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COMPARATIVE ECONOMICS OF TENDER NUTS AND MATURED NUTS OF COCONUT IN RATNAGIRI DISTRICT (M.S)

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Abstract: *The present study entitled "Comparative economics of tender nuts and matured nuts in Ratnagiri District (M.S)" was undertaken to estimate comparative cost, returns and profitability of coconuts and its disposal pattern with a 80 coconut growers. Results revealed that, the per hectare inputs utilized for matured coconut orchards were 287.95 human days, 17.27 quintals of manures, 183.45 kg of N, 56 kg of P, 80 kg of K, Rs.679 for plant protection chemicals and Rs.2251 for irrigation charges, whereas for tender coconut orchards per hectare input utilized were 135.49 human days, 19.96 quintals of manures, 195.26 kg of N, 56.4 kg of P, 80.47 kg of K, Rs. 736 for plant protection chemicals and Rs. 1335 for irrigation charges. The per farm yield of matured and tender coconut were 5328.78 and 1050.83 nuts respectively and per hectare gross returns realized were Rs.148315 from matured nuts and Rs.171713 from tender nuts orchard. It is also revealed from the study that the coconut orchard has good scope for tender nuts production than matured nuts for supplementing the farm income.*

Keywords: *Costs, returns and profitability, comparative.*

Introduction:

Coconut is a benevolent crop and a perfect gift to mankind. The coconut meat is gelatinous, soft and sometimes referred to as coconut jelly. It contains 17% fat, out of which 95% is saturated. The coconut water, which is sterile until the coconut is opened, is a highly nutritious food source. As per 2014 world statistics, India is the largest coconut producing country in the world contributing 31.02 per cent of the world production. World productiondecreased from 70931.79 million nuts in 2013 to 69836.36 million nuts in 2014. India, Indonesia and Philippines are the leading coconut growing countries having 75.87 per cent of the total coconut area & contribute 75.48 per cent of the coconut production in the world. Among the major coconut growing countries, Brazil hold the highest productivity of 11630 nuts per ha followed by India with 10345 nuts per ha.

As per the India estimates for the year 2014-15, the area and production of coconut in the country is 1.98 million hectares and 20439.61 million nuts respectively. The corresponding figures for the year 2013-14 were 2.14 million hectares and 21665.19 million nuts, recording decrease in area by 7.69 per cent and production by 5.66 per cent. The four southern states of Kerala, Karnataka, Tamil Nadu and Andhra Pradesh accounted for 87.86 per cent of the coconut area and 90.11 per cent of the coconut production in the country.Konkanregion is the coastal plain of Maharashtra State in the Western India with Asian Sea on the West and Western Ghats on the East and it is the major coconut growing belt as about 92.34 per cent of the total area and production of coconut is concentrated in this region. The region composes of Ratnagiri, Raigad, Sindhudurg, Thane districts and greater Mumbai and has hilly terrain and extensive sea coast of 720 Kilometers. It is reported that Ratnagiri district covers area of 4882 ha with production of 444 lakh nuts and Productivity is 9093 nuts per hectare.

Most of the established coconut plantations in Konkan region are of the variety West Coast Tall (WCT). However, on the basis of superior morphological, inflorescence and fruiting characteristics accompanied by high yield potential,

Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli in Ratnagiri district has released the cultivar 'Banavali Green Round' during the year 1987 named as 'Pratap' for commercial cultivation in the Konkan region. Since then 'Pratap' variety is cultivated on large scale in Ratnagiri, Sindhudurg and Thane, Raigad districts. Besides these varieties, dwarf varieties like Andaman Dwarf, Nicobar Dwarf, Lakshdweep tall and dwarf, and hybrid varieties TxD, DxT and VHC-1 are also planted in this region.

Material and Methods:

Sampling design

Since the study is aimed at finding out the comparative economics of tender nuts and matured nuts, the sample for the study necessarily involved the selection of cultivators for gathering the relevant data on the aspects of the study.Three stage sampling technique was used in this study for the selection of coconut growers. Tahsilwas as a primary unit, village as a secondary unit and coconut growers as an ultimate unit for the study.There are nine tahsils in Ratnagiri district. Out of these nine tahsils viz. Ratnagiri, Chiplun, Guhagar and Dapoli were selected on area proportionate basis. The lists of villages growing coconut were obtained from revenue records of selected tahsils. From each tahsil two villages were selected randomly. Similarly a list of coconut growers were obtained from the revenue records of selected villages and ten coconut growers were selected randomlyfro each village. Thus final sample consisted of four tahsils, eight villages and eighty coconut growers. Out of the ten selected coconut growers in the respective villages, the available number of farmer who were selling coconut as a tender nut were selected for the study.The data collected from the selected farmers were analyzed separately for each group to draw the conclusions, by using simple statistical tools such as arithmetic mean, averages, frequency distribution, percentages and ratios etc.Standard cost concept were used to study cost, returns and profitability of coconut production.

Results and Discussion:

Land holding and its utilization

The size of operational holding has profound influence on different economic aspects of farming business such as scale of production, intensity of resources use and ultimately the levels in expenditure. The average size of land holding and its utilization is given in Table 1.

Table 1: Per farm size of land holding

(Area in ha.)

Sr. No.	Particular	Overall	Percent
i)	Cultivated		
a.	Irrigated	0.536	39.07
b.	Unirrigated	0.449	32.73
	Sub-Total (A)	**0.985**	**71.8**
ii)	Uncultivated(B)	0.387	28.21
	Total (A+B)	**1.372**	**100**

(Figures in the parentheses indicates percentage to total)

At overall level the average size of holding owned by sample coconut farmers was 1.372 ha. Out of total holding of land the irrigated area was 39.07per cent and un-irrigated land was about 32.73 per cent whereas land unsuitable for cultivation (Uncultivated) was 28.21 per cent.

Cropping pattern of coconut grower

Cropping pattern is another important factor influencing the level of total annual expenses on the farm as well as net returns from the farm business. The cropping intensity of sample coconut grower was 123.53 per cent at overall level. It was also observed that, the gross cropped area was 0.64 ha and net cultivated area was 0.52 ha. Out of the gross cropped area, 15.12 per cent area was under Kharif crops, 3.59 per cent under *Rabi* crops and 81.29 per cent under perennial crops, indicated that the cropping pattern of the study area was dominated by perennial crops.

Table 2: Cropping pattern followed by sample coconut growers (Per farm)

Sr. No.	Particulars	Overall (N=80)	Percent
1)	*Kharif* Season		
	a)Paddy	0.096	15.12

	b)Others	0	
	Sub total	**0.096**	**15.12**
2)	*Rabi* Season		
	a)Vegetable & Pulses	0.022	3.59
	Sub total	**0.022**	**3.59**
3)	Perennial		
	a)Coconut &Arecanut	0.52	80.96
	b)Others	0.0021	0.33
	Sub total	**0.5221**	**81.29**
4)	Gross Crop area	0.64	100
5)	Net Cultivated area	0.52	----
6)	Cropping Intensity (%)	123.53	----

(Figures in the parentheses indicates percentage to total)

Farm assets

The farm assets are very important as they indicate economic position of the coconut farmer.

Table 3: Per farm investment in farm asset. (Figures in Rs.)

Sr. No.	Particular	Overall (N=80)	Percent
1)	Buildings		
a)	Residential buildings	40928	55.21
b)	Cattle shed	3014	4.07
c)	Store house and Engine house	6242	8.42
	Total	**50184**	**67.70**
2)	Livestock	6715	9.06
3)	Implements, machinery and hand tools	17230	23.24
	Total investment	74129	100

(Figures in the parentheses indicate percentages to total)

The investment on total assets possess by the coconut grower including residential building, store and engine houses, sheds, livestock, and implements, machinery & hand tools is given in Table 3.

The average value of total assets at overall level for sample cultivators was Rs.74129, out of which maximum (55.21%) was in residential building, followed 23.24 per cent in implements, machinery and hand tools, 9.06 per cent in livestock, 8.42 per cent investment in store houses and engine houses, and 4.07 per cent in cattle shed.

Composition of coconut cultivators under matured and tender nuts

The coconut growers were observed to take production in two different ways as matured nuts and tender nuts. The distribution of coconut palms and cultivators according to the purpose of production is given in the Table 4.

Table 4: Distribution of coconut palms and cultivators

Sr. No.	Production purpose	Numbers	Percentage to total
1.	**Matured nuts**		
a.	Palms	6892	94.20
b	Cultivators	74	92.50
2.	**Tender nuts**		
a.	Palms	424	5.80
b	Cultivators	24	30.00
3	**Total**		
a.	Palms	7316	100.00
b.	Cultivators*	80	

(*Total numbers of cultivators are more than 80 as some were taking both matured and tender nuts)

Total numbers of palms with sample growers were 7316, of which only 5.80 per cent (424 palms) were maintained for tender nuts and 94.20 per cent (6892 palms) were maintained for matured nuts. Maximum numbers of palms were reserved for production of matured nuts by large numbers of cultivators.

Cost and returns for coconut cultivation:

Input utilization for maintenance of matured nut and tender nut coconut orchard:

In study area, all operations in the coconut cultivation, viz., cleaning of orchards, irrigation, intercultural operations, application of manures and fertilizers, plant protection, harvesting of coconuts and supervision of orchards required human labour exclusively. Labour is an important input in cultivation practices of coconut.

Labour utilization was worked out and presented in Table 5. It was revealed from the table that, per hectare total labour utilization were worked out to be 287.95 and 135.49 man days for maintenance of mature and tender coconut orchard respectively.

Table 5: Per hectare input utilization for maintenance of coconut orchards

Sr. No.	Inputs	Matured nut orchard	Tender nut orchard
1.	Labour (Man Days) Both hired & family	287.95	135.49
2.	Manures (q)	17.27	19.96
3.	Fertilizers in kg N P K	 183.45 56 80	 195.26 56.4 80.47
4.	Plant protection(Rs)	679	736
5.	Irrigation Charges(Rs)	2251	1335

It is also seen from the Table 5 that, the per hectare inputs utilized for matured coconut orchards were17.27 quintals of manures, 183.45 kg of N, 56 kg of P, 80 kg of K, Rs. 679 for plant protection chemicals and Rs. 2251 for irrigation charges Howeverthe inputs for the maintenance of per hectare tender coconut orchardutilized were 19.96 quintals of manures, 195.26 kg of N, 56.4 kg of P, 80.47 kg of K, Rs.736for plant protection chemicals and Rs.1335 for irrigation charges. The per hectare total cost of maintenance (Cost-C) of matured coconut orchard was worked out to Rs. 132748, out of which share of cost-A was 56.11 per cent and cost-B was 87.98 per cent.

Cost of maintenance of coconut orchards:

Table 6: Per hectare maintenance cost of matured coconut orchard.

Sr. No.	Items of expenditure	Quantity	Rate (Rs)	Amount (Rs)	Percentage
1	Hired human labour (days)				
	a) Male	188.08	249.3	46888	35.32
	b) Female	62.15	156.4	9720	7.32
	Total	**250.23**		**56608**	**46.10**
2	Manures(q)				
	FYM	17.27	172.2	2974	2.24
3	Fertilizers (Kg)				
	N	183.45	5.8	1064	0.80
	P	56	8.24	461	0.35
	K	80	18.2	1456	1.10
4	Plant protection			679	0.51
5	Irrigation charges			2251	1.70

6	Land revenue and other cesses			108	0.08
7	Depreciation on implements and machinery			1019	0.77
	Input cost			**65493**	**49.34**
8	Interest on working capital @12 per cent for the period of 12 months			7859	5.92
	COST A			**74480**	**56.11**
9	Rental value of land (1/6th of the gross returns-land revenue)			24611	18.54
10	Interest on fixed capital (@10% of fixed investment)			3450	2.60
11	Amortization value			14255	10.74
	COST B			**116795**	**87.98**
12	Family human labour (days)				
	a) Male	37.72	249.3	9404	7.08
	b) Female			-	-
13	Supervision charges @ 10% input cost			6549	4.93
	COST C			**132748**	**100**
14	Yield and Gross returns				
	i)Main Produce(Nuts)	10073	14.59	146965	
	ii)By produce			1350	
	Total			**148315**	
15	**B:C Ratio**			**1.12**	
16	**Average cost per nut**			**13.1**	

(Percentage is worked out to Cost-C)

As regards the item wise cost, it was found that the maximum cost was incurred to hired labours (46.10%), followed by rental value of land (18.54 %).

Table 7: Per hectare maintenance cost of tender coconut orchard

Sr. No.	Items of expenditure	Quantity	Rate (Rs)	Amount (Rs)	Percentage
1	Hired human labour (days)				
	a) Male	106.99	249.3	26673	28.48
	b) Female	24.16	156.4	3779	4.03
	Total	**131.15**		**30452**	**32.51**
2	Manures(q)				
	FYM	19.96	172.2	3437	3.67
3	Fertilizers (Kg)				
	N	195.26	5.8	1133	1.21
	P	56.4	8.24	465	0.50
	K	80.47	18.2	1465	1.56
4	Plant protection	-	-	736	0.79
5	Irrigation charges	-	-	1335	1.43
6	Land revenue & other cesses	-	-	100	0.11
7	Depreciation on implements and machinery	-	-	976	1.04
	Input cost	-	**-**	**39021**	**41.66**
8	Interest on working capital @12 per cent for the period of 12 months	-	-	4683	5.00
	COST A	-	**-**	**44780**	**47.81**
9	Rental value of land (1/6th of the gross returns-land revenue)	-	-	28519	30.45
10	Interest on fixed capital (@ 10% of fixed investment)	-	-	1119	1.19
11	Amortization value	-	-	14255	15.22
	COST B	-	**-**	**88673**	**94.68**
12	Family human labour (days)				
	a) Male	4.34	249.3	1082	1.16

	b) Female	-	-	-	
13	Supervision charges @ 10%input cost	-	-	3902	4.17
	COST C	**-**	**-**	**93657**	**100**
14	Yield and gross returns				
	i)Main Produce (Tender nuts)	9385.26	18.16	170436	-
	ii)By product	-	-	1276	-
	Total	**-**	**-**	**171713**	**-**
15	**B:C Ratio**	**-**	**-**	**1.83**	**-**
16	**Average cost per nut**	**-**	**-**	**9.97**	**-**

(Percentage are worked out to Cost-C)

However the cost for Amortization value was worked out to be Rs. 14225 which is followed by Family human labour (Rs. 9404), Interest on working capital (Rs. 7859), Supervision charges (Rs. 6549), chemical fertilizers (Rs.2981), manures (Rs. 2974) and irrigation charges (Rs. 2251).The per hectare item wise cost incurred for the maintenance of the tender coconut orchards was worked out separately and presented in Table 7.Per hectare total cost of maintenance (Cost-C) of the tender coconut orchard was accounted to Rs93657, out of which share of cost-A was 47.81 per cent and cost-B was 94.68 per cent. As regards the item wise cost, it was found that the maximum cost was incurred to hired labours(32.51%), followed by rental value of land (30.45 %) amortization value (15.22%), interest on working capital (5%), supervision charges (4.17%) and FYM (3.67%). The average per nut cost of production of matured and tender coconut was worked out, and it was Rs13.10 and 9.97 respectively.

Profitability of matured and tender coconutproduction

On the basis of per hectare production of matured and tender coconuts gross returns were worked out. The profitability at various costs level viz. Cost-A, Cost-B and Cost-C were worked out by deducting respective costs from gross returns. The per hectare profitability at these various costs are presented in Table 8.

Table 8: Per hectare profitability of matured and tender coconut

Sr. No.	Particulars	Matured nuts amount (Rs)	Tender nuts amount (Rs)
1	**Gross return**	148315	171713
2	**Costs**		
	a) Cost A	74480	44780
	b) Cost B	116795	88673
	c) Cost C	132748	93657
3	**Profit at**		
	a) Cost A	73836	126933
	b) Cost B	31520	83040
	c) Cost C	15567	78056
4	**Benefit cost ratio**	1.12	1.83
5	**Per nut cost of production**	13.10	9.97

Per hectare gross returns for matured coconut received were 148315, whereas Cost-A, Cost-B and Cost-C were Rs.74480, RS.116795 and Rs.132748 respectively. However the per hectare gross returns for tender coconut received were Rs.171713, whereas Cost-A, Cost-B and Cost-C were Rs.44780, Rs.88673 and RS.93657. After deducting the various cost from gross returns, the per hectare profit for matured and tender coconut orchard at Cost-A (Farm business income) were worked out to Rs. 73836 and Rs.126933 respectively, whereas, profit at Cost-B (Family labour income) were accounted toRs.31520 and Rs. 83040 respectively. Similarly the per hectare profit at Cost-C (Net income) for matured and tender coconut orchard were accounted to Rs.15567 and Rs. 78056 respectively.

The benefit-cost ratio of matured and tender coconut orchard worked out to 1.12 and 1.83 respectively. However, the benefit-cost ratio is

greater than one indicates the profitability of orchard. Thus the table revealed that the coconut orchard has good scope for tender nuts production than matured nuts for supplementing the farm income.

Disposal pattern of coconut: To know the quantity of farm produce marketed as well as used for home consumption, per farm disposal pattern at overall level was studied and the result are presented in Table 9.

The per farm total production of matured coconut at overall level was worked out to be 5328.78 nuts, out of which 89.01 per cent of produce were sold in market, 4.37 per cent quantity of nutswere kept for home consumption, 3.51 per cent of produce used for wages and 3.29 per cent of nuts were used for other purposes. However, the total production of tender coconut at overall level was 1050.83 nuts, out of which 92.10 per cent of produce were sold in market, 5.74 per cent quantity of tender nuts were kept for home consumption, 0.96 per cent tender nuts used for wage payment and 1.20 percent tender nuts used for other purposes.

Conclusions

1. The per hectare inputs utilized for matured coconut orchards were 287.95 human days, 17.27 quintals manures, 183.45 kg of N, 56 kg of P, 80 kg of K, and Rs.679 for plant protection chemicals and Rs.2251 for irrigation charges. However, for tender coconut orchards the per hectare inputs utilized were 135.49 human days, 19.96 quintals manures, 195.26 kg of N, 56.4 kg of P, 80.47 kg of K, Rs. 736 for plant protection chemicals and Rs. 1335 for irrigation charges.

2.

Table 9: Per farm disposal of coconuts (Numbers)

Sr. No.	Size	Total production of nuts (Nos.)	Home consumption	Storage loss	Gift to relatives	Used for preparation of seedling	Wage payment	Marketed surplus
1	Matured nuts (N=74)	5328.78 (100)	229.1 (4.37)	3.78 (0.072)	162.9 (3.11)	5.91 (0.11)	183.9 (3.51)	4743.19 (89.01)
2.	Tender nuts (N=24)	1050.83 (100)	60.27 (5.74)	- (00.00)	12.62 (1.20)	- (00.00)	10.11 (0.96)	967.83 (92.10)

(Figures in the parentheses indicate percentage to total)

(* Total numbers of cultivators are more than 80 as some were taking both matured and tender nuts)

3. Per farm yield of matured and tender coconut was accounted to 5328.78 nuts and 1050.83 nuts respectively. Whereas per hectare yield of matured and tender coconut was worked out to 10073nuts and 9385.26 nuts respectively.
4. per hectare gross returns realized from matured coconut orchard was Rs.148315 and it was Rs.171713 from tender coconut orchard.
5. The coconut orchard has good scope for tender nuts production than matured nuts for supplementing the farm income.

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