A Comparative Economic Analysis of GI Tagged Chilli and Hybrid Teja Chilli in the Guntur district of Andhra Pradesh, India

Abstract

Chilli is an important spice in every Indian cuisine and is grown throughout the country. Andhra Pradesh is India's largest chilli-producing state, contributing about 45 per cent of the country's chilli production. The study was conducted in the Guntur district of Andhra Pradesh chosen purposively, where the geographical indication (GI) tagged Guntur chilli cultivation is concentrated. Data was collected from the selected 60 farmers using the questionnaire. The impact of Guntur Sannam chilli cultivation over Teja variety chilli cultivation was analysed using the Partial budgeting technique. The total cost of cultivation of Guntur Sannam chilli was lower (Rs. 1,69,798/acre) compared to Teja chilli (Rs. 1,85,027/acre) by 8.23 per cent. The Guntur Sannam chilli farmers realised a price of Rs. 19,283 per quintal while the Teja chilli farmers realised a relatively lower price of Rs. 17,566 per quintal which in turn determined the profitability of adoption of Guntur Sannam chilli cultivation. In terms of net returns per acre, Guntur Sannam chilli farmers earned Rs. 1,44,519 per acre while Teja chilli growers earned Rs. 1,18,865 per acre showing a substantial difference in net returns (21.5%). Partial budgeting of Guntur Sannam chilli and Teja variety chilli farms revealed that the economic worthiness i.e., net gain of Guntur Sannam chilli cultivation over Teja variety chilli cultivation was Rs. 24,309 per acre. Thus, there is a need to increase the awareness of GI-tagged chilli cultivation as it was inferred that the adoption of GI-tagged Guntur Sannam chilli cultivation was economically viable.

Keywords: Guntur Sannam chilli, Teja variety chilli, Partial Budgeting, Profitability

INTRODUCTION

Chilli (Capsicum annum L.) is a basic food commodity in India, popularly known as mirchi. Chilli is also known as the miracle spice since it is the most extensively used universal spice. Chillies come in over 400 different varieties from all over the world. Different varieties are grown for different purposes, such as vegetables, pickles, spices and sauces (Geetha and Selvarani, 2017). The colour and spice levels of Indian chillies are considered world-famous commercial features. Chilli is used as a condiment regularly in many forms in Indian Kitchens (Rakesh *et al*., 2020).

India is the world's largest chilli producer, consumer and exporter. During the year 2022, the dry chilli production in the world was estimated to be 8.06 million tonnes, India stands first in production (2.05 million tonnes) which was almost 25.42 per cent of the world's dry chilli production. Out of the total area, 0.25 million hectare was confined to Andhra Pradesh alone, earning a prime status in dry chilli production contributing a remarkable share of 27.73 per cent of the country's dry chilli area with 49.56 per cent production, thereby ranking first in the area and production (Anon. 2023).

Guntur Sannam chilli was granted the Geographical Indication status in the year 2009 where the Geographical Indication sign describes the unique characteristics of the product that are specific to its origin. Guntur Sannam Chilli is cultivated and made available mainly from Guntur district of Andhra Pradesh because of the suitable climatic conditions and it is renowned

as “Chilli capital of India”. This GI tag differentiates a spice from others of the same species, which helps farmers to receive a good price for their produce.

GI tagged Guntur Sannam chilli is the most famous type among the chillies and has a huge demand throughout the world. Guntur Sannam chilli has got its specific characteristics which have enabled it to earn international and national acclaim. It is generally known to trade as S4/334 type chilli and is globally well-known for its fiery hotness and pungency. The primary variety that is grown in addition to the Guntur Sannam chilli in the Guntur region is the Teja variety chilli which is known for its intense heat.

As a result, after GI registration, the demand for GI products increases, and consumers then decide to buy GI products that have undergone registration. Furthermore, GI protection encourages the producers to maintain premium quality which enables them to generate income due to increased consumer’s preference for the GI goods. Therefore, it advances the economic prosperity of producers of GI goods (Usha and Kishor, 2013, 18-20). The efforts made by public and quasi-public institutions in obtaining GI tags are indeed significant to protect, exploit market potential and facilitate better returns to legitimate rural producer from origin-linked reputed products (Kundan, 2019). This study shows the positive impact of GI tag on price of Guntur Sannam chilli and this, in turn, can serve as an incentive for farmers to either switch to Guntur Sannam chilli cultivation or other GI tagged crops too.

Hence, to uphold that continuance of GI tagged Guntur Sannam chilli cultivation could generate relatively more profit over Teja variety chilli it is essential for the producers to know about potential benefits of Geographical indication. With this background, the present study was conducted to investigate the profitability of GI-tagged Guntur Sannam chilli cultivation over the checkmate Teja variety chilli.

METHODOLOGY

For the study, a purposive multistage random sampling technique was followed in the selection of the sample farmers. Guntur district is known as the hub of production of chilli with an area of 1,08,832 hectares (Anon, 2022) where spicy flavour reigns supreme and was selected purposively for the study. At the first stage of sampling, Prathipadu and Pedanandipadu taluks were purposively selected due to the area dominance under chilli cultivation in the Guntur district. Two villages from each taluk were selected randomly. Furthermore, the Teja variety chilli had been chosen as a checkmate variety as it was widely cultivated besides Guntur Sannam chilli. Therefore, the primary data were collected from the selected cluster in which, 15 farmers growing Guntur Sannam chilli and 15 farmers growing Teja variety chilli in each taluk were selected randomly from each cluster. Thus, a total of 60 farmers were selected for the study comprising 30 from each taluk. The primary data were collected using the pre-tested and well-structured questionnarie through personal interviews with sample farmers during the agricultural year 2022-23.

Analytical Tools employed

Costs and returns analysis

The total costs were divided into two broad categories:

a. Variable costs

b. Fixed costs

a. Variable costs: are the costs incurred on variable inputs such as cost of seedlings, farm yard manure (FYM), fertilizers, pesticides, hired human labour and interest on working capital. The computations of different terms of variable cost components are as follows:

i. Seedlings: The cost incurred for purchasing seedlings was based on the actual amount paid by the farmers.
ii. Farm yard manure: The existing price per tractor load was used to impute the value of farm yard manure produced on the farm.
iii. Fertilizers and plant protection chemicals: The cost of fertilizers and plant protection chemicals was based on the actual prices paid by the farmers.
iv. Labour: The cost of hired labour was calculated at the prevailing wage rates paid per day (8 hours) in the study area for men, women and machine labour during the study period.
v. Interest on working capital: The working capital consists of the expenditure on human labour, machinery labour, seedings, farmyard manure, fertilizers and plant protection chemicals. Interest on working capital was calculated at the rate of seven per cent per annum it is the rate at which commercial banks advance short-term loans.
b. Fixed costs: These include depreciation on farm implements and machinery, rental value of land, land revenue and managerial cost.
Total cost = Total Variable cost + Total Fixed cost
i. Depreciation charges: Depreciation on each capital equipment and machinery owned by the farmers were calculated separately, based on the purchase value using the straight-line method. Thus, the

$$\text{Annual depreciation} = (\text{Purchase value} - \text{Junk value})/\text{Useful life of the asset} \ldots (1)$$

The average life of an asset as indicated by each farmer was used in the computation of the depreciation. The average value of an asset after its useful life (economic life) was considered based on the value furnished by the respondents. The deprecation cost of each equipment was apportioned to the crop, based on its percentage use.
ii. Land revenue: Land revenue was charged at the rates levied by the Government.
iii. Rental value of land: Is taken based on a yearly basis and crop sown.
Cost of cultivation: It is the sum of variable costs and fixed costs and expressed on per-acre basis.
Total cost (TC): Total cost is the sum of total variable cost (TVC) and total fixed cost (TFC).

$$TC = TVC + TFC \ldots (2)$$

i. Gross returns (GR): Per acre gross returns were calculated by using the below formula.

$$\text{Gross Returns (GR)} = \text{Yield} \times \text{Price} \ldots (3)$$

ii. Net returns over variable costs: It is the gross returns minus variable costs.

$$\text{Net returns over variable costs} = \text{GR} - \text{TVC} \ldots (4)$$

iii. Net returns over cost of cultivation: It is the gross returns minus variable costs plus fixed costs.

$$\text{Net returns over cost of cultivation} = \text{GR} - \text{TC} \ldots (5)$$

iv. Returns per rupee of investment: Worked out by taking the ratio of gross return and total cost.

Partial Budgeting Technique
To evaluate the effects of intervention by adopting Teja and Guntur Sannam chilli cultivation partial budgeting technique was employed to determine added costs, added returns, reduced cost and reduced returns to ascertain the net gain.

Net change in profit due to adoption of Guntur Sannam chilli cultivation = (Added returns + reduced cost) - (Added costs + reduced returns) … (6)

RESULTS AND DISCUSSION

Economics of Guntur Sannam and Teja chilli cultivation

Variable cost of Guntur Sannam chilli cultivation accounted for Rs. 1,50,495 per acre constituted to 88.63 per cent of the total cost of cultivation. In contrast, Teja chilli cultivation accounted relatively higher variable cost of Rs. 1,65,297 per acre constituting 89.34 per cent of the total cost of cultivation per acre. This translated to an 8.95 per cent higher variable cost compared to Guntur Sannam chilli. Most of the operations such as harvesting, plant protection chemicals, fertilisers, seedlings and weeding were labour-intensive and required more human power. Hence, expenditure incurred on human labour accounted for a larger portion of the variable costs.

Economics of both Guntur Sannam and Teja variety chilli has been analysed and presented in Table 1. The total cost of cultivation of Guntur Sannam chilli was lower (Rs. 1,69,798/acre) compared to Teja chilli (Rs. 1,85,027/acre) by 8.23 per cent, as there existed a significant difference between both varieties' cost of cultivation as indicated by t-stat value (t=0.03) at five per cent probability level, which was mainly attributed to the difference in human labour cost as there was relatively higher requirement of labour engaged in multiple pickings to harvest Teja variety chilli (17.3 tonnes/acre) whose yield was relatively more than Guntur Sannam chilli (16.3 tonnes/acre). The results of the present study are on par with the study conducted by Navyasri *et al*. (2021) who showed that variable cost needed was Rs.2,21,891 per hectare (73.19 % of production cost) and in which human labour occupied the highest share i.e., 25.58 per cent of total cost of production of red chilli in conventional irrigation system.

Table 1: Comparative cost and returns of Guntur Sannam chilli and Teja chilli cultivation in the Guntur district

(Rs. Per acre)

Sl. No.	Particulars	Guntur Sannam		Teja		% Change over Teja variety
		Cost	% Share	Cost	% Share	
A.	**Variable cost**					
1.	Seedlings	14,423	8.49	17,171	9.28	-16.00
2.	Human labour	42,172	24.84	53,600	28.97	-21.32
3.	Bullock labour	5,149	3.03	5,095	2.75	1.06
4.	Machine labour	5,362	3.16	5,390	2.91	-0.52
5.	Plant protection chemicals	40,186	23.67	36,143	19.53	11.19
6.	Manure	13,378	7.88	15,450	8.35	-13.41
7.	Fertilizers	15,860	9.34	17,540	9.48	-9.58
8.	Irrigation charges	2,874	1.69	2,842	1.54	1.11
9.	Miscellaneous expenses	1,245	0.73	1,252	0.68	-0.56
10.	Interest on working capital@7%	9,845	5.80	10,814	5.84	-8.95
Total variable cost		**1,50,495**	**88.63**	**1,65,297**	89.34	-8.95
B	**Fixed cost**					
1.	Depreciation	2,057	1.21	2,288	1.11	11.24

2.	Land revenue	150	0.09	150	0.08	0.00
3.	Rental value of owned land	15,028	8.85	15,178	8.20	-0.99
4.	Interest on fixed capital @12%	2,068	1.22	2,114	1.14	-2.16
Total fixed cost		**19,303**	**11.37**	**19,730**	**10.66**	-2.16
C	**Total cost**	**1,69,798**	100	**1,85,027**	100	-8.23 (0.03)**

Note: The figure in parentheses indicates the t-statistic value.
** indicates significance at five percent level of probability.

Yield and returns of Guntur Sannam and Teja variety chilli

Yield and returns of both varieties have been presented in Table 2. These results revealed that the yield obtained from the cultivation of Guntur Sannam chilli was comparatively lower than that of Teja chilli. Conversely, the price received for Guntur Sannam chilli was higher due to consumers' preference for this variety as it is known for its pungency level.

It was also observed that the Guntur Sannam chilli farmers generated higher gross returns (Rs. 3,14,318 /acre) compared to those who grew Teja chilli (Rs. 3,03,892/acre) due to higher price realisation by farmers. Therefore, the net returns received from Guntur chilli cultivation were higher (Rs. 1,44,519/acre) than Teja variety chilli (Rs. 1,18,865/acre). The higher gross returns are mainly attributed to higher net returns in Guntur sannam chilli cultivation.

Table 2: Yield and returns of Guntur Sannam and Teja variety chilli production in Guntur district

(per acre)

Sl. No.	Particulars	Unit	Guntur Sannam chilli	Teja Chilli
1.	Yield	q	16.30	17.30
2.	Price	Rs. /q	19,283	17,566
3.	Gross returns	Rs.	3,14,318	3,03,892
4.	Total cost	Rs.	1,69,798	1,85,027
5.	Net Returns	Rs.	1,44,519	1,18,865
6.	Cost of Production	Rs. /q	10,417	10,695
7.	Return per rupee of expenditure	-	1.85	1.64

Partial budgeting of Guntur Sannam chilli over Teja chilli cultivation

The partial budgeting technique was employed to determine the effects of intervention by adopting Guntur Sannam chilli and Teja chilli cultivation and the obtained results were presented in Table 3. The net change in profit due to the adoption of Guntur Sannam chilli cultivation and the required data on added costs added returns, reduced costs and reduced returns were represented in the respective table.

It was observed that the net gain from the adoption of Guntur Sannam chilli cultivation was Rs. 24,309 per acre against Teja chilli cultivation. This net gain was mainly due to the higher price realisation for Guntur Sannam chilli. Hence, the adoption of Guntur Sannam chilli cultivation is a financially feasible choice. These findings are in line with the study conducted

by Sowjanya and Vijaya (2017) on partial budgeting of ICM, IPM and Non-IPM Chilli farms in Telangana region stating that adoption of Integrated Crop Management (ICM) approach in chilli farms of Gundepaly village resulted in estimated net gain of Rs. 1,32,729 than in Non-IPM chilli farms.

Table 3: Partial budgeting of Guntur Sannam chilli over Teja chilli cultivation

(per acre)

Debit		**Credit**	
Added costs from cultivating Guntur Sannam	Value (Rs.)	Reduced costs by adopting the Guntur Sannam	Value (Rs.)
a) PPC Cost incurred for cultivating Guntur Sannam	4,044	a) Savings by decreased human labour	11,428
		b) Decreased seedling cost	2,747
		c) Decreased FYM cost	2,072
		d) Decreased fertiliser cost	1,680
Total increased cost (A)	**4,044**	**Total decreased cost (B)**	**17,927**
Revenue lost by cultivating Guntur Sannam	0	Added revenue from cultivating Guntur Sannam	
		a) Difference in gross returns	10,426
Total decreased revenue (C)	**0**	**Total increased revenue (D)**	**10,426**
Total debit (A+C)	**4,044**	**Total credit (B+D)**	**28,353**
Net gain	**24,309**		

CONCLUSION

It was inferred from the study that the cost of cultivation of Teja chilli was significantly higher than Guntur Sannam chilli cultivation by 8.23 per cent at five per cent level of probability. Although the yield obtained from the cultivation of Teja chilli was relatively higher than Guntur Sannam chilli cultivation the price realised per quintal of Guntur Sannam chilli was significantly more than Teja chilli (t=<0.1) at a one per cent probability level. The net gain from the adoption of Guntur Sannam chilli was found to be Rs. 24,309 per acre against Teja chilli cultivation due to increased revenue. Return per rupee of expenditure was found to be 1.85 and 1.64 in Guntur Sannam chilli and Teja chilli, respectively. Consequently, the GI tag helped to raise the demand and price of Guntur sannam chilli thus, making it more profitable for producers. Hence, Guntur sannam chilli was found to be more economical than Teja variety chilli cultivation. Furthermore, policymakers can manage to increase awareness about the GI-

tagged Guntur Sannam chilli to boost the economic condition of farmers by launching campaigns to raise consumer awareness about Guntur Sannam chilli and its unique qualities and training programs to educate farmers about the importance of GI tags and their benefits, including high market prices, potential for export to avail its benefits for producers. Since, chilli crop is more susceptible to the attack of pests and diseases as evidenced by higher expenditure on plant protection chemicals, the development and promotion of Integrated Pest Management (IPM) strategies to minimize pesticide use can reduce the production costs and training on the management of pests and diseases would benefit the farmers with the support from Government.

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