

Research Article

Price spread, marketing efficiency and constraints in supply chain of mango in Krishnagiri district of Tamil Nadu

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SUMMARY : An attempt has been made to study the price spread, marketing efficiency and constraints in supply chain of mango in Krishnagiri district of Tamil Nadu. Primary data were collected from various stakeholders constituting 240 farmers and 70 intermediaries operating in various levels of supply chain channel. Five supply chain channels were identified based on the varieties *i.e.*, Bangalora, Alphonso, Neelum and Banganapalli which occupied the larger area in the study district. Intermediaries like retailers, wholesalers and pre-harvest contractor or local trader took more profit margin in the channels I, III and IV compared to channel II and V without taking any risk. It could be concluded that channel II and V were found to be beneficial to most of the farmers. The marketing efficiency was much higher in channel II ranging from 4.07 to 7.14 and poor marketing efficiency was found in the channel I and III. From the result it showed that the movement of mango from farmers to consumer at lowest cost consistent in channel II which benefit both farmers and consumer. The major constraint faced by farmers in production was lack of water for irrigation during summer, followed by incidence of pests. The major marketing constraints were cartel among traders and lack of cold storage facilities to enhance the shelf-life followed by unremunerative price and lack of institutional support.

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KEY WORDS :

Price spread,
Marketing efficiency,
Mango, Constraints

BACKGROUND AND OBJECTIVES

Mango is one of the popular Asian fruits. It is well known for its excellent exotic flavour and known as the “King of fruits”. India is one of the major producers of mango in the world, growing more than half of the world’s supply. It is a popular and economically important fruit, widely cultivated in the tropics and subtropics. Major mango growing states in India are Uttar Pradesh, Bihar, Andhra Pradesh, Orissa, West Bengal, Maharashtra, Gujarat, Karnataka, Kerala and Tamil Nadu. India is a rich source of mango varietal wealth and 1300 varieties are grown in different parts of the country. However, only about 30 varieties are grown on a commercial scale in different states. The major mango varieties grown in the country are Alphonso, Dashehari, Langra, Fajli, Chausa, Totapuri, Neelum etc. Tamil Nadu accounted for 6-7 per

cent of the total Indian mango production in 2011. The important commercial varieties in Tamil Nadu are Alphonso, Totapuri, Banganapalli, Neelum and Sendura. Krishnagiri, Dindugal, Theni and Dharmapuri are the major districts producing mango in Tamil Nadu.

Most farmers in developing countries like India are small holders. They are also information-poor. Consequently, they are viewed as being the least powerful in the marketplace. Traders, who are generally information-rich, are seen as wielding much of the power and of doing so at the expense of farmers. But, this is not always the case and, indeed, there are instances of traders acting as “supply chain champions”. As numbers of supply chains rise in developing countries, traders will have an important role to play in their management. In situations where trust already exists, the most profitable application of supply chain management may be

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to improve operational effectiveness. Options for improvements might include training to increase the skills and capacities of chain members so that they are more able to adapt to change, improved infrastructure and logistics and better information flows, especially in relation to markets and consumer preferences. The main objective of the study was to identify production and marketing constraints faced by mango farmers and to evaluate marketing efficiency in different channels of mango.

Objectives of the study :

- To examine the existing marketing channels for mango in study area.
- To evaluate the price spread and marketing efficiency of mango in different channels.
- To identify the production and marketing constraints faced by mango farmers in the study area.

RESOURCES AND METHODS

Farmer respondents were selected randomly based on the varieties grown like Bangalora, Neelum, Alphonso and Bangnapalli at the rate of 15 from each selected village. Thus, a total of 240 sample farmers were selected. The farmers were contacted individually for collection of details on supply chain of mango with the help of well structured and pre-tested interview schedule. Totally 70 intermediaries involved

in supply chain of mango namely, pre-harvest contractor, local traders, commission agents, wholesalers, retailers, processors and exporters were also considered for the study along with consumers. Garrett ranking, Price spread and Acharya market efficiency measures were used for the analysis.

OBSERVATIONS AND ANALYSIS

The results of the present study as well as relevant discussions have been presented under following sub heads:

Production constraints :

Production constraints faced by the mango farmers were analyzed and are presented in the Table 1.

From Table 1 it could be concluded that lack of water for irrigation during summer was the major problem followed by incidence of pests. These constraints are mainly due to the lack of proper water conservation practices and non-adoption of timely preventive measures against the pests. Trainings will be given to the farmers to get awareness about the drip irrigation and the necessity of the drip irrigation.

Marketing constraints faced by the mango farmers :

Table 2 reveals the marketing constraints of the sample respondents. The major marketing constraints were cartel among traders and lack of cold storage facilities to enhance

Table 1: Production constraints

Sr. No.	Constraints	Garrett's score
1.	Lack of irrigation facilities during summer	73
2.	Incidence of pests	71
3.	Disease Infestation	66
4.	Scarcity of labourers to carryout farm operations	64
5.	Alternate years of bearing	55
6.	Lack of institutional support	47
7.	Non availability of quality seedlings	43
8.	Dependence of traders for plant protection chemicals	42
9.	Non-availability of suitable harvesting tools to reduce losses by bruising	40
10.	Wind during flowering seasons	38
11.	Practical difficulty in the adopting of recommended packages of practices	31
12.	High cost of institutional credit	27

Table 2 : Marketing constraints

Sr. No.	Constraints	Garrett's score
1.	Cartel among traders	76
2.	Lack of cold storage facilities to enhance the shelf life	70
3.	Un remunerative price	66
4.	Lack of institutional support in establishing local and export market	61
5.	Non availability of adequate number of processing units near the production catchments	56
6.	Lack of market intelligence and market information	54
7.	Unsustainable production surplus	52
8.	Complicated institutional procedures to facilitate export	50

the shelf-life followed by unremunerative price, lack of institutional support etc.

Price spread in marketing of mango :

Market channels and price spread for mango varieties :

The analysis of price spread in different market channels for mango varieties are presented below. The results revealed that for the varieties like Bangalora and Neelum, the following channels were in existence in the study area:

- Channel-I : Producer-Commission agent-Wholesaler-Retailer-Consumer
- Channel -II: Producer- Processor
- Channel-III: Producer-Pre-harvest contractor-Commission agent-Wholesaler-Retailer-Consumer
- Channel-V: Producer- Commission agent - Roadside vendor

The market channels in respect of Alphonso variety were:

- Channel - I: Producer-Commission Agent-Wholesaler - Retailer - Consumer
- Channel - II: Producer - Processor
- Channel-III: Producer- Pre-harvest contractor - Commission agent-Wholesaler-Retailer-Consumer.
- Channel-IV: Producer-Local trader-Commission agent- Wholesaler - Exporter

For selling Banganapalli variety, the cultivators used the following channels:

- Channel-I: Producer-Commission agent - Wholesaler- Retailer -Consumer
- Channel-III: Producer - Pre-harvest contractor - Commission agent - Wholesaler-Retailer- Consumer
- Channel-IV: Producer - Local trader - Commission agent-Wholesaler - Exporter

The analysis conclusively showed that the channels were similar for Bangalore and Neelum on one hand and for Alphonso and Banganapalli on the other hand. The varieties namely, Alphonso and Banganapalli are exported, while Bangalora and Neelum are either sold fresh in the local/national market or processed and sold. The price spread worked out for the above said varieties in different channels indicated that the price spread was Rs.8000 per tonne for Bangalora in channel-I, whereas for Alphonso it was the highest at Rs.24,000 per tonne, for Neelum and Banganapalli, it was Rs.12,000 and Rs.17,000 per tonne, respectively. In the case of Channel III, price spread was Rs. 13,000 per tonne for Bangalora, whereas, for Alphonso it was Rs. 30,000 per tonne, for Neelum and Banganapalli it was Rs. 12,000 and Rs. 20,000 per tonne. The price spread was Rs. 8000 per tonne for Bangalora in channel V and for Neelum it was highest at Rs. 14,000 per tonne.

Table 3: Marketing cost of producers and intermediaries

Sr. No.	Particulars	Rs./Ton																
		Market channel-I			Market channel-II			Market channel-III			Market channel-IV			Market channel-V				
		B	A	N	BA	B	A	N	BA	B	A	N	EA	BA	A	B	N	
1.	Cos: incurred by the producer	1400	2600	1600	2000	1650	2100	1475	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1400	1300
2.	Cos: incurred by the LT or PHC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2500	3600	2050	2900	2000	2000	2300	2000	0.00	0.00
3.	Cos: incurred by the wholesaler	875	1480	1000	1200	0.00	0.00	0.00	1000	1500	950	1100	1100	1100	1500	1100	0.00	0.00
4.	Cos: incurred by the retailer	800	900	840	720	0.00	0.00	0.00	1000	950	800	720	0.00	0.00	0.00	0.00	0.00	0.00
5.	Cos: incurred by the roadside vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1550	1400
6.	Total marketing cost of the intermediaries	3075	4980	3440	3920	1650	2100	1475	4500	6050	3800	4720	3800	3100	3800	3100	2950	2700

Note: B-Bangalora, A-Alphonso, N-Neelum, BA-Banganapalli.

Table 4 : Profit margin for intermediaries

Sr. No.	Particulars	Market channel-I										Market channel-II			Market channel-III			Market channel-IV			Market channel-V	
		B	A	N	BA	B	A	N	BA	B	A	N	EA	BA	A	B	N	B	N			
1.	Profit margin: of the LT or PHC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	500	2400	950	2100	3800	3000	3000	0.00	0.00	0.00			
2.	Profit margin: of the wholesaler	2125	4520	2000	4800	0.00	0.00	0.00	3000	4500	3050	2900	2900	4500	2900	2900	0.00	0.00	0.00			
3.	Profit margin: of the retailer	4200	17100	8160	10280	0.00	0.00	0.00	5000	17050	4700	10280	10280	0.00	0.00	0.00	0.00	0.00	0.00			
4.	Profit margin: of the roadside vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	6450	12600				
5.	Total profit margin of the intermediaries	6325	21620	10160	15080	0.00	0.00	0.00	8500	23950	8200	15280	8300	5900	8300	5900	6450	12600				

Note: B-Bangalora, A-Alphonso, N-Neelum, BA-Banganapalli.

Marketing cost for producers and intermediaries :

Table 3 reveals that marketing cost was the least at Rs.1650, Rs.2100 and Rs.1475, respectively per tonne for Bangalora, Alphonso and Neelum when mangoes were sold to the processors in channel II. It was relatively, lower at Rs.2950 and Rs.2700 per tonne for Bangalora and Neelum when sold to the roadside vendor in channel V. The channels were shorter while selling to either processors or roadside vendor. There was no grading/sorting cost or commission when sold to processors. The wholesalers and retailers were involved in channel-I in the sale of produce. The cost incurred by the wholesaler was relatively higher at Rs.875, Rs.1480, Rs.1000 and Rs.1200 per tonne for Bangalora, Alphonso, Neelum and Banganapalli, respectively, while it was Rs.800, Rs.900, Rs.840 and Rs.720, respectively, for the retailer. In case of channel III and IV, there was no cost to the producer as all of them sold the produce either to the pre-harvest contractor (PHC) or the local trader (LT) who met all the expenses. The cost incurred by either the PHC or LT was higher per ton compared to sale by producers for all varieties the both III and IV channel. It would indicate that the PHC or LT could minimize cost through better planning and organization. For the wholesalers the cost remained the same for Alphonso and Banganapalli varieties in the channel III and IV.

Profit margin for intermediaries :

The details of profit margin of intermediaries are reported in Table 4. The profit margin of the PHC or LT was relatively higher in the channel IV ranging from Rs.3000 to Rs.3800 per tonne compared to channel III which ranged from Rs.500 to Rs 2400 per tonne. The total profit margin earned by the wholesalers was very high for Alphonso and Banganapalli ranging from Rs. 4500 to Rs.4800 per tonne in the channel I, III and IV, whereas retailers profit margin was higher in both channel I and III ranging between Rs.4200 and Rs.17,100 per tonne. In case of roadside vendor, profit margin was higher ranging from Rs. 6450 to Rs.12600 per tonne for Bangalora and neelum. Thus, it is obvious that intermediaries like retailers and wholesalers took more profit margin compared to others like PHC or LT and roadside vendor without taking any risk.

Marketing margin for intermediaries :

The details of marketing margin of intermediaries for the sale of produce are given in Table 5. The market margin of the wholesaler and retailer was Rs.8000, Rs.24,000, 12,000 and 17,000 per tonne, respectively for varieties like Bangalora, Alphonso, Neelum and Banganapalli in Channel I. The market margin for the PHC or LT was Rs.13,000, Rs.30,000, Rs.12,000 and Rs.20,000 per tonne for Bangalora, Alphonso, Neelum and Banganapalli in

Channel III. The margin of roadside vendor was higher ranging from Rs.8000 to Rs.14000 per ton for varieties Bangalora and Neelum in channel V. There was no marketing margin for processor in channel II due to direct procurement from farmers.

Farmer's share in consumer's rupee :

From Table 6, it could be concluded that the farmer's share in consumer's rupee was relatively high ranging from 76.43 per cent, 86 per cent and 75.42 per cent for Bangalora, Alphonso and Neelum in channel II and it was found to be ranging from 24 per cent to 37.33 per cent in channel I. In channel III, the farmer's share in consumer's rupee was 20 per cent to 25 per cent. In case of channel IV, farmer's share in consumer's rupee was high, 35.71 per cent and 45.45 per cent, respectively. In Channel V, it was 23.50 per cent and 37.33 per cent for Bangalora and Neelum. The results indicated that channel III showed low farmer's share in consumer's rupee compared to other channels due to presence of more intermediaries.

The above analyses would conclusively show that the farmers by avoiding one or more intermediaries could gain considerably in terms of their share of the rupee paid by the end user or consumer.

Marketing efficiency :

The results of the marketing efficiency are presented in Table 7. The analysis depicted that the marketing efficiency for Bangalora (4.24) was higher in channel II followed by channels I and V with the marketing efficiency of Bangalora (1.60). The marketing efficiency of Alphonso was 7.14 in channel II which was found to be higher than other varieties. For Neelum variety, the highest marketing efficiency (4.07) was observed in channel II and similarly for Banganapalli the marketing efficiency was higher in the channel IV. In channel II, marketing efficiency was higher for all varieties, since the produce was sold directly to the processors.

Thus, the efficiency analysis would conclusively show that for Banganapalli, channel III was most efficient (1.56), and for Bangalora, channels I, II and V were efficient. In case of Alphonso the most efficient channels were II and IV whereas for Neelum, channels II and I were efficient. This would imply that farmers should avoid the pre-harvest contractor and local traders and in the case of Bangalora it would be better to sell directly to processor or through commission agents as it helped the farmer to realize the highest net price.

Conclusion :

Production constraints faced by the mango farmer's was lack of water for irrigation during summer, followed by

incidence of pests. The major marketing constraints were cartel among traders and lack of cold storage facilities to enhance the shelf-life followed by unremunerative price and lack of institutional support.

The net price received by the farmers was higher for Alphonso in channel I (Rs.13,800) compared to channel II (Rs.12,900). For Bangalora and Neelum it was Rs.5,600 and Rs.4,700, respectively in channel V. In case of Banganapalli, farmers received higher net price in channel I (Rs.6000). The channel III showed low farmer's share in consumer's rupee compared to other channels due to presence of more intermediaries. Farmers should avoid the pre-harvest contractor and local traders and in the case of Bangalora it would be better to sell directly to processor or through commission agents as it helped the farmer to realize the highest net price.

The policy implications emerging out of the study are outlined below:

Timely and accurate availability of market information is important since it improve both operational and pricing efficiency. Farmers in Krishnagiri district about 80 per cent of Bangalora and Neelum varieties sell to processors without any negotiation. If there is demand for mango pulp in international market then farmers will fletch higher price for Bangalora and Neelum. So government should take measure to support the pulp industry to ensure to increase the export.

In case of Alphonso and Banganapalli, farmers benefit selling through wholesalers. So, the farmers should improve the quality of production through which they can get higher price and consumers will benefit through good quality.

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