

**A STUDY ON MANUFACTURING AND
MARKETING OF COIR PRODUCTS IN PURI
DISTRICT OF ODISHA**

BY

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B.Sc. (Ag.)

**THESIS SUBMITTED TO
PROFESSOR JAYASHANKAR TELANGANA STATE
AGRICULTURAL UNIVERSITY
IN PARTIAL FULFILMENT OF THE REQUIREMENTS
FOR THE AWARD OF THE DEGREE OF**

**MASTER OF BUSINESS ADMINISTRATION
(AGRIBUSINESS MANAGEMENT)**

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2016

CERTIFICATE

Mr. PRITAM KUMAR PADHI has satisfactorily prosecuted the course of research and that thesis entitled “**A STUDY ON MANUFACTURING AND MARKETING OF COIR PRODUCTS IN PURI DISTRICT OF ODISHA**” submitted is the result of original research work and is of sufficiently high standard to warrant its presentation to the examination. I also certify that neither the project nor its part thereof has been previously submitted by him for a degree of any university.

Date:

(Dr. P. RADHIKA)

Chairperson

CERTIFICATE

This is to certify that the thesis entitled “**A STUDY ON MANUFACTURING AND MARKETING OF COIR PRODUCTS IN PURI DISTRICT OF ODISHA**” submitted in partial fulfilment of the requirements for the degree of ‘Masters of Agribusiness Management’ of the Professor Jayashankar Telangana State Agricultural University, Hyderabad, is a record of the bonafide original research work carried out by **Mr. PRITAM KUMAR PADHI** under our guidance and supervision.

No part of the thesis has been submitted by the student for any other degree or diploma. The published part and all the assistance and help received during the course of the investigations have been duly acknowledged by the author of the thesis.

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ACKNOWLEDGEMENT

It is by the lavish and boundless blessing of the Almighty that I have been able to complete my studies successfully hitherto and present this humble piece of work for which I am eternally indebted.

*Fervently and modestly, I extol the genuine cooperation, inspiration, advice and affection offered to me by the Chairman of my Advisory Committee **Dr. P. radhika**, Associate Professor, School of Agribusiness Management, College of Agriculture, Rajendranagar, PJTSAU, Hyderabad right from the initiation of the work to shaping of the manuscript.*

*I am greatly beholden beyond words to express my deep sense of gratitude and a great privilege to work under the able and highly exceptional guidance of **Dr. Seema**, Professor & Head, School of Agribusiness Management, College of Agriculture, Rajendranagar, PJTSAU, Hyderabad for her brilliant counsel, constructive suggestions.*

*I equally owe my deep sense of gratitude to **Sri. M.H.V. Bhave**, Associate Professor & Head, Department of Statistics and Mathematics and member of my Advisory Committee for his invaluable guidance, suggestions and support during my course of study.*

*I express my heartfelt love and affection from the inner core of heart to my beloved parents **Sri Bijay kumar padhi** and **Smt. Kalpana padhi**, for their blessings, inspiration, encouragement and moral support to achieve the pinnacle of success in my life. It remains less even if I say a lot about them.*

*I owe much to my loving **brother Satyam padhi** for his everlasting unparalleled affection, co-operation, constant encouragement and moral support. He has been my source of confidence and motivation all through my life.*

*It is time to surface out genuflect love and affectionate gratitude to my dearest friends **Jogamaya, Philos, Gulab, Sharad and Ajay** for their unhesitating help and constructive criticisms throughout my educational career.*

*I would like to extend thanks to all my **teachers, batch mates** and **juniors** for sharing their ideas, joy and sorrows throughout the period of my study over here. Words are not enough to express my heartfelt thanks to my seniors Mahendra Sir for their moral support timely, which instilled in me confidence to proceed forward.*

I am very much delighted to express my indebtedness to non-teaching staff of SABM Anusha, Anand, Victoria, Upendar and others for their constant co-operation at various stages of the study and immense help as when needed in completion of project report. I wish to extend my thanks to one and all those have contribution even in a small way in the completion of my project work.

Finally I am very much thankful to Professor Jayashankar Telangana State Agricultural University and Indian Council of Agricultural Research for the financial support received to pursue MBA (Agribusiness).

I convey my wholehearted thanks to many of my well-wishers and to other friends requesting their forgiveness for not mentioning them here by names.

Date:

(PRITAM KUMAR PADHI)

Place: Hyderabad

DECLARATION

I, **PRITAM KUMAR PADHI**, hereby declare that the thesis entitled “**A STUDY ON MANUFACTURING AND MARKETING OF COIR PRODUCTS IN PURI DISTRICTS OF ODISHA**” submitted to the **Professor Jayashankar Telangana State Agricultural University** for the degree of **Master of Agribusiness Management** is the result of the original research work done by me. I also declare that no material contained in the thesis has been published earlier in any manner.

Place: Hyderabad

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Date:

I. D. No. RMBA/2014-14

LIST OF SYMBOLS AND ABBREVIATIONS

<i>et al.</i>	:	And others people
Rs.	:	Rupee
Fig	:	Figure
i.e.	:	That is
No.	:	Number
Si. no.	:	Serial number
RBQ	:	Rank Based Quotient
Qt	:	Quintals
Kg	:	Kilogram
mt	:	Metric tonnes
CAGR	:	Compound Annual Growth Rate
Km.	:	Kilo meters
&	:	And

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DEGREE : **MBA (ABM)**

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UNIVERSITY : **PROFESSOR JAYASHANKAR TELANGANA STATE AGRICULTURAL UNIVERSITY**

YEAR OF SUBMISSION : **2016**

ABSTRACT

Coir is a natural fibre extracted from the husk of coconut and used in products such as floor mats, doormats, brushes, mattresses, etc. Coir is the fibrous material found between the hard, internal shell and the outer coat of a coconut. India is the largest producer and consumer of coir and coir products followed by Sri Lanka in the world. India alone accounts for about 70 per cent of the world production of coir and coir products. Coir industry is one of the important cottage industries in India. The coir industry is contributing significantly for creation of livelihood in major coconut growing states and union territories i.e. Kerala, Tamil Nadu, Odisha, Andhra Pradesh, Karnataka, Maharashtra, Goa, Assam, Andaman & Nicobar and Lakshwadeep.

The study on manufacturing and marketing of coir products was conducted in Puri district of Odisha with the following specific objectives:

- To trace the origin, growth and development of coir industry at the national and state level.
- To estimate the production cost and returns of various coir products manufactured.
- To identify the existing marketing channels and marketing efficiency for different coir products.

- To enumerate the major problems in production, marketing and provide suitable suggestions for improving the overall performance of coir industry.

About 15 coir manufacturers and 10 market intermediaries were selected from Satyabadi block of Puri district. Techniques like Compound Growth Rate (CGR) and Rank Based Quotient (RBQ) were used to analyze the coir units growth rate and problems in manufacturing and marketing of coir products respectively. The compound growth rates (CGR) for number of coir units in India and Odisha during the period of 2009-10 to 2013-14 was 1.8 and 4.3 respectively. Net returns of coir units producing coir ropes, mats and rugs are higher than the coir units producing fibre and yarn. The net return of manufacturing coir ropes, mats and rugs is lower in co-operative than in private sector. Two channels of marketing were identified to sell coir products by the manufacturer in the study area; which are

Channel I: Manufacturer – wholesaler – retailer – customer

Channel II: Manufacturer – local vendor – customer

The manufacturer's share in customer rupee in channel II is highest since it is the shorter channel (84.07 per cent) than channel I. Whereas the manufacturer's share in customer rupee in channel I is 71.70 per cent. Price spread in channel II is the lowest (Rs. 2288.55) because it is the shorter channel than channel I. The marketing efficiency for channel I and channel II were 2.53 and 5.27 respectively. It is observed from this efficiency index that channel II was the more efficient one than channel I. The R.B.Q values with regard to the constraints in manufacturing placed unavailability of raw material as the most important with top rank followed by non-availability of labour, fluctuation of price of raw material, lack of credit facility, high labour charges, non-supportive Government policies, infrastructure problems, high transportation cost and poor quality of raw material. The study suggested for capacity maximization, increasing coconut plantation for raw material sourcing and training the workers. For marketing of coir products high competition was placed as rank one constraint among other constraints. High price fluctuation, long distance to market, demand fluctuation, non-co-ordination between channel members, strict deadlines of delivery, non-availability of credit, rejection based on quality and recovery of credit are the other constraints of marketing. The study suggested for pre-agreement between manufacturer and wholesaler or vendor, co-ordination between different channel members, entering into untapped market as possible solutions to improve the marketing situation.

Chapter I

INTRODUCTION

The economic development of any country demands industrialization. Though it has got recognition in our country, it is high time we thought about balanced regional development, an important component of industrialization. Rural development forms a key component in a nation's progress towards economic freedom and equality. But the migration of rural people to cities and the ineffective utilization of rural resources stand as hurdles to rural development. Hence it is very important to develop and to encourage rural industry by considering its significance on the socio-economic front of the country.

Rural or traditional industry, one of the sub-sectors of small-scale industry, has a direct and important influence on sustainable economic development. Encouraging setting up of rural industries in the small area is an instrument for not merely attaining political freedom, but an instrument for economic freedom and a foundation of a new social order. It is a matter of common knowledge that India is a land of villages and around 70 per cent of its population live in rural areas. The future of India lies in these teeming rural millions. It is only from a progressive, growing and dynamic rural society that India could put itself on the desired developmental path. Rural small-scale industries play an important role under the peculiar Indian conditions. They contribute about half the gross value of output originating in the manufacturing sector. At present it contributes 40 per cent to exports in the country and provides employment to 14 million.

The Government of India, in pursuance of its announcement in the Union Budget for 2009-10, came out with a scheme to promote rural industrialisation in the country, called "Scheme of Fund for Regeneration of Traditional Industries" (SFURTI) with an initial allocation of Rs.115.25 crore. The scheme's chief objectives were to make traditional industries more competitive and to strengthen the local governance systems of industry clusters with the active participation of the local stakeholders. The Union Ministry of Agro and Rural Industries implement this scheme. The target sectors and the potential beneficiaries of the scheme include artisans, workers, machinery makers, raw material providers, entrepreneurs, institutional and private business development service providers engaged in traditional industries and working in selected clusters of Khadi, Coir and village industries including leather and pottery.

1.1 Coir Industry

India with an annual production of 12685 million nuts occupies the third place in the world production of coconuts after Indonesia and Philippines. The share of India in the world coconut production is about 16.28 per cent of the total production and 17.07 per cent in the area harvested. The four Asian countries India, Sri Lanka, Indonesia and Philippines, together have recorded 76.26 per cent of the area harvested and 79.3 per cent of the world production of coconut (FAO statistics, 2013). Therefore, these four countries have the potential to produce the raw material required for the coir industry and even they could develop monopoly of the coir industry in the world.

Coir industry has to its credit a tradition and heritage of centuries. It is one of the few rural or traditional industries converting the coconut husk, a waste, into wealth. The development of this agro-based industry helped in economic prosperity as it has backward and forward linkages. One of the special characteristics of the coir industry is that it provides full time employment to unskilled workers and part time employment opportunities to agricultural labourers. Coir industrialisation can be considered a vehicle for the generation of productive employment and income for the rural poor.

Indian coir industry is an important cottage industry contributing significantly to the economy of the major coconut growing states and Union Territories. About 14 lakh persons get employment, mostly part time, in this industry. The exports from this industry are around Rs. 1630.33 crores. Coconut husk is the basic raw material for coir products. Around 50 per cent of the available coir husk is used to produce coir products. Hence, there is scope for growth of coir industry. Special training programmes have been formulated for women artisans. Improved modern treadle machines would be provided to trained women artisans to increase employment and earnings. Emphasis has been given on developing devices/equipment/machinery through R&D to reduce drudgery and to improve productivity of coir workers. The development programmes so far undertaken aimed at revitalisation of coir cooperatives, improvement in quality and products diversification. Efforts were also made for exploring wider export markets for coir and coir products.

Table: 1.1World area and production of coconuts-2013

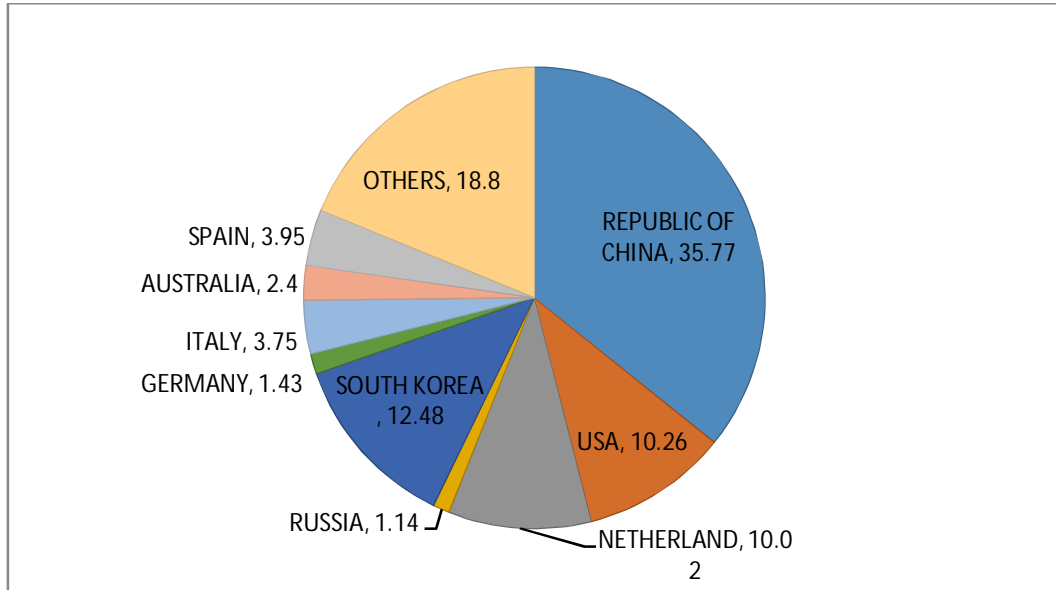
SI. No	Name of country	Area harvested (In '000 ha)	Percentage of Area	Production of Nuts (In Million)	Percentage of Production
1	Bangladesh	43	0.38	113	0.15
2	Brazil	287	2.53	2467	3.17
3	China	28	0.25	388	0.50
4	Columbia	16	0.14	102	0.13
5	Cote d Ivoire	32	0.28	267	0.34
6	Fiji	60	0.53	188	0.24
7	Ghana	56	0.49	396	0.51
8	India	1940	17.07	12685	16.28
9	Indonesia	2950	25.96	26957	34.60
10	Malaysia	174	1.53	575	0.74
11	Mozambique	70	0.62	338	0.43
12	Mexico	179	1.58	1256	1.61
13	Papua New Guinea	203	1.79	1163	1.49
14	Philippines	3380	29.75	19585	25.14
15	Sri Lanka	395	3.48	2624	3.37
16	Thailand	246	2.17	1726	2.22
17	Vietnam	138	1.21	1411	1.81
18	Other countries	1165	10.25	5673	7.28
	Total	11362	100.00	77914	100.00

(Source: Food and Agriculture Organization, 2015-16)

India is the largest producer and consumer of coir and coir products followed by Sri Lanka in the world. India alone accounts for about 70 per cent of the world production of coir and coir products. The coir industry is contributing significantly for creation of livelihood in major coconut growing states and union territories i.e. Kerala, Tamil Nadu, Odisha, Andhra Pradesh, Karnataka, Maharashtra, Goa, Assam, Andaman and Nicobar, Lakshwadeep and Pondicherry. The Coir Board, a statutory body was established by the Government of India under the aegis of Ministry of Micro, Small and Medium Enterprises, Government of India. It helps in development and strengthening of

domestic market for coir and coir products and also development of export market. (MSME, 2013)

Fig: 1.1 Country wise coir exports in per cent, 2014-15



A total quantity of 5,37,040.38 MT of coir and coir products valued at Rs.1476.04 crores was exported from the country during the period April 2013 to March 2014 as against an export of 4,29,500.92 MT valued at Rupees 1116.02 crores achieved during the corresponding period of previous year. There is an overall increase of 25% in quantity and 32% in value over the export achieved during the corresponding period of the previous year.

Table: 1.2 Selected State/sector-wise number of coir units registered with coir board in India (As on 31.03.2015)

States/UTs	Public Sector Units	Private Sector Units	Total No. of Coir Units Registered
Kerala	12	8802	8814
Tamil Nadu	9	3932	3941
Andhra Pradesh	8	761	769
Odisha	7	805	812
Karnataka	4	688	692
West Bengal	-	42	42
Puducherry	-	31	31
Maharashtra	-	23	23
New Delhi	-	17	17
Uttar Pradesh	-	18	18
N E Region	-	42	42
Lakshadweep	-	16	16
Goa	-	4	4
Gujarat	-	3	3
Andaman and Nicobar Islands	-	1	1
Rajasthan	-	4	4
Haryana	-	2	2
Punjab	-	5	5
Madhya Pradesh	-	3	3
Jammu and Kashmir	-	2	2
India	40	15195	15235

(Source: Indian statistics data)

Table: 1.3 Coir fibre and yarn production in India

States	Fibre production (In mt)			Yarn production (In mt)		
	2011-12	2012-13	2013-14	2011-12	2012-13	2013-14
Kerala	140000	141235	142025	84000	84738	85317
Tamil Nadu	215700	217600	218815	129420	130556	131447
Karnataka	53400	53870	54170	32040	32321	32541
Andhra Pradesh	61400	61940	62285	36840	37163	37416
Odisha	2800	2825	2840	1680	1695	1706
Others	58200	58715	59050	34920	35228	35473
India	531500	536185	539185	318900	321701	323900

(Source: Indian statistics data)

1.2 Origin of word “coir”

The name of coir is said to come from the Malayalam word “Kayar” (from the verb “Kayaru”- meaning “to twist”) through the Portuguese word “coire”. The first time the word appeared in English language was in New English Dictionary, as “COIRE” in 1697 and later as “COIR” in 1779. “Kayar” or “Kayer” is also the word for “rope” in ancient Tamil or ancient “Adidravidian” language.

Coir is the fibre or thread obtained from the husk of the fruit of the coconut (cocosnucifera). Thus “coir” means “the fibre” obtained from the husk of the fruit of the coconut palm tree. In other words, it is one of the innumerable products of the coconut palm, and is a by-product of the coconut industry.

1.3The history of coir

Coir epitomizes the concept of “wealth from waste”. Coir has been known and is in use in India for more than 1000 years. The development of coir industry began taking root in India alongside the coconut groves. So the history of coir industry can be dated back to that of the fruits of the coconut palm. It is rightly remarked that one cannot narrate the story of coir except by starting with the coconut tree—where it really begins.

According to early Greek Chronicle, it was Megasthenes, the Ambassador of Seleucus Nicator, who told the Indian King Chandra Gupta about the coconut palm he found in Ceylon [Sri Lanka] in 300 B.C. The first mentions of the coconut palm are believed to have been generated during the circumnavigation of the globe by Ferdinand Magellan between 1519 and 1522 and by Francis Drake between 1577 and 1580. Martius (1850) claimed South America as the origin of the coconut. Ceylon, the Philippines and the Caribbean may have been the early stars in the history of the coconut economy but in later years India made its mark. Coconut has a recorded history of 2000 to 3000 years in the coastal areas of Sri Lanka and South India.

The coir manufacturing industry producing coir mats, matting's and other floor coverings was started in India on factory basis, over a hundred years ago when the first factory was set up in Alleppey in 1859 by Mr. James *Darragh*, an Ireland born American national.

1.4 Coir - nature's wonder fibre

Nature has provided the coconut with a large outer covering made of fibrous material to absorb shock of the fall and to save the nut from the heat of sunlight. This covering is known as coconut husk. Coir is obtained from the fibrous husk, which lies between the outer coverage of the coconut and the inner shell. The nut, which has a thin smooth outer skin, is called the "exocarp". The space between the nut and the exocarp is filled with a spongy fibrous material called the "mesocarp". It is this mesocarp part of the coconut husk which is the central importance in the coir industry. Coir fibre is 100 per cent natural, biodegradable and environmental friendly. It is tough and durable, versatile and resilient, resistant to flame and fungi. It provides insulation and helps sound modulation. Coir falls under the category of industrial hard fibres. Sisal, abaca, henequen and hemp are other hard fibres competing with coir on its uses. It has been estimated that with about 4 months of immersion in water, coir loses only 35 to 40 per cent of its strength while abaca loses 50 to 54 per cent and sisal even 52 to 59 per cent. One important aspect of a coir fibre is its elongation before break, which has about 29 per cent elongation. The chemical composition of coir fibre is also worth mentioning and is presented in table 1.1.

Table: 1.4The chemical composition of coir fibre

Si. no.	Items	Percentages
1.	Water soluble	5.25
2.	Pectin and related compounds	3.30
3.	Hemi- cellulose	0.25
4.	Lignin	45.84
5.	Cellulose	43.44
6.	Ash	2.22
Total		100.00

Source: Secondary data

1.5Varieties of Coir Fibre

Depending upon the method of extraction, coir fibre is of two varieties namely “white fibre” and “brown fibre”.

White fibre:

It is obtained by retting the green husks in saline water for 6 to 9 months. As they are comparatively lighter and flexible, they are spun into coir yarn used for producing value-added products like doormats, mattings, carpets, rugs and geo-textiles. This fibre is of superior quality and is unofficially branded as “Golden Fibre”.

Brown fibre:

It is obtained from unretted dry or semi-dry husk. It is the result of a fully machine-aided process. The fibre so extracted after soaking the husk barely for five days is called “Brown Fibre”. This fibre is tougher and resilient. It is used for stuffing upholstery; manufacture of curled coir used in rubberized coir industry, needled felt, nonwoven geo-textiles and coir ply.

Major coir products

The coir yarn, when woven takes various forms, namely mattings, mats, rugs, maurzouks and carpets etc according to the types of the material used the pattern of weaving, texture and thickness. These products are used for both decorative and functional purposes. The major coir products produced are discussed below:

Coir mats

Coir mat is an exemplary comfort material which is most popular and widely used as rod mats, fibre mats, creel mats, loop mats, matting mats, sinnet mats, corridor mats, rope mats, rubber tufted mats and P.V.C. tufted mats.

Coir matting

Coir matting is made on handlooms of sturdy construction and it is primarily used as a floor furnishing material.

Coir rugs

Coir mattings cut to specified length and suitably finished are marketed as “coir rugs”. Rugs of various sizes with attractive designs are specially produced for overseas markets.

Coir carpets

Coir carpets are commonly known as “Alleppey carpets”. These are manufactured by the same techniques as those of mourzouks but for the difference in the thickness and number of the warp strands.

Coir geo-textiles (coir bhoovastra)

Coir Bhoovastra, is a natural coir fibre, holds soil in place and prevents soil erosion. It is a biodegradable and eco-friendly product.

Coir ropes

Coir ropes manufacture from coconut fibre is highly regarded for its strength and durability. In this age of nylon ropes the fact coir rope is still holding fort is due to its ruggedness and versatile nature.

1.6Uses of coir fibre and coir products

The fibre extracted from the husks of coconuts, coir, has been in use by man from time immemorial. It has been put to a variety of uses integral to daily living: building of houses, boat making, rope making, carpet making and so on. It's diversified new uses include protecting the tropical forests, increase rural employment opportunities and also promote agriculture.

Another important use of coir fibre is for making rubberised coir which is used in bed mattresses, automobile seats, cushions, carpet underlays, pillows and packing

materials. Coir yarn apart from its main use as a semi-finished raw material finds 11 applications in agricultural operations also. Coir ropes are used for training climbers in traditional agriculture in rural areas, even in small farms in the developed world. There are many other coir products in use in modern agriculture. Coir fibre webs, woven coir mesh mattings, de curled coir fibre mats and woven coir is used in modern soil conservation, landscaping, mulching and other agro-horticultural applications, as a biodegradable material. India exports large quantities of “hop yarn”, a special variety of coir yarn used in the U.K and the U.S as support string for “hop cultivation”.

Even “Coir pith” (coco peat or processed coir pith), a by-product, is an excellent plant-growing medium and it is exported in brick form and used as a soil conditioner for plants growing in nurseries and indoor gardens.

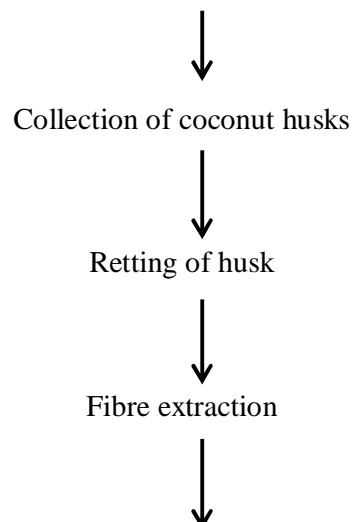
1.7 Production process in coir industry

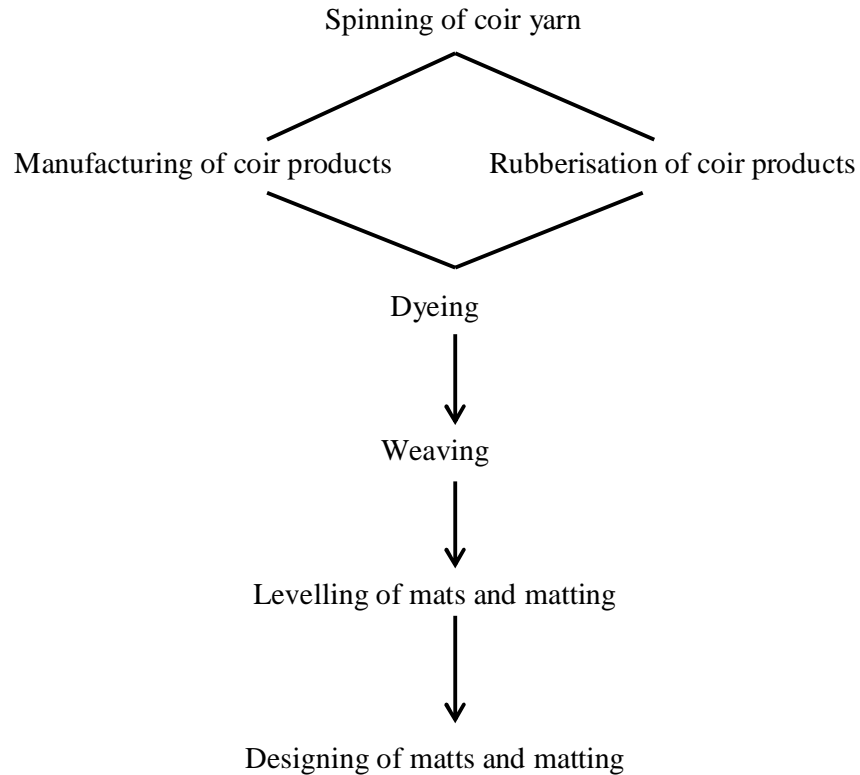
The production of process of coir starts from the extraction of coir fibre involving a lengthy process of either retting or unretting of coconut husk. Thus, the process of the extraction of the fibre is done through two methods viz the traditional methods (retting) and the mechanical method (unretting).

The traditional method is generally followed in coastal areas where brackish water facility is available. This method is gradually on the wane as the production of coir fibre and coir products spreads to non-traditional areas. The advent of the mechanical method of extraction reduces the period of retting and speeds up the production of fibre. The following figure depicts the production process involved in the Coir Industry.

Fig: 1.2 Production process in coir industry

Production Process in coir industry





Traditional way of coir extraction

The traditional production of fibres from the husks is a laborious and time-consuming process. After separating of the nut, the husks are processed by various retting techniques generally in ponds of brackish waters (for three to six months) or in backwaters or lagoons. This requires 10-12 months of anaerobic (bacterial) fermentation.

By retting, the husks are softened and can be decorticated and the fibre is extracted by beating, which is usually done by hand. After hackling, washing and drying (in the shade) the fibres are loosened manually and cleaned. The remaining residual pith – which was previously considered a waste problem – has recently found new profitable markets as a peat moss substitute for horticultural production.

Traditional practices of this kind yield the highest quality of (white) fibre for spinning and weaving. Retted fibres from green husks are the most suitable fibres for dyeing and bleaching. For the production of more coarse brown yarns shorter periods of retting may be applied. These find an increasing outlet in geo-textile applications.

Mechanical extraction

Alternatively, mechanical processes using either de-fibering or decortivating equipment process the husks after only five days of immersion in water tanks. Crushing the husk in a breaker opens the fibres. By using revolving “drums” the coarse long fibres are separated from the short woody parts and the pith. The stronger fibres are washed, cleaned, dried, hackled and combed.

Green decortication and Microbial treatments

New environmentally friendly methods for fibre production are of interest. These can be locally exploited on relative small-scale, and have the potential to produce a more constant quality of fibres. Novel developments by the Central Coir Research Institute, under Coir Board, using a bio-technological approach with specific microbial enzymes have reduced the retting time substantially to three to five days. High quality fibre production has been maintained.

Similar protocols can be developed to enhance the properties of the fibres in regard to surface properties such as smoothness and porosity. By using specific (microbial) lignolytic enzymes (laccase/phenoloxidase), the fibre surface can be bleached (or activated to react more easily with the dyes).

Bleaching

Bleaching of coir fibres and yarn is undertaken to obtain lighter coloured fibres and more commercially attractive products. Coir yarns and fibres bleached enhance the performance and appeal of the products (for example, for mats and matting).

Dyeing

Dyeing of coir products is considered to be essential for diversification of markets and for enhancing the appeal of the products to consumers. The performance of the dyes on coir products should meet the highest quality standards. Coir is dyed in large vessels (made of copper or aluminium, 1200 mm diameter and 750 mm high) heated by fuel wood. The required quantities of dyestuff (depending on the depth of shade required) and chemicals are added as a paste when the liquor in the vessel has reached the required temperature. For dyeing 60 kg of coir yarn a fibre to liquor ratio of 1:12 is used, while smaller quantities of coir fibre (30 kg) are dyed at a 1:20 ratio. The dye bath is stirred manually and the material is turned frequently to obtain even

distribution of the dye. After dyeing the material is removed, washed with cold water and air dried in the shade.

1.8 Economic importance of coir industry

It is common knowledge that rural India is mostly characterized by poverty, unemployment, under-employment, low per capita income, under-utilisation of natural resources, regional imbalances and the like. Encouraging and starting of rural industries like the coir industry may hold the key to solving these problems.

The major share of the coir production is contributed by thousands of small entrepreneurs who exploit the untapped rural resources and act as revival agents in villages by generating employment and income in addition to standing as the backbone of the exporters of coir products who earn valuable foreign exchange.

The increased use of coir composites (coir with resin, coir with bamboo) and as alternatives for wood products, plastic mouldings and asbestos will encourage the concept of sustainable development. Coir composites in all probability would become the “Sunrise” sector of the coir industry.

The coir industry employs more than 7 lakh persons of whom a majority is from rural areas belonging to the economically weaker sections of society. Nearly 80% of the coir workers in the fibre extraction and spinning sectors are women. It employs more than 1.5 lakh weavers and 4 lakh spinners.

The domestic market in India has adequate potential for coir and its products. Still it remains unexploited. At present coir is mostly consumed for institutional needs; promoting the manufacture of coir products to turn their attention to tapping the unexploited household sector in the country is the need of the hour.

1.9 OBJECTIVES OF STUDY

- To trace the origin, growth and development of coir industry at the national and state level.
- To estimate the production cost and returns of various coir products manufactured.
- To identify the existing marketing channels and marketing efficiency for different coir products.
- To enumerate the major problems in production, marketing and provide suitable suggestions for improving the overall performance of coir industry.

1.9 Scope of study

The study was conducted in Puri district of Odisha. It focuses on the costs and returns of various coir products manufactured. The study covers most of the aspects from production to marketing; hence identification of existing marketing channels and evaluation of marketing efficiency is done. The results of the study would throw light on the profitability of coir manufacturing, marketing and overall performance of coir industry.

1.10 Limitations of the study

The limitations of the study are:

- As there is no any recent survey regarding the production of coir and coir products done by authorized agency, the data regarding area and production is only estimated data given by Coir board.
- There are no proper recording of data related to cost, income and benefit by the manufacturer and marketing intermediaries. Hence the researcher had to depend on the recall memory of the sample.

1.11 Organization of the project report

- Introduction: Introduction to the coir and coir products, objectives, scope and limitations are covered.
- Review of literature: The available and relevant literature is thoroughly reviewed.
- Methodology: The methods and materials encompassing sampling, data collection, analytical tools, and methods of evaluation are explained.
- Results and discussion: The results and discussion with respect to all the objectives of the study is presented systematically.
- Summary and conclusions: Summary and conclusion of the study and suggestion for development of coir sector are presented.

Chapter II

REVIEW OF LITERATURE

For any investigation, the findings of earlier studies will give insight in to the problem and set direction for the research. An extensive survey of literature was undertaken in order to have an understanding of various concepts related to the problem concerned, interpretation of the findings of the study and the limitations. Hence in this chapter the reviewed literature is presented under following sub-heads.

- 2.1 Cost of production of different coir products, labour cost and production function related to coir industry
- 2.2 Marketing of coconut and coir products
- 2.3 Problems and constraints related to coir industry
- 2.4 Performances of coir industry

2.1 COST OF PRODUCTION OF DIFFERENT COIR PRODUCTS, LABOUR COST AND PRODUCTION FUNCTION RELATED TO COIR INDUSTRY

Perumal (1988) in his study on the progressive mechanism in the Coir Industry observed that labour costs work out to 30 to 45 per cent of the total cost in the case of yarn produced under the conventional method. The study stated that labour cost could be kept low if mechanization was introduced in the spinning area. The machine could not only increase the production of coir but also improve the quality of yarn in such a way as to fetch a better price for the producers and higher wages for the workers. Hesuggested that research aiming at reducing the cost of production and increasing production, productivity, quality of coir and coir products was the need of the hour.

Seeni (1992) in his study on coir industry in Thanjavur district, Tamil Nadu fitted a multiple regression type production function to coir manufacturing. The output of coir in rupees was taken as dependent variable. The values of raw material, capital in rupees and labour in rupees have been treated as independent variables.

Using the Cobb-Douglas production function, he noticed that constant returns to scale prevailed in coir industry.

Rani and Murthy (1993) in their study analysed the investment pattern and employment pattern in the coir industry in Coimbatore district. The study revealed that the labour share to the total cost accounted for 10-39 per cent. It can be seen that the crushing units enjoy more profits than fibre units which implies that the vertical integration is more profitable than single operational unit. The results indicate that the potential for increasing the turnover would be by using more and more of raw materials like coconut husk. These units provide employment for both men and women.

Divakaran et al. (1999) in their article on utilisation of slaughter house waste as a retting agent for coir opined that the hike in the price of yarn and other products manufactured was caused by the increased process costs of retting and defibring as they were more conventional. They stated that the cost and price minimization would alone ensure the revival of the coir industry. The study concluded that cost reduction was possible if the period of retting could be reduced to some extent.

Chandaran (2005) in his article on the Indian coir industry pointed out that the high labour cost in Kerala forced the manufacturers to take the coconut husk to the neighbouring state for defibring and bring it back as fibre to Kerala which was another reason for the increase in the price of fibre. Further, he observed that when demand had gone up on account of short supply of fibre to the production centres, there had been an unprecedented increase in the price of fibre.

Mathiazhagan (2006) in his study on economics of coir industry in Tamil Nadu used the Cobb Douglas type production function to express the input-output relationship of per tonne of coir fibre produced to work out the productivity of resources. He considered the production of coir fibre per tonne as a dependent variable. The cost of production per kilogram in rupees, selling price in rupees, cost of labourers involved in work were considered the independent variables. He further concluded that nearly 87 per cent of coir fibre production was dependent upon the cost of production and the quantum of labour involved.

Joseph (2007) in his article on schemes implemented by coir board in Kerala region with special reference to public service facilities stated that the production of coir fibre, coir yarn and the production of value-added products like door mats and floor coverings were undertaken on a limited scale.

Kumarasamy (2009) in his article towards self-reliance in coir fibre production, stated that it might not be possible to utilise the entire coconut husks produced in the country for coir production due to a variety of reasons such as lack of a well-defined mechanism for collection of husks, increased cost of transportation, lack of awareness among the coconut producers, dealers and domestic households about the economic value of husk.

Unnithan (2011) in his study on coir industry in India with special reference to marketing and trade analysed the cost of production of different varieties of coir and coir products in detail. He stated that mechanisation was the key to cost reduction. He also studied in detail the marketing of coir. He stated that marketing of coir could be studied by adopting two approaches namely the institutional approach and the functional approach. He further stated that both approaches could be used simultaneously to understand the problems of the marketing of coir.

2.2MARKETING OF COCONUT AND COIR PRODUCTS

Dinesh (1985) made a study on organizing the coir co-operatives in Tamil nadu region. The study revealed that it is necessary to organize large co-operatives combining the operations right from the primary process to the finished products to promote marketing. The societies should be large enough to incorporate a variety of processing.

Jeya (1989) in his economic study of the coir industry in Kanyakumari district, Tamil nadu pointed out that the private efforts played a vital role in the marketing of coir fibre and coir products in the district. He pointed out that limited operations, delay in payments, lack of grading and standardisation and lack of marketing knowledge were some of the problems identified in the internal markets of the district. He concluded that market conditions were weakened by the inaction of government agencies.

Pillai (1994) in his study on the role of government agencies for the development of coir industry in Kerala analysed the marketing costs and price spread for coir and coir products in four marketing channels, and stated that the channel of direct selling was the most profitable while the one through government agencies was the least profitable for coir products. The four marketing channels identified are: Channel I (Manufacture-Native trader-Consumer), Channel II (Manufacturer-Market Trader-Wholesaler-Consumer), Channel III (Manufacturer- Kerala Coir Marketing Federation-Consumer) and Channel IV (Manufacturer-Wholesaler-Retailer-Consumer)

Sudhedharan and Sreedharan (1998) studied the internal markets of coir and coir products and found that the export promotion activities in India are low. This has to be stepped up considerably to increase the domestic sales. It revealed that more than 90 per cent of the production is in the traditional way. They suggested measures for increasing the use of coir products and they also suggested that the government agencies should also take steps to popularize the products.

Kutty (1999) in his article on marketing strategy for promoting sales of coir products, stressed on the vital importance of improving the marketing of coir and coir products in India and elsewhere for survival and growth of coir industry. He warned that severe competition from synthetic coir products and natural substitute, machine spun coir yarn and mats from Sri Lanka and European countries may create problems to the industry. Therefore publicity about the unsurpassable quality of Indian coir products is to be accelerated.

Soundarapandian and Philip (2000) in their article on coconut waste-husk products industries in Kerala identified some of the constraints faced by coir industry in Kerala. The study found that the major problem is availability of husk. In Kerala only 30 per cent of the husk is utilized for coir production, the rest is declined due to inappropriate climatic conditions. Finally, there was decrease in production due to the lack of demand in the market and traditional methods of production. The study clearly suggested that the industry should not continue with the present method of production.

Ramkumar (2001) wrote an article on costs and margins in coconut marketing. He got some evidences from Kerala, while analysing the three marketing

channels, observed that Channel III (Producer–Co-operative Society–Kerala Coir Marketing Federation– Consumer) was the most efficient and cost-effective compared to costs found in Channels II (Producer–Oil miller–Consumer) and Channel I (Producer–Copra maker–Oil maker– Consumer). He concluded that the presence of the intermediaries in the channels led to a low price realization to the producers.

Murugesan (2003) in his study on production and marketing of coir in Virudhunagar district, Tamil Nadu has stated that the concurrent margin method could be used as a tool to calculate marketing cost and margins. He further suggested that the variations in cost and returns of different intermediaries at different markets could be smoothed by averaging them over the same point of time. He identified three different marketing channels; they are Channel I (Producer–Co-Operative Society– Tamil nadu State Coir Co-Operative Marketing Federation–Customer), Channel II (Producer– Private firm–Wholesaler–Retailer–Customer) and Channel III (Producer–Private firm–Market trader–Wholesaler–Customer).

Maheswari *et al.* (2008) in their article on marketing strategies for coconut stated that the production of coconut was high from March to June but it was low from August to January which ultimately affected not only the coconut industry but also the coir industry. They further stated that the rainfall had the maximum influence on the seasonal variations in the yield not only in the coconut industry but also in the coir industry. Development of market intelligence, collaboration with the cooperative marketing federations or cooperative consumer federations and concept of constructive competition and growing together rather than destructive competition are the strategies suggested for coconut marketing.

2.3 PROBLEMS AND CONSTRAINTS RELATED TO COIR INDUSTRY

Malik (1988) in his study on strengthening co-operatives in coir industry examined the historical background of coir co-operatives in Kerala. According to him until the starting of coir development scheme during 1950-1951, there were no organized attempts made to stabilise and strengthen the industry. The industry was depending on the initiative, enterprise and financial resources of the private industrialists. He found out that the weaknesses of central coir societies were due to the shortage of working capital and concluded with a suggestion that coir co-

operatives should be strengthened in order to protect foreign exchange earnings and to prevent the throwing of workers out of employment.

Nair (1997) in her article on women's health in a traditional sector: A study of coir yarn spinning industry in Kerala, after considering the health effects and working conditions of coir women workers in the unorganized sector of coir industry concluded that women workers face numerous problems as they had no protection from labour laws. She mentioned that they were made to work long hours without any extra pay and most workers worked standing directly under the blazing sun and the working conditions were unhygienic and oppressive.

Kumar (2001) in his study on coir industry in India: problems and prospects has pointed out that the domestic market in India still remains unexploited. He further concluded that the organized selling channels of coir products in the country at present may not be sufficient to tap the unexploited household sector in India.

Ghose (2003) in his article on present status of coconut processing industry in India observed that the owners of the private coir units were not employing government coir agencies to market their various coconut diversified products and coir and coir products and hence local traders played a vital role in the marketing of coconut processed products.

Fernandez (2003) in his article on strategic alliance for the development of coir industry in the APCC (Asia Pacific Coconut Community) countries mentioned that the stiff competition from synthetic barriers creates hurdles for the prospective global market. He further concluded stating that an institutionalized mechanism should be set up for bringing the coir producing countries of the world together under an international agreement similar to such arrangements existing for commodities like coffee, rubber, and spices for promoting their export.

Mohamed and Hameed (2003) in their article on Indian coir industries challenges and future prospects have stated that with the advent of synthetic fibres in European countries, Indian exports of coir and coir products have met with a serious setback. They concluded that some form of technological improvement in the coir industry is the need of the hour so as to maintain its position in the world market for its products and sought innovative marketing methods including development of new products which alone could reverse the stagnation in India's coir exports.

Harma (2004) in his article on coir industry in the Lakshadweep, highlighted that even though the industry had good infrastructure, better availability of raw material at their door steps, skilled employees and availability of husk at cheap prices, they were not able to manage the industries profitably. The survey finally found that the major problems faced by the industry were due to low capacity utilization, excess manpower, high production cost and lower value addition to the coir fibre, marketing-related issues and higher fixed overheads.

Pandi (2005) in his article on problems and challenges of industrial co-operatives with special reference to coir co-operative units in Tamil Nadu pointed out that the causes for losses of the co-operative coir units were the problems of production, labour, marketing, finance and supervision. He identified the main reason for high cost of production and stated that power and fuel supply was the main reason for the high cost of production.

Gunasekarane(2006) in his article on implication of shortage of dried coir pith on exports reported that unavailability of concrete drying yards is affecting coir pith export. Inadequate availability of coir pith is a setback for export, he further stated.

2.4PERFORMANCES OF COIR INDUSTRY

Sundaresan (2002) in his article on globalisation, technological change and traditional industries: a study on coir yarn spinning industry in Kerala has attempted to compare the traditional and modern technologies in coir industry and evaluated the impact of technological change under the globalised regime. He has mentioned that the modernization of coir industry in the global regime has neither succeeded in bringing more benefits to the workers nor brought better prospect to the industry.

Gangi (2004) in his article on growth performance of village and small industries analysed the growth performance of the rural industries (khadi and village industry, handloom, sericulture, handicrafts, coir) vis-a-vis small-scale industries during the last few decades in the light of the assistance received from time to time. In his study four variables—production, capital, employment and export — were considered to find out the growth of village and small industries. He found that small industry sector has performed exceedingly well and enabled our country to achieve a wide measure of industrial growth and diversification.

Pillai (2007) in his article on government agencies and coir co-operatives in Kerala compared the performance of coir units in the co-operative sector with their counterparts in the private sector by taking into account the six variables— return on investment, capacity utilization, average annual production, average number of workers employed, average annual man days of employment and average annual sales. He stated that all these six variables were found to be better in the private coir sector.

Thiripurasundari (2012) in her article on coconut fibre units in Tenkasi taluk, Tamil nadu – a case study, has surveyed 30 fibre units in Tenkasi taluk and pointed out that the major problems faced by the coir fibre units were lesser amounts of subsidy, higher electricity charges and inadequate water supply during summer season. She has also pointed out that the season (January–May) was the best-suited for the coir fibre units. The study highlighted that the coir business was a lucrative business in Tenkasi taluk.

Gouri (2013) in her article on modernization of coir industry stated that in the last financial year the industry earned more than Rs.450 crore as foreign exchange and created more employment in the rural areas. The industry had its root in the rural area and since mostly women workers were involved at different stages of production, this industry had an added relevance in the national income. She concluded that coir workers, small and large manufacturers, industrialists and exporters should work together and render their whole hearted support to the government for strengthening the industry.

Manikandan (2013) in his article on model coir village care for coir workers formulated the model coir village scheme and focused on the welfare of coir workers. The scheme on model coir village program gave major emphasis on extending assistance in improving the basic amenities and living conditions of coir workers and its success was a motivating factor for taking up welfare programs for coir workers in a big way in the succeeding years. One of the components of the package was extension of the coverage of the model coir village in Kerala and the socioeconomic needs of the villages selected were identified through a bench mark survey.

Chapter III

MATERIALS AND METHODS

The present study was carried out in Puri district of Odisha. The study pertains to understanding the costs, returns and constraints involved in manufacturing and marketing of coir products. This chapter presents the sampling design, nature and methods of data collection and analytical tools applied in attaining the specific objectives of the study.

The chapter is presented under the following sub heads.

3.1 Description of study area

3.2 Sampling procedure

3.3 Collection and sources of data

3.4 Details of estimation

3.5 Tools and techniques used for analysis

3.1 DESCRIPTION OF STUDY AREA

The study was carried out in Puri district of Odisha.

3.1.1 Location

Puri district is a coastal district on the Eastern part of Odisha, India. It is located at 19.85° N Latitude 85.72° E Longitude. It has one subdivision (Purisadar), 11 tehsils and 11 blocks. Puri is the only municipality of the district.

3.1.2 Demographics

According to the 2011 census Puri district has a population of 1,697,983. The district has a population density of 488 inhabitants per square kilometre. Its population growth rate over the decade 2001-2011 was 13 per cent. Puri has a sex ratio of 963 females for every 1000 males, and a literacy rate of 85.3 per cent.

3.1.3 Geography

Puri district has a geographical area of 3051 km² or 264988 ha. Its Northern boundary touches Cuttack district, the Southern and Eastern part touches the Bay of

Bengal whereas the Western side has the district of Khorda. The major rivers that flow through these districts are tributaries of the river Mahanadi.

3.1.4 Climate

Being in close proximity to the Bay of Bengal, Puri district has tropical climate. The summer months from March to May are hot and humid. Puri faces the South West monsoon in June, and the rainfall peaks to around 250 mm during July and August. Winter in Puri makes its presence felt from November, when temperatures start falling to maintain an average of 16° centigrade in December and January. Cold winds from the North East keep the temperatures low in spite of the bright sunshine. However, this is the most pleasant time of the year for visitors to Puri.

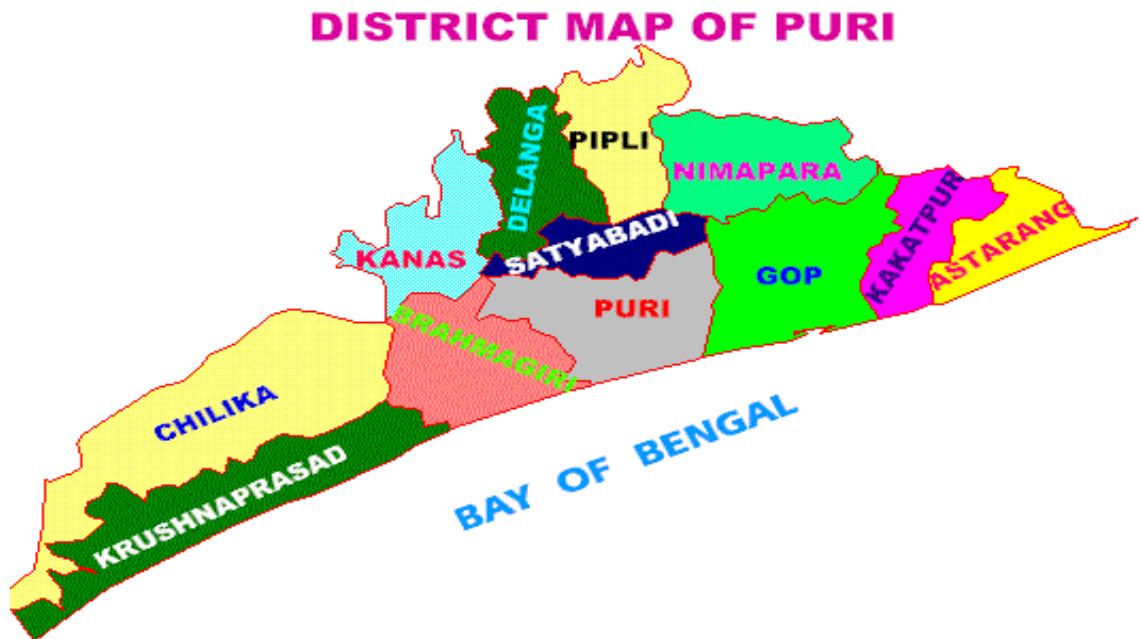


Fig: 3.1 District map of Puri

3.1.5 Land and land use pattern

Land in the district is mainly low and produces one crop in a year and so the necessity for high cultivation does not arise. As far as agricultural production is concerned, the district is mainly a paddy, pulses and oilseed growing area. Like other districts in the state Puri district is also dependent for irrigation of crops on the local rainfall.

3.1.6 Livestock

The district is well stocked with cattle, and the Gop and Delanga blocks contain a large number of milch cattle, draught cattle and agricultural stock of all kinds. A number of veterinary hospitals and dispensaries have been opened at different centres in the district which has reduced the mortality rate of cattle.

3.1.7 Economy

Puri district's income mainly comes from tourism as there are a number of tourist sites. The economy of Puri town is dependent on the religious importance of the Jagannath temple to the extent of nearly 80 percent. The 24 festivals, including 13 major ones, held every year in the temple complex contribute to the economy; [RathaYatra](#) and its related festivals are the most important which are attended by millions of people every year. People of this district depend on sea and lake for sustaining their livelihood. Around 200 functional coir units provide employment directly to more than 60000 workers in Sakhigopal area. Average investment in plant and machinery is around 18 lakhs. Coconut farmers and local traders are also making profit by depending on coir industries.

3.1.8 Major local markets for coir products

Sakhigopal market is a major trading centre because of the presence of coir clusters and major traders in that area. Mainly coir traders directly procure coir products from processors. Approximately 4584 MT of coir fibres is traded in the district annually. The produce is transported to other states through train or surface transport (trucks).

3.2 SAMPLING PROCEDURE

3.2.1 Selection of study area

Puri district was selected purposefully as it represents top coir producing district of Odisha. The Central Sakhigopal is responsible for 75 per cent of coconut plantation and 82 per cent of total production in the block. Total area of this block is about 183.89 sq. km. Out of 11863 ha of cultivated area of the block, 64.11 ha come under coconut plantation. Sakhigopal occupies 1460 ha of high land which is suitable for

intensive cultivation of coconut comprising six panchayats of the block like Sri Ramchandrapur, Biraramchandrapur, Biswanathpur, Nuasomeswarpur, Penthapada and Kadua. Hence this block is selected and from this block the six panchayats mentioned above were selected to carry out the study.

Table: 2.1Details of the selected study area in Puri

District	Block	Panchayat
Puri	Satyabadi(Sakhigopal)	Biswanathpur Kadua Sri Ramachandrapur Nuasomeswarpur Penthapada Biraramchandrapur

(Source: Primary data)

3.2.2 Selection of coir unit

More than 35 coir units are operating in study area. Among these 15 firms (12 privately owned and 3 co-operative firms) were selected as sample for the study.

3.2.3 Selection of marketing intermediaries

The study also intended to identify various marketing channels adopted for marketing coir products and marketing costs and margins involved at various levels of marketing. Hence 10 market intermediaries (5 wholesalers and 5 local vendors) of coir products from Sakhigopal block were selected randomly for the study.

3.3 COLLECTION OF DATA

Primary data was collected from the selected coir products producers and market intermediaries from the study area through survey method with the help of pre-tested schedule specially designed for the purpose. Secondary data was collected from coir board, journals, magazines and Government websites.

3.4 DETAILS OF ESTIMATIONS

3.4.1 Cost aspects of coir products

Human labour: Human labour generally consists of the hired labour and permanent workers. In coir production no child labour utilization was involved in any of its operations. In case of permanent labour, payments made in kind and other pre-requisites were evaluated at the prevailing market rates and payments made in cash were added. Thus the average per day wage of permanent labour was calculated. In the case of hired labour daily wages were lower than permanent labours and working hours were also more in comparison to permanent labours.

Costs: The total costs were divided into variable costs and fixed costs.

Variable costs: Variable costs included cost of human labour, material, energy, machine running, unretting, interest on working capital and land revenue etc.

Fixed costs: Fixed costs included rental value of owned land, office and administrative cost depreciation on machinery and building and interest on fixed capital.

Procurement cost: procurement cost included transportation cost, packaging cost, labour charges, commission agent charges and wastages.

Depreciation: The depreciation was worked out for the farm machinery and implements. Depreciation was worked out at 10 per cent of the present value plus repairs.

Rental value of owned land: The average value of rent on which leased land or pond was available in similar condition had been taken.

Rental value of leased land: Actual price paid by the farmer towards rent for land was taken into account for estimation of input cost.

Interest on working capital: The interest on working capital was calculated at the rate of 9 percent per annum at which commercial banks in the study area were lending loans to Micro Small and Medium Enterprises (MSME).

Interest on fixed capital: The rate of interest was 13.50 per cent per annum on fixed assets as the fixed deposits in commercial banks fetch 13.50 per cent interest on the amount deposited. Since rental value of owned land was considered, land value was excluded from fixed capital.

3.4.2 Marketing aspects of coir products

The information pertaining to marketing aspects of coir product was collected from producers, wholesalers and retailers, on the quantity sold or purchased, the price paid or received, expenditure on labour, transport, taxes and other incidental charges. Gross marketing margin includes the sum of margins of the various intermediaries involved in coir products marketing.

Area of operation: Traders were classified as local, state level and national level dealers based on their area of operation. .

Marketing channels and their cost of operations per unit of product: The market functionaries involved in different marketing channels of coir products marketing were identified. The activities done by the functionaries and per unit cost of each operation were identified to calculate the efficiency of identified marketing channels.

Marketing efficiency: Marketing efficiency is a measure of market performance. The movement of goods from producer to the ultimate consumer at the lowest possible cost consistent with the provision of service desired by the consumers is termed as efficient marketing.

Wholesaler: It is the merchant middlemen who buy and sell agricultural commodities in large quantities. They may either buy from manufacturers or from processors.

Distant wholesaler: One who involves in buying activity by contacting the wholesaler over telephone. He is the one who performs marketing activity in distant markets as Kolkata, Raipur etc.

Retailer (local vendor): Retailers buy goods from wholesaler and sell them to consumers in small quantities. Retailers are closest to consumers.

Supply chain of coir products marketing: Supply chain of coir products marketing starts from procurement of coconut from farmers, then processing by coir industries and finally delivery to the final consumer through marketing intermediaries.

3.5 TOOLS OF ANALYSIS:

The data collected from primary sources were analyzed in multiple stages. The collected data were tabulated by using Microsoft excel and is illustrated appropriately to make meaningful inferences. Compound Growth Rate (CGR) technique was used to examine the coir units growth rate in the study area. Rank Based Quotient technique (RBQ) was used to analysis the problems of manufacturing and marketing of coir products.

3.5.1 Compound Growth Rate

The **compound annual growth rate (CAGR)** is a useful measure of growth over multiple time periods. Growth rate with regard to coir production and coir export have been estimated on the basis of its initial value to the ending value if we assume that the production and export have been compounding over the time period.

$$\log Y = a + bt$$

Where,

Y = Coir Production and Coir exported

t = Time periods

‘a’ and ‘b’ are the parameters to be estimated.

The Compound Growth Rate (CGR) = $[(\text{Anti log of } b) - 1] \times 100$

3.5.2 Analysis of price spread of different channels

It is the difference between the price paid by the consumer and the price received by the producer. The price spread was worked out by using following method.

$$\text{Price spread} = P_p - P_f$$

Where,

P_p = price paid by the consumer

P_f = price received by the farmer

3.5.3 Analysis of marketing efficiency of different channels

Marketing efficiency is a measure of market performance. The movement of goods from producers to the ultimate consumers at the lowest possible cost consistent with the provision of service desired by the consumers is termed as efficient marketing.

Shepherd's formula

Shepherd (1965) suggested that the ratio of total value of goods marketed to the marketing cost could be used as a measure of marketing efficiency. The higher this ratio, higher would be the efficiency and vice versa. This can be expressed in the following form:

$$ME = [(V/I)-1]$$

Where,

ME = Index of marketing efficiency

V = Value of goods sold

I = Total marketing cost

Rank Based Quotient (RBQ)

The constraints faced by the producers and their market intermediaries in marketing of coir products were identified. The quantification of data was done by first ranking the constraints based on the responses obtained and then calculating the rank based quotient (RBQ) (Sabarathanam, 1988) which is as follows:

$$R.B.Q = \frac{f_i (n+1-i)}{N \times n}$$

Where,

f_i = Number of respondents reporting a particular constraint under i th rank

N = Number of respondents

n = Number of constraints identified

Chapter IV

RESULTS AND DISCUSSION

In accordance with the pre-determined objectives of the study, data have been collected and analysed by using suitable techniques. This chapter deals with the presentation and discussion of the results that emerged from the research work. For easy understanding and convenience, this chapter is presented under the following sub-heads:

- 4.1 Origin, growth and development of coir industry at the national and state level
- 4.2 Estimation of production cost and returns of various coir products
- 4.3 Identification of marketing channels of different coir products and determining marketing efficiency
- 4.4 Problems associated with production and marketing of coir products

4.1 ORIGIN, GROWTH AND DEVELOPMENT OF COIR INDUSTRY AT THE NATIONAL AND STATE LEVEL

There are several legends associated with the origin of this coconut palm in many countries. In Indian mythology, it is believed that this is one of the five wish giving trees that emerged after the churning of the might oceans by the Gods. According to the Indian Coconut Committee's "History and Home of Coconut" published in September 1954, the coconut palm originated in Sri Lanka. In another view, the coconuts drifted in the sea from Polynesia and found new homes in many parts of the world. According to early Greek chronicles, it was Megasthenes, ambassador of the Seluces Nicater, who told the Indian king, Chandra Gupta about the coconut palm, he found in Sri Lanka in 300 BC.

The origin of coir industry dates back to pre- historic times, but it is only during the 19th century that coir products were increasingly introduced to the other parts of the world from the countries of their origin. Arab writers of 11th century AD referred to the uses of coir as ships cables, fenders and rigging. Marco Polo's celebrated travelogue of the 12th century mentioned the uses to which coir fibre and mats were put in use in the sailing vessels of Arabs. He later saw the land where

Arabs brought their coir and recorded how it was made out of the fibre from the coconut husk.

It is likely that both India and Sri Lanka were the first countries in the world to have discovered the multiple uses of coconut fibre coir. Coir fibre and yarn was therefore, known beyond the shores of India from ancient times. The coir industry, which forms the main plank of the economy of the coastal areas of the country, is one of the oldest and most traditional industries.

The manufacture of coir fibre and coir yarn was traditional old industry in the coastal areas of the native states of Travancore and Cochin and the coir was purchased and exported by the traders from the Calcutta port. Convinced by the potentiality of the fibre and yarn, Mr. Darragh an American came to Alleppey, which was the chief port of the state and started a manufacturing unit with the establishment of the first coir factory in India at Alleppey in 1859. He enlisted the help of the foreign trader called Henry Smail and the factory was known as “Darragh Smail & Company”.

After Darragh, so many foreign entrepreneurs started coir factories in Kerala and turned to act as agency firms. They collected orders for coir from their own countries and supplied coir and coir products produced and manufactured in India. This mode of operation developed a supply chain and an export orientation in Indian coir industry. This export orientation of coir industry has led to the concentration of coir industry in port towns of Alleppey and Kollam (Asari, 1988). The golden textured Kerala coir fibre, which earned the unofficial brand name ‘golden fibre’, captured European and world markets in no time. By 1967, the domestic coir industry had spread its wings, with coir factories coming up in several states including Karnataka, Tamil Nadu, Andhra Pradesh, Odisha and Goa.

Modernization process, though slow in coming, in keeping with the international market trend the Indian coir industry has also woken up to the call for modernization. The ancient coir manufacturing techniques have been replaced by advanced technological processes, with the introduction of motorized rest, automatic spinning machines, mechanized de-husking processes and the technology for yarn based value added products. Semi-mechanized looms and power looms are now used for making mats, matting and carpets. The continued R&D efforts are bearing fruits

with the innovative developments in the coir sector – non-woven items like coir mattresses, needled felt, PVC tufting were developed.

4.1.1 Growth of coir industry in India

After independence, the Government of India wanted to make the nation industrially strong and vibrant. Concerted and consistent efforts were made especially through the five year plans. The development of village and small industries was one of the key programmes under the Five year plans. The Government launched major schemes and extended financial assistance for the growth of the village coir industry.

The performance of coir industry during the second five year plan was considerable after the establishment of the Coir Board. A record number of 929 coir units with 10,992 looms were established in 1958-92. The development of coir industry in India began in an organised way only since 1959. The survey in 1960 showed that, 100 coir units were set up and the total exports of coir and coir products was 3,58,474 tonnes during this plan period.

The third five year plan witnessed increased financial assistance provided by the Government of India, which stood at Rs.3.0 crore, though financial difficulties were noticed during this period. The exports of coir and its products for the whole plan period was 3,24,500 tonnes and 5,63,445 metric tonnes respectively.

Under the fourth five year plan, Rs.53 crore was allotted for the development of the industry. The major objective of the fourth plan was to improve progressively the production techniques of coir so as to enable the owners of the coir industry to produce quality goods and to bring them to a viable level to promote decentralisation and dispersal of coir units. Rapid growth of units was a significant feature during the plan period. The number reached by the coir industry stood at 2,448 and the industry achieved a coir production of 6,00,000 tonnes. The progress in the fifth plan showed that the production of coir and its products increased to 3,53,740 tonnes and the exports rose to 2,08,985 tonnes. It was the outcome of the operation of 2,673 coir units.

The production of coir was 6,11,300 metric tonnes during the eighth five year plan, registering an increase of 40 per cent over the plan period. These industries

used modern technology and produced a large variety of coir goods ranging from traditional goods to most sophisticated items like coir geo-textiles, and coir pith plus.

The rapid expansion of coconut cultivation in non-traditional areas increased the availability of coconut husk which acted as a boost for starting new units. Large numbers of units were started in co-operative, private and public sectors.

The growth of coir industries in India from the 2009-10 to 2013-14 has been presented in the table 4.1. Numbers of coir units in 2009-10 were 14050. In 2010-11 coir units increased to 14300 i.e. an increase of 250 units or 1.77 per cent rises over the previous year. It further increased to 14637 in 2011-12 (2.35 per cent) in the subsequent year. Similarly, in 2012-13, number of coir units increased to 14885 i.e. an increase of 248 units numbers higher than 2011-12 by 1.69 per cent. Finally, in 2013-14, coir units increased from 14885 to 15060 i.e. 1.17 percent rise from previous year. From 2009-10 to 2013-14 coir units increased from 14050 to 15060 respectively i.e. an increase of 1010 units or an increased by 7.18 percent. Compound growth rate for coir units established in India from 2009-10 to 2013-14 is 1.8 percent.

Table: 4.1 Growth of coir units in India from 2009-10 to 2013-14

Si. no.	Year	Number of Units	Increase/Decrease	Percentage change over previous over
1.	2009-10	14050	-	-
2.	2010-11	14300	250	1.77
3.	2011-12	14637	337	2.35
4.	2012-13	14885	248	1.69
5.	2013-14	15060	175	1.17
	CAGR	1.8 per cent		

**Significant at 1per cent level of probability

(Source: Coir Board, 2014-15)

It could be seen from the table that from the period of 2009-10 to 2013-14 coir units established increased at a steady rate. The healthy growth rate is due to the extensive cultivation of coconut besides the concerted efforts taken by the Coir Board and the respective state governments.

4.1.2 Region-wise distribution of coir units

Region-wise coir units' distribution for the year 2013-14 has been presented in the table 4.2. South region has highest number of coir industries in India followed by eastern region, western region and so on. South region has total 14087 number of coir units i.e. around 93.53 percent of the total units in India. This is due to the presence of suitable climate, brackish water, quality raw materials and state government's support. Eastern region was in second position in establishing coir units in India especially in Odisha. Eastern region has 840 coir units which is 5.57 percent of the total. Western region has 46 coir units (0.30 per cent of total) where as in north eastern region has 37 coir units (0.24 per cent of total). Northern region registered 30 coir units and central region registered 20 coir units which are 0.19 per cent and 0.13 per cent of the total respectively. Coir units establishment in central region are very negligible i.e. only 0.13 per cent. Main reason behind this is the poor climate conditions prevailing in this region for coconut or coir production.

Table: 4.2 Regions – wise distribution of coir units in India as on 31st March, 2014-15

Si. no.	Region	Number of units	Per cent to total
1	Central Region	20	0.13
2	Northern Region	30	0.19
3	Western Region	46	0.30
4	Eastern Region	840	5.57
5	North Eastern Region	37	0.24
6	Southern Region	14087	93.53
	Total	15060	100

(Source: Indian statistics data, 2014-15)

From table 4.2, it is evident that the maximum numbers of coir units are located in the southern region of India which is mainly due to the high density of coconut palms in this region. Apart from the presence of coconut palm, the conditions are also suitable for processing of coir.

4.1.3 State-wise distribution of coir units in India

State wise growth of coir units in India from the year 2009-10 to 2013-14 has been presented in the table 4.3. Among all the mentioned states in the table, Kerala

has highest number of coir units followed by Tamil Nadu, Odisha, Andhra Pradesh and Karnataka. Kerala registered highest number of coir units i.e. 8790, whereas Tamil Nadu was in second position with 3824 coir units in the year of 2013-14. Odisha occupied third position with 797 number of coir industries. But in terms of growth percentage from 2009-10 to 2013-14 Karnataka was at top position with 40.01 per cent growth, whereas Odisha was in second position with 18.07 per cent growth. Many states had not seen any growth or have seen only low growth rate of coir industries since 2009-10. Unavailability of raw materials for coir industries, unskilled labour force and inaccessible markets for the products were the valid reasons for low growth rates in many states.

Table: 4.3 State-wise number of coir units registered with coir board in India (2009-2010 to 2013-2014)

Si. no.	States/UTs	2009-10	2010-11	2011-12	2012-13	2013-14
1.	Andaman and Nicobar Islands	1	1	1	1	1
2.	Andhra Pradesh	662	674	685	730	760
3.	Delhi	17	17	17	17	17
4.	Goa	3	3	4	4	4
5.	Gujarat	1	1	1	3	3
6.	Haryana	2	2	2	2	2
7.	Jammu and Kashmir	2	2	2	2	2
8.	Karnataka	487	540	656	670	682
9.	Kerala	8649	8693	8744	8773	8790
10.	Lakshadweep	16	16	16	16	16
11.	Madhya Pradesh	3	3	3	3	3
12.	Maharashtra	20	21	23	23	23
13.	North Eastern Region	37	37	37	37	37
14.	Odisha	675	702	721	772	797
15.	Puducherry	30	30	31	31	31
16.	Punjab	5	5	5	5	5
17.	Rajasthan	4	4	4	4	4

18.	Tamil Nadu	3379	3490	3626	3733	3824
19.	Uttar Pradesh	17	17	17	17	17
20.	West Bengal	40	42	42	42	42
21.	India	14050	14300	14637	14885	15060

(Source: Indian statistics data, 2014-15)

4.1.4 Growth of coir industry in Odisha

Prior to 1978, coir industry in Orissa had not come to lime light. Limited coir fibre and coir products were produced by traditional methods in coconut concentrated areas. The husks were mostly used as fuel.

Subsequently, on realizing the potentiality for development of coir industry in the state, the State Government took-up various developmental activities through training, research and extension services, financial assistance and awareness programme etc. Similarly Coir Board has also been extending its support for development of coir industry in the state. They had established a regional coir training and development centre at Bhubaneswar during the year 1986 to provide skill training and other inputs for promotion of coir industry.

The growth of coir units registered in Odisha from the 2009-10 to 2013-14 has been presented in the table 4.4. Number of coir units in 2009-10 was 675. In 2010-11 coir units increased to 702 i.e. and an increase of 27 units or 4.00 per cent rise in coir units over the previous year. It further increased to 721 units in 2011-12 (2.70 per cent) in the subsequent year. Similarly, in 2012-13, number of coir units increased to 772 which were 51 units more than previous year. The year 2012-13 also registered highest growth rates among all the years i.e. an increase of 7.07 per cent. Finally, in 2013-14, coir units increased from 772 to 797 i.e. a 3.23 percent rise over previous year. From 2009-10 to 2013-14 coir units increased from 675 to 797 i.e. an increase of 122 units or 18.07 percent increase. Compound growth rate for units established in Odisha is 4.3 per cent from 2009-10 to 2013-14.

Table:4.4 Coir units registered in Odisha from 2009-10 to 2013-14

Si. no.	Year	Coir units Registered	Increase/Decrease	Percentage change over previous year
1.	2009-10	675	-	-
2.	2010-11	702	27	4.00
3.	2011-12	721	19	2.70
4.	2012-13	772	51	7.07
5.	2013-14	797	25	3.23
	CAGR	4.3**		

**Significant at 1%

(Source: Indian statistics data, 2014-15)

It can be seen from the above table that year wise from 2009-10 to 2013-14 coir units have increased steadily in Odisha. From the secondary source it is also known that during the year 2009-10, the increase was marginal. This was mainly due to 40.2 per cent of the coir units in the state of Orissa becoming non-functional in the post-super cyclone period.

4.1.5 Government initiatives

The Coir Board is a statutory body established under the Coir Industry Act, 1953 for promoting the overall development of the coir industry and improvement of the living conditions of the workers engaged in this traditional industry.

The functions of the Coir Board for the development of coir industry, inter-alia, include undertaking scientific, technological and economic research and development activities; collection of statistics relating to exports and internal consumption of coir and coir products; development of new products and designs; publicity for promotion of exports and internal sales; marketing of coir and coir products in India and abroad; preventing unfair competition among producers and exporters; assisting in the establishment of units for the manufacture of products; promoting cooperative organisations among producers of husk, coir fibre, coir yarn and manufacturers of coir products; ensuring remunerative returns to producers and manufacturers, etc.

The Indian government has provided a few incentives to encourage the growth of the Indian coir industry.

- Modernisation of production infrastructure by means of appropriate technology
- Expansion of domestic market through publicity and propaganda
- Promotion of export of coir and new products through undertaking market promotion abroad
- Development of manpower through training
- Promotion of research and development activities like process improvement, product development and diversification and elimination of drudgery and pollution abatement
- Extension of Research and Development findings through field demonstration

4.2 ESTIMATION OF PRODUCTION COST AND RETURNS OF VARIOUS COIR PRODUCTS

4.2.1 Cost of production

Cost refers to the amount of expenditure incurred or value of resources sacrificed either to manufacture a product or to render a service. The cost of production means the total expenditure incurred in manufacturing a product and becomes the preponderant portion of the total cost. It includes the cost of raw material, labour and manufacturing overheads. The cost of production being a parameter in determining the return and the production efficiency of an industry, its analysis is of vital importance. Thus it is taken into consideration in every business decision.

The cost of production in coir industry of the study area means the expenses incurred in the sequence of manufacture of various coir products. The costs which are incurred in manufacturing of coir products are placed in two broad categories namely variable cost and fixed cost. Variable costs vary in direct proportion to changes in output and an increase in output means a proportionate increase in the total variable cost. Thus a linear relationship exists between the output and the variable cost. These costs are incurred on the employment of the variable factors of production like labour and raw material. Fixed costs, on the other hand, remain constant in total regardless of the changes in volume up to a certain level of output further they are not affected by changes in output. There is an inverse relationship between the output and the fixed cost per unit. These costs will exist even if no output is produced.

There are significant differences between the costs of production of various intermediary coir products like coir fibre and coir yarn. Also differences in the costs between various final products like coir ropes, coir mats and coir rugs are noticed.

The coconut husk is procured into coir fibre and coir yarn. Few coir units are involved only in producing coir fibre and coir yarn. Hence, the costs and returns for manufacturing coir fibre and coir yarn have been calculated. Coir fibre and coir yarn form raw material for the production of final products like coir ropes, coir mats and coir rugs. The coir units producing these final products either manufacture coir fibre and coir yarn on their own or buy from other units. The costs and returns involved in manufacture of these coir products are also calculated.

It is noticed in the study area that out of total sample of 15 units, 6 units are producing only coir fibre and coir yarn, 9 units are involved in manufacturing of final products like coir mats, ropes and rugs. Among these 9 coir units 3 are co-operatives and 6 are private units of coir products. All the costs have been calculated for utilising one ton of raw material.

4.2.1.1 Costs and returns from the production of coir fibre and coir yarn

The cost of production of coir intermediary products such as coir fibre and coir yarn is given in table no. 4.5. Processing of coir husk to fibre and then to yarn is an important function in making other different coir products like coir ropes, coir mats and coir rugs. The economy of the processors depends upon the efficient exploitation of the raw materials. Costs are estimated per quintal of raw material used. Of the total variable cost of making coir fibre, the cost of raw material (Rs. 1000 per quintal) was the major cost component which constituted about 56.28 per cent of the total processing cost. The next important variable cost incurred was procurement of raw material estimated at around Rs. 250/quintal which contributed about 14.07 percent to the total processing cost. Third important cost incurred was labour wages i.e. Rs. 240/quintal (13.50 per cent). Beside these, coir processing machinery requires electricity supply for coir processing. The electricity charges, retting cost, machine running cost and interest on working capital were about Rs. 160/quintal (9.00 per cent), Rs. 13.33/quintal (0.75 per cent), Rs. 80.00/quintal (4.50 per cent) and Rs. 33.33/quintal respectively. Total variable cost of making coir fibre is around Rs. 1776.66/quintal, which is 30.11 per cent of total cost of producing coir fibre.

The variable cost of producing coir yarn was estimated at 3950/quintal. The cost of raw material was the major component of variable cost and it worked out to Rs. 2500/quintal (63.29 per cent). The other major component of variable cost was labour wages, which accounted for Rs. 800/quintal i.e. 20.25 per cent of total variable cost. The other items of expenditure were electricity cost, procurement cost and machine running cost which amounted to Rs. 266.67/quintal (6.75 per cent), Rs. 250/quintal (6.85 per cent) and Rs. 133.33/quintal (3.38 per cent) respectively. Variable cost of making coir yarn was around 66.95 per cent of total cost of producing coir yarn.

Table: 4.5 Variable cost components of the selected coir intermediary units

Si. no.	Cost components	Cost of production of coir fibre (Rs. per quintal)	Percentage	Cost of production of coir yarn (Rs. per quintal)	Percentage
1.	Cost of raw material	1000.00	56.29	2500.00	63.29
2.	Cost of procurement	250.00	14.08	250.00	6.33
3.	Cost of labour	240.00	13.50	800.00	20.25
4.	Cost of retting	13.33	0.75	-	-
5.	Cost of power	160.00	9.00	266.67	6.75
6.	Cost of machine running	80.00	4.50	133.33	3.38
7.	Interest on working capital	33.33	1.88	-	-
		1776.66	100	3950.00	100

(Source: Primary data)

Raw material required for making coir fibre is coir husk whose cost is Rs.1000 per quintal of husk and for making coir yarn; coir fibre is used as raw material. It cost to processing firm is around 2500/quintal of coir fibre. It is essential to mention that white fibre is usually used for making coir yarn because of its superior quality than brown fibre.

100 kg of coir husk generally results in production of 90 kg of coir fibres. Hence cost for 90 kg of coir fibre works out to cost around Rs. 1776.66. 100 kg of coir fibre,

which is raw material for coir yarn, produces 98 kg of coir yarn. The cost of producing one kg of coir fibre is Rs. 19.74, whereas the cost of producing one kg of coir yarn is Rs. 40.30.

The main component of fixed cost was interest on the long term borrowing which amounted to Rs. 83.03/quintal constituting 47.92 per cent of total fixed cost. The depreciation on machinery and building was valued at 53.87/quintal (31.09 per cent). Other fixed cost component was office and administrative charges which was around Rs. 36.36/quintal (20.98 per cent). Total fixed cost of coir processing unit was Rs. 173.26/quintal.

Table: 4.6 Fixed cost components for producing coir fibre and coir yarn

Si. no.	Cost components	Amount in rs.	Percentage
	<u>Fixed cost:</u>		
1.	Office and administrative expenses	36.36	20.98
2.	Depreciation on building and machinery	53.87	31.10
3.	Interest on long-term borrowings	83.03	47.92
		173.26	100

(Source: Primary data)

The coir processing unit processed about 82.5 quintals of raw material per month, working 8 hours a day and 180 days in a year (15 days in a month). On an average 8 persons were working per day i.e. 120 man days per month. As indicated in the table 4.7 total cost of the processing was Rs. 5899.92/quintal and the gross return worked out to Rs. 6668.00/quintal. Therefore a net return of Rs. 768.08/quintal was obtained from the processing of coir husk into coir fibre and coir yarn.

Table 4.7 Returns from processing of coir husk into coir fibre and then into coir yarn

Si. no.	Particulars	Unit	Coir fibre	Unit	Coir yarn	Total
1.	Quantity processed	Qt/month	75	Qt/month	7.5	
2.	Quantity produced	Qt/month	67.5	Qt/month	7.35	
3.	Price	Rs./kg	24	Rs./kg	46	
4.	Total cost	Rs./qt	1863.29	Rs./qt	4036.63	5899.92
5.	Gross return	Rs./month	162000	Rs./month	33810.00	2992500
6.	Gross return	Rs./qt	2160	Rs./qt	4508	6668.00
7.	Net return	Rs./qt	296.71	Rs./qt	471.37	768.08

4.2.1.2 Costs and returns of the selected coir products manufactured in co-operative sector

The structure of costs incurred by manufacturers in converting coir fibre (brown fibre and white fibre) into ropes, mats and rugs are presented in the table 4.8 and 4.9. Among variable cost components, the cost of raw material (coir fibre) for making ropes was Rs. 2100/quintal which constituted about 66.10 per cent of the total variable cost. The cost of labour wages was Rs. 800/quintal (25.18 per cent) which formed the next major component of variable cost. The procurement cost and machine running cost were Rs. 250/quintal (7.86 per cent) and Rs. 26.67/quintal (0.83 per cent) respectively.

Coir yarn is generally used as a raw material to produce coir mats, whose cost was around Rs. 4600/quintal (46.50 per cent). Mat making process requires skilled labour and intensive work so labour charges were the second most important cost. It was estimated around Rs. 4000/quintal (40.44 per cent). Other variable cost components were procurement cost; stencilling cost, electricity and machine running cost which were Rs. 750/quintal (7.58 per cent), Rs. 187.60/quintal (1.89 per cent), Rs. 273.33/quintal (2.76 per cent) and Rs. 80/quintal (0.83 per cent) respectively.

Coir rugs use yarn as its raw material and its cost is Rs. 4600/quintal which constituted 46.55 per cent of variable cost. Labour charges were second highest i.e. Rs. 4000/quintal (40.48 per cent). Other variable cost components were procurement cost,

stencilling cost, electricity and machine running cost which were Rs. 750/quintal (7.59 per cent), Rs. 184.80/quintal (1.87 per cent), Rs. 253.33/quintal (2.56 per cent) and Rs. 93.33/quintal (0.94 per cent) respectively.

The main component of fixed cost was interest on the long term borrowing which was Rs.173.33/quintal constituting 42.90 per cent. Depreciation on machinery and building was valued at 124.07/quintal (30.70 per cent). Other component was office and administrative charges which amounted to cost around Rs. 106.67/quintal (26.40 per cent). Total fixed cost of coir processing unit was Rs. 404.07/quintal.

Table: 4.9 Fixed cost components for producing coir mat, coir rope and coir rug in the selected co-operative sector

Si. no.	Cost components	Amount in Rs.	Percentage
	<u>Fixed cost:</u>		
1.	Office and administrative expenses	106.67	26.40
2.	Depreciation on building and machinery	124.07	30.70
3.	Interest on long-term borrowings	173.33	42.90
		404.07	100

(Source: primary data)

Coir co-operative units in the study area produce coir ropes from brown fibre and coir mats and rugs from coir yarn. It can be observed from the data collected from the co-operative units that total 30 quintals of raw material are utilised in a month to produce 7.5 quintals of coir rope, 14.85 quintals of coir mats and 7.42 quintals of coir rugs. These units work for 8 hours in a day and 15 days in a month which require producing 29.775 quintals of coir products. As indicated in the table 4.7 total cost of the manufacturing was Rs. 23353.12/quintal and the gross return worked out to Rs.

28349.00/quintal. Therefore a net return of Rs. 4995.88/quintal was obtained from the total production.

The net returns from manufacturing coir rope, coir mat and coir rug worked out to Rs. 35, Rs. 120, Rs. 131 per kg of final product.

4.2.1.3 Costs and returns of the selected coir products manufactured in private sector

The structure of costs incurred in converting coir fibre (brown fibre and white fibre) into ropes, mats and rugs in the private sector are presented in the table 4.11 and 4.12. Among variable cost components, the cost of raw material (coir fibre) for making ropes was Rs. 2100/quintal which constituted about 65.18 per cent of the total cost. The cost of labour wages was Rs. 800/quintal (24.83 per cent) which formed the next major component of variable cost. The procurement cost and machine running cost were Rs. 250/quintal (7.76 per cent) and Rs. 14.28/quintal (0.44 per cent) respectively.

Coir yarn is generally used as a raw material to produce coir mats, whose cost was around Rs. 4600/quintal (46.26 per cent). Mat making process requires skilled labour and intensive work so labour charges were the second most important cost. It was estimated around Rs. 4000/quintal (40.22 per cent). Interest on variable cost was 112.50 (1.13 per cent). Other variable cost components were procurement cost; stencilling cost, electricity and machine running cost which were Rs. 750/quintal (7.54 per cent), Rs. 185.00/quintal (1.86 per cent), Rs. 243.75/quintal (2.45 per cent) and Rs. 52.50/quintal (0.53 per cent) respectively.

Coir rugs use yarn as its raw material and its cost is Rs. 4600/quintal which constituted 46.39 per cent of variable cost. Labour charges were second highest because coir rugs require labour intensive work and it was around Rs. 4000 (40.33 per cent). Interest on variable cost was Rs. 112.50 (1.13 per cent). Other variable cost components were procurement cost, stencilling cost, electricity and machine running cost which were Rs. 750/quintal (7.56 per cent), Rs. 180.00/quintal (1.82 per cent), Rs. 206.25/quintal (2.08 per cent) and Rs. 67.50/quintal (0.69 per cent) respectively.

The main component of fixed cost was interest on the long term borrowing which was Rs. 166.67/quintal constituting 52.67 per cent. Depreciation on machinery and building was valued at 72.01/quintal (22.76 per cent). Other component was office and administrative charges which amounted to around Rs. 77.77/quintal (24.57 per cent). Total fixed cost of coir processing unit was Rs. 316.44/quintal.

Table 4.12 Fixed cost components for producing coir rope, mat, rug in the selected private sector

Si. no.	Cost components	Amount inrs. per quintal	Percentage
	<u>Fixed cost:</u>		
1.	Office and administrative expenses	77.77	24.57
2.	Depreciation on building and machinery	72.01	22.76
3.	Interest on long-term borrowings	166.67	52.67
		316.44	100

(Source: primary data)

Coir manufacturing units in the study area produce coir ropes from brown fibre and coir mats and rugs from coir yarn. It can be observed from the data collected from the private units that total 54 quintals of raw material are utilised in a month to produce 14 quintals of coir rope, 19.80 quintals of coir mat and 19.80 quintals of coir rug. These units work for 8 hours in a day and 15 days in a month which requires producing 53.6 quintals of coir products. As indicated in the table 4.13 total cost of the manufacturing was Rs. 23397.85/quintal and the gross return worked out to Rs. 28,349.00/quintal. Therefore a net return of Rs. 4951.15/quintal was obtained from the total production. The net returns from manufacturing coir rope, coir mat and coir rug worked out to Rs. 35, Rs. 120, Rs. 131 per kg of final product.

From the study of costs and returns of coir units it is concluded that those coir units producing coir fibre and yarn their net return is lower than other type of units i.e. Rs. 384.04. Private sectors producing coir mat, rope and rug have earned highest net return among all i.e. Rs. 1839.52. Net return by co-operative units is Rs. 1749.03. In the case of total cost of manufacturing, co-operative units have high cost of production than other sectors i.e. Rs. 8053.75.

4.3 IDENTIFICATION OF MARKETING CHANNELS OF COIR PRODUCTS AND THEIR EFFICIENCY

The success of any enterprise depends on how efficiently the ultimate products are marketed. In an unorganized market the interests of both the producers and consumers suffer, while those who dominate the marketing activity will immensely benefit. In the study area, coir traders directly procured coir products from processors. The produce is transported to other states through train or surface transport (trucks). Local vendors also take part in buying activity directly from manufacturers.

4.3.1 Marketing channels of coir products in study area

Marketing channel refers to the way through which the goods move from the producers' level to the ultimate consumers. It involves various trade practices and middlemen who facilitate the flow of goods and services from the point of production to the point of consuming centres. The channels are linked with the chains of intermediaries involved at various levels of marketing for smooth distribution of the products. The channels adopted are generally influenced by the factors like location of the producers and distance of the market centres. Among various products of coir, mat is taken in to consideration for analysis of price spread and evaluation of marketing efficiency of different channels.

Two marketing channels were identified in coir products marketing in the study area.

Channel I

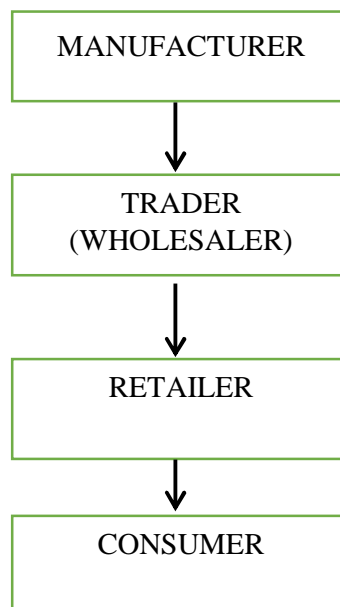


Fig: 4.1

Channel I consists of manufacturer, wholesaler, retailer and consumer. In this channel coconut growers sell coconut husk to the processors for producing coir fibre and coir yarn and the manufacturer of final products like ropes, mats and rugs purchases these intermediary products from many processors. The manufacturers make durable goods like rope, mat and rug from the intermediary products. They sell it to coir traders or wholesalers and the wholesalers in turn sell these products to the retailers.

Chapter II

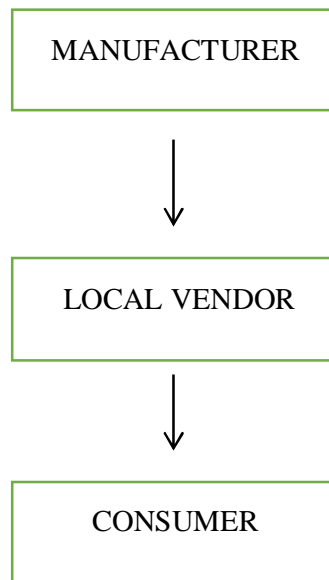


Fig: 4.2

Channel II consists of manufacturer, local vendor and consumer. In this channel manufacturing units of coir products sell products directly to local vendors. Local vendors procure coir products from the gate of the manufacturers and sell it directly to consumers.

4.3.2 Marketing costs, margins and price spread analysis

Channel I: The channel I comprised of manufacturer, wholesaler, retailer and consumer. Manufacturer received Rs. 12211.45/quintal of coir mat which is 71.83 per cent of consumer rupee. Manufacturing cost incurred on bagging was Rs. 15.26, loading and unloading cost was Rs. 2.49 per quintal of coir mats. All these costs accounted to Rs. 21.58/quintal which is 0.12 per cent of consumer rupee, and the net return to the manufacturer was Rs. 12,189.97 which is 71.70 per cent of consumer rupee.

The selling price of manufacturer to wholesaler was Rs 12211.45/quintal. Market cost incurred by the wholesaler included market fee (Rs.122.11), loading and

unloading charges (Rs.6.25), wastage (Rs.15.26), storage (Rs.4.21) and transportation cost (Rs.43.75). The total marketing cost incurred by wholesaler was Rs. 191.58 which is 1.12 per cent of consumer rupee. The margin obtained by wholesaler was Rs 2096.97/quintal of coir mat which is 12.34 per cent of consumer rupee.

Marketing cost of retailer includes market fee (Rs. 145.08), loading and unloading charges (Rs 2.12) and transportation cost of Rs 19.25/quintal of coir mat. Margin of retailer was Rs 2333.63/quintal of coir mats which is 13.72 per cent of consumer price. In this channel maximum margin was taken by retailer. Purchase price of consumer was Rs. 17000.00/quintal. Price spread in market channel I was Rs. 4,788.55/quintal of coir mat.

Table 4.14 Price spread analysis of channel I

Si. no.	Particulars	Rs./quintal	Percentage of consumer rupee
1.	Price received by manufacturer	12,211.45	71.83
	Marketing cost incurred by manufacturer		
i.	Bagging	15.26	0.090
		3.12	0.018
ii.	Loading and unloading	3.20	
iii.	Other expenses		0.019
2.	Total marketing cost of manufacturer	21.58	0.12
3.	Net price received by manufacturer	12189.87	71.70
	Wholesaler		
4.	Selling price of manufacturer or purchase price of wholesaler	12,211.45	71.83
	Marketing cost incurred by wholesaler		
i.	Loading and unloading	6.25	0.04
		4.21	0.02

ii.	Storage	15.26	0.09
iii.	Spoilage	43.75	0.26
iv.	Transportation cost	122.11	
v.	Market fee @ 1%		0.72
5.	Total marketing cost incurred by wholesaler	191.58	1.12
6.	Wholesaler's margin	2096.97	12.34
	Retailer		
7.	Selling price of wholesaler/purchasing price of retailer	14500	85.29
	Marketing cost incurred by retailer		
i.	Loading and unloading charges	2.12	0.01
ii.	Transportation cost	19.25	0.11
iii.	Market fee @ 1%	145.00	0.85
8.	Total marketing cost incurred by retailer	166.37	0.97
9.	Retailer's margin	2333.63	13.72
10.	Purchasing price of customer	17,000	100
11.	Total marketing cost (2+5+8)	379.53	
12.	Price spread	4788.55	
13.	Producer's share in consumer rupee		71.70

(Source: Estimates from the survey data of the study)

Channel –II: Channel II comprises of manufacturer, vendor and customer. This table indicates that the net share of the manufacturer in the consumer's rupee in this channel is 78.98 per cent. Manufacturer sells to the vendor at Rs.12211.45/quintal. The cost incurred by manufacturer on bagging, loading and unloading, transportation cost, spoilage and miscellaneous charges etc. was Rs.21.06/quintal which is 0.14 per cent of consumer's rupee. Thus, net price received by the manufacturer was Rs.12190.39.

The vendor sold directly to the consumer at Rs.14500.00/quintal. The cost incurred by vendor was, loading and unloading cost, storage cost, spoilage cost and transportation cost which was Rs.51.78/quintal i.e. 0.36 per cent of consumer's rupee. Thus, the margin retained by the local vendor amounted to Rs.2236.77/quintal which is 15.43 per cent of consumer's rupee. The price spread which shows the difference between price paid by the consumer and price received by the producer was Rs.2288.55/quintal.

Table 4.15 Price spread analysis of channel II

Si. no.	Particulars	Rs./quintal	Percentage of consumer rupee
1.	Price received by manufacturer	12,211.45	84.21
i.	Marketing cost incurred by manufacturer	15.26	0.10
	Bagging	3.12	0.02
	Loading and unloading	2.68	
	Other expenses		0.018
2.	Total marketing cost of manufacturer	21.06	0.14
3.	Net price received by manufacturer	12190.39	84.07
	Local vendor		
i.	Selling price of manufacturer/purchasing price of local vendor	12211.45	84.21
	Marketing cost incurred by vendor	3.45	0.024
		2.72	0.019
	Loading and unloading	8.11	0.05
	Storage	37.5	
iv.	Spoilage		0.26

v.	Transportation cost		
4.	Marketing cost by vendor	51.78	0.36
5.	Vendor's margin	2,236.77	15.43
6.	Purchasing price of customer	14500	100
7.	Total marketing cost (2+4)	72.84	
8.	Price spread	2288.55	
9.	Producer's share in consumer rupee		84.07

(Source: Estimates from the survey data of the study)

This above analysis clearly shows that longer the channel and more the number of intermediaries in the system, larger is the price spread and the share of producer in consumer rupee declines. It is also noticed that the share of manufacturer in consumer rupee declines with the increase in number of market intermediaries.

4.3.3 Marketing channel efficiency

Marketing efficiency measures to what extent the marketing agencies have been able to move the goods at minimum cost extending the maximum service from producer to final consumer. Marketing efficiency was calculated using Shepherds formula.

Table 4.16 Marketing efficiency of different marketing channels

Si. no.	Channel	Consumer price (v)	Total marketing cost* (i)	Marketing efficiency (m)
1.	Channel I	17000	4810.13	2.53
2.	Channel II	14500	2309.61	5.27

(Source: Estimates from the survey data of the study)

*Total marketing cost includes marketing cost and profit margin of intermediaries

Marketing efficiency (M) represents the effectiveness of a marketing system. The marketing efficiency for channel I and II was 2.53 and 5.27 respectively. It is concluded that the channel II is more efficient than channel I. This is because of the fact that channel-II involves only one intermediary and hence, this channel was more efficient than channel I. The channel I is seen as the less efficient because of presence of more intermediaries and multiple margins in the channel. However, it should also be

mentioned that all the quantity produced by coir units cannot be channelled through channel II, because of the limited capacity of local vendors to sell. So invariably the manufacturers have to route their outputs through channel I.

4.4 CONSTRAINTS IN PRODUCTION, PROCESSING AND MARKETING OF COIR PRODUCTS

Manufacturers and market intermediaries faced some problems while dealing with coir products at their level of operation. Survey has been done to identify these constraints.

4.4.1 Constraints in manufacturing of coir products

Constraints in coir products production were identified after discussion and interaction with the owner/manager of these units. The nine identified constraints were incorporated in the schedule for preferential ranking by the owners. Rank Based quotient technique has been used for quantification of rank and overall rank is presented in the table 4.17.

The constraints unavailability of raw material received the maximum rank based quotient(R.B.Q.) score of 94.8 and was ranked as the first constraint. Natural calamities in the coastal part of Odisha and disease pest infestations were the main reasons of unavailability of raw material.

The constraint non availability of labour was ranked as second constraint with RBQ of 83.0. Labour is utilised during husk processing and manufacturing of coir into various consumer durable products. Now-a-days it is difficult to find labour in study area. Two reasons behind this problem are migration of labour and Government's food security scheme.

Fluctuation of price of raw material was the third constraint. This problem is directly related to unavailability of raw material.High cost of raw material is the prime reason for high cost of final products. Likewise, low cost of raw material leads to less profit to coconut producers.

Lack of credit facility was ranked as the fourth major constraint. Allocation of credit totally depends on bank. Bank never wants to take risk by sanctioning loan to micro enterprises like coir industries. Bank interest rate is also high for these small village industries.High labour charges were the fifth most ranked constraint. Coir products like fibre, yarn, mat, rope and carpet require skilled labour. So the labour charges born by the industries were high.

Non supportive Government policies are ranked as the sixth constraints. Coir owners claimed that high tax rate, high duty on exporting were the areas of concern.Infrastructure problems like power cuts, high transportation cost and poor quality of raw material

were considered as the seventh, eighth and ninth constraints respectively by the manufacturer. Transport of product from manufacturing unit gate was not a big constraint.

4.4.2 Constraints in marketing of coir products

An opinion survey regarding the constraints in marketing of coir products was conducted among 10 selected market intermediaries. Sample includes five wholesalers and five local vendors.

High competition was the main constraint according to the market intermediaries and it received highest R.B.Q. score i.e. 64.4 and is given first rank among various constraints faced by intermediaries. Competition at wholesaler level causes difficulty in sourcing coir products at suitable price. There are chances of applying unfair trade practices by manufacturers. High price fluctuation was the second most important constraint and it got 59.3 R.B.Q. score. Price fluctuation of coir products is directly linked with price of sourcing of raw materials from the coconut growers. Price fluctuation is also linked with transportation cost, labour charges, tax structure of a particular state and demand fluctuations. Long distance to market was third most important constraint and it received R.B.Q. score of around 43.0. Wholesalers transporting coir products from Puri district of Odisha to distance markets like Bihar, Delhi, Pune and Dehradun face problems. They are bearing heavy cost in transporting and there are always chances of theft, wastages etc.

Demand fluctuations were ranked as fourth constraints and it scored 49.6 on R.B.Q. Demand for coir products is generally high during festival seasons and rest of the season it is at stagnant level. Co-ordination between market channel members was ranked as fifth constraint. There are chances of conflict of interest among different channel members in the matter of price, sourcing period and in fixing an appropriate selling price.

Strict deadline for delivery and non-availability of credit were placed as sixth and seventh constraints respectively. The wholesalers enter into contract with retailers to supply to them on a particular rate, and strict adherence to his date means that the manufacturer has to supply the material to the wholesalers in time. Wholesalers complained that the manufacturers do not strictly adhere to the supply dates and postponement is a habit. Credit unavailability is a major problem to wholesalers and native vendors.

Rejection based on quality by exporters and recovery of credit was given rank eighth and ninth among constraints. Rejection chances were less due to good quality and proper

packing of products. There are no credit deals between any two channel members, so there is no question arising on recovery of credit. Hence this constraint is at lower most position.

Table: 4.8 Variable cost components of the selected coir co-operative units

Si. no.	Cost components	Cost of production of coir rope (Rs. per quintal)	Percentage	Cost of production of coir mat (Rs. per quintal)	Percentage	Cost of production of coir rug (Rs. per quintal)	Percentage
1.	Cost of raw materials	2100.00	66.11	4600.00	46.51	4600.00	46.56
2.	Cost of procurement	250.00	7.86	750.00	7.58	750.00	7.59
3.	Cost of labour	800.00	25.19	4000.00	40.45	4000.00	40.48
4.	Stencilling cost (chemicals, printing etc)	-	-	187.60	1.89	184.80	1.87
5.	Cost of power	-	-	273.33	2.76	253.33	2.56
6.	Cost of machine running	26.67	0.84	80.00	0.81	93.33	0.94
		3176.66	100	9890.93	100	9881.46	100

Table: 4.10 Returns from coir rope, mat and rug produced in the co-operative sector

Si. no.	Particulars	Unit	Coir rope	Unit	Coir mat	Unit	Coir rug	Total
1.	Quantity manufactured	Kg/month	750	Kg/month	1500	Kg/month	750	
2.	Quantity produced	Kg/month	750	Kg/month	1485	Kg/month	742.5	
3.	Price	Rs./kg	35	Rs./kg	120	Rs./kg	131	
4.	Total cost	Rs./qt	3311.35	Rs./qt	10025.62	Rs./qt	10015.92	23353.12
5.	Gross return	Rs./month	26250	Rs./month	178200	Rs./month	97267.5	301717.5
6.	Gross return	Rs./qt	3500	Rs./qt	12000	Rs./qt	13100	28349.00
7.	Net return	Rs./qt	188.65	Rs./qt	1974.38	Rs./qt	3084.08	4995.88

Table: 4.13 Returns from coir rope, mat and rug produced in the private sector

S.i. no.	Particulars	Unit	Rope	Unit	Mat	Unit	Rug	Total
1.	Quantity manufactured	Kg/month	1400	Kg/month	2000	Kg/month	2000	
2.	Quantity produced	Kg/month	1400	Kg/month	1980	Kg/month	1980	
3.	Price	Rs./kg	35	Rs./kg	120	Rs./kg	131	
4.	Total cost	Rs./quintal	3,221.44	Rs./quintal	9,943.75	Rs./quintal	9916.25	23,397.85
5.	Gross return	Rs./month	49,000	Rs./month	2,37,600	Rs./month	2,59,380	545980.00
6.	Gross return	Rs./quintal	3500	Rs./quintal	12000	Rs./quintal	13100	28349.00
7.	Net return	Rs./quintal	278.56	Rs./quintal	2056.25	Rs./quintal	3183.75	4951.15

Table: 4.11 Variable cost components for producing coir mat, coir rope and coir rug in the private sector

Si. no.	Cost components	Cost of production of coir rope (Rs. per quintal)	Percentage	Cost of production of coir mat (Rs. per quintal)	Percentage	Cost of production of coir rug (Rs. per quintal)	Percentage
1.	Cost of raw materials	2100.00	65.19	4600.00	46.26	4600.00	46.39
2.	Cost of procurement	250.00	7.76	750.00	7.54	750.00	7.56
3.	Cost of labour	857.14	26.61	4000.00	40.22	4000.00	40.33
4.	Stencilling cost (chemicals, printing etc)	-	-	185.00	1.86	180.00	1.82
5.	Cost of power	-	-	243.75	2.45	206.25	2.08
6.	Cost of machine running	14.28	0.44	52.50	0.53	67.50	0.69
7.	Interest on working capital	-	-	112.50	1.14	112.50	1.13
		3221.41	100	9943.75	100	9916.25	100

Table 4.18 Constraints in manufacturing of coir products in Puri district of Odisha

SI. No.	Constraints	Rank									R.B.Q	Overa ll rank
		I	II	III	IV	V	VI	VII	VIII	IX		
		Number of respondents										
1	Unavailability of raw material	9	5	1	0	0	0	0	0	0	94.8	I
2	Fluctuation of price of raw material	2	3	6	2	2	0	0	0	0	78.5	III
3	Lack of Credit facility	0	1	1	7	4	2	0	0	0	63.0	IV
4	Poor quality of raw material	0	0	0	0	0	1	2	3	9	18.5	IX
5	High transportation cost	0	1	1	0	0	1	2	6	4	30.4	VIII
6	Non availability of labour	3	7	2	1	1	1	0	0	0	83.0	II
7	High labour charges	0	1	2	3	6	2	1	0	0	60.0	V
8	Infrastructure problems	1	0	2	1	3	3	4	1	0	47.4	VII
9	Non supportive Government policies	0	0	2	2	2	7	2	0	0	51.9	VI

(Source: Estimates from the survey data of the study)

Table 4.17 Constraints in marketing of coir products in Puri district of Odisha

Si. no.	Constraints	Rank									R.B.Q.	Overall rank
		I	II	III	IV	V	VI	VII	VIII	X		
		Number of respondents										
1	High Competition	7	3	0	0	0	0	0	0	0	64.4	I
2	Strict deadlines for delivery	0	0	0	0	2	5	2	1	0	28.1	VI
3	Non availability of Credit	0	0	0	0	1	1	6	2	0	23.0	VII
4	Rejection based on quality	0	0	0	0	0	0	3	4	3	14.8	VIII
5	Demand fluctuations	0	0	2	5	2	1	0	0	0	43.0	IV
6	High price fluctuations	3	5	1	1	0	0	0	0	0	59.3	II
7	Long distance to market	0	2	4	3	1	0	0	0	0	49.6	III
8	Recovery of credit	0	0	0	0	0	0	1	2	7	10.4	IX
9	Co-ordination between market channel member	0	0	1	3	4	2	0	0	0	39.3	V

(Source: Estimates from the survey data of the study)

Chapter V

SUMMARY AND CONCLUSION

5.1 SUMMARY

Coir or coconut fibre is a natural fibre extracted from the husk of coconut. Coconut belongs to the family Arecaceae (palm family). It is the only species in the genus *Cocos* and its botanical name is "*Cocos Nucifera*". The outer mesocarp comprises of fibrous materials which is known as fibre and pith. Coir fibre is used for making various coir products like ropes, mats, carpets etc. and pith is used for horticultural operations. As this coir fibre is golden in colour when cleaned after removing from the coconut husk, it's popularly known as 'The Golden Fibre'. Its large scale cultivation is concentrated in a few countries such as India, Sri Lanka, Indonesia and Philippines which together have recorded 76.26 per cent of the area harvested and 79.3 per cent of the world production of coconut (FAO statistics, 2013). The share of India in the world coconut production is about 16.28 per cent of the total production and 17.07 per cent in the area harvested.

The coir industry is mainly confined to major coconut growing states and union territories i.e. Kerala, Tamil Nadu, Odisha, Andhra Pradesh, Karnataka, Maharashtra, Goa, Assam, Andaman and Nicobar, Lakshwadeep. Out of 15060 number of units, Kerala had highest number of coir units i.e. 8790, whereas Tamil Nadu is in second position with 3824 coir units in the year of 2013-14.

Odisha occupied third position with 797 number of coir industries. But in terms of growth percentage from 2009-10 to 2013-14 Karnataka was at top position with 40.01 per cent growth, whereas Odisha was in second position with 18.07 per cent growth. Coir board has registered 797 units in the Odisha producing 6521 MTs of coir fibre a year, which are used for making various value-added coir products. In Odisha, districts like Puri, Khurda, Nayagarh, Ganjam, Keonjhar, Cuttack, Jagatsingpur, Kendrapara, Jajpur have presence of coir units.

The study on coir units was conducted in Puri district of Odisha. Fifteen coir units were selected (twelve co-operative units and three private units) as a sample from six panchayats where coir units were present. Ten marketing intermediaries were also taken as the sample to understand the existing marketing channel. The objectives of the study are:

1. To trace the origin, growth and development of coir industry at the national and state level.
2. To estimate the production costs and returns of various coir products manufactured.
3. To identify the existing marketing channels and marketing efficiency for different coir products.
4. To enumerate the major problems in production, marketing and provide suitable suggestions for improving the overall performance of coir industry.

Analysis of collected data was done by various tools and techniques. Compound Growth Rate (CGR) technique was used to examine the coir production in the study area. For analysis of all costs incurred in the production of coir products i.e. variable costs and fixed costs were considered to arrive at the total cost. Marketing efficiency was calculated by Shepherd's formula. Marketing cost, marketing margin and price spread of different channels were calculated using averages and percentages. For analysing constraints in production and marketing of coir products Rank Based Quotient method was used.

5.1.1 MAJOR FINDINGS OF THE STUDY

From 2009-10 to 2013-14 coir units in India increased from 14050 to 15060 i.e. an increase of 1010 units or an increase by 7.18 percent. Compound Growth Rate for coir units established in India from 2009-10 to 2013-14 is 1.8. South region has highest number of coir industries in India followed by eastern region, western region, central region, north region and north east region. South region has total of 14087 coir units i.e. around 93.53 percent of the total units in India. In Odisha from 2009-10 to 2013-14 coir units increased from 675 to 797 i.e. an increase of 122 units or 18.07 percent increase. Compound growth rate for units established in Odisha is 4.3 from 2009-10 to 2013-14.

Among the sample, six firms processed husk into coir fibre and coir yarn. For the production of coir fibre variable cost utilised by coir units is Rs. 1776.66/quintal, which is 30.11 per cent of total cost. Similarly for the production of coir yarn variable cost incurred was Rs. 3950.00/quintal which is 66.95 per cent of total cost. Total fixed cost incurred was Rs. 173.26/quintal. Gross return worked out to Rs. 6668.00/quintal. A net return of Rs. 768.08/quintal was obtained from the processing of coir husk into coir fibre and coir yarn.

Nine firms are involving in production of coir fibre and coir yarn to ropes, mats and rugs. Among nine firms three firms are in co-operative sector and six firms are private ownership firms. In the coir co-operative sector, for the production of coir ropes variable cost utilised by coir units was Rs. 3176.66/quintal, which is 13.60 per cent of total cost. Coir mats variable cost was 9890.93/quintal which is 42.35 per cent of total cost. Similarly for the production of coir rugs variable cost incurred was Rs. 9881.46/quintal which is 42.31 per cent of total cost. Total fixed cost incurred was Rs. 404.07/quintal which is 1.73 per cent of total cost. Gross return from ropes, mats and rugs were Rs. 3500/quintal, Rs. 12000/quintal, Rs. 13100/quintal respectively. So net return of Rs. 4995.88/quintal was earned by coir co-operatives by selling their coir products.

Six private coir units are involved in producing same products like coir co-operatives i.e. coir ropes, mats and rugs. For the production of coir ropes variable cost utilised by coir units is Rs. 3221.41/quintal, which is 13.76 per cent of total cost. Coir mats variable cost was 9943.75/quintal which is 42.49 per cent of total cost. Similarly for the production of rugs variable cost incurred was Rs. 9916.25/quintal which is 42.38 per cent of total cost. Total fixed cost incurred was Rs. 316.44/quintal which is 1.35 per cent of total cost. Gross return from ropes, mats and rugs were Rs. 3500/quintal, Rs. 12000/quintal, Rs. 13100/quintal respectively. So net return of Rs. 4951.15/quintal was earned by coir units functioning in the private sector by selling their products.

Coir products are marketed through two different market channels. Channel-I consists of manufacturer → wholesaler → retailer → consumer. Channel-II consists of manufacturer → local vendor → consumer.

In channel I, net price received by manufacturer was Rs. 12189.87 which is 71.70 percent of consumer price. Marketing cost incurred by manufacturer was Rs. 21.58. Wholesaler margin was Rs. 2096.97 whereas retailer's margin was Rs. 2333.63. Total marketing cost incurred by manufacturer, wholesaler and retailer was Rs. 379.53. Total price spread was Rs. 4788.55. Marketing efficiency of this channel was 2.53 which was lower than channel II.

In channel II, net price received by manufacturer was Rs. 12190.39 which is 84.07 percent of consumer price. Marketing cost incurred by manufacturer was Rs. 21.06. Local vendor's margin was Rs. 2236.77 and total marketing cost incurred by

manufacturer and local vendor was Rs. 72.84. Total price spread was Rs. 2288.55. Marketing efficiency of this channel is 5.27.

Constraints in manufacturing and marketing of coir products have been studied. In manufacturing related constraints unavailability of raw material secured highest Ranking Based Quotient score of 94.8. Non availability of labour, fluctuation of price of raw material, lack of credit facility, high labour charges, non-supportive Government policies, infrastructure problems, high transportation cost, poor quality of raw material are other constraints faced by farmers in production of coir products in decreasing order of their importance.

In marketing related constraints, high competition among traders scored highest R.B.Q. among other constraints. High price fluctuations, long distance to market, demand fluctuations, lack of co-ordination between market channel members, strict deadlines for delivery, non-availability of credit, rejection based on quality, recovery of credit are other constraints faced by farmers in production of coir products in decreasing order of their importance.

5.2 CONCLUSIONS

In the prevailing scenario of the coir industry, the present research is a humble attempt to throw light on certain specific areas of the working of the coir units located in Puri district of Odisha. The findings of the present study are not exclusive in nature, but are common to a majority of the units in India.

From the compound growth rates of coir units established, it is understood that number of coir units growth in total India is lower than coir units growth in Odisha. Coir fibre and yarn producing firm require less capital for its operation. As these coir units are present in village area, so it is easy to find labour. Raw material cost is lower than distance manufacturer. Coir rope, mat and rug are made from coir fibre and yarn. So fibre and yarn is used as raw material in ropes, mats and rugs producing firms. Cost of making coir mat is little higher than rugs and much higher than ropes. For every product raw material cost is higher than any other cost. So raw material price has profound impact on cost of production. Net return per quintal in coir products like ropes, mats and rugs is more than coir fibre and yarn. But quantity of production of coir fibre is more than others. So net returns per month in the production of fibre and yarn is

higher than other firms. But in terms of per quintal coir rug generates high income than others.

Marketing through Channel II is more efficient than channel I, this is because of the fact that channel II involves only one intermediary. However, it should also be mentioned that all the quantity produced by coir units cannot be channelled through channel II, because of the limited capacity of local vendors to sell. So invariably the manufacturers have to route their outputs through channel I.

Raw material unavailability, fluctuation of price of raw material and non-availability of labour are the main constraints opined from manufacturer. High price fluctuation high competition and distant market are major constraints faced by marketing intermediaries.

5.2.1 SUGGESTIONS

The researcher offers the following suggestions for the sustenance and improved performance of the coir units in Puri district of Odisha.

- Since the coir husk is the chief raw material for the production of coir fibre and other coir products, the state government as well as the Coir Board may encourage the coconut farmers to go for coconut plantation and husk production which will fulfil coir products manufacturing units demand.
- As the study area is facing the problems of unavailability of raw material, stocking them and utilising them in an effective manner may be an effective solution. This can also help in decreasing the impact of fluctuation of price of raw material.
- Coir units generally operate 15- 20 days per month. Monsoon period, labour shortage is the major problems in hindering production and capacity utilization. So appointment of permanent workers and building storing space and use of modern technology in processing is useful for capacity utilization and income generation.
- Commercial banks and other financial institutions can conduct “Coir Loan Melas” to meet the working capital requirements of the coir units.
- To tackle the constraints like high competition and price fluctuations market intermediaries can enter into agreement with manufacturers where quantity, quality and price are specified.
- Co-ordination between different market channel members is essential to overcome the issues like delivery date, prices and quantities etc.

- It is suggested that to popularize the unique properties of coir fibre and products. The Coir Board can open showrooms and conduct road shows besides organizing seminars, symposia and workshops in the study area. The entrepreneurs of the study area with the support of government assistance should also be encouraged to participate in the major exhibitions held at the National and International levels.

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