



Socio-economic correlates and determinants of cashew productivity: An analysis of Dakshina Kannada district

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Abstract

The study analyses the socio-economic correlates and determinants of cashew productivity in the Dakshina Kannada district of Karnataka state, as a prerequisite for developing and initiating effective extension interventions for combating low productivity and profitability from cashew cultivation. Results show that majority of the cashew farmers recorded medium to low productivity in cashew cultivation. Extension contact and participation were identified as significant correlates of cashew production and productivity along with level of education and primary occupation. Age of the farmer, primary occupation, years of experience in farming, cosmopolitanness, number of yielding cashew trees, yearly expenditure made in cashew farming and net income from cashew farming were identified as determinants of cashew productivity. The study suggests motivating farmers to take up cashew cultivation in high density mode, undertake cashew cultivation in better quality land with recommended management practices and proportionately increasing yearly expenditure for cashew farming in relation to net income from agriculture. The results clearly indicate that socio-personal and economic correlates and determinants along with policy environment have a larger contribution in explaining cashew productivity, while technology component alone cannot be expected to bring a positive impact.

Keywords: Cashew, economic factors, Karnataka, productivity, socio-personal factors

Introduction

Cashew (*Anacardium occidentale* L.) is a versatile tropical nut grown in around 28 countries in the world, scattered around Asiatic, African and Latin American zones. The average global productivity of cashew is about 500 kg ha⁻¹ while in India it is about 770 kg ha⁻¹. Beginning largely as a neglected crop, it ends up as a favourite snack food all over the world. The crop involves wider social and economic significance in India as cashew plantation engages around 0.3 million people and cashew processing provides employment to another 0.3 million people in the country. One heartening point about this sector is that it gives employment in the lean agricultural season and mostly to women from economically backward strata of rural and tribal belts (NABARD, 2007).

Cashew is grown in several parts of India and the cashewnut generates significant income for

farmers. Cashew trees can grow in fairly poor soils with relatively little rainfall, as long as there is a clear dry season of two to four months. These attributes, plus the facts that little capital is required for cashew establishment and that low nut perishability minimises the coordination requirements for post-harvest activities, have given cashew the reputation of being a poor man's crop (Jaffee, 1995). Cashew industry provides source of livelihood for the growers, empowers rural women in the processing sector, creates employment opportunities and generates foreign exchange through exports (Yadav, 2010). Cashew gained status of a commercial crop through technological advancements with respect to propagation, production and management. This change was fuelled as a result of increasing demand for raw cashewnuts and enhanced interest for its commercialization (Venkattakumar, 2009).

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The cashew cultivation in India mainly confines to the states of Kerala, Karnataka, Maharashtra and Goa along the West Coast and Tamil Nadu, Andhra Pradesh, Orissa and West Bengal along the East Coast region. It is also grown in plains like Chhattisgarh, Gujarat, Bihar and Northeast Hill Regions like Meghalaya, Manipur and Tripura and also in Andaman and Nicobar Islands (DCR, 2011). In India, it is cultivated in an area of 9.82 lakh ha with a production of 7.28 lakh tonnes and productivity of 772 kg ha⁻¹ (DCCD, 2012-13). India has the maximum area (21.6%) under cashewnut and is the third largest producer (17.3%) of raw nuts in the world. After Vietnam, the country is the second largest exporter, accounting for 34 per cent of the world's export of cashew kernels. India has a comparative advantage in the production and processing of cashew nuts on account of its cheap and skilled labour force. There are 3650 cashew processing industries in the country (both organized and unorganized sector together), with an installed capacity for processing of 15 lakh tonnes, for which the contribution from the indigenous production is only 48 per cent. India earned ₹ 4450 crores through export of processed cashew kernels and cashewnut shell liquid during 2011-12 (CEPCI, 2013). The cashew sector has received additional impetus after introduction of the National Horticulture Mission in the country in 2005-06 with an aim to double the production of horticulture crops in seven years, in which cashew has been identified as a potential crop.

Dakshina Kannada district being a major cashew producing region of Karnataka, increasing production in this district will contribute largely for the Karnataka state's production (Dixit *et al.*, 1998). Cashew cultivation receives dwindling importance in Dakshina Kannada district in relation to the prices of other crops like arecanut, cocoa, rubber and coconut. Fall of prices of the above crops brings attention and interest among farmers towards cashew (Venkattakumar and Bhat, 2003). Various problems faced by cashew farmers in the region are forcing them to shift to rubber cultivation and some other remunerative cash crops (Ganapathi and Akash, 2013).

To improve the cashew cultivation scenario of major cashew-growing regions, assessment of the impact of socio-personal and economic factors on

area, production and productivity of cashew are very important. To explore the applicability of technology impact premise in the context of socio-economic factors, the present study was undertaken to analyze the socio-personal and economic profile of cashew farmers in relation to their productivity status, to identify the relationship of socio-personal and economic factors with productivity of cashew and to measure the contribution of socio-personal and economic factors towards productivity of cashew.

Materials and methods

The study was conducted by DCR, Puttur. Purposive sampling technique was used to select Dakshina Kannada district since it is a major cashew producing area of Karnataka. Farmers from all the five taluks of the district namely Mangalore, Bantwal, Puttur, Belthangady and Sullia represented the sample. Detailed pre-tested interview schedule were administered to 75 random respondents. Inferences on the relationships between independent and dependent variables had to be drawn on the basis of effects already manifested. Hence an '*ex-post-facto* cause to effect' design was applied. The non-manipulable variables that were already evident formed the presumed cause (independent variables).

An interview schedule measuring the adoption status of the farmers, along with their profiles, was developed. The questionnaire contained 123 questions and took about 45 minutes to elicit information from one household. The instrument was pre-tested on a group equivalent in size to 10 per cent of the sample used in the subsequent research. Based on the results, the schedule was structured, sharpened and standardized. The content validity was ensured by examining the responses for appropriateness and through subsequent discussion with the researchers working on impact analysis at various institutes under the Indian Council of Agricultural Research. The data were collected during March to April, 2013 through questionnaire and personal interviews. Appropriate statistical measures such as Phi, Spearman's rank correlation, linear regression and step-wise regression analysis were employed to arrive at conclusions. Data were analyzed using Microsoft Excel 2007 and IBM SPSS statistics Ver. 20.

Results and discussion

Impact of socio-personal and economic factors on productivity of cashew

The results on socio-personal and economic factors affecting productivity of cashew are discussed to arrive at conclusions on their impact. For ease of comprehension, the 12 socio-personal

variables and 10 economic variables measured for the study are discussed separately.

Socio-personal profile of cashew farmers

The twelve personal variables studied are furnished in Table 1. The cashew farmers were equally distributed as far as their age was concerned with mean age of 47 years. Majority were high

Table 1. Socio-personal profile of cashew farmers (n=75)

Independent variables	Mean	SD	Category		Respondents	
					f	%
Age (years)	46.5	12.93	Young	<40	24	32
			Middle age	40-53	25	33
			Old	>53	26	35
Level of education	3.77	1.19	Illiterate		3	4
			Primary		11	15
			Secondary		7	9
			High School		34	45
			PUC		4	5
			Degree		11	15
			PG		5	7
Primary occupation			Agriculture		70	93
			Others		5	7
Experience in farming (years)	23.5	13.54	Low	<17	21	28
			Medium	17-30	36	48
			High	>30	18	24
Experience in cashew farming (years)	10.5	7.24	Low	<7	31	41
			Medium	7-14	23	31
			High	>14	21	28
Extension contact	3.03	6.29	Low		51	68
			Medium		17	23
			High		7	9
Extension participation	6.69	7.36	Low		15	20
			Medium		48	64
			High		12	16
ICT usage	10.03	5.90	Low		17	23
			Medium		42	56
			High		16	21
Cosmopolitaness	7.81	5.13	Low		27	36
			Medium		27	36
			High		21	28
Land used for cashew			Fully irrigated		2	3
			Partially irrigated		5	7
			Rain-fed		68	90
Land used for other crops			Fully irrigated		57	76
			Partially irrigated		8	11
			Rain-fed		10	13
Distance of cashew plot from home (meters)	427	850	Less		2	3
			Moderate		60	80
			Large		13	17

Table 2. Economic profile of cashew farmers (n=75)

Independent variables	Mean	SD	Category	Respondents		
				f	%	
No. of crops grown	3.28	1.62	Less	<2	20	27
			Moderate	2-4	36	48
			High	>4	19	25
Importance given to cashew	1.56	1.00	Least		54	72
			Moderate		8	11
			High		11	14
			Very High		2	3
Farm size (acres)	1.90	0.82	Low	<2.5 ha	31	41
			Medium	2.5-5 ha	23	31
			High	>5 ha	21	28
Cultivable land available (cents)	0.86	1.29	Low	<0.21	41	55
			Medium	0.21-1.51	20	27
			High	>1.51	14	18
Yielding cashew trees (nos.)	173	220	Low	<63	26	35
			Medium	63-283	38	51
			High	>283	11	14
Yield of cashew tree ⁻¹ (kg)	2.92	2.09	Low	>3.96	23	31
			Moderate	3.96-1.87	27	36
			High	<1.87	25	33
Expenditure in agriculture (₹)	90981	64037	Low	<52523	35	46
			Medium	52523-129258	20	27
			High	>129258	20	27
Net income from agriculture (₹)	240540	149649	Low	<124032	37	49
			Medium	124032-357048	20	27
			High	>357048	18	24
Expenditure in cashew farming (₹)	9293	11028	Low	<3780	28	37
			Medium	3780-14806	31	41
			High	>14806	16	21
Net income from cashew farming (₹)	29664	70426	Low	<5994	29	39
			Medium	5994-64602	40	53
			High	>64602	6	8

school pass (45%) while 93 per cent had agriculture itself as their primary occupation. Most farmers (48%) had medium level of experience in farming with an average experience of 23.5 years in agriculture. These findings are in line with that of Lakshmisha (2000), Shivaramu *et al.* (2004), Veerkar *et al.* (2006) and Venkattakumar (2006; 2008; 2009). Majority (41%) had low experience in cashew farming with an average experience of 10.5 years only. These findings are in line with that of Venkattakumar (2006) but in contrast with studies conducted in same region by Veerkar *et al.*

(2006). Contact with extension agencies was found to be low among majority of cashew farmers (68%) while participation in extension programmes was found to be medium for almost two-third of the farmers (64%). These findings are in line with that of Lakshmisha (2000) and Shivaramu *et al.* (2004). More than half of the cashew farmers (56%) exhibited medium levels of ICT usage while in case of cosmopolitanism, majority were equally divided into low and medium categories (36%). These findings are contrary to earlier ones by Lakshmisha (2000), Shivaramu *et al.* (2004) and Venkattakumar (2006).

Table 3. Classification of farmers based on production and productivity of cashew (n=75)

Category	Production (kg ha ⁻¹)			Productivity (kg tree ⁻¹)		
	f	%	Range	f	%	Range
High	13	17	>674	25	33	>3.96
Medium	30	40	674-177	27	36	3.96-1.87
Low	32	43	<177	23	31	<1.87
Mean	425	2.92				
SD	497	2.09				

While three-fourth majority (76%) of cashew farmers was giving irrigation for other crops grown by them, 90 per cent of them cultivated cashew under rainfed system only. The average distance of cashew plots from farmers' homes were found to be around half a kilometer (427 meters).

Economic profile of cashew farmers

The economic profile of cashew farmers is presented in Table 2. Around half of the farmers (48%) grew 3-4 crops on an average in their farms while almost three-fourth of them (72%) gave least priority to cashew farming. These findings are in line with that of Venkattakumar (2008). The average farm size was found to be 1.9 acres while average area of un-used land available for cultivation was found to be 86 cents. Majority (55%) had nil or negligible amount of unused land available for cultivation. The study showed that households had an average number of 173 cashew trees with a mean

yield of 2.92 kg tree⁻¹. More than half of the cashew farmers (55%) realized only moderate yields with an average net income of ₹ 29,664 ha⁻¹ year⁻¹ against an average expenditure of ₹ 9293 ha⁻¹ year⁻¹. Majority (46%) made low levels of yearly investment in agriculture of ₹ 90,981 ha⁻¹ year⁻¹ with a net income to the tune of ₹ 2,40,540 ha⁻¹ year⁻¹.

Production and productivity profile of cashew farmers

The production and productivity profile of cashew farmers (Table 3) showed that farmers achieved a mean production of 425 kg ha⁻¹ and productivity of 2.92 kg tree⁻¹. In case of production, majority fell in to medium (40%) and low (43%) producer categories while they were almost equally divided into high (33%), medium (36%) and low (31%) categories with respect to productivity achieved.

Table 4. Relationship of socio-personal factors with productivity of cashew (n=75)

Sl. No.	Variables	Productivity 'r' value
1.	Age	-0.067
2.	Level of education	0.075
3.	Primary occupation	0.244 *
4.	Experience in farming	-0.058
5.	Experience in cashew farming	0.134
6.	Extension contact	0.229 *
7.	Extension participation	0.292 *
8.	ICT usage	0.067
9.	Cosmopolitaness	-0.194
10.	Land used for cashew	-0.198
11.	Land used for other crops	0.065
12.	Distance of cashew plot from home	-0.001

* Significant at the 0.05 level (2-tailed)

Table 5. Relationship of economic factors with productivity of cashew (n=75)

Sl. No	Variables	Productivity 'r' value
1.	No. of crops grown	-0.052
2.	Importance given to cashew	0.378 **
3.	Farm size	0.077
4.	Cultivable land available	0.011
5.	No. of yielding cashew trees	0.090
6.	Yield of cashew tree ⁻¹	0.351 **
7.	Expenditure in agriculture	0.310 **
8.	Net income from agriculture	0.467 **
9.	Expenditure in cashew farming	0.284 *
10.	Net income from cashew farming	0.186

* Significant at the 0.05 level (2-tailed)

** Significant at the 0.01 level (2-tailed)

Relationship of socio-personal factors with productivity of cashew

Twelve socio-personal variables were studied for their relationship with cashew productivity. The correlation analysis revealed that extension contact and extension participation along with primary occupation registered a significant relation with cashew productivity. The contact with extension agencies was found to be low among majority of cashew farmers while participation in extension programmes was found to be medium for almost two-third of the farmers. Majority had high school education while, 15 per cent of them had acquired a degree and 93 per cent had agriculture itself as their primary occupation. The relationship carries

importance in light of the fact that extension contact and participation is on a downward trajectory while better educated farmers were found to be shifting from cashew due to perceived high benefits from alternative crops like rubber.

Relationship of economic factors with productivity of cashew

Ten economic variables were studied for their relationship with cashew productivity. The correlation analysis revealed that these economic factors have a higher relationship with cashew productivity with five economic variables registering a significant relationship. These variables are importance given to cashew crop,

Table 6. Contribution of socio-economic variables towards variability in cashew productivity

Variables	Standardized Coefficients	t value	Significance
	Beta		
(Constant)		0.343	0.733
Age	-0.613 **	-3.590	0.001
Level of education	-0.168	-1.334	0.188
Primary occupation	0.370 **	3.491	0.001
Experience in farming	0.192	1.210	0.232
Experience in cashew farming	0.242 *	2.276	0.027
Extension contact	-0.025	-0.145	0.885
Extension participation	0.374	1.731	0.089
ICT usage	0.000	-0.003	0.997
Cosmopolitaness	-0.370 **	-3.292	0.002
Land used for cashew	-0.030	-0.282	0.779
Land used for other crops	-0.049	-0.476	0.636
Distance of cashew plot from home	-0.019	-0.146	0.885
Number of crops grown	-0.007	-0.049	0.961
Importance given to cashew	-0.022	-0.165	0.869
Farm size	0.183	1.677	0.100
Cultivable land available	-0.012	-0.079	0.938
Number of yielding cashew trees	-0.517 *	-2.402	0.020
Expenditure in agriculture	-0.148	-0.853	0.397
Net income from agriculture	0.136	0.923	0.361
Expenditure in cashew farming	0.545 **	3.818	0.000
Net income from cashew farming	0.684 **	2.835	0.007

* Significant at the 0.05 level (2-tailed)
 ** Significant at the 0.01 level (2-tailed)

Model Summary

R	R Square	Adjusted R Square	Std. Error of the estimate
0.800 ^a	0.640	0.495	1.48

number of yielding cashew trees, yield of cashew per tree, expenditure incurred in agriculture and net income from agriculture. It may be noted that almost three-fourth of cashew farmers had recorded least priority to cashew farming. Households had an average number of 173 cashew trees only with a mean yield of 2.92 kg per tree which was very low. More than half of the cashew farmers realized only moderate yields with an average net income of ₹ 29,664 ha⁻¹ year⁻¹ against an average expenditure of ₹ 9293 ha⁻¹ year⁻¹ which was on a very lower side. Majority made low levels of yearly investment in agriculture of with moderate net income.

Contribution of socio- personal and economic variables towards cashew productivity

Regression analysis revealed that seven variables viz., age of the farmer, primary occupation, years of experience in farming, cosmopolitaness, number of yielding cashew trees, yearly expenditure made in cashew farming and net income from cashew farming contribute significantly to the productivity achieved by cashew farmers.

The primary occupation being agriculture and their less experience in cashew farming make them still experimenting and switching between various remunerative crops thereby increasing and decreasing their area under cashew as well as interest shown in cashew cultivation thus explaining the negatively significant contribution towards productivity. Majority were equally divided into low and medium categories (36%) with respect to their cosmopolitaness levels. Their cosmopolitaness has adversely contributed to cashew productivity with marked shifting to other remunerative crops and decreased care and interest in cashew cultivation. The number of yielding cashew trees were also found to be on lower side in most households thus negatively affecting the per unit productivity. Majority of cashew farmers belonged to low and medium categories with respect to average net income and average expenditure made for cashew cultivation per year. The variables selected for the study could explain upto 50 per cent of the variability ($R^2=0.495$) in cashew productivity.

Conclusions

The correlates identified in this study throws light on the fact that extension contact and

participation is on a downward trajectory while better educated farmers were found to opt for other remunerative crops and are shifting from cashew. The study on determinants revealed that seven variables viz., age of the farmer, primary occupation, years of experience in farming, cosmopolitaness, number of yielding cashew trees, yearly expenditure made in cashew farming and net income from cashew farming were found to contribute significantly and act as determinants of cashew productivity. Development agencies may focus on motivating farmers to take up cashew cultivation in high density mode, in better quality land with recommended management practices and proportionately increasing yearly expenditure for cashew farming in relation to net income from agriculture. Understanding the above dynamics can help development agencies working in cashew sector to design better outreach strategies towards alleviating the existing fatigue in cashew productivity.

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