



## **Value Chain Mapping of Maize in Ranga Reddy and Mahaboobnagar Districts of Andhra Pradesh**

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### **ABSTRACT**

Maize is occupying an important position in Andhra Pradesh Agriculture due to the growing demand from the poultry and other related industries in urban areas like Hyderabad. The present study is an attempt to examine prevailing marketing system of maize, value addition at micro level particularly in Ranga Reddy and Mahaboobnagar districts along with analysis of value chain of maize. Porter's (1985) concept of value chain is used to identify inbound and outbound logistics, technology operations, marketing and sales etc. Apart from this there is a potential to improve the farmers income by developing better supply chain networks and involving better mechanism for forward and backward integration. Study of value chain analysis indicated that feed manufacturers assume integrated functions like buying maize in lots and examining the quality, developing direct contracts with farmers to procure. The marketing logistics, infrastructure and distribution network were captured and analyzed to find out possibility of better integration in value chain.

**Key words :**Maize, Value chain, Value addition

Maize is a crop with multiple uses such as food for humans, feed for poultry and a basic raw material for the production of starch, oil and protein, alcoholic beverages and food sweeteners. More recently maize is also used in producing bio-fuel. In 2006, maize used for bio-fuel accounted for one-fifth of maize production in the United States. By the end of 2016, it is predicted that 32 percent of maize production will be used for bio-fuel production. In 2007-08, Indian farmers cultivated maize in 8.6 million hectares of area compared to 7.77 M.ha over the previous year. Major states that contribute to Maize production are Karnataka, Andhra Pradesh, Bihar, Punjab, Uttar Pradesh and Madhya Pradesh.

Indian produced maize is used domestically for food (70%), feed (15%) and industrial uses (15%). According to the ASSOCHAM (Maize Report 2008), poultry sector forms the largest chunk (51% of total maize consumption in India) followed by human consumption (26%), starch (12%) and livestock feed etc. (11%). Share of maize being used in feed industry is increasing due to increased consumption of meat, particularly poultry meat both in rural and urban areas. Increased industrial demand for maize comes from the starch industry also.

The objectives of the study focused on ascertaining the key components of the value chain by mapping it and finding out value added products.

### **MATERIAL AND METHODS**

Ranga Reddy and Mahaboobnagar districts of Andhra Pradesh were purposively selected considering tremendous area expansion of 89.3 per cent happened under maize from 2000-01 to 2008-09 i.e; 4.52 lakh ha to 8.56 lakh.ha. In each district three mandals recording highest area under maize were selected. One village from each mandal with highest maize area was selected. Maize growers were identified and respondents were selected from the identified list by adopting simple random sampling technique. Primary data was obtained from six villages in two districts, 15 farmers from each village by interview method form a sample of 90 farmers and traders and processors of maize 10 each. The data collected for the year 2009-10.

Processing industries situated in and around Rangareddy and Mahabubnagar districts buy the produce and process maize using all other required ingredients. This processed product is used as poultry feed in most of the poultry farms like Venkateshwara hatcheries and Suguna poultries.

The officers of NECC (National Egg Coordination Committee) were contacted. Processors who process maize to poultry feed and sell on their own brand names to the retailers or farmers directly like Vimala feeds, Chelimeda feeds and Janaki feeds, Raghupathi poultry farm, Venkateswara Foods and Feeds, Agro Tech Foods and Feeds, Rizwan Food Corn pops and Fryums and kurkure industry in Katedan were studied.

Porter's (1985) value chain conceptual tool to understand the factors that impact the long term profitability of a business was used as a guidance to capture the value chain of maize.

**Total fixed costs:** Fixed costs include cost items like taxes, insurance, depreciation, machinery, implements, tools, buildings, salaries of personal working in the farm etc

**Total variable costs:** These include costs of raw materials, labour, power, repairs, maintenance charges of machinery etc.

## RESULTS AND DISCUSSION

### Value chain of Maize – Key components

The results of the study revealed facts of how the raw maize reach the manufacturers and maize products reach the consumer. An examination of value chain revealed that inbound logistics are credit, seed, fertilizer, labour and managerial skills for production of maize and the maize seed network is highly developed in Ranga Reddy and Mahaboobnagar districts leading to competition among the suppliers but on the other hand due brand name seed prices are growing at the rate of 20 to 30 per cent every year. The usage of hybrids is 100 per cent of the total sampled area hence replacement of seed every year adds to cost of cultivation. There is high cost of labour (Rs. 9456) per ha and lack of managerial skills.

Outbound logistics of maize were existing arrangements in marketing, value addition, processing and distribution. Existing markets include private and regulated markets. This maize being transferred to ultimate consumers of different products like poultry feed, Kurkure and Pop corn, involve multiple players like traders, feed processors, food processors, distributors, wholesalers, retailers and consumers are found.

### Mapping of maize value chain in Ranga Reddy and Mahaboobnagar districts

The value chain is conceptualized and presented in figure 1 which included, inbound and outbound logistics, procurement marketing arrangements, margins and value addition. This tracked the production arrangements, production process, marketing, agents, value addition, distribution networks etc and even tried to gauge the complexity in terms of value addition at the industry level. It also tried to depict the level of integration.

A cursory look into the conceptual value chain of maize in Ranga Reddy and Mahaboobnagar districts provide insights into value chain system of maize in the study area. Accordingly to mapping of the value chain is done which is viewed in three different levels.

#### i) Primary level:

This deals the preliminary producer (farmer) procuring seed, other inputs preparing the land for cultivation, cleaning the field and making bunds and sowing, managing the labour management and coordinating the sequential operations etc. The backward integration to maize production lies with the input and seed suppliers.

#### ii) Secondary level:

Dealing with the stakeholders like market intermediaries such as commission agents and traders making the logistics of marketing

#### iii) Tertiary level:

Tertiary channel involving processing activity to produce value added consumer goods like poultry feed, kurkure, popcorn and corn flakes etc.

The primary level key players are the farmer himself, private and public seed producing companies, seed suppliers/ dealers, input suppliers making arrangement for good quality seed in desired quantities, irrigation, power, capital mobilization and finance support etc. the government policies also influence these decisions.

Input suppliers for fertilizers and pesticides perform activities like supply of new material, inputs

Fig. 1 Conceptual Value chain of Maize – Ranga reddy and Mahaboobnagar districts.

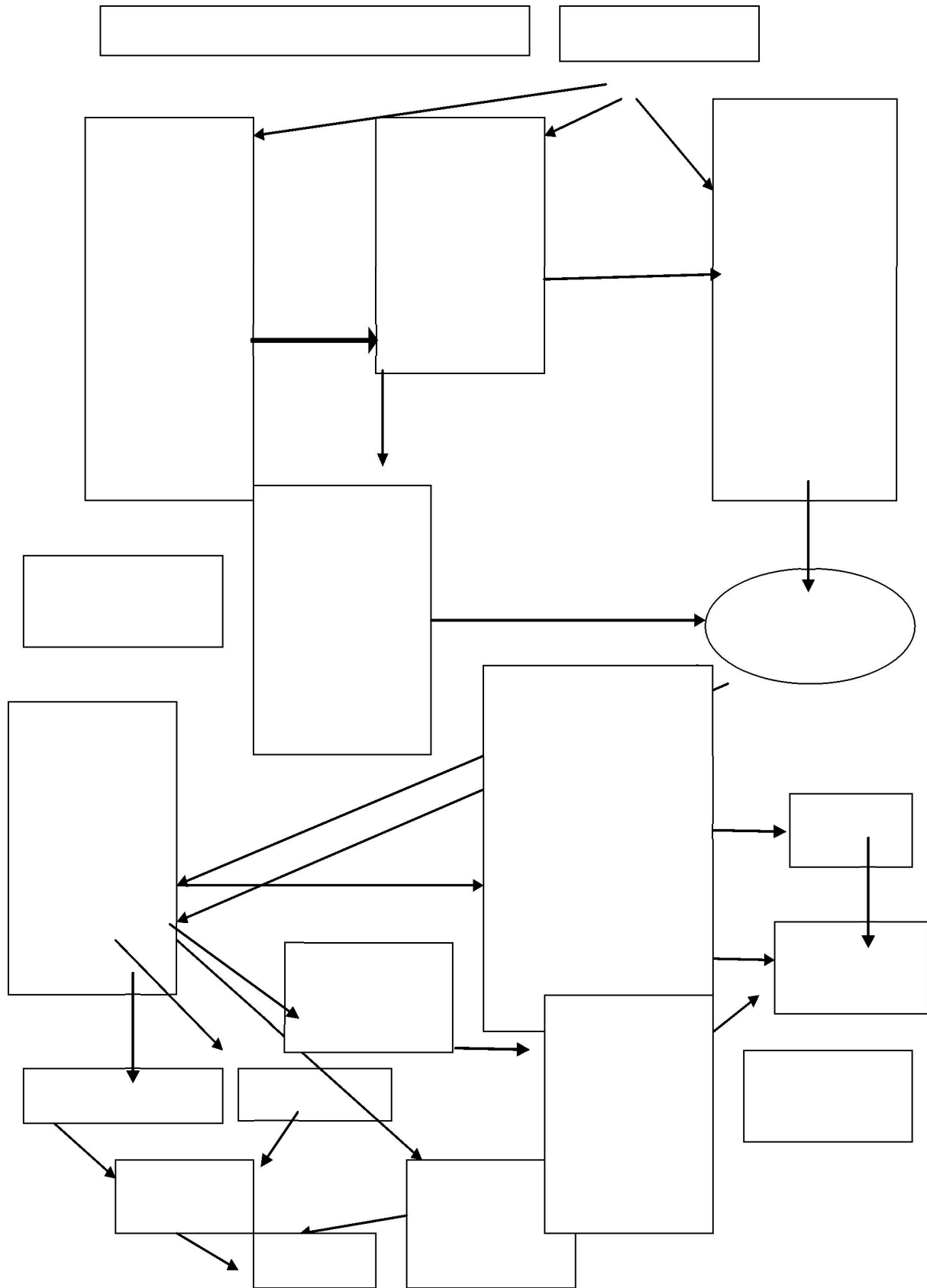


Table 1. Average cost of handling at the poultry feed processor's level.

Crop	Maize as Raw material		Other Ingredients added			TFC (Rs/Qt )	TVC (Rs/Qt)	Total handling costs (Rs/Qt)	Total cost with raw material (Rs/ Qt)
	Quantity (Qt)	Value (Rs)	Particulars	Quantity (Qt)	Value (Rs/Qt)				
Maize	1212.2	963.3	Param	250	850	124.3	71.27	187.7	1158.87
			Jowar	120	970	“	“	“	-
			Dry fish	200	1650	“	“	“	-
			Ragi	200	950	“	“	“	-
			DOB	200	750	“	“	“	-
			GNC	250	1850	“	“	“	-
			Broken rice	150	930	“	“	“	-
			SFC	200	1050	“	“	“	-
			Rice polish	20	1100	“	“	“	-
Total	1212.2	963.3	-	1410	11110	124.3	71.27	187.7	1158.87

Table 2. Value addition done to maize for converting it into poultry feed (Rs/Qt)

Particulars	Cost of value addition
Quantity of maize (Qt)	1
Cost of maize (Rs/Qt)	963.3
Other Ingredients (Qt)	1.16
Cost of other ingredients (Rs/Qt)	7.87
Total qty of feed prepared (Qt)	2.16
Selling price of poultry feed obtained @Rs1500/qt (Rs/Qt)	3240
Cost incurred in handling maize (Rs/Qt)	187.7
Total cost including the cost of raw material (Rs/Qt)	1158.87

offering, sales, crop advocacy, some times purchasing the produce at the time of harvest. They organize demonstrations, discounts and for the sale of good seed. They also assume the position of commission agents by purchasing the produce after the harvesting. There is a horizontal integration found among these players.

Secondary level of the value chain includes commission agents and traders who perform the role of price determination, drying, cleaning and sale to poultry processors and other feed and food

manufacturers. They store the produce from few days to weeks and arrange transportation to various destinations. Some other traders do grading also and sell the raw material to the hatcheries directly who own the feed mixing plants. At this level horizontal and some degree of vertical integration is observed.

At the tertiary level, when the question is value addition and creation of value addition and better remuneration to the farmer; there are different agents who become crucial. Among these

players poultry feed manufacturing industry, manufacturers of kurkure, pop corn and corn flakes were dominant. Poultry feed manufacturing channel emerged to be the major share holder handling almost 80 per cent of the maize produced in these two districts with other food manufactures having the remaining 20 per cent share of the value chain.

The value chain mapping is in conformity with Asche *et al.* (2002) worked on derived demand and relationships between prices at different levels in the value chain and they noted that when there is only one variable factor in the intermediaries' production technology, prices at different levels in the value chain will move proportionally to each other over time. Praat *et al.*, (2003) in which Mapping of pip fruit (apple) and kiwifruit information provides case studies that explore the implications, and identify current limitations, for researchers, developers and users of the various technologies and in pointing out lacuna in the existing system.

#### **Product manufacturing channels identified in the study area**

The value addition done for maize in the three major areas are identified namely a) Poultry feed manufacturers b) Pop corn manufacturers c) Kurkure manufacturers

First channel pertaining to feed industry and the rest of the two to the food manufacturing industry. Here, it is evident that the processors assume two three levels of vertical integration in the value chain. They prepare feed by themselves, thus reducing the cost of marketing and provides good remunerative price to producers/farmers. They distribute the poultry feed through the network developed. In fact some hatcheries are purchasing directly from traders, make the feed and sell it through network for broiler/ poultry meat production and egg production. These hatcheries also show 3-4 level vertical integration. This becomes backward vertical integration for the contract poultry production.

#### **Average cost of handling at the poultry feed processor's level**

It is evident from the Table 1 that the poultry feed manufacturers realize that there is 216 per cent value addition to maize in terms of quality and

995 per cent increase in terms of value (price). The cost of handling when delineated to per unit basis is Rs.1158.87 per quintal poultry feed is found to be a mixture of maize and other ingredients namely param, Jowar, dry fish, ragi, De-oiled rice bran, ground nut cake, broken rice, polish rice and Bajra.

#### **Economics of value addition done to maize for converting it into poultry feed (Rs/Qt)**

The Table 2 clearly indicates that when one quintal maize is processed it generates 2.16 quintals of feed. The net value addition carried out for one quintal maize is Rs. 2081. The tremendous potential in this channel exists; it is needed to sustain the channel and as majority of farmers are linked with this channel.

#### **Value addition done to maize for converting it into pop corn and kurkure (Rs/ Qt)**

Even though manufacturing of popcorn handles less quantity, similar to kurkure preparation as shown in Tables 3 and 4, good amount of value addition and employment generation is associated with it. Tremendous value addition is observed in processing, with a value of Rs.2200 and Rs.15888 per quintal in case of pop corn and kurkure. The cost incurred in handling the maize is higher for popcorn and kurkure (Srinivasa rao et al, 2011). It indicates that these are important and a definite amount of total production 5 to 10 per cent can be diverted to this channel systematically.

#### **Suggestions to improve value chain:**

Maize is a crop having complex value chain seeks establishment of commodity board to promote value addition by providing linkages of marketing. Vertical integration can be tried by assuming functions like grading and cleaning and ware housing facilities can be promoted. Networks related to the buyback arrangements, and extension institutes are strongly needed for proper integration of the supply chain management. Contracts by way of backward and forward linking with farmers and poultry growers respectively contractual arrangements can be promoted by the intervention of marketing department and establishment of standardized procedures and certification are to be addressed. Importance should be given to the

Table 3. Value addition done to maize for converting it into pop corn (Rs/ Qt).

Particulars	Cost of value addition
Quantity of maize (Qt)	1
Cost of maize (Rs/ Qt)	900
Other Ingredients (kg)	10
Cost of other ingredients (Rs/ Qt)	10
Total qty of pop corn prepared (kg)	50
Selling price of pop corn (Rs/ Qt)	5600
Cost incurred in handling maize (Rs/ Qt)	1500
Total cost including the cost of raw material (Rs/ Qt)	3400
Value addition done to one quintal of maize	2200

Table 4. Value addition to maize for converting it into kurkure (Rs/ Qt).

Particulars	Cost of value addition
Quantity of maize (Qt)	1
Cost of maize (Rs/Qt)	900
Other Ingredients (Qt)	700
Cost of other ingredients (Rs/ Qt)	1712
Total qty of kurkure prepared (Qt)	800
Selling price of kurkure (Rs/ Qt)	20000
Cost incurred in handling maize (Rs/ Qt)	1500
Total cost including the cost of raw material (Rs/ Qt)	4112
Value addition done to one quintal of maize	15888

agro processing industries which are popping out so that more and more value can be added to the farmers produce. Providing increased minimum support price to maize also needed. The risk of price fluctuation is low in maize when compared to other cereal crops. The vast scope in value addition shows that maize farmers are to be concentrated by the Government so that they can be linked directly to the processors to make farmers beneficial.

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