

Production and Marketing of Coconut *viz-a-viz* Natural Ball Copra in Tumakuru District : A Comparative Economic Study

S. D. LOKESH AND MAHIN SHARIF

Department of Agricultural Economics, College of Agriculture, UAS, GKVK, Bengaluru - 560 065
e-Mail : sharif.mahin@gmail.com

ABSTRACT

Tumakuru is the largest coconut producing district in Karnataka, typically known for natural ball copra production. Majority of the farmers in Tumakuru district are cultivating coconut over decades and their livelihood primarily dependent on coconut farming. The present study revealed that the total cost of Rs.37031.09 and Rs.54069.89 were incurred for coconut and copra production, respectively. The gross returns of coconut was found to be Rs.39753.38 and B:C ratio was 1.07 which is on par with the unity representing coconut venture, a less profitable enterprise. The gross returns of copra was Rs.14369.11 and benefit cost ratio was 1.27 which was higher than the one representing copra processing, a profitable venture in the study area. The determinants of farmers' choice to take up ball copra processing were analysed by using logit regression model where additional income generated from the family members, number of productive palms in the orchard, farming experience and education of the farmer were positively and significantly influencing farmers to take up processing of ball copra. Discounting method was adopted to calculate the cost of carrying inventory to process coconut into ball copra. The net returns earned by selling copra was Rs.10651.40 discounted at the rate of 12 per cent, as a result, Rs.9479.75 was obtained which was higher than net returns of coconut. Water scarcity and higher commissions were the major problems during the coconut production and marketing whereas, decreasing production of coconuts due to less rain fall and price volatility were the major problems faced by farmers in copra production and marketing.

Keywords : Coconut production, Copra making, Logit model, Inventory cost, Natural ball copra

COCONUT palm (*Cocos nucifera*) is also known as 'Kalpavruksha' in Sanskrit meaning 'a divine tree which fulfills all the needs'. It is a nature's great boon for a healthy and wealthy life of mankind. Center of origin for coconut is believed to be Southeast Asia (Philippines, Malaysia and Indonesia). However, the center of cultivation is periphery of Southern India. Coconut is being cultivated for thousands of years in India and is an inevitable part of Indian culture, tradition, religious and social practices and cuisine. Every part of the tree, from the top to the bottom has variety of applications. One of the major products of coconut is coconut oil which is rich in essential nutrients and vitamins. Apart from oil, the commercial importance is growing rapidly for other coconut products like packed tender coconut water, coconut milk, virgin oil and other fiber / coir products.

India is one of the top five countries in the world in total production of coconut. In India, Kerala stands

first in production followed by Tamil Nadu and Karnataka. In Karnataka almost all the districts cultivate coconut palms and it is the second most important horticultural crop. Majority of the people getting either direct employment by cultivating the coconut palms or indirectly employed in coconut-based processing industries or marketing of the produce.

In Karnataka, approximately 60 per cent of the total production consumed as raw nuts for domestic culinary purposes, traditional rituals and religious purposes. Nearly, 25 per cent of the nuts processed into edible ball copra and desiccated coconut powder. Remaining 15 per cent of the nuts utilized for tender coconut purposes (Shashikumar and Chandrashekhar, 2014). Karnataka plays a prominent role in production of ball copra. Processing of ball copra from coconuts is practiced by both small and large farmers particularly from the regions of Tumakuru, Hassan, Chitradurga and Chikkamagaluru districts. There are six APMC

markets in the state dealing with ball copra trading viz., Arasikere, Channarayapatna, Gubbi, Huliya, Tiptur and Turuvekere. Out of these six major copra markets four markets i.e., Gubbi, Huliya, Tiptur and Turuvekere markets are in Tumakuru district and Tiptur copra market is considered to be the Asia's largest copra trading market.

Tumakuru district is known as 'Kalpatharu Nadu' naturally blessed with unique and elegant local varieties such as Tiptur tall, Arasikere tall etc. The demand for ball copra produced in Tiptur region is high throughout the country. But, copra makers had seen a high volatility in price of copra over last decade. Despite of having a choice to dispose-off the raw coconut immediately after the harvest, farmers in this region prefer to make ball copra which could be sold (after 10 to 12 months) this possesses huge cost of carrying inventory, opportunity cost, interests and risks etc. In this regard, the present study analyses the costs and returns of natural ball copra production, cost of carrying inventory, factors influencing the farmers' choice for opting to make ball copra and constrains faced by the farmers' in production and marketing of the ball copra. This study was carried out with the following specific objectives.

1. To analyse the costs and returns from coconut and natural ball copra production in Tumakuru district
2. To study the determinants of farmers' choice for natural ball copra processing over selling raw coconut
3. To estimate the cost of carrying inventory of coconut in the processing of natural ball copra
4. To identify the constrains in production and marketing of natural ball copra and coconut

METHODOLOGY

Tiptur taluk of Tumakuru district has been selected for the current study. The primary data was collected from randomly selected 80 farmers consists of 40 farmers who were selling raw coconut directly after harvest and 40 copra processing farmers. The secondary data was collected from official websites, magazines and periodicals of concerned authorities and

departments. Descriptive statistics was followed to analyze the cost and returns. The costs were classified into variable and fixed costs. Variable cost included cost of inputs (seed, farm yard manure, fertilizer and plant protection chemicals), labour cost, irrigation cost and interest on working capital. Fixed cost included depreciation on farm implements, rental value of land, land revenue, interest on fixed capital, risk premium, managerial cost and amortized establishment cost. The income gained out of harvested produce was calculated in terms of gross returns i.e., returns gained from main product and by-products and net returns which is the returns obtained after deducting the cost of production and other expenses.

Logit Model

Logit model was used to analyse the determinants of processing of ball copra. The empirical form the logit employed in the study presented and described below;

$$Y_i = \beta_0 + \sum_{j=1}^{10} \beta_j X_j + u_i$$

Where,

Y_i is not observed. It is known as 'latent' variable. However, the latent variable can only be observed as a dichotomous variable as (y_i) is defined by:

$$Y_i = \begin{cases} 1 & \text{if } i^{\text{th}} \text{ farmer is processing ballcopra} \\ 0 & \text{otherwise} \end{cases}$$

β_0 = Constant term

β_j = Parameters to be estimated

u_i = Random error term

X_1 = Education (No. of years in formal education)

X_2 = Total adult family members (No.)

X_3 = Total Land Holding (Acres)

X_4 = Experience in farming (No.)

X_5 = Average age of the coconut garden (years)

X_6 = Number of nut bearing palms

X_7 = Allied income (1 /annum)

X_8 = Yield of nuts (Nuts/acre)

X_9 = Income from other family members (1 /annum)

X_{10} = Loan outstanding (1)

Discounting Method

Discounting method was used to estimate the cost of carrying inventory to process the copra using below mentioned formula. The net returns of copra were multiplied with discounting factor to arrive at present value of future net returns.

$$D_n = \frac{1}{(1+i)^n}$$

Where,

D_n = Discounting factor

i = Discounting rate

n = Number of periods in discounting

Garrett's Ranking

To evaluate the constraints faced by coconut growers and copra makers in production and marketing, Garrett's Ranking was used to prioritize the constraints. The order of merits given by the respondents were changed into ranks by using the below formula;

$$\text{Percentage position} = \frac{100(R_{ij} - 0.5)}{N_j}$$

Where,

R_{ij} = Rank given for i^{th} factor by j^{th} individual

N_j = Number of factors ranked by j^{th} individual

The percentage position of each rank so obtained was converted into scores by referring to the table given by Garrett (Garrett and Woodworth, 1969). Then, for each factor the scores of individual respondents were added together and divided by the total number of respondents for whom scores were added. These mean scores for all the factors were arranged in descending order and the constraints were ranked.

RESULTS AND DISCUSSION

Costs and Returns from Coconut and Natural Ball Copra Production

The cost and returns for coconut and ball copra were separately studied to compare the economic viability of these ventures. The fixed cost, variable cost, gross

returns and net returns were computed for the coconut and copra production to analyse the profitability. The gross returns and net returns were arrived based on the prevailing market price during study period.

Cost of Coconut Cultivation

The total cost for coconut production incurred during the study period was estimated Rs.37031.09 which includes total fixed cost of Rs.21398.44 (57.79%) and variable cost of Rs.15632.65 (42.31%). However, fixed cost component was higher in the present study due to inclusion of establishment cost. The fixed cost includes various components such as depreciation of the building and machineries, rental value of land which was calculated at the rate of 20 per cent of the gross return, land revenue, managerial cost at the rate of 10 per cent of working capital, risk premium at the rate of 5 per cent of 80 per cent of working capital and amortized establishment cost as shown in Table 1. Amortized establishment cost was highest among all the components, constituted 34.09 per cent of the total cost. The results are on par with the research findings of Kishore and Murthy (2017) where total cost of cultivation of coconut worked out to be Rs.121827 per hectare which is similar to the total cost of our study.

Cost and Return Structure of Coconut Production

The cost and returns structure of the coconut is represented in Table 2. Average yield of 3505.50 nuts were obtained per acre per year in the study area. Cost of production of coconut incurred over total was Rs.10.29 per nut. The cost of production over paid out cost was Rs.4.46 per nut. where cost of production over total cost and paid out cost were Rs.3.30 per nut and Rs.2.60 per nut, respectively which is due to variation in the input cost over a period of time. Gross return of Rs.39753.38/acre/annum was obtained where returns from the main product was Rs.37245.88 (93.69%), considering average price of Rs.10.54 per nut during the study season and returns from the by-product like raw leaves, firewood etc. constituted Rs.2507.50 (6.31%). These results are in line with the study conducted by Vinodhini *et. al.* (2017). The returns over total cost of production were found to be Rs.2722.29 and B:C ratio was 1.07 which is on par

TABLE 1
Cost of coconut cultivation

Particulars	Unit	Quantity	Value (Rs.)	Per cent share
Variable cost/working capital				
Farm yard manure	Tractor load	2.00	1759.50	4.75
Fertilizers (NPK and others)	Quintal	3.47	4326.50	11.68
Plant protection chemicals	Litre	0.92	1074.00	2.90
Human labour	Man days	8.84	1703.75	4.60
Irrigation	Acre inch	4.29	1107.50	2.99
Transportation of resources	-	-	552.50	1.49
Interest on working capital @ 10 % per annum	-	-	1421.15	3.84
Intercultural operations	Machine hours	7.99	3230.00	8.72
Miscellaneous	-	-	457.75	1.24
Total variable cost			15632.65	42.21
Fixed cost				
Depreciation	-	-	224.75	0.61
Rental value of land @ 20 % of the gross return	-	-	6490.33	17.53
Land revenue	-	-	75.00	0.20
Managerial cost @ 10 % of working capital	-	-	1416.15	3.82
Risk premium @ 5 % of 80 % of working capital	-	-	568.46	1.54
Amortized establishment cost	-	-	12623.75	34.09
Total fixed cost			21348.94	57.79
Total cost			37031.09	100.00

with the unity representing coconut venture, a not much profitable enterprise. Similar results were found in the study conducted by Kerutagi *et. al.* (2020) where B:C ratio of 0.80 was found during the study. However, the study conducted by Venkat Reddy (2017), showed B:C ratio of 1.23 which was higher than the present study. Water scarcity and infestation of pest and

TABLE 2
Cost and return structure of coconut production

Particulars	Value (Rs.)		
	Per acre / annum	Per palm	Per nut
Fixed cost	21348.94	533.72	6.09
Variable cost	15632.65	390.82	4.46
Total cost of cultivation	37031.09	925.78	10.29
Paid out cost (Variable cost)	15632.65	390.82	4.46
Yield (nuts)	3505.50	87.60	-
Price per nut	10.54		
Returns from main product	37245.88	931.15	10.63
Returns from by-product	2507.50	62.69	0.72
Gross returns	39753.38	993.84	11.34
Returns over total cost of cultivation	2722.29	68.06	0.78
Returns over paid out cost	24120.73	603.02	6.88
Returns per rupee of total cost of cultivation		1.07	
Returns per rupee of paid out cost		2.54	
B:C ratio		1.07	

diseases in recent years, decreased the yield and productivity of the coconut palms. Monsoon failure, low rainfall and decrease in the ground water level caused less production in turn low returns; otherwise, coconut production is a profitable venture.

Cost of Copra Production

Farmers who took up copra processing incurred similar cost of production as coconut growers until the stage of coconut production. The various components of total cost are represented in Table 3. The total cost of production of copra was Rs.54069.89 of which fixed cost was Rs.34047.55 (62.97%) and variable cost was Rs.20022.34 (37.03%). Rental value of the land at the rate of 20 per cent of the gross returns, accounted for 25.32 per cent of the total cost was highest contributing component. Among the variable cost components, cost of fertilizers accounted for 7.74 per

TABLE 3
Variable and fixed cost for copra production

Particulars	Unit	Quantity	Value (Rs.)	Per cent share
Variable cost/working capital				
Farm yard manure	Tractor load	2.00	1952.50	3.61
Fertilizers (NPK and others)	Quintal	3.47	4182.50	7.74
Plant protection chemicals	Liter	0.92	1102.88	2.04
Human labour	Man days	8.84	1948.75	3.60
Irrigation	Acre inch	4.29	1336.25	2.47
Transportation of resources	-	-	1038.75	1.92
Intercultural operations	hours	7.99	3821.25	7.07
Miscellaneous	-	-	601.25	1.11
Removing of husk	-	-	1361.25	2.52
Breaking of shell	-	-	336.75	0.62
Grading and Packing	-	-	520.00	0.96
Interest on working capital at 10 %	-	-	1820.21	3.37
Total variable cost	-	-	20022.34	37.03
Fixed cost				
Depreciation	-	-	250.75	0.46
Rental value of land @ 20 % of the gross return	-	-	13687.80	25.32
Land revenue	-	-	75.00	0.14
Managerial cost @ 10 % of working capital	-	-	1548.29	2.86
Risk premium @ 5 % of 80 % of working capital	-	-	619.32	1.15
Amortized establishment cost of coconut orchard	-	-	13320.00	24.63
Amortized establishment cost of copra processing unit	-	-	781.25	1.44
Interest on fixed cost at 12 %	-	-	3765.14	6.96
Total fixed cost (1)			34047.55	62.97
Total cost (1)			54069.89	100.00

cent followed by cost incurred for intercultural operations (7.07%). The results obtained in the study were on par with the research findings of Kishore and Murthy (2017) where total cost for production of copra was worked out to be Rs.67032.

Cost and Return Structure of Copra Production

Economics of copra production is represented in Table 4. It was revealed that a gross return of Rs.68439 was obtained per year per acre during the study period. On an average, 3600 nuts were produced from 40 palms occupied at one acre of land, processed into 4.40 quintal of copra. Average price of Rs.14239.83/quintal of copra was realized by the farmers during the period of the study despite of high price volatility observed over the years. The gross returns earned by selling main product accounted for Rs.62655.25/acre/annum which was 91.55 per cent of the total gross returns and remaining 8.45 per cent *i.e.*, Rs.5783.75 was gained from by-products such as coconut husk, shell and fire woods (*matte in Kannada*). The returns over total cost of production and paid out cost were Rs.14369.11 and Rs.48416.66, respectively. The benefit cost ratio arrived at 1.27 which was higher than the

TABLE 4
Cost and return structure of copra production

Particulars	Value in Rs.	
	Per Acre / annum	Per Quintal
Fixed cost	34047.55	7738.08
Variable cost (A)	20022.34	4550.53
Total cost of copra production	54069.89	12288.61
Paid out cost (Variable cost)	20022.34	4550.53
Returns from main product	62655.25	14239.83
Returns from by-product	5783.75	1314.49
Gross returns	68439.00	15554.32
Returns over total cost	14369.11	3265.71
Returns over paid out cost	48416.66	11003.79
Returns per rupee of total cost of cultivation	1.27	
Returns per rupee of paid out cost	3.42	
B:C ratio	1.27	

unity representing copra processing was a profitable venture in the study area. These results were slightly lesser than the studies of Kerutagi *et. al.* (2020) where B:C ratio of 1.68 was found for copra processing venture.

Determinants of Farmers' Choice for Ball Copra Processing

The determinants of farmer's choice to take up ball copra processing were analysed by using logit regression model. This model predicts the odds of copra processing *i.e.*, the ratio of probability of copra processing to the probability of copra not processing. Whereas, the odds ratio (OR) is a measure of association between the exposure (*i.e.*, determinants of copra processing) and outcome (*i.e.*, copra processing) and they are used to compare the relative odds of the occurrence of the outcome of interest (*i.e.*, copra processing in our case), given exposure to the variable of interest (*i.e.*, factors determining the copra processing).

The results of the estimated logit function are presented in Table 5. From the pseudo-R² value of 0.727 it can be concluded that about 72.7 per cent of the variance in the probability of prediction of copra processing is explained by the considered explanatory variables. Further, from the Hosmer-Lemeshow chi-squared test with 8 degrees of freedom indicated goodness of fit of the model. It can be seen that 2.43 Hosmer-Lemeshow chi-squared value with 96.5 per cent probability value indicated very good fit of the model. The explanatory factors like additional income generated from the family members, number of productive palms, farming experience and education of the farmer were positively and significantly influencing factors on processing of ball copra. Keeping all other things at a fixed level a unit increase in the additional income from the family member will increase the odds ratio by increase by 0.001 levels. Similarly, a unit increase in number of productive palms, farming experience of the farmer and farmer's education leads to increase in odds ratio by 0.47, 0.25 and 0.72, respectively. The negatively influencing significant factors of copra processing were loan outstanding

TABLE 5
Determinants of copra processing
(Logistic regression)

Particulars	Odds Ratio	Coefficient in (Odds Ratio)
Constant	0.001 (0.000)	-17.853 * (9.946)
Education (no of years)	1.720 (0.433)	0.542 ** (0.251)
Adult family members (No.)	1.268 (0.593)	0.2380 (0.468)
Land holdings(Acre)	0.0001 (0.000)	-16.2810 ** (6.877)
Farming experience(years)	1.253 (0.166)	0.2250 * (0.132)
Garden age (years)	1.098 (0.163)	0.0940 (0.148)
Nut Bearing palms (Nos)	1.474 (0.162)	0.3880 ** (0.239)
Nut yield (No./acre)	1.002 (0.002)	0.0020 (0.002)
Income from allied activities (INR/Annum)	1.000 (0.000)	0.0001 (0.000)
Income generated family members (INR/Annum)	1.0001 (0.000)	0.00011 *** (0.000)
Loan outstanding (INR)	0.999 (0.000)	-0.00004 *** (0.000)
Number of observations		80
Pseudo R ²		0.727
Hosmer-Lemeshow chi ² (8)		2.430
Prob> chi ²		0.965

Figures in parentheses are standard error

Note : ***, ** and * represent significance at one per cent, five per cent and 10 per cent levels, respectively

amount and land holding. By the discussion with the farmers, it was observed that the farmers who have higher outstanding loan amount were in need of urgent cash so dispose the freshly harvested coconuts to the local traders. The large farmers also prefer to sell the coconut immediately after harvest. But during the discussion it was observed that the large farmers also process the coconut into ball copra but its proportion is very small compared to the sale of fresh coconuts. Surprisingly, numbers of adult family members, age of

the garden, nut yield and income from allied activities have insignificant impact on copra processing.

Cost of Carrying Inventory of Processing Coconut into Ball Copra

Inventory carrying cost refers to all the expenses related to storing goods which includes depreciation, loss of opportunity cost and storage facility. In case of copra, processing of coconut into ball copra would take 10 to 12 months which is one more year of waiting period involved in the venture to generate income. Hence, it was necessary to find out the present value of future cash flow to assess profitability. Present value was calculated at the discounting rate of 12 per cent because most of the nationalized banks charge 12 per cent rate of interest on term loans which are repayable in more than five years. Number of periods was considered to be one year as processing of coconut into ball copra takes 10 to 12 months. Thus, discounting factor for one year at the rate of 12 per cent was found to be 0.89.

It was found that Rs.14369.11 was earned per acre of copra production. However, processing cost of Rs.2999.25 and value of spoiled copra, Rs.718.46 were deducted from the gross returns to arrive at net returns, Rs.10651.40 as shown in Table 6. Discounting at the rate of 12 per cent was applied to the net returns. As a result, Rs.9479.75 were obtained which was the present value of future cash flow (after 10 to 12 months). The results clearly indicated higher returns from copra compared to the negative net returns from coconut (-Rs.4579.46). Even though, some of the farmers selling the coconut immediately after harvest to meet their financial needs, most of the farmers took up processing of nuts into ball copra due to assess of higher returns in the study area.

Constraints in Production and Marketing of Coconut

Production and marketing constraints faced by the coconut growers were are represented in Table 7 and Table 8, respectively. It was revealed that water scarcity was the major problem during the coconut

TABLE 6
Estimation of cost of carrying inventory of coconut in the processing of ball copra

Particulars	Value in Rs.	
	Per Acre / annum	Per Quintal
Returns from copra (a)	14369.11	3265.71
Spoilage of copra @ 5% during processing (b)	718.46	163.29
Removing of husk (c)	1361.25	309.38
Breaking of shell (d)	336.75	76.53
Grading and Packing (e)	520.00	118.18
Amortized establishment cost Copra processing unit (f)	781.25	177.56
Total processing cost of copra (g = c+d+e+f)	2999.25	681.65
Net returns (h = a-b-g)	10651.40	2420.77
Discounted net returns	9479.75	2154.49
Net returns from coconut	-4579.46	-1072.43

TABLE 7
Constraints in production of coconut

Constraints in production	Garrett's mean score	Rank
Water scarcity	74.20	I
Infestation of pest and diseases	69.60	II
Labour requirements	60.55	III
Expensive planting material	51.25	IV
High initial investment	47.80	V
Loan facility	34.55	VI
Availability of coconut processing industries	33.08	VII
Technical know-how	28.98	VIII

production in the study area followed by infestation of pest and diseases. Major pest and diseases found in the study area were than javoor wilt, bud rot, lethal yellowing and nusiroga. Other major problems such as non-availability of labours, expensive planting material, high initial investment, non-availability of loan facility, limited access to coconut processing industries and technical knowledge were ranked as shown in Table 7. Similar findings were reported by Bhoopathy

TABLE 8
Constraints in marketing of coconut

Constraints in Marketing	Garrett's mean score	Rank
Commission agents	69.15	I
Price fluctuations	65.70	II
Lack of storage facilities	56.95	III
High wage demand of labours	51.10	IV
Grading	43.93	V
Transportation	34.48	VI
Less demand	28.70	VII

(2016) where water shortage due to rainfall failure was a major problem in Coimbatore followed by price fluctuation. Kumari *et. al.*, (2003) reported infestation of pest and diseases in Kozhikode district of Kerala affected the coconut production. Other than these constraints Sivalingaiah *et. al.*, (2102) reported yield gaps in coconut production due to lack of adoption of improved cultivars.

There were constraints faced by the farmers during marketing of produce as were shown in Table 8. Commission agents were highly problematic in the study area which was ranked first. Involvement of commission agents at various levels of marketing resulted in decrease in the farmer's share of consumer rupee. Price fluctuation stood at second place which was the most common problem faced by other agricultural commodities. Lack of storage facility ranked third due to which farmers were forced to sell their produce immediately after harvest at prevailing market price which resulted in decreased returns. High wage demand was another major problem faced by marginal and small farmers followed by non-grading where farmers were not practicing grading of the produce because of which all the small and large sized nuts in the lot fetched the same price and caused decreased returns. Transportation facility and lack of demand for the coconut were least problematic. Similar marketing problems were observed in study conducted by Kerutagi *et. al.*, (2020).

Constraints in Production and Marketing of Copra

The constraints faced by the farmers during processing of coconut into copra and marketing of copra were expressed in Table 9 and Table 10, respectively. Decreasing production of coconuts due to less rain fall and decreased ground water level was the major problem because yield of coconuts directly related to the yield of copra followed by unfavorable climatic

TABLE 9
Constraints in production of copra

Constraints in Production	Garrett's mean score	Rank
Decreasing production of coconut	71.90	I
Climatic conditions	61.58	II
Labour requirements	58.83	III
Lack of Storage facility	43.43	IV
Cost of freight	38.25	V
Loss of copra at storage	26.03	VI

TABLE 10
Constraints in marketing of copra

Constraints in Marketing	Garrett's mean score	Rank
Price fluctuation	62.58	I
Middlemen	60.28	II
Lack of market information	40.03	III
Inadequate storage facility	37.13	IV

conditions which affected the coconut production. Labour requirement for copra making was very important at the stages like harvesting of matured nuts, storage, dehusking, deshelling and packing. Non-availability of labours created high wage demand which was another main constraint followed by inadequate storage facility which hindered farmers from taking up copra making; improper storage of nuts might cause huge loss due to spoilage. Cost of transportation of the produce was not a major constraint and copra makers recorded an average loss of nuts at storage to the tune of five per cent which was not a major problem faced by copra makers ranked at last place.

All most all the agricultural commodities face marketing problems in India. Price volatility was very high in case of copra and witnessed a price range Rs.9,000 per quintal to Rs.20,000 per quintal, which was ranked first. During the festival season, price used to go up and vice versa during peak production season. Studies conducted by Muniraju and Jaysheela (2016) reported price fluctuation as the major constraint in production of copra. Middlemen problem persisted as major as price fluctuation in the market which was ranked at second place. Since the price fluctuation was very high which was changing on a daily basis, market information for copra makers was very important. However, most of the farmers could not update themselves with the ongoing price range resulted in getting low returns which was ranked at third place. Inadequate storage facility was least expressed problem among the respondents because most of the farmers constructed a storage space called 'atta' at their dwelling house, which caused them low investment cost and a proper storage place (Table 10).

The research findings of the study revealed that drastic climate change and price volatility where more problematic in the study area. Sometimes, wholesalers faced lack of demand and retailers were affected by high transportation cost. Government may involve in managing crisis by providing artificial air dryers at subsidized price, financial help in constructing copra units, bringing policy changes in export of copra and creating awareness among the farmers and traders regarding online trading platforms.

REFERENCES

- BHOOPATHY, G., 2016, A study on marketing problems of coconut with special reference to Coimbatore district. *Int. J. Eng. Res. Mod. Educ.*, **1** (2) : 59 - 69.
- GARRETT, H. E. AND WOODWORTH, R. S., 1969, Statistics in psychology and education. *Bombay Vakilsfeffer and Simons Pvt. Ltd.*, pp. 329.
- KERUTAGI, M. G., PAVITHRA, A. S. AND GOLLAGI, S. G., 2020, Performance of palm industry in Karnataka : A case study in Tumkur district. *Econ. Affairs*, **65** (1) : 85 - 96.
- KISHORE, M. S. AND MURTHY, C., 2017, Growth in area, production and productivity of coconut in Karnataka. *Int. J. Commerce Business Management*, **9** (2) : 156 - 162.
- KUMARI, P., THAMBAN, C. AND ARULRAJ, S., 2003, Constraint analysis in coconut cultivation. *Indian Cocon. J.*, **33** (9) : 8 - 12.
- SHASHIKUMAR, S. AND CHANDRASHEKHAR, H. M., 2014, An analysis of production and marketing of coconut in Tumkur district, India. *Int. J. Curr. Res. Aca. Rev.*, **2** (10) : 167 - 175.
- VINODHINI, C. AND DESHMUKH, K. V., 2017, An economic analysis of coconut farming in Karur district of Tamil Nadu, India. *Int. J. Curr. Microbiol. App. Sci.*, **6** (12) : 1566 - 1573.
- VENKAT REDDY, K., PRABHU KUMAR AND RAMANA RAO, S. V., 2017, Economic analysis of coconut in West Godavari district of Andhra Pradesh. *IOSR, J. Business Management*, **19** : 68 - 72.

(Received : February 2021 Accepted : April 2021)