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Socio-Economic Impact of Cashew Cultivation in Cuddalore District of Tamil Nadu-An Overview

R.Venkattakumar[1]

ABSTRACT

Tamil Nadu is one of the important cashew growing states in East Coast region of the country. Cuddalore district of the state has second largest area under cashew and second highest number of cashew processing industries which contributes a major share in the cashew economy. This study was conducted to assess the socio-economic impact of cashew cultivation in this district, with cashew growers having cashew gardens of seedling (32) and graft origin (33). It was found that cashew cultivation was the main source of income for livelihood of the respondents. The knowledge and adoption scores of farmers with graft cashew gardens were significantly higher than that of the other category whereas there was no significant difference between the perception level of both the categories. The average technology gap score of the farmers with seedling gardens was significantly higher than that of the other category. However, the use of cashew grafts, as planting material for cashew gardens did not give any significant contribution to the yield. It was suggested based on the correlation studies that by imparting training to the cashew growers on improved cashew cultivation practices, the knowledge level of the higher than that of the other category. However, the use of cashew grafts, as planting material for cashew gardens did not give any significant contribution to the yield. It was suggested based on the correlation studies that by imparting training to the cashew growers on improved cashew cultivation practices, the knowledge level of the respondents could be improved and in turn adoption, perception levels whereas adoption and technology gaps of the respondents could be narrowed down. The Department of Horticulture, Government of Tamil Nadu needs to take up intensive efforts to educate the cashew growers on improved cashew cultivation practices.

Cashew cultivation in lndia dates back to sixteenth century with the introduction of the crop by Portuguese travelers in west coastal region. Cashew became one of the important plantation crops with its significant contribution to the country's foreign exchange through export of processed cashew kernels and Cashew Nut Shell Liquid (CNSL). Tamil Nadu is one of the important states in east coast region of the country wherein cashew is grown in 1,04,659 ha with a production of 44,497 MT and productivity of 425 kgl ha. Tamil Nadu ranks fifth in area and production of cashew. Cashew is predominantly grown in Perambalore, Cuddalore, Kanyakumari, Pudukkottai, Sivagangai, Vizhupuram, Tirunelveli and Tanjore districts of Tamil Nadu (Jeeva et al 2006). Regional Research Station (RRS), Tamil Nadu Agricultural University Vridhachalam released four high yielding cashew varieties viz., VRI-1,2,3 and 4 for cultivation under the cashew growing conditions of Tamil Nadu. Cuddalore district, which has second largest area under cashew (Jeeva et al 2006), and second highest number of cashew processing industries (20% to the total) (Saravanan, 2000) in Tamil Nadu, contributes a major share in the cashew economy of the state. Cashew cultivation and cashew processing activities taken up in this district provide employment and livelihood income to a considerable proportion of rural population of this district (Saravanan, 2000).

The projected area and production of cashew in Cuddalore district will be 3,52,060 ha and 1,40,413 MT respectively by 2020 (Anonymous, 2004) which shows the significance of cashew cultivation and in turn processing to the economy of the district. Hence, a study

[1] Senior Scientist, Directorate of Oilseeds Research, Rajendranagar-500 030, Hyderabad

was conducted in Cuddalore district during September and December 2006, with the following objectives:

- To delineate the reasons for cashew cultivation
- To study the knowledge, adoption and perception level of farmers towards recommended practices of cashew cultivation
- To access the socio-economic impact of cashew cultivation
- To delineate the constraints encountered in cashew' cultivation and to suggest strategies to improve the socio-economic status of the cashew growers

The salient findings of the study are presented in this paper.

METHODOLOGY

Locale of the study

The study was conducted in Cuddalore district of Tamil Nadu, since the district has second largest area under cashew (Jeeva et al 2006), second highest number of cashew processing industries (Saravanan, 2000) and RRS, Vridhachalam is located in this district. The district falls under the North-east costal zone of Tamil Nadu, has the total geographical area of 4283 sq. km, Average rainfall of the district-is 1146 mm whereas the temperature ranges between 20 to 41 ^{0}C, and the climate is basically tropical (Selvarajan and Dharmalingam, 1998 and Anonymous, 2004). The predominant soils of the district are, red loam, clay loam, sandy loam and red soils. The average pH of the soils is ranging from 6.5 to 8.0. The district has a coastal line of 57.5 km suitable for the plantation crop viz., coconut and cashew. The district has cashew area of 29,831 ha with a production of 26,585 MT of raw cashew nuts and productivity of 890 kg/ha (Jeeva et ai, 2006). Panruti taluk of the district stands first in cashew area, production and productivity and most of the cashew processing industries of the district are located in this taluk. Hence, the study was conducted in Panruti taluk of Cuddalore district.

Sampling design

Snowball sampling procedure was followed to select the respondents of the study. The officials of Department of Horticulture of Cuddalore district and Panruti Taluk guided the survey. Initially, the farmers who had problems in cashew cultivation and had contact with the officials were interviewed. Based on the information given by these farmers, the neighbouring cashew growers were also interviewed through snowball sampling method. Thus, a total of 65 cashew growers comprising of 32 with seedling cashew gardens and 33 with graft cashew gardens constituted the sample of the study. Apart from cashew growers, extension personnel and researchers who were working on cashew in the study area were also used as respondents to collect data on constraints in cashew cultivation and suggestions to 'overcome the constraints. Key informants were contacted for collection of data pertaining to cost of cashew cultivation and triangulation of the collected data on socio-economic impact, constraints and training needs of the cashew growers.

Variables and their measurement

Knowledge level of the respondents was measured by assigning different scores to knowing and unknowing behaviour of the respondents towards the selected technologies among the package of recommended cashew cultivation practices. The technologies were selected based on their importance/ significance to the cashew yield (Table.2). The 'knowledge level of the respondents was classified into low, medium and high using mean and SD of the knowledge scores. Similarly adoption level of the respondents was measured after assigning different scores to 'recommended adoption' and 'non adoption' behaviour of the respondents and it was classified into low, medium and high using mean and SD of the adoption scores. The adoption gap of the respondents was assessed using the following formula :

Adoption gap of the respondents towards a particular technology =

$$\frac{\text{Total no. of respondents} - \text{No. of respondents who adopted the technology}}{\text{Total no. of respondents}} \times 100$$

Similarly, the technology gap of the respondents was assessed using the following formula :

Technology gap =

$$\frac{\text{Total no. of technologies selected} - \text{No. of technologies adopted by the farmers}}{\text{Total No. of technologies selected}} \times 100$$

The perception level of the respondents towards the recommended cashew cultivation practices was assessed by getting the opinion of the respondents towards the recommended cashew cultivation practices against a

three point continuum viz., useful, not useful and undecided. The response of the respondents was decoded and classified in to low, medium and high using mean and SD. The socio-economic impact referred to the socio-economic changes that occurred among the cashew growers as a result of commercial cashew cultivation. Training needs and constraints in cashew cultivation were also assessed from the cashew growers.

Method of data collection

The study was an expost-facto survey research. The impact was assessed adopting with-without approach. Standardized data collection tools were utilized to collect the data from farmers (interview schedule), key informats (interview schedule), officials of development departments (questionnaire) and researchers (questionnaire).

Statistical tools

The responses were coded, tabulated and subjected to descriptive statistical analysis comprising percentage, mean and SD. Simple correlation was employed to examine the socio-economic variable in relation to knowledge, adoption and perception levels of the respondents. 't' distribution was employed to find out the significance of difference between scores of farmers with seedling and graft gardens.

RESULTS AND DISCUSSION

Profile of the respondents

Both the category of farmers were middle aged. The average educational level of the overall respondents 10^{th} Std. The average farm size of both the respondents was 4.4 ha indicating that all these farmers were medium farmers. Both the type of farmers had similar farming and cashew cultivation (28 years) experience. The average tree density of cashew gardens (about 110 trees/ha) was below the recommended level (156 trees/ha). However, the farmers opined that trees with spreading and open umbrella type canopy in wider spaced gardens would give more yield. So, the respondents do not follow the recommended spacing. The mean yield of seedling cashew gardens (880kg/ha) with a mean age of 33 years was more than that of the graft cashew gardens (805kg/ha) with a mean age of 13 years. However, the difference was not significant. Both the type of cashew gardens had three-fourth average percent share to the total farm size of the respondents indicating that cashew cultivation is the main source of income for the livelihood of the respondents. The three-fourth share of cashew gardens to the total farm size of the respondents was already reported by Suganthi (2004). It could also be inferred from the above results that the use of cashew grafts, as planting material for cashew gardens did not give any significant contribution to the yield.

Reasons for cashew cultivation

The following are the motivational reasons for which the cashew growers of the study area started cultivating cashew :

1. Lack of availability of irrigation water warranted suitable rainfed crops like cashew.
2. Cashew is a rainfed crop, and hence suits the situation.
3. To utilize the unfertile/degraded lands, which suits cultivation of cashew.
4. Cashew is a profitable crop under rainfed conditions.
5. Less supervistion in needed for cashew cultivation.
6. Intercrops can be grown in cashew gardens

These results clearly indicate that the environmental factors prevailed in the study area warranted the respondents to start cashew cultivation.

Adoption behaviour of the respondents towards recommended cashew cultivation practices

Majority of the cashew growers with graft cashew gardens had medium level of knowledge, adoption and perception towards recommended cashew cultivation practices whereas majority of the cashew growers with seedling cashew gardens had high, low to medium and medium levels of knowledge, adoption and perception respectively towards the recommended cashew cultivation practices (Table. 1). The medium technologies is in conformity with the report of Suganthi (2004). However, the knowledge and adoption scores of farmers with graft cashew gardens were significantly higher than that of the other category whereas there was no significant difference between the preception level of both the categories.

Table-1 : Adoption Behaviour of respondents towards recommended cashew cultivation practices (N=65)

Type of Behaviour	Category	Distribution (%)		
		Farmers with seedling gardens (n=32)	Farmers with graft gardens (n=32)	't' value
Knowledge level	Low	25.00	6.06	3.72**
	Medium	12.50	72.73	
	High	62.50	21.21	
	Mean	9.56	11.45	
	SD	2.40	1.79	
Adoption level	Low	34.36	3.03	8.13**
	Medium	43.75	72.73	
	High	21.88	24.24	
	Mean	8.56	10.42	
	SD	2.41	2.40	
Perception level	Low	12.50	0.00	1.07 NS
	Medium	50.00	78.78	
	High	37.50	21.22	
	Mean	17.56	18.06	
	SD	1.80	1.70	

**Significant at 0.01 level

The adoption gap for both the categories was similar towards the technologies viz. application of manures and plant protection measures against Tea mosquito bug (TMB) (Table 2). The adoption gap of the farmers with seedling gardens was higher than that of the farmers with graft gardens for irrigation and initial training and pruning. The adoption gap of the farmers with graft cashew gardens was nearly double than that of the other category towards the recommended technologies viz., plant protection measures against cashew stem and root borer (CSRB), adoption of soil and water conservation measures (ploughing the field and application of FYM/ compost). Most of the respondents had medium to high level of technology gap towards the recommended practices. Theses findings are in line with that of Suganth (2004). However, the average technology gap score of the farmers with seedling gardens was significantly higher than that of the other category (Table 3).

Table-2 :Technology wise adoption gap of respondents (N=65)

Technologies	Adoption gap (%)	
	Farmers with seedling gardens(n=32)	Farmers with graft gardens(n=32)
Planting techniques	55	0
Soil and water conservation measures	40	64
Manure application	3	3
Irrigation	61	42
Initial Training & Pruning	85	27
Plant Protection against TMB	3	3
Plant Protection against CSRB	33	67

Table-3 Technology gap of respondents (N=65)

Category	Technology gap (%)		
	Farmers with seedling gardens (n=32)	Farmers with graf tgardens (n=32)	't' value
Low	21.87	24.25	3.13**
Medium	53.13	72.72	
High	25.00	30.3	
Mean	38.84	25.54	
SD	17.22	17.14	

**Significant at 0.01 level

The correlation studies indicated that the knowledge, adoption and perception level of both the category of respondents positively influenced the yield level and these variables also had positive and significant intercorrelation. In both the cases, the technology gap negatively influenced the yield of cashew gardens. The knowledge, adoption and perception level of both the categories of farmers had negative and significant correlation with technology gap of the respondents. It could be implied from the results that the knowledge level of them need to be improved by imparting intensive training to the cashew growers on improved cashew cultivation practices, which in turn would result in improved adoption, perception level and decreased adoption and technology gaps of the respondents. Hence the Department of Horticulture, Government of Tamil Nadu need to take up intensive efforts to educate the cashew growers on improved cashew cultivation practices.

Socio-economic impact of cashew cultivation

The failure of air layers to perform in the field conditions, which were introduced by the Department of Horticulture as planting material for cashew during 1980s, resulted in the negative attitude of the farmers cashew

grafts as planting material also. Hence majority of the cashew gardens were of seedling origin (reported by Jeeva et al 2004) and even now many of the new cashew gardens are being established by seedlings only. Leasing in and out of cashew gardens were the common phenomena noticed as far as the cashew cultivation is concerned. The lease amount was ranging from Rs. 3,000 to 6,000 per acre depending upon the fertility of the soil, irrigation facilities avaiable, and availablity and cost of hired labour of the place. The average labour cost was Rs. 80/- for female and Rs. 100/- for male.

The farmers, based on their experience, opined that the performance of seedling cashew gardens was better than that of the graft cashew gardens. The farmers did not follow the regular spacing, since they felt that the big trees with wider spacing yield more. Ploughing and adoption of FYM/compost were the general soil and water conservation measures adopted by the respondents. Five to seven rounds of chemical sprays were applied by the respondents against the attack of TMB, since they felt that control of the pest alone can save a lot cashew nut yield. Root feeding of pesticides was followed against the control of CSRB. The cost of cashew cultivation varies depending upon the involvement of family labours in harvest, adoption of irrigation and number of sprays against TMB. cost of cashew cultivation was ranging between Rs. 10,000 and 16,250/- ha with an average of Rs. 13,650/- ha. (Table.4), implies that the raw cashew nut price should be more than Rs. 35/ha to get considerable profit. The respondents also opined that the yield of irrigated cashew gardens were almost double than that of the rainfed gardens. The commonly grown intercrops in cashew gardens were black gram, green gram, groundnut, and tapioca.

Table-4 Cost of cashew cultivation in Cuddalore district of Tamilnadu

Operations	Cost Involved (Rs/ha)*Key Informants					
	1	2	3	4	5	Avg.
Establishment, Land preparation, Planting technique, SWC measures	2000	1000	1000	3000	1250	1650
Application of manures	2500	2500	2500	4500	4500	3300
Irrigation	3000	3000	0	0	3000	1800
Application of Plant Protection measures	5000	3000	3000	3000	5000	3800
Harvesting	2500	3000	3500	4000	2500	3100
Total	15000	12500	10000	14500	16250	13650

* Approximate figures as expressed by the Key Informants

The cashew processing units located in this district were functioning for an average of 140 days per year. The number of working days of these factories was directly depending upon the quanity of cashew nuts produced in this district. The average annual kernel production from the factories located in this district was 834 MT whereas that of Cashew Nut Shell Liquied (CNSL) was 20 MT. The extent of employment generated by each cashew processing factory was ranging from 12,471 to 37, 387 man days per year (Saravanan, 2000).

Contraints/problems in cashew cultivation

The following were the constraints or problems in cashew cultivation as perceived by the respondents and the researchers, extension personnel of the study area:

- Lack of high yielding varieties, which perform better than the local types.
- Yield reduction due to sucking pests.
- Lack of better market price for raw cashew nuts.
- Lack of irrigation facility.
- Indiscriminate use of pesticides against sucking pests.
- Lack of supply of quality planting material (cashew grafts).
- Reduction in nut quality due to sumer or pre-monsoon rains.
- Cashew is generally grown in unfertile and degraded lands.

'Lack of irrigation facility and cashew cultivation in unfertile and degraded lands' as constraints in cashew cultivation in the study area were already reported by Suganthi (2004) and Jeeva et al (2006).

Training needs of the respondents

The following were the training needs of the respondents:

- Method of application of plant protection measures
- Method of application of fertilizers
- Irrigation in cashew
- Cashew apple processing
- Small scale cashew nut processing
- Soil and water conservation in cashew during summer months.

Suggestions to overcome the cashw cultivation scenario in Cuddalore district of Tamil Nadu

The following were the strategies suggested by the researchers and extension personnel of the study area for improving the cashew cultivation scenario of Cuddalore district of Tamil Nadu :

- Introduction and popularization fo high yielding cashew varieties, which can perform better than the local types.
- Intensive training is needed for the cashew growers on method of adoption of plant protection measures, fertilizers, irrigation and soil and water conservation measures.
- Supply of quality planting material (cahsew grafts)
- Implementing subsidy scheme on drip irrigation wherever the irrigation sources are available.
- Organizing awareness campaigns on various improved aspects of cashew cultivation to educate the cashew growers
- Organizing large number of frontline demonstrations to convince the cashew growers on improved aspects of cashew cultivation including performance of grafts as planting material for cashew plantations. (reported by Selvarajan and Dharmalingam, 1998 and Suganthi, 2004)
- Monitoring regularly the quality of cashew grafts supplied by private cashew nurseries.
- Training cashew growers on establishing and processing of small scale level cashew nut processing to enhance their profit level and thereby their socio-economic status.

CONCLUSION

Majority of the cashew gardens were of seedling origin and even now many of the new cashew gardens are being established by seedlings only. Cashew gardens had three-fourth percent share to the total farm size of the respondents indicating that cashew cultivation is the main source of income for the livelihood of the respondents. Suitability of cashew to rainfed conditions of the study area motivated the respondents to start cashew cultivation. The knowledge and adoption level of farmers with graft cashew gardens were significantly higher than that of the other category. However, the mean yield of seedling cashew gardens (880 kg/ha) with a mean age of 33 years was more than that of the graft cashew gardens (805 kg/ha) with a mean age of 13 years. Cashew cultivation and cashew processing activities taken up in this district provided employment and livelihood income to a considerable proportion of rural population of this district. Hence there is urgent need to improve the cashew cultivation scenario of the district. By imparting training to the cashew growers on improved cashew cultivation practices the knowledge level of them could be improved which in turn would result in improved adoption, perception level and decreased adoption and technology gaps of the respondents. The Department of Horticulture. Government of Tamil Nadu needs to take up intensive efforts to educate the cashew growers on improved cashew cultivation practices.

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