

**Economic Analysis of Production and Marketing
of JUTE in Nagaon District of Assam**

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In

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By

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This is to certify that the thesis entitled “**Economic Analysis of Production and Marketing of JUTE in Nagaon District of Assam.**” Submitted in partial fulfillment of the requirement for the degree of **MASTER OF SCIENCE (AGRICULTURE)** in **Agricultural Economics** of Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur is a record of the bonafide research work carried out by **Ms. Hilari Bordoloi, Enroll No. 170109008** under my guidance and supervision. The subject of the thesis has been approved by the Student’s Advisory Committee and the Director of Instruction.

All the assistance and help received during the course of the investigation has been acknowledged by her.

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INTRODUCTION

Jute is a natural fiber popularly known as golden fiber and is one of the cheapest and strongest of all natural fibers. Jute is extracted from the bark of the white jute plant (*Corchorus capsularis*) and to a lesser extent from tossa jute (*C. olitorius*). It is a natural fibre with golden and silky shine and hence called the Golden Fibre. Jute is an annual crop taking about 120 days (April/May-July/August) to grow.

It thrives in tropical lowland areas with humidity of 60percent to 90percent. Jute is a rain-fed crop with little need for fertilizer or pesticides.

The fibre Jute is a major fiber cash crop grown in eastern India and this is the second most important fiber in India after cotton. Jute is largely grown in West Bengal, Bihar and Assam with an acreage share of 70.1 percent, 14.4 percent and 10.2 percent, respectively during the year 2017-18. India is the largest producer of Jute in the world. It is estimated that that the jute industry provides direct employment to 0.37 million workers in organized mills and in diversified units including tertiary sector and allied activities and supports the livelihood of around 4.0 million farm families. Jute, the golden fiber, meets all the standards for 'safe' packaging in view of being a natural, renewable, biodegradable and eco-friendly product. A hectare of jute plants consumes about 15 tonnes of carbon dioxide and releases 11 tonnes of oxygen. Cultivating jute in crop rotations enriches the fertility of the soil for the next crop. Jute also does not generate toxic gases when burnt.

Apart from being eco-friendly jute possesses the characteristics of a silky luster with high tensile strength and low extensibility. It also resists heat considerably. The grading of jute fibers is assessed by the characteristics like strength, defects, colour, root content, fineness and density. Traditionally jute is used to make hessian cloths and sacks, but now jute has been diversified to make various products like all

kind of bags from necessary to luxury, sacks, carry bags, door-mats, carpets, file- covers, sofa- backs and covers, decorates, shoes and sandals, curtails etc. Diversified by-products from jute include its use in cosmetics, medicine, paints, and other products. Jute sticks are also used as fuelling and fencing materials in the rural areas.

The demand for Jute-based factory products have also increased manifold during the last few years since they are eco-friendly, bio-degradable and environmentally protective. Besides now jute has also been used to reduce soil-erosion and one of the ingredient of geo-textile etc. Due to its diversified usability, the demand for jute made products have been increasing day by day in the world market as well as domestic market as there is an emerging trend to use eco-friendly product.

At farmers' level jute marketing is concerned with domestic market. Basically jute marketing is done as raw jute marketing at farmers' level. It is raw in the sense that farmers sell jute fibre as a raw material without making any change in its physical appearance and grading. There are various grades in jute fibres according to its qualities. Higher grade demands higher prices and vice-versa. As an agricultural product jute is not perishable, it can be stored for long time. But since farmers need money, jute is disposed immediately after the fiber is ready to sell at farmers' level. The final consumers' of jute are jute mills.

Area under jute has been declining by about 18.3 percent and production by 4.3 percent between 2008-09 and 2017-18. However productivity rose by 17.3 percent, from 2114 kg/ha in 2008-09 to 2480 kg/ha in 2017-18. There is a steady decline in area under cultivation mainly due to variations in rainfall during sowing season, raw jute prices and profitability of competing crops during the previous season resulting in significant fluctuations in production.

Assam is the third largest producer of jute in India. Assam covers an area of about 79000 hectare and 825000 bales of production

and 1880 kg/ha yield in 2016-2017. Nagaon is one of the major jute producing district of Assam. Nagaon district covers 10510 hectare area in 2015-16. The production was 179536 bales and average yield of 3075kg/ha.

The proposed study seeks to answer the following questions i.e,(i)What is the level of the investment return and profitability from jute production? (ii) Existing marketing pattern of jute. (iii)Export competitiveness of jute. (iv) Yield gap and constraints responsible for jute production and its marketing in the study area.

Looking into these facts, the present study is under taken with the following objectives.

1.1. OBJECTIVES

1. To analyse the costs and return structure of jute cultivation under different size sample farms.
2. To examine marketing pattern and identify the value added products of jute.
3. To analyse the growth performance and export competitiveness of jute.
4. To identify the production and marketing constraints of jute and suggest suitable measures to overcome them.

1.2. Presentation of the study

The entire study has been presented in six chapters.

Chapter-I: Introduction, problem statement, objectives, scope and limitations of the study.

Chapter-II: The review of earlier studies connected with present investigation.

Chapte -III: Describes the material and methods used in the study.

Chapter-IV : The results of the study were discussed in this chapter.

Chapter-V : The chapter includes discussion of the result.

Chapter-VI: The chapter concludes with the summary, conclusions and suggestion.

1.3. Limitation of the study

The coverage of study area was limited. This is due to the fact that coverage of large area is beyond the capacity of investigator. The primary data collected for the study were entirely based on memory of the respondents because cultivators do not keep any record regarding their farm practices and marketing.

Review of Literature

In this chapter, an attempt has been made to critically review the literature of the past research work in relevance to the present study. The review of earlier studies is very much helpful in providing guidelines to the present researchers to develop a comprehensive knowledge on the objectives and enable to formulate concepts for use in the study and draw meaningful conclusions and also helps in identifying the conceptual and methodological issues relevant to the study. Keeping in view the objectives of the study, the reviews related to the present study are presented under the following headings.

2.1 Cost and return structure analysis

2.2 Marketing pattern and value added products

2.3 Growth performance

2.4 Export competitiveness

2.5 Production and marketing constraints in jute

2.1 Cost and return structure analysis

Dutta (2012) did a study on comparative economics of production of jute and mesta in Dakshin Dinajpur district of West Bengal. The study attempts to find out the cost of cultivation and profitability for jute and mesta in Dakshin Dinajpur district of West Bengal. The study reveals that the cultivation for both the crops is profitable. The operational cost of mesta is slightly higher than Jute whereas the result is reverse in case of net return. The input-output relationship indicates that farmers apply negligible quantity of plant protection chemicals though net return may be augmented by taking care of plant protection Benefit-cost ratio for jute cultivation is higher than the mesta. The study exhibits that the family labour engagement is more than 43 per cent of total man days for both crops.

Chakraborty and Bera (2014) conducted a comparative study on the economic viability of jute production by organic system of farming in West Bengal. Under this backdrop, the present study is a modest attempt to examine the relative profitability of jute cultivation, an important cash crop in West Bengal, by practicing three alternative crop production system namely organic, conventional and purely inorganic farming system. Primary information related to costs and returns structure of jute cultivation by following three major crop production systems collected from 60 sample farmers, 20 each of these three groups of farmers forms the basis of the study. Lower yield coupled with high cost of cultivation have rendered organic jute production is less remunerative compared to conventional system. As the yield of organically produced jute is below the average of conventional and inorganic farms, higher premium prices through development of dedicated marketing channel for organic jute may be an efficient strategy to encourage farmers to grow organic jute.

Kumar *et al.* (2014) conducted a study to investigate productivity, profitability and energy use of different jute (*Corchorus olitorius L.*) based cropping systems in the eastern India on farmers' fields during 2009-12. Nine cropping systems, viz. jute-rice-wheat; jute-rice-potato; jute-rice-garden pea; jute-rice-lentil; jute-rice-mustard; jute-rice-French bean; jute-rice-rice; rice-rice-mustard and fallow-rice-rice were tested in randomised block design. Jute-rice-potato system recorded significantly higher system productivity in terms of jute equivalent yield (JEY) than all other cropping systems. The JEY of jute-rice-garden pea and jute-rice-French bean cropping systems were comparable, but recorded significantly higher JEY than that of rice-rice-mustard and rice-rice cropping systems. The jute-rice-potato cropping system recorded the highest net return (₹134 868/ha), benefit-cost ratio (2.0) and economic efficiency (₹369.5/ha/day). Thus among the nine cropping systems of Indo-

gangetic plain jute-rice-potato system had the highest system productivity, energy productivity and profitability.

Shambhu (2016) conducted the study to examine direct and indirect resources of input energy in jute production. He reached the conclusion that Jute is mainly grown by marginal and small farmers. Among them 87percent were marginal farmers and only 13percent were small farmers. The research result revealed that total energy requirement for marginal and small farmers was 17,121 MJ/ha and 17,060 MJ/ha respectively and overall average energy requirement for jute production was 17,091 MJ/ ha. The research result revealed that jute production was highly labor intensive crop and about 74percent of total cost of jute production was consumed by human power followed by irrigation which is in terms of stationary engine/ electric motor (about 14%). The benefit cost ratio was 1.24. The study revealed that if sowing of jute and post harvest operations are mechanized then there will be considerable reduction in total energy requirement and also cost of jute production.

2.2 Marketing pattern

Ghimire *et al.* (2013) based on their survey highlighted that unstable or low price of raw jute the unavailability of quality jute seeds, limited irrigation water at the sowing period, complex diseases (wilt), the labour shortage during the peak season, the weed problem and the lack of retting water/ retting ponds, were the main constraints in jute production and processing.

Kumar *et al.* (2014) analyzed that marketing of Jute including various activities ranging from assembling, grading and transportation to its distribution. The whole exercise involves different intermediaries like farmer, itinerant trader, whole seller, broker, commission agent, mill agent etc. As per the business volume the number of intermediaries changes. Small volume business involves more number of intermediaries in

comparison to large volume business where jute mills directly purchase the produce from broker/ mill agent. Small size jute grower (up to 5 q) and medium size growers (up to 10 q) usually follow market channel comprising either Farmer-Itinerant trader-wholesaler/commission agent-miller or farmer-wholesaler/commission agent-miller. But farmers through a cooperative can easily execute all these activities without involvement of any middlemen/broker/mill agent and can sell it directly to the jute mill with higher price.

Das and Chanu (2016) analyzed the jute farmers' share in consumer price in Assam in order to test whether 'lower the number of middlemen in the process of marketing of agricultural produce, higher is the farmer's share in consumer's price. The study revealed that involvement of more middlemen between farmers and consumers reduces the share of farmers in consumer's price, hence, it is suggested to select another marketing channel by the jute farmers in order to get higher share.

Islam (2017) observed marketing of raw jute in Bangladesh and various problem related to marketing. He observed five different marketing channel in Bangladesh. Five marketing channels are: farmer→ faria→ kutcha baler→ pucca baler/exporter→ mill/foreign buyer, farmer→ bepari→ kutcha baler→ pucca baler/exporter→ mill/foreign buyer, farmer→ kutcha baler→ pucca baler/exporter→ mill/foreign buyer, farmer→ faria→ pucca baler/exporter→ mill/foreign buyer and farmer→ bepari→ mill/pucca baler→ foreign buyer were identified. A large number of people were involved in the marketing of raw jute. At best it could be said that the present marketing system is not inefficient in the country. Proper and adequate steps to develop this sector are required to making the business more profitable to the entrepreneurs.

Kalita (2018) analyzed the marketing practices of jute farmers in Assam. The study was carried out in central brahmaputra valley zone of Assam. Nagaon district was selected purposively based on area

under Jute acreage and Jute production Data were analyzed with the help of diagram, simple percentage and Chi square test. It was found that irrespective of age, income and sources of credit, farmers adopt the same marketing practices in the study area. Marketing practices of Jute farmers varies with their land holding status i.e. category, distance to nearest market and time of sale. Marginal small and marginal farmers having limited surplus prefer to sell their produced in the nearest primary market depending upon the cash requirement. Medium and semi medium farmers having comparatively greater volume of produce prefer to sell their produces to the traders from the door step to save the carrying charges or transportation cost. Besides, farmers prefer to engage traders to save men days, which can be allocate for farming other crop of crop portfolio of the growers. Saving time as well as trouble of selling is another factors considered by the growers. Farmers having primary market in the close proximity with in a distance of 10 km prefer to sell the produce in the market, where as primary market locating far from the growers place prefer to engage the traders. Time of sale also influence the choice of channel section. Depending upon the cash requirement, farmers sell their produces either in the market or the traders.

2.3 Growth performance

Banik and Shil (2016) analyzed the overall performance of Indian jute industry focusing on production, consumption, export and import of jute goods during 2000-01 to 2012-13. Compound Annual Growth Rate (CAGR), Annual Growth Rate (AGR) and for trend analysis, linear least squares method were worked from the data collected for the period of 2000-01 to 2012-13. The performance has declined over the years and at the same time export of jute goods has shown negative trend, which indicates that the demand of jute goods has declined in the international market over the years. It has also been found that import of jute goods has increased during the period 2000-01 to 2012-13, it is because of Indian producers are not able to produce good quality of

products and at the same time they are not in a position to meet the domestic demand too.

Thiripurasundari and Rathi (2017) observed the growth of Indian jute industry during 1950-51 to 2012-13 and also evaluate the overall performance of Indian jute industry focusing on production and export of jute goods during 2005-06 to 2015-16. Average Annual Growth Rate (AAGR) and Compound Growth Rate (CGR) was worked to make an in depth analysis of the export potentials of jute industry and jute goods in India and to draw a meaningful conclusion. The export of jute export was high in the year 2010-11 when compared to other years. The export of jute products achieved an Average Annual Growth Rate of 8.87percent and Compound Annual Growth Rate of 4.34percent over period of 11 years. . It was also been found that export of jute goods has increased during the period 2005-06 to 2015-16 and at the same time they are not in a position to meet the domestic demand too.

Seidu *et al.* (2018) assessed the trends, growth and instability in area, production and yield of cotton in Haryana for the period from 1966-67 to 2013-14 using semilog linear function, compounded annual growth rate and Cuddy Della Valle Index. The study revealed a positive significant ($P < 0.01$) trends with low annual growth rates of area of harvest (2.00%), production (3.99%) and yield (1.66%). Instability was high and also inclined at an annual rate of 30.96percent in area, 25.76percent in production and 28.04percent productivity in the same order. The study, therefore, recommended the development and spread of innovations at an affordable price to farmers. Effective disease and pest control measures should be developed to check the perennial pest infestation of cotton in the state.

2.4. Export competitiveness

Ohlan (2013) in his study revealed that the values of Nominal Protection Coefficient are above unity (1.28) indicating lack of

export competitiveness for dairy products. One of the major reasons for the lack of export competitiveness may be the low quality of dairy products being exported from India.

Guledagudda *et al.* (2014) analyzed export competitiveness in general, indicated that all the commodities were found to be competitive for their export to other countries as was evident from NPCs of less than unity. The NPCs for cashew kernel have been estimated both under the importable and exportable hypothesis. The NPC for the period 2004 under exportable hypothesis was 0.98, which also revealed that the domestic prices received by the farmers were lower than the international prices.

Banik and Shil (2014) analyzed the performance of diversified jute products in marketing mix of the industry in export market, the study covered the period from 2000-01 to 2012-13. The study revealed that there were many ups and down in the export market because of low production, heavy demand in the domestic market, competition from other substitutes like synthetic, plastic etc. in the financial year 2006-07, 2007-08, 2009-10 there was great fall of export of jute goods, in this particular financial year Indian jute industry measured a heavy decline in production of jute goods due to various reasons and because of this it hampers the export as well as domestic market.

Idris *et al.* (2015) studied the trade competitiveness and impact of food safety regulations on market access of India's horticultural trade for the period 1991-92 to 2013-14. They looked into the composition and direction of India's horticultural trade and the comparative advantage. The Revealed Comparative Advantage (RCA) index was estimated to measure trade competitiveness of major horticultural commodities against major competitors. It was observed that Asian countries were the favorite export destinations for most of the Indian horticultural commodities in study period. They also found that India had comparative advantage over China in the Asia market in fresh grapes, guava, and mango. In cashew,

Tanzania and Vietnam have consistently enjoyed comparative advantage over India in the European market, but not in the Asian markets.

Samuel *et al.* (2015) analyzed the state wise production scenario of cotton over the years as well as the export composition and competitiveness for the period of 1981-82 to 2008-09. The Revealed Comparative Advantage/ Export Performance Ratio (EPR) were used to identify the comparative advantage or disadvantage India has for cotton. The export competitiveness revealed that India's comparative advantage in cotton exports has been increasing over the years.

Bhavani *et al.* (2016) studied the direction of trade of chillies by Markov chain analysis and has shown that USA is the most stable market of chilli, followed by UAE and Sri Lanka, while Malaysia, Bangladesh and Pakistan are the unstable importers. The paper has found that during 2011-12, the major markets for Indian chilli were Malaysia (24.83%) and Sri Lanka (14.70%). The estimated NPCs have indicated that the Indian chilli was price competitive during the study period 2006-07 to 2010-11. A comparison of competitiveness of Indian chilli against Chinese red chilli has revealed that Indian red chilli is globally price competitive for three years in the study period of five years, 2006-07 to 2010-11.

Kazal *et al.* (2017) assessed the future potential of the jute sector in Bangladesh by examining its growth performance, international competitiveness, using national time-series data of over the period 1973–2013. It revealed that the jute sector has experienced substantial growth in area, production, productivity, prices, and exports. However, productivity has stagnated during the latter 10-year period (2004–2013), while it grew at a rate of 1.3percent per annum (p.a.) during the first 31-year period (1973–2003). Analysis of Nominal Protection Coefficient on Output(NPCO), Nominal Protection Coefficient on Input (NPCI), and Effective Protection Coefficient (EPC) showed that the white jute

producers in Faridpur were uncompetitive and were protected or subsidized by government policy, while the traditional jute producers were competitive. The domestic price of white jute production was 26percent higher than the world price, i.e., NPCO = 1.26. Only traditional jute production was globally competitive, although financial profitability of white jute was relatively higher (benefit cost ratio = 1.24 and 1.17, respectively). Policy implications included investments in research and development, irrigation, and tenurial reform and export protection for white jute in order to revive the sector and boost export earnings.

2.5. Production and marketing constraints

Deka *et al.* (2012) analyzed constraints and prospects of agricultural marketing in North-east India. They observed that marketing of agricultural commodities in the northeastern states, by and large, is dominated by the private traders due to the absence of proper implementation of Market Regulation Act by the State Agricultural Marketing Boards. The northeastern states had observed high production of fruits, spices and cashew in the recent past but could not fetch market price to the farmers at par with the markets in the other states. The infrastructure, procurement practices, marketing approaches and processing facilities were observed as the major constraints in the rural marketing in the NE region. Due to lack of marketing infrastructure, shortage of storage facilities and poor road conditions as well as poor road linkage with the headquarters of district, the villagers are deprived from the actual benefits of their agricultural produce. Most of the roads of the villages are seasonal and during rainy seasons their roads are almost cut-off from the market place.

Chapke (2013) observed a constraint analysis to assess the reasons of low productivity of jute in the state of west bengal. He found that majority of the farmers about (89%) , were facing middlemen in

marketing of jute fiber due to lack of appropriate regularized market and grading system (93%), followed by more labor requirement for retting operation of jute (81%) and high wages of labor during peak season (79%). Non-availability of good quality water (42%) and insufficient water bodies for retting (28%) and irrigation were among the other major constraints in jute cultivation. He suggested that improved technologies can increase production of jute fiber by about 445 kg per ha with an additional income of 5570 per ha. However, the technologies need to be upscaled in other locations and agro-climatic areas of jute for its wider adoption.

Sheheli and Roy (2014) observed a household level analysis on constraints and opportunities of raw jute production on Bangladesh. The study revealed that the maximum production cost has involved in fiber extraction (20%) and weeding (20%). The study also revealed that lack of quality seed, high cost of jute production, lack of training facilities, inadequate credit facilities, high disease infestation, high price of inputs, unstable jute price, shortage of labor at peak period, lack of retting water and weed problem were the main constraints in jute production and processing. Cost effective technologies have to be developed in jute production and processing aspects for lowering the production cost and increasing the profit margin.

Sarkar *et al.* (2018) studied the problem regarding diverse socio-economic and technological issues and the area and production reduced in Jute cultivation in North 24 Pargan district of West Bengal with a sample of 150 jute cultivators to understand the major issues, problems and devise future strategies using participatory assessment technique. It was understood from wealth ranking that majority of the Jute growers belonged to poor family (50%) followed by middle class (40%), rich (7%) and very rich (3%) families. The major problems identified by the jute growers were use of low quality seeds

(Rank based quotient score-89.58), followed by pre-monsoon water shortage, semi-looper problem, labour shortage etc.

Sharma (2018) observed agricultural marketing in north-east India with special reference to Assam and discussed its problems and prospects. The study revealed that marketing of agricultural produces in the state is a serious problem for the farming community. As most of the agricultural products are perishable in nature, lack of organized marketing facility, lack of storage infrastructure near the field, poverty and need of money after harvest for repayment of agricultural debt push the farmers to dispose of their produces at the earliest and at low prices. Hence there is a good potential to develop agricultural marketing infrastructure with private sector participation.

Method and materials

This chapter gives a comprehensive view of methodology adopted for the present study viz., the study area, nature and sources of data, and the various statistical tools and techniques employed for analyzing the data and for evaluating the objectives of the present study

3.1. Profile of the study area

3.1.1. Location of the district

The Central Assam district of Nagaon (spelled by the British as Nowgong) is one of the largest districts of Assam. It sprawls across almost four thousand square kilometers of fertile alluvial plains and thickly forested hills. Nagaon is a centrally located district in Assam, situated on the Southern bank of the Brahmaputra river between 25°45' to 26°45' North latitudes and 91°50' and 93°20' East longitude.

3.1.2. General boundaries

The district is bounded by Sonitpur district and the river Brahmaputra in the north, West Karbi Anglong and North Cachar Hills in the south and East Karbi Anglong and Golaghat district in the east. Lying at a distance of 123 kilometers by road from Guwahati, Nagaon town constitutes a vital corridor linking the Upper Assam districts of Golaghat, Jorhat, Sivasagar, Dibrugarh, Tinsukia and the North Assam districts of Sonitpur and North Lakhimpur. Nagaon has covered total area of 3,993 sq. km.

3.1.4. Administrative division

On the administrative front, Nagaon district has 2 civil sub divisions namely Nagaon, Kaliabor, with 7 revenue circles and 13 development blocks. District has 169 gram panchayats in 960 inhabited

Figure 3.1 : Map of Assam

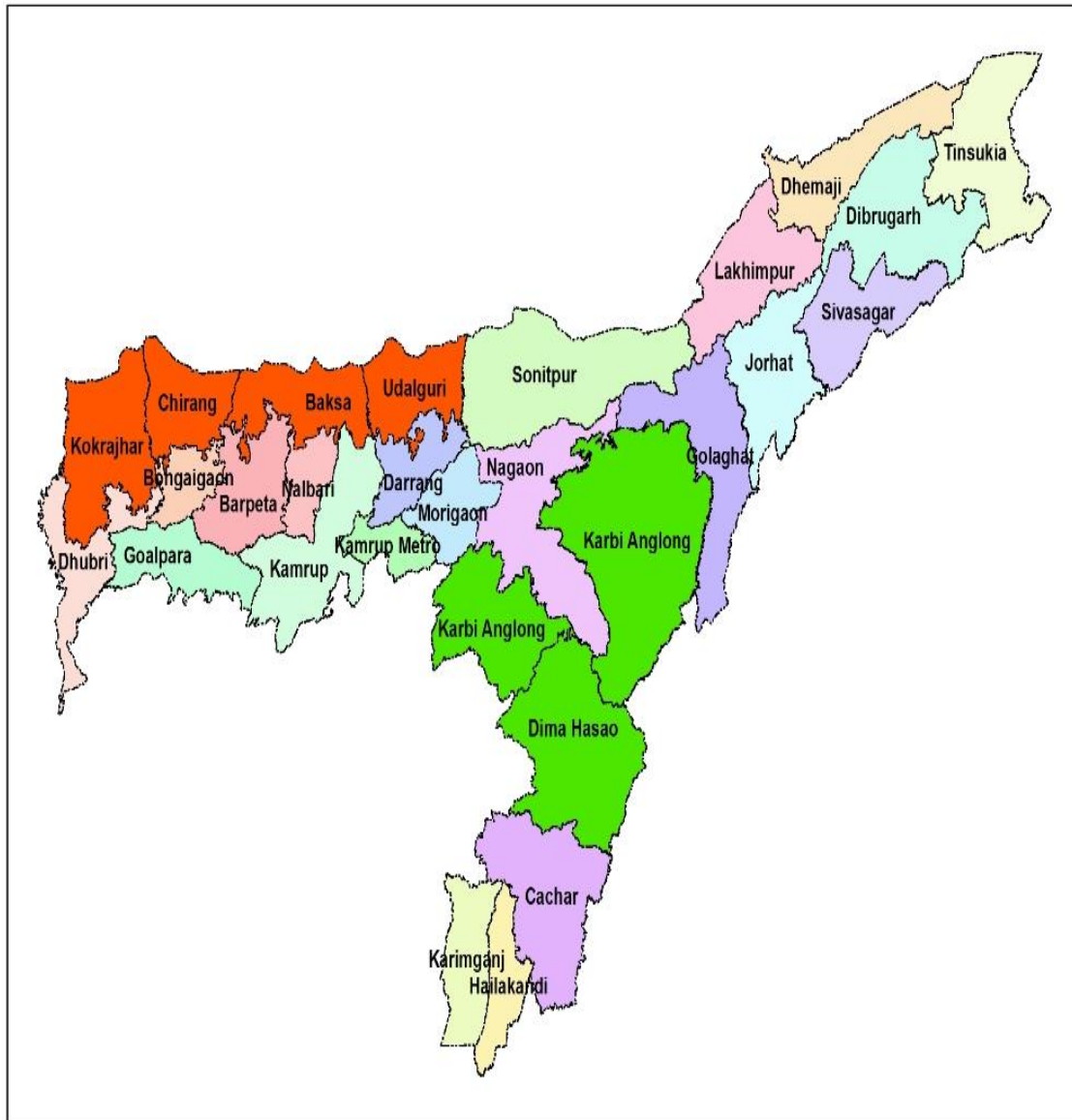
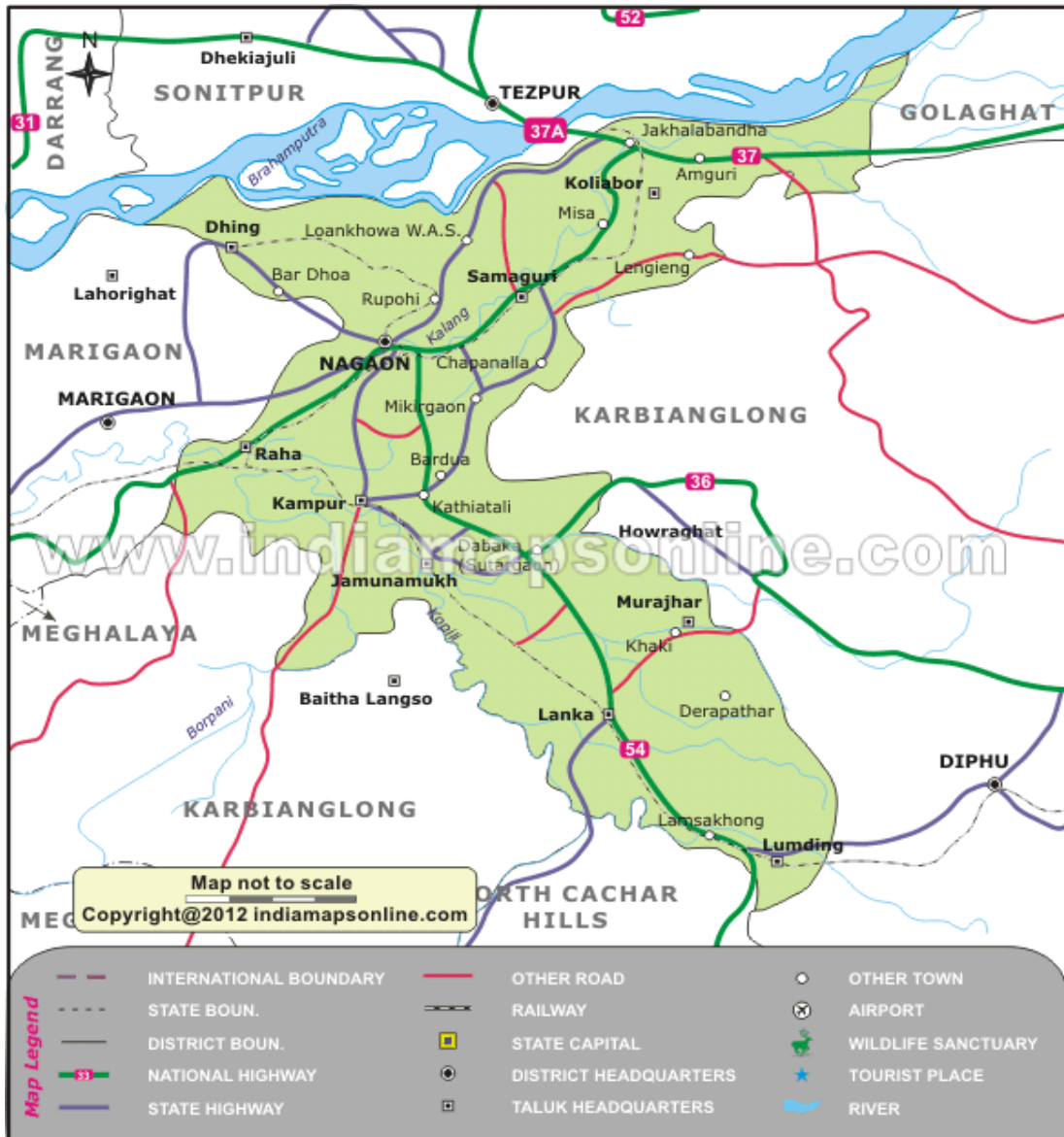


Figure 3.2 : Map of Nagaon district



villages. Total number of police station is 15. Two national highways, N.H.-36 and N.H.-37 cross the district.(Nagaon.gov in)

3.1.5. Population distribution

As per 2011 census the population of nagaon district is 2814629 out of which male population is 1439112 and female population is 1384656. The population density of nagaon district is 711 and the sex ratio is 962/1000. The rural population is 2454234 and urban population is 369534. The literacy rate of nagaon district is 72.37percent and the male literacy rate is 76.51percent and female literacy rate is 68.07percent. The rural literacy rate is 64.98percent and the urban literacy rate is 81.65percent.

3.1.6. Demographics

Nagaon presents a mix of cultures of Hinduism, Islam, Sikhism, Jainism, and Buddhism. About 43.39percent are Hindus, 55.36percent are Muslims, 0.95percent are Christian ,0.11percent are Sikh , 0.04percent are Jain and 0.11percent others. It has different language speakers including Assamese, Gorkhali, Bengali, Hindi, Bodo, Tiwa, Karbi, Dimasa, Manipuri. Major Communities in the district are Bengali Muslims, Assamese Muslims, Assamese Hindus including Assamese Brahmins, Kalitas, Tiwas, Kaibartas, Keots, Ahoms, Koch Rajbongshis , Sutyias, Dimasas, amongst others. Assamese is the lingua franca and the communicating language in the district.(Wikipedia)

3.1.7. Rivers and drainage

The mighty river Brahmaputra flows along the northern periphery of the district. Other major tributaries meandering through the district such as Kolong, Kopili drain into the Brahmaputra. Among these, Kopili is the major river originating in the hills of Karbi Anglong to the south and flows on north-westerly direction and meet with Diyang river near

Dhing. It follows north-westerly direction from Dhing to the same north-westerly trend up to Kampur and deflects towards west. Kalong, the tributary of Kopili joins the later near Jagiroad. Together with Morigaon district, it has the shape of a broken dish. The north and the south are uplands. The general slope of the district is towards the west. The eastern, north eastern and the south eastern parts are hilly terrains.

3.1.8. Soil and topography

The major geomorphic units in the district are:

i. Denudational Hills: It occupies eastern and southern part of the district comprising parts of Karbi angling hills and N.C.hills. They are NE-SW trending rugged topographic highs standing out due to differentiated erosion. The hilly terrain is covered by thick mantle of lateritic deposit and is densely forested.

ii. Piedmont Zones: These zones occur at the contact of the denudational hills and plains. They are high land forms deposited adjacent to hill slopes by fluvial action. They consist of assorted admixture of cobbles, pebbles, sand and a matrix of clay.

iii. Flood Plain deposits: Flood Plain deposit occupy a major part of the district with huge thickness of unconsolidated alluvial sediment deposited by the mighty Brahmaputra and its tributaries. The Kopili river on the south and the Kalong river on the north-east have deposited the sediment during floods.

iv. Charland: Charland is relatively low lying area along the river Brahmaputra within the recent flood plain. The area is characterized by fertile land with sandy and silty loam. The Charland is formed due to oscillation of the river water which is either washed away by subsequent floods or strengthened by further deposition.

v. Swampy areas: Swampy areas are low lying areas or the natural depressions created due to change of river courses as abandoned channels or meander lakes. They are locally known as beels and are found abundantly in the district.

Nagaon district is rich in natural resources. Geologically the soil in the district of Nagaon is sandy new alluvium. The alluvial soil is mostly loamy and consists of a mixture of clay and sand in varying proportions, ranging from pure sand on the banks of the Brahmaputra to sticky clay which is considered unfit for cultivation. Marshy soil is chiefly found in the low lying areas. These are black in colour. The red soil generally occupies the hill slopes and foot hills. Occasionally lateritic soil is also found near about Lumding.

The plain areas bordering Brahmaputra river are occupied by alluvial sediments belonging to Quaternary ages. Based on such criteria such as sedimentation, soil characteristics and geomorphic features, the Quaternary sediments can be grouped into two subdivisions,

viz. (i) Older Alluvium, and (ii) Younger Alluvium.

3.1.9. Rainfall and Climate

The area experiences hot sub-tropical humid climate. A hot and humid pre-monsoon from March to mid-May, a prolonged southwest monsoon or rainy season from mid-May to September, a pleasant post-monsoon or retreating monsoon from October to November and a cold pleasant winter from December to February are the characteristics of the general climate. Summer runs concurrently with the later part of the pre-monsoon season and continues throughout the monsoon season.

The four climatic seasons viz pre-monsoon, monsoon, post-monsoon and winter could be considered as comprising of the following months:

- i. Pre-monsoon: March, April and May
- ii. Monsoon: June, July, August and September
- iii. Post-monsoon: October and November
- iv. Winter: December, January and February

Sometimes, the monsoon commences in mid-May and ends in mid-September. Therefore, the boundaries between the seasons are not very rigid.

The climate is in general monsoon type. However, there are some differences from the other districts of Assam. The climate is of an extreme type compared to other districts of Assam. The pattern of rainfall is such that the south is usually dry and the north is relatively rainier. Rainfall from south to north increases. The average rainfall is near about 1750 mm. Deforestation, speedy urbanization and global warming, etc. are changing the rainfall pattern of the district. Nagaon district has a vegetation cover of around 12 percent. Temperature in winter varies from a maximum of 24.8°C to a minimum of 11.2°C. In summer, temperature varies from a maximum of 32.9°C to a minimum of 25.5°C. The annual average maximum temperature is 30.4°C and the minimum is 19.8°C.

3.1.10. Land use pattern

The district has total geographical area of 397300 hectares. About 19.52percent area is covered by forest. The district has 15percent area under non-agricultural uses and 8.47percent area under other uncultivated land excluding fallow land and 2.01percent fallow land of the total geographical area of the district. The net cropped and gross cropped area is about 54.98percent and 80.47percent respectively of the total geographical area of the district. The cropping intensity is 192percent.

Primarily due high population density, the percentage of fallow land in the district is considerably low.

3.1.11. Agriculture

Nagaon district is primarily dependent on agriculture and forest products. Main source of income is paddy with surplus production. The district has cropping intensity 192 percent as against 152.43 percent for the state. Besides rice, jute and sugarcane, mustard seed, potato, wheat and vegetables etc. are other important agricultural products of the area. Dhing town is surrounded by a fertile area of land which produces jute, rice and mustard seeds abundantly. Besides these crops, the district produces various types of horticultural fruits like banana, papaya, litchi, pineapple, lemon etc. and other plantation crops such as coconut, areca nut etc. Tea cultivation is also done mostly in the organized sector. Sericulture is also an important activity practiced widely in the district. It is an important source of supplementary income and employment particularly to the rural womenfolk. The craft is mostly practiced in the tribal areas. Eri is most extensively raised in the district followed by Mulberry.

3.1.12. Transport and communication

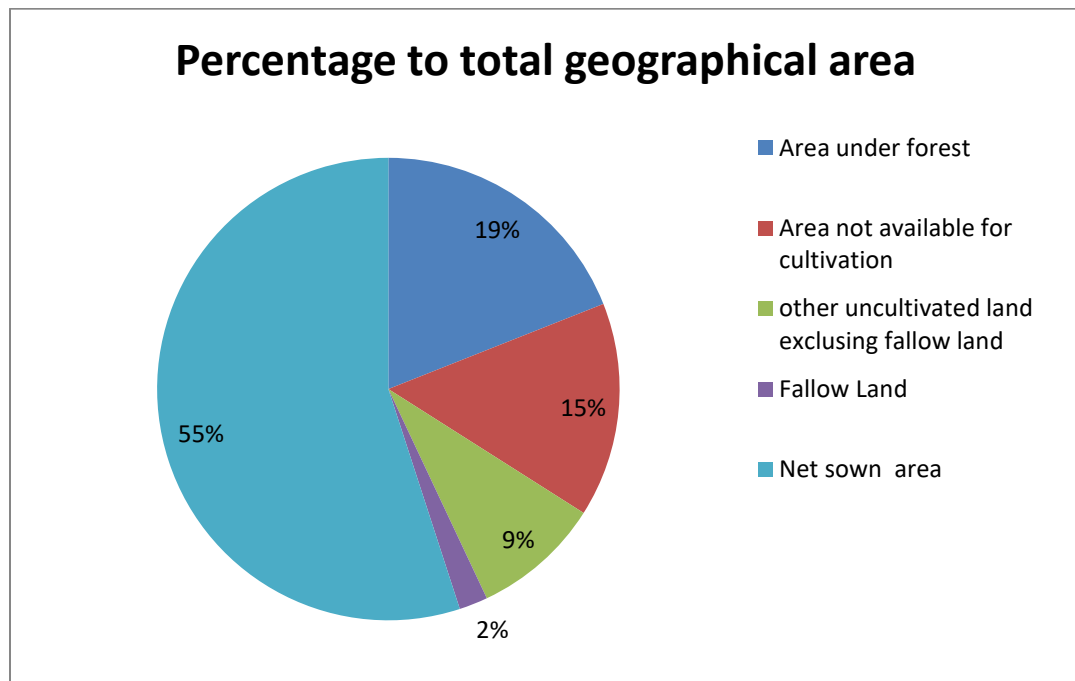
Nagaon is well connected by road links. The national highway No. 36 and No. 37 provide easy access to important places of Nagaon district. Road distance from Guwahati to Nagaon town is 123 kilometers. The North-East frontier railway has its divisional headquarters in Lumding which is connected with all important centres in the district. Railway station named Haiborgaon is at Nagaon town. Nearest railway Junction is at Chaparmukh which is around 28 kilometers from Nagaon town. Nearest airport is Lokapriya Gopinath Bordoloi Airport at Borjhar (Guwahati).

Table .3.1: Land use pattern of Nagaon district

S no	Particular	Area (ha)	Percentage(%)
1	Total geographical area	397300	100
2	Area under forest	77580	19.52
3	Area not available for cultivation	59603	15
4	Other uncultivated land excluding fallow land	33658	8.47
5	Fallow land	8020	2
6	Net sown area	218439	54.98
7	Total cropped area	319708	80.47
8	Area sown more than once	101269	25.49

Source: Statistical handbook Assam 2016

Figure 3.3: Land use pattern of Nagaon district



3.2. Selection of the study area

Nagaon district of Assam is selected for the present study as this district is one of the major producer of jute in the state with 10510 hectare area under Jute crop. It has highest productivity in the state. Nagaon district consist of twenty blocks namely Bajjagaon, Barhampur, Batadrawa, Binnakandi, Dhal Pukhuri, Dulongghat, Jugijan, Juria, Kaliabor, Kalili, Kathiatoli, Khagarijan, Laokhowa, Lumding, Mairabari, Pachim kaliabor, Pakhimaria, Raha, Rupahi, Udali out of these Laokhowa block was selected purposively based on highest area and production.

3.3. Selection of the village

After the selection of the block, five villages ,having maximum area under jute were selected in consultation with the Agricultural Officials for the study namely Bhurbanda, Bogamukh 4, Bogamukh 5, Bogamukh 6, Bogamukh 7.

3.4. Selection of Respondents

A list of jute growers were prepared and categorized into three size groups on the basis of size of land holding i.e, (i) Marginal (upto 1 ha) (ii) Small (1 to 2 ha) and (iii) Medium size (above 2 ha). From each size group 20 farmers were selected randomly. Thus total 60 farmers were considered for detail investigation to fulfill the stated objectives.

3.5. Period of study

The primary data pertains to agricultural year 2017-18.The secondary data were collected for a decade from 2006-07 to 2016-17 for estimation of growth performance and export competitiveness.

3.6. Method of analysis

3.6.1. For estimation of cost and returns following cost concepts and profitability aspect were used.

(i) **Cost of cultivation(Rs/ha)** : Variable cost + Fixed cost

(ii) Cost Concepts

Cost A_1 = All actual expenses incurred in the Production.

Cost A_2 = Cost A_1 + Rent paid for leased in land.

Cost B_1 = Cost A_2 + Interest on fixed capital excluding land.

Cost B_2 = Cost B_1 + Rental value of owned land.

Cost C_1 = Cost B_1 + Imputed value of family labor.

Cost C_2 = Cost B_2 + Imputed value of family labor.

Cost C_3 = Cost C_2 + 10 percent of Cost C_2 as managerial cost.

(iii) Profitability Aspect

a) Gross Income: Total value of main product and by product.

b) Farm Business Income: Gross income – Cost A_1

c) Family Labor Income: Gross income – Cost B_2

d) Net Farm Income: Gross income – Cost C_3

e) Cost-Benefit Ratio: Gross income/Gross expenses

3.6.2. Marketing Pattern:

For knowing the marketing pattern of jute in the study area suitable numbers of market functionaries/agencies were considered. The information related to marketing cost and marketing margin of jute were collected from selected market functionaries in the study area.

(i) Total cost of Marketing

$$C = C_F + C_{m_1} + C_{m_2} + C_{m_3} + \dots + C_{m_n}$$

where, C = Total marketing cost

C_F = Cost paid by the producers

C_{mi} = Cost incurred by the i^{th} middlemen

(ii) Marketing Margin of the middleman

(a) Absolute margin of i^{th} middleman(A_{mi})

$$A_{mi} = P_{Ri} - (P_{Pi} + C_{mi})$$

(b) Percentage margin of i^{th} middleman(P_{mi})

$$P_{mi} = \frac{P_{Ri} - (P_{Pi} + C_{mi})}{P_{Pi}} \times 100$$

$$P_{Pi}$$

(c) Percentage mark-up margin of i^{th} middleman(M_i)

$$M_i = \frac{P_{Ri} - (P_{Pi} + C_{mi})}{P_{Pi}} \times 100$$

P_{Ri} = Total value of receipts per unit (sale price)

Price spread:

The difference between price paid by the consumer and price received by the producer for an equivalent quantity of farm produce.

Price spread = Consumer Price – Producer Price

3.6.3. Export competitiveness

Competitiveness is ability of a nation to grow successfully and to maintain its share of world trade. The export competitiveness of jute in the present was assessed by using a simple measure known as Nominal Protection Coefficient (NPC). NPC is a straight forward measure of competitiveness. It is calculated as ratio between the domestic price to the border price or reference price of the commodity.

Symbolically,

$$NPC = P_d / P_r$$

Where,

NPC = Nominal Protection Coefficient

P_d =Domestic price of the jute

P_r = Border price or reference price of jute

If the nominal protection coefficient is greater than one, then the commodity is Non-competitive, compared to the situation that what would prevail under free trade and if it is less than 0.5 highly competitive and from 0.5 to 1.0 it is regarded as moderately competitive.

NPC basically helps in measuring the divergence of domestic price from the international price and thus determines the degree of competitiveness of the commodities.

Growth performance

To analyse the growth performance in production and export of jute, trend and compound growth rate were worked out.

Trend : Trend analysis for selected variables can be estimated with the help of linear equation. The linear trend was fitted with the method of least square technique.

$$Y=a + bx$$

Where,

Y= Dependent variable

x= Independent variable

a= Intercept/Constant

b= Regression co-efficient

Simple growth rate = $b/\bar{y} \times 100$

Compound growth rate:

The compound growth rate per annum over the period for all variables were calculated from the following formula

$$Y=ab^x$$

Compound growth rate=(Antilog of b-1) x 100

where, b= log b

3.6.4. Garrett's ranking technique

For identifying constraints Garrett's ranking technique will be used

$$\text{Percent position} = \frac{100 (R_{ij} - 0.5)}{N_j}$$

Where,

R_{ij} = Rank given for the i th variable by j^{th} respondents

N_j = Number of variable ranked by j^{th} respondents

As per this method respondents were asked to assign the rank for all the factors and the outcome of such ranking will be converted into score value with the help of the formula. With the help of Garretts table the percent position estimated were converted into scores. Then for each factor the scores of each individual were added and the total value of scores will be calculated. The factors having highest mean value is considered to be the most important factor.

Results

Data collected for the study from various sources were analyzed using appropriate techniques and the results of analysis are presented in this chapter under the following headings.

4.1. Socio economic characteristics of the respondents.

4.2. Analysis of costs and return structure of jute cultivation under different size sample farms.

4.3. Analysis of marketing pattern and identify the value added products of jute.

4.4. Analysis of the growth performance and export competitiveness of jute.

4.5. To identify the production and marketing constraints of jute and suggest.

4.1. Socio economic characteristics of the respondents

4.1.1. Family size of sample respondents

It was revealed from the table 4.1 that in case of marginal 33.12% were children, 33.75% were male and 33.12% were female. And in case of small farmer 31.64% were children, 30.5% were male and 37.85% were female. And in case of medium farmers 33.33% were children, 35.55% were male and 31.11% were female. On overall it was found that 32.68% were children, 33.27% were male and 34.05% were female. It is revealed from the table that the average family size is 7 for marginal farmer, 9 for small farmer and 9 for medium farmer. The overall average family size is 8 member.

Table 4.1: Family size of selected respondents

S .No	Size group	Family size			Total	Average family size
		Children	Adult			
			Male	Female		
1	Marginal	52 (33.12)	53 (33.75)	52 (33.12)	157 (100)	7
2	Small	56 (31.64)	54 (30.5)	67 (37.85)	177 (100)	9
3	Medium	60 (33.33)	64 (35.55)	56 (31.11)	180 (100)	9
4	Overall	168 (32.68)	171 (33.27)	175 (34.05)	514 (100)	8

Figure in bracket show percentage to total.

4.1.2. Types of family on sample respondents

Table 4.2: Types of family on sample respondents

Size group	Nuclear	Joint	Total
Marginal	14 (70)	6 (30)	20 (100)
Small	11 (55)	9 (45)	20 (100)
Medium	13 (65)	7 (35)	20 (100)
Overall	38 (63.33)	22 (36.67)	60 (100)

Figure in brackets show the percentage to total.

It was found that in case of marginal farmers 70% of respondents had individual family and only 30% had joint family. In case of small farmers 55% of respondents had individual family and 45% had joint family. In case of medium farmers 65% of respondents had individual family and 35% had joint family. Overall on an average 63.33% of the respondents had individual family and 36.67% of the respondents had joint family.

4.1.3. Age wise distribution of selected respondents

Table 4.3: Age wise distribution of selected respondents

AGE				
Size group	No of respondents	Young (18-40)	Middle (41-60)	Old (>60)
Marginal	20 (100)	8 (40)	5 (25)	7 (35)
Small	20 (100)	4 (20)	10 (50)	6 (30)
Medium	20 (100)	5 (25)	7 (35)	8 (40)
OVERALL	60 (100)	17 (28.33)	22 (36.6)	21 (35)

Figure in brackets show percentage to total.

It was revealed from the table 4.3 that in case of marginal farmers more respondents belong to old age group (35%) followed by young age group (40%) and then middle age group(25%). In case of small farmers more respondents belong to middle age group (50%) followed by old age group (30%) and then young age group (20%). In case of medium farmers more respondents belong to old age group (40%) followed by middle age group (35%) followed by young age group (25%). It was revealed from the table that overall more number of respondents belong to middle age group

(36.6%), followed by old age group (35%) and followed by young age group(28.33%).

4.1.4. Caste of sample respondents

Table 4.4: Caste of sample respondents

Size group	No of respondents	General	OBC	SC	ST
Marginal	20 (100)	15 (75)	0	5 (25)	0
Small	20 (100)	9 (45)	0	11 (55)	0
Medium	20 (100)	10 (50)	0	10 (50)	0
Overall	60 (100)	34 (56.67)	0	26 (43.33)	0

Figure in brackets show percentage to total.

It was revealed from the table 4.4 that in case of marginal farmers majority of farmers belong to the general category (75%) and about 25% belong to schedule caste category. In case of small farmers majority of respondents belong to schedule caste category (55%) and other 45% belong to general category. In case of medium farmers it was found that 50% of respondents belong to general category and other 50% belong to schedule caste category. Overall it was found that 56.67% respondents belong to the general category and 43.33% sample respondents belong to schedule caste category.

4.1.5. Education level of selected respondents.

It was observed from the table 4.5 that in case of marginal respondents 40% were illiterate, 30% had primary education, 10% had middle school level and 20% had higher secondary level education respectively. In case of small farmers 20% were illiterate, 30% had

primary level, 35% had middle level and 15% had higher secondary level education. In case of medium farmers 20% were illiterate, 25% had primary level, 15% had middle level and 40% had higher secondary level education. Overall it was found that 26.67% respondents were illiterate, 28.33% respondents had primary education, 20% had middle school level and 25% had higher secondary level education.

Table 4.5: Education level of selected respondents.

Size group	No. of respondents	Level of education			
		Illiterate	Primary	Middle	HSS
Marginal	20 (100)	8 (40)	6 (30)	2 (10)	4 (20)
Small	20 (100)	4 (20)	6 (30)	7 (35)	3 (15)
Medium	20 (100)	4 (20)	5 (25)	3 (15)	8 (40)
Overall	60 (100)	16 (26.67)	17 (28.33)	12 (20)	15 (25)

Figure in brackets show percentage.

4.1.6. Cropping pattern

The cropping pattern and cropping intensity of different sample respondents of different sample are shown in the table 4.6.

Under kharif season rice was found to be the major crop under cultivation which covered under 89.24% of the cropping area on an average. In rabi season the main crops cultivated under marginal size group was potato, chilli and brinjal which covered about 28.87%,27.95% and 23.96% of the total cropped area respectively. In case of small farmers potato, rapeseed and chiillie covered major areas in rabi season at about 36.07%,18.66% and 13.99% of the total cropped area respectively.

In case of large farmers potato, rapeseed and chilli covered the main areas under cultivation i.e, about 35.06%, 20.49% and 14.96% of the total cropped area respectively.

In summer season the two main crops grown were jute and paddy which covered about 77.93% and 22.06% of the total cropped area respectively. The cropping intensity of the sample area was found to be 199.25 on an average, which varied between 195 percent on marginal farm to 203 percent in small farm followed by medium farm 199 percent. The cropping intensity of the area was found to be higher as compared to that of the district. The reason being that the selected respondents grew crops all round the year as their main job was agriculture.

Table 4.6: Cropping Pattern of Sample respondents

	Crop	Marginal	Small	Medium	Overall
A.	Kharif				
1	Paddy	7.61 (95)	13 (91.54)	20 (85.91)	13.53 (89.24)
2	Other	0.4 (5)	1.2 (8.4)	3.28 (14.08)	1.62 (10.68)
	Sub total	8.01 (100)	14.2 (100)	23.28 (100)	15.16 (100)
B.	Rabi				
1	Potato	1.88 (28.87)	4.83 (36.07)	13.5 (37.22)	6.63 (35.06)
2	Tomato	0	1.56 (11.44)	3.24 (8.9)	1.6 (8.46)
3	Chilli	1.82 (27.95)	1.95 (13.99)	4.74 (13.06)	2.83 (14.96)
4	Brinjal	1.56 (23.96)	1.56 (11.44)	4.9 (13.5)	2.78 (14.70)
5	Cauliflower	0.73 (11.21)	1.43 (10.26)	1.43 (3.94)	1.19 (6.29)
6	Rapeseed	0.52 (7.98)	2.6 (18.66)	8.46 (23.32)	3.86 (20.41)
	Sub total	6.51 (100)	13.93 (100)	36.27 (100)	18.91 (100)
C.	Summer				
1	Paddy	5.58 (45.81)	3.14 (11.83)	12.62 (3.11)	7.11 (22.06)
2	Jute	6.6 (54.18)	23.4 (88.16)	45.33 (78.22)	25.11 (77.93)
	Sub total	12.18 (100)	26.54 (100)	57.95 (100)	32.22 (100)
	Gross cropped area	26.7	54.67	117.5	66.29
	Net cropped area	13.6	26.96	59.18	33.27
	Cropping intensity(%)	195	203	199	199

4.2. Analysis of costs and return structure of jute cultivation under different size sample farms.

4.2.1. Cost of cultivation of jute under different farm size

The operational and fixed cost of jute crop of sample respondents has been given in the table 4. 7.

The cost of cultivation of jute under selected size groups was estimated and on an average the cost of cultivation was found Rs.75930.14 and ranged from Rs.75164.83 to Rs.76659.24 on different categories of farmers. The cost of cultivation was found to be highest for medium farm size at Rs.76659.24 followed by marginal farm size at Rs.75966.36 and then small farm size at Rs.75164.83 .The operational cost was observed to be 71.43 percent and remaining as fixed cost to the total cost on an average.

The total labor cost accounted for 53.99% of the total cost. The labor cost was found to be higher in case of marginal farm size followed by medium farm size followed by small farm size at Rs.42701, Rs.40778 and Rs.40154 respectively. In case of input material, it was observed to be highest for medium size farm followed by small size farm followed by marginal size farm size at Rs.11710, Rs.11511 and Rs.10995 respectively. Thus it could be concluded that labor cost was one of the major part of the operational cost in the production of jute as lots of labor are required for different operation during the production of jute.

(Figure in bracket shows percentage on table 4.7)

Table 4.7: Cost of cultivation of jute under different size of farms

Particulars		Size Groups			
		Marginal	Small	Medium	Average
1.Labour cost					
A. Human labour	Family	9315 (12.26)	3923 (5.22)	2327 (3.03)	5188 (6.83)
	Hired	28181 (37.09)	29987 (39.89)	31048 (40.5)	29738 (39.16)
B.Bullock labour	Owned	2115 (2.78)	3445 (4.58)	4860 (6.33)	3473.33 (4.57)
	Hired	0	0	0	0
C.Machine Labour	Owned	0	0	420(0.54)	140(0.18)
	Hired	2460 (3.23)	2799 (3.72)	2123 (2.76)	2460.67 (3.24)
Sub total		42071 (55.38)	40154 (53.42)	40778 (53.19)	41001 (53.99)
2.Input/Material cost					
A.Seed		1515 (1.99)	2091 (2.78)	2256 (2.94)	1954 (2.57)
B.Manure		3787 (4.98)	3752 (4.99)	3766 (4.91)	3768 (4.96)
C.Fertilizer		3863 (5.08)	3765 (5)	3766 (4.91)	3798 (5)
D.PPM		1830 (2.40)	1903 (2.53)	1922 (2.5)	1885 (2.48)
E. Irrigaion		0	0	0	0
Sub total		10995 (14.47)	11511 (15.31)	11710 (15.27)	11405 (15.02)
Interest on working capital@7%		1857 (2.44)	1808 (2.41)	1837 (2.39)	1834 (2.41)
Total operational cost		54923 (72.29)	53473 (71.14)	54325 (70.86)	54240 (71.43)
3.Indirect cost					
A. Rental value of Owned Land		19577 (25.77)	19733 (26.25)	19874 (25.92)	19728 (25.98)
B. Depreciation		413 (0.54)	873 (1.16)	1342 (1.75)	876 (1.15)
C. Revenue/Tax		51 (0.07)	52 (0.07)	54 (0.07)	52 (0.06)
D. Interest on Fixed cost @10%		1002 (1.32)	1032 (1.37)	1063 (1.38)	1032 (1.36)
Total fixed cost		21043(27.7)	21690(28.85)	22333(29.13)	21689(28.56)
Total cost(OC + FC)		75966(100)	75164(100)	76659(100)	75930(100)

4.2.2. Cost of cultivation of jute (Cost concepts)

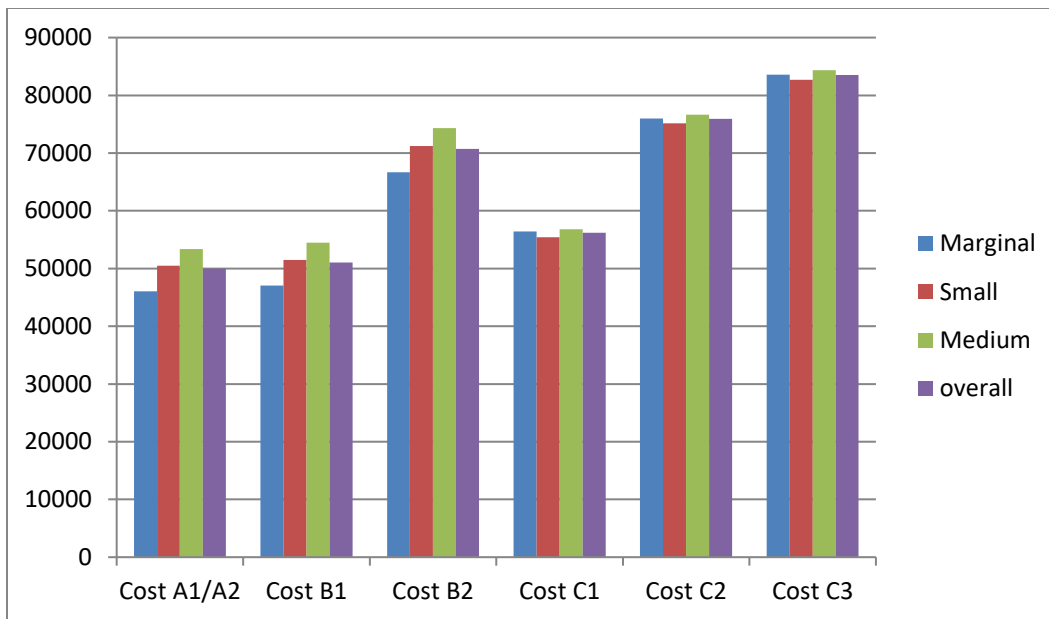
Table 4.8: Cost of cultivation of jute based on cost concepts (Rs./ha)

S.no.	Cost concepts	Size groups			
		Marginal	Small	Medium	Overall
1	COSTA1/A2	46072.31	50475.27	53394.08	49980.55
2	COST B1	47074.36	51508.20	54457.61	51013.39
3	COST B2	66651.36	71241.82	74332.24	70741.81
4	COST C1	56389.36	55431.20	56784.61	56201.73
5	COST C2	75966.36	75164.83	76659.24	75930.14
6	COST C3	83562.99	82681.31	84325.17	83523.16
7	COST OF PRODUCTION(Rs./q)	2194.71	2113.35	2078.14	2127.62

It was revealed from the table 4.8 that the total cost of cultivation per hectare was highest in medium size followed by marginal and small size of land holding. It was Rs.84325.17, Rs.83562.99 and Rs.82681.31 for medium, marginal and small respectively. Cost A1 and Cost A2 were same due to absence of practice of leasing in land therefore cost A1 was not mentioned. . The percentage of cost A2 to cost C3 on an average was 59.84 percent. The medium farm size had the highest percentage of cost A2 to Cost C3 about 63.31 percent followed by small farm size about 61.04 percent followed by marginal farm size about 55.13 percent. The cost of production per quintal was found to be highest in case of marginal farmer followed by small and then medium. It was Rs.2194.71, Rs.2113.35 and Rs.2078.14 for marginal, small and medium size group respectively. On an average the cost of production was Rs.2127.62 per quintal.

It could be concluded that medium farm size group requires more investment for cultivation of jute as compared to small and marginal farm group in the study area.

Figure 4.1. cost of cultivation(Rs/ha) of jute (cost concepts)



4.2.3. Gross income from jute production of sample respondents.

It was revealed from the table 4.9 that the average production of jute was 33.93 quintal per ha. The value of the produce sold by farmers on an average was Rs.119065.7/ha and the value of by-products sold by farmers was Rs.11325.83 per ha. The gross income on an average was found to be Rs.130391.5 per ha. The gross income was highest for medium farmer, followed by small and then marginal farmer. The gross income for medium, small and marginal farmer are Rs.134090, Rs.129659.2 and Rs.127425.3 respectively.

Table 4.9. Gross income from jute production of sample respondents(Rs./ha)

s.no	Items	Size group			Average
		Marginal	Small	Medium	
1	Productivity (Quintal/Ha)	33	33.8	35	33.93333
2	Price (MSP)(Rs./q)	3500	3500	3500	3500
3	Value of main product(Rs.)	116287.8	118409.2	122500	119065.7
4	Value of by products(Rs.)	11137.5	11250	11590	11325.83
5	Gross income(Rs)	127425.3	129659.2	134090	130391.5

4.2.4. Profitability of jute production of sample respondents.

The results show that total cost of cultivation per ha (Cost C3) was highest in medium group of farmers followed by marginal and small size group. It was Rs.83563, Rs.82681.31 and Rs.84325.17 for marginal, small, and medium size group respectively.

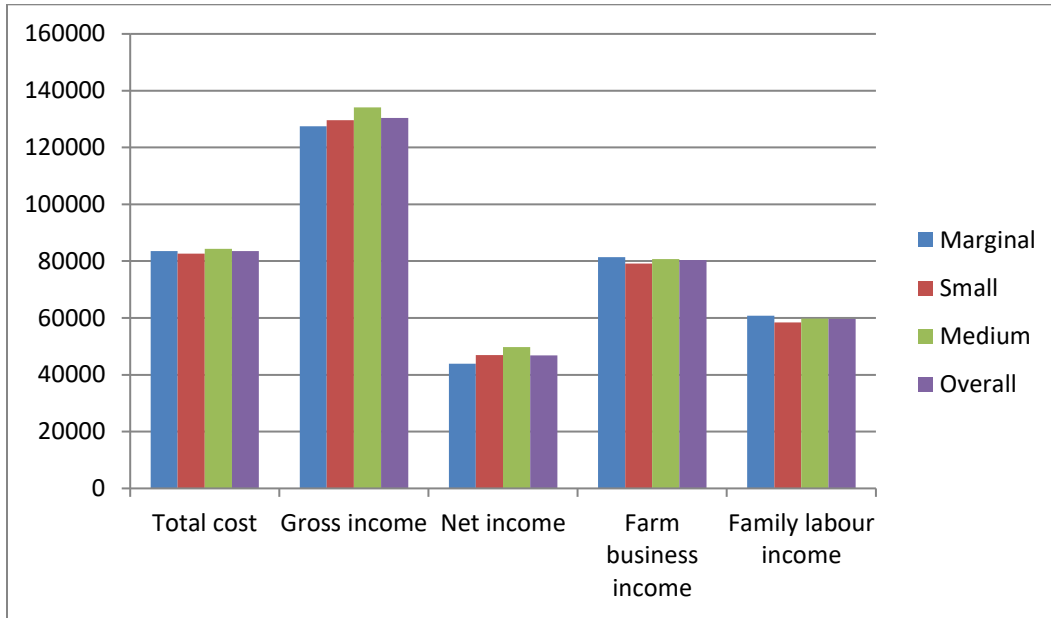
The net income was found to be more for medium farmer followed by small and then marginal. It was Rs.49764.83, Rs.46977.87 and Rs.43862.3 for medium, small and marginal respectively.

The farm business income however was found to be more for marginal farmer followed by medium and then small farm size, it was Rs.81352.99, Rs.79183.91 and Rs.80695.92 for marginal, small and medium farm size respectively. The family labor income followed the same trend as the farm business income. The B:C ratio over cost C3 was 1:1.56 for overall study.

Table 4.10: Profitability of jute production of sample respondents (Rs./ha)

S.no	Economic parameter	Marginal	Small	Medium	Overall
1	Total cost	83563	82681.31	84325.17	83523.16
2	Gross income	127425.3	129659.2	134090	130391.5
3	Net income	43862.3	46977.87	49764.83	46868.34
4	Farm business income	81352.99	79183.91	80695.92	80410.94
5	Family labour income	60773.94	58417.35	59757.76	59649.68
6	Breakeven production	23.87514	23.62323	24.0929	23.86376
7	Breakeven cost	2532.212	2446.193	2409.29	2462.565
8	Benefit cost ratio	1.524901	1.56818	1.590154	1.561078

Figure 4.2. Profitability of jute production of sample respondents.(Rs/ha)



4.3. Analysis of marketing pattern and identify the value added products of jute.

4.3.1. Identified marketing channels

There were two type of marketing channels identified in the study area. They are as follows:

Channel I: Producer \longrightarrow Big trader/Regulated market \longrightarrow Broker/commission agent \longrightarrow consumer

Channel I: Producer \longrightarrow Village market/small trader \longrightarrow Big trader /Regulated market \longrightarrow Broker/commission agent \longrightarrow consumer.

Table 4.11: Quantity sold in different marketing channels

Quantity sold in different marketing channels				
Purchaser	No. of sellers	Quantity sold	Rate	Value received
Small traders	45 (75)	1905.4 (74.6)	3400 (48.57)	6478360 (73.52)
big traders	15 (25)	647.9 (25.3)	3600 (51.42)	2332440 (26.47)
Overall	60 (100)	2553.3 (100)	7000 (100)	8810800 (100)

(Figures in bracket show percentage to the total)

It was observed from the table that the majority of the respondents prefer to sell their produce to the local village market or small trader or beparis (75%) followed by big traders at the regulated market or far away market. Also maximum quantity was sold to small traders (74.6%) followed by big traders(25.3%), although the rate receive per quintal was found to be higher from big traders(Rs.3600/q) compared to small traders(Rs.3400/q).

The quantity sold to small traders or village merchant is higher because the primary market is closer to them and is convenient for transport and is easily disposable.

4.3.2. Marketing cost

Table 4.12: Marketing charges paid by various intermediaries under different marketing channels of jute(Rs/Q)

S.no	Particulars	channel 1	Channel 2
Producer			
1	Transport charge	125	50
2	Mandi fees	100	40
3	Loading unloading	25	25
4	Other(including commission)	100	90
	Sub total	350	205
Village trader/small trader			
1	Transport charge		125
2	Mandi fees		100
3	Loading unloading		20
4	Other(including commission)		150
	Sub total		395
Regulated market or big trader			
1	Transport charge	200	150
2	Mandi fees	100	100
3	Loading unloading	60	60
4	Other(including commission)	200	200
	Sub total	560	510
	Total	910	1100

The marketing charges paid by the producer in the channel 1 which was worked out and found to be Rs.350/Q and bid trader was found to be Rs. 560/Q. The marketing charges paid by the jute producer in channel 2 was Rs. 205/Q, and small trader was Rs. 395/Q and big trader was

Rs.510/Q. The total marketing charges were higher being Rs.1100/Q in channel 2 than that of channel 1 Rs.910/Q in the study area.

4.3.3. Price spread and market margin

Table 4.13: Price spread and market margin under different marketing channels of jute

S.no	Particular	Channel 1	Channel 2
Producer			
1	Gross price received by the producer	3600	3400
2	Market cost incurred by the producer	350	205
3	Net price received by producer	3250	3195
Small traders			
1	Purchase price		3500
2	Market cost incurred		395
3	Net price		3895
4	Selling price		4000
5	Profit		500
	Market margin		105
Big traders			
1	Purchase price	3600	4000
2	Market cost incurred	560	510
3	Net price	4160	4510
4	Selling price	4500	4700
5	Profit	900	700
	Market margin	340	190
Commission agent			
1	Purchase price	4500	4700
	producers share in consumer rupees	72.22%	67.978%
	price spread	900	1300

The table 4.13 shows price and marketing margin under different marketing channels of jute.

The big-traders' margin at a regulated market in channel-I and channel-II were worked out to be Rs.340 Qt⁻¹ and Rs.190 Qt⁻¹ respectively. The small traders or village-traders' margin in channel-II was worked out to be Rs.105 Qt⁻¹. The prices paid by the commission agent or broker were Rs.4500 Qt⁻¹ and Rs.4700 Qt⁻¹ in Channel-I and Channel-II respectively. The producers' share in consumers' rupee was found to be more in channel-I (72.22 percent) as compared to channel-II (67.97 percent).

4.3.4. The various value added products available in the market are:

- Floor covering.
- Hand and Shopping bags.
- Wall hangings.
- Gift articles.
- Decorative fabrics.

Floor coverings: Made by jute fabrics, this product is mostly used in bedrooms and snugs because of its soft texture which is a pleasant feeling for the foot.

Hand & shopping bags : These jute bags are not only fashionable and handy but also have the capacity of bearing loads.

Decorative fabrics : These fabrics are used in making cushion covers, curtains, bed sheets and many more for home furnishing.

Handicrafts and other gift novelty items : Used in home furnishing and giving presents, these products are famous for their eco-friendly nature available at affordable price

4.4. Analysis of the growth performance and export competitiveness of jute.

4.4.1. Export competitiveness of jute

The competitiveness of exports was analyzed by using the Nominal protection coefficient (NPC). This measures the deviation of domestic price from bordered price or reference price. If NPC is less than 0.5 considered highly competitive, and if it is between 0.5 to 1.0 indicates moderately competitive and if it is more than 1.0 indicates not competitive. The Nominal Protection Coefficient (NPC) of JUTE exports from India for the period 2006 to 2016 was presented in table 4.14.

It was clear from the result that the average NPC of jute during the period 2006-2016 was 0.99 indicating that it is non-competitiveness for raw jute export. The NPC is almost 1 during the entire period from 2006-2016.

Table 4.14: Export competitiveness of jute by NPC

S no.	Year	India	World	NPC
1	2006	0.283207	0.283209	0.999995
2	2007	0.283207	0.283208	0.999998
3	2008	0.283207	0.283207	1.000001
4	2009	0.283207	0.282844	1.001282
5	2010	0.283207	0.282836	1.001311
6	2011	0.283207	0.282928	1.000985
7	2012	0.283207	0.283205	1.000006
8	2013	0.283207	0.283204	1.000011
9	2014	0.283207	0.283093	1.000404
10	2015	0.283207	0.282838	1.001303
11	2016	0.283634	0.283115	1.001836

(Source FAO stats)

4.4.2. Growth performance

Trend analysis provides the rate of change of a particular variable during the period of reference and direction of change but it fails to provide the rate of change per annum. The growth rates have been worked out for the export of jute products.

Table 4.15 : Growth rate of production of jute goods in india

Year	QUANTITY(in 000'M Tonnes)
2006-07	1356.3
2007-08	1776
2008-09	1633.7
2009-10	1323.3
2010-11	1565.7
2011-12	1581.8
2012-13	1591.3
2013-14	1527.7
2014-15	1267.3
2015-16	1217.3
2016-17	1142.5
2017-18	1178.1
	CGR= -2.71

(Source: Indian Jute Mill Association, Kolkata, India, Various Issues)

It was evident from the above table that the jute goods production in India has shown a negative trend during the study period 2006-07 to 2016-17. A Compound Growth Rate (CGR) of (-) 0.2.71 percent can be observed over the period, 2006-07 to 2016-17. That clearly shows that jute goods production in India has declining trend over the years.

Table 4.16 : Growth rate of jute product export

Year	Quantity(in '000M Tonnes)	Export (IN CRORES)
2006-07	242	1055.16
2007-08	149.5	1178.49
2008-09	162.3	1216.16
2009-10	83.8	859.46
2010-11	175.5	1854.15
2011-12	211.8	2094.96
2012-13	185.4	1991.8
2013-14	165.7	2121.95
2014-15	161.7	1813.83
2015-16	155.2	1889.4
2016-17	114.7	2074.2
CGR	-1.95	7.88

(Source: Indian Jute Mill Association, Kolkata, India, Various Issues)

Compound growth rate is used to determine the export trends of jute industry in India for 11 years from 2006-07 to 2016-17. CGR denotes that the quantity of jute export has decreased every year at a compound rate by -1.95per cent for the period of 2006-07 to 2016-17, this is due to the reason that there also has been decline in the production of jute goods during the period. However in case of value the jute goods export has grown every year at a compound rate by 7.88 percent.

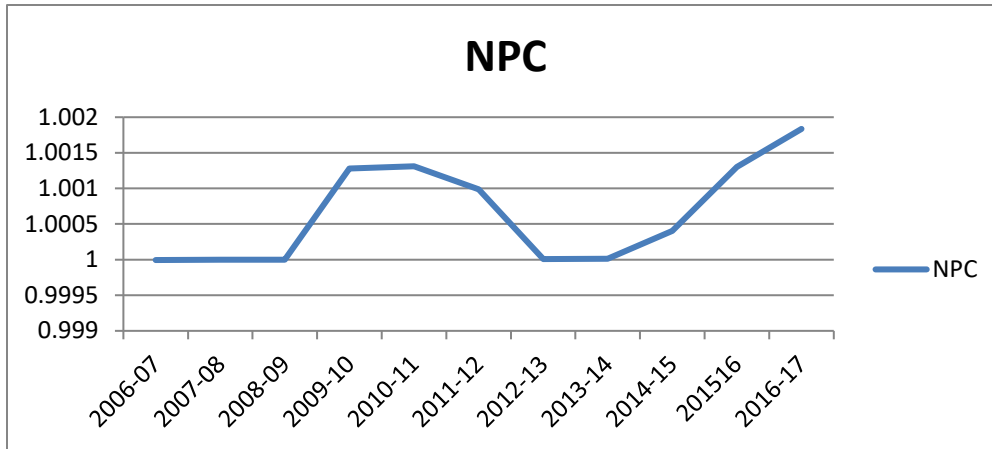


Figure 4.3: Export competitiveness of jute

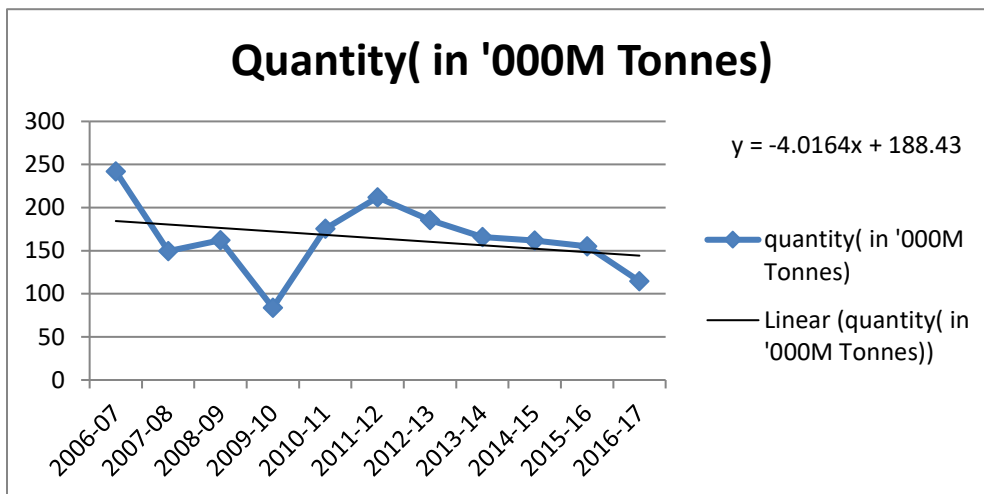


Figure 4.4: Trend of jute goods export from India

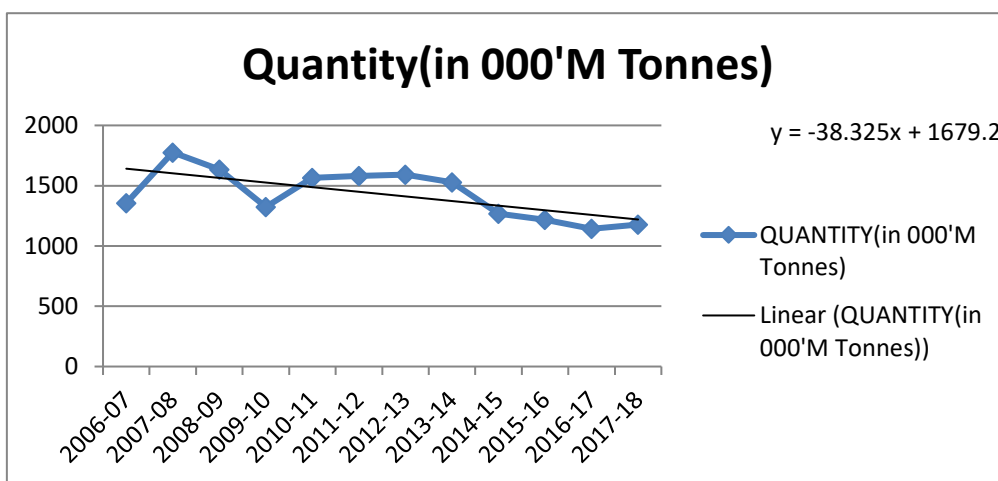


Figure 4.5: Trend of jute goods production in India

4.5. Production and marketing constraints of jute.

4.5.1. Garrett ranking technique:

Garrett ranking technique has been used to analyse the factors influencing the production and marketing of jute by the respondents Under Garrett Technique the percentage position is calculated by using the following formulae.

$$\text{Percentage position} = 100 (R_{ij} - 0.5) / N_j$$

Where R_{ij} = Rank given for i^{th} variable by the j^{th} respondent

N_j = Number of variable rank by the respondent

4.5.2. Production constraints

Table 4.17: Percent position and Garret value for production constraints

S.no	$100(R_{ij}-0.5)N_j$	Calculated value	Garret value
1	$100(1-0.5)/12$	4.166666667	84
2	$100(2-0.5)/12$	12.5	73
3	$100(3-0.5)/12$	20.83333333	67
4	$100(4-0.5)/12$	29.16666667	61
5	$100(5-0.5)/12$	37.5	57
6	$100(6-0.5)/12$	45.83333333	53
7	$100(7-0.5)/12$	54.16666667	48
8	$100(8-0.5)/12$	62.5	44
9	$100(9-0.5)/12$	70.83333333	40
10	$100(10-0.5)/12$	79.16666667	34
11	$100(11-0.5)/12$	87.5	28
12	$100(12-0.5)/12$	95.83333333	17

The respondents were asked to rank the twelve factors identified for the purpose of this studies as 1, 2, 3, 4 ...12 in order to know their preference in the selection of constraint. The calculated percentage position for the rank 1, 2, 3...12 and their correspondent Garrett table as show in Table 4.17 .For factors, the total score is calculated by multiplying the number of respondents ranking that factor as 1, 2, 3... and 12.(Zalkuwi J et,al)

The result from table 4.18 indicate the various production challenges/constraints experienced by the jute farmers in the study area. The study revealed that the major challenges experienced by farmers while cultivating jute are the unavailability of labor on time (69.2%), unavailability of quality seeds (68.6%),lack of knowledge of improved retting (65.7%),high price of inputs (65.2%),lack of irrigation facilities (62.1%) and low return of produce (61.7).

Among the production constraints the shortage of human labor during different agricultural operations such as sowing, intercultural, harvesting, retting and extraction of jute fibers faced by all size groups of respondents.

The sample respondents also face the problem of unavailability of quality seeds as a result of which they are unable to produce higher quality fiber which has more market value and greater demand.

They also face the problem of lack of knowledge of improved retting technology, as a result of which they are unable to produce better quality fiber and get more value for their produce. The sample respondents also face the problem of high price of input. The sample respondents also face the problem of lack of any irrigation facilities provided by the government and also do not receive any subsidiaries from the government.

Table 4.18: Scores and rank of the production constraints calculated using garret value

Constraints	rank given by respondents												Total	%	Rank
	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th	10 th	11 th	12 th			
1.Unavailability of quality seeds	2940	219	134	122	114	159	48	88	80	102	56	51	4113	68.6	2
2.Unavailability of quality fertilizers	1848	146	201	305	171	212	192	132	240	102	84	34	3667	61.2	7
3.Weed problems	1680	365	268	183	114	53	96	132	160	170	140	102	3463	57.7	9
4.Germination problems	840	438	402	244	171	212	240	264	160	102	112	85	3270	54.5	10
5.Lack of technical know how	1260	365	469	244	285	212	192	88	120	68	112	85	3500	58.3	8
6.Labor problems	2520	438	268	183	171	159	96	132	80	34	56	17	4154	69.2	1
7.High price of inputs	2268	292	134	183	171	265	192	132	80	102	56	34	3909	65.2	4
8.Low return	1932	365	134	244	114	106	240	220	120	102	56	68	3701	61.7	6

9.Lack of retting water	588	511	201	366	228	159	240	264	160	170	112	102	3101	51.7	12
10.Lack of knowledge in improved retting	2100	365	335	244	285	159	96	88	80	102	56	34	3944	65.7	3
11.Lack of irrigation facilities	2016	438	201	122	114	106	96	176	200	102	84	68	3723	62.1	5
12.Lack of pest management problems	672	365	402	244	342	106	240	176	160	170	140	102	3119	52	11

Table 4.20: Scores and rank of marketing constraints calculated using Garret value

Constraints	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	total score	%	Rank
1.Unstable jute prices	2370	528	348	200	258	105	66	3875	64.58	2
2.Low jute price	2686	528	232	250	129	70	88	3983	66.38	1
3.No involvement of govt. or mills in jute purchasing	2528	330	406	150	172	175	88	3849	64.15	3
4.No grading system	1580	264	348	200	215	350	242	3199	53.32	7
5.Market management problem	1975	330	348	350	172	315	88	3578	59.63	5
6.Lack of transportation availability during sell	2291	462	406	300	86	140	110	3795	63.25	4
7.Lack of storage facilities	1185	396	464	450	387	280	110	3272	54.53	6

4.5.3. Marketing constraints

The respondents were asked to rank the seven factors identified for the purpose of this studies as 1, 2, 3, 4, 5,6,7 in order to know their preference in the selection of constraint. The calculated percentage position for the rank 1, 2, 3, 4, 5 6, 7 and their correspondent Garrett table as show in Table: For factors, the total score is calculated by multiplying the number of respondents ranking that factor as 1, 2, 3... and 7.

Table 4.19: Percent position and Garret value for marketing constraints.

s.no	$100(R_{ij}-0.5)/N_j$	Calculated value	Garrett value
1	$100(1-0.5)/7$	7.142857143	79
2	$100(2-0.5)/7$	21.42857143	66
3	$100(3-0.5)/7$	35.71428571	58
4	$100(4-0.5)/7$	50	50
5	$100(5-0.5)/7$	64.28571429	43
6	$100(6-0.5)/7$	78.57142857	35
7	$100(7-0.5)/7$	92.85714286	22

The sample respondents also face various constraints while marketing of the jute produce.

The result from table 4.20 indicate the various marketing challenges/constraints experienced by the jute farmers in the study area.

The study revealed that the major challenges experienced by farmers while marketing jute are low prices of jute (66.38%), unstable prices of jute (64.58%), no involvement of government or mill in jute purchasing (64.15%), lack of transportation availability during the time of sell (63.25%), market management problem (59.63%) and lack of storage facilities (54.53%).

Many of the respondents revealed that they often get low prices for their produce while selling in the market. This is due to the presence of many intermediaries who buy in less-price from the producer in the nearby markets. Also the farmers sell their produce directly after the harvest.

The sample respondents also revealed the problem regarding the absence of the government or mills in purchasing of their produce directly from them. Also the sample respondents revealed the problem of unavailability of transport and high cost of transport to take their produce to the market for the sell. They also revealed the problem of lack of storage facilities to store the jute fiber to sell in future.

Discussions

- **Socio economic characteristics of the res respondents.**
 - **Analysis of costs and return structure of jute cultivation under different size sample farms.**
 - **Analysis of marketing pattern and identify the value added products of jute.**
 - **Analysis of the growth performance and export competitiveness of jute.**
 - **To identify the production and marketing constraints of jute and suggest suitable measures to overcome them.**
- The result shows that the average family size of the sample respondents were 8 members which is directly associated with farm size. It was found that individual family type dominated in the study area over joint family type.
- More than half (57 percent) of the respondents belong to the general category followed by schedule caste category (43.33 percent) in the study area.
- On an average about 28.33 percent respondents had primary level education, 20 percent had middle school level of education and 25 percent had higher secondary level of education. It was found that none of the farmers were graduate . This is due to the cause that the area of study was remote and the transportation was not very much developed. The study area is also often affected by floods during the monsoon season as it is in the bank of Brahmaputra river. Hence it can be said that more than one-fourth of the respondents were illiterate.

➤ The main crops grown by the sample respondents during kharif season were Paddy which covered about 89.24 percent area of the total cropped area. In rabi season the main crops cultivated was potato, chilli and brinjal which covered about 35.06 percent, 14.96 percent, and 14.7 percent of the total cropped area respectively. In summer season the two main crops grown were jute and paddy which covered about 77.93% and 22.06% of the total cropped area respectively. The cropping intensity of the sample farmers was found to be 199.25 on an average. The cropping intensity varies along the farm size as some areas grow more crops as compared to others.

➤ The cost of cultivation per hectare incurred in jute production on sample farm was Rs.75930.14. The cost of cultivation was found to be highest for medium farm size at Rs.76659.24 followed by marginal farm size at Rs.75966.36 and then small farm size at Rs.75164.83. The operational cost and fixed cost was observed to be 71.43 percent and 28.57 percent to the total cost on an average. The total labour cost accounted for 53.99 percent of the total cost. The material cost was more in case of medium farmers about Rs.11710/ha followed by small farm size about Rs.11511/ha followed by marginal farm size at about Rs.10995 /ha. on an average the material cost was found to be 15.02 percent of the total cost incurred in jute cultivation. Thus it could be concluded that labor cost was one of the major part of the operational cost in the production of jute as lots of labor are required for different operation during the production of jute.

➤ The cost A1 and A2 of sample respondents were same due to absence of the practice of leasing of land. The average cost of cultivation(cost C3) was found to be Rs.83523.16 per ha. The percentage of cost A2 to cost C3 on an average was 59.84 percent. The medium farm size had the highest percentage of cost A2 to Cost C3 about 63.31

percent followed by small farm size about 61.04 percent followed by marginal farm size about 55.13 percent. It could be concluded that medium farm size group requires more investment for cultivation of jute as compared to small and marginal farm group in the study area.

➤ The production of jute per hectare was maximum in medium size group (35 Q) followed by small size group (33.8 Q) and marginal size group (33 Q). The value of the main produce and by-products sold by farmers on an average was Rs.119065.7/ha and Rs.11325.83 per ha. The gross income on an average was found to be Rs.130391.5 per ha. which was highest for medium farmer, followed by small and then marginal farmer. The gross income for medium, small and marginal farmer are Rs.134090, Rs.129659.2 and Rs.127425.3 respectively.

➤ The cost of production per quintal was found to be highest in case of marginal farmer followed by small and then medium. It was Rs.2194.71, Rs.2113.35 and Rs.2078.14 for marginal, small and medium size group respectively. On an average the cost of production was Rs.2127.62 per quintal. The net income was found to be more for medium farmer followed by small and then marginal. It was Rs.49764.83, Rs.46977.87 and Rs.43862.3 for medium, small and marginal respectively. The farm business income however was found to be more for marginal farmer followed by medium and then small farm size, it was Rs.81352.99, Rs.79183.91 and Rs.80695.92 for marginal, small and medium farm size respectively. The family labor income followed the same trend as the farm business income.

➤ There were two type of marketing channel identified in the study area.



Channel II: Producer \longrightarrow village market/small trader \longrightarrow Big trader
 /Regulated market Broker/commission agent consumer. \longrightarrow

- Most of the big traders in nagaon district sell their produce to commission agent or brokers who take the produce to the terminal market in Kolkata for further marketing. The final consumers' of jute are jute mills.
- Majority of the respondents preferred to sell their produce to the local village market or small trader or beparis (75%) followed by big traders at the regulated market or far away market. Also maximum quantity was sold to small traders (74.6%) followed by big traders (25.3%), although the rate receive per quintal was found to be higher from big traders (Rs.3600/q) compared to small traders (Rs.3400/q). The quantity sold to small traders or village merchant is higher because the primary market is closer to them and is convenient for transport and is easily disposable.
- Regarding marketing cost, the marketing charges paid by the producer in the channel 1 was found to be Rs.350/Q and big trader was found to be Rs.560/Q. The marketing charges paid by the jute producer in channel 2 was Rs. 205/Q, and small trader was Rs.95/Q and big trader was Rs.510/Q. The total marketing charges were higher being Rs.1100/Q in channel 2 than that of channel 1 Rs.910/Q in the study area. The main cost in marketing was the transport cost. It can be concluded that the marketing channel –I was more profitable as marketing cost is less as compared to channel-II.
- Regarding the market margin and price spread, The big traders margin at regulated market in channel-I and channel-II were worked out to be Rs.340 Qt⁻¹ and Rs.190 Qt⁻¹ respectively. The small traders or village traders margin in channel-II was worked out to be Rs.105 Qt⁻¹. The prices

paid by the commission agent or broker were Rs.4500 Qt⁻¹ and Rs.4700 Qt⁻¹ in Channel-I and Channel-II respectively. The producers share in consumers rupee was found to be more in channel-I (72.22 percent) as compared to channel-II (67.97 per cent). The price spread was found to be Rs.900 in channel-I and Rs.1300 in channel-II. It can be concluded that involvement of more middlemen between farmers and consumers lowers the share of farmers therefore a system of marketing channel which is directly from producer to consumer or less number of middlemen between the producer and consumer is the better marketing channel.

➤ The various value added product available in the market were floor covering, hand and shopping bags, wall hangings, gift articles, decorative fabrics.

➤ The Nominal Protection Coefficient (NPC) of jute exports from India for the period 2006 to 2016 was 0.99 indicating that it is non-competitiveness for raw jute export. The NPC is almost 1 during the entire period from 2006-2016. It is due to the reason that the quality of jute fiber produced by the Indian farmers is inferior as compared to the jute fiber produce by Bangaldesh. Also the domestic consumption of jute is very high as jute bags are used for packaging of food materials in India.

➤ Growth performance of production of jute goods was calculated and it was found that the jute goods production in India has shown a negative trend during the study period 2006-07 to 2016-17. A Compound Growth Rate (CGR) of (-) 0.2.71 percent can be observed over the period, 2006-07 to 2016-17. That clearly shows that jute goods production in India has declining trend over the years. Quantity of jute export has decreased every year at a compound rate by -1.95per cent for the period of 2006-07 to 2016-17, this is due to the reason that there also has been decline in the production of jute goods during the period. However in case of value

the jute goods export has grown every year at a compound rate by 7.88 percent.

➤ Among the production constraints the shortage of human labor during different agricultural operations such as sowing, intercultural, harvesting, retting and extraction of jute fibers faced by all size groups of respondents. The sample respondents also face the problem of unavailability of quality seeds as a result of which they are unable to produce higher quality fiber which has more market value and greater demand. They also face the problem of lack of knowledge of improved retting technology, as a result of which they are unable to produce better quality fiber and get more value for their produce. The sample respondents also face the problem of high price of input. The sample respondents also face the problem of lack of any irrigation facilities provided by the government and also do not receive any subsidies from the government.

➤ Among the marketing constraints, many of the respondents revealed that they often get low prices for their produce while selling in the market. This is due to the presence of many intermediaries who buy in less price from the producer in the nearby markets. Also the farmers sell their produce directly after the harvest. The sample respondents also revealed the problem regarding the absence of the government or mills in purchasing of their produce directly from them. Also the sample respondents revealed the problem of unavailability of transport and high cost of transport to take their produce to the market for the sell. They also revealed the problem of lack of storage facilities to store the jute fiber to sell in future.

Summary, Conclusion and Suggestion

6.1. Summary

Jute is a natural fiber popularly known as golden fiber and is one of the cheapest and strongest of all natural fibers. Jute is a major fiber cash crop grown in eastern India and this is the second most important fiber in India after cotton. Jute is largely grown in West Bengal, Bihar and Assam with an acreage share of 70.1 percent, 14.4 percent and 10.2 percent, respectively during the year 2017-18. India is the largest producer of Jute in the world. It is estimated that the jute industry provides direct employment to 0.37 million workers in organized mills and in diversified units including tertiary sector and allied activities and supports the livelihood of around 4.0 million farm families.

The demand for Jute-based factory products have also increased manifold during the last few years since they are eco-friendly, biodegradable and environmentally protective. Traditionally jute is used to make hessian cloths and sacks, but now jute has been diversified to make various products like all kind of bags from necessary to luxury, sacks, carry bags, door-mats, carpets, file-covers, sofa-backs and covers, decorates, shoes and sandals, curtains etc. Besides now jute has also been used to reduce soil-erosion and one of the ingredient of geotextile etc. Due to its diversified usability, the demand for jute made products have been increasing day by day in the world market as well as domestic market as there is an emerging trend to use eco-friendly product.

Assam is the third largest producer of jute in India. Assam covers an area of about 79000 hectare and 825000 bales of production and 1880 kg/ha yield in 2016-2017. Nagaon is one of the major jute producing district of Assam. Nagaon district covers 10510 hectare area in 2015-16. The production was 179536 bales and average yield of 3075 kg/ha.

Looking into these facts, the present study is under taken with the following objectives.

6.1.1. OBJECTIVES

1. To estimate the costs and return structure of jute cultivation under different size sample farms.
2. To examine marketing pattern and identify the value added products of jute.
3. To estimate the growth performance and export competitiveness of jute.
4. To identify the production and marketing constraints of jute and suggest suitable measures to overcome them.

Nagaon district of Assam is selected for the present study as this district is one of the major producer of jute in the state with 10510 hectare area under Jute crop. It has highest productivity in the state. Nagaon district consist of twenty blocks Bajiagaon, Barhampur, Batadrawa, Binnakandi, Dhal Pukhuri, Dulongghat, Jugijan, Juria, Kaliabor, Kalili, Kathiatoli, Khagarijan, Laokhowa, Lumding, Mairabari, Pachim kaliabor, Pakhimaria, Raha, Rupahi, Udali out of these Laokhowa block was selected purposively based on highest area and production. After the selection of the block, five villages having maximum area under jute were selected in consultation with the Agricultural officials for the study namely Bhurbanda, 4 no. Bogamukh, 5 no. Bogamukh, 6 no. Bogamukh, 7 no. Bogamukh.

From the selected villages, a list of jute growers was prepared and further categorized into three size groups on the basis of size of land holding i.e, (i) Marginal(up to 1ha) (ii)Small (1 to 2ha) and (iii) Medium size(up to 4ha). From each size group 20 farmers were selected randomly. Thus total 60 farmers were considered for detail investigation to fulfill the stated objectives.

The required data were collected by the survey method, for that personal interview of respondents with the help of pre-tested interview schedule was used. The primary data pertain to agricultural year 2017-18. For estimation of cost and returns, different cost concepts i.e, cost A1, cost A2, cost B1, cost B2, cost C1, cost C2 and cost C3 and measure profitability, net farm income, farm business income and family labor income were considered. The data were also collected regarding to marketing of jute i.e, marketing pattern, quantity sold through various agents, market margin and price spread in the study area. Also the identification of value added products of jute in the study area. The secondary data was also collected for a decade from 2006-07 to 2016-17 to estimate the growth performance and export competitiveness of jute. Opinion of the respondents was also sorted out to identify the production and marketing constraints in jute production.

6.2. Conclusion

The following conclusions were drawn from this study:

6.2.1. Socio-economic characteristics of Jute growers.

- The result shows that the average family size of the sample respondents was 8 member which is directly associated with farm size. The family size were observed to be same in case of medium and small farm size in the study area with 9 members each. The marginal farm size had a family size of 7 members.
- It was found that on an average majority of the sample respondents belong to individual family type about 63.33 percent and the other 36.67 percent belong to joint family type.
- Regarding caste, it was observed that overall maximum of the sample respondents belong to the general category(56.67 percent) followed by schedule caste category(43.33 percent) in the study area. It was found that the study area did not have farmers belonging to OBC and

ST category. In case of marginal farmers 75 percent belong to general category and 25 percent belong to SC category.

➤ As far as education level was concerned on an average more than one fourth 26.67 % of the sample respondents were illiterate, 28.33 % had primary level of education, 20 % had middle school level of education and 25 % had higher secondary level of education. It was found that none of the farmers were graduate of any kind. This is due to the cause that the area of study was remote and the transportation was not very much developed. The study area is also often affected by floods during the monsoon season as it is in the bank of Brahmaputra river.

➤ As far as cropping pattern of the sample respondents is concerned, the main crops grown by the sample respondents during kharif season were Paddy which covered about 89.24 percent area of the total cropped area. Potato, chilli and brinjal were the main rabi crop which covered about 35.06 percent, 14.96 percent, and 14.7 percent of the total cropped area respectively. In summer season the two main crops grown were jute and paddy which covered about 77.93% and 22.06% of the total cropped area respectively. The cropping intensity of the sample area was found to be 199.25 on an average. The cropping intensity varies along the different farm sample as some areas grow more crops as compared to others.

6.2.2. Cost and returns of Jute Cultivation.

➤ The cost of cultivation per hectare incurred in jute production on sample farm was Rs.75930.14. The cost of cultivation was found to be highest for medium farm size at Rs.76659.24 followed by marginal farm size at Rs.75966.36 and then small farm size at Rs.75164.83. The operational cost was observed to be 71.43 percent and remaining as fixed cost to the total cost on an average. The total labour cost accounted for 53.99 percent of the total cost. The material cost was more in case of medium farmers about Rs.11710/ha followed by small farm size about Rs.11511/ha followed by marginal farm size at about Rs.10995 /ha. on an average the material cost was found to be 15.02 percent of the total cost

incurred in jute cultivation. Thus it could be concluded that labor cost was one of the major part of the operational cost in the production of jute as lots of labor are required for different operation during the production of jute.

➤ The cost A1 and A2 of sample respondents were same due to absence of the practice of leasing of land. It was revealed from the table that the total cost of cultivation per hectare was highest in medium size followed by marginal and small size of land holding. It was Rs.84325.17, Rs.83562.99 and Rs.82681.31 for medium, marginal and small respectively. The average cost of cultivation (cost C3) was found to be Rs.83523.16 per ha. . The percentage of cost A2 to cost C3 on an average was 59.84 percent. The medium farm size had the highest percentage of cost A2 to Cost C3 about 63.31 percent followed by small farm size about 61.04 percent followed by marginal farm size about 55.13 percent. It could be concluded that medium farm size group requires more investment for cultivation of jute as compared to small and marginal farm group in the study area.

➤ The production of jute per hectare was maximum in medium size group followed by small size group and marginal size group. It was 35 Q, 33.8 Q and 33 Q for medium small and marginal size group respectively. The value of the produce sold by farmers on an average was Rs.119065.7per ha and the value of by-products sold by farmers was Rs.11325.83 per ha. The gross income on an average was found to be Rs.130391.5 per ha. . The gross income was highest for medium farmer, followed by small and then marginal farmer. The gross income for medium, small and marginal farmer are Rs.134090, Rs.129659.2 and Rs.127425.3 respectively.

➤ The cost of production per quintal was found to be highest in case of marginal farmer followed by small and then medium. It was Rs.2532.21, Rs.2446.193 and Rs.2409.29 for marginal, small and medium size group respectively. On an average the cost of production was Rs.2462.565 per

quintal. The net income was found to be more for medium farmer followed by small and then marginal. It was Rs.49764.83, Rs.46977.87 and Rs.43862.3 for medium, small and marginal respectively. The farm business income however was found to be more for marginal farmer followed by medium and then small farm size, it was Rs.81352.99, Rs.79183.91 and Rs.80695.92 for marginal, small and medium farm size respectively. The family labor income followed the same trend as the farm business income.

6.2.3. Marketing pattern, marketing cost and price spread and margin of various intermediaries present on Jute marketing in study area.

➤ It was revealed that most the big traders in nagaon district sell their produce to commission agent or brokers who take the produce to the terminal market in Kolkata for further marketing. The final consumers' of jute are jute mills.

➤ It was observed that the majority of the respondents preferred to sell their produce to the local village market or small trader or beparis(75%) followed by big traders at the regulated market or far away market. Also maximum quantity was sold to small traders (74.6%) followed by big traders(25.3%), although the rate receive per quintal was found to be higher from big traders(Rs.3600/q) compared to small traders(Rs.3400/q). The quantity sold to small traders or village merchant is higher because the primary market is closer to them and is convenient for transport and is easily disposable.

➤ Regarding marketing cost, the marketing charges paid by the producer in the channel 1 which was worked out and found to be Rs.350/Q and bid trader was found to be Rs.560/Q. The marketing charges paid by the jute producer in channel 2 was Rs.205/Q, and small trader was Rs.395/Q and big trader was Rs.510/Q. The total marketing charges were higher being Rs.1100/Q in channel 2 than that of channel 1 Rs.910/Q in the study area. The main cost in marketing was the transport

cost. It can be concluded that the marketing channel –I was more profitable as marketing cost is less as compared to channel-II.

➤ Regarding the market margin and price spread, The big traders margin at regulated market in channel-I and channel-II were worked out to be Rs.340 Qt⁻¹ and Rs.190 Qt⁻¹ respectively. The small traders or village traders margin in channel-II was worked out to be Rs.105 Qt⁻¹. The prices paid by the commission agent or broker were Rs.4500 Qt⁻¹ and Rs.4700 Qt⁻¹ in Channel-I and Channel-II respectively. The producers share in consumers rupee was found to be more in channel-I (72.22 percent) as compared to channel-II (67.97 per cent). The price spread was found to be Rs.900 in channel-I and Rs.1300 in channel-II. It can be concluded that involvement of more middlemen between farmers and consumers lowers the share of farmers therefore a system of marketing channel which is directly from producer to consumer or less number of middlemen between the producer and consumer is the better marketing channel.

➤ The various value added product available in the market were floor covering, hand and shopping bags, wall hangings, gift articles, decorative fabrics.

6.2.4. Export competitiveness and growth performance of Jute.

➤ The competitiveness of exports of jute was analyzed by using the Nominal Protection Coefficient (NPC). This measures the deviation of domestic price from bordered price or reference price. If NPC is less than 0.5 considered highly competitive, and if it is between 0.5 to 1.0 indicates moderately competitive and if it is more than 1.0 indicates not competitive. The Nominal Protection Coefficient (NPC) of jute exports from India for the period 2006 to 2016 was calculated using secondary data. It was clear from the result that the average NPC of jute during the period 2006-2016 was 0.99 indicating that it is non-competitiveness for raw jute export. The NPC is almost 1 during the entire period from 2006-2016. It is due to the reason that the quality of jute fiber produced by the Indian farmers is inferior as compared to the jute fiber produce by Bangladesh. Also the

domestic consumption of jute is very high as jute bags are used for packaging of food materials in India.

➤ Growth performance of production of jute goods was calculated and it was found that the jute goods production in India has shown a negative trend during the study period 2006-07 to 2016-17. A Compound Growth Rate (CGR) of (-) 0.2.71 percent can be observed over the period, 2006-07 to 2016-17. That clearly shows that jute goods production in India has declining trend over the years. Compound growth rate is used to determine the export trends of jute industry in India for 11 years from 2006-07 to 2016-17. CGR denotes that the quantity of jute export has decreased every year at a compound rate by -1.95per cent for the period of 2006-07 to 2016-17, this is due to the reason that there also has been decline in the production of jute goods during the period. However in case of value the jute goods export has grown every year at a compound rate by 7.88 percent.

6.2.5. Production and marketing constraints of faced by Jute growers.

➤ Among the production constraints the shortage of human labor during different agricultural operations such as sowing, intercultural, harvesting, retting and extraction of jute fibers faced by all size groups of respondents. The sample respondents also face the problem of unavailability of quality seeds as a result of which they are unable to produce higher quality fiber which has more market value and greater demand. They also face the problem of lack of knowledge of improved retting technology, as a result of which they are unable to produce better quality fiber and get more value for their produce. The sample respondents also face the problem of high price of input. The sample respondents also face the problem of lack of any irrigation facilities provided by the government and also do not receive any subsidies from the government.

➤ Among the marketing constraints, many of the respondents revealed that they often get low prices for their produce while selling in the market. This is due to the presence of many intermediaries who buy in less-price from the producer in the nearby markets. Also the farmers sell their produce directly after the harvest. The sample respondents also revealed the problem regarding the absence of the government or mills in purchasing of their produce directly from them. Also the sample respondents revealed the problem of unavailability of transport and high cost of transport to take their produce to the market for the sell. They also revealed the problem of lack of storage facilities to store the jute fiber to sell in future.

6.3. Recommendation:

Based on the findings of the study, following suggestions/recommendation are given below:

- Jute is a major cash crop grown in the area so emphasis should be given to the jute growers regarding better production of the crop.
- Training should be given to the jute growers about new technology of production and improve retting method so that they can produce high quality fiber that can be competitive in the international market.
- Also the government and agricultural department should provide better quality seeds to the jute growers so that they can produce high quality fiber.
- Better marketing system should be made available to the farmers so that farmers, they can sell their produce directly to the consumers (jute mill) and make profit. Instead of the presence of many middlemen in the process.

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Appendices

QUESTIONNAIRE

1.General information of the respondent

Name of the respondent	
Mobile number	
Adhar card number	
Age	
Education	
Occupation	
1)Main	
2)Secondary	
Years of experience in farming	
Major source of capital for farming	
Name of the village	
Name of the block	
Name of the district	

2.Details of family

S.NO	Name of the family member	M/F	Age	Relationship with the head of the family	Level of education	Occupation
1						
2						
3						
4						
5						

3. Information about land holding(ha)

Type	of	owned	Leased	Leased	Permanent	Current	Cultivated	Total
------	----	-------	--------	--------	-----------	---------	------------	-------

land		in	out	fellow	fellow	area	
Irrigated							
unirrigated							

Land revenue(Rs)

4.Information about livestock

S.NO	Type	Number	Age	Rent (Rs)	price	Medicinal charges(Rs)
1	Working animal					
	Bullock					
	Buffalo bull					
2	Milking animal					
	Cattle					
	Buffalo					
3	Other animal					
	Goat					
	Calf					
	Other					

4.Cropping pattern

s. no	Crop	Variety	Area	irrigated	unirrigated
1.					
2.					
3.					

Rabi

s.no	crop	Variety	area	irrigated	unirrigated
1.					

2.					
3.					

Summer

s.no	Crop	Variety	area	irrigted	unirrigated
1.					
2.					
3.					

5.Farm Assets

s.no	particulars	Year of purchase/construction	quantity	Value
1	Land			
2	Farm house/store house			
3	Livestock			
4	Tubewell			
5	Pump elect/diesel and accessories			
Bullock operated implements				
1	Bullock pair			
2	Bullock cart			
3	Cultivator			
Tractor operated implements				
1	Tractor			
2	Cultivator			
3	Seed drill			
4	Trolley			
5	Harrow			
Hand operated implements				
1	Spade			
2	Khurpi			

3	Rope			
---	------	--	--	--

Others				
1				
2				

6.information about Cost of cultivation:

1. Information of operational cost

a) Labour cost

variety Area(ha)

S. No.	Operation	Human labour (days)				Bullock labour (days)			Machine labour(days)		
		Family		Hired		Owned	Hired	Value (Rs)	Owned	Hired	Value (Rs)
		M	Wage (Rs)	F	Wage (Rs)						
1.	Land preparation										
3.	Sowing										
4.	Fertilizer application										
5.	Irrigation										
6.	Inter culture										
7.	Weeding										
8.	Plant protection measures										
9.	Harvesting and post harvest										

	operation										
	a)harvesting										
	b) retting										
	c)extraction of fibre										
	d)drying										
10.	Grading										
11.	Other										

Note : M = Male, F= Female

b) Input cost

S.NO	Input	Quantity	Value (Rs)	Total value (Rs)
1	Seed material			
2	F.Y.M			
3	Fertilizer			
4	Plant protection chemicals			
5	Irrigation charges			
6	Other			
	Total			

Fixed cost

Rental value of land /leased in land (Rs/ac)

Land revenue (Rs/ac).....

8. Production of jute:

Yield qtl
 Price/ctl..... Rs
 Total value..... Rs
 By product value Rs

9. Constraints faced by Jute grower.

s. no	Constraints	Ranking
	Crop management	
1	Unavailability of quality seed	
2	Unavailability of quality fertilizer	
3	Weed problems	
4	Germination problem	
5	Lack of technical know how	
	Socio economics constraints	
6	Labor problems	
7	High price if inputs	
8	Small holding of land	
9	Low return	
	Marketing	
10	Unstable jute prices	
11	Low price of jute	
12	No involvement of govt. or mills in jute purchasing	
13	No grading system (grade wise price)	
14	Market management problem	
	Retting problem	
15	Lack of retting pond	
16	Lack of retting water	
17	Lack of knowledge in improved retting	

18	Problem of jute pressing materials	
19	Transportation problem in retting	
Others		
20	Lack of irrigation facilities	
21	Wilt problem(stem rot)	
22	Lack of soil testing facilities	
23	Lack of pest management technology	

10. Marketing related

.1 From where do you purchase Agricultural Inputs?

- A. Seeds.....
- B. Fertilizers.....
- C. Pesticides

2 Are you aware about the subsidies provided by Government on Agricultural Inputs?

Yes No

3 If yes, have you taken benefit of subsidies?

Yes No

4. Which type of Crops do you sow?

Commercial Crops

Medical Crops.....

5. To whom do you sell these crops?

.....

6 What is the reason for not focusing on these high market price crops?

.....

7. Do you use chemical fertilizers to improve productivity?

Yes No

8. Are you aware about Organic Farming?

Yes No

9. If yes, than what is your opinion about the Organic Farming as marketing promotion tool?

.....

10. To whom do you sell your produce?

- Village Merchant Big Cultivators Mandi
 Broker/Arhatiya Corporate Government Agency

11. Why do you sell your produce to Village Merchant?

.....

12. Do you get proper price of your produce?

- Yes No

13. Have you ever sold your produce to Government Agencies?

- Yes No

14. Are you satisfied with Food Procurement Process of Government?

- Yes No

15. If no, than what type of problems do you face?

.....

16. Do you think that existing Agro Marketing Strategies are effective and Useful for farmers?

- Yes No

17. If not, then what is your suggestion to make them effective?

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Curriculum Vitae

Name of the author Hilari Bordoloi

Place Barapujia

Date of birth 30-09-1994



Institutions attended

1. Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur, Madhya Pradesh
2. Assam Agricultural University, Assam
3. South Point School, Guwahati

Educational Qualification

Name of the Degree	Subjects Major	Name of the Institution	Year of passing	Percentage of marks/OGPA obtained
M.Sc. (Agriculture)	Agricultural Economics and F.M.	JNKVV, Jabalpur, M.P	2019	8.02
B.Sc. (Agriculture)	Agriculture	AAU, Assam	2017	7.82
12 th	Biology, Physics, Chemistry	South Point School, Assam	2012	7.5
10 th	Mathmatics Science Social Science	Oil Valley School, Assam	2010	9.6

For the partial fulfilment of the Masters degree programme, she was allotted a research problem on “**Economic Analysis of Production and Marketing of JUTE in Nagaon district of Assam**” which was successfully conducted by her and being submitted in the form of thesis.