during late 1960's. By the late 1970's, however, their share in the total jute goods imports declined, while import of jute carpet backing and jute sacks and bags increased. Imports of corn and flour sacks declined by 19 percent between late 1960's to late 1970's. Nevertheless, these sacks continue to be the largest jute item of import into Australia. These sacks are mostly used in the export of grain to countries which either do not have the facility to receive and distribute them in bulk or have expressed their willingness in favour of jute as a packaging material.

Due to sharp competition from lighter and often cheaper synthetic materials imports, of jute wool packs fell by 72 percent during the 1970's. The development of synthetic wool packs in Japan took place during the early 1970's when disturbances in Bangladesh led to supply shortages of both jute fibre and jute goods.

Import of jute carpet backing cloth increased significantly during the 1970's. The heavier jute primary carpet backing, however, suffered in competition with synthetic backing fabrics. In 1981, the shares in primary backing materials were 40 percent jute and 60 percent synthetics. Jute secondary carpet backing was estimated to have 90-95 percent of the Australian market in 1981.

Apparent consumption of jute in Australia is in decline due to serious erosion of demand for jute hessian cloth and wool packs. FAO projects apparent consumption in Australia in 1990 at 60,000 mt.

EASTERN EUROPE:

Czechoslavakia, Hungary, Poland and Romania account for more than 60 percent of estimated apparent consumption of jute in the region. Apparent consumption of jute fibre and jute goods was 86,000 mt. in 1969-71 and 83,000 mt. in 1979-81. In recent years, however, apparent consumption has declined due to supply shortages and high prices. In recent years the volume of imports was in the range of 70,000 - 80,000 mt. the fibre and products constituting nearly 50 percent each in terms of tonnage.

The production of jute goods in Eastern Europe approximates 45,000 mt. and is concentrated in Poland, Romania and Bulgaria.

Bagging of agricultural commodities is the largest single outlet for jute. Some other important uses are for carpet backing, insulation in construction and in the furniture industry.

In Poland, about 75 percent of total consumption was for bagging agricultural commodities in the early 1970's. In more recent times, however, about 40 percent of jute goods is used for floor covering purposes. The capacity of existing machinery cannot meet the demand for jute carpet backing. The use of woven jute bags constituted only about 3 percent of total bagging material used in Poland in 1981.

In Czechoslovakia, bags (40 percent) and wrapping cloth (35 percent) represent a major portion of jute goods consumed in the country. Jute sacks are used for packaging flower seeds and for exports of hops and sugar. Jute cloth is used for wrapping textiles for exports and machinery and a little goes to wall coverings.

In Romania, about 60 percent of jute usage is for packaging agricultural commodities, 25 percent is used as hessian and the rest is used as carpet backing or yarn in woven carpets.

No new investment in jute processing industry is likely to take place in Eastern Europe. Abandonement of old machinery and its replacement with equipment for producing synthetic would lead to a reduction in processing of jute. Eastern European countries, therefore, may import a greater proportion of total requirements in processed form. Total jute requirements in Eastern Europe by 1990 are estimated at about 80,000 mt.

NEAR EAST:

Egypt, Iran, Iraq, Sudan, Syria and Turkey account for about 90 percent of the total jute consumption in Near East during 1979-81. Among developing regions, the Near East was the fastest growing market, with apparent consumption of jute goods rising from 140,000 mt in 1969-71 to 240,000 mt in 1979-81. From 1981 onward, however, onsumption of jute goods had taken a divergent trend. The Near East accounted for about 13 percent of world net imports in 1979-81. Increased production and trade of commodities bagged in jute accounted for increased consumpton of jute in the region. Packaging requirement for ceareals explained more than half of the requirement, with jute products accounting for the bulk of total imports.

A large volume of fibre was imported into Egypt. In 1984, however, imports of fibre into Egypt declined sharply. Imports of jute products rose sharply from 169,000 mt. in 1969-71 to 226,000 mt. in 1983. In 1984, jute goods import declined sharply.

Production of jute goods is concentrated in Egypt, Iran, Iraq and the Sudan. About 50,000 mt. of jute goods were produced in the late seventies. Inadequacy of domestically produced fibre and higher manufacturing costs compared to those of major jute exporting countries are expected to check further expansion of jute industry in the region.

Introduction of bulk handling of grains and other agricultural commodities has posed a threat to jute. Bulk handling is most widely used for transport and handling of cereals. The existance of centralized crop marketing boards in some contries e.g. Syria and Turkey has encouraged the use of bulk handling facilities. Another factor whch has contrbuted to the spread of bulk handling is the sharp increase in imports of grains into the region. Imported grains, which rose by 29 million mt between 1970 and 1984, come in bulk and are transported in bulk from silos to flour mills. Moreover, bulk handling is being preferred even in case of exports. About 90 prcent of shipments of groundnuts from Sudan is handled in bulk.

Polypropylene, cotton and paper bags are the major alternative packaging material which compete with jute bags. Polypropylene bags are extensive used in packaging fertilizer and flour. The below listed factors seem to have impeded rapid expansion of jute goods in the Near East:

1. grave foreign exchange problems;
2. tariff and non-tariff barriers;
3. price instability and uncertain supplies;
4. lack of promotional effort; and
5. information gap

It is expected that the rate of increase in demand for jute products would be lower than in the previous decade. This conclusion is based on the assumption that no further increase in use of jute will take place for defence purpose and the bagging requirements for domestically produced and imported grains would decline because of the preference for bulk handling. The increased use of polypropylene bags in Turkey, which has synthetic bag industries based on domestic raw materials will pose further threat to jute bags as a packaging material. The fastest growth in jute is likely to take place in Iran, followed by Syria. Consumption of jute for handling of cotton or oilseeds in the domestic market is expected to record the highest growth. Import requirements of jute products is estimated at about 230,000 mt per annum during the rest of the decade.

Between 1960's and 1970's consumption of jute in Africa has remained more or less unchanged, 130,000 mt in the early 1960's to some 145,000 mt at the beginning of the seventies. Consumption of jute registered a decline during 1983 and 1984. Within the African continent, East Africa acconted for nearly 50 percent of the total jute consumption, followed by West Africa (10 percent). While jute consumption declined in West Africa and Central Africa, consumption remained stable in East Africa and in Northeast Africa a steady increase took place.

Nearly 40 percent of Africa's jute consumption requirements are met from products domestically produced from imported fibre. During 1979-81, imports of jute fibre reached 63,000 mt. while those of jute products was around 70,000 mt.

About 60 percent of new packaging material in Northwest Africa is used for bagging internally produced as well as imported cereals. Wrapping of sugar loaves, flour, potatoes and seeds represent other major uses. Polypropylene bags are used extensively in packaging of nonagricultural commodities. Cardboard boxes are also being used for packaging refined sugar.

Competition from synthetics and alternative handling practices are not expected to adversely affect North African requirement for jute packaging material in the period to 1990. Consumption of jute kenaf products are expected to remain at the average level of 1979-81.

Bagging of cocoa, coffee, oilseeds, cotton and tobacco account for the large part of jute use in West Africa. Salt, textiles and charcoal are the nonagricultural commodities packed or wrapped in jute bags. In 1979-81, apparent consumption approximated 27,000 mt. but was lower over the mid-eighties.

Consumption of jute products in West Africa is concentrated in three countries - Ghana, Cote d'Ivoire and Nigeria. These countries account for nearly 70 percent of the total. Shortages of foreign exchange in some countries, tariff and other import barriers on jute products and shortages of jute in the world market facilitated encroachment by sisal and polypropylene bags. Bulk handling of cereals has also caused decline in use of jute bags. About 90-95 percent of apparent consumption in West Africa is met by imports of jute fibre and products. Import of fibre reached a peak of 35,000 mt. in 1973 and 1974 and started falling since then, shrinking to less than 5,000 mt. in 1984.

Inadequate production of fibre within the sub-region, reduced domestic production of jute goods, limitations on import of jute fibre and products to protect high cost domestic industries, periodic supply shortages and foreign exchange problem are likely to encourage a further shift to alternative packaging material.

Cereals, sugar, oilseeds, cotton, coffee and tobacco are mostly bagged in jute and account for the bulk of jute use in East Africa. Moreover, use of jute bags is confined mostly to handling commodities produced and consumed internally. Ethiopia, Kenya, Tanzania and Zimbabwe are the most important markets accounting for about 70 percent of total consumption. Apparent consumption of jute in East Africa was around 60,000 - 70,000 mt. during the seventies. A severe drought in 1983 led to a sharp reduction in bag requirements in several countries of the sub-region. Reduced supply of jute and consequential hike in prices caused further reduction in consumption of jute. Tariff and other restrictions on imports of jute and jute goods in most East African countries have also done considerable damage to the use of jute there.

According to FAO, jute requirement in East Africa is projected to recover by 1990 to 70,000 mt. Bulk handling and use of synthetic materials are likely to make further inroads in packaging of agricultural commodities. Further, jute imports may be curtailed by the availability of doemstically produced sisal e.g. in Tanzania.

Foreign exchange restrictions could limit any prospects for increase in the use of jute in East Africa.

LATIN AMERICA:

Brazil and Cuba accounted for 80 percent of apparent consumption of jute production in the region in 1979-81. In Brazil, jute sacks are used for coffee and sugar, while heavy jute bags are used for packaging fertilizer, salts and mineral ore and some light sacks are used for packaging potatoes, onions, grains and forage. Sugar packaging has been lost to bulk handling. In all the Latin American countries jute bags are being displaced by synthetic sacks and bulk handling. Apparent consumption of jute has declined over time in Latin America, from 210,000 mt. in 1979/81 to 151,000 mt. in 1984. Product imports account for about one-third of the region's apparent consumption, bulk of these imports being in the form of hessian and sacking cloth for conversion into bags. Rise in the use of polypropylene bags and bulk handling are the main reasons for the decline in imports of jute goods in Latin America. In 1983 and 1984, imports of jute products into Latin America fell mainly as a result of fall in imports by Argentina and Chile. Cuba remained by far the largest producer.

Tariff and non-tariff barriers play an import role in determining the size and direction of trade in jute. Imports of jute from countries out side of the region are subject to import duty ranging from 40 to 100 percent. About 140 million bags and 10 million square meters of cloth are produced every year in Latin America.

Increased use of bulk handling has considerably displaced jute bags. The use of bags (both jute and synthetic) is used for packaging planting seeds and a small amount of grains for domestic distribution. There has also been rapid expansion in the production of polypropylene bags and many jute mills are now producing these bags. On the whole, prospects for jute consumption in 1980 in Latin America do not appear promising. Further expansion of the polypropylene manufacturing capacity and the profitability of investment for bulk handling of grains in countries like Brazil and Cuba are expected to adversely affect consumption of jute in the region. Consumption of jute in 1990 is expected to be 147,000 mt. as against 210,000 mt. in 1979-81.

FAR EAST:

Bangladesh, India, Indonesia, The Republic of Korea, Nepal, Pakistan, The Philippines and Singapore account for about 90 percent of jute consumption in the region. The packaging of cereals is the single largest outlet followed by sugar and cotton. Cement and fertilizer account for the largest share among non-agricultural products bagged in jute. Bagging of cement in India accounts for nearly one-fourth of total utilization. Jute is also used for packaging textiles, salt and for handicrafts and paper pulp. It is also used for carpets and wallpaper in some countries. Apparent consumption of jute and kenaf was about 1.5 million mt, India, Bangladesh and Thailand accounting for a large part of this consumption. Pakistan and Indonesia are two other important markets which import most of their requirements. While legislative measures in some of the fibre consuming countries have contributed to increased use of jute packaging material, competition from polyolefin bags is more pronounced in consuming importing countries.

The total mill capacity of the region is little more than 3.0 million mt. Use of fibre for different purposes in India, Bangladesh, Thailand, Nepal and Burma ranged between 130,000 - 150,000 mt. in recent years.

Bulk handling has posed a threat to the use of jute in countries such as Singapore, the Republic of Korea and the Philippines. In general, the use of polypropylene and polythylene bags has gained moments in non-jute producing countries.

It is believed that packaging practices followed in 1979-81 would continue in times to come. On the basis of this assumption, jute requirements in the region is estimated to rise from 1.4 million mt. in 1979-81 to 1.9 million mt. in 1990. Most of the increase is expected to take place in the producing countries themselves, more specifically in India. With the increase in demand being concentrated mainly in the jute producing countries, only a slight increase is expected to take place in regional import requirements. By 1990, net import requirements would increase by only 70,000 mt. to 248,000 mt.

JUTE VS SYNTHETICS:

The preceding discussion has adequately highlighted the weakening position of jute and jute goods in the world market. In addition to the damage done to jute as a bagging material by the introduction of bulk handling in major jute consuming countries, synthetic substitutes have encroached on jute's territory. Consequently, jute has lost a large part of its share in the international market despite decline in real prices of jute.

Jute started facing severe competition since the 1960's from the polyolefin, polypropylene (PP) and polyethylene. These products of the petrochemical industry, with great flexibility for processing in different forms, make viable substitutes to compete with jute in each of its end-uses. During the 1970's polypropylene was the most important synthetic substitute for jute. Over time, it has led to complete displacement of jute in the North American, West European and Japanese primary carpet-backing market and has made substantial inroads into the bag market in many Asian, African and Latin American countries.

In West Europe, jute manufacturers themselves were in the lead in producing synthetic substitutes, and their close links with the product distribution system was a definite advantage to the competitiveness of the synthetics. Foreign exchange limitations and fluctuating prices of jute facilitated production of synthetic substitutes in Eastern Europe. Currently PP resin is produced in all countries of Eastern Europe, the largest PP producing capacity of over 140,000 mt. being in Czechoslovakia. Bulgaria and Romania established new industries in the early 1980's. Western Europe, the United States and Japan are and will remain the main polypropylene producers in 1990 accounting for about three-quaters of world capacity. In many countries of Near East, Africa and Latin America, substitutes of jute produces by synthetic has been facilitated by import restrictions and high tariff on import of jute and jute goods. PP bags have made considerable inroads in Syria, Turkey, Iraq and Sudan. Major petro-chemical complexes have been set up in Saudi Arabia, Libya and Turkey. In countries such as Nigeria and Kenya and Polyester/ viscose bags have made significant inroads into a number of markets for jute products. In almost all the Latin American countries jute bags have been displaced by synthetic sacks and bulk handling of commodities. There are about 20 PP bag manufacturing firms in Brazil.

Significant increase in crude oil prices in 1973/74 and again in 1979 were believed to raise the cost of synthetic high enough to allow jute to regain its lost market position competing in terms of prices. This, however, remained a mere wishful thinking as the investment policies pursued by the chemical industries and technical innovations in the processing of chemicals were effective enough in checking the cost of production of synthetic products. Contrary to the common expectation, therefore, synthetic substitutes suffered no substantive loss in the world market. At the same time, enterprising industrialists, apprehending a loss in the market share of synthetics, banked upon a more agressive production policy, which led to the development of over capacity in chemical industries. Moreover, reduced cost of production, as a result of invention of new processes, facilitated successive reduction in the selling prices of synthetics. Therefore, unlike what was anticipated, jute's position in the international market did not improve despite hike in crude oil prices. In fact, compared to its position with synthetics prior to rise in crude oil prices, jute has been found much less price competitive in the early part of 1980's. As stated earlier, economies of scale and improvements in technology largely reduced costs of production. Since the early 1980's, however, feedstocks and base chemicals have accounted for a rising share of total costs, and the scope for absorbing further increases in prices has been reduced.

Owing to weak demand for oil because of slow recovery in economic activity in industrialized countries and increasing shift to alternative energy sources, prices of crude oil began to depress since the beginning of 1986. Accumulation of large stocks and continued high level of production led to drastic reduction in crude oil prices, from US$ 28 a barrel in early January to about US$ 12 at the end of March 1986. As a result of failure of OPEC countries to control production, prices further dropped to about US$ 8 per barrel in July 1986. However, following agreement among OPEC countries to temporarily cut production to 16 million barrels a day in July, oil prices began to reover after August,1986. For the first nine months of 1986 prices of light Arabina crude oil averaged US$ 13 a barrel. While in current terms this was the lowest since 1978, in real terms prices had fallen back to the levels that existed in 1973/74 when the effects of marketing action by OPEC were first felt.

The decline in oil prices had significant effect on the prices of derivative products. By the third quarter of 1986, contract prices of naptha fell to US$ 110 per ton, as against an average of US$ 250 in 1985. A slight recovery in naptha prices took place following announcement of the OPEC temporary production quota agreement.

Prices of propylene, the base chemical from which polypropylene is derived, declined sharply in 1986.

Although prices of polypropylene declined in 1986, the reduction was far less than for most other polymers showing the continued strong demand and high rates of capacity utilization.

During 1985/86, the competitive position of jute vis-a-vis polypropylene showed a marked improvement. This is attributed mainly to the large increase in production of jute in 1985/86. Prices of raw jute, which were at a peak of US$ 960 per mt. in early 1985 began to fall rapidly and by mid-1986 further depressed to less than US$ 350 a ton. During most of 1986, the price of BWD grade jute fibre in Western Europe was about 50 percent that of polypropylene raffia grade material. This was a considerable improvement on the rates during the 1984/85 period of jute shortage and represented a return to the levels that prevailed in the early-1980's. At the product level, the competitive position of jute goods also showed a marked improvement. By mid-1986, average import price of jute hessian fell to the lowest level since 1982. The market situation for sacking in Western Europe was characterized by very sharp price decreases for both jute and imported polypropylene bags. In the United States, a more pronounced reduction took place in prices of polypropylene cloth and synthetic retained a competitive price advantage. The weakening of the US$ and the existence of heavy stocks in Western Europe contributed to the depression in prices of jute bags.

The upward trend in the polypropylene polymer continued through all the quarters of 1987 reaching US$ 1,074/mt. in the fourth quarter of the year. The prices of PP continued to rise in early 1988, the quotated price in January being US$ 1,146/mt. The rise is attributed to strong demand for PP products. This rise in prices in 1987 resulted in the most advantageous position of jute fibre in the last decade. However, the rise in prices of PP polymer was not adequately reflected in the prices of PP products that compete directly with jute products. For example, the main price increases took place in secondary PP carpet backing both in the United States and Europe. Competitive position of jute products improved during 1987 due mainly to fall in their prices. The ratio of jute hessian prices to competing PP hessian in Belgium fell to 121 percent in 1987 from 184 percent in 1984. The ratio in the United Kingdom fell by 63 points during the same period. Competitive position of jute cloth improved only slightly as prices of both jute and PP cloth increased. The competitive position of jute bags vis-a-vis PP bags also increased considerably during 1987. Due to inability of supply to keep pace with demand for PP polymer, prices of PP are likely to increase in the next two years. Demand for PP to 1990 is forecast to grow by 30 percent between 1984 and 1990. (Polypropylene Prospects to 1990). Even with average plant utilisation rate of about 90 percent, some 300,000 mt. of additional capacity would be required to abridge the gap between supply and demand.

Developments in the polymer market up to 1990 are, therefore, not likely to have a deterimental effect on the current competitive relationship with jute and jute goods. The prospects for a further rise in prices of PP polymer may lead to a rise in prices of PP products allowing jute products further advantage over synthetics and may regain some of the lost market provided their supply and price level remain favourable.

IX

SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

This chapter summarizes major findings of the study and provides policy-oreinted recmmendations to improve the production, yield, internal marketing and export supply of jute, a traditional primary commodity that has contributed immensely in a variety of ways to the Nepalese economy.

This investigation is the result of a lack in Nepal of an authentic, comprehensive study on jute which is facing severe competition from synthetic substitutes in the world market and from substitutes crops e.g. paddy and maize in the jute growing areas of Nepal. The broad objective of this study is to examine factors that influence yield, acreage under cultivation and export of jute from Nepal. The approach taken to fulfil the objective has been empirical. While on the supply (fibre production) side, two equations 1) acreage and 2) yield have been estimated, on the trade side, an export supply model for Nepalese jute has been estimated. Extensive use of time series information has been made. These data have been supplemented, wherever required, by information collected by the researcher during his trip to the jute producing areas of Nepal. The researcher has also made use of information collected by him during his trip to the jute/kenaf growing belts of Bangladesh, China, India and Thailand. This has facilitated a comparative analysis of cultivation practices followed by farmers in the major jute/kenaf producing countries of the world (Bangladesh, China, India, Nepal and Thailand).

The major producers of jute and allied fibres are India, China and Bangladesh. These countries, along with Nepal and Thailand, constitute more than 90 percent of the global production of jute and allied fibres.

The creation of Pakistan in 1947 left India with the total manufacturing units of an undivided India but with little fibre production to feed them: the main jute growing pockets fell in Pakistan. Concerted efforts made by India resulted in a drastic improvement in jute production in the country; India reached near self-sufficiency by the end of the 1950's. The emergence of Bangladesh (formerly East Pakistan) left Pakistan (formerly West Pakistan) with no internal source of fibre to feed its mills. Since then Pakistan has been importing jute from Bangladesh. Thailand's share in world production reached 20 percent in 1966-67. In recent times, however, its share has stabilized around 6 percent. China's production in recent years has been above 20 percent of the world total. Nepal's share in recent years has fallen below 1 percent.

Despite jute'e high socio-economic importance to the economy of Nepal as a major source of foreign exchange earnings and as an industrial crop accounting for employment of a large number of farm families, no public sector efforts were made for its development prior to 1970. Initiation of planned development efforts can be traced to the creation in 1970 of NJDB which carried out research and development activities and executed a programme to modernize two jute mills in Nepal. To strengthen the marketing activities, NJDB was upgraded to the level of a corporation (JDTC) in 1974. Currently, JDTC is inolved in 1) improved seed multiplication programme, 2) improved jute fibre production programme and 3) jute agricultural research programme. In addition, JDTC collects information on jute and jute products, conducts surveys, organizes training programmes and regulates the trade in jute and jute goods.

A large part of the total jute production in Nepal is accounted for by Morang, Sunsari and Jhapa districts where white and tossa jute are extensively grown. Despite slightly higher yields (1.36mt/ha) and better fibre quality, tossa jute cannot occupy large areas due to its inability to withstand water-logging and the necessity for late sowing (mid-April - mid-May). However, in recent years, the availability of a new tossa variety that can be sown as early as mid-March had led to a drastic increase in the acreage planted to tossa. The current capsularis/tossa ratio in Nepal stands at 38:62. Nepal is annually producing about 150 - 250 mt. of certified seeds from Indian cultivars.

Jute in Nepal is grown using traditional cultivation practices. As the entire crop is grown under rain-fed conditions, the time of sowing and the growth of plants depend on timely occurrence in adequate quantity of rain water. Land is ploughed using an animal-drawn plough and almost all the jute farmers sow jut seeds by broadcasting. Weeding and thinning of jute is not done efficiently. Despite the effectiveness of chemical fertilizers in increasing yield, their application to jute is almost non-existent. Only a few progressive farmers use chemical fertilizers. Prior to land preparation 6-8 mt. of FYM/ha is used.

Jute is harvested about 120 days after seeding using sickles. The harvested stems are left in the field for some days to effect defoliation and are then steeped in water to ret for 10-15 days before extracting fibre by hand. The extracted fibre is not properly washed and many farmers spread fibre on roadsides and on bridges/culverts to sun dry.

Apparently, the poor cultural practices followed by farmers and the non-application of chemical fertilizers and associated inputs explains the unsatisfactory level of yields (1.25mt/ha) in Nepal. Another factor cited to explain unsatisfactory yield levels, not only in Nepal but in the whole region, is that jute farmers are reducing the duration of the crop to facilitate cultivation of paddy. Farmers, always wanting to be assured of a minimum level of staple crop, find it necessary to harvest jute early so as to grow paddy on the same land. This reduces the yield of jute, there being a positive relationship between yield and age of the plant. A jute variety with improved yield and the ability to fit into a multicrop system is yet to be developed.

Total cost of production of jute can be grouped under two heads 1) labour costs and 2) non-labour costs e.g. expenses incurred by the farm operator on associated inputs of the cost items. The cost of human input (189 man-days/ha) is very significant and accounts for a large part of the total cost of production. Animal power (39 bullock-pair/ha) also constitutes a significant portion of the total cost. Labour input requirements are highest in China (about 400 man-days/ha); this is mainly ascribable to the adoption of better cultural practices and the higher yield of kenaf.

Total cost of production of jute is higher than returns resulting in a loss of about US$ 69 on every ha of land planted with jute. Net return is negative in Bangladesh (US$ 79) and India (US$ 52) too. Of the five major jute producing countries, it is only China where kenaf cultivation is still a profitable venture. This is attributed to higher yields, better cultural practices followed and the existence of effective networks in China for procurement of fibre at state-announced prices and distribution of inputs. Jute in Nepal would yield a positive return only when a downward adjustment of 50 percent is made in calculating the cost of human and animal power. A similar situation exists in Bangladesh, India and Thailand.

Despite the net losses incurred, however, farmers are still growing jute and a number of factors have contributed to the survival of jute. They are:

Farmers do not take into account the cost of family labour in rural Nepal where off-farm employment opportunities are very rare. When gross returns are examined only against paid-out cost, jute does not appear unprofitable. Farmers also make a point to allocate some area to jute cultivation every year, irrespective of the price factor, as they are convinced that jute improves soil fertility. Moreover, the increasing use of jute sticks for various utilitarian purposes e.g. fuel for heating and cooking and construction material for fencing, has contributed to the survival of jute.

The research findings clearly domonstrate that insufficient use of chemical fertilizers, unavailability of irrigation water and poor cultural practices have kept the yield of jute at a low level. Moreover, the varieties grown are highly photo-period sensitive and have low resistance to disease and pests. The need, therefore, is to develop varieties that would posses the following qualities :

a) photoperiod insensivity;
b) tolerance to problem soils, low temperature; drought and flooding;
c) resistance to diseases and pests;
d) cylindrical stem; and
e) higher yields with improved fibre quality.

It is difficult for Nepal alone to develop jute varieties with the above-mentioned qualities. Due to the lack of equipment, research staff and other physical facilities, JRC has to confine its activities to adaptive research. The centre needs to be strengthened both in terms of manpower and equipment to facilitate basic research.

In most of the developing countries, the poor performance of the agricultural sector is blamed on a lack of proper coordination between research and extension. In the case of Nepal, however, the problem of linkage between research and extension has not surfaced. Very limited on-going jute research in Nepal and the fact that both research and extension fall under the purview of JDTC may have contributed to this. The extension wing of JDTC has performed quite satisfactorily over the years and appears capable of disseminating to farmers technical knowhow once it is made available to it. The need, therefore, is to strengthen the research capability through staff development programme and provision of equipment. The JDTC should also maintain continuous contacts with BJRI and JARI, both of which have an edge over JRC in the fields of research and development (R&D) in jute. A process of exchange and sharing of knowledge has already started through interactive regional programmes organised under the aegis of IJO.

IJO has also initiated a number of projects to develop higher yielding varieties of jute (germplams project), upgrade the quality of jute through improved retting practices (retting project), tackle the problem of insect pests (IPM project), reduce the cost of sowing and weeding (seeder project), ensure timely availability of quality seeds (seed security project), and enable farmers to adopt improved jute-based farming system (farming system projects).

While in view of the competition faced by jute from synthetic products in the world market it may not be wise to increase the price of raw fibre on a regular basis, it is equally important to pay remunerative prices to farmers if the object is to maintain sizeable production of jute. In such a delicate situation, the best solution would be to increase yield per unit area of land and reduce the cost of cultivation of jute. Further, efforts have to be made to fit jute into a multi-crop system. Investigation into the further use of jute sticks is also called for.

It is believed that effective participation by Nepal in the above-mentioned projects would help jute farmers overcome some of the major problems faced by them, enabling the crop to survive on its own without any protection (subsidy).

It is hoped that the recent decision of the Government to place JDTC under the jurisdiction of the Ministry of Agriculture (MOA), previously under the Ministry of Commerce (MOC), would strengthen the R&D activities of JDTC. Agricultural experts working in different agencies under MOA can be deputed to JDTC to mitigate the problem in regard to the scarcity of agricultural experts. Further, it may also be advisable to keep the present extension wing of JDTC intact so that the existing linkage between research and extension continues to the benefit of all concerned. The current decision has placed JDTC, renamed the Jute Development Research Centre (JDRC) in a similar position to pre-1974 time when NJDB had nothing to do with jute trading. The first task of the management now should be to initiate concerted efforts to enhance its R&D capabilities, which is a prerequisite to Nepal's participation in various IJO projects. Both internal and external sources should be explored and utilized to develop a sound R&D system in Nepal. Some projects of IJO have made special provision to strengthen R&D facilities for jute in Nepal.

No proper econometric work on jute acreage response has been carried out in Nepal. In Bangladesh and India, however, a number of empirical investigations have been made into the responsiveness of jute farmers. Most of these studies conducted along the line of Nerlove's adoptive expectation model have recognised the price responsiveness of jute farmers, although acreage elasticity with respect to price has been found to vary both among countries and over time. In addition to jute's own price, the price of its substitute (paddy in the case of Bangladesh, India and Nepal) and risk factor are the major explanatory variables included in the supply model. In line with Nerlove's formulation, this research has made an attempt at ascertaining the influence exerted by various explanatory variables on the planned production of jute, the dependent variable in the supply model. Actual area under jute has been taken as a proxy variable for planned production of jute.

Rice is practically the only substitute to jute cultivation. Moreover, the cultivation practices of the two crops are so similar that the inputs required for their production are interchangeable. A farmer's decision regarding allocation of acreage to these crops is, therefore, influenced by his assessment of the probablities of the price situations. A lagged jute rice price ratio has often been used in jute acreage response models. Besides reflecting the competition between jute and rice, the inclusion of a price ratio saves one degree of freedom and also solves the problem of finding a suitable deflactor. However, it is also argued that a correct specification of the acreage function should include the price of rice separately as it is a separate influence. Both approaches have been tested in the present analysis. Risk factor has been included in the form of moving standard deviation of the ratio of previous three year's jute/rice acreage. Inclusion of weather variation and extent of irrigation was precluded by a lack of recorded information on these. A time variable is included to account for shifting effects not adequately accounted for by other variables in the equation. The ratio of jute yield to rice yield is used as a proxy for expected relative yield.

A number of response equations, both linear and log linear, with different combinations of variables have been estimated. The price variable has been used both in the form of a ratio (jute/paddy) and as two separate influences. Since a number of equations were found unsatisfactory in terms of their explanatory power, only those showing a good fit and those considered relevant from the standpoint of interpretation of results have been reported. In addition to the national acreage function, a separate response function for the three major jute growing districts (Jhapa, Morang and Sunsari) has been estimated.

Lagged price of jute, during the months of Bhadra/Aswin (September/October), deflated by the consumer price index, lagged price of rice deflated by the consumer price index, and lagged jute/rice yield ratio came out with expected signs. Although the risk variable came out with an expected sign, it was not statistically significant. The statistically significant coefficient on the lagged jute price (Sep/Oct) reveals tht jute farmers, most of whom are small holders, dispose of their produce immediately after harvest and, therefore, are more sensitive to Sep/Oct prices than the annual average price. The statistically negative coefficient on the lagged rice price shows the existence of an inverse relationship between jute acreage and rice prices.

The three districts acreage function was found to be an improvement over the national acreage response function both in terms of overall fitness of the model and the statistical significance of various variables. Jute being a major cash crop in the three districts, the acreage here is likely to be more sensitive to changing economic and noneconomic factors.

The estimated coefficients of adjustment values show rigidities in the relationship. While significant adjustment lags are found, the lag is relatively shorter in Nepal than in Bangladesh. This may be because in Nepal there is no obligatory jute land where rice cannot be grown and farmers, therefore, respond quickly to changing exogenous factors. In Bangladesh where there is obligatory jute land and where jute cultivation has become a way of life, the adjustment lag is bound to be relatively longer than in Nepal.

In line with the argument that separate modelling of yield and acreage is the best specification of a risky supply function, an analysis of yield behaviour has also been made. The inclusion of theoretically important variables such as weather conditions and fertilizer use was not possible due to lack of information on these variables. Therefore, the analysis of yield behaviour is limited to regressing jute yield with time trend and the acreage under jute. The acreage variable shows a negative but highly insignificant relationship with yield. The negative coefficient on the time variable shows a gently declining trend in yield with time. Although the explanatory power of the estimated equation is not that high, the yield function can be taken as the best approximation of a gently declining curvelinear trend.

Sharp fluctuations in jute acreage and production have taken place in Nepal during the period 1970/71 - 1986/87. The glut production of jute in 1985/86 and a sharp decline in both area and production of jute in 1986/87 are attributed to sharp fluctuations in jute prices in 1984/85 and 1985/86. Among the three major jute proudcing countries (Bangladesh, India and Nepal), such fluctuations have been most severe in Nepal. This can be attributed to the lack of a proper regulatory mechanism with regard to pricing and procurement of jute. Farmers find themselves at a loss when they are faced with the farm management decision as to what and how much to grow each year.

The findings of the econometric models have shown both lagged jute and rice prices to be statistically important variables in explaining the annual fluctuations in jute acreage. For example, a sharp rise in the price of rice in a particular year may jeoparadise the production of jute in another year. Therefore, if the object is to maintain a sizeable production of jute both for internal consumption and exports, the timely announcement and execution of minimum support price of jute deserves the prime attention of policy makers.

Agricultural marketing has remained the domain of the private sector with periodic public sector intervention. Equity consierations, lack of well developed private trading channels and exploitative behaviour of traders seem to have prompted the public sector to intervene in agricultural marketing.

The formation of the Food Management Committee in 1962 is often taken as the beginning of a systematic public sector approach in grain trading. The Agricultural Marketing Corporation was created in 1971 to deal with both agricultural inputs and outputs. The serious food deficits in the hills and the need for a wider diffusion of improved agricultural inputs paved the way for the split in 1974 of AMC into the Nepal Food Corporation and the Agricultural Inputs Corporation. Along with the creation of NFC, the Food Policy Coordination Committee was formed and Rice Export Companies were created in the Terai to 1) regularize rice export, 2) provide incentive prices to growers, 3) diversify the export market, and 4) increase revenue of the Government by checking illegal trade. Although some of the companies did quite well in the beginning, serious problems began to surface with a decline in marketable surplus of rice in Nepal and the loss of the traditional export market (India) as a result of commendable improvements in food production there. The companies were dissolved in July,1980. Currently, the NFC is the sole agency charged with the responsibility of executing the Government mandated foodgrain distribution programme and that of protecting the interest of farmers. The NFC, constrained both by physical and financial resources, has not been able to do justice to its responsibility of protecting the interests of producers.

The jute market of Nepal consists of three tiers : 1) prmary (village level) market; 2) secondary (assembly) market; and 3) terminal market. A large majority of fibre producers sell their produce to primary (haat) markets from where it moves on to the secondary market and from the secondary market to the terminal market. A number of market intermediaries such as Farias, Beparis, Dallals, Kutcha and Pucca ballers and Exporters are involved in effecting transmission of jute from producers to consumers. Important modes of conveyance involved in transporting jute are 1) pack animals, 2) carts, and 3) trucks and tractors. In addition to these modes of transport, a significant portion reaches primary markets in head loads.

The completion of the 264 km East - West Highway has made significant contribution in linking all jute growing districts and lowering transportation costs leading to an integration of markets. Therefore, unlike the Tarai paddy market, which is segmented into three national markets - 1) Eastern, 2) Central, and 3) Western Tarai, the jute market in Nepal is not that disintegrated. The calculation of price spread between two markets at two different periods of time shows a decline in price spread. This could be attributed to relatively well developed physical infrastructures and public sector participation in both internal marketing and export trade.

Prior to the creation of JDTC, a few business magnates enjoyed monopoly over both internal and export trade in jute and jute goods. The first procurement price was announced in October, 1973 and the government has been fixing minimum prices. Apparently, the fixation of a minimum support price intends to benefit farmers. However, the announcements are most often ill-timed and they are also below the market price requiring no public sector intervention. The JDTC, constrained by financial resources, could not prevent the distress selling of jute by farmers in 1980/81 when the minimum price fixed by the government was higher than the prevailing market price.

The JDTC is charged with the responsibility of executing the government mandated minimum support price programme. It buys jute through its procurement centres set up during the post harvest season. Further, JDTC buys jute from the primary market through mobile teams. The corporation relies on government grants and government guaranteed loans for the procurement of jute. Except for a few years, JDTC has always incurred heavy losses on jute trading and the losses have been financed by borrowing from commercial banks against government guarantee. Although JDTC may have been able to infuse a sense of competitiveness in jute trading, it has not been able to do full justice to its procurement function due to reasons which are external to JDTC management.

The fixation of a minimum support price of jute and periodic procurement of jute fibre by JDTC have been done on an ad hoc basis to meet the exigencies of a specific period rather than the start of a national pricing and procurement policy. There are instances where JDTC was instructed by the government to intervene in the market using its development fund. The Corporation has to procure jute only at such times when the profit margin in the export of jute is very low. Jute procurement by JDTC has always been influenced by the funding it received from the government as grant or loan. The JDTC could never adopt independent procurement planning. The lack of perspective planning with clear cut policies/programmes and means to execute the programmes have been the major impediment to the satisfactory performance of JDTC. The present plight of JDTC, therefore, cannot be solely blamed on the JDTC management. In terms of allocation of budgetary resources, especially for development work, JDTC has received only a lukewarm treatment from the concerned quarters.

The Seventh Plan (1985/86 - 1989/90) seeks to give fair prices and reliable market opportunities for the agricultural goods. It also states that proper price and marketing will be guaranteed for 15 percent of the total marketable quantity of agricultural products. The plan further states that cash crops will not be allowed to be purchased from the haat and wholesale market below the approved price. Now, with JDTC having to concentrate only on R and D. the kind of institutional arrangement which will be made to actualize these programmes remains to be seen. Though the researcher does not advocate any serious intrusion on the private traders' areas of operation, the presence of a public agency as a buyer of the last resort is a must in view of the oft reported distress selling of jute by farmers and also to check the drastic shrinkage in the jute area which may jeopardize the operational viability of the two jute mills. The type and structure of the organisation involved in this task is not so critically important because the success of policies depends more on the drive and energy with which they are executed rather than on the type of agency involved. The agency to be charged with the responsibility for executing jute price policy should be provided with adequate funds to intervene in the market whenever it is deemed essential. Alternatively, it could operate as a normal business house buying and selling jute on a regular basis to protect the interests of growers as well as to earn a reasonable level of profit for its expansion and development. This would represent a move towards a balanced mix of private market forces and public sector action. In fact, a range of interventionist measures have been used at one time or the other in a number of newly developed Asian countries whose success stories, however, are solely attributed to the market liberalization currently being advocated by them. While talking about the spectacular development of these economies, the interventionist measures followed by some of these countries is often ignored. The latter paved the way for the shift towards an increased reliance on markets in the mid-1980's and the eventual attainment of high growth. A country like Nepal, therefore, has to make a careful analysis of these factors before embarking heavily on a programme of market liberalization.

Nepal's trade sector is characterized by a wide discrepancy between export and import. The rate of increase in exports has always been low and highly fluctuating. The fluctuations are largely explained by changes in annual agricultural production. Two semi-log linear trend equations estimated for the period 1970/71 - 1985/86 to examine the growth trend of exports and imports reveal that while the exports during the period had been 10 percent, the corresponding growth in imports was 17 percent.

Nepal's exports mainly consist of primary products e.g. raw jute, jute goods, rice, hides and skins, woollen carpets, handicrafts, medicinal herbs, spices, etc., while imports consist of a wide range of consumer goods and investment goods. Nepal's trade with India has always remained voluminous and regular. Two simple equations estimated to examine the position of exports to and imports from India in total exports and imports of Nepal reveal that India still accounts for a large part of the total Nepalese exports.

The land-locked position of Nepal, inadequate facilities provided by India through different treaties, Nepal's open border with India and the high cost involved in both exporting to and importing bulky materials from overseas countries are often cited as factos obstructing the diversification of Nepal's export and import trade. Since the early 1960's, the political and economic vulnerability of heavy concentration of trade with India began to be felt. Various policies adopted by the government, such as the EEC scheme and the DER system,aimed at :

i) expanding exports to enhance the country's capacity to import goods needed for development;

ii) diversifying foreign trade by commodity and by country to reduce overdependence on a single country; and

iii) reducing the disadvantage resulting from land-lockedness through the process of export augmentation and industrialization of the country.

The introduction of these schemes led to a significant increase in Nepal's exports to countries other than India.

These policies, however, did not contribute towards creating a viable and strong export sector. The diversification of Nepalese exports was not the result of greater product diversification. Many primary commodities such as rice and raw jute which could be profitably exported to India also became diverted to overseas countries under the lure of foreign exchange entitlement which could be used for importing otherwise restricted luxury and semi-luxury goods whose ultimate outlet was the Indian market. The influx into Nepal of these luxurious items could not be checked even under the DER system and overinvoicing in exports was rampant. In view of these realities, the DER system, introduced to substitute the EEE scheme in 1978, was abolished in September,1981.

Hessian sacking and twine are the major jute products produced by four jute manufacturing units. Production of jute goods over the period 1970/71 - 1986/87 has fluctuated between 13,644 mt. in 1970/71 to 20,026 mt. in 1984/85. Among different jute products, production of sacking has registered a significant increase over the period. A large part of the increase in production of sacking seem to have been observed internally as available data do not show corresponding increases in exports of sacking. Internal consumption of sacking is expected to increase further as the packaging requirement of cement and sugar industries is likely to expand further with the expected installation of additional capacities in these areas. Internal consumption of jute goods accounted for about 35 percent (6,005 mt) of total jute goods production in 1985/86.

The research has made an in-depth analysis of the export of jute fibre to India, a traditional market for Nepalese jute. About 100 registered firms, all located in Biratnagar, are entitled to export raw jute but less than 20 actually account for most of the country's export. Because of serious transportation problems, Nepalese exporters find it difficult to sell their jute in the overseas market. Their jute is sold at a discount compared to similar qualities of other exporting countries. Only a small quantity is sold directly to the international traders and the Indian traders in Calcutta. However, sales of a large quantity of Nepalese jute is negotiated by agents in Calcutta.

In the absence of artificial measures to discourage exports to India, the Indian market has again become dominant. The situation of over supply in the world jute market and increasing transportation costs for fibre from Nepal has caused this shift in export destinations. In this context, an export supply equation is estimated to assess the influence of various explanatory variables assumed to exert influence on the export of Nepalese jute to India. Annual exports of jute fibre from Nepal have been regressed on three explanatory variables, (two continuous and one binary). The results reveal that the higher the difference between Calcutta price, which becomes export prices for Nepalese exporters, and the procurement price in Nepal, the more will be the export of jute to India. The negative sign on the policy variable reveals that export of jute declined significantly during the period when policy mesures were introduced to diversify Nepalese exports. The estimate also reveals that internal availability of raw jute greatly influences the annual exports of jute fibre. This corroborates our assertion that internal supply constraints inhibit export growth.

No institutional efforts are being made by Nepal to develop its old markets or to export to new markets. The lack of a reliable and adequate market intelligence system has obstructed conduct of the export trade in a desired manner. Exporters in Nepal have limited sources of information on consumer markets other than that received from agents in Calcutta and the traders. Arrangements should be made to increase the proportion of direct sales to users to reduce the marketing margin. The TPC is expected to play a major role in the collection and timely dissemination of market information. It may, however, not be advisable to attempt diversification of export trade through provision of artificial measures as were adopted in the 1960's and the 1970's. The effective export strategy would be one which is oriented towards overall expansion of exports both to the Indian and overseas markets.

Quality control could improve the export of raw jute. There are reported to be wide variations in quality in Nepal's exports of jute goods. A strict adherence to the system of premium for quality jute could improve the quality of jute for exports.

Nepal has a number of special problems in transporting the export items, including jute, to Calcutta, whence it is shipped by ocean transport to its final destination. Due to delays in the transport system, the jute does not arrive in time for loading according to booked space on a vessel. This increases the cost of transport both for trucking services that are held up and for the extra cost of storage and arranging alternative ocean transport. It is believed that Nepal's transport problems could be solved with international assistance. India could extend a helping hand in reducing substantially the transportation costs of Nepalese goods destined both for the Indian and overseas markets.

Although export proceeds have been quite unstable in Nepal, it has not inflicted serious injury to the economy because exports constitute only 5 percent of the gross domestic product. Moreover, a continuing inflow of foreign aid has suppressed the role of exports in the national economy. However, once aid is discontinued or drastically reduced, Nepal will have to concentrate entirely on export earnings to procure capital goods, so much required for development and industrialization of Nepal. Therefore, in the long run, a vital element in the smooth management of the economy appears to be the stabilisation of export earnings so that the ability to procure capital goods or raw mateials does not remain uncertain.

As far as accumulation of foreign exchange for procuring capital goods from abroad is concerned, Nepal could adopt both an outward looking strategy (promoting exports through measures such as tax concession, bonus, etc) and an inward looking strategy which advocates the substitution of previously imported manufactured goods by domestic production through tariff control, etc. While an outward-oriented strategy helps earn an extra unit of foreign exchange, an inward-oriented policy saves a unit of foreign exchange, in essence performing the same function. As long as the cost of earning or saving a unit of foreign exchange is the same, there is no reason for choosing one policy over the other. A proper blend of both the approaches should be followed by a country like Nepal. The effective implementation of a policy that provides selective protection to domestic production (inward policy) and also with provisions for subsidizing certain exports (outward policy) may help to accelerate the process of development in Nepal. The experiences of some other countries, which adopted a blend of both the policies to achieve a faster rate of growth, also corroborate this assertion.

As per the question of public secor intervention, there can be little doubt that excessive and prolonged protection often results in a dampening effect on efficiency and competitiveness. However, there should be a gradual and selective removal of this element. The experiences of many countries that have achieved a rapid industrialization reveal that they focussed attention on the interventionist policies in the beginning, which was proved to be beneficial. Therefore, in the case of a country like Nepal, where external forces are unlikely to have a significant effect on the country's export performance, one has to have an analysis of domestic factors to explain its export performance. As stated earlier, domestic supply constraints within the country itself are the limiting factors in the growth of jute exports. Domestic production of jute is influenced by Government policies with regard to the production, pricing and marketing of these commodities. An integrated approach is called for to tackle the intertwined problems in the fields of production, pricing and marketing, which would also ensure a stable supply of jute for export.

A large number of countries all over the world buy jute, while in some countries marketing of jute is handled by private firms, in the Socialist countries and in some developing countries, public sector agencies handled it. The world consumption of jute increased rapidly during the post World War II period. Between 1969/70 - 1970/71, consumption dropped by one-third, the largest decrease being in North America and Western Europe. In recent years consumption of jute fibre has increased more rapidly in the developing countries than in the developed.

In the developed jute consuming countries, three main factors have shifted the demand away from jute packaging:

1. development and extension of bulk handling facilities;
2. the increased use of multi-wall paper sacks; and
3. the widespread prepackaging of groceries due to the boom in supermarkets.

High operating costs of manufacturing units in the consuming countries have encouraged them to buy jute goods instead of fibre. The rapid dismantling of jute industries in Japan and Western Europe has led to a sharp fall in local production of jute goods. Major jute markets of the world can be classified as:

1. Western Europe - (mainly for jute bags and secondary backing cloth) where jute consumption by 1990 is estimated to be between 190,000 - 220,000 mt

2. North America - (mainly for carpet backing and burlap) where jute consumption is expected to be around 60,000mt by 1990;

3. Japan - (mainly for jute bags and carpet backing) where the jute industry has suffered considerable losses;

4. Australia - (mainly for hessian cloth and sacks) wher apparent consumption of jute is expected to be 60,000 mt. in 1990;

5. Eastern Europe - (bagging of agricultural commodities being the largest single outlet for jute) where the total jute requirement by 1990 is estimated at about 80,999 mt;

6. Near East - where import requirements are estimated at about 230,000 mt/annum during the rest of the decade;

7. Africa - where bagging of internally produced crops as well as imported cereals is the primary use of jute;

8. Latin America - where consumption of jute in 1990 is expected to be 147,000 mt. as against 210,000 mt. during 1979-81;

9. Far East - with the increase in jute consumption being concentrated mainly in the jute producing countries, only a slight increase is expected to take place in regional import requirements. By 1990, net import requirements are estimated to increase by only 70,000 mt. to 248,000 mt.

In all the above-mentioned markets, synthetic substitutes have made considerable inroads into jute's traditional market. Stable supply at reasonable prices of both jute and jute goods is a vital element to face the competition. Nepal has very little jute trade with overseas markets. Due to added transportation costs and quality drawbacks, jute from Nepal cannot compete with jute from other major producers in the world market. However, efforts should be made to explore new markets and direct selling of jute to end users. This requires the implementation on a continuous basis of market intelligence and promotional activities.

In the context of Nepal, jute, in addition to its direct contribution to the economy of Nepal in terms of employment generation and foreign exchange earnings, can make the following contributions:

Firewood from the forest and animal dung, also being used as a manure for crops, are being used in Nepal for heating and cooking purposes. Due to the scarcity of firewood, more and more dung is used for cooking instead of being used on the field, which seems to have a detrimental effect on the crop productivity in rural Nepal where farmers cannot afford to use expensive chemical fertilizers. The destruction of forests in Nepal in the last decade or so has been severe enough to disturb the eco-system. A similar situation has occurred in the neighbouring countries too. Ecological models developed after remote-sensing analysis of the Himalayas predict the mountains may face biological extinction within a few decades (The Bangladesh Times, October 8,1988). The Himalayas have lost their capacity for growth, with most of the area being badly deforested and malformed due to human influences. A FAO report in 1981 stated that Nepal accounted for the extraction of 11 million cubic meters of timber annually. The swelling of river beds by siltation, resulting in devasting floods, is often blamed on the wanton destruction of forests. The present rate of destruction of forests has to be stopped. This can only be possible by following a policy that would delink any further demand of the growing population on these forests and also limit the present rate of logging and clearing.

Jute sticks can be of great use in substituting firewood as a source of fuel. On the basis of norms provided by the Bangladesh Energy Planning Project, it is estimated that the energy generated by the quantity of jute sticks used as biomas fuel in 1986/87 would require the combustion of 864,442 mt. of firewood. It is believed, therefore, that a systematic increase in the use of jute sticks would significantly, contribute towards the maintenance of ecological balance as less firewood would be extracted from forests. Further, it will also release more dung to fertilize crops and thus contribute to increased agricultural productivity.

Geo-jute, made out of high grist rove using low grade, coarse and short filaments of jute, has been successfully tested as a soil stabilisation blanket to control erosion on disturbed earth surfaces while encouraging the growth of pretective vegetation. Further, it is biodegradable and adds rich organic nutrients to the soil (about 5 mt/ha). Geo-jute could be used to help control the massive soil erosion in Nepal and thereby contribute immensely to the maintenance of ecological balance.

Stalks of jute/mesta have also been used as raw material for the manufacture of paper pulp and tissue papers in India, Sri Lanka and Thailand. France has started production of papers with jute pulp. Nepal is currently importing its entire requirement of tissue papers, including cigarette tissues, and a substantial quantity of other grades of paper is still being imported. Nepal could, therefore, look into the possibility of using jute stalks for producing these items. Moreover, it is expected that the demand for packaging material will increase significantly with the completion in 1988/89 of the Udayapur Cement Plant with a capacity of 3,000 mt/day. If the entire production is bagged in jute sacks, internal consumption of jute sacking will increase by 10,000 mt/year. From the environmental standpoint also, it may be advisable to check the production/import of synthetic products by maintaining a reasonable production level of jute through increased yield.

Since jute contributes to soil fertility through incorporation of leaf litters and continuous cultivation of paddy is said to have a deleterious effect on soil fertility, farmers make a point to grow jute irrespective of the price situation. The leaves of jute plants and nonfibrous matter of the plant released during retting greatly increase the soil fertility level.

The jute scenario, therefore, may not be as hopeless as is often reported if all the indirect benefits assoiated with it are taken into account and attempts be made to use it in the above mentioned areas. The position of jute in Nepal can be substantially improved through the initiation of integrated approaches that would aim at improving productivity and reducing the cost of fibre production from the farmers field to its conversion in the mills. As far as processing of fibre in the two mills is concerned, improved quality of jute products and higher labour productivity can be achieved through technical and management training, including training of the workers. The possibility of creating a unit to provide management and technological skills should be explored.

In the fields of jute agriculture, JDTC is expected to play a vital role through the initiation of appropriate R&D activities. So far, JDTC seems to have been constrained by a lack of funds. The developmnt budget of JDTC has decreased with time, from Rs.17.7 million in 1983/84 to Rs.11.7 million in 1987/88. On the other hand, the Administrative budget has increased from Rs.2.9 million in 1983/84 to Rs.40.4 million in 1987/88. These budgetary allocations could be interpreted to imply that JDTC in the last couple of years may not have been able to gainfully employ its staff in productive activities. The existence in JDTC of more administrative staff (104 in 1987/88) than technical staff (89 in 1987/88) appears somewhat inappropriate considering that JDTC is supposed to focus its activities more on the technical aspects of jute. Any organisation to be established in the future should take these points into consideration. Moreover, any programme/ policy in the jute sector should be adequately backed by proper means and facilities in order not to repeat the history of failure presented by most of the public sector agencies in Nepal. A consistent jute policy with well defined objectives, properly formulated programmes and adequate provision for finance is therefore, the need of the time.

It is hoped that the inferences drawn from the present study in regard to crop management practices, production and yield, marketing and export trade of jute may provide planners and administrators with sufficient base necessry for them to develop concrete policies and programmers aimed at ameliorating the prevailing situation in different areas of jute.

Annex I

NEPAL

PHYSICAL FEATURES

Nepal is a small, landlocked and hilly country wedged between the two Asian giants - China and India. The country has a rectangular shape with a territory of 141,000 sq. km. The country can be broadly divided into three parallel geogrpahic regions extending east to west (Fig. 14) - the Terai (the plains), the Hills and the high mountains, covering respectively 23, 44 and 34 percent of the land area. The average annual precipitation in the country is about 1600 mm, a major portion of it occurring from June to September. The country is drained by a number of major rivers originating in the Himalayas and numerous tributaries, all emptying into the Bay of Bengal.

The country has a population of about 17 million growing at a rate of 2.66 percent per annum.

POLITICAL SETUP

After a life long struggle, the late King Prithivi Narayan Shah (the founder of the Shah dynasty) was able to consolidate numerous petty states into one country (Nepal) by 1769. In 1846, the power of the monarchy was seized by Jung Bahadur Rana (who established the system of hereditary premiership), the Kingship was relegated to a largely ceremonial status. With the overthrow of Rana regime in 1951, the monarchy was reinstated as the supreme authority of the country. In 1960, late King Mahendra dissolved the Parliament, dismissed the elected Nepali Congress

Party Government and introduced partyless panchayat system for the governance of the country. The system strives to achieve maximum participation of the mass in the formulation of the development goals and in the administration of the development process. While the district panchayats (75) formulate district-level plans and supervise their implementation, the village panchayats, about 4000, plan and implement village-level projects, collect taxes and undertake other tasks assigned to them by the Government. The national panchayat (the Rashtriya Panchayat) is the legislative branch of the national Government.

THE ECONOMY

Agriculture is the most important sector in the economy with a contribution of about 59 percent to GDP. Above 90 percent of the economically active population is dependent on agriculture. The agriculture sector is not only the major producer and source of foreign exchange, but also the sector is responsible for absorbing the growing labour force.

Agricultural production is dominated by the production of cereals, which account for approximately two-thirds of agricultural GDP. The main crops are paddy, maize and wheat. These crops together account for over 85 percent of the national cropped area, paddy alone constituting about 51 percent. The other important crops are millet, barley, potatoes, oilseeds, sugarcane, jute and tobacco. Over 80 percent of rice and 65 percent of wheat is produced in the Terai, while 70 percent of maize is accounted for by the Hills.

One of the perplexing feature of Nepalese agriculture is the stagnant yields of the main crops. Despite significant increase both in the use of Chemical fertilizers and area covered by modern seeds, yields of the major crops have remained unsatisfactory. The unsatisfactory yield levels have been blamed by some on the environmental deterioration.

Besides crop production, livestock and forestry are most important sub-sectors. Livestock, providing about a quarter of the agricultural GDP, provides draft power for cultivation and a large share of soil nutrients. Due to poor nutrietion and lack of health care facilities, however, livestock productivity is very low.

Forest land covers about 30 percent of the country's physical area. The forest output constitutes about 10 percent of total agricultural production. Due to limited transport net-work and difficult topography, the economic activities are extremely segmented. Many people in the Hill, encomphassing about 43 percent of the area and containing about half the population, and Mountain, covering about 34 percent of the country's area and containing 8 percent of the population, live on subsistence level of agriculture in conditions of extreme poverty. The Terai region produces agricultural surplus which is traded in organised markets.

LAND OWNERSHIP

The distribution of land ownership in Nepal is highly skewed. The highly skewed distribution of land has worsened between over the time. More than 50 percent of households own less than 1 ha of land, while the percentage of household possessing between 10-20 ha of land is about 1 percent. The Land Reform Programme of 1964 represented a first nation wide attempt aimed at a comprehensive redistribution of land, improvement of the living conditions of tillers and diversion of resources, both capital and human, away from land. However, the achievement of the Programme fell far short of the desired objectives as powerful land owners resisted and in most cases waded the legislation.

The Government has made provision for subsidized distribution of chemical fertilizers through different offices of the Agricultural Inputs Corporation (AIC) and the cooperatives. However, one-third of the fertilizer consumed in the country is used in Terai. Due to subsistence nature of hill agriculture, application of chemical fertilizers is minimal there.

With the sole exception of wheat, most of the seeds used in case of other crops are traditional varieties.

INDUSTRY

The composition of industrial output in Nepal manifests a very early stage of industrialization, agro-based industries accounting for about 70 percent of the output. Some import substitution industries have been established in the public sector with grants from friendly countries like China and Russia.

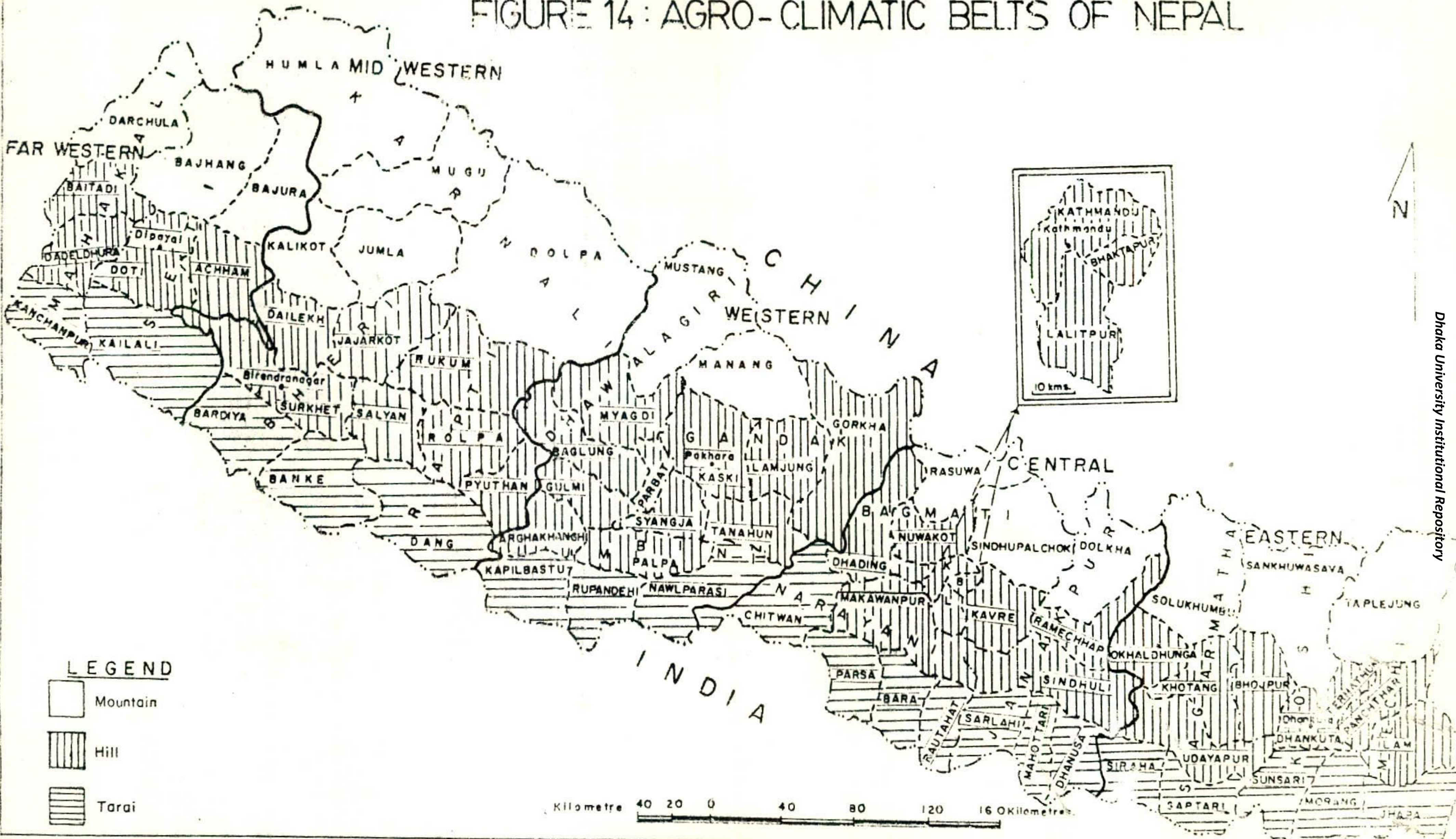
These industries have been producing consumer goods such as sugar, cigarette, beverages, shoes, textiles and construction materials. Private sector investment is mostly concentrated in industries such as biscuits and confectionaries, cigarette and matches, soaps, vegetable ghee, polythene pipes and stainless steel utnesils. Private investment is concentrated in areas such as trade, transport and real estate business, where returns on investment are very attractive. It seems that the investment climate for private investors has not been very conducive. Moreover, inadequate physical and institutional impastructure have created problems for increased private sector participation in the industrial development of the country. However, some more industries to produce paper, cement, sugar and textiles are being established under public sector initiative.

FOREIGN TRADE

Nepal's foreign trade is characterized by huge deficits due to stangant export and growing imports. Nepal's export consists of mainly commodities such as foodgrains, timber, jute, ghee and some other items such as woollen carpets, garments and handicrafts. Items imported range from live animals, poultry products and milk to capital equipment. Increase in the size of population and the resultant increase in internal demand have sharply cut the outflow of traditional export items such as rice and timber. On the other hand, the import of both consumer items and capital goods is increasing leading to an ever widening gap between exports and imports. While food and live animals and crude materials account for about 80 percent of total exports, consumer goods account for 60 percent of total imports. This is a vivid manifestation of lack of industrialization of Nepal.

Nepal's foreign trade is excessively concentrated with India. Nepal's exports to countries other than India increased significantly after 1960's when the export entitlement scheme and dual exchange rate system were adopted by Nepal. However, with the termination of these policies exports have again started concentrating to India. Currently, Nepal suffers huge trade deficits with India.

FIGURE 14: AGRO-CLIMATIC BELTS OF NEPAL



Annex II

The International Jute Organisation

INTRODUCTION

Pursuant to the Resolution 93(IV) of the Fourth Session of the United Nations Conference on Trade and Development (UNCTAD), the International Agreement on Jute and Jute Products, 1982, was negotiated. A number of preparatory, prenegotiation and negotiation meetings were held to put into force the Agreement. The International Jute Organisation (IJO) was established in February, 1984 with its headquarters at Dhaka.

The objectives of the Agreement are to:

a) improve structural conditions in the jute market;

b) enhance the competitiveness of jute and jute products;

c) maintain and enlarge existing markets as well as develop new markets for jute and jute products;

d) develop production of jute and jute products with a view to improving, inter alia, their quality for the benefit of importing and exporting members; and

e) develop production, exports and imports of jute and jute products as regards quantity so as to meet the requirement of world demand and supply.

The objectives referred to above are to be met by means of:

I. projects of research and development, market promotion and cost redcuction:

II. collation and dissemination of information relating to jute products:

III. consideration of important issues concerning jute and jute products, such as the question of stabilisation of prices and supplies and of competition with synthetics and substitutes.

THE COUNCIL

The International Jute Council (IJC) is the supreme body of IJO and meets twice annually to deliberate on major policy matters. The IJC sessions are preceded by the Committee on Projects (COP) whose major function, among others, is to technically appraise projects and recommend them to the Council for approval.

The IJC has to categories of members : (a) producing/exporting; (b) consuming/importing. In addition, a number of countries, inter-governmental organisations and non-governmental organisations have observer status with the Council.

Producing/exporting members

Bangladesh
China
India
Nepal
Thailand

	Observers
Countries	Brazil
	Bulgaria
	Iraq
	Romania
	USSR
	The Philippines
Inter-governmental organisations	The Asian Development Bank
	ESCAP
	ITC/UNCTAD-GATT
	Islamic Development Bank
	Organisation of Islamic Conference
	UNCTAD
	UNDP
	UNIDO

Comsuming/importing members

Australia
Austria
Belgium Luxembourg
Canada
Denmark
EEC (Commission)
Germany, Federal Republic
Greece
Spain
France
Ireland
Italy
Netherlands
United Kingdom
Egypt
Finland
Indonesia
Japan
Norway
Pakistan
Poland
Sweden
Turkey
United States
S.F.R. Yogoslavia

	Observers
Non-governmental organisations	BJA (Bangladesh)
	BJEA (Bangladesh)
	BJGA (Bangladesh)
	BJMA (Bangladesh)
	BJSA (Bangladesh)
	CJFSA (India)
	EATJP (Netherlands)
	IBPA (Indonesia)
	IJMA (India)
	PJMA (Pakistan)

PROFESSIONAL STAFF

The IJC has sanctioned eight professional staff positons as listed below :

1. Executive Director
2. Director, Projects and Administration
3. Senior Officer, Agricultural Research and Development and Cost Reduction
4. Senior Officer, Industrial Research and Development and Cost Reduction
5. Senior Market Promotion Officer
6. Officer, Agricultural Research and Development and Cost Reduction
7. Officer, Industrial Research and Development and Cost Reduction
8. Administrative and Conference Officer

Of the eight sanctioned professional posts, three posts have not been filled and two out of the twenty approved posts in the General Service Category are yet to be filled. IJO has three technical sections - Agriculture, Industry and Market Promotion - to coordinate projects and to carry on other allied works.

FINANCE

The Council has established two accounts : (a) The Administrative Account; and (b) The Special Account.

While the expenses necessary for the administration of the Agreement are brought into the Administrative Account and are met by annual contributions from the producing/exporting and comsuming/importing members on a 50/50 basis, all receipts pertaining to specific identifiable projects are brought into the Special Account.

The probable sources of finance for the Special Account are:

a) The Second Account of the Common Fund for Commodities, when operational;

b) Regional and international financial institutions such as The United Nations Development Programme, The World Bank, The Asian Development Bank, The Inter-American Development Bank and The African Development Bank, etc; and

c) Voluntary contributions.

The Second Account of the Common Fund is yet to be operational and the response from the regional and international financial institutions has been limited. For project funding, therefore, IJO has to depend primarily on voluntary contributions. Despite strenuous efforts by IJO to secure adequate funds, the flow of funds has not been very encouraging nd a gap between the availability of funds and the amount required for implementing the approved projects of IJO persists.

The announcement by USSR and other countries at UNCTAD VII to join the Common Fund has raised hopes that the Fund and its Second Account will become operative in the near future. Although IJO will have to compete with a number of commodity organisations to draw funds from the Second Account, it will definitely contribute towards timely execution of IJO projects. Moreover, there has been a significant improvement in the funding position of IJO projects as a number of donor countries have agreed to finance some of the projects through their trust funds with the UN executing agencies.

Article 14 of the Agreement requires IJO, to the maximum extent possible, to rely upon and fully utilise the facilities, services and expertise of various UN organisations such as FAO, ITC, UNIDO, etc. These agencies are involved in various activities of IJO ranging from pre-project activity to project execution.

STATUS OF IJO PROJECTS

The current status of IJO projects in the field of agriculture, industry and market promotion is listed below.

A. AGRICULTURAL PROJECTS

1. Collection, Conservation, Characterization and Exchange of Germplasm for the Development of Improved Varieties of Jute, Kenaf and Other Allied Fibres.

The projects, to be implemented over a period of 5 years, is estimated to require US$2093,731. Due to funding constraints, two sub-projects (A & B) were prepared to cover activities for the first two years. Sub-project A, with a total resource requirement of US$347,480, is funded by ADB/Manila, and Sub-project B, with a total outlay of US$446,000 and funded by Japan, Switzerland and the Netherlands are being executed by IJO. A number of collecting missions to acquire new sources germplasm from Africa have been successfully accomplished. The seed material has been distributed to the participating countries for use by breeders within the project regional network.

2. The Development of Integrated Pest and Disease Management Strategies for Jute and Kenaf.

The project is monitored by a Coordination Committee comprising focal point scientists from the six participating countries (Bangladesh, China, India, Indonesia, Nepal and Thailand). Under the project, IJO is providing facilities to strengthen the capability in member countries for jute/kenaf germplasm collection, conservation, evaluation and utilisation for varietal improvement. IJO also conducts workshops, training courses and seminars to standardise genetic resources activities in the region and to promote information exchange dissemination among collaborators.

The project to be implemented over a period of 5 years would require US$624,370. Pursuant to the decision of the Fifth Session of the Council to carry out further pre-project activities, a regional network meeting was held in Dhaka on 31 July - 2 August, 1986.

The Government of Italy has decided to fund this project through its trust fund with FAO, the designated executing agency. An Agreement to this effect is expected to be signed shortly between the Government of Italy, FAO and IJO.

3. Strengthening Jute and Kenaf Seed Programmes.

The project with a duration of 5 years would require US$548,728.

4. Improved Retting of Jute.

The project proposal initially formulated by FAO was reformulated by IJO with the help of experts from the producing countries. The project to be implemented over a period of 3 years would cost US$798,000.

The Government of Italy has agreed to provide fund through its trust fund account with FAO. An Agreement to this effect is likely to be signed soon between FAO, IJO and the Government of Italy.

5. Jute Seeder Development

The project costing US$240,690 will be executed by IJO over a period of 3 years. The First Discussion Meeting on Jute Seeder Development, held on 6 - 8 June, 1988, marked the commencement of execution of this project. Funds from the Special Account of IJO will be utilised to execute this project.

6. Development and Extension of Jute Based Farming Systems.

The project, requiring US$839,590, has a duration of 3 years.

B. Industrial Project

Expanding the Market for Jute Goods through the Use of Blends.

The project with a resource requirement of US$280,000 + 13% has been executed by UNIDO. The project has a duration of one-and-a-half year.

C. Market Promotion Projects

1. Market Promotion Project of Geotextiles in the USA
2. Market Promotion for the Italian Market
3. Jute Market Promotion (Japan)
4. Jute Market Promotion for Western Europe, 1985
5. Jute Market Promotion for Western Europe, 1986.

The above mentioned projects of IJO in three specific areas aim at making a frontal attack on problems faced by jute. The Agricultural Projects aim at improving the yield and reducing the cost of cultivation through development of high yielding varieties and better crop management practices. The Industrial Projects aim at product and process diversification and cost reduction. The Market Promotion Projects have also a challenging task of ensuring a comfortable position for jute and jute goods in the competitive world market.

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