



## **Economics Of Value addition in Chillies in Krishna zone of Andhra Pradesh**

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### **ABSTRACT**

The study was carried out in 3 districts of Krishna zone namely Guntur, Krishna and prakasam districts of Andhra Pradesh to estimate the additional investment involved in value addition to chilli crop to produce high quality economic product. The farmers are investing an additional amount of about Rs. 919/- per quintal accounting for 16.53 percent more than the production cost at several stages of pre and post harvest processing with main objectives of realizing a better and profitable price. The crucial processing stages of additional investment for chilli are drying, grading, packing and storage. Keeping produce in cold storage is a very common practice in and around Guntur district resulting in better price realization from Rs. 8000 to 8500 during the year 2014-15 with an additional price realization of Rs 2000/- to Rs.2500/- than other farmers. Capacity building trainings need to be conducted for farmers to reduce the additional cost especially where managerial aspects are involved. The raw produce purchased from the market at Rs. 85/kg by the processor/trader will be Rs 160/kg at consumer level as chilli powder. Thus, the producer share in the consumer rupee works out to be 53.12 percent.

Chilli is the second largest traded spice in the world with a 22 percent contribution in the world spice trade. The major producers in the world are India, China, Pakistan, Morocco, Mexico, Turkey and Bangladesh. India is the largest producer and also largest consumer, exporter of Chilli. Chilli is the most common spice cultivated in the country. In India, Chilli is widely grown in states viz., Andhra Pradesh, Telangana, Karnataka, Madhya Pradesh, Orissa, Gujarat, Tamilnadu and Maharashtra. About 65 percent of the total chillies produced in India are traded from six major markets, i.e. Guntur in Andhra Pradesh, Warangal and Khammam in Telangana, Raichur and Bellary in Karnataka, and Jalgoan in Maharashtra and even exported to Srilanka, Bangladesh, Malaysia, USA, Nepal, Indonesia, UAE and Italy from these markets. Andhra Pradesh accounts for nearly 30 percent of Indian chilli exports with a distinguished research centre at Guntur which is popularly known as Lam farm. The centre has distinct credibility in producing good number of chilli varieties with G-series and now the popular varieties viz., LCA-334 grown in larger areas in Guntur, Warangal, Khammam, Prakasam, Krishna and even other neighboring states of Andhra Pradesh and Telangana. Guntur is the biggest Chilli market center in Asia

contributing 45-50 percent to the total production of Andhra Pradesh. Hence area and production of chilli in Krishna decides the prices.

The Guntur regulated market yard is very popular with a prefix name as chillies market yard. Krishna zone has a large number of cold storage facilities, 150 to be precise, including 88 in close proximity to Asia's largest market yard in Guntur city. The storage capacity of each one of them is estimated to be 1,00,000 bags. The Guntur city is surrounded by a cluster of more than 88 cold storage units both with single (2 Tons) and double chamber (4 Tons), which are catering to the needs of the farmers of surrounding districts and also from a radius of more than 150 kilometers which are providing storage facility for the dry chillies so as to preserve this internationally valuable commodity to last for a good length of time in the interest of the farmers.

Besides, there are more than 20 processing units in and around Guntur to convert the raw chillies into fine powder for export markets with special processing units exclusively for export purpose. India's Chilli exports are drastically increasing and Indian chillies are mostly exported to Sri Lanka, Bangladesh, Bahrain, Israel, Japan, Malaysia, USA and UAE. Among these countries, Malaysia, Sri Lanka and

Bangladesh are the major importers of Indian Chillies. India's share in world trade of spices is about 40-50 percent in volume terms and 25 percent in value terms. Thus, India's demand and supply play an important role in the world market. The export performance (Table 1) during the period 2010-11 to 2014-15 has indicated that there was an increase in quantity of exports by

148.29 % and in value terms by 461.15 %. During 2014-15, Chilli continued to remain upbeat in spices as a total quantity of 2,81,000 tonnes of the spice valued at Rs. 2,261.44 crore was exported as against 2,41,000 tonne valued at Rs. 2144.08 crore, registering an increase of 17% in volume and 5.5% in value when compared to 2013-14.

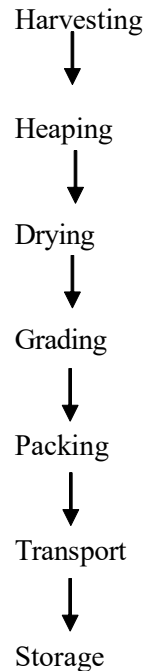
**Table1. Export performance of Chillies from India**

Particulars	2010 - 11	2011-12	2012-13	2013-14	2014-15	Percent increase in quantity of exports from 2010 – 11 to 2014 - 15
Quantity (MTs)	113174	204000	200000	241000	281000	148.29
Value (Rs in crores)	403.00	1291.72	1200.00	2144.08	2261.44	461.15

## RESULTS AND DISCUSSION

### *Post Harvest stages*

**Fig1.** Post harvest stages in Chillies where value addition is possible with additional investment for better price



The total export of Chilli from India during 2010-11 was 1,13,174 tons valued at Rs.403crores which has stood up to 281000 tons valued at Rs.2261.44 crores during 2014-15. Over the years, exports were increasing at a faster rate. Malaysia is now the largest importer of Chillies from India which contributes 26 percent to the total exports from India. Srilanka stands second with 19 percent followed by Bangladesh (17%), USA (14%) and others (16%). This explains the growing importance of Indian chilli as an internationally valuable commodity. Chillies constitute about 22 percent of total spices exports in quantity and with 14 percent in value. In Andhra Pradesh, Krishna zone ranks top in areas with 90000 hectares and with more than 4.10 lakh tons of production with 22.5 percent share in total production.

Keeping all the above in view and its importance domestically and internationally, an attempt was made in the present study to work out the economic aspects of value addition taking place at several post harvest stages practiced by chilli farmers to fetch or realize a good remunerative and profitable.

#### MATERIAL AND METHODS

Krishna zone was selected purposefully for the present study during (2014-15 to work out the economics of value addition from post harvest stage to market disposal stage at farmers level. The data

was collected from a sample size of 50 farmers spread over in five villages of five mandals namely Amaravathi, Medikonduru, Sattenapalli, Inkollu, Vastavavi where chili crop (LCA 334) is extensively grown. Random sampling technique was used to elicit data from farmers. The farmer makes several efforts by making additional investments at several post harvest stages in chillies in Krishna zone viz., harvesting, drying, grading, transport, storage, and marketing (Fig.1.) The present study was confined to the variety LCA-334 as it is popular among the farming community and Krishna zone was selected purposefully because of its strategic importance for chilli crop.

#### PRODUCTION COST

The cultivation expenses pattern and production cost information presented in Table-2&3 indicated that cultivation expenses per hectare of chillies was Rs. 271241.65/-, of which pesticide expenditure contribute 16.28 percent with Rs.44151.25/- followed by fertilizer share of 15.38 in percentage terms and in absolute terms, it was Rs. 41724.48/-. The production cost was estimated as Rs.5343.61/- per quintal yielding 48.78 quintals per hectare. The BC Ratio found to be 0.526. The efforts of the farmer for better price are more important at every post harvest stage and hence detailed description was given regarding the economic aspects of value addition at different stages.

**Table 2. Economics of Chillies in Krishna zone of Andhra Pradesh (2014-15)**

S. No	Particulars	Cost/ha (Rs.)	% age
1	Land preparation	6175.00	2.28
2	FYM	926.25	0.34
3	Sowing/Trans.	13557.21	5.00
4	Irrigation	22415.25	8.26
5	Weeding/intercultivation	9571.25	3.53
6	fertilisers&Appl.	41724.48	15.38
7	Pesticides&Appl.	44151.25	16.28
8	Harvesting	98722.81	36.40
9	Transport/Marketing cost	5998.57	2.21
10	Depreciation	370.50	0.14
11	Interest on working capital	1214.31.00	0.45
<b>A</b>	<b>Total variable cost</b>	<b>244826.89</b>	<b>90.26</b>
1	Land Revenue	494.00	0.18
2	Land lease	25780.63	9.50
3	Interest on fixed capital	140.13	0.05
<b>B</b>	<b>Total fixed cost</b>	<b>26414.76</b>	<b>9.74</b>
<b>C</b>	<b>Total cost</b>	<b>271241.65</b>	<b>100</b>

**Table 3. Productivity and profitability of chillies in Krishna Zone**

S. No	Particulars	Rs/hectare
1	Yield (qtl/ha)	48.78
2	Price (Rs/qtl)	8250.00
3	By product(white chilli(qtl/ha))	5.15
4	Price(Rs/qtl)	2250.00
3	Gross Returns (Rs/ha)	414022.50
4	Cultivation Expenses (Rs/ha)	271241.65
5	Net Returns (Rs/ha)	142781.50
6	BC Ratio	0.53
7	Cost of Production (Rs/quintal)	5343.61

**Table 4. Value addition pattern in Chillies at different post harvest stages**

Stage	Cost (Rs/Q)
Harvesting	150.00
Drying	1500.00
Heaping	75.00
Grading	225.00
Packing	15.41
Transportation	28.55
Storage	350.50
Total	994.46

**Value addition in Chillies**

Value addition is an important and crucial task in chillies that involves additional investment from farm gate to marketing stage for realizing remunerative and profitable price acceptable to farmer producer. The farmer level value addition starts from avoiding pesticide application 10 to 15 days prior to harvesting to avoid the residual presence of toxics substance in ripe fruits for maintaining better quality and high price in the market.

**Harvesting of ripe fruits**

Harvesting time of chillies mostly depend on the purpose for which it is grown. Most of the farmers in Krishna zone in Andhra Pradesh grow chillies for the production of dried whole chillies. The chillies crop becomes ready to harvest in 6 to 7 months after transplanting or direct sowing as the case may be. Ripe fruits are harvested by hand picking at frequent intervals (about 3-4 times) to maintain quality and colour. Mostly, the women labour are engaged in picking the chillies. The method of picking generally will be on daily wage basis which is very crucial for quality maintenance. This requires more labour than contract basis i.e, @ Rs.2/- per kilo. In the opinion of farmers, this

kind of contract harvesting affects the quality as ripe fruits may get damaged if proper care is not taken. Harvesting of chillies on wage rate basis warrants additional expenditure of Rs.150 per three quintals of ripe chilli pods or one quintal of dry chilli (Table 4). Thus, the value addition is Rs.150 to maintain quality of chilli which is an essential parameter for better price.

**Avoiding of pesticides application**

Harvesting without applying pesticides 15 days ahead of due date of harvest will help the farmers to avoid pesticides residue and maintain quality and also saving of Rs 75/Q which can be added to the value addition to the economic product and the production cost will be reduced by Rs 75/- per quintal.

**Bamboo Baskets to keep handpicked ripe fruits**

Bamboo baskets usage in manual harvesting of ripe fruits will enhance the quality parameters of ripe chillies as bamboo baskets maintain quality of ripe fruits at the time of harvest due to aeration available when compared to the ordinary gunny bags. The additional expenditure per quintal will be another two women labour as more time consumed in harvesting and transferring them to drying floor.

**Heaping of harvested ripe fruits**

Soon after the harvest of ripe fruits, the produce is generally kept in shade in the form of heaps for one day for uniform development of the pods (Hanumanthaiah and Satyanarayana, 2007). The next day the heaps are spread on the floor in a layer of about 5 to 10 cm thickness. The labour involvement is very crucial and requires a women

labour as careful handling of the economic produce starts at this point. The operation requires an additional expenditure of Rs. 75/quintal.

#### **Drying of ripe fruits after harvest**

The general practice is drying the chillies on open floor. Silpaulin sheets and also latest available technology such as polyhouses or solar driers for drying of chillies are also available. The additional investment to be made by farmers in case of silpaulin was Rs. 100/-per quintal. Which will help the farmers to fetch Rs. 400 to 500 per quintal when compared to floor drying. The poly houses investment is also slowly coming to use and farmers are still to be accustomed to polyhouse usage involving huge investments.

#### **Grading of dry chillies**

Grading of chillies is very essential as the produce consists of visible foreign mater, discolored parts, damaged, under sized and curly parts. The grading is based on colour, glossiness; size and. grading requires on an average 1.5 skilled women labour per quintal. Personal hygiene of the women labour in handling chilli during grading is a critical control point to avoid contamination (Satyanarayana and Sukumaran, 2007) with an additional investment of Rs.225/- per quintal.

#### **Packing and Transportation of chillies**

The transportation of dried chillies in gunny bags generally will be done in morning times when temperature is relatively cooler as fully dried chillies became brittle causing considerable breakage. The compressing of dry chillies required to save transport and cold storage costs. Generally, farmers pack maximum quantity of about 40 to 45 Kgs per gunny bag. This gunny bag stacked with dry chillies is called TIKKI in local language (Telugu). The entire transportation generally is carried out on the basis of TIKKI as a reference unit. The additional expenditure in transporting dry chillies from farm gate to cold storage generally will be Rs. 15.41/quintal for normal distance of 100 km including unloading charges.

#### **On farm storage of dry chillies**

Farmers generally do not prefer on farm storage for longer time as the storage problems cannot be handled at farmer level as it leads to quality deterioration in the economic product.

#### **Storage of chillies in cold storages**

Many of the farmers who are not in immediate need of physical money prefer to keep the produce in cold storage (at about 5-8°C) in anticipation of a better price. The additional expenditure of the farmer on per quintal basis includes storage cost, insurance, watch & ward sample expenses and other miscellaneous expenditure which comes to Rs. 350/- per Q. This additional investment of Rs. 350/- per quintal helps the farmer for retention of the color of chillies which ultimately helps the farmer to claim and bargain for an attractive price. The use of cold storage by farmers in chilli growing areas of Andhra Pradesh has almost become a regular phenomenon which helps the farmers to get remunerative and better prices in the off season

#### **Marketing of dry chillies**

The marketing of chillies from cold storage involves a commission of 2% (officially), 4% (unofficially) on the value of the produce on per quintal basis. Thus, if the value of the produce is Rs 8000/-, the expenditure on market commission is Rs 160/- to 320/- per quintal.

Thus the value addition takes place right from the harvesting time, drying, heaping, grading, transportation and storage that warrant additional expenditure over the original production cost at the farmer level. Thus value addition made by the farmer need to be acknowledged properly by the traders by offering a remunerative and profitability price. The farmers are realizing a better price depending upon the market situation. The price realization in Guntur market ranges from Rs 8000 to Rs. 8500 per quintal which was highest during 2014-15.

This again depends on several parameters like variety, proper drying, grading, packing, color quality and extent of post harvest care taken by the farmer. Beside all this, chemical analysis should be satisfactory based on aflatoxin levels. The prescribed levels of aflatoxin vary from 1 to 10 ppb for EU and other countries.

#### **Processing of raw chillies**

Processors are the important functionaries in supply chain of chillies because they take up different value addition processes like chilli powder, making oleoresin extraction, pigment extraction, pickles etc. In Guntur, main process is chilli powder making. The local processing units available in and around Guntur city takes care of processing of raw

**Table 5. price spread, marketing cost and margin of chilli powder.**

Particulars	Price Rs.	Percent to Total
Producer cost (Price realized by farmer) – Dry Chillies	8500.00	53.12
Processor Cost (Margin)	3044.00	19.02
VAT @ 4%	461.76	2.88
Producer to wholesaler	12005.76	75.03
Wholesaler (Cost + Margin)	1561.95	9.75
VAT @ 4%	542.70	3.39
Wholesaler to Retailer/petty shops	14110.41	88.19
Retailer Cost (Margin)	1155.00	7.21
VAT @ 4%	610.61	3.81
Retailer to Petty shops	15876.02	9.85
Margin	123.98	0.77
Total	16000.00	100.00
Cost per kg (Consumer)	160.00	

chillies to fine powder both for domestic and International consumers. Extra care will be paid by the processor to cater to the needs of export market to maintain quality for a remunerative price. The domestic price will be around **Rs 160 to 175/kilo** for chilli powder at consumer level. This is an organized sector, hence many difficulties are not expressed by the processors.

The raw produce purchased from the market at Rs. 85/kilo by the processor/trader will be Rs 160 per kilo at consumer level. The difference of Rs 75/kilo from farmer producer to consumer level in the market chain is shared by the processor packer, distributor, retailer and labour along with their due profits. Thus the producer share in the consumer rupee works out to be 53.12 percent followed by processor cost and margin with a share of 19.02 percent. This is quite natural as the processing involved many stages before it reaches destined consumer in palatable shape.

### CONCLUSION

The additional expenditure was 16.53 percent more than the production cost, it is worth additional investment because of premium price realization in the market for quality product. The farmers who kept the produce in cold storages received premium price ranging from Rs. 8000 to 8500 during the year 2014-15 with an additional price realization of Rs 2000/- to Rs.2500/- than other farmers. The raw produce purchased from the market at Rs. 85/kg by the processor/trader will be Rs 160/kg at consumer level as chilli powder. Thus,

the producer share in the consumer rupee works out to be 53.12 percent. Capacity building trainings need to be given to farmers to reduce the additional cost especially where managerial aspects are involved.

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