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## **A STUDY ON MAPPING THE MARKETING CHAIN OF MAIZE CROP IN KARNATAKA**

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### **ABSTRACT**

*The chain mapping enables to visualize the flow of the product from conception to end consumer through various actors. To understand the various patterns of interaction between different actors and organizations, it is significant to map linkages in general ways, but then it is also necessary to understand the nature and the purpose of these linkages. Hence, value chain mapping has been used to understand the pattern of interactions between the key actors. In maize value chain various actors are acting in different stages such as Input supplier, Producers, Marketing agents, Consumers and Information and Research centers. In this study made an attempt know the marketing channel of Maize crop in Karnataka.*

**Key Words:** Maize, Actors, Marketing, Channels.

### **1. Introduction**

The chain mapping enables to visualize the flow of the product from conception to end consumer through various actors. To understand the various patterns of interaction between different actors and organizations, it is significant to map linkages in general ways, but then it is also necessary to understand the nature and the purpose of these linkages. Hence, value chain mapping has been used to understand the pattern of interactions between the key actors. It allows seeing the extent of links to be systematically investigated. Below distinction was made for maize commodity to show a separate marketing channels, value chain mappings, cost and margin and profit analysis. The major stages in marketing of maize

crop are as follows;

- 1. Input supply:** Input supply stage mainly encompasses cooperatives to supply seed, fertilizers and herbicides to nearby centers.
- 2. Production:** In the production stage, producers grow maize using agricultural inputs supplied by the cooperatives/unions/institutions etc.
- 3. Marketing:** Farmers in turn supply the commodity to traders in the market in different quantity. Collectors, Retailers and wholesalers purchase the quantity of maize. Wholesalers purchase bulk amount of maize rather than other actors. and
- 4. Consumption:** Collectors, Retailers and wholesalers purchase the quantity of maize and sell it into the different users.

Information flows among all actors to improve quality of the product and to determine the level of production. Research centers, districts administrations, informal credit suppliers, banks, and marketing and cooperatives offices were also found as enablers. In this study made an attempt know the marketing channel of Maize crop in Karnataka.

## **2. Objectives of the Study**

1. To know the major actors in maize marketing chain in the study region.
2. To study access of inputs and other extension services by the farmers

## **3. Methodology**

This research study was carried out in the selected districts namely, Davanagere and Chitradurga of Karnataka state. This study was mainly based on primary information and the required data was collected through interview from the sample units. A random sampling method has been used to chosen the maize farmers and traders for the purpose of the study. Total 150 sample units have been selected for the study and the required data was gathered from them. The information collected from the sample units has been arranged in table and graphs. The statistical tools such as percentage and the 'chi-square' ( $\chi^2$ ) test were made used.

## **4. Data Analysis and Discussion**

In value chain map diverse actors were participated directly or indirectly. The direct actors are those involved in commercial activities in the chain (input suppliers, producers, traders, consumers) and indirect actors are those that provide financial or non-financial supports, such as credit agencies, business service providers, government, Microfinance cooperatives, researchers and extension agents.

### **4.1. The Primary Actors**

The primary actors in the maize value chain in the study region were input suppliers, farmers, traders and consumers. Each of these actors adds value in the process of changing

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product title. Some functions are performed by more than one actor, and some actors perform more than one role.

#### 4.1.1. The Input Suppliers

Primary cooperatives and Government agricultural offices are playing an important role in the supply of inputs required for maize production. Improved seeds, fertilizer, and pesticide are the main inputs delivered to producers in the state. These inputs are supplied either in subsidies or in loan base. Among sample respondents which indicate that the government and cooperatives have major contribution for the supply of inputs (table 1). The major responsibility of cooperatives is to supply factors of production with non-profit base except adding transportation costs incurred. Those input suppliers also pool grain produced from members to deduct producers' transaction costs and strengthen the cooperatives. The main buyers of the grains were wholesalers, urban consumers and exporters. Other important services Government/cooperatives provided to maize producers were storage facility, transportation and credit services. These unions joined members of business associations like unions, federations, banks, insurances. Major identified functions of the membership were to produce marketing and farmers' cooperatives. The advantages of belonging to the associations were getting easier access to market information and helps negotiate with authorities and annual dividend for members.

**Table 1**

#### Source of Inputs for Maize Production in Study Area

Source of Inputs	Seeds		Fertilizer		Pesticide	
	F	%	F	%	F	%
Government institutions	67	44.85	53	35.14	49	32.86
Primary Cooperative	61	40.86	73	48.86	69	45.71
Local trader	5	03.14	9	06.00	12	08.00
Agro-dealers	11	07.15	15	10.00	20	13.43
Own saved seed	6	04.00	0	00	0	00
<b>Total</b>	<b>150</b>	<b>100</b>	<b>150</b>	<b>100</b>	<b>150</b>	<b>100</b>

Source: Field study

The table 1 presents the data relating to the sources of inputs for maize production in the study area. Farmers depended on government institutions for seeds (44.85 per cent), fertilizers (35.14 per cent), and pesticides (32.86 per cent). Followed by, the primary cooperatives for seeds (40.86 per cent), fertilizers (48.86 per cent) and pesticides (45.71 per cent). Even farmers were depended on private player like local traders and agro dealers. Farmers purchased seeds (3.14 per cent) & (7.15 per cent), fertilizers (6 per cent) & (10.00

per cent) and pesticides (8 per cent) & (13.43 per cent) from the local traders and agro dealers when timely inputs are not supplied by the government institutions and primary cooperatives in the study area. It can be inferred that the majority of the farmers have depended on government institution and cooperative societies for inputs like seeds, fertilizers and pesticides.

#### 4.1.2 The Producers and Traders of Maize

The role of maize producers and their marketing outlets are identified. The mode of transportation, marketing options and type of market of producers' market aspects considered in selling their products. Ans the same has been presented in the table 2. It portrays that the data relating to the means of transportation used by the respondents in the study area. The majority of the farmers were used Tractors with share of 52.85 per cent as means of transportation, followed by 42 per cent of them were depended on Lorry and remaining i.e. 5.15 per cent of the farmers still used Cart. Hence, from the above table it can be inferred that the majority of farmers of sample area are using Tractors and Lorry as means of transportation (to sell their Maize production to near markets).

**Table 2**

#### Means of Transport using by the Respondents

Means of Transport	Frequency	Percentage
Tractor	79	52.85
Lorry	63	42.00
Cart	8	5.15
<b>Total</b>	<b>150</b>	<b>100</b>

Source: Field Survey

The farmers had several marketing options, directly selling to consumers and collectors. They sell directly more than one-third amount of produced maize directly flowing outlet to wholesalers. Farm gate, village market and town markets were type of markets used. Farmers sold their maize crop to urban wholesalers (50.00 per cent) and Local traders (42.00 per cent) were the main buyers of maize (Table 3).

**Table 3**

#### Market Outlets for Maize Crop in Study Area

Agents	Frequency	Percent
Local Traders	63	42.00
Rural wholesalers	5	03.14
Urban wholesalers	75	50.00
Urban retailers	7	04.86
<b>Total</b>	<b>150</b>	<b>100</b>

Source: Field Survey

This stage consists of traders who buy from farmers, grain trade enterprises and other traders to sell maize in different markets. Major marketing actors, volume of sale in percentage and their roles were identified.

**The Collectors/Local traders:** These are traders in assembly markets who collect Maize from farmers in village markets and from farms for the purpose of reselling it to wholesalers and retailers. They use their financial resources and their local knowledge to bulk maize from the surrounding maize production area.

**Table 4**

**Market Outlets for Local Traders in Study Area**

<b>Agents</b>	<b>% Sales</b>
Wholesalers	61.70
Retailers	10.10
Consumers	28.20
<b>Total</b>	<b>100</b>

Source: Field Survey

The Table 4 illustrates the market outlets for the local traders in the study area. The Local traders (collectors) play an imperative role and they have information about areas of surplus well. Collectors are the key actors in the maize value chain, responsible for the trading of 61.70 per cent, 10.10 per cent and 28.20 per cent to wholesalers, retailers and consumers, respectively from production areas to wholesale and retail markets in the study areas. The trading activities of collectors include buying and assembling, repacking, transporting and selling to wholesale markets.

**Brokers/Middlemen:** Brokers plays a vital role in linking farmers to market and other stakeholders of the commodity chain while the ability of market accession of farmers is limited and the market demand requires an improvement in quantity amount as well as diversity of products type. The brokers sometimes go beyond facilitation of transaction and tend to control and fix prices, create price symmetry and make extra benefits from the process in addition to convincing the producers to sell their maize at the prices set by wholesalers. More over brokers are divided in to village level brokers, urban brokers, commission agents etc. Village level brokers facilitate transaction by convincing farmers to sell maize and facilitating the process of searching good quality and quantity to traders and urban brokers. Commission agents are brokers working for specific traders.

The information pertaining to the suppliers of maize to the wholesalers in the sample area has been elicited and presented in the table 5.

**Table 5****Suppliers of Maize to the Wholesaler in Study Area**

Agents	% Sales
Producers	61.7
Local Traders	28.2
Other Agents	10.1
<b>Total</b>	<b>100</b>

Source: Field Survey

**Wholesalers:** The study identified two types' of wholesalers: urban wholesalers and rural wholesalers. The producers, local traders and other agents were the maize grain supplier to wholesalers. The table 5 shows the supplied level of the grain by producers (61.7 per cent), local traders (28.3 per cent) and other agents was 10 per cent respectively to wholesalers.

**Retailers:** Retailer involvement in the chain includes buying of maize, transport to retail shops, grading, displaying and selling to consumers. Retailers are key actors in maize value chain in the study area. They are the last chain link between producers, wholesalers and consumers. They mostly buy from wholesalers and sell to consumers. Sometimes they could also directly buy from the producers. Consumers usually buy the product from the retailers as they offer according to requirement and purchasing power of the buyers. Retailers purchase from collectors and wholesalers in village market and sale to consumers (from APMC Traders). The study identified two types of retailers: rural and urban retailers. Wholesalers were the main suppliers of retailers. Table 6 describes the supplier of maize to the retail seller. 60.00 per cent of retailers purchased from wholesalers, and local traders also supplied 30.28 per cent to retailers and 9.72 per cent of the retailers were purchased maize directly from producers of maize.

**Table 6****The Suppliers of Maize to the Retailers**

Agents	Percentage
Wholesalers	60.00
Local Traders	30.28
Producers	09.72
<b>Total</b>	<b>100</b>

Source: Field Survey

**Consumers:** Consumers are those purchasing the products for consumption. About two types of maize consumers were identified: households and institutions which give services such as for local consumption and processing local brewery. The study result indicated producers, wholesalers and retailers are suppliers to the consumers. The study results identified two

types of consumers: urban and rural consumers. 7.54 per cent and 28.2 per cent maize supplied from farmers and collectors respectively. Consumers bought from wholesalers and retailers around 28.35 per cent and 71.65 per cent respectively. Wholesalers were the main sources of maize supply to the consumers.

#### 4.2 The Business Development Service Providers

Such actors are those who provide supportive services including training and advisory, information, financial and research services. Access to information or knowledge, technology and finance determine the state of success of value chain actors.

**Access to market information:** the study results revealed that 205 sample households provided market information at 5 per cent significance level. Usually the information is with regard to commodities price in the market and they are retrieved from different sources such as fellow/other farmers in the neighbor traders and visual observations.

**Credit access:** The survey result enlightens that the 50.70 per cent took credit. In the study areas, micro finance, individual lenders, cooperatives, relatives and credit and financial institution have been identified as main sources of credit. The major purposes of their credit were to buy agricultural inputs like seeds, fertilizers, and herbicides and pesticides, to run nonfarm business, to buy food and other consumption needs. It has been shown in the table 7.

**Table 7**

#### Access to services by the Sample Farmers

Variables	Particulars	Frequency	Per cent	$\chi^2$ - value
Market Information	Yes	88	58.60	4.15**
	No	62	41.40	
Credit	Yes	76	50.70	-0.51*
	No	74	49.30	

Note: \*\*\*, \*\* and \*statistically significant at 1 per cent, 5 per cent and 10 per cent significance level.

Source: Field survey

**Table 8****Household Credit Needs and Sources (In %)**

Reason for Loan	Needed credit? Code		Did you get the amount you requested Code		Sources of Credit
	Yes	No	Yes	No	
Seeds/ fertilizer	82	18	69	31	Cooperative Society
Pesticides/herbicide	90	10	71	29	Cooperative Society
Farm equipment	95	05	63	37	Bank/cooperative Society
Invest in transport	12	88	08	92	Cooperative Society
Buy other livestock	83	17	51	49	Cooperative Society
Irrigation facility	91	09	58	42	Bank/cooperative Society
Non-farm business/trade	15	85	10	90	Bank/cooperative Society
To pay land rent	00	100	00	100	Cooperative Society
Consumption needs (food/health/education/travel)	38	52	16	84	Cooperative Society/loan from villagers

Source: Field Survey

The table 8 reveals the credit needs of the farmers and sources of credit they needed. Farmers of the sample area borrowed credit for purchase of Seeds/ fertilizer, pesticides/herbicide, farm equipment, invest in transport; buy other livestock, irrigation facility, non-farm business/trade, to pay land rent and Consumption needs (food/health/education/travel). All the farmers were opined that they have need of credit/loan facility, which can get through the cooperatives and for some purpose they need credit by Banks/financial institutions. The respondents are needed credit for different purpose that has been seen in the table 8.

**Table 9****Access to Extension Services**

Particulars	Received Training/ Information (%)		Average No. of Contacts in a year (days/year)		
	Yes	No	Govt. Extension	NGOs	Private Companies
New varieties of maize	35	65	42	00	15
Field pest and disease control	28	72	53	00	23
Soil and water management	18	82	34	00	12
Crop rotation	33	67	16	00	28
Adaptation to climate change	12	88	18	00	13
Irrigation	65	35	35	00	12
Crop storage pests	59	41	26	00	18
Output markets and prices	39	61	12	00	14
Input markets and prices	62	38	16	00	27
Livestock production	73	27	56	00	39
Health & hygiene	24	76	41	00	32
Tree planting	64	36	15	00	25

Source: Field Survey

Note: Figures are related to how many days the respondents were visited to the different offices for particular purposes which is mentioned in the first column of the table

The information pertaining to the access to extension services available to the farmers has been elicited and presented in the table 9. The farmers had information about irrigation (65 per cent), crop storage pests (59 per cent) input markets and prices of maize (62 per cent), livestock production (73 per cent) and tree planting (64 per cent) even received training from government and private institutions, etc. Farmers had received/attended the training/information on new varieties of maize i.e. 35 percent and majority of them were not received/attended the training/information i.e. 65 per cent. The respondents had received/attended the training/information on field pest and disease control i.e. 28 percent and majority of them were not received/attended the training/information i.e. 72 per cent. The household respondents had received/attended the training/information on Soil and water management i.e. 18 percent and majority of them were not received/attended the training/information i.e. 82 per cent. The sample farmers had received/attended the training/information on Crop rotation i.e. 33 percent and majority of them were not received/attended the training/information i.e. 67 per cent. Farmers were unaware about adaptation to climate change, output markets and prices and health& hygiene around 88 per cent, 61 per cent and 76 per cent respectively.

Hence, it can be inferred that the results of the study shows that the extension services are not developed in expected level on an average below 30 per cent of the farmers are utilizing extension services providing by the different agencies. There are different reasons for this the important are lack of knowledge of the farmers, lack of information, lack of interest by the service provider etc.

#### **4.3. The Value Chain Governance**

The Governance of maize actors was assessed by volume of commodities flow, price setting strategy, share of margins, level of competition and quality control. Volume of maize flow carried out varies on the basis of actors purchasing, and transaction and storage ability. The Price setting strategies are different throughout the actors. The strategies are prevailing market price, negotiated price, seller quoted or contractual. Quality attributes of the maize are also assessed through various methods.

In maize value chain, out of the total volume of maize flow, 74.45 per cent is carried out through wholesalers. Of these volume 25.55 per cent traded to other traders and consumers. Moreover, wholesalers govern the value chain by giving credit, transportation and

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storage services to its suppliers, and delayed payment and packaging to the buyers. The major sources of market price information were through personal contact, agents and neighbors. Maize is restricted to domestic market.

As emphasized in Table 10, since the regular suppliers and buyers of traders were few in numbers, they usually buy and sell without contractual agreement. Even though prevailing market price has a room in setting the market price of maize which is 39.70 per cent and 34.50 per cent during buying and selling respectively, price setting is much of negotiation between buyer and seller. Traders around 60.30 per cent and 65.50 per cent had undergone price negotiation to buy the maize from their suppliers and to sell to other traders. But producers received the price set by the traders even for quality products. Traders complain about non-licensed traders, market infrastructure and non-satisfying credit from lending institutes. They complain about farmers for not providing quality product. Farmers also complain back on traders for offering low prices though supporting prices announced by the government. Traders are also often open for credit sell for customers in the market. Mediation was a primary source of remedy for those who do not repay credit and followed by termination of business relationships with them. Smallholder farmers are not well organized and not governing the value chain, rather they are price takers and hardly negotiate the price of maize produced. The contractual agreement bear trust among actors by allowing credit sale with long repayment period. But it is not used in districts study area in Karnataka.

**Table 10**  
**The Price Setting Strategies in Maize**

Price set	When Purchasing		When Selling	
	Frequency	Per cent	Frequency	Per cent
Negotiation price	211	60.30	229	65.50
Market price	139	39.70	121	34.50

Source: Field Survey

Major quality attributes looked by maize traders were maturity, moisture, pest damage, foreign matters and age of the maize. Their methods of quality assessment depended on its attributes. All traders check color, shape, and size of the grain and pest damages by visual inspection. Visual inspection was also used by 68.00 per cent of the traders to estimate age of the product, 86.00 per cent of the traders to estimate the Maturity of the product. Around 08.10 per cent of the traders assess moisture content by biting the grain. 66.00 per cent and 49.00 per cent of the traders assess moisture content by visual inspection and smell respectively. They were less accessed to use accurate quality measurements like laboratory analysis and moisture meters which assure testing and grading standards to the product. Basic

attributes considered when buying those raw materials are cleanliness, size, maturity, color, season produced, moisture content and weight. Main methods of assessment are sieving for percent of foreign matters; visual inspection to assess size, maturity, color and age; moisture meter to detect moisture Content and weight through laboratory analysis. These assessment methods gave accurate standards of specification, testing and grading to the products (Table 11).

**Table 11**  
**The Major Maize Quality Attributes and Methods of Assessment**

Quality Attributes	Assessment Methods				
	Visual Inspection	Smell	Weight	Bite	Experience
	%	%	%	%	%
Moisture	86	49	8.3	66	89
Maturity	18	00	00	34	96
Product age	68	05	42	4	77
Pest damage	95	71	00	00	45
Foreign Matters	28	00	00	00	21
Color	69	00	00	00	92
Shape	33	00	00	00	67
Size	67	00	00	00	87

Source: Field Survey