Cost and Returns Analysis of Coir Products: A Case of East Godavari District of Andhra Pradesh

J. J. Nehru Naik[1*] and G. Nagaraja[2]

[1]*FDP Research Scholar, Department of Economics, Andhra University, Viskhapatnam-530003, India.*
[2]*Department of Economics, Andhra University, Viskhapatnam-530003, India.*

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Case Study

ABSTRACT

This study was analysing the cost and returns of coir products in East Godavari District of Andhra Pradesh. The production performance of coir industry have been examined. The primary data collected from 40 sample coir products manufacturing units/ producers and Cobb Douglas model has been employed to analyse the factors that actually contributed to more coir products production. The study mainly shows that the increasing returns to scale all coir products manufacturing units. The study also shows that the expected gross revenue of coir products were to increase 1.12, 1.00, 1.11, 1.01 and 1.02 percent for coir fibre, yarn, rope, mattings and mats respectively these units when the variable inputs in the production functions are at once increased by one percent. Further, finally comparative cost and returns medium sized coir units are in better economic and institutional conditions comparative to small size of coir units in terms of profitability.

_____

*Corresponding author: E-mail: jnehrunaik@gmail.com;
E-mail: nagarajag918@gmail.com;

1. INTRODUCTION

The development of coir agro-based industry is the sine qua non for 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. Over seven lakhs employees, of whom a majority are from rural areas and economically weaker sections of the society (Coir Board Annual Report 2014-15). India accounts for more than two thirds of the world production of coir and coir products and also largest consumer. It is an important cottage industry contributing significantly to the economy of major coconut growing states and union territories i.e. Kerala, Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra, Goa, Orissa, Assam, Andaman & Nicobar, and Lakshadweep and Pondicherry. The study mainly focused on cost and returns and also efficiency of coir products production in East Godavari District of Andhra Pradesh.

2. REVIEW OF LITERATURE

Varkey's V.O [1] Doctoral thesis was focused on the Coir Co-operatives with special reference to Primary Coir Vyavasasya Co-operatives. The study made an attempt to analyse the organization and development of Coir co-operatives, the working of coir co-operatives operating at different stages, the role played by different developmental agencies, besides analyse particular problems and working conditions of primary Coir Vyavasaya Co-operatives. The socio-economic profile of the coir workers in both co-operative and private sector were also analysed in his study.

Shah [2], Ojha [3], UM Shah [4], Anjaneyulu and Deshinamurthy [5], Sarngadharan [6], Thondarson [7] have categorically stated that for the multi-dimensional development of co-operatives, professionalism is to be brought in all the functional areas of co-operatives. They have emphasised that co-operatives should develop their own cadre of personnel who are not only professionally competent but also are dedicated to the cooperative values and have stake in the co-operative organisation.

Kulandaiswamy [8], Co-operative Fortnightly [Editor] [9], Taimni [10] Hynniewta [11], have in their writings expressed concern over the undue influence of bureaucracy in co-operative management. They have viewed that the statutory power granted to the Registrar of co-operative societies enables him to step into the shoes of the Board of Directors of the societies and wield virtual monopoly power which is against the cherished role of a friend, philosopher and guide to the Co-operative Movement. Since continuous progress of co-operatives should be based on local initiative, democratic leadership and managerial competence, it was suggested that deliberate and concerted efforts are called for to de-officialise and de-bureaucratise the co-operative movement.

Gopalan Nair [12], while explaining the relevance of coir industry and coir co-operatives in Kerala finds out that the traditional decentralised nature of the coir industry was the major factor that retarded effective quality control. He also has given a brief picture of the technology improvement attempted by the Coir Board and observes that it was essential for reducing human drudgery to a great extent. He identifies that co-operatives are the best agency for effective transformation of results of research to the industry.

Malik [13], examined the historical background of coir co-operatives in Kerala. According to him until the starting of coir development scheme during 1950- 51, there were no organised 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 (not existing now) 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.

Rajendran [14] in his article stresses the importance of the export of coir products and the necessity of getting direct financial assistance to coir vyavasaya societies from Coir Board for the revival of sick coir vyavasaya co-operatives (1990). He also suggests that for boosting domestic market for coir goods the rebate details must be published through the media.

C. Chandaran [15] 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 centers, there had been an unprecedented increase in the price of fibre.

Raju and Kakadia [16] their study mainly focsed on marketing of groundnut in Gujarat state observed that the marketing cost for farmers was Rs. 5.07 and Rs. 4.99 per quintal at Gondal and Rajkot markets, respectively. However, in the case of traders, the marketing cost was found to be Rs. 9.49 and Rs. 9.42 per quintal at Gondal and Rajkot markets, respectively.

Mittendof and Hertag [17] analyzed the marketing costs and marketing margins for major food items in developing countries and found that marketing costs and margins of rice accounts for about 30-60 per cent of consumer's price while those for wheat were 60-80 per cent and maize 40 per cent. They suggested that marketing costs and margins should be reviewed regularly to assess their effect on producers share in consumer's rupee.

Hassan and Raghuram [18] their study mainly emphasised on cashew processing and marketing in Prakasam district of Andhra Pradesh observed that drying of nuts, roasting of nuts, shelling of nuts, drying of shelled kernels, peeling of kernels, grading of kern els, cond itioning of graded kernels and packing of graded kernels were the major stages in processing. The study reported that 80 kg of raw nuts when processed resulted in 22 kg of kernels (28 per cent recovery). The processor incurred Rs. 87.06 as processing cost of which labour constituted 56.6 per cent and material cost stood at 42.5 per cent. Within the labour cost shelling accounted for higher proportion followed by peeling.

2.1 Objectives

The main aim of the study is to analyse costs and returns of coir products in East Godavari district. The specific objectives are:

1. To estimate the cost and returns structure of coir products production for small and medium units
2. To analyse the resource productivity and to examine the resource-use efficiency of different factor inputs used in coir products production.

3. METHODOLOGY

East Godavari District was selected for the present study since the coir products production occupied first place in industry in this district. The study is based on Primary Data, primary data was collected from East Godavari District of Andhra Pradesh. The study was covered three mandals namely, Amalapuram, Ambajepeta and Rajol of East Godavari District of Andhra Pradesh. The total number of the coir fibre manufacturing units were running in East Godavari district are 150 coir units (East Godavari District Hand Book 2014-15). Out of 150 coir manufacturing units 40 coir units were selected. Primary data have been collected mostly by direct contact method. The Questionnaires and schedules have been used for whole study. Primary data have been collected from the selected three mandals with pre-structured questionnaires on a number of major aspects of Cost and returns of coir products. Primary data was collected during the year 2014- 2015.

To find out input and output relationship (Returns to scale) the Cobb- Duggles function production function has been used. Cobb Doughlas function was applied to find the effect of fixed cost and variable cost on coir products production and also to find the return to scales of producers.

3.1 Cobb- Douglas

To find out the input variables which influence the gross revenue of coir fibre and thereby resource productivity of coir fibre production at small and medium category of coir units, a Multiple Log- Linear Regression Model of the Cobb - Douglas type production function of the following form has been used.

$$\ln Y = {}_0 + {}_1 \ln X_1 + {}_2 \ln X_2 + {}_3 \ln X_3 + {}_4 \ln X_4 + {}_5 \ln X_5 + U$$

Where,

0 = intercept
y = Estimated gross revenue of coir products in rupees
X_1 = human labour in rupees
X_2 = raw material (Husk) in rupees
X_3 = unretting in rupees
X_4 =Power in rupees
X_5 =Machine running in rupees
U = Disturbance term
i = regression (slope) co-efficient
i = 1,2........5.

The return to scale is estimated by the elasticity co-efficient at the production function for the small, medium and pooled category of units.

The field survey was carried out from October 2014 to May 2015 to collect primary data. This period October to May sidered the main season for the coir industry of the study area.

4. RESULTS AND DISCUSSION

Table 1 shows that the total revenue, marketing cost, net return and also net profit from Coir products namely coir fibre, yarn, rope, mattings and mats. The gross revenue was at Rs. 30, 270.96 and Rs. 31, 809.96 the small and medium sized units respectively per 100 bundles of coir fibre. The net profit stood at Rs. 1,187.15 and Rs. 5,039.73 for the small and medium sized units respectively. The medium sized units by showing an increased net profit of Rs. 3,852.73 indicating increased profitability than the small units in the study area. The gross returns worked out after deducting the marketing costs were Rs. 25,995 and Rs. 27,829.96 for the small and medium sized units respectively. The net return earned by the medium sized units was more by Rs.5, 563.33 (Rs.4,174.4 - Rs.9,737.73).

The gross revenue was at Rs. 2,750 and Rs. 2,890 for small and medium sized units respectively per 100 kg of coir yarn (Table 1). The net profit stood at Rs. 238 and Rs.740 for small and medium sized units respectively. The medium sized units by showing an increased net profit of Rs. 502 indicating increased profitability than the small units in the study area. The gross returns worked out after deducting the marketing costs were Rs. 2,358 and Rs. 2,625 for the small and medium sized units respectively. The net return earned by the medium sized units was more by Rs. 585 (Rs. 360 - Rs. 945). Finally, it could be concluded that the comparative advantages of medium sized coir units over small sized units in terms of profitability.

The gross revenue was at Rs. 6,148 and Rs. 6, 464 for the small and medium sized units respectively per 200 kg of coir rope. The net profit stood at Rs. 463 and Rs. 944 for the small and medium sized units respectively. The medium sized units by showing an increased net profit of Rs. 481 (Rs. 463 - Rs. 944) indicating increased profitability than the small units in the study area. The gross returns worked out after deducting the marketing costs were Rs. 5,463 and Rs. 5,854 for the small and medium sized

units respectively. The net return earned by the medium sized units was more by Rs. 556 (Rs. 873 - Rs. 1429).

The gross revenue was at Rs. 356 and Rs. 392 for small and medium sized units respectively per 4 coir mattings (Table 1). The net profit stood at Rs. 60 and Rs. 136 for small and medium units respectively. The medium sized units by showing an increased net profit of Rs. 76 (Rs. 60 - Rs. 136) indicating increased profitability than the small units in the study area. The gross returns worked out after deducting the marketing costs were Rs. 291 and Rs. 337 for the small and medium sized units respectively. The net return earned by the medium sized units was more by Rs. 91 (Rs. 118 - Rs. 209).

The gross revenue was at Rs. 1,195 and Rs. 1,250 for the small and medium sized units respectively per 10 coir mats. The net profit stood at Rs. 280 and Rs. 472 for the small and medium sized units respectively. The medium sized units by showing an increased net profit of Rs. 192 (Rs. 280 - Rs. 472) indicating increased profitability than the small units in the study area. The gross returns worked out after deducting the marketing costs were Rs. 1,075 and Rs. 1,152 for the small and medium sized units respectively The net return earned by the medium sized units was more by Rs. 187 (Rs. 530 - Rs. 717). Finally, Table 1 shows that the comparative advantages of medium sized coir units over small size units in terms of profitability in all coir products.

Comparative cost and returns analysis of all coir products of small and medium sized coir units presented in Table 2. The input-output ratio in terms of the variable cost is the highest in the case of the medium sized coir units. The ratio for the medium units was 1.53, 1.56, 1.32, 1.68 and 2.64 coir fibre, yarn rope, mattings and mats respectively. whereas it is 1.19, 1.18, 1.19, 2.63 and 1.97 for the small units all coir products namely, coir fibre, yarn rope, matting's and mats respectively.

In the case of the total cost, the input-output ratio for the small units worked out to 1.03, 1.11, 1.09, 1.25 and 1.35 for all coir products, whereas it is 1.20,1.39,1.19,1.67 and 1.62 for all coir products for the medium sized coir units. It also shows that each rupee spent leading to a benefit of Rs. 0.04, 0.11, 1.09, 0.092 and 0.35 for small sized units for all products respectively and Rs. 0.21, 0.39, 0.192, 0.67 and 0.66 for the medium sized units

Table 1. Revenue/income from coir products production

Sl. no	Particulars	Coir fibre		Yarn		Coir Rope		Mattings		Mats	
		Small units amount Rs.	Medium units amount Rs.	Small units amount Rs.	Medium units amount Rs.	Small units amount Rs.	Medium units amount Rs.	Small units amount Rs.	Medium units amount Rs.	Small units amount Rs.	Medium units amount Rs.
1	Gross revenue	30,270.96	31,809.96	2750	2890	6148	6464	356	392	1195	1250
2	Less: Marketing cost	4,275	3,980	392	265	685	610	65	55	120	98
3	Gross return	25,995	27,829.96	2358	2625	5463	5854	291	337	1075	1152
4	Less: variable cost	21,820.71	18,092.23	1990	1680	4590	4425	173	128	545	435
5	Net return	4,174.4	9737.73	360	945	873	1429	118	209	530	717
6	Less: Fixed cost	2987.2	4,968	130	205	410	485	58	73	250	275
7	Net profit	1,187	5039.73	238	740	463	944	60	136	280	472

Source: Primary data

Table 2. Cost and returns of coir products production for both types of coir units

Sl. no	Particulars	Coir fibre		Yarn		Coir Rope		Mattings		Mats	
		Small units amount Rs.	Medium units amount Rs.	Small units amount Rs.	Medium units amount Rs.	Small units amount Rs.	Medium units amount Rs.	Small units amount Rs.	Medium units amount Rs.	Small units amount Rs.	Medium units amount Rs.
1	Gross returns	25,995	27,829.96	2358	2625	5463	5854	291	337	1075	1152
2	Total variable cost	21,820.71	18,092.23	1990	1680	4590	4425	173	128	545	435
3	Net returns over variable cost	4,174.4	9737.73	360	945	873	1429	118	209	530	717
4	Total cost	24807.94	23060.23	2120	1885	5000	4910	231	201	795	710
5	Net return over total cost	1,187	5039.73	238	740	463	944	60	136	280	472
6	Input- output ratio (Gross return/Variable cost)	1.19	1.53	1.18	1.56	1.19	1.32	1.68	2.63	1.97	2.64
7	Input- output ratio (Gross return/Total cost)	1.03	1.20	1.11	1.39	1.09	1.19	1.25	1.67	1.35	1.62
8	Cost benefit ratio (Net return over total cost/Total cost)	0.047	0.21	0.11	0.39	0.092	0.192	0.25	0.67	0.35	0.66

Source: Primary data

Table 3. Estimated values of co-efficient and related statistics of Cobb-Douglas production function model for all coir products

Particulars	Coir fibre	Coir yarn	Coir rope	Coir mats	Coir mattings
Intercept	12.98	12.56	14.26	15.16	13.39
Labour (X_1)	0.178*	0.147*	0.121*	0.040*	0.129*
	(0.287)	(0.214)	(0.321)	(0.129)	(0.365)
Raw materials (X_2)	0.087*	0.073*	0.032*	0.520*	0.029*
	(0.135)	(0.120)	(0.126)	(0.123)	(0.127)
Unretting (X_3)	0.298	0.284	0.325	0.018	0.012
	(0.636)	(0.6145)	(0.612)	(0.421)	(0.425)
Power charges (X_4)	0.369*	0.314*	0.541*	0.014*	0.019*
	(0.035)	(0.026)	(0.214)	(0.214)	(0.223)
Machine operating	0.025*	0.018*	0.016*	0.019*	0.017*
Charges (X_5)	(0.236)	(0.215)	(0.217)	(0.214)	(0.223)
R2	0.89	0.85	0.91	0.71	0.68
F value	35.87**	32.65**	35.14**	33.21**	34.25**

Source: Computed data
*Indicates that the co-efficient are statistically significant at the 5 per cent level
** Indicates that the co-efficient are statistically significant at the 1 per cent level

respectively all coir products. Further, finally comparative cost and returns medium sized coir units are in better economic and institutional conditions comparative to small size of coir units in terms of profitability.

Table 3 shows that the explanatory variables included in the model for coir fibre, yarn, rope, mats and mattings have indicated greater variation in gross income of coir products. In case of coir fibre the regression co-efficient of multiple determination (R^2) was 89 per cent indicated that five variables included in the model namely labour, (X_1), raw material (X_2), unretting (X_3), power (X_4) and machine operating charges (X_5) were 0.178, 0.087, 0.298, 0.369 and 0.025 per cent respectively gross income could be increased, if one per cent increase investment of these variables. The regression co-efficient of the variable unretting is positive but found to be insignificant among the significant variable labour had a great influence on gross income of coir yarn production in the industry. The F-value of the equation for coir yarn product was 35.87 per cent which was significant at 1 per cent level.

In case of coir yarn the regression co-efficient of multiple determination (R^2) was 85 per cent indicated that 5 variables included in the model namely labour, (X_1) raw material, (X_2) power (X_3) and machine operating charges (X_4) were, 0.147, 0.073, 0.314 and 0.018 per cent respectively gross income could be increased. It one per cent increase investment of these variables. The regression co-efficient of the variable unretting is positive but found to be insignificant among the significant variable labour had a great influence on gross income of coir fibre production in the industry. The F-value of the equation for coir yarn product was 32.65 per cent which was significant at 1 per cent level.

Further table also indicate the explanatory variables considered for the analysis for the coir rope had indicated greater variation in gross income of coir rope products. In case of coir rope the regression co-efficient of multiple determination (R^2) 91 per cent of variation in gross income of the coir rope. The regression co-efficient of variables namely labour, (X_1) raw material, (X_2) power (X_3) and machine operating charges (X_4) were significant at 5 per cent level. It indicating one per cent increase in the investment on these resources. The gross income could be increased 0.121, 0.032, 0.541 and 0.016 per cent respectively. The regression co-efficient of unretting is positive found to be insignificant. Among the all variable labour had a greater influence on gross income of coir rope production. The F-value shows that significant at 1 per cent level.

All the five explanatory variables which are responsible for 71 per cent for growth income of coir mats (Table 3). The regression co-efficient of labour, raw materials, power and machine running charges were statistically significant at 5 per cent level and they were positively impact on gross income of coir mats. It indicating 1 per cent increase in the investment on these resources. The gross income could be increased 0.040, 0.520, 0.014, 0.017 and 0.019 per cent increase gross income respectively. The variable unretting (0.018 per cent) was found to be positive but non-significant as per F-value given above table significant at 1 per cent level.

Table 4. Returns to scale for different types of coir products

Sl. no	Size of coir units	Sum of elasticity co-efficient (Returns to scale)	Types of return to scale
1	Coir fibre units	1.1236	Increasing returns
2	Coir yarn	1.0035	Increasing returns
3	Coir rope	1.1132	Increasing returns
4	Coir mats	1.0121	Increasing returns
5	Coir matting's	1.0231	Increasing returns

Source: Primary data

In case of coir mattings the explanatory variables considered above table R^2 indicates that 68 per cent variable in the dependent variables are explained in the model. The independent variable viz., labour, (X_1) raw material, (X_2) power (X_3) and machine operating charges were significant at 5 per cent level and they positively impact on gross income of coir mattings. If, one per cent increase independent variables could increase gross income by 0.129, 0.029, 0.019 and 0.017 per cent respectively. In case of coir mattings the labour, had a greater influence on gross income of coir producer the F-value shows that the significant at 1 per cent level.

Table 4 shows that the increasing returns to scale all coir products manufacturing units, the return to scales are 1.1236, 1.0035, 1.1132, 1.0121, 1.0231 for coir fibre, coir yarn, rope, mats and coir mattings manufacture units respectively. Table indicates the type of returns to scale increasing returns to scale all five types of coir products respective of size, further table shows that the expected gross revenue of coir products were to increase 1.12, 1.00, 1.11, 1.01 and 1.02 percent for these units when the variable inputs in the production functions are at once increased by one percent.

5. SUGGESTIONS

- ❖ The State government should establish a separate agency called 'fibre exchange centre' and abolish the private dehusking units, as these owners are producing on casual basis without giving supporting price for the husk to the coconut growers.
- ❖ The entire licensing of fibre extraction units shall be reviewed, prevent the operation of ghost or pseudo-defibering units in fibre extraction operation.
- ❖ Financial assistance for coir unit's owners must be available from various private/ public sector financial institutions without much delay and at nominal charges of interest.

6. CONCLUSION

Coir industry has very wider scope for future prospects in terms of availability of coconut husks, providing employment, reducing unemployment, generating income, alleviating of poverty, improving standard of living of the people in the district, creating great demand in both internal as well as external markets, and promoting country's economy. The study mainly shows that the increasing returns to scale all coir products manufacturing units, the return to scales are 1.1236, 1.0035, 1.1132, 1.0121, 1.0231 for coir fibre, coir yarn, rope, mats and coir mattings manufacture units respectively. The study shows that the expected gross revenue of coir products were to increase 1.12, 1.00, 1.11, 1.01 and 1.02 percent for these units when the variable inputs in the production functions are at once increased by one percent. Further, finally comparative cost and returns medium sized coir units are in better economic and institutional conditions comparative to small size of coir units in terms of profitability. The present study is mainly emphasised on the cost and returns of coir products in East Godavari District of Andhra Pradesh. The policy implications suggested, if properly implemented may result in increased prospects and revenue for the nation.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Varkey's VO. Development and working coir co-operatives in Kerala. Ph.D Thesis Submitted to the University of Poona; 1981.
2. Shah UM. Co-operative development-challenges and opportunities. Co-operative Perspective. April-June and July Sept. 1988;23:12-20.

3. Ojha G. Guidelines for development of co-operatives. [Seminar Proceedings], Co-Operative Perspective, Vol. 23 Nos. 3 & 4, October-December 1988 and January-March. 1989;87-94.

4. Shah UM. Co-operative development-challenges and opportunities. Co-operative Perspective, Vol. 23, April-June and July Sept. 1988;12-20.

5. Anjaneyulu G, Dakshinamurthy D. Co-operatives and human resource development. The Co-Operator. 1990; 153-154. Volume No. 6 (2016), Issue No. 05 (May) ISSN 2231-4245. International Journal of Research in Commerce, Economics & Management A Monthly Double-Blind Peer Reviewed (Refereed/ Juried) Open Access International e-Journal - Included in the International Serial Directories.
   Available:http://ijrcm.org.in/ 41

6. Sarngadharan M. Towards 21st century-challenges of cooperative sector," co-operative life. The Journal for Indian Cooperatives. January-March, April-June. 1990;3-14.

7. Thordarson Bruce. Main strategies for co-operative development. Tamil Nadu Journal of Co-operation. 1984;81(5):262-266.

8. Kulandaiswamy V. Bureaucracy and co-operative management. Co-operative Perspective. 1989;21(1):10-13.

9. SO, Editor. Co-operatives Invaluable Institutions: United Nation's report. Co-Operative Fortnightly; June 1st. 1987;3.

10. Taimni KK. An agenda for the future. Co-operative Perspective. 1988;23:3-4. October-December 1988 & January March 1989;64-78.

11. Hynniewta NHR. Co-operative leadership in India context. Co-Operative Perspective. 1988;23:3-4. October-December 1988 and Jan-March. 1989;3-10.

12. Gopalan Nair N. Role of co-operatives in improvement of technology and quality in coir industry. Kerala Industry. 1987;XXXIV: VIII. January 1987;31-33.

13. Malik IR. Strengthening co-operatives in coir industry. Glimpses of Co-Operatives through Press. 1988;3:605-608.

14. Rajendran. Peeditha Kayar Sanghamghalude Punarundhanam Chila Margharekhakal Kayar Vyavasayam. COIR FED. 1988;1:26-32.

15. Chandaran C. The Indian Coir Industry. Agriculture and Industry Survey. 2005; 15(2):16-19.

16. Raju VT, Kakadia BH. Marketing of groundnut in Rajkot district of Gujarat State. Indian J. Agric. Econ. 1980;39:234.

17. Mittendof HJ, Hertag O. Marketing costs and margins for major food items in developing countries. Food and Nutrition. 1982;8(1):27-32.

18. Hassan M, Raghuram P. Cashew processing and marketing. Agric. Mktg. 1987;30:13-19.