

Analysis of supply chain of Spices in India: A case study of Red chillies

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Abstract- India 'Land of spices' is the major producer and exporter of chillies. An efficient supply chain ensuring remunerative prices to the producers for their products and to deliver maximum satisfaction to the end consumers for the price they pay. Two major supply chains have been identified, Which reveals that supply chain II is more efficient than the supply chain I because more value goods are delivered to consumer from producer at low marketing costs. The study shows that farmers who bring good quality chillies to market prefer Supply chain-II to supply chain-I. But farmers who bring poor quality, discolored chillies, are preferring supply chain-I. Delay in payment after sale, problems in fare price evolution process, collection of excess commission and availability of loan through bank on produce important problems that farmers are facing in this market.

Index Terms- Supply Chain of Chillies, Marketing Spices, Price spread, Price discovery

I. INTRODUCTION

India's Agro climatic conditions provide scope for cultivation of 63 different spices, making India the 'Land of spices'. India is the largest producer (76 lakh MT), consumer (73 lakh MT) and exporter (3.8 lakh MT) of spices in the world. India's share in world trade of spices is 3.8 lakhs MT i.e. 48%. The area under spices is 57 lakh hectares. In India the southern states grow spices like pepper, cloves and cardamom. Southern states of India together produce 30percent of cardamom and 25-30% pepper of the world. Gujarat and Rajasthan grow the spices like cumin, coriander, fennel and fenugreek. They alone produce 80 % and 90 % world production in respect of coriander and cumin. The states of Uttar Pradesh, Madhya Pradesh, Andhra Pradesh, Maharashtra, and West Bengal, are major producers of onion, garlic, mustard and chillies. Orissa, Tamil Nadu, Andhra Pradesh, Mehalaya, Assam and Himachal Pradesh grow turmeric and ginger. Kerala contributes 96 percent of the total black pepper production in the country. Karnataka and Kerala alone grow 90 percent of small cardamom.

Chillies are pungent fruits of *capsicum annum L* and *capsicum frutescence*. It is also known as red pepper or dry chillies. Majorly used as condiment or culinary. It is specially used for its pungency, spicy taste, besides the appealing colour it adds to the food. It is used in pickles, sauces, ketchup, essences, oleoresins and it is an inevitable ingredient in Indian dishes. An alkaloid capsaicin is extracted from chili. which has medicinal value, besides its richness in vitamin C. Average per capita consumption in India ranges from 50gms-60gms per day.

The major producers in the world are India, China, Pakistan, Morocco, Mexico, Turkey and Bangladesh. Chillies are grown in all regions of India. The major Producers are Andhra Pradesh, Maharashtra, Karnataka, Tamil Nadu, Orissa and Rajasthan contributing 2/3 rd of India's production. And Andhra Pradesh alone contributes 46% for production making it the largest producer in India.

Andhra Pradesh has a production of 5.58 lakh MT area from 1.74 lakh hectares, which accounts for 26 % percent of area and 54 % percent of production in the country. In Andhra Pradesh it is grown in all the districts namely Warangal, Khammam, Guntur, Karimnagar, Prakasham and some other districts.

About 65% of the total chillies produced in India are traded from six major markets, Guntur, Warangal, and Khammam in Andhra Pradesh, Raichur and Bellary in Karnataka, and Jalgoan in Maharashtra and even exported to Srilanka, Bangladesh, Malaysia, USA, Nepal, Indonesia, UAE, Italy from these markets.

An efficient supply chain ensuring remunerative prices to the producers for their products and to deliver maximum satisfaction to the end consumers for the price they pay. This motivates the producers to increase the production and productivity on the one hand and can generate additional income and employment to their farm family. In this view an analytical study of supply chain of chillies, to know the problems associated with marketing of chillies and preferences of producers towards different supply chains.

II. METHODOLOGY

Present study was carried out in three major production centers namely Khammam, Warangal, and Guntur districts of Andhra Pradesh with specific objectives of supply chain analysis of chillies. A combination of purposive stratified and random sampling techniques were used for market functionaries, district, market and farmer selection required for the purpose of study. Personal interviews were conducted with growers belonging to different strata and marketing intermediaries with specially designed questionnaire for all the stakeholders. Besides data relating to quantity purchased, price paid/received, costs incurred were collected from the market functionaries.

III. FINDINGS AND DISCUSSIONS

The major functionaries involved in supply chain of chillies are:

REGULATED MARKET:

The market committee is the major institutional unit established under the APMC act of the state to establish regulated market, which also creates and develops infrastructural requirements for the market and see that there is no malpractices during the marketing process.

PRODUCER

Producers play a major role in marketing because important practices like drying, cleaning, grading and packing are done by them. which play major role in supply chain because these practices influence the price of produce, which is ultimate goal of any marketing process .

COMMISSION AGENT

Commission agents are licensed brokers in regulated market, who take 3% commission from farmers on sale the produce at good price, by treating a competitive environment between the (traders ,wholesale and processor) purchasers during the price evolution process. Commission agents are not directly involved in trade process but facilitated trade process by arranging weighing machines, hamalli, transport and credit to farmer.

TRADER/ EXPORTER

Traders/Exporters are the purchasers who participate in trade. They handle the produce for a short period on behalf of distantly located wholesalers, exporters and for processors. They play very important role in chillies trade then other crops because the quantity sold by the wholesale and exporter are in small quantities but throughout the year . But chillies require cold storage facilities to retain their quality (colour). These traders purchase in behalf off wholesalers and exporters by taking in hand order and store them in cold storages nearby market yard and facilitate year around supply.

WHOLESALEERS:

There are the functionaries who purchase large quantities and sell them in bulk to retailers. There are only very few wholesalers take part who belong to local areas. For distant wholesalers depend on traders for purchasing these products as storage is main constraint for them, because cold storage facilities are not available at their place of business as wholesalers are scattered unlike traders.

PROCESSORS:

Processors are the important functionaries in supply chain of chillies because they take up different value addition process like chilli powder ,making olieoresin extaction, pigment extraction, pickles etc. In Warangal most of the processors are small and main process is chilli powder making. Few branded companies like Priya foods Ltd, ITC, MTR are also located but they have direct tie ups with farmers. In case of shortage they also come for procurement through regulated market. The Processors located at distant places depend upon traders for procurement of chillies on behalf of them as these traders procure the specific quality as per the requirement of processor and arrange for cleaning, grading and transporting to the place of processors which is added

advantage to them. Some local processors who process chillies to powder and pack on behalf of some exporters.

RETAILER:

Retailer who finally deliver chillies and chilli powder from the wholesalers and processors and sell in small quantities required to the consumer. These retailers are scattered all over and are the ultimate contact points with consumers.

The chilli growing farmers bring the produce into the market after well drying, grading and packed in gunny bags. The quantity packed in gunny bags vary from 40kg to 70kg per gunny bag. The farmer bring their produce to the market by his own transport facilities as large farmer do, or through common transport arranged by a group of farmers of the village hired vehicle as in case of marginal and medium farmers do. This produce after arriving to the market is stacked to lots at shop of the authorized commission agent. The commission agent arranges for hamali (labour)who help the farmers in stacking their produce into different lots as per different grades, in weighing the produce and also show the produce by cutting the gunny bags to the traders who is willing to purchase.

The general method of sale process involved is open auction method. When few number of traders assemble at the commission agent shop the commission agent starts the auction by price by quoting a starting price which is decided by him. In negotiation with farmer, previous day closing price in market and considering the market arrivals then individual trader quotes the maximum price to pay to own the produce. After the auction process, if any quantity of chillies is not sold due to high prices or poor quality the commission agent negotiates with farmer for little lower price. If the farmer agrees, the commission agent keeps the produce for auction otherwise the farmer has an option to store the produce in the cold storage until he gets a good price and disposes the produce when he gets good price.

Two major supply chains are identified in trade of chillies in India:

SUPPLY CHAIN-1

In this supply chain the movement of produce from producer is through trader, wholesaler, retailer and finally to the consumer. The trader purchases the chillies through open auction at Regulated Market, in presents of commission agent. The trader avails a credit facility from the commission agent who in turn pay to the farmers after receiving payment from trader. Generally there is a period to 30 days for payment during which no interest is charged either to trader or commission agent due to which farmer are generally at loss. Here no major value addition takes place. The raw chillies are just sold from intermediary to other in variable quantities as per requirements. Only in few cases grading and cleaning takes place.

SUPPLY CHAIN-II

In this supply chain the produce is purchased from the producer by the processor in Regulated market through open auction method. Unlike supply chain I the processor pays

immediately for the produce purchased. So farmers at advantage when compared to supply chain-I The processor adds value to the raw chillies by different value addition processing and change the produce in to ready to use products like chilli powder and is attractively packed in small quantities as per the consumer choice then their value added products are distributed to retailers as per their orders and they are finally reach consumer through retailers.

PRICE SPREAD IN SUPPLY CHAIN I

The price spread in supply chain I revealed that the consumer's rupee was shared as Producer's share 49%, Trader's share 6%, Wholesaler's share 6%, Retailer's share 13% and marketing costs incurred at all levels was incurred to 26%. Out of the total marketing cost incurred in the supply chain 30% was incurred at Producer level, 25% at Trader level, 18% at Wholesaler level, and 27% at Retailer level.

PRICE SPREAD IN SUPPLY CHAIN II

The price spread in supply chain II revealed that the consumer's rupee was shared as Producer's share 40%, Processor's 17%, Retailer's share 20% and marketing costs incurred at all levels was incurred to 23%. Out of the total marketing cost incurred in the supply chain 28% was incurred at Producer and 28% at Processor's level.

COMPARISION OF SUPPLY CHAIN I TO SUPPLY CHAIN II

The study marketing costs and market margins in supply chain I and supply chain II reveal that marketing cost in supply chain I and supply chain II are 50% and 40% respectively and market margins are 50% and 60% respectively. Which reveals that supply chain II is more efficient than the supply chain I because more value goods are delivered to consumer from producer at low marketing costs.

PREFERENCE OF FARMERS TOWARDS DIFFERENT SUPPLY CHAINS:

The study shows that farmers who bring good quality chillies to market prefer Supply chain-II to supply chain-I. But farmers who bring poor quality, discolored chillies, are preferring supply chain-I. The procurers are willing to buy well graded, clean and well dried chillies with maximum of 8-12% moisture, packed in 40Kg gunny bags and rejecting those which are tightly packed that weigh more than 40Kgs of chillies. However, the traders are ready to buy any quality material because they get more bargaining power if the produce is poor in quality, there by more margins. They supply these materials to many small and unorganized far distance processors, and they also go for grading and repacking of this poor quality material in to 2 or 3 grades as possible and supply them to as per the grades required by their customers.

PROBLEMS ASSOCIATED WITH MARKETING OF CHILLIES

To identify the problems in the two supply chains, a pre-tested questionnaire was designed. Separately for identifying constraints producer level, trader level and processor level as

they were the important functionaries in two identified supply chains. The constraints faced by producers covered in the questionnaire were grouped under ten headings. The rank wise constraints identified were:

- (1) Poor transportation facilities.
- (2) Poor market information
- (3) Delay in sale of produce.
- (4) Poor weighing procedures.
- (5) Unfair practices during in open auction.
- (6) Delay in payments from agents.
- (7) Collection of excess commission.
- (8) Lack of storage facilities at market yard.
- (9) Poor finance for ware house receipts during lean market prices.
- (10) Lack of facilities for farmers at market yard.

IV. CONCLUSION

1. Poor understanding of Volatile Price fluctuations, which affect the benefit of farmers and middle men are being profited due to this.
2. The Traders take major share in chilli supply chain due to which Producers are not able to get there actual share in the consumer's rupee.
3. The present supply chain which is dominated by Supply chain-I is inefficient, because the farmer is getting a better price for the same quality of produce in Supply chain-II.
4. There is no value addition involved in supply chain-I which is the major supply chain at present.
5. Poor post harvest practices like drying, cleaning, grading, and packaging of farmers are rendering the quality of chillies and not attracting the processor during the open auction process causing loss in the actual price.
6. Delay in payment after sale, problems in fare price evolution process, collection of excess commission and availability of loan through bank on produce important problems that farmers are facing in this market.

V. POLICY IMPLICATIONS:

1. Flow of market information of both domestic and international market prices, taken through forward and back ward integration and best utilization ICT solutions, So that Producer will be benefited through proper price discovery.
2. Arrangements for training and education of post harvest handling so that producers would meet world food standards and packing standards.

3. Processing units should be encouraged to make the supply chain more organized.
4. Adequate finance facilities should be made available at producer level to reduce dependence on non institutional credit, so that producer would get time utility and more bargaining power at open auction process.

REFERENCES

- [1] Agarwal N L 1998 Marketing costs, margins and price spread for major agricultural commodities of Rajasthan. Indian Journal of Agricultural Marketing 12(3) : 122-132.
- [2] Basavaraja B 1980 Economics of Karnataka hybrid tomato in Bangalore . M.sc.,(Ag) Thesis, University of Agricultural Sciences, Bangalore.
- [3] Babu G S K and Naidu S H and Prasad Y E 2003 Price Spread and Marketing of Chillies in Guntur district of Andhra Pradesh. Agricultural Marketing.46 (1): 21-23
- [4] Bhupal D S 1994 Vegetable marketing – Delhi experience. Agricultural Marketing 36(4) : 45-52.
- [5] Brahmaiah P and Naidu M R 1993 Economics of chillies production in Guntur district of Andhra Pradesh . Indian Cocoa, Arecanut and Spices Journal 17(1&2): 22-25.
- [6] Brodway A C and Nannapaneni A 1975-76 Study on cost of production and Marketing of chillies in Paruchuru Block, Prakasham district, of Andhra Pradesh. Research report , Allahabad Agricultural Institute.
- [7] Duren E et al 1998 studied supply chain management and the Canadian Agri-food Sector. Canadian Journal of Agricultural Economics. 46(4): 479-489.
- [8] Furlanetto E L 2006 Revista Brasileria De Engenharia Agricola E Ambiental.10(3): 772-777.
- [9] Goswami S N 1991 Price spread of tomato in a vegetable market of Kamrup District Assam . Agricultural Marketing 2 (2): 207-212.
- [10] Gupta and Ram 1978 Behavior of marketing margins costs of vegetables in Delhi Indian Journal of Marketing 9(3): 12-15.
- [11] Hamapaiah H 1989 Economics of production and marketing of coriander in Kurnool District of Andhra Pradesh . M.Sc.,(Ag) Thesis, Andhra Pradesh Agricultural University, Hyderabad
- [12] Khunt K A and Desai D B 1996 Economic feasibility and marketing of perennial Vegetables in Souht Gujarat. Financing Agricultural 28 (1) : 9-14.
- [13] Maertens M 2007.Global supply chain standards and the poor.How the globalization of food systems and standards effects rural development and poverty.2007: 159-172
- [14] Mari F M Industrial journal of biological sciences.2005;2 (1)183-190.
- [15] Marsden T 2000 Food supply chain approaches;Exploring their role in rural development. Sociologia-ruralis 40(4):424-438
- [16] Mishra J P, Vishwakarma R S and Shri Kumar Rawat 1999 Production and marketing of chillies.The Bihar Journal of Agricultural Marketing 7 (1) : 36-43.
- [17] Nahatkar B S and Pant S P 1984 Farm profitability,resource productivity incultivation of chillies in chindwara distict of Madhya Pradesh. Agricultural situation in India 39(6):421-424.
- [18] Naidu M R, Raju V T,Bhramaiah P and Pandurangadu K 1988 A comparative study of different marketing supply chains of green chillies in Guntur district of Andhra Pradesh .Indian Journal of Agricultural Marketing 2:80-81.
- [19] Nannapaneni A Q and Broad way A C 1976 A study on the cost of production and Marketing of chillies in Parchuru Block,Prakasham district,Andhra Pradesh Allahabad Agricultural Institute.
- [20] Reddy P C 1979 Production and marketing of chillies (dry) in Gudur block of Nellore District , Andhra Pradesh. M.Sc(Ag) Thesis ,Andhra Pradesh Agricultural University.
- [21] Setyadjit et al 2004 Agri –Product supply chain management in developing countries Proceedings of a workshop . Bali, Indonesia ,19-22, August 2003.,2004:59-68.
- [22] Singh D V and Jagadish C Kharwal 1995 Components of vegetable marketing .
- [23] A case study in Himachal Pradesh. Department of Economics, Himachal Pradesh University, Simla. Indian Journal of Agricultural marketing Special:55.
- [24] Stank T P and Frankel 2000 Gave Supply Chain integration in the food and consumer good Industries. Staff paper. Department of Agricultural Economics, Michigan state University,(00-46):45.
- [25] Venkatanarayana 1990 Economics of chilli cultivation in Khammam district of Andhra Pradesh. M.Sc(Ag) Thesis, Andhra Pradesh Agricultural University, Hyderabad.

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