

Improving Income from Coconut Cultivation through Farm Level Value Addition – An Analysis

P. Anithakumari¹, M.S. Rajeev² and Jissy George²

Abstract

Coconut cultivation in India is mostly in small and marginal land holdings. Farm level coconut processing for value addition is one of the options for risk reduction and improving the income from such holdings. This study was conducted during 2009-10 with the objectives of analyzing the profile of farm level processors as well as the constraints faced by those who have adopted minimal processing at the farm-household and community levels. It was found that 63.3% of the respondents were of middle age group, literate, low income group and 80% of them were women. The experience in coconut value addition was for 8 years or less. Further, the entrepreneurship behavior of the respondents was found to be positively and significantly correlated with the credit availed, annual income and investment made. The analysis on the utility of the training programmes indicated need for reorientation of training curricula in terms of project preparation techniques, communication/marketing skills etc. The value addition obtained per nut was found to vary from Rs.0.5 to Rs.15 depending on the products. The constraints and suggestions for improving farm level value addition were also furnished as perceived by the respondent farmers. The study showed that there is tremendous potential for farm level value addition for utilizing the marketable surplus of coconut locally. The importance of providing further technical support to those involved in value addition was also revealed by the study.

Keywords: Farm level coconut value addition, constraints, training utility

¹ Senior Scientist (Agrl. Extension), Central Plantation Crops Research Institute, Regional Station, Krishnapuram. P.O., Kayamkulam, Kerala, India. Email: anitha_kv@yaho.co.in

² Central Plantation Crops Research Institute, Regional Station, Krishnapuram. P.O., Kayamkulam 690533, India.

Introduction

Coconut is being cultivated in an area of 1.89 million hectares in India with an annual production of 15,730 million nuts and contributes over 70,000 million rupees to the country's GDP. Kerala accounts for 42% of the area under and 37% of the production nuts in India, i.e., 5,802 million nuts per annum (CDB, 2008). Small farms represent a significant proportion of total coconut holdings and current trends in agriculture pose new challenges for their viability and survival. Income from small holdings could not sustain family needs due to low and fluctuating prices of the produce, escalating input cost and low productivity due to the incidence of root wilt disease and pests like rhinoceros beetle, red palm weevil, eriophyid mite etc. To meet such challenges there is need to improve on-farm income by popularizing farm level processing for value addition. Small farms are facing uncertainty and additional risks in today's competitive world. It is necessary to acquire and use risk management tools and possess other management skills. The small farms should seek innovative approaches to survive, like more diversified enterprises and value added activities as well as product and market development (Tubine and Hanson, 2002).

The study reported here explored farm level value addition in coconut such as direct marketing with minimal processing, tender nut as an alternative produce, primary processing for copra and coconut oil, and production of virgin coconut oil, food products and oil based products as an individual or group activity. Skill development trainings were organized by the Krishi Vigyan Kendra attached to Central Plantation Crops Research Institute (CPCRI) Regional Station at Kayamkulam. The major objectives of the study were the following:

- To analyze the profile of micro entrepreneurs in coconut product diversification/value addition.
- To bring out the relationship of the socio economic characteristics with the entrepreneurship behavior.

- To analyze the farm based rural micro enterprises in coconut value addition.
- To document the constraints, technology needs and suggestions.

Materials and Methods

The data for the study were collected through face to face interview with 60 respondents selected through purposive random sampling techniques. The respondents were selected from Alleppey, Kollam and Trivandrum districts during 2009-10. Since the respondents have undergone skill development training, the utility of the programme in serving its various purposes as per the selected utility dimensions was studied and recorded. Utilities were studied on the three point continuum with 2, 1 and 0 scores following the procedure used by Upadhyaya and Hansra (1982) with slight modification. A total of 10 variables have been selected after reviewing relevant literatures and consulting extension experts assuming that they will affect entrepreneurship behavior. The relationship was brought out using the Pearson Product Moment correlation coefficient. The profile characteristics like age, educational level, family size, operational land holding, gender, trainings attended, experience in processing activities, average annual income, occupation, credit and entrepreneurship behavior were measured using standard tools and techniques. The classification of the demographic characteristics was done with slight modification of the procedure adopted by Meena *et.al* (2009). The farm-household level coconut based rural micro enterprise was treated as processing or value addition unit operated and managed by coconut farmer(individual or in groups) with a minimum initial investment of Rs. 10,000. The constraints faced by the rural processors were classified as very much severe, severe and not severe with a score of 3, 2 and 1 and ranked them accordingly.

Results and Discussion

Demographic characteristics of the rural micro entrepreneurs

The demographic characteristics have been presented in Table 1. The results showed that a majority of the respondents (63.33%) were between 28 to 48 years old. The people in this age group could engage in the physical activities of nut collection, husk removal, meat separation and other jobs associated with subsequent processing. It could be noted that one third of the respondents were above 48 years old. The experiences of this age group also play a role in the conflict solving and fine tuning the group efforts. The women participation in rural coconut processing was 80%, since they could utilize their extra time after routine household activities and earn an income. This aspect could be linked with the occupational status of the respondents also. The employment profile in India as per 1991 census indicated that 81.23% all economically active women are engaged in agriculture and agro based enterprises (Chabra, 1998). Since majority of the respondents were with experience of less than eight years with fairly high literacy rate, the gap in technology provided and capacity building in developing entrepreneurship needs to be bridged with extension strategies like Entrepreneurship Development Programmes (EDP), continuous technology support and after training confidence building and motivation. 100 percent of the respondents availed credit either from institutional or non institutional sources, indicating the need for working funds and also viability of coconut based rural units in repaying the credit. It was noted in the study that the majority of the women respondents were not willing to avail credit of more than Rs.10, 000 at a time to minimize the risk due to the fluctuating price situation and the income. This finding is supported with the report of Santhi and Muthu (2005). The thrift and credit system of the self-help-groups enabled the respondents to avail credit and repay conveniently with reserve for revolving fund for regular continuous operation. The demographic characteristics showed that coconut based rural farm level processing units,

particularly group managed ones, provided income, eligibility for credit, and employment generation.

Relationship between entrepreneurship and demographic characteristics of the rural coconut processors

The entrepreneurship behavior of the rural agro processors was found to be either medium (72.34%) or low (27.66%) level. This indicates the need for skill up-gradations in entrepreneurship among the rural farmers. During the data collection interview sessions the women members opined that they do not want to expand their business beyond a level because of the lesser time availability after attending the household duties and that the risk could be minimized and they will be in the 'safer zone'. The relationships of their entrepreneurship behavior with the socio economic characteristics are given in table 2.

From table 2 it could be inferred that age, education, farm size and number of yielding palms are positively correlated and this finding is supported with the report of Santhi and Muthu (2005). Variables such as occupation, adoption of inter crops and training programmes attended were negatively correlated with their entrepreneurship behavior. This may be due to the factor that major share of the time of the rural farmers engaged in agriculture or as farm labour as the main occupation will be spent for the same rather than for the value addition activities. This is in agreement with the results reported by Khorate and Hardikar (2002). It may also be inferred that the production cycle of the inter crops in coconut gardens requires labour and investment throughout the year.

The credit availed was found to be significantly correlated with entrepreneurship behavior since credit availability is a determining factor in developing farm based enterprises in rural areas. This also is an indicator that the policies should be credit friendly to resource poor farmers for the development of agriculture. It is noteworthy that the women self-help-groups (SHG's) could avail credits with the support of developmental schemes like Kudumbasree, operational in their

areas. The investment made in the rural micro enterprise and the average annual income also was found to be significantly correlated with their entrepreneurship behavior. This may be because these two factors may improve their confidence, enable production to the market demand and sustain the production of their products. This is supported with the findings of Santhi and Muthu (2005) in case of income and its relationship.

Utility of the training programmes on coconut value addition and processing

Skill up-gradation training programmes form a vital input in promoting rural agro enterprises in value additions. In these training programmes not only the technical skills but communication skills, conflict resolution, managerial and marketing skills are also important. Hence an analysis of the utility of the training programmes was carried out among the respondents. The data are presented in table 3.

From table 3 it is very evident that majority (80.23%) of the respondents were benefited in technical knowledge gain and skill development from the training programmes. However, for utilizing the technical knowledge in income generating activities, which require good entrepreneurship skills, almost half of them could not succeed. This indicates the need for reorientation of training curriculum in imparting entrepreneurial skills and equipping the trainees to obtain support from credit organizations through preparation, planning and implementation of credit worthy projects. One of the noteworthy responses from the table was, 20% of the respondents could use the trainings attended by them in disseminating the knowledge/ skills to the fellow farmers of their villages. Jeya and Somasundaram (2003) also reported usefulness of training programmes in knowledge/skill gain. The utility of the trainings in terms of getting support from credit organizations (not useful to 68.82%), technology dissemination (not helpful for 80.48%), establishing linkages (62.99% not useful) and social interaction skills (60.57% needs improvement) was on the lower level as shown in table 3. The data indicated the need for

reorienting training programmes in terms of curriculum and skill development in areas like credit worthy project preparations, linkage establishment, communication/management and marketing skills along with newer technology provision.

Value addition obtained per nut through the interventions

The value addition activities in coconut mainly undertaken by the respondents were selling raw coconut with minimum processing, i.e., husk removal, grading as per local consumer preferences and direct marketing. Other activities covered production of copra by sun drying or using small holder's copra drier with either husk and shell or shell only as fuel, extraction of coconut oil in local milling establishments, tender nut direct marketing after harvesting at 7 to 8 months stage and minimal processing, coconut based food products like vinegar, coconut beverage, coconut syrup, chutney powder and virgin coconut oil (VCO) preparation, packing, labeling and marketing. The value addition obtained per nut shows considerable variation from Rs.0.5 to Rs.15 per nut. The respondents indicated that considerable portion of the marketable surplus produced locally could be processed into quality copra and policy support and market support in procuring the copra on minimum support price (MSP) will benefit the farming community in getting value addition. The data obtained in terms of value addition per nut is furnished in table 4.

Majority of the rural agro processors opined that selling their products directly to the consumers will considerably add to their profit. Being resource poor farmers they are skeptical in taking risks by investing more in their rural processing units. It was inferred from this study that direct marketing with minimal processing by itself constitutes a viable value addition activity at the farm-household level. But the farmers should also understand that there is difference between marketing and selling. In this regard the farmers of the coconut clusters could themselves reorient their activities in marketing their coconuts, tender nuts and other coconut based products.

Table 1. Demographic attributes of rural coconut micro entrepreneurs (n=60)

S. No.	Demographic characters	Frequency	Percentage
1	Age(years)		
	Young(less than 28)	4	6.66
	Middle (28-48)	38	63.33
	Old (more than 48)	18	30.00
2	Gender		
	Male	12	20.00
	Female	48	80.00
3	Experience in processing (years)		
	Low (less than2)	24	40.00
	Medium(2-8)	34	56.67
	High (more than 8)	2	00.33
4	Educational level		
	Illiterate	1	1.67
	Up to primary	8	13.33
	Up to middle class	17	28.33
	Up to senior secondary	28	46.67
	Above senior secondary	6	10.00
5	Family size		
	Small(<5)	47	78.33
	Medium(5-8)	11	18.33
	Large(>8)	2	0.33
6	Average annual income		
	Less than 30,000 Rs.	41	68.33
	Between 30,000-60,000 Rs.	19	31.67
	Above 60,000 Rs.	0	00.00
7	Land holding size		
	Small	60	100.00
	Medium	-	0.00
	Large	-	0.00
8	Credit		
	Institutional	21	35.00
	Non institutional	39	65.00
9	Occupation		
	Agriculture	4	6.67
	Labour +agriculture/diary	16	26.67
	Agriculture +diary	14	23.33
	Others	6	10.00
10	Trainings attended		
	Coconut Production	7	11.67
	Coconut processing	53	88.33

Table 2. Relationship between entrepreneurship and demographic characteristics of the rural coconut processors (n=60)

S. No.	Demographic characters	'r' value
1	Age	0.0143818
2	Education level	0.0777717
3	Occupation	- 0.056679
4	Farm size	0.1687638
5	Credit availed	0.3353799**
6	Average annual Income	0.2280486*
7	No of yielding palms	0.1739738
8	Adoption of inter crops	- 0.0129749
9	Investment made	0.51570127**
10	Experience in Value addition activities	0.02359846
11	Training programmes attended	- 0.052670646

* Significant at 0.01 level

** Significant at 0.05 level

Table 3. Utility of the training programmes on coconut value addition and processing

S. No.	Dimensions	Response category	Percentage
1	Usefulness of undertaking economic oriented activities	Very much useful	5.82
		Useful	43.71
		Not at all useful	50.47
2	Usefulness in technical knowledge gain	Very much useful	80.23
		Useful	18.77
		Not at all useful	--
3	Usefulness in skill development	Very much useful	64.20
		Useful	35.80
		Not at all useful	--
4	Extent of fulfillment of needs	Highly fulfilled	55.00
		Partially fulfilled	45.00
		Not at all fulfilled	--
5	Benefitted from interaction among trainees during training	Highly benefitted	51.33
		Partially benefitted	34.07
		Not at all benefitted	14.06
6	Usefulness of training experience in day to day activities	Very much useful	49.82
		Useful	46.97
		Not at all useful	3.91
7	Usefulness in getting support from credit organizations	Very much useful	3.00
		Useful	28.18
		Not at all useful	68.82
8	Helpful in organizing similar trainings in their respective villages	Highly helpful	8.52
		Helpful	11.00
		Not at all helpful	80.48
9	Helpful in establishing linkages with agencies/entrepreneurs	Highly helpful	12.10
		Helpful	24.91
		Not at all helpful	62.99
10	Usefulness in acquiring skills in social interaction of opportunities	Very much useful	9.33
		Useful	30.10
		Not at all useful	60.57

Table 4. Value addition obtained per nut through the interventions

S. No.	Value addition activity	Cost of raw materials/ other expenses	Other expenses	Net Income (Rs.)	Value addition obtained per nut
1	Mature raw nut-minimal processing	Rs.500.00 @ Rs.5.00/nut	Rs.100.00 (Husk removal (Rs.60) +transportation(Rs.40))	Rs.900.00 – Rs.1,200.00	Rs 0.5- Rs.1.00
2	Tender nut	Rs.600.00 @ Rs.6.00/nut	Rs.400.00 (Rs.4.00/nut for climbing, harvesting, transporting and preparing)	Rs.1,500.00	Rs.5.00
3	Copra-coconut oil-500 nut/ batch				
	Sun drying	Rs.2,500.00	Rs.655.00	Rs.4,135.00	Rs.1.96
	Smallholders copra drier	Rs.2,500.00	Rs.845.00	Rs.3,675.00	Rs.0.66
	Shell fired copra drier	Rs.2,500.00	Rs.763.00	Rs.3,673.00	Rs.0.82
4	Copra+ coconut oil + coconut water based beverage	Rs.2,500.00 @Rs.5.00/nut 25 liters coconut water	Rs.1,215.00 (Husk removal, breaking, drying, sugar, yeast, bottling, etc)	Rs.4,835.00	Rs.2.42
5	Coconut water vinegar	10 liters coconut water/100 nuts	Rs.100.00 (Sugar, citric acid, packing, labeling, etc)	Rs.240.00	Rs.1.40
6	Coconut water based syrup or squash	10 liters coconut water/100 nuts	Rs.300.00 (Sugar, ginger, packing, labeling, fuel, etc)	Rs.1,200.00	Rs.3.00
7	Coconut chutney powder + virgin coconut oil (VCO-traditional method)	200 nuts @ Rs.7.5 /nut Rs.1,500.00 (cost of nut)	Rs.1,800.00 (for ingredients, fuel price, labour charges, packing materials)	Rs.6,000.00 – Rs.6,300.00	Rs.13.50 – Rs.15.00
8	Coconut oil based soaps	10 liters coconut oil Rs.580.00 (150 nuts)	Rs.920.00 (soap kit, butter paper and labour)	Rs.2,380.00	Rs.6.00

Features of the farm level value addition units

The general features of the rural coconut processors are indicated as below. The average number of nuts processed at farm level ranges from 4,500 to 25,000 nuts per unit per year,

engaging average of 6 paid workers. The major marketing mode was direct marketing by the rural processors with only 15% of them resorting to wholesale or retail marketing. The clustering of the units could be made for better quality production and income.

Average number of nuts processed per annum	6,000 nuts/year (range 4,500 – 2,5000 nuts)
Average number of persons engaged	6 (range of 4-10)
Average investment made per unit	Rs. 8,500 (range Rs.2,500 to 35,000)
Average income generated per unit per year	Rs.38,000 (Range Rs.24,000 to Rs.130,000)
Average distance covered for procuring raw materials	7.5 km
Average distance of the units from main road	4.3 km
Most preferred training destination for coconut based processing	Krsihi Vigyan Kendra, CPCRI
Average credit availed for the units	Rs.25,000/-
Employment generated/year	40-80 man days/year

Marketing channels - 85% of the rural coconut processors resort to direct marketing from their units or home to home sales

Producer → Rural agro processors → minimal processing → consumers.

(large quantum could be marketed with less margin, fresh products for consumers, transportation/packing etc could be avoided)

Producers → Rural agro processors → nut processing → packing /labeling → consumers

(storage period is less, maximum profit, fresh produce for consumers, mostly fast recovery of investment, ensures sale of maximum products)

Producers → Rural agro processors → nut processing → packing /labeling → retailers
→ consumers

(profit realized reduced by 30 percent, ensuring continuous production at steady price rate, more quality conscious)

Producers → Rural agro processors → nut processing → packing /labeling → wholesalers
→ retailers → consumers

(large quantity, transportation cost of products also, risky, margin realized is less)

Constraints perceived by rural coconut processors in adoption

The major constraints expressed by the respondents are furnished in table 5. The constraints they perceived as most severe were low knowledge level on packing techniques, small size of holding restricting them from value addition of their own produce, high competition from general markets, drudgery involved and low skills in marketing techniques. It could be noted that social taboos, domestic works or group conflicts do not keep them demotivated since the constraints ranked higher indicated their need for improving entrepreneurship skills in making their units more competitive.

Suggestions of the respondents in improving farm based value addition of coconut

The respondents suggested the following points for improving the efficiency of rural farm based value addition units. The suggestions put forward by more than 80% of the respondents were the following.

- Facility or centers for coconut product preparation, packing, labeling and marketing
- Ensuring availability of quality packing material and packing skills
- Periodic updating of knowledge/skill on value addition technologies in coconut

Table 5. Constraints perceived by rural coconut processors in adoption

Constraints	Average Score	Rank
Social taboos	1.54	XV
Lack of knowledge on newer products suitable for rural processing/value addition	2.10	X
Low level of knowledge/data on consumer preferences	2.34	VI
Conflicts in group activities	1.59	XIV
Low level of availability of quality raw nut regularly	1.84	XIII
Fluctuating price of coconut	2.27	VIII
High cost of raw materials	2.10	XI
Small land holding size , hence raw nuts to be procured from other farmers, high cost of transportation	2.66	II
Drudgery involved in coconut processing	2.53	IV
Lack of small scale low cost equipments/tools to reduce drudgery	2.25	IX
Low keeping quality of products	1.98	XII
Low level of knowledge/skill on quality packing techniques	2.77	I
Low level of knowledge on marketing strategies	2.50	V
High competition with general markets	2.63	III
Low level of focus or project implementation on processing/ value addition	2.32	VII
Less number of emulative success stories/publicity	2.20	X

- Activities for popularizing coconut products at Government level
- Contact programmes with coconut farmer's groups/clusters for appraisal of needs
- Simplified credit provision at affordable interest rates and frequencies
- Strengthening of group activities in coconut processing and value addition
- Ensuring availability of simple low cost drudgery reduction equipments/tools
- Common brand name and quality control facilities for domestic marketing
- Popularizing the nutritional and health benefits of coconut and its products
- Designing specific projects and implementation involving relevant stakeholders

Conclusion

The coconut farmers do not benefit from the income potential of coconut due to low productivity resulting in small marketable surplus, limited scope for value addition and marketing options. The rural farm based units sell products like copra, coconut oil, husked nuts, tender nuts, virgin coconut oil, food products etc. but their income is not high due to inadequate access to favorable markets. But it could be seen that the units enjoy local demand for their products and that they are earning reasonable income and profit. The major constraints include weak policy implementation especially in the case of MSP of copra, inadequate extension support for technology dissemination, low entrepreneurial skills, and lack of easy access to credit and markets. The cluster approach of coconut farmers could be strengthened for improving community based procurement, processing and marketing. The research system should also focus on the development of new products as well as simple but efficient processing equipments.

Acknowledgement

The authors express their sincere thanks to Dr. George V. Thomas, Director, CPCRI, Kasaragod and Dr. P.M. Jacob, CPCRI (RS), Kayamkulam for the support and guidance. The cooperation from the respondents is acknowledged with thanks.

References

- Chabra, V. 1998. The invisible women workers. *Kurukshetra*. **46** (19):17
- Jeya, R. and Somasundaram, D. 2003. Perceived opinion of trained farm women on TANWA training. *J. of Ext. Edn.* **14**(3&4):3552-3553
- Khorate, V.S. and Hardikar, D.P. 2002. Impact of DWCRA scheme. *Maha. J. of Ext. Edn.* **21**(1):125-126
- Meena, M.S., Prasad, M. and Singh, R. 2009. Constraints perceived by rural agro – processors in adopting modern post-harvest technologies. *Ind. Res. J. Extn. Edn.* **9**(1):1-5
- Santhi, P. and Sathyavathy, M. 2005. Impact of employment generating technologies to empower rural women through Krishi Vigyan Kendra. *J. of Ext. Edn.* **21**(1):125-126
- Tuben, S. and Hanson, J. 2002. The wholesale produce auction: an alternative marketing strategy for small farmers. *American J. for Alt. Agri.* **17**(1)
- Upadhyay, K.P. and Hansra, B.S. 1982. Utility of agriculture broadcasts of radio, Nepal as perceived by Nepalese farmers. *Ind. J. of Extn. Edn.* **28**(3&4):68-69
- Coconut development board web site - www.coconutboard.gov.in