



Constraints in Production and Marketing of Ginger in state of Telangana, India

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Authors' contributions

This work was carried out in collaboration among all authors. Author SS designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Authors TL, B. Sowjanya and B.Savitha managed the analyses of the study and literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Aim: The study has been taken to identify and analyze the reasons for decline in area and production of Ginger and problems faced by the farmers in cultivation of ginger in state of Telangana. By understanding these problems, the study seeks to provide insights for decline in area under Ginger cultivation and provide recommendations to the Ginger farmers to overcome the problems faced in production and marketing of ginger in study area.

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Study Design: Ex-Posto Facto research design was used for the study.

Place and Duration of Study: The study was conducted in Sangareddy district of Telangana, where ginger has been cultivated as a traditional crop for more than 20 years. Within the district, two mandals with the highest area under ginger cultivation were selected for the study. The study period is from 2023- 2024.

Methodology: A multi-stage random sampling technique was employed for the study, with a sample size of 60 farmers. The farmers were interviewed personally through a well-structured and pre-tested schedule and Garrett's ranking technique was used to rank the problems.

Results: The results of the study revealed that farmers were facing problems in the production and marketing of Ginger. Incidence of pests and diseases was the major problem and ranked as the first constraint which was followed by high cost of seed and non -availability of quality seed at village level, high cost of FYM and fertilizers, labour shortage and high cost of labour during peak season, un-favourable weather conditions etc. are identified as the other major production constraints. Whereas in marketing of Ginger, high Price fluctuations was identified as the major constraint followed by high charges by commission agents, lack of market infrastructure, high marketing costs etc.

Conclusion: To increase the area under ginger and enhance the profitability of ginger farming, it is essential to address these constraints through targeted interventions and support systems. Improving market infrastructure and reducing intermediary costs are also vital steps toward stabilizing prices and boosting farmers incomes. Solving these complex issues will necessitate collaborative efforts from stakeholders throughout the agricultural value chain.

Keywords: Ginger; production; marketing; Garrett's ranking; constraints.

1. INTRODUCTION

India, blessed with diverse agroclimatic conditions remains the 'spice bowl of the world', offering the largest range of spices and spice products to the global markets. It is the world's leading producer of spices. It produces around 75 out of the 109 spice varieties listed by the international organization for standardization (ISO). The most commonly produced and exported spices include pepper, cardamom, chilli, ginger, turmeric, coriander, cumin, celery, fennel, fenugreek, garlic, nutmeg, mace, curry powder, spice oils, and oleoresins. Among these, chili, cumin, turmeric, ginger, and coriander account for about 76 percent of the total production [1]. Among all the spices, Ginger is one of the major spices. Ginger botanically known as *Zingiber officinale* rosc. Belongs to the family zingiberaceae is the oldest known spices, one of the significant commercial crops in tropical and subtropical region. It is one of the earliest known treasured spices known for its pungency and aroma, viewed as a healing gift from God by Indian ayurvedic systems. It is also known as sunthi in ayurveda. The primary components of ginger include amino acids, shogaols, gingerols, fiber, essential oils, and minerals. Due to its distinctive flavor and medicinal properties, Ginger is widely used as an ingredient in various products. There are two main primary products of ginger, fresh ginger and dried ginger. Fresh

ginger is consumed as vegetable and dried products are the major form in which ginger is internationally traded. In international market fresh ginger, dried ginger, pickled ginger, preserved ginger, crystallized ginger and ground ginger are traded. Globally, ginger is used in different forms such as raw ginger, dry ginger, bleached dry ginger, ginger powder, ginger oil, ginger oleoresin, ginger candy, etc. As people are becoming more health conscious, the use of ginger and ginger products is increasing among the households.

India is the world's largest producer of Ginger with the production of 22 lakh tonnes. It occupies highest global area in ginger cultivation with 37.55 percent followed by China (24.51%) Nigeria (18.68%) and Nepal (4.28%). Indonesia occupies highest yield per hectare followed by Nepal, India and China [2].

In India, the total area under ginger is 1.90 lakh ha, production is 22.011 lakh tons and productivity is 11530(Kg/hectare) [3]. The major ginger producing states in India are Madhya Pradesh, Karnataka and Assam (APEDA, 2021-2022) [4].

In Telangana, ginger is cultivated in area of 844 ha with production of 7547 tonnes and productivity of 8942 (kgs/hectare). In Telangana it is cultivated mainly in Sangareddy, Vikarabad,

Siddipet, Adilabad and Nirmal districts. In 2022-23, Sangareddy ranks first both in area & production (778 ha, 6924 MT) followed by Vikarabad (57 ha, 542 MT) [5].

In the recent years the area under Ginger cultivation has decreased by 50.93 percent i.e. 1720 ha (2021-22) to 844 ha (2022-23) and production has also decreased by 53.62percent i.e. 16273 MT (2021-22) to 7547 MT (2022-23). In this context it is felt necessary to probe into the reasons for decline in Ginger cultivation by the farmers in Telangana.

2. MATERIALS AND METHODS

Multi stage random sampling technique was adopted for the study. In the initial stage of the sampling technique, Sangareddy district was selected as it has got highest area & production under ginger among the 33 districts of Telangana. In the second stage, the two mandals with the highest area under ginger cultivation were chosen. In the third stage, the top two villages from each of these mandals were identified and fifteen farmers from each village were randomly selected constituting a sample size of 60 farmers for the study. These farmers were interviewed with the help of pretested schedule to find out the reasons for decline in area and production of ginger. The problems faced by farmers were listed and categorized into two types i.e. problems related to production and marketing.

2.1 Garrett's Ranking Technique

To prioritize these constraints faced by the farmers, Garrett ranking technique was employed. In this method, the Ginger farmers were asked to rank the constraints or problems faced by them according to the magnitude of the problem. Rank one meant most important and last rank meant least important. Then, the rank assigned to each constraint by each individual farmer was converted into per cent position using the Formula

$$\text{Percent position} = \frac{100 \times (R_{ij} - 0.50)}{N_j}$$

Where, R_{ij} stands for rank given for the i^{th} constraint ($i = 1, 2, \dots, n$)

by the j^{th} individual ($j = 1, 2, \dots, n$)

N_j stands for number of constraints ranked by j^{th} individual.

After calculating the percent position using the formula, the corresponding values were selected from Garrett's chart for each calculated percent position. The ranks were then replaced with the values from Garrett's chart. Finally, the average mean score for each statement was calculated, and the statements with the highest mean scores were given the highest ranks.

3. RESULTS AND DISCUSSION

The constraints faced by the farmers in production of Ginger are presented in Table 1.

Majority famers in the study area stated that the ginger crop is highly vulnerable to pests, such as the rhizome fly, and diseases like rhizome rot, leaf spot, and bacterial wilt. This resulted decline in both the yield and quality of the crop, often leading to significant financial losses for farmers. Thus, majority of the farmers identified this problem i.e. Prevalence of pests and diseases as the first major challenge, with mean score of 75.97. The findings are in consistent with the research conducted by Chaudhary et al. [6] and Neupane et al. [7].

Ginger is propagated by rhizomes. Among the inputs, costs of rhizomes constituted major input costs, i.e. around 50,000 to 1,00,000 per acre which found to be expensive for small and marginal farmers. This was considered as second important constraint by the farmers with mean score of 73.03.

Majority farmers in the study area source their rhizomes from Kerala due to non-availability of high-quality and high yielding rhizomes locally. Only few farmers retained the rhizomes for next crop depending upon the quality. This usage of farm-produced inconsistent quality rhizomes as seed material significantly affects the productivity in Ginger cultivation, increased susceptibility to diseases. Whenever the farmers have to buy seeds, they have to travel very far to the other state. Hence the nonavailability of quality seeds at the village level was identified as the third major constraint with a mean score of 58.80. The findings are in line with Upadhyaya et al. [8] and Das et al. [9].

Farm Yard Manure (FYM) is crucial for sustaining the soil fertility and supporting crop growth. Many farmers reported that they lack sufficient quantities of FYM which made them to buy it from other farmers. Additionally, ginger crop requires various micronutrients that includes N,

P, K, Ca, and Mg, which need to be supplied at different stages of growth to ensure proper development. This necessity increases the cost of fertilizers. Consequently, the combined expense of procuring FYM and fertilizers leads to a higher overall cost of cultivating ginger. Hence, this constraint was identified as fourth major constraint by the farmers with mean score of 57.20.

Ginger is labour intensive crop and requires labour for carrying out various farming activities such as sowing, weeding and harvesting. Majority farmers with mean score of 47.80. expressed that shortage of labour, particularly during the peak season is of prime concern. This may be due to migration of labour to towns in search of better employment opportunities which resulted in labour scarcity and high cost of labour during peak season. The findings are in line with the findings of Jakkawad et al. [10].

Unfavourable weather conditions, such as heavy rainfall during the rhizome formation stage, resulted in waterlogging and affected both the yield and quality of the rhizomes. This problem was ranked as the sixth major constraint by the farmers, with a mean score of 46.20. The findings are in line with the findings of Borbaruah, and Barman [11].

In the study area, some farmers are not practicing seed treatment for rhizomes and are not familiar with Integrated Pest Management (IPM) practices due to a lack of technical knowledge. They rarely visit local research or resource centers and have not participated in specific training on production methods, often relying on practices followed by neighboring farmers. Thus, the farmers ranked this issue as the seventh constraint, with a mean score of

35.47. These findings are in line with Kumar et al. [12] and Vikas [13].

The production of ginger is significantly affected by the availability of institutional credit. Timely credit enables farmers to access inputs on time and conduct agricultural operations efficiently. Farmers reported that inadequate access to institutional credit, along with high interest rates charged by money lenders and commission agents, was one of the major issues. They ranked this as the eighth constraint, with a mean score of 31.07. Limited access to credit can restrict farmers ability to invest in inputs, machinery, and technology, thereby impacting overall productivity These findings are in line with Ayodele and Sambo [14].

Ginger crop is cultivated under irrigated conditions. It typically needs irrigation every 7-10 days, but this can vary depending on climate, soil type, and growth stage. Some of the farmers expressed lack of adequate irrigation facilities as ninth constraint with a mean score of 27.02.

3.1 Constraints in Ginger Marketing

The problems faced by the farmers in marketing of ginger are presented in Table 2.

Price fluctuations of agricultural commodities is common phenomena due to seasonality. Farmers in the study area stated that they were realizing lower prices at the time of harvesting due to lack of price assurance and price fluctuations. Hence, high price fluctuations in Ginger crop were ranked as first major constraint with mean score of 76.30. These findings are in line with Bhutia and mula [15] and Kumar et al. [12].

Table 1. Constraints in ginger production

S.no	Particulars	Score	Rank
1	Incidence of pests and diseases	75.97	I
2	High seed/rhizome cost	73.03	II
3	Non availability of quality seed at village level	58.80	III
4	High cost of FYM and Fertilizers	57.20	IV
5	Labour shortage and high cost of labour during peak season	47.80	V
6	Unfavourable weather conditions	46.20	VI
7	Lack of technical knowledge	35.47	VII
8	Inadequate access to credit	31.07	VIII
9	Inadequate irrigation facilities	20.47	IX

Source: Field survey

Table 2. Constraints related to ginger marketing

S.no.	Particulars	Score	Rank
1	High Price fluctuations	76.30	I
2	High charges by commission agents	63.70	II
3	Lack of market infrastructure	51.15	III
4	High marketing costs	47.85	IV
5	Lack of market information	30.36	V
6	Lack of Proper Grading	28.63	VI

Source: Field survey

Farmers in the study area disposing their produce through village traders and also directly in the market through commission agents. They stated that commission agents are charging commission fee ranging from 4 to 8 per cent of value of produce resulting in high market costs. Hence, this problem was ranked as second constraint, with an average score of 63.70.

Majority farmers in the study area reported that they were unable to process the Ginger into its value-added products such as Ginger paste, Ginger Flakes, Ginger oil and oleoresins due to lack of processing units. Hence this problem was ranked as the third most challenge, with a mean score of 51.15. The findings are in line with Borbaruah and Barman [11].

High marketing costs, including charges related to loading and unloading such as hamali charges and transportation costs was ranked as fourth constraint by the farmers with mean score of 47.85 in marketing of Ginger. High marketing costs can have a profound impact on the profitability of Ginger farmers.

Access to accurate market information is critical for farmers to make informed decisions about when and where to sell their produce. Efforts to provide farmers with better market information can improve their market participation. Farmers in the study area felt that due to lack of market information, they were unable to realize better price. Thus, lack of market information was ranked as fifth constraint by the respondents with mean score of 30.36. The findings are in line with the findings of Bordoloi and Bhuyan [16].

Lack of Proper Grading is ranked as the sixth constraint by the farmers with a mean score of 23.1. The major reason for this is farmers are not fully aware of the benefits of grading and how it can impact their market prices and profitability. Majority of the farmers are prioritizing immediate sales over investing in grading. Necessary infrastructure for grading, such as sorting facilities, grading equipment, and trained

personnel are not available in the study area. This makes it difficult for farmers to implement proper grading practices. The findings are in line with Borbaruah, and Barman [11].

4. CONCLUSION

Ginger farmers perceived number of constraints in both production and marketing of ginger. The most important hinderances in production were non availability of high yielding variety, quality seed material at the village level and high cost of seed. Focused research in developing high yielding varieties suitable for the locality by research stations and provision of subsidies for small-scale and marginal farmers by the government to cover the initial cost of high-quality seeds will help the farmers to overcome these major production problems. While in marketing the main constraints include price fluctuations, high commission charges. Collective marketing of ginger through cooperatives, FPOs helps to negotiate better prices and reduce marketing cost. Promoting value addition activities such as processing by setting up processing units in the study area will help the farmers in better marketing and increase the profitability of ginger in the study area.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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