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Value chain analysis of chilli in Kurnool district of Andhra Pradesh

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Abstract

Aim: This study aimed to find out the price spread among the marketing channels as well as marketing efficiency of various marketing channels involved in the chilli crop and the problems faced by the farmers in the study area.

Study design: Stratified random sampling method was adopted for the current study where the primary data has been collected from 120 chilli growers and 5 each of market intermediaries.

Place and Duration of study: The research was carried out in Kurnool district of Andhra Pradesh and the primary data was collected from April to July 2022.

Methodology: Price spread and marketing efficiency of chilli was estimated and constraints were ranked using Garette Ranking technique in the study area.

Results: Among the five marketing channels, farmers share in consumer rupee was relatively higher in channel II with 82.98 Percent. Marketing efficiency of channel 2 was found to be more efficient.

Conclusion: Better post-harvest practices like drying, cleaning, grading and packaging are lacking from farmers rendering the loss in quality of chillies and due to this price is not attractive. Delay in payment after sale and low price received are the constraints faced by farmers.

Keywords: Value chain, marketing cost, marketing efficiency, price spread

1. Introduction

India 'Land of spices' is the major producer and exporter of chillies. An efficient supply chain ensures remunerative prices to the producers for their products and delivering maximum satisfaction to the end consumers for the price they pay (Y. Prabhavathi, NT Krishna Kishore, Dr. Seema, 2013) ^[1]. India is the world's largest producer, consumer and exporter of dry chillies in the world. India also has the largest area under chillies cultivation in the world. Dry chillies are one amongst the most common spices cultivated in India (Somashankar IC, Dr. JK Raju and Dr. Hema Patil, 2013) ^[2]. As chilli have many medicinal properties, it is useful in reducing the pain of arthritis, headaches, burns and neuralgia. They have the power to boost the immune system and lowers cholesterol. India is a home to various kind of spices. Varying climates of India helps in the production of almost all spices. India holds an important place in spice production by producing 3.2 million tonnes of various spices in the world. India is the world's largest producer with 1.75 million tonnes, contributing 43% to worldwide production followed by China, Ethiopia, Thailand, Pakistan and Bangladesh.

2. Materials and Methods

Present study was carried out in Kurnool district of Andhra Pradesh with specific objectives of Value chain analysis of chillies. Based on stratified random sampling method 3 Mandals namely Sanjamala, Yemingalur and Halaharvi were selected and from each Mandal 2 villages were selected and from each village 20 farmers were selected randomly for this study. In total 120 farmers and 5 each of market intermediaries comprise the sample respondents for this study.

Personal interviews were conducted with growers belonging to different strata and marketing intermediaries like Traders, Processors, Wholesalers, and Retailers with specially designed questionnaire. Besides data relating to quantity purchased, price paid/received, costs incurred were collected from the market intermediaries. Estimation of the price spread, marketing efficiency using Shepherd's and Agarwal method and ranking constraints using Garrett ranking technique were done.

3. Result and Discussion

The major market intermediaries involved in the value chain of chillies are:

- a) **Producer:** Producers play a major role in marketing because important practices like drying, cleaning, grading and packing were done by them which play major role in value chain because these practices influence the price of produce, which is the ultimate goal of any marketing process. Chilli farmers bring their produce to market after thoroughly drying, grading, and packing them in gunny bags. The amount packed in gunny bags ranges from 40kg to 45kg per bag. Farmers bring their produce to market using their own transportation, as large farmers do, or through shared transportation arranged by a group of farmers from the village, as marginal and medium farmers do. After arriving at the market, this produce is stacked in lots.
- b) **Commission agents:** Commission agents are licensed brokers in the regulated market, who took 2% commission from farmers and sale the produce at good price, by making a competitive environment between the traders, wholesalers and processors during the price evolution process. Commission agents are not directly involved in trade process but facilitate the trade process.
- c) **Traders/exporters:** Traders/Exporters are purchasers who engage in trade. They handle the produce for a limited time on behalf of distant wholesalers, exporters, and processors. They play a more important role in the chilli trade than others because the quantity sold by Traders and Exporters is consistent throughout the year. Chillies, on the other hand, require cold storage facilities to maintain their quality (colour). These traders buy on behalf of wholesalers taking in-person orders and storing them in cold storages near the market yard to ensure year-round supply.
- d) **Wholesalers:** There are the functionaries who buy in large quantities and sell them in bulk to retailers. Only wholesalers from the surrounding areas participate. Distant wholesalers rely on traders to purchase the produce because storage is their main constraint, as cold storage facilities are needed at their place of business and wholesalers are dispersed, unlike traders.
- e) **Processors:** Processors play an important role in the chilli

value chain because they carry out value addition processes such as chilli powder production. The majority of processors in Kurnool are small, with the main process being the production of chilli powder. Corporates like Priya Foods Ltd, ITC and MTR are also present, but they have direct contact with farmers. In the event of a shortage, they will also seek procurement through a regulated market. Processors located in remote areas rely on traders to procure chillies on their behalf because these traders obtain the specific quality required by the processor and arrange for cleaning, grading and transportation to the processors' location, which is an added benefit to them.

- f) **Retailers:** A retailer who receives chillies and chilli powder from wholesalers and processors and sells them in small quantities to consumers. These retailers are located all over the country and serve as the primary point of contact for consumers.
- g) **Marketing Channels:** Identification of marketing channels is necessary to investigate the marketing aspects of chilli. Chilli varieties included in the study area are Syngenta 2043, Nuziveedu 1530, Seminis 2222, Teja, DD and Open Pollinated Variety Super 10. Among these varieties majority of the farmers were preferring Super 10 variety. The following marketing channels were identified in the study area.

Channel I

Farmer-Commission Agent-Exporter-Consumer (Export Market).

Channel II

Farmer-Commission Agent-Wholesaler-Retailer-Consumer.

Channel III

Farmer-Commission Agent-Processor-Wholesaler-Retailer-Consumer.

Channel IV

Farmer-Commission Agent-Processor-Retailer-Consumer.

Channel V

Farmer-Procurement Agents of ITC.

Table 1: Price structure and cost drivers of value chain I

Actors	Price Structure and cost drivers (Rs/kg)										
	Activities	Super 10	%	Syngenta 2043	%	Nuziveedu 1530	%	Seminis 2222	%	Teja	%
Farmer	Sale price	150	81.52	180	82.47	200	82.93	160	81.86	200	82.93
	Marketing cost	1.50	0.82	1.50	0.69	1.50	0.65	1.50	0.79	1.50	0.65
	Net price received	148.5	80.70	178.5	84.33	198.5	85.46	158.5	82.96	198.5	85.46
Commission Agent	purchase price	150	81.52	180	82.47	200	82.93	160	81.86	200	82.93
	Transport cost	1.50	0.82	1.50	0.69	1.50	0.62	1.50	0.77	1.50	0.62
	Miscellaneous	0.50	0.27	0.50	0.23	0.50	0.21	0.50	0.26	0.50	0.21
	Marketing cost	2	1.08	2	0.91	2	0.82	2	1.02	2	0.82
	Margin	4.50	2.45	5.40	2.47	6.00	2.49	4.80	2.46	6.00	2.49
	Sale price	156.50	85.05	187.40	85.86	208.00	86.25	166.80	85.34	208.00	86.25
Exporter	purchase price	156.50	85.05	187.40	85.86	208.00	86.25	166.80	85.34	208.00	86.25
	Transport cost	8.00	4.35	8.00	3.67	8.00	3.32	8.00	4.09	8.00	3.32
	Labour charges	0.25	0.14	0.25	0.11	0.25	0.10	0.25	0.13	0.25	0.10
	Packaging cost	0.40	0.22	0.40	0.18	0.40	0.17	0.40	0.20	0.40	0.17
	spoilage loss	1.20	0.65	1.20	0.55	1.20	0.50	1.20	0.61	1.20	0.50
	Miscellaneous	0.60	0.33	0.60	0.27	0.60	0.25	0.60	0.31	0.60	0.25
	APMC CESS	1.54	0.84	1.85	0.85	2.05	0.85	1.64	0.84	2.05	0.85
	GST	7.72	4.20	9.25	4.24	10.27	4.26	8.23	4.21	10.27	4.26
Marketing cost	19.71	10.71	19.71	9.03	19.71	8.17	19.71	10.08	19.71	8.17	

	Margin	7.80	4.24	9.30	4.26	10.40	4.31	8.34	4.27	10.40	4.31
	Sale price	184.01	100	218.25	100	241.17	100	195.46	100	241.17	100
	Consumer price	184.01	100	218.25	100	241.17	100	195.46	100	241.17	100
	price spread	34.01	18.48	38.25	17.53	41.17	17.07	35.46	18.14	41.17	17.07

Majority of the farmers preferred Super 10 chilli variety in this value chain. Super 10 is an open pollinated variety.

The total marketing cost incurred by the participants in the channel I was Rs23.21. The marketing cost incurred by the Farmer, commission agent and exporter were Rs1.5, Rs2 and Rs19.71 respectively. Among the marketing costs Transport

cost incurred by the exporter had the major share. Majority of the farmers preferred Super 10 Chilli variety in this value chain. Super 10 is an open pollinated variety.

Table 2: Price structure and cost drivers of value chain II

Actors	Price structure and cost drivers (Rs/kg)										
	Activities	Super 10	%	Syngenta 2043	%	Nuziveedu 1530	%	Seminis 2222	%	Teja	%
Farmer	Sale price	150	82.99	180	85.05	200	86.11	160	83.75	200	86.11
	Marketing cost	1.50	0.83	1.50	0.71	1.50	0.65	1.50	0.79	1.50	0.65
	Net price received	148.5	82.15	178.5	84.33	198.5	85.46	158.5	82.96	198.5	85.46
Commission Agent	purchase price	150	82.99	180	85.05	200	86.11	160	83.75	200	86.11
	Transport cost	1.5	0.83	1.5	0.71	1.5	0.65	1.5	0.79	1.5	0.65
	Miscellaneous	0.5	0.28	0.5	0.24	0.5	0.22	0.5	0.26	0.5	0.22
	Marketing cost	2	1.10	2	0.94	2	0.86	2	1.04	2	0.86
	Margin	4.50	2.49	5.4	2.55	6	2.58	4.8	2.51	6	2.58
	Sale price	156.50	86.58	187.4	88.54	208	89.56	166.8	87.31	208	89.56
Wholesaler	purchase price	156.5	86.58	187.4	88.54	208	89.56	166.8	87.31	208	89.56
	Transport cost	0.5	0.28	0.5	0.24	0.5	0.22	0.5	0.26	0.5	0.22
	Labour	1.5	0.83	1.5	0.71	1.5	0.65	1.5	0.79	1.5	0.65
	Miscellaneous	0.5	0.28	0.5	0.24	0.5	0.22	0.5	0.26	0.5	0.22
	Marketing cost	2.5	1.38	2.5	1.18	2.5	1.07	2.5	1.30	2.5	1.07
	Margin	5	2.77	5	2.36	5	2.15	5	2.62	5	2.15
	Sale price	164	90.73	194.9	92.09	215.5	92.79	174.3	91.23	215.5	92.79
Retailer	Purchase price	164	90.73	194.9	92.09	215.5	92.79	174.3	91.23	215.5	92.79
	Transport cost	0.5	0.28	0.5	0.24	0.5	0.22	0.5	0.26	0.5	0.22
	Miscellaneous	0.25	0.14	0.25	0.12	0.25	0.11	0.25	0.13	0.25	0.11
	Labour	1	0.55	1	0.47	1	0.43	1	0.52	1	0.43
	Marketing cost	1.75	0.96	1.75	0.82	1.75	0.75	1.75	0.91	1.75	0.75
	Margin	15	8.30	15	7.09	15	6.46	15	7.85	15	6.46
	Sale price	180.75	100	211.65	100.00	232.25	100.00	191.05	100.00	232.25	100.00
	Consumer Price	180.75	100	211.65	100.00	232.25	100.00	191.05	100.00	232.25	100.00
Price spread	30.75	17.012	31.65	14.95	32.25	13.89	31.05	16.25	32.25	13.89	

Majority of the farmers preferred Super 10 Chilli variety in this value chain. Super 10 is an open pollinated variety

The total marketing cost incurred by the participants in the channel II was Rs 7.75. The marketing cost incurred by the Farmer, commission agent, Wholesaler and Retailer were Rs 1.5, Rs2, Rs2.5 and Rs 1.75 respectively. Among the marketing costs Transport cost incurred by the Commission

agent and Labour cost incurred by the Wholesaler had the major share. DD (Devnur Deluxe) is the major chilli variety exclusively preferred for processing of chilli powder by the processors in this value chain.

Table 3: Price structure and cost drivers of value chain III

Actors	Price structure and cost drivers (RS/kg)		
	Activities	DD	%
Farmer	Gross price received	230	79.31
	Sorting/Grading	0.25	0.09
	Loading/unloading	0.2	0.07
	Transport cost	0.75	0.26
	weighing charges	0.2	0.07
	Miscellaneous	0.35	0.12
	Marketing cost	1.75	0.60
	Net price received	228.25	78.71
Commission Agent	purchase price	230	79.31
	Transport cost	0.75	0.26
	Miscellaneous	0.4	0.14
	Marketing cost	1.15	0.40
	Margin	4.6	1.59
Processor	Sale price	235.75	81.29
	purchase price	235.75	81.29
	Transport cost	0.75	0.26

	packaging charges	0.25	0.09
	Inputs required (salt, colour)	2.25	0.78
	Labour	2	0.69
	Electricity charges	2	0.69
	Miscellaneous	0.5	0.17
	Marketing cost	7.75	2.67
	Margin	7	2.41
	Sale price	250.5	86.38
Wholesaler	purchase price	250.5	86.38
	Transport cost	0.75	0.26
	Labour	1.25	0.43
	Miscellaneous	0.25	0.09
	Marketing cost	2.25	0.78
	Margin	10	3.45
	Sale price	262.75	90.60
Retailer	purchase price	262.75	90.60
	Transport cost	0.5	0.17
	Labour	1.25	0.43
	Miscellaneous	0.25	0.09
	Marketing cost	2	0.69
	Margin	25.25	8.71
	Sale price	290	100.00
	Consumer Price	290	100.00
	Price spread	60	20.69

DD (Devnur Deluxe) is the major chilli variety exclusively preferred for processing of chilli powder by the processors in this value chain

The total marketing cost incurred by the participants in the channel III was Rs14.90. The marketing cost incurred by the Farmer, commission agent, Processor, Wholesaler and

Retailer were Rs1.75, Rs1.15 and Rs7.75, Rs2.25 and Rs2 respectively. Among the marketing costs input cost incurred by the processor had the major share.

Table 4: Price structure and cost drivers of value chain IV

Actors	Price structure and cost drivers (Rs/kg)		
	Activities	DD	%
Farmer	Gross price received	230	80.70
	Sorting/Grading	0.25	0.09
	Loading/unloading	0.2	0.07
	Transport cost	0.5	0.18
	weighing charges	0.2	0.07
	Miscellaneous	0.35	0.12
	Marketing cost	1.5	0.53
	Net price received	228.5	80.18
Commission Agent	purchase price	230	80.70
	Transport cost	0.75	0.26
	Miscellaneous	0.4	0.14
	Marketing cost	1.15	0.40
	Margin	4.6	1.61
	Sale price	235.75	82.72
Processor	purchase price	235.75	82.72
	Transport cost	1	0.35
	Packaging charges	0.25	0.09
	Inputs required (salt, colour)	2.25	0.79
	Labour	2.5	0.88
	Electricity charges	1.5	0.53
	Miscellaneous	0.5	0.18
	Marketing cost	8	2.81
	Margin	25	8.77
		Sale price	268.75
Retailer	purchase price	268.75	94.30
	Transport cost	0.5	0.18
	Miscellaneous	0.25	0.09
	Labour	0.5	0.18
	Marketing cost	1.25	0.44
	Margin	15	5.26
	Sale price	285	100.00
	Consumer Price	285	100.00
	Price spread	55	19.30

Majority of the processors preferred the DD (Devnur Deluxe) chilli variety in this value chain as this variety is exclusively meant for processing of chilli powder

The total marketing cost incurred by the participants in the channel IV was Rs11.90. The marketing cost incurred by the Farmer, commission agent, Processor and Retailer were Rs 1.5, Rs1.15 and Rs8 and Rs1.25 respectively. Among the marketing costs input cost incurred by the processor had the

major share.

Super 10 is an open pollinated variety having high export potential which is exclusively preferred by the Corporates like ITC.

Table 5: Price structure and cost drivers of value chain V

Actors	Price structure and cost drivers (Rs/kg)		
	Activities	Super 10	%
Farmer	Sale price	160	86.02
	Purchase price	160	86.02
Procurement Agents of (ITC)	Transport cost	2	1.08
	Loading and unloading charges	0.25	0.13
	Weighing and Packing charges	1.15	0.62
	Gunny bag	2	1.08
	Pesticide residue testing	10	5.38
	Vendor Commission	1	0.54
	GST	8	4.30
	APMC CESS	1.6	0.86
	Marketing cost	26	13.98
	Purchase price by the Corporates like ITC	186	100.00

Super 10 is an open pollinated variety having high export potential which is exclusively preferred by the Corporates like ITC

The total marketing cost incurred in the channel V was Rs26. Among the marketing costs pesticide residue testing incurred by the procurement agents had the major share. The

marketing margin and other cost details were not shared by the Corporate Firms and hence the price spread was not calculated.

Table 6: Price spread in existing channels of chilli Marketing (in Rs/kg)

S. No	Marketing Channel	Price received by the farmers	Price paid by the consumer	Price Spread
1	Channel I	150	184.01	34.01
2	Channel II	150	180.75	30.75
3	Channel III	230	290	60
4	Channel IV	230	285	55
5	Channel V	160	-	-

Channel II was found to be more cost effective since it has the lowest price spread.

Table 7: Farmer share in Consumers rupee

S. No.	Marketing Channel	Price received by the farmers	Price paid by the Consumer	Farmers share (in %)
1.	Channel I	150	184.01	81.5
2.	Channel II	150	180.75	82.98
3.	Channel III	230	290	79.31
4.	Channel IV	230	285	80.70
5.	Channel V	160	-	-

The above table 7 revealed that the farmers share in consumer's rupee in the four channels were 81.5 percent, 82.9 percent, 79.31 percent, and 80.70 percent respectively. Among the four marketing channels, farmers share in consumer rupee was relatively higher in channel II.

assigned function is referred to as marketing efficiency.

3.2 Marketing efficiency-Shepherd's method

The marketing efficiency analysis using Shepherd's method was worked out and furnished in Table 8.

3.1 Marketing efficiency

The effectiveness with which a market structure executes its

Table 8: Marketing efficiency analysis using Shepherd's method (in Rs/kg)

Particulars	Channel I	Channel II	Channel III	Channel IV	Channel V
Consumer price (V)	184.01	180.75	290	285	160
Total marketing cost (I)	23.21	7.75	14.9	11.9	26
ME=((V/I)-1))	6.92	22.32	18.46	22.14	6.11

From the above table it can be inferred that the marketing efficiency of channel II was found to be more efficient.

Table 9: Marketing efficiency analysis using Acharya and Agarwal’s method

Particulars	Channel I	Channel II	Channel III	Channel IV	Channel V
Total marketing cost (MC)	23.21	7.75	14.9	11.9	26
Net marketing margin (MM)	12.3	24.5	47.6	44.6	-
Farmer received Price (FP)	150	150	230	230	160
Marketing efficiency = (FP/MC+MM)	5.06	5.58	3.68	4.07	-

From the above table it can be inferred that the marketing efficiency of channel II was found to be more efficient.

3.3 Problems associated with production of chillies

The constraints faced by producers covered in the questionnaire were grouped under seven headings. The constraints were ranked using Garrett’s ranking technique and furnished in table 10.

Table 10: Constraints faced by chilli farmers

S. No.	Problems faced	Mean score	Rank
1.	Inadequate/excess rainfall	70	I
2.	Pest and disease attack	68.25	II
3.	High cost of inputs	56.37	III
4.	Low productivity	44.37	IV
5.	High labour cost	38.89	V
6.	Labour scarcity	37.03	VI
7.	Lack of credit facilities	33.37	VII

It was inferred from the above table that Inadequate/excess rainfall and pest and disease attack were the major constraints faced by the chilli farmers followed by High cost of inputs, Low productivity, High labour cost, Labour scarcity and Lack of credit facilities respectively. The problem of pest and disease outbreaks could be tackled by producing and supplying high quality pest and disease resistant variety seeds at a subsidized cost.

3.4 Problems associated with marketing of chillies

To identify the problems in the value chains, a pre-tested questionnaire was designed separately for identifying constraints at producer level. The constraints faced by producers covered in the questionnaire were grouped under eight headings. The rank wise constraints identified were:

Table 11: Constraints faced in Chilli Marketing

S. No.	Problems faced	Mean Score	Rank
1.	Poor quality of produce	68.25	I
2.	Price fluctuation	63.37	II
3.	Delayed payment made by the market intermediaries	58.12	III
4.	High cost of transportation	54.75	IV
5.	Wastage due to improper handling	42.5	V
6.	Non-availability of market information	39.37	VI
7.	High Commission Charges	36.5	VII
8.	High loading and unloading charges	36.12	VIII

The above table showed that the poor quality of produce was the first and most critical constraint in marketing followed by price fluctuation, Delayed payment made by the market intermediaries, High cost of transportation, Wastage due to improper handling, non-availability of market information, High Commission charges and High loading and unloading charges.

4. Conclusion

Five marketing channels were identified in the study area. The total marketing cost incurred by participants in the channel I,

channel II, channel III, channel IV and channel V are Rs23.21, Rs 7.75, Rs14.9, Rs11.9 and Rs26 respectively. Among the five marketing channels, farmers share in consumer rupee was relatively higher in channel II with 82.98 percent. Among the five marketing channels, the marketing efficiency of channel II was found to be more efficient. The price spread in the four channels are Rs34.01, Rs30.75, Rs60 and Rs55 respectively. The channel II was more cost effective since it has the lowest price spread. Better post-harvest practices like drying, cleaning, grading, and packaging are lacking from farmers and this renders the loss in the quality of chillies and leads to low price. Delay in payment after sale and low price received are the constraints faced by farmers. Arranging training sessions on post-harvest handling of produce to the farmers in order to meet the expected standards by the intermediaries could be made by extension functionaries and research institutions for overcoming this constraint.

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