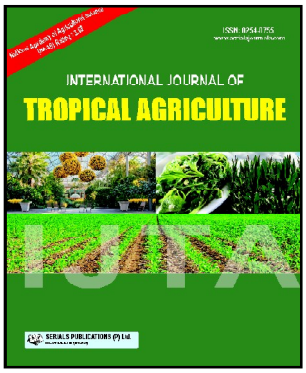

INTERNATIONAL JOURNAL OF TROPICAL AGRICULTURE

ISSN : 0254-8755

available at http: www.serialsjournal.com

Volume 35 • Number 4 • 2017

Economics of Production of Cashewnut in Ratnagiri District of Maharashtra

R.B. Hile, D.J. Sanap and D. B. Yadav

Abstract: The present investigation was conducted with keeping view an overall objective of studying the economics of production and marketing of cashewnut in Ratnagiri district of Maharashtra for the year 2015-16. The costs and returns structure, resource use productivities, maketing costs and constraints faced by the cashewnut growers have been estimated in the study.

The average per hectare cost of maintenance of cashewnut cost C was ₹ 92,104.59 and per quintal cost 4,775.50 of cashewnut was profitable with 1.94 B:C ratio. The cost of maintenance for cashewnut orchard had increased with increase in size group of holdings. The major items of cost of maintenance in cashewnut were rental value of land, total human labour charges, manures, and amortization cost. The cost of maintenance increased with increase size group of holdings. The per hectare average yield of cashewnut orchard was 18.43 q, at the overall level. The functional analysis has indicated that, at the overall level 4 variables *viz;* human labour (X_1), manures (X_2), nitrogen (X_3), and phosphorous (X_4) were significant variables for which the output is responsive.

The most important constraint in cashewnut production has been identified as non availability of labours on time and high wage rate, problem of pest and diseases were the major constraints in production.

The study revealed that the farmers were not fully aware of some of the components of cashewnut production improved technology. To increase their yield levels, there is a need to increase adoption of recommended technologies like use of HYV and hybrid varieties, fertilizers, plant protection and other technologies given by the Universities for increasing the cashewnut productivity. There was a scope for extension agencies to educate the farmers for adopting recommended technologies.

Keywords: C.D. Function, Resource use efficiency and marketing cost.

INTRODUCTION

Cashew (*Anacardium Occidentale L.*) belongs to the family Anacardiceae is an economically important tropical plantation crop. It ranks second only to Almond, among the nine tree nuts of importance in the world trade. Cashew was a native of Brazil introduced by Portuguese travelers during 16th century at Goa from where it was spread to other parts of India. It is an important plantation crop in wasteland development programme due to its utility in soil and water conservation and to build up balanced ecosystem. Apart from economic significance, cashew industry has the potential leading role in the social and financial upliftment of the rural poor. So, cashew is generally described as poor man's crop and rich man's food.

The area under cashew in the world is 30.62 lakh hectares. The world production of cashew is estimated to be around 22.82 lakh tones. India's share in the world raw nut production contributes to about 25 per cent. In recent times, India is facing stiff competition from Vietnam and Brazil in the international cashew trade. Commercial cultivation of cashew is taken up in eight states of our country mainly in west and eastern coast *viz.,* Andhra Pradesh, Goa, Karnataka, Kerala, Maharashtra, Orissa, Tamil Nadu and West Bengal. In addition, cashew is also grown in few pockets of Assam, Chattisgarh, Gujarat, Meghalaya, Nagaland and Tripura. India has an area of 8.93 lakh ha under cashew with an estimated annual production of about 6.95 lakh tonnes of raw cashew nut. Maharashtra topped cashew production with 1,83,000 MT followed by Andhra Pradesh at 92,000 MT.

In Maharashtra state, the production and productivity of cashewnut is highest in the country, as majority of plantations are developed primarily by clones of high yielding varieties and also cultivators are adopting better management practices. Maharashtra topped cashew production with 1,83,000 MT followed by Andhra Pradesh at 92,000 MT. Maharashtra ranked 1st in productivity with 1500 kg/ha followed by West Bengal 950 kg/ha and Kerala 900 kg/ha. Cashew is traditional crop of Konkan region, mainly grown on hill slopes as rainfed perennial horticultural crop. The Konkan region of Maharashtra comprising of Thane, Raigad, Ratnagiri and Sindhudurg districts is the major tract of cashew cultivation. The total area under cashew cultivation is 1.60 lakh hectares of which more than 80 per cent (1.30 lakhs ha) is in the South Konkan region of Maharashtra, mainly in Sindhudurg and Ratnagiri district. Therefore, it is attempted in the present study to understand cultivation of cashewnut by selecting one district like Ratnagiri.

METHODOLOGY

The data was based on a sample of 90 cashewnut growers selected from nine villages; three from Khed, three from Chiplun and three from Rajapur tahsils of Ratnagiri district were selected for study. The primary data was obtained by survey method for the year 2015-16 concerning aspects of production and marketing.

I. **Cobb-Douglas production function**

$$Y = aX_1^{b1} X_2^{b2} X_3^{b3} X_4^{b4} X_5^{b5} X_6^{b6} X_7^{b7} ... X_n^{bn} e^{u}$$

Where,

Y = Dependent variable (Output) in quintals

a = Constant

X_1 = Human Labour (man days)

X_2 = Manure (q)

X_3 = Nitrogen (kg)

X_4 = Phosphorus (kg)

X_5 = Potash (kg)

X_6 = irrigation costs (₹)

X_7 = Plant Protection charges (₹)

bi's= Regression Coefficients

e = Error term

II. **Resource use efficiency following formula was used.**

$$MVP = bi\ Py$$

Where,

bi = production elasticity corresponding to the i^{th} input

= geometric mean of output

= geometric mean of i^{th} input

Py = Price per unit of output

III. **Price spread** is the difference between the price paid by processer and price received by producer. To work out price spread the data obtained for the year 2015-16.

IV. **The marketing efficiency** of markets will be worked out by modified method as suggested by Acharya and Agrawal (1999) and will becalculated as,

$$MME = [RP \div (MC + MM)] - 1$$

Where,

MME = Modified measure of marketing efficiency

RP = Price paid by processer

MC = Total marketing cost and

MM = Net market margin

V. **Constraints in cashewnut production in Ratanagiri district of Maharashtrta.**

The constraints were estimated with help of percentages.

RESULTS AND DISCUSSION

Cost of Maintenance of Cashewnut Orchard

It can be observed from the Table 1, per hectare cost of maintenance of cashewnut cost C was ₹ 92,104.59, at the overall level. Amongst the different items of cost, the rental value of land was the major item of cost (32.12%) followed by manures (17.07%), hired human labour charges (15.05%), amortization cost (10.25%) and family human labour (8.07%). The total cost of maintenance of cashewnut, cost A was ₹ 42,753.96 (46.42%) and cost B was ₹ 84,670.56 (91.93%). The per hectare total cost of maintenance for one hectare of cashewnut was ₹ 82,306.59, ₹ 85,357.98 and ₹ 96,348.70 for small, medium and large size group of holdings, respectively. It was higher for large size group, it is worth noting that as large size group has readily available cash at their hand and credit at banks leads to higher use of resources which ultimately results into higher productivity of crop than the other size groups. Per quintal cost of maintenance of cashewnut was ₹ 4,707.63, ₹ 4,564.52 and ₹ 4,861.76 for small, medium and large size group, respectively.

Results of Cobb-Douglas Type of Production Function

From Table 2, at the overall level, coefficient of multiple determinations (R^2) was found to be 0.88 indicating that 88 per cent variation in output is jointly explained by the above considered independent variables. The regression coefficients of human labour (X_1), manure (X_2), nitrogen (X_3) and phosphorus (X_4) were positive and significant. If we increase one unit in the manure (X_2) would result into 0.44 per cent increase in the output. The other resources like potash (X_5) were positive but non-significant, while irrigation (X_6) and plant protection (X_7) were found negatively non-significant, indicating that there is no scope to increase use of resources.

Resource Use Efficiency

It is observed from the Table 3 that, at the overall level the ratio of marginal value product to factor cost ratio (MVP/MC) was greater than unity in case of human labour, manures, phosphorus and potash fertilizers in large size group. The marginal value product to factor cost ratio more than unity indicating there is large potential to increase input use for increasing yield.

Table 1
Cost of maintenance of cashewnut (₹/ha)

			Size group							
			Small		*Medium*		*Large*		*Overall*	
Sr. No.		*Items*	*Qty*	*Value*	*Qty*	*Value*	*Qty*	*Value*	*Qty*	*Value*
I.	1.	Hired human labour (days)								
		(a) Male	31.99	6398.31 (7.77)	36.28	7256.32 (8.50)	38.76	7751.67 (8.05)	37.42	7483.64 (8.13)
		(b) Female	39.62	5942.80 (7.2)	37.73	5658.84 (6.63)	44.86	6729.22 (6.98)	42.52	6377.79 (6.92)
	2.	Manures (q)	39.66	11898.31 (14.46)	40.49	12146.21 (14.23)	59.16	17747.88 (18.42)	52.41	15724.04 (17.07)
	3.	Fertilizers (kg)								
		N	298.94	1996.92 (2.43)	309.48	2067.30 (2.42)	314.10	2098.19 (2.18)	311.33 (2.26)	2079.68
		P	224.15	2017.37 (2.45)	235.47	2119.22 (2.48)	245.39	2208.49 (2.29)	240.65	2165.81 (2.35)
		K	85.17	2044.07 (2.48)	87.64	2103.25 (2.46)	91.83	2203.86 (2.29)	90.07	2161.68 (2.35)
	4.	Irrigation charges (₹)		526.91 (0.64)		607.58 (0.71)		835.08 (0.87)		745.36 (0.81)
	5.	Plant protection charges (₹)		761.86 (0.93)		972.20 (1.14)		1216.80 (1.26)		1107.18 (1.20)
	6.	Incidental charges (₹)		565.04 (0.69)		445.04 (0.52)		610.70 (0.63)		564.41 (0.61)
	7.	Reapirs (₹)		324.36 (0.39)		329.87 (0.39)		337.88 (0.35)		334.44 (0.36)
		Working capital (₹)		32475.95 (39.44)		33705.83 (39.48)		41739.77 (43.32)		38744.03 (42.06)
	8.	Int. on working capital		1948.56 (2.37)		2022.35 (2.37)		2504.39 (2.60)		2324.64 (2.52)
	9.	Depriciation farm impliments		1635.03 (1.99)		1229.61 (1.44)		1619.03 (1.68)		1523.36 (1.65)
	10.	Land revenue		156.99 (0.19)		137.64 (0.17)		172.19 (0.18)		161.93 (0.18)
		Cost A		36216.53 (43.00)		37095.43 (43.46)		46035.38 (47.78)		42753.96 (46.42)
	11.	Rental value of land		25593.82 (31.10)		28114.29 (32.94)		30821.94 (31.99)		29587.96 (32.12)

Contd. Table 1

		Size group							
		Small		*Medium*		*Large*		*Overall*	
Sr. No.	*Items*	*Qty*	*Value*	*Qty*	*Value*	*Qty*	*Value*	*Qty*	*Value*
12.	Int .on fixed capital (₹)		2532.40 (3.08)		2854.95 (3.34)		2958.88 (3.07)		2887.46 (3.13)
	Amortization cost (₹)		9860.03 (11.98)		9234.64 (10.82)		9452.10 (9.81)		9441.18 (10.25)
	Cost B		74202.78 (90.15)		77299.32 (90.56)		89268.30 (92.65)		84670.56 (91.93)
13.	Family labour								
	(a) Male	23.52	4703.39 (5.72)	22.38	5148.01 (6.03)	17.78	4374.68 (4.54)	19.54	4603.07 (5.00)
	(b) Female	22.67	3400.42 (4.13)	19.40	2910.65 (3.41)	19.33	2705.72 (2.81)	19.70	2830.96 (3.07)
	Cost C		82306.59 (100)		85357.98 (100)		96348.70 (100)		92104.59 (100)
II.	Output (q)								
	(a) Main produce	16.79	151239.41	17.88	165767.15	18.92	181600.49	18.43	174407.13
	(b) By-produce	29.88	3265.47	30.60	3744.40	30.69	4364.26	30.58	4092.21
III.	Cost C net of by produce		79041.12		81613.58		91984.44		88012.38
IV.	Per quintal cost		4707.63		4564.52		4861.76		4775.50

Figures in parentheses indicate percentage to the respective cost C.

Gradewise Quantity of Cashewnut Produced

Table 4, reveals that, at overall level, per ha quantity of cashewnut produced by sample farmers was 50.65 quintals. Out of this total quantity produced, maximum quantity 41.90 per cent was of grade-III which was followed by Grade-II (35.83%) and Grade-I (22.27%).

Per Quintal Cost of Marketing Through Different Channels of Cashewnut

It can be seen from the Table 5 that, the per quintal cost of marketing of cashewnut for Channel-I, Channel-II and Channel-III was ₹ 105.24, ₹ 212.66 and ₹ 221.54, respectively. Thus, per quintal cost of marketing was highest in Channel-III (Producer – Village merchant – Wholesaler - Processer). Among the marketing cost commission charges and transport charges were the major items and contributed highest share in total cost of marketing.

Price Spread and Marketing Efficiency in Different Marketing Channels

It is revealed from the Table 6, it could be observed that, the net price realized by producer was ₹ 9,715.20, ₹ 9,472.71 and ₹ 9,258.97 in Channel I, Channel II and Channel III respectively. Price spread was null in Channel I (Producer - Processer), as there were no any marketing costs and market margin between producer and processer. Price spread was maximum in Channel III (₹ 395.35), followed by Channel II (₹ 222.78). This is due to fact that as the market chain increases price spread also increases. The price paid by processer was highest in Channel II followed by Channel III.

Table 2
Results of Cobb–Douglas production function of cashewnut

Sr. No.	Particulars	Regression coefficient of variables			
		Small	Medium	Large	Overall
1.	Intercept	0.6077	1.2048	1.5908	0.9810
2.	Human labour (X_1)	1.3912*** (0.3673)	0.7581* (0.3741)	0.3896*** (0.1077)	0.4060* (0.2058)
3.	Manures (X_2)	0.4936** (0.2062)	0.8096** (0.2938)	0.4072*** (0.1335)	0.4431*** (0.1556)
4.	Nitrogen (X_3)	0.1224 (0.2463)	0.2382* (0.1204)	0.0056 (0.1210)	0.2712* (0.1393)
5.	Phosphorus (X_4)	0.1048 (0.1848)	0.1594 (0.1886)	0.3341* (0.1646)	0.3212* (0.1577)
6.	Potash (X_5)	0.2064 (0.2107)	0.1774 (0.1474)	0.7143*** (0.1795)	0.2238 (0.1435)
7.	Irrigation charges (X_6)	–0.0720 (0.4229)	–0.0747 (0.2050)	–0.0398 (0.1511)	–0.0434 (0.1660)
8.	Plant protection (X_7)	–0.3607 (0.2598)	–0.0676 (0.1160)	–0.0913 (0.0854)	–0.0731 (0.1118)
	R^2	0.67	0.60	0.86	0.88
	D.F.	22	22	22	82
	No. of observation	30	30	30	90

***,**,* Indicate significant at 1 ,5 and 10 per cent level respectively.
Figures in the parenthesis are the standard errors of the respective regression coefficient.

Table 3
Resource use efficiency in cashewnut production

Sr. No.	Particulars	bi Value	MP	MVP	MC	MVP/MC
		Overal				
1.	Human labour (X1)	0.4061	0.0606	587.19	17₄.22	3.37
2.	Manures (X_2)	0.4431	0.177	1714.01	300.00	5.71
3.	N (X_3)	0.2712	0.0158	153.40	6.68	22.96
4.	P (X_4)	0.0494	0.0038	36.57	9.00	4.06
5.	K (X_5)	0.2238	0.0286	25.74	28.65	0.90
6.	Irrigation (X_6)	–0.434	–0.0052	–25.88	1.00	–25.88
7.	Plant protection (X_7)	–0.0731	–0.001	–9.94	1.00	–9.94

Table 4
Gradewise quantity of cashewnut produced (q/ha)

Sr. No.	Grade	Size group: Small	Medium	Large	Overall
1.	A	0.26 (1.69)	3.17 (18.75)	7.85 (42.68)	11.28 (22.27)
2.	B	6.25 (40.73)	5.54 (32.76)	6.36 (34.58)	18.15 (35.83)
3.	C	8.84 (57.58)	8.20 (48.49)	4.18 (22.74)	21.22 (41.90)
4.	Total quantity marketed	15.35 (100.00)	16.91 (100.00)	18.39 (100.00)	50.65 (100.00)

Figures in parentheses are the percentage to the total quantity marketed.

Table 5
Channelwisemarketing cost forcashewnut (₹/q)

Sr. No.	Particulars	Size group: Channel I (Producer – Processer)	Channel II (Producer – Wholesaler – Processer)	Channel III (Producer – Village merchant – Wholesaler – Processer)
1.	Grading charges	19.56 (18.59)	20.12 (9.46)	21.42 (9.66)
2.	Packing material charges	28.24 (26.83)	30.65 (14.41)	32.74 (14.78)
3.	Transport charges	45.18 (42.93)	50.68 (23.84)	55.76 (25.17)
4.	Hamali	12.26 (11.65)	14.36 (6.75)	16.82 (7.60)
5.	Commission charges	–	96.85 (45.54)	94.80 (42.79)
	Total marketing cost	105.24 (100.00)	212.66 (100.00)	221.54 (100.00)

Figures in parentheses are the percentage to the total marketing cost.

Table 6
Price spread and marketing efficiency in different channels of cashewnut (₹/q)

Sr. No.	Particulars	Channel I	Channel II	Channel III
1.	Gross price received by the farmer	9820.44 (100.00)	9685.37 (97.75)	9480.51 (96.00)
	(i) Marketing cost	105.24 (1.07)	212.66 (2.15)	221.54 (2.24)
	(ii) Net price received	9715.20 (98.93)	9472.71 (95.61)	9258.97 (93.75)
2.	Village merchant			
	(i) Price paid	–	–	9480.51 (96.00)
	(ii) Marketing cost	–	–	105.75 (1.07)
	(iii) Market margin	–	–	112.86 (1.14)
	(iv) Price received	–	–	9699.12 (98.21)
3.	Wholesaler			
	(i) Price paid	–	9685.37 (97.75)	9699.12 (98.21)
	(ii) Marketing cost	–	100.36 (1.01)	80.95 (0.82)
	(iii) Market margin	–	122.42 (1.24)	95.79 (0.97)
	(iv) Price received	–	9908.15 (100.00)	9875.86 (100.00)
4.	Processor			
	(i) Price paid	9820.44 (100.00)	9908.15 (100.00)	9875.86 (100.00)
	Price spread	0.00	222.78	395.35
	MME	92.31	21.75	15.01

Figures in parentheses are the percentage to the price paid by processers.

From the table it was seen that, the marketing efficiency was maximum for Channel I (92.31), followed by Channel II and Channel III, respectively. Channel I was the most efficient channel in marketing of cashewnut.

Table 7
Constraints in production of cashewnut

Sr. No.	Type of problems	Size group: Small	Medium	Large	Overall
1.	Non-availability of quality seedlings	20 (66.67)	16 (53.33)	14 (46.67)	50 (55.56)
2.	Non-availability of credit in time	8 (26.67)	14 (46.67)	16 (53.33)	38 (42.22)
3.	Problems of pests and diseases	22 (73.33)	25 (83.33)	27 (90)	74 (82.22)
4.	Non-availability of labours and high wage rates	15 (50)	20 (66.67)	25 (83.33)	60 (66.67)
5.	High cost of fertilizers	9 (30)	12 (40)	18 (60)	39 (43.33)
6.	Lack of technical knowledge	25 (83.33)	23 (76.67)	15 (50)	63 (70)
7.	Problem of theft	15 (50)	18 (60)	22 (73.33)	55 (61.11)
	Total samples	30 (100.00)	30 (100.00)	30 (100.00)	90 (100.00)

Figures in parentheses are the percentage to the total.

Constraints in Production

From Table 7 at overall level, the problem of pest and disease (82.22%), lack of technical knowledge (70%), non-availability of labours and high wage rates (66.67) and quality seedlings (55.56%) were the major constraints reported by farmers, respectively.

CONCLUSIONS

1. The study as whole, per hectare average yield of cashewnut orchard was 18.43 quintals and ₹ 4,775.50 per quintal cost of cashewnut was a profitable with 1.94 B:C ratio. The cost of maintenance for cashewnut orchard had increased with increase in size group of holdings. The functional analysis has indicated that, the variables *viz;* human labour (X_1), manures (X_2), nitrogen (X_3), and phosphorous (X_4) are significant variables for which the output is responsive.

2. The per quintal cost of marketing and Price spread (₹ 221.54 and ₹ 395.35),) were highest in Channel-III (Producer–Village merchant–Wholesaler-Processer). This is due to fact that as the market chain increases price spread also increases. Marketing efficiency was maximum for Channel I (92.31), followed by Channel II and Channel III, respectively. Channel I was the most efficient channel in marketing of cashewnut.

REFERENCES

Gupta, S.P. and Prashant, D.S. (2004), Constraints in cashewnut production and marketing. Agricultural Marketing, **47**: 20-29.

Landage, V.V., Pawar, B.R., Deshmukh, D.S. and Yeware, P.P. (2010), Resource use productivity and resource use efficiency in flood irrigated banana production.Internat. J. of Commerce and Business Management (Vol. No. **3**), Issue 1: 114-116.

Pawar, B.R., Kolambkar, R.A. and Kauthekar, P.U. (2015), Resource productivity and resource use efficiency in cashewnut production. Internat. Res. J. Agric. Eco. and Stat., **6**(2): 317-320.

Pawar, B.R., Kolambkar, R.A. and Kauthekar, P.U. (2015), Resource productivity and resource use efficiency in cashewnut production. Internat. Res. J. Agric. Eco. and Stat., **6**(2): 317-320.

Shetye, A.S. (2011), Economics of cashewnut production in Sindhudurg district. Agricultural Economics Research Review Vol. **25**(No. 1).

Senthil, A. and Dr. Mahesh, M.P. (2010), Analysis of cashewnut production in india. Asia Pacific Journal of Marketing and Management Review ISSN 2319-2836 Vol. **2**(3).