Research Article

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Waste to wealth generation via areca plate manufacturing on micro scale

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Abstract

Areca leaf sheath which was hitherto wasted on the garden has found profound importance in the hands of microenterprise owners. Value has been added to leaf sheath through their conversion into biodegradable plates and bowls. Micro scale production units are concentrated in arecanut hinterlands of Karnataka. The study was conducted considering 30 micro units from Shivamogga and Davangere districts of Karnataka. The average of total cost incurred, gross returns and net returns realized over the production period of six months was Rs. 315518.40, 4,21,000, 1,89,467 respectively. Profitability reflected in the Benefit Cost Ratio of 1.33 indicating that every rupee invested on plate manufacturing unit enabled manufacturer to reap gross returns of Rs. 1.67. Waste to wealth generation not only results in income generation but also results in employment generation for rural folk.

Keywords: Areca leaf sheath, biodegradable plates, micro production units

Introduction

Arecanut (*Areca catechu* L.) an important perennial cash crop of India is presently cultivated in 5.52 lakh ha with a production of 9.03 lakh tonnes and productivity of 1.72 tonnes per ha (Anon., 2018). Arecanut is concentrated in Karnataka, Kerala, Assam, Maharashtra, West Bengal and Andaman and Nicobar Islands. Nearly 3.50 million farmers depend directly/ indirectly on arecanut for their livelihood. Arecanut produces nut and other products *viz.,* leaf sheath, trunk and arecanut husk. As per the package of practice 1371 palms/ha can be accommodated by adopting recommended spacing (Anon., 2022). On an average individual palm produces 5-6 leaf sheaths/year after four years of planting. Technological innovations have paved a way for economic utilization of leaf sheaths in manufacturing of plates and bowls of different dimensions. It has been observed that leaf sheath products are eco-friendly and biodegradable in nature. Currently, the areca plates have demand in overseas market. It is exported to USA (36%), Netherlands (17%), Germany (16%), Spain (10%) and UK (6%) (Anon. 2018). Areca leaf sheaths which was hitherto wasted on the lands have found form utility in the hands of manufacturers of areca leaf plates, bowls and spoons. These units have mushroomed in large scale of varied size in the hinter land. These units generate substantial employment opportunities for rural area (Vishwajith, 2012). In the present study, an attempt has been made to examine the economics of conversion of area leaf sheath into plates/blows, identify the marketing channels and to work out the benefit cost ratio.

Material and methods

The post-facto study was conducted to examine the profitability of manufacturing plates from areca leaf sheath in Shivamogga and Davangere districts.

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The above districts were selected based on the concentration of arecanut in these regions and presence of micro production units. The information on raw materials, investment made on the construction of manufacturing unit, expenditure incurred on human labour, electricity/fuel, repair charges of machines, packing and packaging materials, for conversion of leaf sheaths into plates was elicited personally from 30 areca plate and bowl manufacturing units using interview schedule. The data was analysed by using descriptive statistics, enterprise budgeting technique. In the present study for working out economics of the micro production unit, commercial production of plates of dimensions *viz*,12",10" and 4" was considered. The cost of raw material inclusive of wastage was divided by available leaf sheath area was considered for arriving at the expenditure on raw material. Piece wages was very common and same was employed to arrive at Labour cost incurred on production of plates. The total expenses on consumption of fuel was divided by total leaf sheath area pressed during production period to arrive at fuel costs. Each bundle containing 100 plates/bowls tied with the help of twines are packed in locally available plastic bag. The cost on packing material was taken into consideration on per plate/bowl basis at the prevailing market price. The repair costs on machineries were considered at prevailing market value. Annual rate of interest of 12% was charged on working capital and included as cost component. Depreciation on machineries and shed was analysed by using straight line method. Depreciation and interest on fixed capital was cost accounted considering the capacity utilization. Finally, gross returns were computed at selling price of Rs. 3.5, Rs. 2.5, Re. 0.8, for 12", 10" and 4" size plates and bowls respectively.

Results and discussion

The socio-economic parameters of the micro production unit presented in Table 1 indicates that vast majority of the manufacturer (53.34%) belonged to middle age group whereas, 33.33 and 13.33 per cent of them belonged to young and old age, respectively. Regarding literacy, majority of the manufacturers were found to be illiterate (43.33 %) followed by high school (30%). The share of male and female manufacturers was 80% and 20% respectively. Based on land holding, 73.33 per cent of the respondents had no arecanut orchards and they purchase the raw material from surrounding area. The present findings were in line with Kirankumar *et al.,* 2019.

The perusal of Table 2 reflects the production duration in a year, source of energy utilized by the manufacturers for conversion of leaf sheath into plates and bowls and ways of using waste generated from the manufacturing process. Nearly87 per cent of the production unit runs for the duration of six-months while and 13.00 per cent functions for 12 months. To operate the units, 80% and 20% of the manufacturers used LPG and electricity as source of energy. After producing the end products *viz*., plates and bowls, 10.00-15.50 per cent of leaf sheath remained un-utilised either as fire or fodder and for production of compost. At present majority of manufacturer burnt waste generated from the production process resulting in loss of potential source of organic matter and valuable nutrients to crops. The study revealed that, 53.33% used areca leaf sheath waste as source of fire wood followed by fodder (30%) and compost (16.66%) (Table 2). These findings are in accordance with Nagaraja *et al.,* 2014 and Gurumurthy *et al.,* 2018.

Marketing channels for plates/bowls

The market channels are the routes through which the various farm products pass from producer to consumers. Vast demand exists for leaf sheath products both in domestic and international markets. Many small industrialists have come forward to start joint ventures with foreign firms. The export quality products are prepared and exported to USA, Australia, Swiss, Denmark and Holland. The marketing channels identified were: 1. Direct marketing wherein producer directly markets product to consumer without involvement of middlemen; 2. Indirect marketing: Producer - wholesalers/retailers- Consumers in the domestic market and Producer - wholesalers/ retailer-exporter – consumer in overseas market. The maximum number of manufacturer (86.66 %) marketed their produce in domestic market and hardly13.33 per cent of producers marketed quality products in overseas market. The study revealed that, 46.66 per cent of the micro production unit realized low annual income followed by medium income (40%) and 13.33 per cent with higher income. These findings are in agreement with

Nagarajappa *et al.,* 2014and Chinnappa *et al.,* 2020.

The capital investment on micro level areca leaf plate and bowl manufacturing unit was furnished in Table 4. Irrigation borewell and pumpsets cornered lion share of investment at Rs. 80000 followed by investment on two die machine for pressing leaf sheath into desired dimension plates and bowls (Rs. 40000). The investment made on establishment for housing machines and enabling labourers to perform processing of leaf sheaths into plates and bowls came to Rs. 50000. Washing gun operated through 2hp motor was essential to clean the procured leaf sheath before processing it into finished products. Leaf sheaths possess dust, soil and fungal spores on it. Before using it for plate manufacturing it should be subjected for washing. Washing for 10 minutes was performed using water gun to remove adhered impurities and also to soften leaf sheath for enabling the process of plate/bowl manufacturing. Sintex tank was essential to assure continuous supply of water for cleaning the leaf sheaths. The similar pattern of investment was reported by Kirankumar *et al.,* 2019 and Chinnappa *et al.,* 2020.

The cost of manufacturing areca leaf plates irrespective of dimension for six months was presented in Table 5. The cost of raw material *i.e*., areca leaf sheath inclusive of transportation cost, expenses on fuel and labour was Rs. 81,000, Rs. 45,000 and Rs. 90,000 respectively towards production 1,80,000 unit of plates of different dimensions. LPG cylinder was used as fuel source by majority of micro production unit. It is considered as labour intensive operation. Labour is required for performing operations like procurement of leaf sheath, washing of leaf sheaths, drying, pressing, cutting, packing and packaging. To keep the product intact, proper packing was followed wherein 1,000 plates were accommodated in 2 plastic bags of 42 inches. Annual repairs on account of machines came to Rs. 5,000. Interest on working capital to cost account the opportunity cost of capital was estimated at the market rate of interest on short term loan of 7 percent apportioned for the production period of 6 months came to Rs. 8,083.80. Total variable cost came to Rs.2,37,184.20. Fixed costs included depreciation, rental value of land and interest on fixed capital estimated at 12 percent rate of interest apportioned for the production period. Fixed costs came to Rs. 78,334.20 towards production of 1,80,000 unit of plates. The total cost of production of areca plates and bowls came to Rs.3,15,518.40. The present findings are in conformity with the previous author Chinnappa *et al.,* 2020.

Total income from production of areca plates and bowls was furnished in Table 6. Among the plates, 63,000 plates of 12 x 12" was produced in six months'and sold at Rs. 3.5 per plate to realize gross returns of Rs. 2,20,500 followed by 10 x 10" plates soldat Rs. 2.5 per plate accounting for Rs. 1,57,500 of gross income. Whereas, smaller sized bowls (4 x 4") was sold at the market price of Rs.0.8 per bowl yielding gross returns of Rs. 43,000. These results are in corroboration with Nagarajappa *et al.,* 2014 and Kirankumar *et al.,* 2019.

Benefit cost ratio of production of areca plates and bowls for six months was presented in Table.7. Manufacturers have set up industries in arecanut growing belts for efficient utilization of by-products. Manufacturers on an average produced1,80,000 plates and bowls during six months'period incurring total cost of Rs.315518.4 and reaping gross returns of Rs. 421000 and net returns of Rs. 105481.60. Benefit cost ratio came to 1.33 signalling that one rupee spent on production of leaf plates or bowls from arecanut will result in gross returns of Rs. 1.33 or net returns of Rs. 0.33. These findings are in corroboration with the study of Nagarajappa *et al.,* 2014, Kirankumar *et al.,* 2019.

Conclusion

Arecanut leaf sheath based products are gaining importance and penetrating deeper into the consumer market. The manufacturing units of arecanut leaf plates and bowls on small scale as well as large scale have emerged in the arecanut growing belts of Karnataka. The average of total cost incurred, gross return and net returns realized by the micro units and B:C ratio accrued for the production period of six months were in the order of Rs. 315518.40, 4,21,000, 1,05481.60 and 1.33 respectively. The production of plate/bowls from areca leaf sheath is profitable enterprise in rural areas having enormous scope for employment.

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