



Research Article

ECONOMIC ANALYSIS OF THE WORLD LARGEST FRESH COCONUT MARKET IN INDIA

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Abstract- The world's largest fresh (tender) coconut market is located in Maddur about 80 kms from Bengaluru, exclusively built for tender coconut. The study pertains to analysis of marketing of tender coconut in Maddur. The data base consist of cultivators, traders, skilled tender coconut extractors (STCE) and consumers of tender coconut from whom primary data were collected by personal interviews during 2015. In addition, secondary data (for 2005 to 2013) pertaining to market arrivals and prices from the official records of the Agricultural Produce Market Committee (APMC), Maddur were collected. The results indicated that the arrivals and prices of tender coconut were at their peak during February-April as 46 per cent of the tender coconuts arrived during Feb-April where the price ranged from Rs. 5.17 to Rs. 6.86 per nut. The marketing channels for tender coconut were: Channel-I: Farmer- Village trader - APMC trader- trader in Bengaluru- STCE- Consumer, Channel-II: Farmer- APMC trader- trader in Bengaluru- STCE- Consumer, Channel-III: Farmer- APMC trader- STCE- Consumer, Channel-IV: Farmer- Village trader-APMC trader-STCE- Consumer. The farmer's share in consumer rupee was higher in channels II and III, since it had 3 intermediaries between farmer and consumer. Here, the farmer incurred a marketing cost, which formed 11.68 per cent of the consumer rupee as the tender nuts were directly sold in APMC by farmers. Farmers expressed that traders in APMC do not prefer to deal with them directly in the marketing of tender coconuts.

Keywords- Tender Coconut, Skilled Tender Coconut Extractor, Marketing Channel, Marketing Cost, Agricultural Produce Market Committee

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Introduction

Coconut (*Cocos nucifera* L.) is the most valuable gift of nature to humankind and is commonly known as KALPAVRUKSHA, which fulfills all vital human needs. It is unique among horticultural crops as a source of food, drink, shelter, fiber, medicine and a variety of raw materials for industrial use.

Coconut is cultivated in more than 93 countries with Indonesia having the largest area followed by Philippines, India and Sri Lanka [1]. These four together accounted for 77 per cent and 80 per cent of the world coconut area (12.62 M ha) and production (64,327 million nuts), respectively during 2014-15. India with the production of around 16,943 million nuts from 2.07 M ha is the largest producer with the productivity of 8,965 nuts/ha. In India, Kerala, Karnataka, Andhra Pradesh and Tamil Nadu account for more than 90 per cent of area and contribute 93 per cent of the production [2]. With respect to consumption, about 20 percent of the coconut is consumed as tender coconut, 50 per cent as matured coconuts and 30 per cent as copra in India.

The liquid endosperm of coconut is called as tender coconut water (TCW). It is also called the fluid of life. Ayurveda highlights that TCW with a calorific value of 17.4 per 100 gm promotes digestion, clears urinary obstructions as also strengthens the human body. Extracting TCW is a rugged exercise since extraction involves manual skilled use of sharp machete where any simple error may lead to loss of hand or palm. Hence, as it is both a skillful and risky operation and the skilled tender coconut extraction can be termed as 'asset specificity', a concept in new institutional economics.

In Karnataka, about 20 per cent of coconuts are harvested as tender coconut and the practice is common in Mandya, Bengaluru, Mysore and Hassan districts where coconut is cultivated. Maddur has the world's largest organized market for tender

coconut with its market area extending to Hassan, Mysore, Chamarajanagar and Ramanagara. The tender coconuts transacted at Maddur are retailed at far off markets such as New Delhi, Nagpur, Hyderabad, Mumbai, Pune, and Kurnool as well as at Bengaluru, Vijayapura, Raichur and Hubli. In this study, an attempt is made to analyze the pattern of arrivals and prices of tender coconut in Maddur APMC, identify the sources of tender coconut, market margins in APMC Maddur and constraints in marketing of tender coconut.

Materials and Methods

Market channels for tender coconut were identified by primary data from farmers, traders and APMC officials. A sample of 90 respondents including 15 farmers, 15 village traders, 15 APMC traders were interviewed in Maddur. Similarly 10 traders, 15 STCEs and 20 consumers in Bengaluru were also interviewed. Primary data regarding purchase price, marketing cost incurred, sale price and other related information were collected from the respondents. Secondary data about the monthly arrivals and prices of tender coconuts for 2005-06 to 2013-14 were collected from the records of APMC, Maddur. The data, thus collected was subjected to tabular analysis obtaining percentages, descriptive statistics and seasonal indices.

Results and discussion

[Table-1] represents the annual arrivals and prices of tender coconut in Maddur APMC and the results indicated that, annual arrivals of tender nuts in Maddur market have increased from 43 to 112 million nuts between 2005-06 and 2013-14. The prices during the same period was also increased from Rs. 132 to Rs. 704 millions. By taking into consider the general price level, the actual price increased

(growth) was 103.90 per cent but the price increase in real value was only 18.52 per cent during the study period. This implies that the tender coconut price has ensured positive and significant trend during the study period [10].

Table-1 Arrivals and prices of tender coconut in the world's largest market for tender coconuts (Maddur APMC) (2005-2013)

Years	Arrivals (million nuts)	Value (Rs. in million)	Price (Rs. per nut)
2005-06	43.0	132.4	3.08
2006-07	56.5	184.6	3.26
2007-08	61.2	209.4	3.42
2008-09	89.5	354.5	3.96
2009-10	92.7	438.9	4.73
2010-11	139.1	586.2	4.21
2011-12	167.0	976.4	5.84
2012-13	170.6	956.7	5.61
2013-14	112.1	704.1	6.28

The result of the seasonal pattern of arrivals and prices of tender coconut is presented in the [Table-2] and [Fig-1]. The arrivals of the tender coconut in Maddur APMC has uni-modal pattern [4]. The arrivals were at their peak during February-April as the demand for tender coconut would be naturally higher during summer season. Consequently, the price of tender coconut was also higher during summer months.

Table-2 Seasonal indices of monthly arrivals and prices of tender coconut in Maddur APMC (2005-2013)

Months	Arrivals	Number of nuts (% to total)	Prices	Price per nut
January	110	8.84	116	4.57
February	131	10.66	140	4.51
March	165	13.19	175	4.48
April	136	11.14	123	4.05
May	110	9.21	104	4.10
June	61	5.37	61	4.20
July	54	4.66	57	4.40

Table-3 Market margins of tender coconut for the existing channels in APMC Maddur (Rs. / tender coconut)

Sl. No.	Particulars	I	%	II	%	III	%	IV	%
1	Price received by the farmer	8.33	33.32	10.53	42.12	10.53	42.12	8.33	33.32
2	Marketing cost incurred by farmer	0.73	2.92	2.92	11.68	2.92	11.68	0.73	2.92
3	Village trader's purchase price	9.06	36.24					9.06	36.24
4	Marketing cost incurred by village trader	2.76	11.04					2.76	11.04
5	Net margin of village trader	1.63	6.52					1.63	6.52
6	Maddur APMC trader's purchase price	13.45	53.8	13.45	53.8	13.45	53.8	13.45	53.8
7	Marketing cost incurred by APMC trader	0.55	2.2	0.53	2.12	0.53	2.12	0.55	2.2
8	Net margin of Maddur APMC trader	1.27	5.08	1.29	5.16	1.29	5.16	1.27	5.08
9	Bengaluru trader's purchase price at Maddur APMC	15.27	61.08	15.27	61.08				
10	Marketing cost incurred by Bengaluru trader	1.47	5.88	1.47	5.88				
11	Net margin of Bengaluru trader	1.61	6.44	1.61	6.44				
12	Bengaluru STCE's purchase price	18.35	73.4	18.35	73.4	15.27	61.08	15.27	61.08
13	Marketing cost incurred by Bengaluru STCE	3.63	14.52	3.63	14.52	5.2	20.8	5.2	20.8
14	Net margin of Bengaluru STCE	3.02	12.08	3.02	12.08	4.53	18.12	4.53	18.12
15	Consumer's price	25	100	25	100	25	100	25	100
16	Producer's share in consumer rupee (%)		33.32		42.12		42.12		33.32

The price and the margin of village trader, APMC trader and Bengaluru trader remains the same irrespective of the channels they were involved [6]. It was the STCEs' price and margin, which was affected when they bought the tender nuts from Bengaluru trader instead of buying the same directly from APMC trader. Bengaluru STCEs purchased the tender nuts from traders in Bengaluru at the rate of Rs. 18.35 per nut and hence they will realize the net margin of 12.08 per cent in channel- I and II. But, if the same produce was purchased directly from APMC traders in Maddur they were getting higher net margin of 18.12 per cent per tender nut. Meanwhile, they as to incur marketing cost of Rs. 5.2 per nut in channel- III

August	61	5.23	64	4.46
September	77	6.61	78	4.58
October	105	8.86	98	4.31
November	91	7.93	92	4.59
December	99	8.30	92	4.32

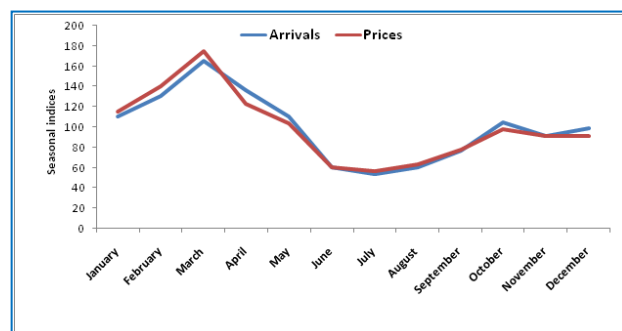


Fig-1 Seasonal indices for monthly arrivals and prices of tender coconut in Maddur APMC (2005-2013)

Marketing Channels for tender coconut

The marketing channels involved in the flow of tender coconut have been identified up to final stage. The important channels identified are as under:

- Channel-I: Farmer-Village trader-APMC trader-trader in Bengaluru-STCE- Consumer
- Channel-II: Farmer- APMC trader- trader in Bengaluru- STCE- Consumer
- Channel-III: Farmer- APMC trader- STCE- Consumer
- Channel-IV: Farmer- Village trader- APMC trader-STCE- Consumer

The price structure and cost drivers for each of the marketing channels identified were worked out separately and presented in [Table-3]. It can be observed that, the farmers' price per tender nut was higher and was Rs. 10.53 (42.12 %) in channel-II and III. While, the same in channel-I and IV where the farmer was sold through village trader was only Rs. 8.33 (33.32 %). However, the farmers had to incur a marketing cost of Rs. 2.92 (11.68 %) under channel - II and III [Fig-2, 3] when they sold it directly in APMC [3,4].

and IV. From this, it can be summed up that the farmer received the highest net price per tender nut when they marketed their produce directly to the traders in APMC.

Flow of tender nuts among the different intermediaries

In the process of marketing of tender nuts, the message flows among different intermediaries exist in the form of mode of sale, flow of produce and mode of payment. From the [Table-4], it's clear that, village traders procure the tender nuts by covering three to four villages based on their requirement. Usually, village

traders contact the coconut cultivated farmers by going to their farms directly (60 %) as well as through the phone call (40 %) and harvest the nuts by offering price of Rs.9 per nut. Interestingly, about 60 per cent of the farmers were getting the payment on the spot itself and they were having only adhoc relationship with those village traders [8, 9]. Whereas, 33 percent of the farmers had regular and long term contact with those village traders and communicate through phone calls and the payment was received one or two days after the harvest of tender nuts.

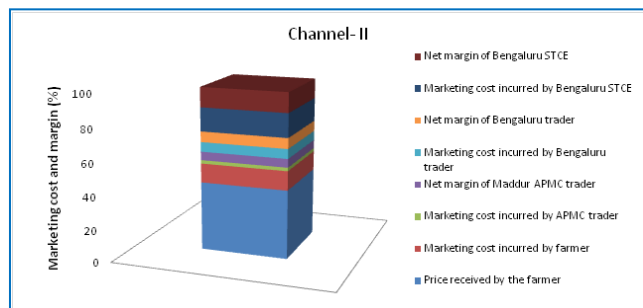


Fig-2 Marketing cost and margins under channel-II

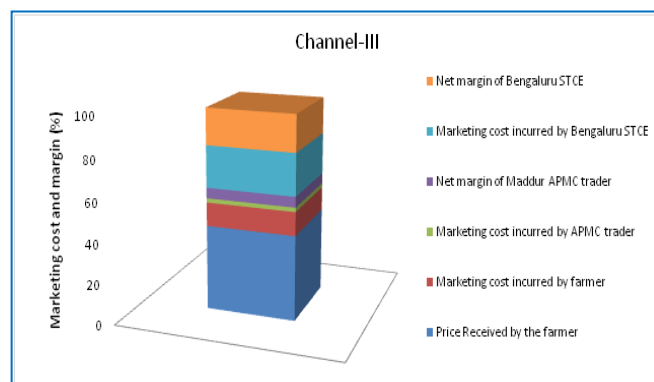


Fig-3 Marketing cost and margins under channel-III

APMC traders getting the order from various parts of the country, accordingly they purchase the tender nuts both from village traders as well as farmers in the APMC yard, Maddur. APMC traders examine the tender nuts at APMC entrance and the price is arrived at through bargaining between the trader and individual seller.

Table-4 Tracing the path of sale of fresh coconuts from farm to APMC Maddur

Mode of sale	No. of farmers	%	Flow of produce	Mode of payment	No. of farmers	%	Relationship b/w stakeholders
Villager trader and farmer person to person contact (for the first time)	9	60	From farmer at farm gate to village trader	On the spot cash payment	9	60.00	Adhoc
Village trader and farmer contacted through mobile phone	6	40	From farmer at farm gate to village trader	On the spot cash payment	1	6.66	Regular and long term contact
				One/two days later	5	33.33	Regular and long term

Tracing the path of sale of fresh coconuts in APMC Maddur

Mode of purchase	No. of village traders and farmers	%	Flow of produce	Mode of payment	No. of village traders and farmers	%	Relationship b/w stakeholders
APMC trader and village trader contacted through mobile phone	7	46.66	From village trader to APMC yard	On the spot cash payment	3	42.85	Long term contact
				One/ two days later	4	57.14	Regular and commercial contact
APMC trader and village trader person to person contact	5	33.33	From village trader to APMC yard	On the spot cash payment	2	40	Regular and recent contact
				Next day	3	60	Commercial contact
APMC trader and farmer person to person contact	3	20	Farm gate to APMC yard	On the spot cash payment	3	100	Recent and unknown

Tracing the path of sale of fresh coconuts from APMC Maddur

Mode of sale	No. of traders	%	Flow of produce	Mode of payment	No. of traders	%	Relationship b/w stakeholders
APMC trader and Bengaluru trader contacted through mobile phone	10	100	From APMC yard to Bengaluru trader	Cash deposit through bank	10	100	Regular and commercial contact
STCE in Bengaluru and trader in Bengaluru contacted through mobile phone	3	20	From Bengaluru retailer to STCE in Bengaluru	On spot cash payment	3	20	Commercial contact
STCE in Bengaluru and APMC trader contacted through mobile phone	7	46.66	From APMC yard to STCE in Bengaluru	Cash deposit through bank	7	46.66	Regular contact
STCE in Bengaluru and APMC trader person to person contact	5	33.33	From APMC yard to STCE in Bengaluru	On spot cash payment	5	33.33	Commercial contact
APMC trader and traders from other states contacted through mobile phone	10	100	From APMC yard to other states	Cash deposit through bank Immediately after reached the produce	1	10	Long term mutual understanding
				Cash remit through bank one week after the produce reached	9	90	

If the price is acceptable to seller, the vehicle is immediately led to the trader's truck and the tender nuts transferred into the truck. Usually, village traders and farmers sell the ungraded tender nuts, as once APMC traders receive the nuts they add value in the form of grading based on different size and maturity [11]. As a matter of fact it's quite interesting that APMC traders had well established connection with village traders as they were having long term, regular and commercial relationship, over the phone call itself (47 %) they were getting adequate and required size of tender nuts. About 33 per cent of nuts were procured from recent or new village traders and only 20 per cent of tender nuts were bought from farmers by offering on the spot cash payment.

Once tender nuts were graded, it was dispatched to Bengaluru traders, STCE in Bengaluru and also across the country. Traders in Bengaluru contact APMC traders through phone call and intimate required quantity and size, accordingly APMC traders supply the nuts. Once the tender nuts reached to Bengaluru traders, immediately they remit the amount to APMC traders through bank account. Similar process was observed in case of cross-country traders, but the payment was delayed for about one week after the produce was reached. In case of STCEs in Bengaluru, majority (47 %) were gave their orders to APMC traders over mobile phone, 20 per cent were purchasing from Bengaluru retailers and 33 per cent were purchased the tender nuts directly from APMC yard by on the spot

cash payment.

The important problems faced by the farmers in marketing of tender nuts were listed in [Table-5]. It was that, APMC traders won't deal with the farmers directly (53 %) was the major problem faced by the farmers as the APMC traders had well established network with the village traders as they were provide in time, sufficient quantity supply of tender nuts in required grade followed by handling small/ inadequate quantity (40 %) and lack of transportation facility (27 %). While, for the retailers [Table-6], there were low volumes of trade during winter season (80 %) and no uniformity in size of tender nuts and low prices for smaller nuts (53 %) were the major problems in marketing of tender nuts [7]. Consumer preference [Table-7 & 8] for tender coconut was because of natural, fresh and healthy drink (80 % and 75 %, respectively). However, majority (55 %) of the consumers opined that they would drink tender coconuts only if it was available in the close vicinity when they are thirsty. It is significant to note that only 20 per cent of the consumers preferred other juices/drinks to tender coconuts [5].

Table-5 Constraints in marketing of tender coconut at farmers level (n=15)

Sl. No	Particulars	Number	%
1	Lack of transportation facility	4	26.66
2	APMC traders won't deal with the farmers directly	8	53.33
3	Inability to grade the produce	3	20.00
4	Small quantity	6	40.00
5	Risky to take the produce to APMC	4	26.66

Table-6 Constraints in selling of tender coconut at STCE in Bengaluru (n=15)

Sl. No	Particulars	Number	%
1	Maintenance and other cost was high	6	40.00
2	Fluctuation in daily sales	12	80.00
3	No similar size of tender coconuts and hence smaller size ones as to sell less price	8	53.33
4	Winter season less tender coconuts were sold	12	80.00

Table-7 Consumers perception towards tender coconut attributes (n=20)

Sl. No	Parameters	SA	A	CS	D	SD
1	It is natural and more fresh	80	20	0	0	0
2	Tender coconut is more tastier and nutritious	65	25	10	0	0
3	Tender coconut is good for health	75	25	0	0	0
4	Superior than cool drinks/juice	40	25	10	20	05
5	Keeps the body cool	45	35	20	0	0

Note: SA: Strongly agree, A: Agree, CS: Can't say, D: Disagree, SD: strongly disagree

Table-8 Consumers opinion regarding tender coconut drink (n=20)

Sl. No	Once in how many days you will drink tender coconut?	No.	%
1	Daily	0	0.00
2	Weekly	0	0.00
3	Fortnight	2	10.00
4	Monthly	5	25.00
5	When I feel sick	2	10.00
6	Whenever I found and I feel to drink	11	55.00

Conclusion and policy recommendations

All over the World craze for tender coconut water is booming up due to its excellent nutritional values. In order to meet growing demand as well as to capture new vista in tender coconut market, Government and concerned authorities as to look into various policy matter in the following issues.

- Associations of tender coconut growers by linking and marketing directly

to the retailers and there by farmers will get higher price and hence farmers share in consumer rupee will be higher.

- Motivate farmers to take up organic tender coconut and capture niche market.
- Placing the tender coconut in the HOPCOMS outlets their by consumers will drink regularly.
- Linking Maddur to major cities in India by providing Railway link for tender coconut so as to reduce the transportation cost.
- Creating awareness about the promotional policies available for production, processing and marketing of tender coconut.



Photo-1: Outside view of World's largest fresh coconut market, APMC Maddur



Photo-2: APMC traders examining the tender coconuts at the entrance of the APMC yard



Photo-3: Farmers and village traders waiting for the good price (mutual negotiation) at the APMC entrance

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Conflict of Interest: None declared

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