

An economic analysis of production performance of coir fibre industry in Western region of Tamil Nadu

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ABSTRACT

Coir is a unique natural fibre used in diverse applications of great economic importance. In the coir fibre sector, Tamil Nadu occupies the first place as being the single largest producer of brown fibre contributing to about 65 percent of total production in India (Directorate of Industries and Commerce, Government of Tamil Nadu). The production performance of coir fibre industry have been examined using primary data collected from 60 sample coir fibre producers and the tobit model has been employed to analyse the factors that actually contributed to more fibre production. Garrett's ranking technique was used to identify the constraints faced by the coir fibre producer. For every rupee of investment in coir fibre processing, about Rs 1.17 was obtained as returns, indicating its profitability. The factors such as education, experience, total investment, total electricity cost, quality maintenance, auto feeder and husk auto feeder were found to be significantly and positively influencing the more production of fibre. The labour hour was found to be negatively influencing for more production of fibre. The traders were the main source of information which were ranked first followed by neighbours and internet. The major problems faced the coir fibre producers were inadequate labour and limited electricity. The study has clearly brought out the urgency of developing innovative technologies to reduce the labour usage and uninterrupted electricity which lead to maximum production and compete in international markets.

KEY WORDS : Coir fibre, Costs and returns, Production, Garrett's ranking technique, Tobit model

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Coir is a unique natural fibre used in diverse applications of great economic importance. This wonder fibre is extracted from coconut husk and is spun into coir yarn and a number of other value added products such as coir rope, mats, mattings, rugs, carpets etc. are produced. Coir fibre is also used in combination with other natural or synthetic fibres or materials such as rubber or synthetic polymers for making products that are better suited for specific uses. Tamil Nadu is

the second largest producer of coir fibre in the country. In the brown coir fibre sector, Tamil Nadu occupies the first place as being the single largest producer of brown fibre contributing to about 65 per cent of total production in India (Directorate of Industries and Commerce, Government of Tamil Nadu).

Coir industry is concentrated in the districts of Coimbatore, Dindigul, Kanyakumari, Vellore, Thanjavur, Tirunelveli, Madurai, Theni, Salem, and Dharmapuri. Coir industry is very important to western region of Tamil Nadu, as it contributes to its rural economy, besides providing employment to the rural people, particularly for women. The percentage of husk utilisation by the coir industry in Tamil Nadu is estimated at 48% as against the national average of 40%. Realizing the importance of coir fibre production, the present paper has examined the production performance of coir fibre industry in western region of Tamil Nadu and to

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assess the constraints faced by the industry and suggestions for improvement.

METHODOLOGY

The study was conducted in western region of Tamil Nadu. According to the coir board statistics (Coir board report, 2012), nearly 35 per cent of the coir and coir products unit were located in the Coimbatore district and Tirupur district. In western region of Tamil Nadu, Pollachi and Udumalpet talukas have major coconut producing areas and also major coir producing industries. The list of coir fibre industries were obtained from Coir Board, Pollachi. Based on the list, 60 coir fibre industries were selected at random by using simple random sampling method. Data were collected during November to December 2012. The data thus collected were processed using tabular analysis, Tobit model and Garrett's ranking techniques.

Costs and returns :

Costs :

To estimate the cost of production of coir fibre, cost approach method was used. The total cost was classified into fixed costs and variable costs. Fixed cost included interest on fixed capital, permanent labour charges depreciation on fixed investment and others. The variable costs included cost on raw materials, power charges, human labour charges, machine labour charges and interest on working capital and others.

Returns :

Gross return was obtained by adding the total value of produce. Net income was estimated as the difference between

the gross return and total cost of production.

ANALYSIS AND DISCUSSION

Data were analyzed by using tabular analysis, costs and returns, ranking techniques and tobit analysis.

Socio-economic characteristics of sample owners :

The socio-economic profile including age, education, experience and occupational level, etc. of sample firms were assessed and are presented in Table 1.

Among the 60 samples, 43 per cent were in the age group of 30-40 years followed by 40 per cent of the owners were in the age group of 41-50 years. Regarding education, it was found that 63 per cent of the owners had studied up to college level education followed by secondary school education (28 %). Thus, mostly college level educated owners were involved in coir fibre industry in the study area. This clearly indicated that highly educated respondents were involved in innovative thinking and risk taking. The overall experience about the coir industry of sample owners showed that about 52 per cent of the respondents had more than 10 years of experience in the field of coir industry followed by 25 per cent of the respondents having the experience of 6-10 years. It showed that educated and experienced persons are interested in further modernization of the unit. The distribution of average annual income among the respondents showed that about 55 per cent of the respondents were in the income category of Rs.10.1 – 20 lakhs followed by the income category of more than Rs.20 lakhs. The results revealed that most of the respondents were earning more income through modernization of the industry.

Table 1 : Socio economic characteristics of sample coir fibre producers

	Particulars	Numbers	Per cent
Age (years)	30-40	26	43.33
	41-50	24	40.00
	51-60	8	13.34
	Above 60	2	3.33
	Total	60	100.00
Education	Primary	5	8.33
	Secondary	17	28.33
	College	38	63.33
	Total	60	100.00
Experience	Less than 5 years	14	23.33
	6-10 years	15	25.00
	More than 10 years	31	51.67
	Total	60	100.00
Income (in Rs.)	Less than 10 lakhs	13	21.67
	10.1-20 lakhs	33	55.00
	More than 20 lakhs	14	23.33
	Total	60	100.00

Occupational status :

The occupational status of sample respondents would influence the pattern of investment in fibre industry. In the study area, major occupation of sample respondents was fibre unit.

Type of ownership :

Type of ownership would influence the decision making authority of the firm. Most of the sample respondents were single proprietor. Single proprietorship would influence for quick decision making, innovation and risk taking of the business.

Structure of processing cost and returns of coconut husk into coir fibre :

The structure of costs incurred by processors in converting raw husk into coir fibre is presented in Table 2. The total processing cost of coconut husk into coir fibre was worked out to Rs.11, 286 per ton, out of which Rs 10,468 (92.74%) was variable inputs, while Rs. 819 (7.26 %) was

fixed costs. The cost of raw material (Rs.4705.88) formed major (41.69%) component of total processing of coconut husk into coir fibre followed by cost of machine labour (22.65 %), power charges (9.54 %) and wages for human labour (8.92 %).

As indicated in Table 3 that from 11,765 kg of husk processed for one tonne of coir fibre was produced in the processing unit. The average gross returns per unit was to Rs. 2,57,09,820/- per year from coir fibre, considering average market price of Rs. 12.00 per kg of coir fibre and by product Re.1 /- per kg of coir pith. Thus, the average net returns per year amounted to Rs. 36, 87,779/-. In other words, Rs. 1,890 was obtained as net returns for every tonne of coir fibre. Further, for every rupee of investment in coir fibre processing, about Rs. 1.17 was obtained as returns, indicating its profitability.

Maximizing the coir fibre production :

The coir industry has been significantly export-oriented and a valuable foreign exchange earner. On an average about

Table 2 : Structure of processing cost of coir fibre

Sr. No.	Particulars	Amount (Rs./year)	Amount (Rs./tonne)	Percentage
A	Fixed cost			
1.	Interest on Fixed Capital	939620.50	481.56	4.27
2.	Depreciation	278311.11	142.64	1.26
3.	Salaries to permanent employees	360000.00	184.50	1.63
4.	Others	20000.00	10.25	0.09
	Total fixed cost	1597931.61	818.95	7.26
B	Variable cost			
1.	Cost of raw material	9182078.43	4705.88	41.69
2.	Power charges	2100978.75	1076.77	9.54
3.	Wages for human labours	1963817.92	1006.47	8.92
4.	Machine labour (including quality maintenance)	4988936.88	2556.87	22.65
5.	Interest on working capital	2188297.437	1121.52	9.94
	Total variable cost	20424109.41	10467.51	92.74
	Total cost	22022041.02	11286.46	100.00

Table 3 : Returns structure of coir fibre processing

Sr. No.	Particulars	Amount (Rs./year)		Amount (Rs./tonne)	
		Quantity	Value	Quantity	Value
1.	Quantity of husk purchased (Raw material)	2,29,55,196	91,82,078.43	11764.706	4,705.88
2.	Quantity of coir fibre produced	19,51,191.7	2,34,14,300.00	1000 kg of fibre	12,000.00
3.	Coir pith	22,95,519.6	22,95,519.61		
	Total cost		2,20,22,041.02		11,286.46
	Gross return		2,57,09,819.61		13,176.47
	Net return (per year)		36,87,778.59		
	Net return (per month)		3,07,314.88		
	Net return (per ton)				1890.01
	BC ratio		1.17		1.17

20 per cent of the total coir products manufactured are exported from the country, mainly to China, West European countries, United States of America (USA) and Canada. The fibre industries are interested to maximize the production of fibre through modernized technology. So, there is a need to identify which factors contribute more for maximizing the production. The Tobit regression analysis was undertaken to identify the factors that actually contributed to more production achieved by the coir fibre industry. The results of the Tobit regression are presented in Table 4.

Table 4 : Results of Tobit regression on factors influencing the coir fibre production

Sr. No.	Variables	Coefficients
1.	Constant	397.6325
2.	Education	78.11099*
3.	Experience	10.49526**
4.	Total investment	5.432026***
5.	Total labour	-2.17497***
6.	Total EB cost	2.484724***
7.	Quality maintenance	0.077247***
8.	Auto feeder	327.2744***
9.	Husk auto feeder	191.8827*
10.	Cement drying yard	28.35957
	Log likelihood function	-392.03983

*, ** and *** indicate significance at of value at P = 0.05, 0.01 and 0.1, respectively

It could be inferred from the results of Tobit model (Table 4) that all the independent variables had the expected sign. The factors such as education, experience, total investment, total electricity cost, quality maintenance, auto feeder and husk auto feeder were found to be significantly and positively influencing the more production of fibre. The labour hour was found to be negatively influencing for more production of fibre. For every increase in level of modernized technologies like auto feeder and husk feeder adoption would result in an increase of Rs.327.27 and Rs.191.88 as value addition per ton production of fibre and also it will reduce the labour usage.

Sources of market information :

Coir fibre industry receives market information from multitude of sources such as traders, neighbours, internet, coir board and media. The informations were ranked by using Garrett's ranking technique and are presented in Table 5. The traders were the main source of information which were ranked first by the sample respondents followed by neighbours and internet. The coir board and media are the comparatively least source of market information to the sample respondents. Thus, it could be concluded that coir board and media take

Table 5 : Source of market information (rank)

Sr. No.	Particulars	Garrett score	Rank
1.	Traders	63	I
2.	Neighbours	58	II
3.	Internet	54	III
4.	Coir board	39	IV
5.	Media	31	V

more initiative to upgrade the market information for the benefit of coir industry.

Problems faced by coir fibre units while processing the husk into fibre :

The constrained faced by coir fibre units are ranked by using Garrett's ranking technique which are presented in Table 6. It could be inferred that the most of the respondents faced the major problems were inadequate labour and limited electricity supply followed by inadequate quantity of water, coconut husk counting, unexpected machine repair, raw material price fluctuation, less price realisation and others. Labour shortage is the major problem in all the industries. The government should motivate the people to do work by providing uninterrupted electricity to maximize the production and compete in international markets. Coconut husk is one of the raw materials for bio power plant. Bio power plant units are ready to purchase the raw materials at higher cost. So, there is a possibility of price fluctuation and sometimes it may lead to non-availability of coconut husk. Coconut husk is the only raw material for fibre industry. Government should take initiative to solve the problem and also uplift the fibre industry.

Table 6 : Problems faced by coir-fibre unit

Particulars	Garrett score	Rank
Inadequate labour	70	I
Limited hours of electricity	63	II
Inadequate quantity of water	54	III
Difficulty in coconut husk counting	50	IV
Unexpected machine repair	49	V
Raw material price fluctuation	46	VI
Less price realisation	42	VII
Husk to be used for bio power plant	38	VIII
Fire accident	35	IX

Rangasamy and Dhaka (2007) had also studied the constraints faced by co-operative and private doing plants and Meipporoul and Bhanumathy (2010) worked on export performance of coir products in India.

Conclusion :

It has been found that majority of the sample respondents were in the age group of 30-40 years and completed college level education. Regarding experience, 52 per cent of the respondents had more than 10 years of experience in the field of coir industry. It showed that educated and experienced persons were interested in further modernization of the unit. Majority of the respondents were single proprietor and their main business was fibre industry. It would influence the quick decision making, innovation, risk taking of the business and pattern of investment in fibre industry.

The average costs worked out to per tonne of coir fibre production was Rs. 11,286 /- , the gross return per tonne of coir fibre was Rs. 13,176 /- and the net return per tonne of coir fibre was Rs. 1890 /- . For every rupee of investment in coir fibre processing, about Rs 1.17 was obtained as returns, indicating its profitability. The Tobit regression analysis was undertaken to identify the factors that actually contributed to more production achieved by the coir fibre industry. The factors such as education, experience, total investment, total electricity cost, quality maintenance, auto feeder and husk auto feeder were found to be significantly and positively influencing the more production of fibre. The labour hour was found to be negatively influencing for more production of fibre. For every increase in level of modernized technologies like auto feeder and husk feeder adoption would result an increase of Rs.327.27 and Rs.191.88 as value addition per ton production of fibre and also it will reduce the labour usage. The traders were the main source of information that were ranked first by the sample respondents followed by neighbours and internet. The major problems faced the coir fibre producers were inadequate labour and limited electricity followed by

inadequate quantity of water, coconut husk counting, unexpected machine repair, raw material price fluctuation and less price realisation.

The policy implications emerging out of the study are outlined below :

- Automatic baling machine and coir fibre drier are the most important and needed technologies for maximising the fibre production, minimisation of cost of production and reduce the labour usage.
- To develop the innovative technologies for more production, reduce the labour usage and further modernization.
- The Government should motivate the employees to do the work in an efficient manner.
- Provision for uninterrupted electricity which lead to maximum production and compete in international market.
- There is a need to disseminate information on international markets, price behaviour and other trade matters to fibre producer for their betterment.

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