

RESEARCH ARTICLE :

Vegetable supply chain management in Kerala

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SUMMARY : Vegetables are known as the protective food. It has great scope in Indian agriculture due to their short duration, high productivity, nutritional benefits and economic viability. Kerala, one of the South Indian state, produces only about five lakh of tonnes of vegetables out of a total annual requirement of around 25 lakh tonnes which is not enough to feed the population. The state now depends entirely on neighboring states for its food requirements. According to the report from department of agriculture, Kerala around Rs. 1,000 crore worth of vegetables are imported into Kerala yearly. The reasons for this low production of vegetables is due to less number of farmers, as most of the land is under rice cultivation and plantation rather than vegetables. As a thousand crore business is under the industry, the current supply chain management of vegetables is seems to be inefficient. This may be due to the interference of intermediaries. Due to these problems, both the farmers and consumers are being affected. Supply chain in Kerala is fragmented and involves numerous intermediaries such as distributors and resellers who earn the maximum benefit. Inter-state supply chain suffers from many taxes. For smooth functioning supply chain needs professional people but we do not have trained work force in this field. So training and education in supply chain management is required. Supply chain related vegetables in Kerala must be worked upon to increase the efficiency. The present study on supply chain management of vegetables in Kerala helps to understand the various channels in SCM, barriers in SCM, problems and price spread of SCM.

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BACKGROUND AND OBJECTIVES

India is known as fruit and vegetable basket of the world. It is the second largest producer of overall fruits and vegetables production in the world, after China and one of the centers of origin of fruits and vegetables with the total production of 100.64 million metric tonnes of fruits and 180.102 million tonnes of vegetables till the year 2015 (DAC, 2015). It has the potential to be the world's largest food producer which is bestowed with

one of the best natural resources in the world. Organized retail and Private label penetration, demand for functional food, and increased spend on health food are major drivers for the growth of this sector (Viswanadhan, 2007). As the population is increasing, the demand for such food is also increasing. To meet such demand and provide a food in proper quality and nutrition, Marketing of horticultural crops is quite complex. Supply chain plays a very vital role in this sector and becomes even more

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important because of perishability and very short shelf life.

Vegetable production scenario in Kerala:

According to the survey conducted by eco stat (2015), cultivation of vegetables in Kerala has a net area of 17, 472 acres are utilized out of the total 48, 153 acres of agricultural land possessed by these cultivators *i.e.* only 36.28% of the total land owned by them is utilized for vegetable cultivation. Totally 7, 20, 671 quintals of different kinds of vegetables were produced in the state. The major vegetable producing district in Kerala is Malappuram. The major crops in this district are Bitter gourd, Cucumber, Ash gourd, Ladies finger and other vegetables. Kottayam district is the second largest producer of vegetables. The least vegetable-producing district is Alappuzha. The major vegetable crops in the state are Ash gourd, ginger, bitter gourd and snake gourd. Brinjal, coccinia, ladies finger, spinach etc are also cultivating in a good extent.

Present scenario of supply chain in Kerala:

In Kerala, most of the vegetables are sourced from the neighbouring states like Tamil Nadu and Karnataka. There is lack of proper infrastructure such as godowns, cold storages, cool chains, ripening chambers etc. Also there is no proper link between production, research system and consumers. Due to this, over 30 per cent of agricultural produce goes waste every year. More than 20% of produce from state is lost due to poor post-harvesting facilities and lack of cold chain infrastructure.

Objectives :

Hence the study has been conducted to analyse the supply chain management of selected vegetables in Kerala.

The specific objectives of the study are:

- To study the supply chain of selected vegetables (Onion, Potato and Tomato) in Kerala.
- To assess the price spread of different marketing channels in vegetable marketing.
- To understand the various channels present in supply chain management of vegetables.
- To analyze the marketing efficiency of these vegetables.

RESOURCES AND METHODS

This study supply chain management of selected

vegetables in Kerala has been done by conducting a survey with wholesalers, retailers, consumers using a well structured questionnaire. Three major vegetables such as Onion, Potato and Tomato were selected for the study. The study area was limited to three districts of Kerala namely Wayanad, Kozhikode and Palakkad. Total sample size is of 135 with 45 retailers (including organized and unorganized), 45 wholesalers and 45 consumers To understand the present scenario of supply chain in vegetables and the efficiency of components in organized and unorganized vegetable market in Kerala, the primary data was collected from the middlemen, wholesalers, retailers and consumers by random sampling method. The secondary data related to the objectives were collected from the reports of National Horticulture Board, Standard Books, Journal, Research Paper, Articles and websites. Price spread is assed using the difference between the price paid by the consumer and price obtained by the producer. Marketing efficiency was assessed using Acharya Method and ranking of problems done by Rank Based Quotient Method.

OBSERVATIONS AND ANALYSIS

Kerala gets majority of vegetables from the nearby state especially Tamil Nadu. Most of the wholesalers in Kerala approach the nearby market such as Ottanchathiram, Kinathukadavu markets in Tamil Nadu, to procure vegetables and sell it to the retailers in the state. The main channel prevalent in Kerala is Channel II, where farmers are selling the vegetables to the commission agents in TN market, from there the intermediaries will procure and sell the products to the unorganized retailers. The unorganized retailers in tyre I and tyre II sells the vegetables to the local retailers, and then it reaches the customers. Nowadays the channel I system is getting popular in Kerala. The organized retailers have intermediaries who purchase the vegetables in the name of organized retailers and they in turn gives to the retailers and finally it reaches the consumers. The channel III is prevailing in the districts like Palakkad, Malappuram etc., Here the intermediaries cum retailers purchase the vegetables and sells directly to the consumers.

From the above table it is clear that the price spread of Onion was found to vary from Rs.16.00 per kg in channel 1 to Rs. 7.80 per kg in the channel 3. The highest difference between the price paid by the consumer and

the price received by the farmer is more ie. Rs. 16.00 in channel 1, Rs. 14.00 in channel 2 and the least difference is found in channel 3 (Rs. 7.80). Majority of the cost associated with the selling of Onion is due to margin of retailers and middlemen, in which margin taken by the

retailer and middle men is high Rs. 8.20 and Rs. 2.80, respectively. Followed by the marketing cost which is Rs. 5.00 per kg (Rs. 3.00 in retailers end and Rs. 2.00 in middle men end). The price spread was low in Channel 3, where the wholesalers act as retailers and pays the

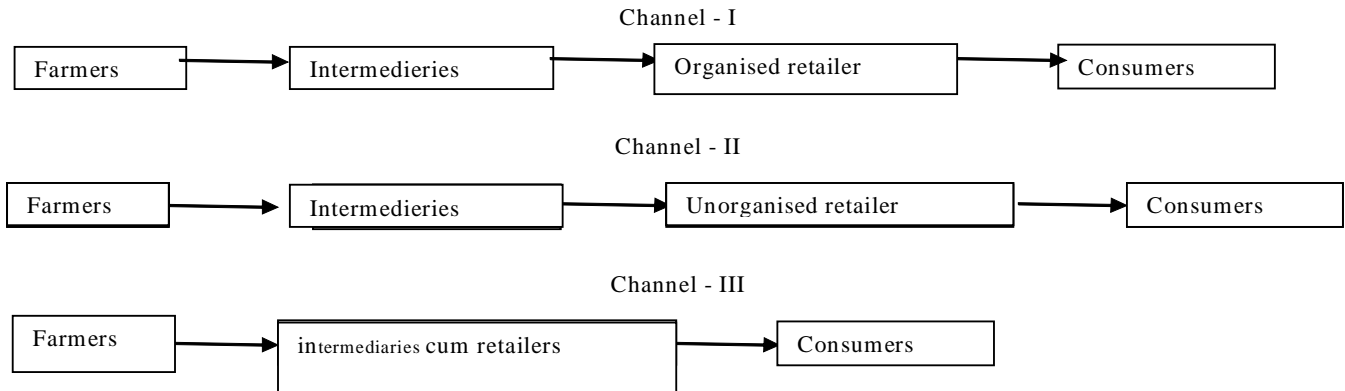


Table 1: Price spread of selected vegetables in Kerala

Sl no.	Particulars	Channel 1			Channel 2			Channel 3		
		Onion (Rs.)	Potato (Rs.)	Tomato (Rs.)	Onion (Rs.)	Potato (Rs.)	Tomato (Rs.)	Onion (Rs.)	Potato (Rs.)	Tomato (Rs.)
I	Farmer									
	Price received by the farmer (Rs/kg)	16.00	20.00	30.00	16.00	20.00	30.00	18.00	23.00	45.00
II	Intermediaries									
	Purchasing price of the commission agent	16.00	20.00	30.00	16.00	20.00	30.00	18.00	23.00	45.00
	Loading & Unloading Charges	1.00	2.25	2.25	1.00	2.00	2.00	1.00	2.00	2.00
	Transportation cost	1.00	2.25	2.25	1.00	2.00	2.00	2.00	1.00	2.00
	Wholesalers Margin	2.80	1.50	5.50	2.80	2.00	5.50	4.80	4.00	11.00
	Selling price of commission agent	20.80	26.00	40.00	20.80	26.00	39.50	25.80	30.00	60.00
	Marketing cost	2.00	6.00	4.50	2.00	4.00	4.00	3.00	3.00	4.00
III	Organized Retailer									
	Purchasing price of organized retailer	20.80	26.00	40.00	-	-	-	-	-	-
	Loading and unloading charges	1.00	1.50	1.50	-	-	-	-	-	-
	Transportation cost	2.00	2.00	2.00	-	-	-	-	-	-
	Margin	8.20	4.50	16.5	-	-	-	-	-	-
	Selling price of the Organized retailer	32.00	34.00	60.00	-	-	-	-	-	-
	Marketing cost	3.00	3.50	3.50	-	-	-	-	-	-
IV	Unorganized Retailer									
	Purchasing price of organized retailer	-	-	-	20.80	26.00	39.50	-	-	-
	Loading & unloading	-	-	-	1.00	1.00	1.00	-	-	-
	Transportation cost	-	-	-	2.00	2.00	2.50	-	-	-
	Margin	-	-	-	6.20	3.00	15.00	-	-	-
	Selling price of the unorganized retailer	-	-	-	30.00	32.00	58.00	-	-	-
	Marketing cost	-	-	-	3.00	3.00	3.50	-	-	-
V	Consumers									
	Purchasing price of the consumers (Rs/kg)	32.00	34.00	60.00	30.00	32.00	58.00	25.80	30.00	60.00
	Price spread	16.00	14.00	30.00	14	12	28.00	7.80	7.00	15.00

high amount to the farmers (Rs. 18.00/Kg). Transportation cost is high in this case because of frequent purchase. Also the selling price is low to the consumers, because of loyal consumers in that area who purchase the vegetables from them.

Similarly the price spread for Potato is found to be Rs. 14.00 in Channel 1, Rs. 12.00 in Channel 2 and Rs. 7.00 in Channel 3. The farm gate price for Potato is high Rs. 23 in Channel 3 compared to Rs. 20 in Channel 1 & 2 which shows that farmers are benefitted when the procurement is done by the retailers directly. In other words, when the farmers sell to the retailers without any middle men, the farmers are getting benefitted. Also the marketing cost is reduced.

Tomato, being a high consumable vegetable, the price spread is high in all the channels when compared to Potato and Onion. Among the channels, Channel 1 has the highest price spread, when compared to Channel 2 & 3 with the difference of Rs. 30/-. The margin of retailers and wholesalers is high in Tomato (Rs. 16.50 in Channel 1, Rs. 14.00 in Channel 2 and Rs. 11 in Channel 3). But the farm gate price of Tomato is high in Channel 3 with Rs. 45/kg.

The main factor responsible for price spread was the margin, marketing cost and profit motive attitude of the intermediaries and the retailers.

Marketing efficiency :

The modified marketing efficiency for each channel was calculated using Acharya's method and the results are depicted here under.

It is concluded from the above table that the marketing efficiency is more in channel 3 for all the crops when compared to Channel 1 & 2. Since the retailers cum middle man purchases directly from the farmers point which enables high marketing efficiency. Here consumers purchasing vegetables directly from intermediaries. Therefore elimination of the marketing margin of retailers is the reason for increasing market efficiency. So the farmers get more prices per kg of the

produce in this channel. The next highest marketing efficiency is found in channel 2. The marketing efficiency was low in channel 1 and compared to others, price received by the farmers also low in this channel. The major reason for the increase in marketing efficiency and price received by the farmer is due to the decrease in number of intermediaries involved in the channel.

Conclusion :

Through this study we would like to conclude that the existing supply chain in onion potato and tomato is not effective as an effective supply chain. This does not help to improve the economic and social status of farmers, but also facilitate the consumers to get quality produce at economic rates. In our study, we found out that the marketing efficiency was found higher the channel 3 *i.e.*, intermediaries cum retailers sells their produce directly to the consumers compared to the other channel primarily because of the elimination of the marketing margin of retailers involved in the marketing. Also, the farmers get more price per kg of the produce in this channel. Major reason for the difference in the marketing efficiencies and the price received by the farmers is due to higher marketing cost and profit margin to the middlemen. Hence, farmers get more benefit if they sell their product directly to the consumers without involving any of the commission agent with less intervention of the intermediaries.

The current supply chain management of vegetables is seems to be inefficient. This may be due to the interference of intermediaries. Due to these problems, both the farmers and consumers are being affected. Supply chain in Kerala is fragmented and involves numerous intermediaries such as distributors and resellers who earn the maximum benefit. Inter-state supply chain suffers from many taxes. Our tax system is also very difficult and involves central and state taxes. Government must work on this to smoothen the process. For smooth functioning supply chain needs professional people but we do not have trained work force in this field. So training

Table 2 : Marketing efficiency

Sr. No.	Particulars	Channel 1			Channel 2			Channel 3		
		Onion	Potato	Tomato	Onion	Potato	Tomato	Onion	Potato	Tomato
1.	Price received by producer	16.00	20.00	30.00	16.00	20.00	30.00	18.00	23.00	45.00
2.	Marketing cost	5.00	9.50	8.00	5.00	7.00	7.50	3.00	3.00	4.00
3.	Marketing margin	11.00	6.00	22.00	9.00	5.00	20.50	4.80	4.00	11.00
4.	Marketing efficiency	1.00	1.29	1.00	1.14	1.67	1.07	2.31	3.29	3.00

and education in supply chain management is needed. Supply chain related vegetables in India must be worked upon to increase the efficiency. It must be designed as per the needs and the availability of the India so that each one can be fed with quality food. So, To reduce the inefficiency of the present supply chain management of vegetables, It is better to obstruct the intermediaries between the producers and consumers.

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