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Financial feasibility of grape wine production in Maharashtra—A.D. KAKADE, B.R. PAWAR AND S.S. BANKAR

Economics of poultry industries in Namakkal (T.N.)—C. PARAMASIVAN
Production and marketing of coir products in Karnataka: A case of Chitradurga district

G. NAGARAJA AND C. BASAVAIAH

ABSTRACT
India is one of the top producers and exporters of coir in international market. The Indian coir products are in great demand in the international market because of their special attributes like fitness, price, craftsmanship, quality, attractiveness and eco-friendly, biodegradable and renewable natural resources, non-pollutant, usage of the product is up to the expected level when compared to plastic and other environment pollutant items. The trend in the overall volume of sale of coir and coir products significantly changed from the sixties when more than 50 per cent of the production used to be exported. This paper focuses on coir products production in India and Karnataka and marketing channel, Marketing cost of coir products in special reference to Chitradurga District.


Key words : Marketing cost, Channel, Eco-friendly, Biodegradable, Coir fibre, Marketing margins

India is the largest coir producer in the world accounting for more than 80 per cent of the total world production of coir fibre. Coir, popularly known as the "Golden fibre" is a natural fibre extracted from fibrous husk of the coconut shell and is used to make a wide range of products such as ropes, mats, mattresses, baskets, brushes, brooms etc.

The preparation of coir is a lengthy process. The coconut husk is immersed in the water for about a month. The softened husk then is beaten to separate the fibre from the husk. This is then woven for making yarn, known as coir. While 50 per cent of coconut husk is used for coir, the remaining share is used as a fuel in rural areas. Kerala is the home of the Indian coir industry, particularly white fibre, accounting for 61 per cent of coconut production and over 85 per cent of coir products. Not more than 50 per cent of the coconut husk is used in the coir industry. The coir sector in India is very diverse and involves households Co-operatives, NGOs producers and exporters (Kumaraswamy Pillai, 2005).

Production of coir and coir products in India:

India is the major producer of coir among the coir producing countries in the world. Of the total world output, India's share is about 56 per cent. Coir Industry in India consists of two distinct segments namely, white fibre and brown fibre. Almost the entire production of white fibre in the country gets converted to coir yarn. About one-fifth of total production of coir yarn goes for the manufacture of valuable added products, namely, door mats, mattings etc. While 60 per cent of the production of finished products is exported, domestic market consumes the balance (Gandhi, 2008). Out of the total production of coir yarn, about 20 per cent gets converted to rope and cordages mainly for domestic consumption. The balance yarn retained as much as shared between the export and the domestic market. The brown fibre produced in the country is consumed for rope making, curbing, for rubberisation, stuffing upholstery etc., besides a part of production being spun into coir yarn for manufacture of finished products of coir one a limited scale and that too recently.

The main producing centres of coir in India are located in Karnataka, Tamil Nadu, Karnataka and Andhra Pradesh. Besides these states, small quantities of coir are produced in Orissa, West Bengal, Gujarat, Goa, Assam, Lakshadweep, Andaman Nicobar Islands, Pondicherry and Tripura. Production of white fibre is mainly concentrated in Kerala with a share of 90 per cent in the total output. Kerala has considered as the home of the
coir industry in India. Tamil Nadu is the second largest producer of coir in India contributing to 54 per cent of total production in the brown fibre.

The Coir Industry is divided into two major segments viz., white fibre and brown fibre. White fibre also known as retted fibre is extracted from the husk of matured coconut after a process known as rettings, which is more suited for spinning coir yarn. It is further processed to get products like doormats, mattings, carpets: geo-textiles, etc.

Brown fibre is also extracted from the coconut husk and is soaked in water for a number of days by mechanical means. It is further processed to get finished products like rubberized coir, curled coir, etc.

Objectives of the experiment was to study the quantum of coir production, to analyse the internal marketing for coir products in the district, to work out the marketing cost of coir products in the study and to give suitable suggestions for improve the coir products marketing in Karnataka.

METHODOLOGY

The study was conducted in coir product producing district of Karnataka viz., Chitradurga out of the 6 taluks in the district; three taluks covering three yarn making units, three rope making units and three units manufacturing mats and mattings were selected for detailed investigations.

Primary data were obtained from selected Taluks of rope making, yarn making and mats and matting manufacturing units and various market intermediaries, through personal interview with the help of pre-tested and structured questionnaires. The secondary data has been collected from Annual Reports of Coir Board, journals, magazines, news papers and from related published materials. Data from different websites also were collected. The obtained data have been analysed with the help of Compound Annual Growth Rate (CAGR). For finding out compound annual growth rate the following formula have been used:

\[
\text{Compound annual growth rate} = 1 + r = \log A - \log B
\]

Period of the study:

Generally, for analyzing the data in social research by using the tools such CAGR and trend analysis, minimum period of 10 years is required. Hence, the secondary data for 10 years from 2000-01 to 2009-10 have been taken into consideration.

ANALYSIS AND INTERPRETATION

The production of coir and coir products has been increasing from 2000-01. Among the products, coir products stand first in the rate of production. This production was 71,500 MT during the year 2000-01 and the same increased to 1.72,000 MT in 2007-08. Coir fibre and coir yarn production are gradually increasing during the period under study. There is slight fluctuation in the production of coir rope, curled coir and rubberized coir during the period from 2000-01 to 2007-08. The Compound Annual Growth Rate is the highest for coir products (13.2). This rate is only 0.19 for coir rope, which is the lowest among the products (Table 1).

Production of coir and coir products in Karnataka:

Karnataka is one of the important producers of coir in India where production is mainly confined to bristle and mattress fibre by mechanized process. Coir industry located in the Districts of Hassan, Tumkur, Chickamagalur, Mysore, Mandya, Bangalore, Chitradurga, Dakshina Kannada, Uttara Kannada and Bellary. About 190 units

<table>
<thead>
<tr>
<th>Year</th>
<th>Coir fibre</th>
<th>Coir yarn</th>
<th>Coir products</th>
<th>Coir rope</th>
<th>Curled coir</th>
<th>Rubberized coir</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-01</td>
<td>3,64,000</td>
<td>2,33,400</td>
<td>71,500</td>
<td>51,300</td>
<td>31,000</td>
<td>51,000</td>
</tr>
<tr>
<td>2001-02</td>
<td>3,69,400</td>
<td>2,36,900</td>
<td>72,575</td>
<td>52,700</td>
<td>31,800</td>
<td>51,800</td>
</tr>
<tr>
<td>2002-03</td>
<td>3,53,700</td>
<td>2,26,800</td>
<td>75,750</td>
<td>50,000</td>
<td>28,000</td>
<td>50,250</td>
</tr>
<tr>
<td>2003-04</td>
<td>3,64,000</td>
<td>2,32,500</td>
<td>77,900</td>
<td>50,000</td>
<td>29,500</td>
<td>51,000</td>
</tr>
<tr>
<td>2004-05</td>
<td>3,85,000</td>
<td>2,45,500</td>
<td>98,000</td>
<td>50,000</td>
<td>36,500</td>
<td>60,000</td>
</tr>
<tr>
<td>2005-06</td>
<td>4,10,000</td>
<td>2,70,000</td>
<td>1,20,000</td>
<td>50,000</td>
<td>38,000</td>
<td>62,000</td>
</tr>
<tr>
<td>2006-07</td>
<td>4,30,000</td>
<td>2,88,000</td>
<td>1,70,000</td>
<td>50,000</td>
<td>48,000</td>
<td>68,000</td>
</tr>
<tr>
<td>2007-08</td>
<td>4,37,800</td>
<td>2,90,000</td>
<td>1,72,000</td>
<td>50,000</td>
<td>49,000</td>
<td>70,000</td>
</tr>
<tr>
<td>2008-09</td>
<td>4,91,000</td>
<td>2,92,900</td>
<td>1,73,550</td>
<td>52,470</td>
<td>49,540</td>
<td>70,840</td>
</tr>
<tr>
<td>2009-10</td>
<td>4,96,000</td>
<td>2,96,000</td>
<td>1,85,000</td>
<td>53,000</td>
<td>50,220</td>
<td>70,820</td>
</tr>
<tr>
<td>CAGR</td>
<td>3.38</td>
<td>2.56</td>
<td>13.2</td>
<td>0.19</td>
<td>3.26</td>
<td>3.25</td>
</tr>
</tbody>
</table>

with an installed capacity of 31000 tonnes are working in the state. Total fibre production in the state is estimated at 20307 tonnes. The share of white fibre is only 86 tonnes. The state produced coir yari and products 908200 tonnes and 29663594 tonnes, respectively. About 208 coir units with an installed capacity of 38000 tonnes are working in the state during 2009-2010. Total fibre production in the state during 2009-10 was 21504.99 tonnes (Table 2).

Table 2 clearly indicates the production of coir products in Karnataka from 2005-06 to 2009-10. Table 2 shows that the coir products production from 2005-06 to 2009-10 in Karnataka. Fibre production showed an increasing trend from 18140 million tones to 20854 million tones during the same corresponding year. Yarn production during the same period showed growth oriented progress from 6.03 per cent to 11.29 per cent. Rope production also showed an increasing trend over the years under study. In 2005-06 rope production was 2850 million tonnes and in 2009-10 it increased to 3950 million tonnes.

Channels of coir products marketing

The marketing channel is the media through which products are move to the production place to consumption place. In the study area, the marketing channels were limited. The different channels through which coir products flow from the point of production to the point of consumption were identified and they are categorized in the following 4 channels:

The identified channels:
- Channel I : Manufacturer-Wholesaler-Consumer
- Channel II : Manufacturer-Wholesaler-Retailer-Consumer
- Channel III : Manufacturer-Retailer-Consumer
- Channel IV : Manufacturer-Retailer-Dealer-Consumer

Manufacturer-wholesaler-consumer:
In this channel, the wholesalers play an active role, most of the manufacturers do not undertake any of the marketing functions. Therefore, services of wholesalers, who look after the marketing, of goods to the consumers, act as intermediaries between producers and consumers.

Manufacturer-wholesaler-retailer-consumer:
This is the most common channel of distribution of coir products. In this channel wholesalers play a vital role, who have broad network of several retailers who sell to the consumers. Considerable quantities of mat and matting are sold in this channel. The services of the middlemen like wholesaler and retailer are found absolutely necessary for coir products. It is observed that both wholesaler and retailer act as link between producer and consumer.

Manufacturer-retailer-consumer:
In this channel, most of the products meant for personal consumption are bought from retailers. The manufacturers sell goods to few retailers who buy in large quantities. Furthermore, mat and matting are sold through big and well established retail organizations also. They deal directly with the manufacturers because they are in position to purchase the products in large quantities. It is also observed that large coir retailers are in a position to eliminate wholesaler from the chain of distribution by performing their services.

Manufacturer-retailer-dealer-consumer:
In this channel, retailers reach consumer through an intermediary viz., dealer. The dealer is a person or organization (including furnishing or decorative houses especially showrooms), who acts as an outlet for the mat and matting. The dealers are classified into two broad groups on economic strength and size of transaction undertaken viz., individual dealer and institutional dealer.

Individual dealer:
Individual dealers are small traders who market mats by the side of a busy road, generally near railway station or central bus stand or busy corners of the cities. It is observed that very little quantity of varied sizes of mats
are marketed here.

Institutional dealer:
Our field investigation revealed that large number of furnishing homes or decorative shops play an important role for high priced mat and mattings and rubberized products. Similarly, Caupery Emporium and Janatha Bazar of the State Government mostly cater the elite class and foreign tourists. Products marketed include decorative, luxury and fancy items made out of fibre.

Market cost:
The cost of marketing of coir products involved in moving the product from the point of production to the point of consumption i.e., the cost of performing the various marketing functions and of operating various agencies, i.e., transportation, storage, loading and unloading most importantly commission and others. When it comes to the market functionaries, the marketing cost involved extra margins of traders, market fee, labour cost, further transportation, grading etc. Marketing cost differs from person to person, place to place and time to time.

Table 3 clearly indicates the estimated cost of production and percentage of marketing cost of yarn.

There are three methods of manufacturing of yarn viz., hand spinning, wheel spinning and motorized ratt spinning of yarn as represented in Table 3. It reveals that though the percentage of marketing cost to sales, cost of production, total cost and profit were less in the hand spinning method adopted. It is very high in respect of alternative method of spinning yarn. It is also evident that almost 50 per cent of the profit estimated to be generated goes in the form of marketing cost in respect of wheel spun and motorized ratt spinning (Table 3).

Table 4 shows the estimated cost of production and marketing cost of rope produced and marketed in the district.

There are four different types of making of ropes as represented in Table 4. It reveals that the cost of production was almost uniform. However, it is clear from
<table>
<thead>
<tr>
<th>Particulars</th>
<th>Bulk (per kg)</th>
<th>Plough (per kg)</th>
<th>Misudukoke</th>
<th>Nelavu rope</th>
<th>Kalavadi rope</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Direct Expenses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material: At 25.00 per kg, 600 kg</td>
<td>15,000.00</td>
<td>15,000.00</td>
<td>15,000.00</td>
<td>15,000.00</td>
<td></td>
</tr>
<tr>
<td>Labour</td>
<td>1,000.00</td>
<td>1,750.00</td>
<td>1,550.00</td>
<td>2,400.00</td>
<td></td>
</tr>
<tr>
<td>Other Expenses</td>
<td>50.00</td>
<td>60.00</td>
<td>80.00</td>
<td>90.00</td>
<td></td>
</tr>
<tr>
<td>B. Indirect Expenses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rent</td>
<td>50.00</td>
<td>50.00</td>
<td>50.00</td>
<td>50.00</td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td>140.00</td>
<td>140.00</td>
<td>140.00</td>
<td>140.00</td>
<td></td>
</tr>
<tr>
<td>Other Expenses</td>
<td>30.00</td>
<td>30.00</td>
<td>30.00</td>
<td>30.00</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16,970.00</td>
<td>17,030.00</td>
<td>16,850.00</td>
<td>17,710.00</td>
<td></td>
</tr>
<tr>
<td>C. Total cost (A+B)</td>
<td>17,360.00</td>
<td>17,500.00</td>
<td>17,330.00</td>
<td>18,520.00</td>
<td></td>
</tr>
<tr>
<td>D. Sales Proceeds</td>
<td>3250.00</td>
<td>2000.00</td>
<td>1600.00</td>
<td>1500.00</td>
<td></td>
</tr>
<tr>
<td>Sales price per unit</td>
<td>7.00</td>
<td>10.00</td>
<td>12.00</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>A. Profit /Loss (D-C)</td>
<td>22,750.00</td>
<td>20,000.00</td>
<td>19,200.00</td>
<td>45,000.00</td>
<td></td>
</tr>
<tr>
<td>Percentage of marketing cost (MC) to cost of production</td>
<td>2.29</td>
<td>2.75</td>
<td>2.84</td>
<td>4.71</td>
<td></td>
</tr>
<tr>
<td>Percentage of marketing cost (MC) to total cost</td>
<td>2.24</td>
<td>2.68</td>
<td>2.76</td>
<td>4.37</td>
<td></td>
</tr>
<tr>
<td>Percentage of marketing cost (MC) to profit</td>
<td>7.23</td>
<td>18.8</td>
<td>25.66</td>
<td>6.80</td>
<td></td>
</tr>
<tr>
<td>Percentage of marketing cost (MC) to sales proceeds</td>
<td>1.71</td>
<td>23.5</td>
<td>2.50</td>
<td>2.70</td>
<td></td>
</tr>
</tbody>
</table>

Source: Field Investigation.

The table indicates that the marketing cost was low in respect of bullock and plough rope when compared to other varieties of ropes. Reasons being, the manufacturer himself carries out marketing activities by visiting nearby villages. Whereas in respect of Kalavadi rope, he depends on an indirect channel. Further, it is also shown that the percentage of marketing cost to profit was high in respect of Misudukoke and Nelavu rope.

Table 5 shows the estimated cost of production and marketing cost for fibre mat.

Table 5 shows that the transportation and commission payable to middlemen was significant in the total marketing cost. Further, nearly 50 per cent of the profit from the marketing of fibre mat was accounted for marketing cost.

Table 6 explains the estimated cost of production and cost of marketing of mats.

Table 6 shows that four types of mats were produced in the survey area. Further, it was observed that the percentage of marketing cost to sales proceeds was low in Sinnet mat when compared to other mats produced. Further, it is inferred that percentage of marketing cost to cost of production and total cost was low in case of Corridor mat which indicates the selection of direct channel of distribution.

Table 7 explains the estimated cost of production and cost of marketing of matting.

Table 7 shows that the cost of production and marketing cost was uniform in all the three types of matting. Further, it was observed that in case of two shaft matting, percentage of marketing cost to sales proceeds, cost of production, total cost and profit was low when compared to three and four shaft matting.

Constraints:
- Small percentage of fibre mat making units get assured market through the co-operatives.


<table>
<thead>
<tr>
<th>Particulars</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of production</td>
<td></td>
</tr>
<tr>
<td>1. Direct expenses</td>
<td></td>
</tr>
<tr>
<td>Material: Fibre consumed 100 Kg at Rs. 10 per kg</td>
<td>1000</td>
</tr>
<tr>
<td>Labour</td>
<td>320.00</td>
</tr>
<tr>
<td>Other expenses</td>
<td>40.00</td>
</tr>
<tr>
<td>2. Indirect expenses</td>
<td></td>
</tr>
<tr>
<td>Rent</td>
<td>70.00</td>
</tr>
<tr>
<td>Depreciation</td>
<td>35.00</td>
</tr>
<tr>
<td>Other Expenses</td>
<td>10.00</td>
</tr>
<tr>
<td>Total</td>
<td>1475.00</td>
</tr>
<tr>
<td>Marketing Cost</td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td>80.00</td>
</tr>
<tr>
<td>Storage (national)</td>
<td>30.00</td>
</tr>
<tr>
<td>Commission</td>
<td>100.00</td>
</tr>
<tr>
<td>Advertisement</td>
<td>40.00</td>
</tr>
<tr>
<td>Inspection and grading</td>
<td>36.00</td>
</tr>
<tr>
<td>Packaging</td>
<td>30.00</td>
</tr>
<tr>
<td>Total</td>
<td>288.00</td>
</tr>
<tr>
<td>Total cost (A+B)</td>
<td>1763.00</td>
</tr>
<tr>
<td>Sales proceeds</td>
<td>2100.00</td>
</tr>
<tr>
<td>Profit / Loss (D-C)</td>
<td>337.00</td>
</tr>
<tr>
<td>Percentage of marketing cost (MC) to cost of production</td>
<td>19.32</td>
</tr>
<tr>
<td>Percentage of marketing cost (MC) to total cost</td>
<td>16.33</td>
</tr>
<tr>
<td>Percentage of marketing cost (MC) to profit</td>
<td>85.47</td>
</tr>
<tr>
<td>Percentage of marketing cost (MC) to sales proceeds</td>
<td>13.71</td>
</tr>
</tbody>
</table>

Note: Selling price per fibre mat is taken at Rs. 180.00 standard size

Source: Field investigation.

- The inadequate and interrupted supply of power is a major constraint for the development and expansion of all stages in the industry. Due to frequent power cuts and non-availability of adequate supply of power for the new establishment, the expansion of units are greatly handicapped.

- At present the market for rope is located at the village level and this product is a rare commodity in semi-urban and urban areas.

- Lack of adequate transport and communication facility are also responsible for imperfections in the markets.

- The disadvantages of plastic rope shall be highlighted in order to make coir rope more popular.

- The Corporation and the Federation at present have neglected the production of various types of ropes leaving to the house-holds in the centres established by them. It is therefore suggested to invent blended ropes and make popular both for domestic and industrial purposes.

- In fact the production of mat and mattresses is relatively low in Karnataka, whereas the demand for products is very high.

- Our market survey indicates that only handful of small weavers have assured market and others have become hawkers selling their products (mat and mattresses) in the streets of Taluka and district headquarters.

- The power loom weavers have virtually no assured market for their products. The weavers, by and large, lack adequate marketing facilities.

- It is well known fact that lack of marketing information puts clogs into the marketing machinery by paralyzing the price structure.

- Owing to the lack of finance, particularly delivering units and small weavers are in bad state, for they depend on market intermediaries for finance. Financial problem is associated with the marketing problem.

Suggestions:

- The production of fibre which is now in the hands of private owners shall be taken over by the government.

- The sale of fibre should be on the basis of quality and not on the basis of quantity.

*Source: Institute of Commerce and Business Management*
<table>
<thead>
<tr>
<th>Particulars</th>
<th>Corridor mat</th>
<th>Spinnet mat</th>
<th>Mehta mat</th>
<th>Rope mat</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Cost of production</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Direct Expenses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material: Fibre consumed</td>
<td>100 Kg at Rs. 10 per kg</td>
<td>96.00</td>
<td>96.00</td>
<td>96.00</td>
</tr>
<tr>
<td>Labour</td>
<td>31.00</td>
<td>37.00</td>
<td>48.00</td>
<td>60.00</td>
</tr>
<tr>
<td>Other Expenses</td>
<td>11.00</td>
<td>10.50</td>
<td>6.00</td>
<td>9.00</td>
</tr>
<tr>
<td>2. Indirect Expenses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rent</td>
<td>10.00</td>
<td>10.00</td>
<td>10.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Depreciation</td>
<td>24.00</td>
<td>4.00</td>
<td>4.00</td>
<td>4.00</td>
</tr>
<tr>
<td>Other expenses</td>
<td>40.00</td>
<td>40.00</td>
<td>40.00</td>
<td>40.00</td>
</tr>
<tr>
<td>Total</td>
<td>212.00</td>
<td>197.5</td>
<td>204.00</td>
<td>219.00</td>
</tr>
<tr>
<td>B. Marketing Cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td>12.00</td>
<td>16.00</td>
<td>16.00</td>
<td>20.00</td>
</tr>
<tr>
<td>Storage (optional)</td>
<td>4.00</td>
<td>4.00</td>
<td>6.00</td>
<td>8.00</td>
</tr>
<tr>
<td>Commission</td>
<td>20.00</td>
<td>20.00</td>
<td>24.00</td>
<td>32.00</td>
</tr>
<tr>
<td>Advertisement</td>
<td>4.00</td>
<td>4.00</td>
<td>4.00</td>
<td>4.00</td>
</tr>
<tr>
<td>Inspection and grading</td>
<td>4.00</td>
<td>4.00</td>
<td>4.00</td>
<td>4.00</td>
</tr>
<tr>
<td>Packaging</td>
<td>8.00</td>
<td>8.00</td>
<td>8.00</td>
<td>8.00</td>
</tr>
<tr>
<td>Total</td>
<td>52.00</td>
<td>56.00</td>
<td>62.00</td>
<td>76.00</td>
</tr>
<tr>
<td>C. Total Cost (A+B)</td>
<td>264.00</td>
<td>253.50</td>
<td>266.00</td>
<td>295.00</td>
</tr>
<tr>
<td>Sales price per unit</td>
<td>80.00</td>
<td>110.00</td>
<td>82.00</td>
<td>105.00</td>
</tr>
<tr>
<td>D. Sales Proceeds</td>
<td>320.00</td>
<td>440.00</td>
<td>328.00</td>
<td>420.00</td>
</tr>
<tr>
<td>E. Profit / Loss (D-C)</td>
<td>56.00</td>
<td>186.50</td>
<td>62.00</td>
<td>125.00</td>
</tr>
<tr>
<td>Percentage of marketing cost (MC) to cost of production</td>
<td>24.52</td>
<td>28.35</td>
<td>30.39</td>
<td>34.70</td>
</tr>
<tr>
<td>Percentage of marketing cost (MC) to total cost</td>
<td>19.69</td>
<td>22.09</td>
<td>23.30</td>
<td>25.76</td>
</tr>
<tr>
<td>Percentage of marketing cost (MC) to profit</td>
<td>92.85</td>
<td>30.02</td>
<td>01.00</td>
<td>60.80</td>
</tr>
<tr>
<td>Percentage of marketing cost (MC) to sales proceeds</td>
<td>16.25</td>
<td>12.72</td>
<td>18.90</td>
<td>18.09</td>
</tr>
</tbody>
</table>

Note: Average price prevailing in Chitradurga district has been taken. Source: Field investigation

- The government should provide quality assurance of fibre to the spinning and manufacturing sections of the coir industry.
- Government should sell the fibre to the units on credit basis with the stipulation that such spinners/weavers have to clear the dues by selling their yarn and rope or mat and mattings only in fibre exchange market.
- The Government shall abandon the present system of marketing fibre in the open market and statutorily fixation of the price for the fibre particularly either by the Corporation or by Federation on the same lines as the agricultural price commission which fixes attractive prices for agricultural commodities in the country.
- The Federation/Corporation should be permitted to sell yarn only to the units engaged in knitting/weaving of coir products.
- The present marketing scheme of the federation should be strengthened and broad based to cover all handloom weavers in the State. This involves vigorous branch expansion policy of the federation.
- We suggest a few more marketing outlay both by the Federation and the Corporation in almost all Taluka headquarters which at present is selling products manufactured by them only in 21 showrooms established and maintained by them. As the Corporation has good expertise to develop an extensive network of distribution, the marketing of mat and mattings produced by the tiny weavers in the State can conveniently and profitably be brought under its fold. This would ensure organized marketing facilities to the tiny sector.
- The Karnataka Handloom and Handicrafts Corporation can also undertake the pooling of mat and mattings manufactured by small and scattered skilled weavers for export purposes.
- The Government should abolish the sales tax on coir products to arrest the diversion of trade, to check all-time high prices of coir products, to curb corruption.
and to eliminate harassment of weavers by the tax authorities.

- Our survey also revealed that new use of coir and vegetable dyes will definitely enhance the quality of the product. It is therefore, suggested to adopt the modern dyeing techniques.

- The Government should do some hard thinking on the removal of transport bottlenecks, perhaps, even by introducing a system of mobile transportation in coir markets.

- Our survey revealed that street vendors have been neglected who act as main market intermediaries in taluk level, both by the Federation and the Corporation.

It is therefore advised to appoint government sales representatives to augment the sale at all levels.

Conclusion:

India accounts for more than two-thirds of the world production of coir and coir products. The production coir fibre, which is now in the hands of private owners shall be taken over by the government, and also provide initiatives to promote good quality of coir products. Govt. of India and Karnataka should take necessary steps to promote coir products marketing i.e., provide tax concessions, tax exemption, provide concessional rate power supply and provide financial facility etc.

REFERENCES


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Uses Of Coir Fibre, Its Products & Utilization Of Geo-Coir In India

* Nagaraja. G
** Dr. C. Basavaiah

INTRODUCTION

Coir (from Malayalam kaya, cord) is a coarse fibre extracted from the fibrous outer shell of coconut, the fruit of Coconut tree (Cocos Nucifera L). This outer layer is called the coconut husk. The husk (exocarp) of the coconut consists of a smooth waterproof outer skin (epicarp) and fibrous zone (mesocarp). The mesocarp comprises of strands of fibre vascular bundles of coir embedded in a non fibrous paranchymatous “corky” connective tissue usually referred to as pith; which ultimately becomes coir dust. Chemically, coir fibre is composed of a highly lignified form of cellulose (cellulose lignin complex), which accounts for its colour, harshness and relative brittleness in comparison with pure cellulose fibre. The bulk of the ground tissue of the husk, on the other hand, is made up of pectin and hemicelluloses. i.e. pectin and hemicellulose act as a spongy binding material that bind the large fibre cells together to make up the husk. Coconuts coir is in great demand unaccounted of natural resilience, durability, resistance to dampness and other properties. [3] Grading of coir is based on its fibre length, colour, resilience and general cleanliness in relation to the quantity of pith present. All coir fibre falls into two distinctly different categories, white coir and brown coir -the differences are due to the conditions of husk used, the method of extraction, the physical properties as well as in the uses. Coir obtained from immature green coconut is generally known as white fibre and is finer than the brown fibre obtained from seasoned coconuts, which has lost their green colour (>12 months). Both types of fibre are widely used and each has its own unique distinct type of application. Coconuts are the seed of the palm trees, these palms flower on a monthly basis and the fruit takes 1 year to ripen. A typical palm tree has fruit in every stage of maturity. A mature tree can produce 50-100 coconuts per year. Coconuts can be harvested from the ground once they have ripened and fallen or they can be harvested while still on the tree. A human climber can harvest approximately 25 trees in a day, while a knife attached to a pole can up the number to 250 trees harvested in a day. Monkeys can also be trained to harvest the coconuts, but this practice is less efficient than other methods. Green coconuts, harvested after about six to twelve months on the plant, contain pliable white fibres. Brown fibre is obtained by harvesting fully mature coconuts when the nutritious layer surrounding the seed is ready to be processed into copra and desiccated coconut. The fibrous layer of the fruit is then separated from the hard shell (manually) by driving the fruit down onto a spike to split it (Dekhusing). A well seasoned husker can manually separate 2,000 coconuts per day. Machines are now available which crush the whole fruit to give the loose fibres. These machines can do up to 2,000 coconuts per hour.

BROWN FIBRE

The fibrous husks are soaked in pits or in nets in a slow moving body of water to swell and soften the fibres. The long bristle fibres are separated from the shorter mattress fibres underneath the skin of the nut, a process known as wet-milling. The mattress fibres are sifted to remove dirt and other rubbish, dried in the sun and packed into bales. Some mattress fibre is allowed to retain more moisture so that it retains its elasticity for ‘twisted’ fibre production. The coir fibre is elastic enough to twist without breaking and it holds a curl as though permanently waved. Twisting is done by simply making a rope of the hank of fibre and twisting it using a machine or by hand. The longer bristle fibre is washed in clean water and then dried before being tied into bundles or hunks. It may then be cleaned and ‘hackled’ by steel combs to straighten the fibres and remove any shorter fibre pieces. Coir bristle fibre can also be bleached and dyed to obtain hanks of different colours.

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WHITE FIBRE

The immature husks are suspended in a river or water-filled pit for up to ten months. During this time, micro-organisms break down the plant tissues surrounding the fibres to loosen them - a process known as retting. Segments of the husk are then beaten by hand to separate out the long fibres which are subsequently dried and cleaned. Cleaned fibre is ready for spinning into yarn using a simple one-handed system or a spinning wheel.

COIR FIBRE PRODUCTION

Production of coir fibre in India in years 2001 to 2006 are indicated in Table 1

Table: 1

<table>
<thead>
<tr>
<th>Year</th>
<th>Brown Fibre</th>
<th>White Fibre</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-02</td>
<td>2,47,600</td>
<td>121,800</td>
<td>369,400</td>
</tr>
<tr>
<td>2002-03</td>
<td>2,41,700</td>
<td>122,000</td>
<td>363,700</td>
</tr>
<tr>
<td>2003-04</td>
<td>2,52,000</td>
<td>112,000</td>
<td>364,000</td>
</tr>
<tr>
<td>2004-05</td>
<td>2,52,000</td>
<td>92,000</td>
<td>345,000</td>
</tr>
<tr>
<td>2005-06</td>
<td>3,14,000</td>
<td>96,000</td>
<td>410,000</td>
</tr>
</tbody>
</table>

Source: Coir Board, Kochi.

Table 1 shows The Coir Fibre Production. It is clear that the Coir Fibre Production has increased over the years. In 2001-02, Total production was 3,96,400 million tonnes and 4,10,000 million tonnes in 2005-06. Brown Fibre production has increased over the year, it was 2,47,600 million tonnes in 2001-02 and 3,14,000 million tonnes in 2005-06. White Fibre production has decreased over the years, In 2001-02, white fibre production was 1,21,800 million tonnes and in 2005-06, it was 96,000 million ton.

COIR DUST

Coir dust or coconut pitch is the by-product of the coir fibre industry, the disposal of which was a problem. It is about 70% of the weight of the coconut husk. It is described as brown spongy particles of low weight, which falls out when the fibre is shredded from the husk. It is rich in lignin and tanin and it also has lignocellulosic bonds, which is resistant to microbiological attack. There is a high demand for coir dust otherwise termed as coir fibre pitch or coir peat, in the market as moisture retaining agent in potting mixtures for horticultural and agricultural applications and is also used for producing domestic or industrial fuel, for producing hard boards, thermal insulator, hydro seeding and shotcreting.

COIR FIBRE PROCESSING

FIBRE EXTRACTION

The effectiveness of the wet processes such as bleaching and dyeing of coir, are strongly dependent on the procedures used to extract fibres from the husks and the pre-treatment given the fibres. Both state-of-the-art and commonly used technologies for fibre extraction are described below.

TRADITIONAL FIBRE EXTRACTION

The traditional production of fibres from the husks is a laborious and time-consuming process. This is highly polluting of surface waters and results in the accumulation of large dumps of pitch. After manual separation of the nut from the husk, the husks are processed by various retting techniques, and generally in ponds of brackish waters (for three to six months) or in salt backwaters or lagoons. This requires 10-12 months of anaerobic (bacterial) fermentation. By retting the fibres, they are softened and can be decorticated and extracted by beating, which is usually done by hand. After backling, washing and drying (in the shade), the fibres are loosened manually and cleaned. The fibre thus obtained is of highest quality and can be used for spinning and weaving purposes. Retted fibres from green husks are most suitable fibers for dyeing and bleaching. For the production of more coarse brown yarns, shorter periods of retting may be applied. Yarn thus obtained can be used extensively in geo-textiles. Alternatively, mechanical process can be applied by using either defibrering or decorticating equipment to process the husks which require only five days of immersion.
in water tanks. Crushing the husk in abreaker 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. The quality of the fibre is greatly affected by these procedures.

**GREEN DECORTICATIONS AND ENZYME TREATMENTS**

New environmentally friendly methods of fibre production are of interest. These can be locally exploited on relatively small-scale scale, and have the potential to produce a more constant quality of fibres. Novel developments by the Central Coir Research Institute (CCRI), Kalavoor using a biotechnological approach with specific microbial enzymes, for example, have substantially reduced the retinging time from three to five days. High quality fibre production has been maintained. Similar protocols can be developed to enhance the properties of the fibres with 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). Similar technology has been developed by NOVO-Nordisk to reduce the amounts of chemicals required to produce wood chips or fibreboard.

**FIBRE PROPERTIES**

The different fibre extraction processes yield different qualities of fibres: generally 56-65 per cent long fibres of over 150 mm (up to 350 mm staple length) and 5-8 per cent short fibres of under 50 mm. The fibre fineness varies between 50 and 300 µm. The fibres are composed of individual fibre cells of about 1 mm length and 5-8 µm diameters. The tensile strength of coir is relatively low when compared to sisal or abaca fibres, but it is less impaired by immersion in water. Coir fibre has the advantage of stretching beyond its elastic limit without rupturing, as well as having the power to take up a permanent stretch. Its resistance to microbial degradation and salt water is unique. The comparison chemical composition of coir and other plant fibres is given in Table 2. It is observed from Table 1 that brown coir fibres contain relatively low amounts of cellulose (35 per cent) but have high lignin content (32 per cent). This exceptionally high lignin content implies that the available dyeing and bleaching techniques for textile fibres cannot simply be transferred to coir.

Table 2: Comparison Of Chemical Composition Of Coir With Other Plant Fibres

<table>
<thead>
<tr>
<th>FibreWare</th>
<th>Cellulose</th>
<th>Hemi cellulose</th>
<th>Pectin</th>
<th>Lignin</th>
<th>Extractives</th>
<th>Fat &amp; percent of dry weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotton</td>
<td>91.8</td>
<td>6.3</td>
<td>-</td>
<td>-</td>
<td>1.1</td>
<td>0.7</td>
</tr>
<tr>
<td>Flax (bast)</td>
<td>71.2</td>
<td>18.5</td>
<td>2.0</td>
<td>2.2</td>
<td>4.3</td>
<td>1.6</td>
</tr>
<tr>
<td>Hemp (bast)</td>
<td>78.3</td>
<td>5.4</td>
<td>2.5</td>
<td>2.9</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Jute (bast)</td>
<td>71.5</td>
<td>13.3</td>
<td>0.2</td>
<td>13.1</td>
<td>1.2</td>
<td>0.6</td>
</tr>
<tr>
<td>Coir (brown)</td>
<td>35.6</td>
<td>15.4</td>
<td>5.1</td>
<td>32.7</td>
<td>3.0</td>
<td>-</td>
</tr>
<tr>
<td>Coir (white)</td>
<td>36.7</td>
<td>15.2</td>
<td>4.7</td>
<td>32.5</td>
<td>3.1</td>
<td>-</td>
</tr>
<tr>
<td>Coir pith</td>
<td>19.9</td>
<td>11.9</td>
<td>7.0</td>
<td>53.3</td>
<td>0.3</td>
<td>-</td>
</tr>
<tr>
<td>Sisal</td>
<td>3.1</td>
<td>13.3</td>
<td>0.9</td>
<td>11.0</td>
<td>1.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Abaca</td>
<td>73.2</td>
<td>21.7</td>
<td>0.6</td>
<td>5.6</td>
<td>1.6</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Source: Coir Board

Table 3: Physical Properties of Coir Fibre

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length in inches</td>
<td>6-8</td>
</tr>
<tr>
<td>Density (g/cc)</td>
<td>1.40</td>
</tr>
<tr>
<td>Tenacity (g/Tex)</td>
<td>10.0</td>
</tr>
<tr>
<td>Breaking elongation %</td>
<td>30</td>
</tr>
<tr>
<td>Diameter in mm</td>
<td>0.1 to 1.5</td>
</tr>
<tr>
<td>Rigidity of Modulus</td>
<td>1.8924 dyn/cm²</td>
</tr>
<tr>
<td>Swelling in water (diameter)</td>
<td>5 percent</td>
</tr>
<tr>
<td>Moisture at 65% RH</td>
<td>10.50 percent</td>
</tr>
</tbody>
</table>

Source: Coir Board

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COIR FIBRE - USES & APPLICATIONS

1) TRADITIONAL APPLICATIONS
- Mattress Filling - Mattress Fibre
- Automobile Upholstery - Twisted Fibre
- Shipping Industry And Fishing - Coir Ropes
- Tube Well Filter - Coir Twine/Coir Yarn
- Hop Industry - Coir Twine
- See Weed Cultivation - Coir Twine

2) NEWLY DEVELOPED APPLICATIONS
EROSION CONTROL
- Road Embankments
- Bio Engineering
- Soil Erosion Control
- Capping Land Fills
- Mining And Wastelands
- Stream Bank Stabilisation
- Golf Courses
- Landscaping
- Ski Slopes And Ski Lift Tracks
- Re-Vegetation
- Shoreline stabilization
- Roof Greening
- Woven Geotextiles
- Stitched erosion control blankets-Soil bags
- Mattress
- Reed beds
- Reed beds
- Coco Gabions

3) HORTICULTURAL APPLICATIONS
1) Growing medium
2) Seed Germination and Root Development
3) Soil Conditioner
   a. Coir Pest/Dust
   b. Coir Bio Fibres
   c. Coconut Husk Chips
4) Plant Nurseries and Re-vegetation
   i. Coir pillows
   ii. Grow Bags
5) Growing Aid For Climbing Plants
6) Indoor and Out Door Horticultural Décor
   - Coco Poles
   - Coir pots/ Jiffy Pots
   - Coir Bio Fibre
   - Coir Pest/Dust
7) Root Balling and Transferring
   - Root Balls

4) FARM LANDS/CATTLE & HORSE
PIGGERIES AND HORSE RACE TRACKS
- Coir Bio Fibre/Coir Dust

5) SOUND BARRIER APPLICATIONS
- Stitched Blankets
- Coir Blankets

6) FENCES & PARTITIONING
    Coco Pole fences

GEO-COIR

Geo-coir geo-textiles are made of pure coir obtained from the husk of the coconut without adding any synthetic material - a cent percent natural product. This is Geo-coir's most essential, distinctive feature compared to conventional geo-textiles used for soil stabilization, reinforcement, landscaping and erosion control. As soon as they have accomplished their function as slope protection/erosion control, (10 years depending upon application), Geo-coir geo-textiles decompose and fit into the natural ecological cycle, thus fulfilling the claim for indulgent, near-natural landscaping. Apart from decomposing after doing their job, coir fibers have other enormous advantages compared with synthetic fibers. They are highly water absorbent, while retaining their physical properties. They store up water and build an ideal microclimate for the seeds underneath. Of all natural fibers, coir has the greatest tensile strength.

ADVANTAGES
- Handles high water velocities.
- UV resistant vs. synthetics.
- High tensile strength.
- Biodegradable after 4-10 years.
- Water absorbent.
- Accepts hydro seeding.
- Plant through fabric.
- Flexible - easy to handle.

USES
- Stream/river bank stabilization
- High altitude - short growing season.
- Silt fencing.
- Construct vegetated geo-grids.
- Re-vegetation projects.
- Effective on all soil surfaces.
- Proven effective on 1:1 slopes and those greater than 1:1.
CONCLUSION

In India, Coir fibre can be used in every way as mentioned above. We have plenty of coconut trees in coastal areas of India. So, a large amount of coir fibres can be collected, processed & used in India. Government of India and Coir Board can take necessary steps to encourage the use of this fibre and its products especially for stabilization, reinforcement, landscaping and erosion control.

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