P-ISSN: 2618-0723
E-ISSN: 2618-0731

NAAS Rating: 5.04
www.extensionjournal.com

International Journal of Agriculture Extension and Social Development

Volume 7; Issue 3; March 2024; Page No. 650-654

Received: 15-01-2024
Accepted: 26-02-2024

Indexed Journal
Peer Reviewed Journal

Economic analysis of production and cultivation of coconut in Southern districts of Karnataka

[1]Raghuramreddy Yeswanth, [2]SS Pramod Nayak and [3]KM Suman

[1, 3]Senior Research Fellow, Senior Research Fellow (SRF), Institute of Agri-Business Management, CoA, UAS, GKVK, Bengaluru, Karnataka, India

[2]Ph.D. Scholar, Ph.D. Scholar, Institute of Agri-Business Management, CoA, UAS, GKVK, Bengaluru, Karnataka, India

DOI: https://doi.org/10.33545/26180723.2024.v7.i3h.486

Corresponding Author: Raghuramreddy Yeswanth

Abstract

The present study was conducted to know the economics of production and cultivation of coconut in Southern districts of Karnataka. India occupies a predominant position in the world were Karnataka ranks first in India with productivity of 6.26 tonnes per hectare. The total cost of cultivation per acre is (C_3) Rs. 65064 with yield of coconut nuts is 4050 with decreasing gross returns of Rs. 14439 and Cost of production was Rs.16 per nut. While, Rs. 13 was the price of coconut per nut. The total cost of coconut converted in to copra was Rs. 74206 with yield of 4.65 quintals per acre with decreasing gross returns of Rs. 21923 per quintal nuts cost of production per copra with a significant return of Rs. 15958 with price of copra per quintal was Rs. 9700. Major problems faced by the growers are *rhinoceros beetle*, non-availability of labor, mechanizing of harvesting dehusking breaking and conversion of copra. Hence, from the study it can be concluded that among the significant variables, labor, manure, pesticides, fertilizer and irrigation were more important input resources for the growers in the study area. Labor cost had a greater influence on the productivity of coconut compared to all other variables. Thus, it can be suggested that the Government should provide technical and financial assistances to these farmers.

Keywords: Total cost (C_3), gross returns, price, cost of production, output and copra

Introduction

The coconut palm (*Cocos nucifera*) is found throughout the tropics, where it is interwoven into the lives of the local people. It is particularly important in the low islands of the Pacific where, in the absence of land-based natural resources, it provides almost all the necessities of life, food, drink, oil, medicine, fiber, timber, thatch, mats, fuel, and domestic utensils. For good reason, it has been called the "tree of heaven" and "tree of life." Today it remains an important economic and subsistence crop in many small Pacific Island states (Naik, 2019) [3].

All parts of the palm are used in some way or another in the daily life of the people of the west coast, the traditional coconut growing area. Its fruit is called *Lakshmi-Phai* and is used in social and religious functions in India irrespective of whether palm is locally grown or not. Each and every part of the coconut tree is useful to mankind. The coconut products like the wet kernel, desiccated copra, coconut water, cream flour, oil, cake, toddy, husk, fiber, shell, coir, wood, and leaves are used for one purpose or the other (Naik, 2019) [3].

In India, the coconut palm is referred to as 'Kalpavriksha' – the 'tree of heaven' as each and every part of the palm is useful in one way or the other (Vinodhini *et al.*, 2018) [4]. Ten million people in India depend on coconut for their livelihood either directly or indirectly. India ranks third in area and first in production of coconut in the world with producer of coconut 20309 million nuts from area of 2173 thousand hectares and productivity accounted with 9,346 nuts/hectares (Anon., 2019) [1]. Karnataka stands first position with an area of 672 thousand hectares, 4120 thousand tonnes with a productivity of 6.26 tonnes per hectares followed Tamil Nadu, Kerala, Andhra Pradesh, West Bengal, Odisha, Maharashtra, Gujarat, Goa and Assam [1]. Southern Karnataka accounted with total area of 618360 hectares with production of 7963 nut/hectares and productivity of 4924.18 thousand nuts. Tumakuru was highest production (1312.37 thousand nuts) and productivity (7342 nuts/ha.) followed by Mandya, Hassan, Chikmagalur, Chitradurga, Udupi, Mysuru, Dakshina Kannada, Ramanagara and Chamarajanagara [2].

Materials and Methods

The study was conducted in the major southern districts of Karnataka pertaining to production and cultivation of coconut were Karnataka's southern districts contributes to highest area and productivity. Hence, these districts are purposively selected. Primary and secondary data were collected. Pertaining to the area, production and productivity of world, India and Southern districts of Karnataka secondary data was collected from Asian and Pacific Coconut Community (APCC) *Statistical Year Book*, Department of Horticulture, GoK and *indiastat.* Whereas, Primary data was collected from a total of 60 farmers to

study cultivation practices and conversion of coconut to copra. The data was collected through personal interview during October 2020.

The cost of cultivation of coconut included both variable cost and fixed costs. The variable cost comprises of costs incurred on variable inputs such as Farm Yard Manure (FYM)/ Neem cake, fertilizer, micronutrients, manure, red earth (tractor loads), dehusking, labour (human & tractor), irrigation charges, marketing expenses and interest on working capital. The fixed cost comprises non-cash items such as crop insurances/ risk premium, land and water tax, depreciation on farm machinery & farm building, rental value of land, amortized establishment cots, managerial cost and interest on fixed capital. Also, costs incurred by farmers on transportation, commission paid and weighment etc. were included in marketing expenses. Gross returns for coconut cultivation was computed by multiplying total physical quantity of produce with average price realized by sample respondents per unit quantity. Gross returns to crop cultivation was calculated over cost A_1 + FL, C_2 and cost C_3. Costs involved in conversion of coconut into crop comprises of Breaking of coconut, de-husking & interest on storing and amortized cost of storing (*low cost*). Gross returns for coconut to copra conversion was computed by multiplying total physical quality of copra with average price realized by sample respondents per unit of copra. Gross returns to copra was calculated over cost A_1 +FL, C_2 and C_3 were cost of production of copra computed as total cost divided by yield of copra was calculated over cost A_1 +FL, C_2 and C_3.

Results and Discussion

Global scenario

Globally, the production of coconut in 2020 is about 65,671 million nuts with an area of 12,258 thousand hectares. India is largest producer of coconuts accounting for 20309 million nuts with an area of 2173 thousand hectares followed by Philippines, Indonesia, Sri Lanka, Vietnam, Papua New Guinea, Thailand, Malaysia, Kenya and Vanautau. By continent, coconut production has a large area in the Asian region reaching 53 million tons, followed by the American continent at 4.9 million tons, and Oceania at 2.1 million tons. While, if looked at the countries view several countries become the center of coconut plantations, because the coconut plant has several benefits, especially in terms of health, many countries are competing to cultivate this plant.

Table 1: Major coconut producing countries 2020

Sl. No.	Countries	AREA (''000 Hectares)	Production (Million nuts)	Productivity (Nuts/ha)
1	India	2,173	20,309	9,346
2	Philippines	3,651	14,491	3,969
3	Indonesia	3,397	13,994	4,120
4	Sri Lanka	444	2,792	6,288
5	Vietnam	159	1,677	10,547
6	Papua New Guinea	221	1,483	6,710
7	Thailand	125	591	4,728
8	Malaysia	85	561	6,600
9	Kenya	89	305	3,427
10	Vanautau	90	303	3,367
Total		12,258	65,671	5,357

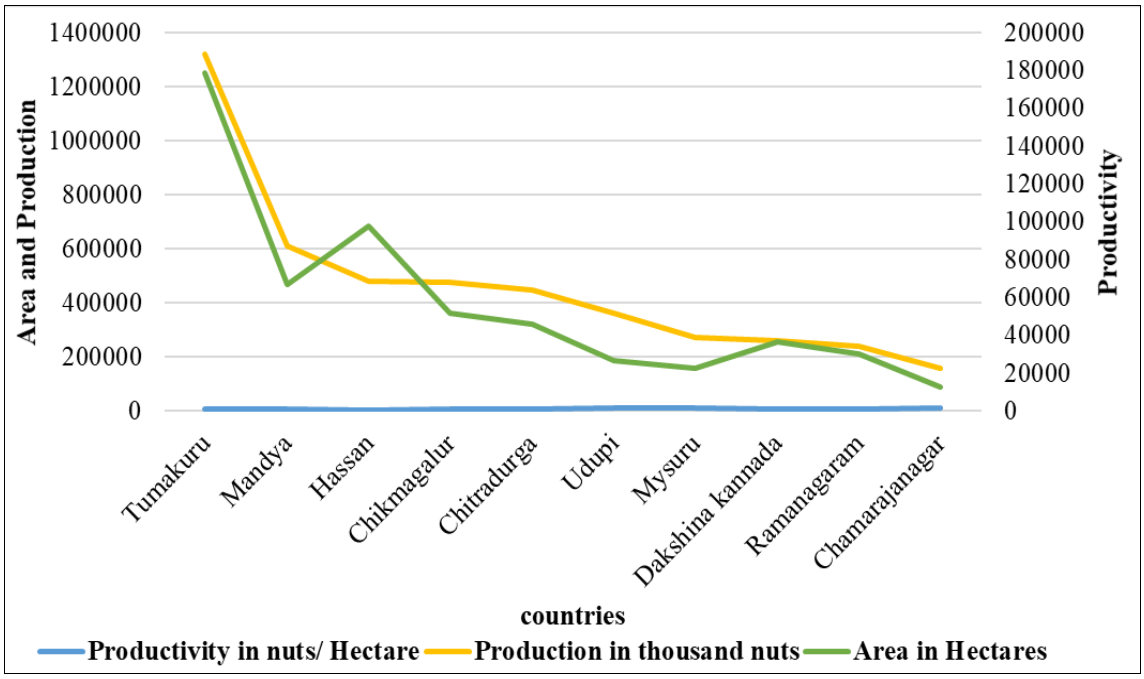

Fig 1: Major coconut producing countries 2020

Indian Scenario

Among all the states, Karnataka stands first with an area of 672 thousand hectares, 4210 thousand tonnes with a productivity of 6.26 tonnes per hectare, followed by Tamil Nadu with an area of 444 thousand hectares, 3751 thousand tonnes and productivity of 8.43 tonnes per hectare, Kerala with an area of 767 thousand hectares, 3307 thousand tonnes nuts and productivity of 4.32 tonnes per hectare. These three states cover more than 80 percent of area and production to the country's total. The production in Karnataka has increased in 2021-22 due to increase in irrigation facilities in prominent growing districts of the state. The results were similar to the findings of Govindasamy (2018) [2].

Table 2: Major coconut producing states in India for the year 2021-22

States/UTs	Area (In ' 000 Hectare)	Production (In ' 000 Metric Tonne)	Productivity (In MT/Hectare)
Karnataka	672.41	4210.87	6.26
Tamil Nadu	444.92	3751.26	8.43
Kerala	767.80	3307.78	4.31
Andhra Pradesh	112.98	1127.27	9.98
West Bengal	32.56	278.73	8.56
Odisha	52.74	273.32	5.18
Maharashtra	29.90	153.44	5.13
Gujarat	25.00	147.26	5.89
Goa	26.63	113.33	4.26
Assam	21.03	107.94	5.13
India	2228.98	13657.37	6.13

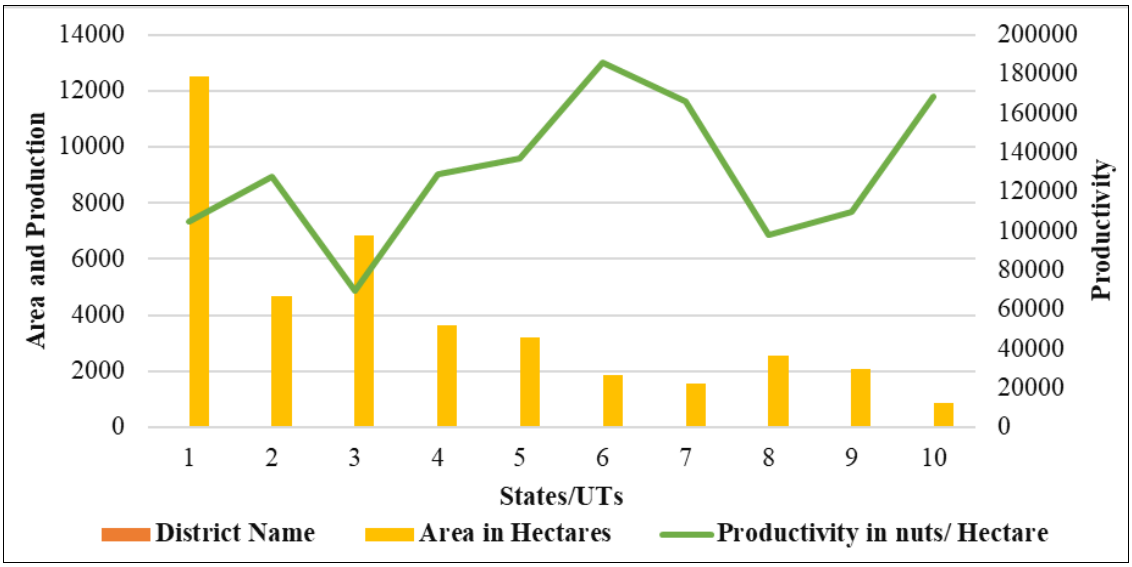

Fig 2: Major coconut producing states in India for the year 2021-22

Scenario of Karnataka

In Karnataka, Tumakuru district accounts for the highest area and production with production of 1312368 thousand nuts from an area of 178748 hectares followed by Mandya, and Hassan these three districts contribute of about 48 percent of total production of the state. There is an increasing trend in production in state because good irrigation facilities and government schemes/ subsidies.

Table 3: District wise Area, production and Yield of coconut in Karnataka state for the year 2020-21

Sl. No.	District Name	Area in Hectares	Productivity in nuts/ Hectare	Production in thousand nuts
1	Tumakuru	178748	7342	1312368
2	Mandya	67106	8955	600934
3	Hassan	97999	4857	475981
4	Chikmagalur	51782	9046	468420
5	Chitradurga	45870	9598	440260
6	Udupi	26707	13016	347618
7	Mysuru	22593	11629	262734
8	Dakshina kannada	36862	6885	253795
9	Ramanagaram	30017	7683	230621
10	Chamarajanagar	12571	11804	148388
State Total		618360	7963	4924179

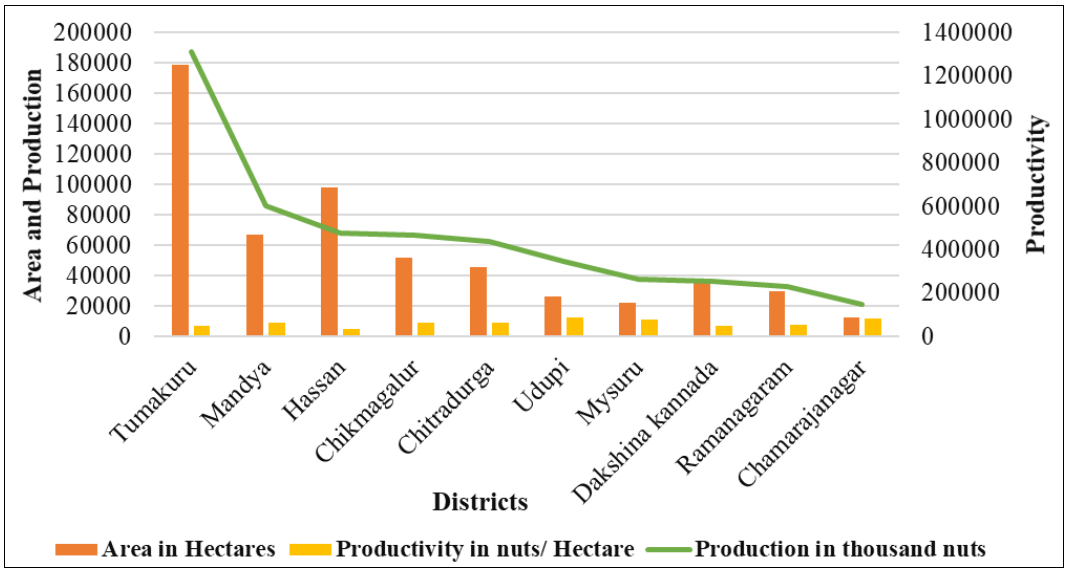

Fig 3: District wise Area, production and Yield of coconut in Karnataka state for the year 2020-21

Cost and returns of coconut cultivation of Sothern Karnataka

Costs and returns of coconut in Karnataka state were estimated and are depicted in Table 4. Coconut is mainly grown as irrigated crop in Tumakuru, Hassan, Mandya and other districts of Karnataka. Supplementary irrigation is given in case of rainfed farming. The profitability is assessed through farm management concepts by estimating cost per acre. Cost A_1 includes all paid out costs, depreciation, interest on working capital, land and water tax and amortized establishment cost. Cost A_2 includes rent paid for leased in land added to Cost A_1. Family labour included in Cost C; imputed value of family labour is considered on par with prevailing / paid out wages to hired labour. It was observed that variable cost constitutes for about 44.60 percent, cost A_1 plus family labour accounted for 60.80 percent and cost C_2 accounted for 92.80 percent of total cost of cultivation. The total cost of cultivation per acre was Rs. 65064. The returns were Rs. 11060 over Cost A_1 + FL and negative over Cost C_2 and Cost C_3. The average yield was 4050 nuts per acre for the year 2020-21. The average yield has likely increased in Karnataka due to increase in irrigation facilities in coconut growing states of Karnataka. The findings are inline with Naik (2019) [3] were labour had a greater influence on the productivity of coconut.

Table 4: Cost and returns of coconut cultivation per acreage

Sl. No.	Details		Unit	Cost/Return	%
	Variable Cost			29031	44.6
1	Human Labour		24	9405	14.5
	Family	Male (no.)	10	4341	6.7
		Female (no.)	8	2270	3.5
	Hired	Male (no.)	4	2144	3.3
		Female (no.)	2	650	1.0
2	Machine & Bullock Labour			3206	4.9
	Tractor (Hrs) Machine		3.5	3150	4.8
	Bullock (Days)		0.08	56	0.1
3	Inputs			12745	19.6
	FYM (Tractor Loads)		1.5	5241	8.1
	Manure (Kgs)		30.82	570	0.9
	Fertilizer (Kgs)		83.65	1912	2.9
	Micronutrients (Kgs/Litres)		10.65	250	0.4
	Red Earth (Tractor Loads)		15.98	4772	7.3
4	Marketing Expenses (Rs)			850	1.3
5	Interest on working capital (7.5%)			2025	3.1
6	Irrigation Charges			800	1.2
	Fixed Cost			36033	55.4
7	Crop insurance/Risk premium (2% of Sum Insured) *			560	0.9
8	Land and water tax			75	0.1
9	Depreciation on farm machinery and farm buildings			664	1.0
10	Rental value of land			18550	28.5
11	Amortised Establishment Cost			9235	14.2
12	Managerial Cost (15% of all cost)			4700	7.2
13	Interest on fixed capital (12%)			2249	3.5

Costs	Cost A_1 + FL		39565	60.8
	Cost C_2		60364	92.8
	Total Cost (C_3)		65064	100.0
Output	Nuts (No's)	4050	50625	
	Price (Per nut)		13	
Return	Gross		50625	
	Over Cost A_1 + FL		11060	
	Over Cost C_2		-9739	
	Over total cost		-14439	
Cost of Production (Rs. / nut)	Cost A_1 + FL	10		
	Cost C_2	15		
	Cost C_3	16		

Table 5: Costs involved in conversion of coconut to copra

Details		Unit	Cost/Return	Percent
Costs of coconut Production	Cost A1 + FL		39565	53.32
	Cost C2		60364	81.35
	Total Cost (C3)		65064	87.68
De-husking			2025	2.73
Breaking			1418	1.91
Interest on storing			4500	6.06
Amortized Cost of Storing (Low Cost)			1200	1.62
Costs of Copra production	Cost A_1 +FL		48707	65.64
	Cost C_2		69506	93.67
	Cost C_3		74206	100.00
Output	Copra (Quintals)	4.65	45105	
	Price		9700	
Return	Gross Return		52283	
	Return Cost A_1+FL		3576	
	Over Cost C_2		-17223	
	Return Over Cost C_3		-21923	
Cost of Production (Rs. / Qtl)	Cost A_1+FL		10475	
	Cost C_2		14948	
	Cost C_3		15958	

The Table 5 depicts that cost and returns of coconut, the cost involved in conversion of coconut to copra is presented in the table. Dehusking, interest on storing, amortized storage is added. The returns were Rs. 3576 over Cost A_1+FL and negative over Cost C_2 and C_3. The returns are likely to increase in the year 2021-22 due to high prices copra during peak season.

Conclusion

The coconut palm being a small land holder's plantation crop in Karnataka majorly growing in southern districts as the production, harvesting and conversion copra is done by farmers. There are various constraints mentioned when interviewed the farmers such as rhinoceros beetle which damages the coconut palms by boring into the crowns or tops of the tree where it damages growing tissues and feed on tree sap. There is no mechanization for harvesting, breaking, dehusking and conversion of copra. Hence, it suggests that yield of coconut & copra and returns to scale was decreasing. Thus, it may be concluded that among the significant variables, labor, manure, pesticides, fertilizer and irrigation were more important input resources for the growers in the study area. The variable "labor" had a greater influence on the productivity of coconut than all other variables. From the study it can also be suggested that Government should provide technical and financial assistances to these farmers.

References

1. Anonymous. Statistical Year Book. Asian and Pacific Coconut Community (APCC). 2019:35-40. Available from: https://www.indiastat.com/coconut/2021-22.
2. Govindasamy R. A Study on Production of Coconut in Coimbatore District, Tamilnadu. Shanlax Int. J Econ. 2018;7(1):27-35.
3. Naik JN. Cost of Coconut Cultivation – Farmer Groups wise in East Godavari District. Int. J Econ Manage Stud. 2019;6(10):136-142.
4. Vinodhini C, Deshmukh KV, Ajay Kumar Srivastava. Economic Analysis of Coconut Marketing and Constraints in Coconut Cultivation with Special Reference to Karur District of Tamil Nadu, India. Int. J Curr Microbiol Appl. Sci. 2018;7(10):2505-2512. Available from: https://horticulturedir.karnataka.gov.in/english.
5. https://www.indiastat.com/coconut/2021-22.
6. https://horticulturedir.karnataka.gov.in/english