



Price Spread, Marketing Efficiency and Constraints in Marketing of Chayote (*Sechium edule*) in Mizoram

Lalrinsangpuii^{1*} • R. Malhotra²

¹College of Horticulture (Thenzawl), Selesih, Aizawl, Mizoram-796014, Central Agricultural University-Imphal

²Division of Dairy Economics, Statistics & Management, National Dairy Research Institute, Karnal – 132001

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ABSTRACT

The present study was conducted to study price spread, marketing efficiency and constraints in marketing of chayote in Mizoram state. The data for the study was collected during the period 2014-15 and was analysed using statistical tools such as percentages, ratios, means and frequency distribution. The study identified three marketing channels in the study area i.e, Channel I (Producer – Commission agent (Association marketing societies) - Retailer – Consumer), Channel II (Producer - Wholesaler – Retailer – Consumer) and Channel III (Producer - Consumer), of which Channel I was the most important channel. Among the three marketing channels identified in the study area, the producers received highest share under Channel III followed by Channel I and the consumer's price was highest under Channel I. Marketing efficiency of chayote was highest in channel – III followed by channel-I and channel- II. In order to improve the marketing efficiency and producer share in consumer's price, it is necessary to reduce the number of intermediaries in marketing supply chain as well as to reduce marketing cost and marketing losses. Among the various marketing problems stated by chayote growers, price fluctuation was the most important problems. There is a need to establish regulated market in the state and improve the marketing system through market intelligence, market research and development and market extension in the area.

1. Introduction

Chayote (*Sechium edule*) is a member of the Cucurbitaceae family and a popular vegetable in North Eastern Hill (NEH) region and grown abundantly without much care and attention. In India, chayote is widely grown in Madurai and Nilgiri district in Tamil Nadu, Karnataka, West Bengal, Mandi district of the Himachal Pradesh and entire NEH region. Mizoram is the leading State with an estimated area of 4796 ha and 81,930 metric ton production in the year 2015-16. Though, it is a native of Mexico but considerable diversity is found in NEH region particularly in Meghalaya, Mizoram, and Sikkim (Rai *et al.*, 2005, Yadav *et al.*, 2005).

The soil and climatic conditions of Mizoram are conducive to the cultivation of fruits and vegetables, for example cabbage, chillies, french beans, grapes, mustard, passion fruit, pumpkin and chayote, and most of which are marketed within the state itself. However, for many farmers, marketing their produce is relatively a new concept and government assistance is necessary for starting the process. So far, government assistance has been limited, and chayote is one of the few crops to have been exported to other states with significant profits. Chayote of the Cucurbitaceae family is a traditional food, usually cultivated in the kitchen gardens of many families in Mizoram. The Welsh Christian missionaries who came to Mizoram more than a century back are believed to have started chayote cultivation and it is said that the word “*iskut*” is derived from the word “squash” as used by the missionaries.

*Corresponding author: mapuii_bh@yahoo.com

Mizoram is extremely rugged mountainous area richly endowed with huge varieties of flora and fauna. The state's economy is primarily agrarian with traditional Shifting cultivation (*Jhum*) in vogue. Horticulture is both a source of livelihood as well as a step to check jhuming practice in the state. The state, despite being rich in horticulture has not been able to create a niche for itself both in the domestic as well as international market. Most of the vegetables produced in the state are off-season vegetables and hence will fetch a higher price if dispatched to the main land markets. Keeping the above background and prospects of chayote in Mizoram in view, the study was conducted to study the price spread, marketing efficiency and constraints in marketing of chayote in Mizoram state.

2. Materials and Methods

The study was conducted in Mizoram state. Out of the eight (8) districts in Mizoram, three districts namely, Aizawl, Kolasib and Champhai were selected. The districts were selected purposively based on the net sown area and production of chayote in the state. Following three stage stratified random sampling technique, two Rural Development (R.D) blocks were selected randomly at the first stage from each selected district. From each of the selected block, cluster of two to three villages was selected. Thus, in all, a total of 14 villages were selected to carry out the present investigation in order to make a total sample of 120 households. The primary data was collected from the selected households for the year 2014-15 consisting of two seasons *i.e.*, rainy season (June to August) and dry season (March to May). The primary data were collected from sample farmers by personal interview method. For this purpose, a special schedule was designed and pre-tested for workability. The data were analyzed using statistical tools such as percentages, ratios, means and frequency distribution *etc.*

The marketing efficiency of the selected channels was studied with the help of slightly shepherd's formula as given below.

$$ME = \frac{V}{I} - 1$$

Where,

ME = Index of marketing efficiency

V = Value of chayote

I = Total marketing cost

The Garrett ranking technique (Garrett and Woodworth, 1969) was used to study the opinions of the farmers regarding the constraints in marketing of chayote. The per cent position of each rank was found out by the following equation.

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

Where,

R_{ij} = Rank given for the i^{th} items by the j^{th} individual, and

N_j = Number of items ranked by the j^{th} individual.

3. Results and Discussion

The experimental findings of the present study have been presented in the following sub-heads:

3.1 General characteristics of chayote growers:

The general information of the respondents regarding age, education, family size and land holding is presented in Table 1. It is evident from the table that the average age of chayote farmers varied from 35 years in case of marginal land holders to 38 years in medium land holders, with an average age of 38 years. Age is an important factor which will influence the attitude of farmers ultimately affecting managerial ability, skill and judgment of farm business. This indicated that the farmers were in the young age group with experience of chayote cultivation. Education is another important factor influencing managerial ability. As evident from the table that chayote farmers on an average studied till 8th standard. The better educational status enabled the farmers to manage their farms. The average size of the family was 6 persons. The size of the family affects production and consumption of farm products. The family size contributes to supply of family labour for management of farm. It was also observed that the average landholding of farmers was 0.52 ha, 2.01 ha and 4.31 ha for marginal, small and medium farmer categories, respectively (Table 1).

Table 1. General information of respondents

Sl. No.	Particulars	Size groups			Overall
		Marginal	Small	Medium	
1.	Age (Years)	35	42	38	38
2.	Education level (class/standard)	9	7	8	8
3.	Family size	5	6	6	6
4.	Land holding (ha)	0.52	2.01	4.31	2.28

3.2 Marketing Channel

The path through which marketed goods or product are moved from the hands of the producer to the hand of the final consumer is known as Marketing Channels. In the present study three major channels of marketing were identified as shown below:

Channel I: Producer – Commission agent (Association marketing societies) - Retailer – Consumer

Channel II: Producer - Wholesaler – Retailer – Consumer

Channel III: Producer - Consumer

It was found from the study that Channel I was the most important channel as larger quantity of the produce was marketed through this channel. In the selected study areas there exists a well organized association called Mizoram *Iskut* (chayote) Grower's Association. Each of the villages had their representatives and they used to organize a proper marketing channel for the welfare of the farmers acting themselves as one of the middlemen in the channel to reduce exploitation from other middlemen. This marketing channel existed mostly during heavy fruiting time *i.e.*, September to December and through this channel the produce was brought to Silchar market. When there was plenty of the produce, the farmers became prey of the middlemen who used to take advantage of the seasonality and perishability nature of the produce. So, the association marketing societies were taking all the necessary steps to reduce the problem.

It is also observed that the next important channel was Channel II, through this channel, chayote was sold to rural and urban markets within the state. It was found to exist throughout the fruiting time *i.e.*, June to December. Through channel III, the produce was sold in the local area and in Aizawl market. The channel existed mainly before and after heavy fruiting months when fruiting was less *i.e.*, June to August and January. During that time the produce was not sufficient for sending outside the state as the middlemen prefer to take chayote in bulk.

3.3 Price Spread

Marketing costs and marketing margins in various Channels are presented in Table 2. Under Channel I the average cost incurred by the producer in handling of chayote from farm to wholesaler was about ` 16/q. The producer's margin was 51.78 per cent in consumer's rupees. The cost incurred by commission agent on per quintal of chayote was 105 and the commission agent's margin was 20 per cent in consumer's price. The average cost incurred by retailer in handling of chayote was ` 18, and the retailer's margin was 16.90 per cent in consumer's price.

The average cost incurred by the producer under Channel II was ` 36/q. The producer's share was 40.39 per cent of consumer's price. The cost incurred by wholesaler on per quintal of chayote was 71 and the wholesaler's share was 27.16 per cent of consumer's price. The retailer bore a cost of ` 19 to sell the produce to the ultimate consumer with a share of 21 per cent in consumer's rupee.

Through Channel III the average per quintal marketing cost was ` 77. Among the marketing costs, transportation cost was the major cost and the producer's share in this channel was 91.49 per cent of consumer's price.

Table 2. Costs and margins in different marketing channels of chayote (₹/q)

Particulars	Channel I (₹/q)	Channel II (₹/q)	Channel III (₹/q)
Producer's sale price	650	480	900
Cost incurred by producer	16 (1.29)	36 (3.25)	77 (8.51)
Producer's margin	634 (51.78)	444 (40.39)	823(91.49)
Cost incurred by wholesaler	-	71 (6.48)	-
Wholesaler's margin	-	299 (27.16)	-
Wholesaler's sale price to retailer	-	850 (77.27)	-
Cost incurred by commission agent	105 (8.57)	-	-
Commission agent's margin	245 (20.00)	-	-
Commission agent's selling price to retailer	1000 (81.63)	-	-
Cost incurred by retailer	18 (1.47)	19(1.73)	-
Retailer's margin	207 (16.90)	231 (21.00)	-
Consumer's price	1225 (100.00)	1100 (100.00)	-

Figures in parenthesis indicate percentage to price paid by consumers

Marketing Efficiency

Marketing efficiency moves around the fact that to what extent marketing agencies are able to move the goods at minimum cost extending maximum service from producer to final consumer.

From Table 3 it could be said that, marketing efficiency of chayote was highest in channel – III (Producer - Consumer) *i.e.* 9.74 followed by channel-I (Producer – Commission agent (Association marketing societies) - Retailer - Consumer) at 7.83 and channel- II (Producer - Wholesaler – Retailer – Consumer) at 7.73 for chayote in the study area.

It could be seen that the marketing efficiency was inverse relation with total cost and margin. Therefore, in order to improve the marketing efficiency and producer share in consumer price, it is necessary to reduce the number of intermediaries in marketing supply chain as well as to reduce marketing cost and marketing losses.

Table 3. Marketing efficiency of chayote under different Marketing Channels

Channel	Consumer's price (V) (₹/q)	Total marketing cost (I) (₹/q)	Marketing efficiency (ME)
I	1225	139	7.83
II	1100	126	7.73
III	823	77	9.74

Constraints in Marketing of Chayote

High price fluctuation was the most serious marketing problem faced by farmers (Table 4). They received very high price during lean period while during peak season the price received was very less. During the month of July to October the price ranged between ₹ 2-5 per kg while in the month of November to June, the price was ₹ 20-30 per kg. There was no assurance about the price of chayote not only at the present time but also for the next season. This therefore makes the farmers hesitated to take risk by growing chayote. The government could not assist the farmers in case if the rate of chayote goes too low which compels the farmers to sell their produce at very low price. The second problem identified was the lack of proper market. There was no proper market where the farmer could sell their produce with a profitable price. This made the farmer to sell their produce through the market intermediaries irrespective of the price. Another problem was lack of storage facilities due to which farmers were compelled to sell their produce just after the harvest at low price.

The next problem was unavailability of desirable and cheaper rate of transportation as a result farmers were reluctant to go to towns or city markets where prices were high and farmers could not sell their produce at their desired market on specific time. Public bus and light vehicles were mainly used to carry their produce to the main market while truck was the major means of transportation for outside market. The farmers mainly used gunny bag for packing the produce which cost ₹10/ bag. The high cost of this material posed problem to the farmers.

Table 4. Problems faced by farmers in marketing of chow-chow

Items	Per cent position	Rank
High price fluctuation	62.37	I
Lack of proper market	45.87	II
Lack of storage facilities	35.27	III
High charges of transportation	34.38	IV
High cost of packaging material	30.42	V
Lack of approach road	17	VI

Problems of Market Intermediaries in Marketing of Chayote

Gluts of produce during peak period was found major problem and ranked first (86.50%); followed by high cost of transportation (70.50%), high loading and unloading charge (52.50%) and risk in transportation (40.50%) as is shown in Table 5.

Table 5. Problems of market intermediaries in marketing of chow-chow

Items	Per cent position	Rank
Gluts during peak period	86.50	I
High cost of transportation	70.50	II
High loading and unloading charge	52.50	III
Risk in transportation	40.50	IV

Suggestion to overcome the Problems

Table 6 revealed that majority of the respondents (97.50%) considered that proper price policy would help to solve the problems they faced in the cultivation of chayote. Price policy is one of the most important factors which need proper scrutiny. The findings of the present study also revealed that there is a serious problem related with training which is evident from the fact that 90 per cent of the respondents considered it as an important item

Some of the respondents (88.75%) considered provision of subsidy as the most important item to overcome the problems faced by them in the cultivation of chayote. Subsidy in terms of input of farmers like chemical fertilizers, pesticides, G.I wire, pump set and several other farm equipments will help in increasing the income of the farmers. It was found that crop loan was not available for chayote growers. Again, the other loans available are not sufficient to meet the needs of the farmers. Because of this, 81.25 per cent of the respondents suggested provision of credit to overcome their problems to some extent. Development of proper infrastructure facilities was also suggested by 68.75 per cent of the respondents. About 26.25 per cent of the respondents considered increasing the size of operational land holding would help to solve the problems they faced in the production of chayote.

Table 6. Suggestions to overcome the problems faced by chayote growers

Items	Percentage
Proper price policy	97.50
Provision of need based training	90
Provision of subsidy	88.75
Provision of credit	81.25
Development of proper infrastructure facilities	68.75
Increasing the size of land holding	26.25

Conclusion

Chayote is one of the most important commercial crops in the state of Mizoram. The study revealed that there are three marketing channels prevailing for chayote, of which Channel I (Producer – Commission agent (Association marketing societies) - Retailer – Consumer) was the most important channel as larger quantity of the produce was marketed through this channel. Among the three marketing channels, producer's share in consumer's rupee was highest under Channel I. The study also revealed that the marketing efficiency was inverse relation with total cost and margin.

Therefore, in order to improve the marketing efficiency and producer share in consumer price, it is necessary to reduce the number of intermediaries in marketing supply chain as well as to reduce marketing cost and marketing losses. Among the various marketing problems stated by the farmers high price fluctuation was the most serious problem faced by farmers. The problem of low price is further augmented because of low keeping quality of vegetables. In-depth research and development support is necessary in the areas of farm and creating ways of extending post harvest life of vegetables.

Apart from the suggestions given by the respondents to overcome the marketing problems, it was observed from the present study that the government needs to make a suitable and applicable policy to solve the marketing problems faced by the chayote growers. This can be achieved by establishment of regulated market in the state, improving the marketing system through market intelligence, market research and development and market extension in the area.

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