



# **An Economic Analysis of Marketing of Maize and Constraints Faced by the Maize Growers in Production and Marketing in Ariyalur District of Tamil Nadu in India**

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## **ABSTRACT**

The present study was conducted in Ariyalur district of Tamil Nadu. Totally 100 respondents were randomly selected and interviewed from the district. The data was gathered in the form of pre-structured interview schedule. The study shows that different marketing channels with their marketing efficiency and major constraints faced by the maize growers in production and marketing

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of maize in the district. Totally three channels are shown in the study channel I with marketing efficiency 10.15, channel II with marketing efficiency 6.72 and channel III with marketing efficiency 3.84. For production the major constraints were eccentric rainfall, high input cost required for cultivation, high wage rate for labours, drastic pest occurrence and birds that eats the crop in budding stage, especially peacocks. From the above constraints, disturbance of birds was a major constraint. While discussing about marketing constraints, price fluctuation, distant market location, commission for middlemen, lack of timely credits and high transport cost. From the above marketing constraints, price fluctuations were a major constraint identified in Ariyalur district.

**Keywords:** Marketing of maize; producer's share in consumer rupee; major constraints.

## 1. INTRODUCTION

Maize, often known as “queen of cereals”, is a member of the *Graminae* family and is a native to Southern Mexico. Globally it was also called as corn. Major wheat growing states in India are Tamil Nadu, Karnataka, Bihar, Telangana, Maharashtra, and Andhra Pradesh. Maize production in India is estimated as 28.64 million tons in 2019-2020. India exported 3,690,469.12 million tons to the world for worth of Rs.7615.46 crores in 2021-2022. Major exports destinations in 2021-2022 are Bangladesh, Vietnam, Nepal, Malaysia, Myanmar, and Sri Lanka [1].

Maize may be one of the oldest human domesticated plants. Its origin is believed to date back to at least 10000 years ago when it was grown in the form of wild grass called teosinte in central Mexico. United states were the world's largest producer, consumer, and exporter of maize (Basavaraju et al. 2020).

Maize in India contributes nearly 9% in the national food basket and more than Rs.100 billion to the agricultural gross domestic product at current prices apart from generating employment to over 100 million mandays at the farm and downstream agricultural and industrial sectors. Maize is globally a top-ranking cereal not only in productivity but also as a human food, animal feed and as a source of large number of industrial products [2].

### 1.1 Objective of the Study

1. To study the different marketing channels and to estimate price spread, marketing efficiency and producer's share in consumer rupee of maize in the district
2. To identify the constraints faced by the maize growers in production and marketing of maize in the district and suggest suitable policy measures

## 2. RESEARCH METHODOLOGY

Random sampling method has been adopted to obtain responses from the respective respondents. The study was conducted in Ariyalur district, which is purposively selected because it serves a great deal of convenience to the researcher in terms of accessibility, familiarity with area, time money and effort. Period of enquiry were related to the agricultural year 2022 to 2023. There are 6 blocks in the district and Thirumanur block has been selected purposively according to area of production. from those blocks, 25 farmers were Melapalur, 24 farmers were from Melavannam, 25 farmers were from Angiyanur and 25 farmers from Venganur. from these respondents, 86 farmers are male and 12 farmers were female. While discussing about the age, 4 members are there up to age 30, 19 members are there in age group between 31 to 40, then 29 members are presented in age group ranges from 41 to 50 and 46 farmers are in the age group above 60. The marketing channels were followed from producer to consumer to know the marketing efficiency of the channel.

## 3. ANALYTICAL TOOLS

### 3.1 Marketing Cost

The price of transporting the goods from the point of production to the point of consumption i.e., the expense incurred by numerous agencies doing the various marketing activities. An important component in affecting the profitability of maize growers and middlemen is called marketing cost.

$$C = C_f + C_{m1} + C_{m2} + \dots + C_{mn}$$

Where, C= Total cost of marketing,  $C_f$  = Cost paid by the producer from the time the produce leaves till he sells it.,  $C_{mn}$  = Cost incurred by the  $i^{\text{th}}$  middlemen in the process of buying and selling the products.

### 3.2 Marketing Efficiency

Marketing efficiency is a measure of market performance. The movement of goods from producers to the ultimate consumers at the lowest possible cost consistent with the provision of service desired by the consumers is termed as efficient marketing.

**Shepherd's Formula:** Shepherd (1965) suggested that the ratio of total value of goods marketed to the marketing cost could be used as a measure of marketing efficiency. The higher the ratio, higher would be the efficiency and vice versa. This can be expressed in the following form:

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

Where, ME = Index of marketing efficiency V = Value of goods sold, I = Total marketing cost

### 3.3 Price Spread Analysis

**i) Sum-of-Average Gross Margin Method:** The average gross margins of all the intermediaries were added to obtain the total marketing margin as well as the breakup of the consumer's rupee.

$$MT = \sum_{i=1}^n \frac{S_i - P_i}{Q_i}$$

Where, MT = Total Marketing Margin  $S_i$  = Sale value of a product for  $i^{th}$  intermediary,  $P_i$  = Purchase value paid by the  $i^{th}$  intermediary,  $Q_i$  = Quantity of the product handled by the  $i^{th}$  intermediary,  $i = 1, 2, 3 \dots N$  (Number of intermediaries involved in the marketing channel).

**ii) Farmers' share in consumers' rupee:** Further, the farmer's share in consumer rupee was calculated with the help of the following formula:

$$F_s = \frac{F_p}{C_p} \times 100$$

Where,  $F_s$  = Farmers' share in consumer's rupee (percentage).  $F_p$  = Farmers' price,  $C_p$  = Consumers' price

**Garrett's Ranking Technique:** In the Garrett's scoring technique, the respondents were asked

to rank the factors or problems and these ranks were converted into percent position by using the formula,

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

Where,  $R_{ij}$  = Ranking given to the  $i^{th}$  attribute by the  $j^{th}$  individual,  $N_j$  = Number of attributes ranked by the  $j^{th}$  individual.

## 4. RESULTS AND DISCUSSION

### 4.1 Marketing of Maize

#### 4.1.1 Marketing channels

The harvested maize pass through the different channels to reach the ultimate consumer. In the study area these three channels were identified as major channels. They are,

Channel 1- Producer (farmer)-wholesaler-feed mills

Channel 2- Producer (farmer) - Commission Agent- wholesaler- Feed Mills

Channel 3 - producer (farmer) –Wholesaler-Retailer - Consumer

From the Table 1, this channel has a single intermediary which was wholesaler. The net price received by the producer was 90.57 percent in this channel due to involvement of single intermediary. The marketing cost and marketing margin constituted 7.15 percent and 1.81 percent respectively.

From the Table 2, the net price received by producer was 87.71 percent due to involvement of two intermediaries which are commission agent and wholesaler. The commission agents are paid by wholesaler according to how much quantity they procured. The cost incurred for commission agent was 0.65 percent. The total marketing cost and marketing margin constituted 8.54 percent and 4.38 percent respectively.

The Table 3, in this channel III, the net price received by producer was 79.36 percent due to involvement of two intermediaries which are wholesalers and retailers. The total marketing cost and marketing margin of wholesaler and retailer accounted 11.1 percent and 9.52 percent respectively. The purchase price for consumer per kilogram was Rs.25.20. while discussing about price spread, channel III was higher than

channel I and II. similar study made by Changule and Gaikwad et al. [3] concluded that price spread was higher in channel III compared to channel I and II.

**Table 1. Channel 1 (producer-wholesaler-feed industries) (Rs/quintal)**

S. No	Particulars	Channel I
<b>1.</b>	<b>Farmer</b>	
	Net price received	2000 (90.57)
<b>2.</b>	<b>Wholesaler</b>	
	Purchase price	2000 (90.57)
	Commission	-
	Loading and unloading	30.00 (1.35)
	Transport cost	90.00 (4.07)
	Packaging material and packaging cost	38.00 (1.72)
	Marketing margin	40.00 (1.81)
	Marketing cost	158 (7.15)
	Sale price	2208.00 (100.00)
<b>3</b>	<b>Feed mills/Consumer</b>	
	Purchase price/ consumer's price (Rs.)	2208.00

*(Figures in parenthesis indicates percent to total)*

**Table 2. Channel 2 (producer-commission agent-wholesaler-feed mills) (Rs/quintal)**

S. No	Particulars	Channel II
<b>1.</b>	<b>Farmer</b>	
	Net price received	2000.00 (87.71)
<b>2.</b>	<b>Price incurred for Commission agent</b>	
	Purchase price	-
	Commission	15.00 (0.65)
	Transport cost	-
	Storage cost	-
	Marketing margin	-
	Marketing cost	15.00 (0.65)
	Sale price	2000 (87.71)
<b>3.</b>	<b>Price incurred for Wholesaler</b>	
	Purchase price	2000.00 (87.71)
	Commission	15.00 (0.65)
	Loading and unloading	30.00 (1.31)
	Transport cost	100.00 (4.38)
	Packaging material and packaging cost	35.00 (1.53)
	Marketing margin	100 (4.38)
	Marketing cost	180 (7.89)
	Sale price	2280.00 (100.00)
<b>4.</b>	<b>Feed mills/ Consumer</b>	
	Purchase price/ consumer's price (Rs.)	2280.00

*(Figures in parenthesis indicates percent to total)*

**Table 3. Channel 3 (producer-wholesaler-retailer-consumer) (Rs/quintal)**

S. No	Particulars	Channel III
<b>1.</b>	<b>Farmer</b>	
	Net price received	2000 (79.36)
<b>2</b>	<b>Cost incurred for wholesaler</b>	
	Purchase price	2000 (79.36)
	Commission	-
	Loading and unloading	30 (1.19)
	Transport cost	70 (2.77)
	Packaging material and packaging cost	40 (1.58)
	Marketing margin	120 (4.76)
	Marketing cost	140 (5.55)
	Sale price	2260.00 (89.68)
<b>3</b>	<b>Cost incurred for retailer</b>	
	Purchase price	2260.00 (89.68)
	Loading and unloading	30.00 (1.19)
	Transport cost	70.00 (2.77)
	Packaging material and packaging cost	40.00 (1.58)
	Marketing margin	120.00 (4.76)
	Marketing cost	140.00 (5.55)
	Sale price	2520.00 (100.00)
<b>4</b>	Purchase price/ consumer's price (Rs.)	2520.00*

\* Indicates Rs.2520/ qtl is calculated using consumer purchase price per kg (Figure in parenthesis indicates percentage to total)

#### 4.1.2 Marketing efficiency of maize in the Ariyalur district

**Table 4. Marketing efficiency of maize in ariyalur district**

S. no	Particulars	Channel I	Channel II	Channel III
1	Price spread	198	280	520
2	Producer's share in consumer rupee (percent)	90.57	87.71	79.36
3	Marketing margin	40	100	240
4	Total marketing cost (V)	158	195	280
5	Value of goods sold (I)	2208	2280	2520
6	Marketing efficiency (V/I-1)	10.15	6.72	3.84

From the Table 4, it is clearly conveyed that channel I, was more efficient than channel II and III. The producer's share in consumer rupee constituted 90.57 percent in channel I and 87.71 in channel II and 79.36 percent in channel III due to involvement of intermediaries. Channel I have only one intermediary and the marketing margin also very low in this channel. So, the producer's share in consumer rupee was 90.57 percent. While discussing about channel II, two intermediaries were involved and the marketing margin and marketing cost was high when compared to channel I. so, the producer's share in consumer rupee was 87.71 percent. Then in channel III also two intermediaries were involved and the marketing cost and marketing margin was higher than both channel I and II, so the producer 's share in consumer rupee was 79.36 percent which was much lower than other channels. from the above discussion, higher the

intermediaries lower will be the efficiency. Since the number of intermediaries in channel I was less it is more efficient, whereas number of intermediaries in the other channel was high it was less efficient than channel I. Similar study done by Kumar and Chahal et al. [4] concluded that higher the intermediaries lower the efficiency.

#### 4.1.3 Constraints in production and marketing of maize

Garette ranking technique was employed to identify the constraints faced by the farmers in cultivation of maize and its disposal. Rank was assigned to the factors expressed by the respondents and percent position was calculated. For the percent position score was given using Garette table. Then Garette score was arranged in descending order and rank was given.

**Table 5. Production constraints faced by maize growers in Ariyalur district**

S. No	Particulars	Garette's score	Rank
1.	Erratic rainfall	36.6	V
2	High input cost	47.9	IV
3	High wage rate	48.2	III
4	Severe pest incidence	54	II
5	Birds (peacock)	63.6	I

**Table 6. Marketing constraints faced by maize growers in Ariyalur district**

S. no	Particulars	Score	Rank
1.	Price fluctuations	73.2	I
2	High transport cost	31.3	V
3	Lack of credits	33.9	IV
4	Distant market location	51.6	II
5	Commission for middlemen	46	III

#### 4.1.4 Production constraints faced by farmers

The major constraints were interviewed from sample respondents. The five major constraints that they facing in productions are erratic rainfall which is uneven rainfall during the cropping period leads to disadvantage for the crop growth. Then, high input cost, which means cost incurred for seed, manures and fertilizers, plant protection chemicals and all. Then, high wage rate which includes wages paid for labours for intercultural operations. Another constraint was severe pest incidence which mainly affects the production. And disturbance of birds like peacock. The birds which eat the half-matured maize in the budding stage that affects the growth of maize which leads to less production.

From the Table 5, It is clearly observed that most of the respondents facing problems by disturbance of peacock which ranks first followed by severe pest incidence was ranks second with Garette's score 54 followed by high wage rate which ranks third with Garette's score 48.2 as a major constraint. Similar study made by Yadav et al. [5] revealed that less availability of quality seeds at right time was the major constraint followed by high cost of seeds and more pest incidence.

#### 4.1.5 Marketing constraints faced by farmers

After the harvesting, the maize had been marketed. The problems faced by farmers in marketing are described below. Those problems were, price fluctuations which the price fall and rise at uneven time so it was as major constraint

faced by farmers. Then, cost required for transportation from distant rural areas. Then lack of credits for the farmers was also identified as a problem. Another constraint was the location of market was so far especially they are present in town area. Commission for middlemen also one of the major problems because producer share in consumer's rupee will decline. By using Garette's ranking technique marketing constraints were calculated.

From the Table 6, it was clearly identified that price fluctuations were ranks first than all the constraints with Garette's score 73.2 followed by distant market location ranks second with Garette's score 51.6 and commission for middlemen ranks third with Garette's score 46. The lack of credits and high transport cost were ranks fourth and fifth with the Garette's score 33.9 and 31.3 respectively. Similar study made by Dhruv et al. [6] showed the lack of transportation facility was the major constraint [7-12].

## 5. CONCLUSIONS AND RECOMMENDATIONS

Findings of the study reveals that price spread will increase with increase of middlemen in the marketing channels. Channel I which has one middleman so the price spread was very less compared to both channel II and III. the involvement of two middlemen which leads to higher price spread in channel II and III. so, linking the farmers and feed mills directly or through a formal institution may result in added

returns to maize growers. And the major marketing constraints was found to be price fluctuations. Though minimum support price is provided to maize it may be fixed at higher level to support the farmers in increasing the net farm income.

## CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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