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Assessment of constraints in mango cultivation in Telangana

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Abstract

The present study was undertaken to identify and analyse the major constraints faced by farmers in mango cultivation in Telangana, with special focus on input, production, knowledge, and marketing related problems. An ex-post facto research design was adopted for the study during 2024–25 in the major mango-growing districts of Telangana, namely Jagtial, Khammam, and Nagarkurnool. A multi-stage sampling technique was followed with a sample size of 60 mango growers, and primary data was collected through personal interviews using a pre-tested schedule. Garrett's ranking technique was employed to prioritise the constraints. The results revealed that incidence of pest and disease, high cost of planting material, scarcity of labour, lack of improved technology, and price fluctuation in the market were the major constraints affecting mango cultivation. Malpractices in market and high commission charges were also reported as important marketing problems. The study suggests that high cost of quality planting material, effective pest and disease management, regular farmer training, market intelligence, and collective marketing through Farmer Producer Organizations (FPOs) are essential to reduce the constraints and improve the profitability of mango cultivation in Telangana.

Keywords: Mango, cultivation, production, marketing, Garrett's ranking, constraints, Telangana

Introduction

India, blessed with diverse agro-climatic conditions, is one of the leading producers of horticultural crops in the world and occupies a prominent position in the production and export of fruits (APEDA). Among the fruit crops, mango holds a unique place and is popularly regarded as the “king of fruits.” Mango (*Mangifera indica* L.) belongs to the family Anacardiaceae and is one of the oldest cultivated fruit crops in tropical and subtropical regions. It is widely valued for its delectable flavour, rich aroma, high nutritive content, and immense economic significance. Owing to its delicious taste, medicinal value, and cultural importance, mango is extensively consumed in fresh as well as processed forms such as pulp, juice, pickle, dried slices, nectar, and canned products. The fruit is rich in vitamins, minerals, antioxidants, dietary fibre, and natural sugars, making it an important component of human nutrition and health. (United States Department of Agriculture, April 2018) [9].

Globally, mango production has witnessed significant growth over the years due to increasing domestic and international demand. The global area under mango cultivation is estimated to be around 5.7–6.0 million hectares with production of about 55–60 million metric tonnes. India remains the world's largest producer of

mango, contributing nearly 40 per cent of the global production, followed by China, Thailand, Indonesia, and Mexico. In India, the total area under mango cultivation was 2.41 million hectares with a production of 22.42 million metric tonnes during 2023–24. Major mango-producing states in the country include Uttar Pradesh, Andhra Pradesh, Telangana, Karnataka, Bihar, and Maharashtra. (APEDA)

In Telangana, mango is cultivated in an area of 3.17 lakh acres with a production of 9.41 lakh metric tonnes during 2023–24 which contributes to 4.20 per cent to total India's production. Mango orchards are mainly concentrated in districts such as Jagtial, Nagarkurnool, Khammam, and Ranga Reddy, which provide favourable agro-climatic conditions for the cultivation of popular varieties like Banganapalli, Dasher, and Neelum. Among these, Jagtial ranks first in mango production followed by Nagarkurnool and Khammam (Department of Horticulture, Government of Telangana). However, in recent years, fluctuations in area and production of mango have been observed due to several production and marketing related constraints faced by farmers.

Methodology

Multi-stage sampling technique was adopted for the present study. In the initial stage of sampling, Telangana state was

selected purposively for the study. In the second stage, three districts namely Jagtial, Khammam, and Nagarkurnool were selected purposively, representing Northern, Central, and Southern agro-climatic zones of Telangana, respectively, based on the highest area and production under mango during the study period. In the third stage, two mandals from each selected district having the highest area under mango cultivation were chosen purposively. Further, from each selected mandal, two villages were selected having highest area and production under mango cultivation. In the final stage, five mango-growing farmers from each village, having orchards in the economic bearing period, were randomly selected, constituting a total sample size of 60 farmers for the study. The selected farmers were personally interviewed with the help of a pre-tested and well-structured schedule to collect primary data on constraints faced in the production and marketing of mango. The problems faced by farmers were listed and categorized four types i.e. problems related to production, marketing, input and knowledge.

Garrett's Ranking Technique

To prioritize these constraints faced by the farmers, Garrett ranking technique was employed. In this method, the Mango 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 ($i = 1, 2..n$) by the j^{th} individual ($j = 1, 2..n$)

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.

Results And Discussion

The constraints faced by mango orchardists were categorized into four broad groups, namely input-related, production-related, knowledge-related, and marketing-related constraints. Understanding these constraints is essential for formulating appropriate policy interventions, strengthening extension services, and improving the overall profitability and sustainability of mango cultivation in the study area.

Input-Related Constraints

High cost of planting material was identified as the first major constraint with mean score of 67.77 under the input-related constraints. The cost of planting material accounted for about 12 per cent of total input costs. Furthermore, farmers were required to travel 100–120 km to procure

high-quality planting material due to the absence of certified local nurseries, which further increased the cost of planting material. The findings are in line with Singh *et al.* (2024) ^[6]. Scarcity of labour was ranked as second major constraint with mean score of 52.15. Labour scarcity was reported to be recurring problem during peak operations like harvesting, pruning, or spraying. The migration of rural youth to urban areas, high daily wages, and increased demand during agricultural seasons in the sample area were found to intensify the challenge. The shortage of labour had a direct impact on productivity and fruit quality due to delayed and untimely operations. Dhenge *et al.* (2018) ^[3] revealed that labour scarcity was the main constraint faced by the commercial mango growers in Maharashtra region.

High cost of chemicals was considered to be the third important constraint with mean score 51.1. Farmers reported that high costs were incurred towards pest management and growth regulation as the pesticides, fungicides, and micronutrients were found to be expensive. Consequently, the dosage of chemicals was reduced or crucial sprays were omitted by many growers, resulting in increased pest and disease incidence and yield loss. High capital requirement was depicted to be a major constraint in the work done by Sowmya *et al.* (2022) ^[8].

Though less severe than other constraints, timely access to inputs was considered to be the fourth major constraint with mean score of 35.83. Access to inputs like FYM, fertilizers, plant growth regulators, and quality planting material was an issue. Delayed availability led to sub-optimal results despite the expenditure incurred.

Production Related Constraints

Incidence of pest and diseases and monkey menace was identified as the first critical production related constraint with a mean score of 69.03. Severe losses were reported due to pests such as fruit flies and mango hoppers and diseases such as powdery mildew and anthracnose. Limited access to timely plant protection advisories and ineffective pesticide usage were found to exacerbate the problem, resulting in yield loss and poor fruit quality. Monkey menace was reported as one of the major biotic constraints in Khammam and Jagtial districts. Monkeys caused considerable damage to flowers, immature fruits and mature fruits, resulting in yield losses and increased expenditure on orchard protection measures such as watchmen, mesh nets in early stages of orchard, scare devices and fencing. The findings were consistent with the research conducted by Kumar *et al.* (2018) ^[4].

Failure of crop due to unfavourable weather conditions was depicted as second major constraint with mean score 59.68. As mango cultivation was highly sensitive to climatic variations, irregular rainfall, unseasonal flowering, frost, and temperature fluctuations were found to adversely affect flowering, fruit set, and fruit development, thereby making mango cultivation unpredictable and risky. These findings are in line with Singh *et al.* (2024) ^[6].

Inadequate irrigation and drainage was ranked third with mean score 36.07. The orchardists opined that during prolonged dry spells or excessive rainfall, trees suffered from moisture stress or waterlogging. Similar results were reported by Neguse *et al.* (2019) ^[5].

Knowledge Related Constraints

On examining the knowledge related constraints, Lack of knowledge on improved technology was ranked as the first major constraint with mean score 55.08. The sample farmers were unaware of scientific pruning, integrated pest management, or efficient irrigation methods. Reliance on traditional practices and limited exposure to modern technologies was identified which resulted in reduced yield and mounting costs.

Lack of market information was ranked as second constraint with 49.13 mean score. A lack of reliable and real-time information on mango prices, demand trends, and potential markets was reported. During periods of market glut, distress sales were resorted to by the farmers

Insufficient training was ranked last knowledge related constraint with mean score is 48.78. Farmers reported that Extension services and technological training were infrequent and inaccessible, thereby limiting their capacity to adapt to changing climatic conditions, adoption of high-density planting or manage pest effectively. Training on post-harvest handling and export standards was also lacking. The findings were in line with Singh *et al.* (2014) [7].

Marketing Problems

Price fluctuations in market was ranked first in market-related constraints with mean score 67.33. One of the most

pressing challenges faced by mango farmers was the high level of price volatility. It was reported by the respondents that prices declined sharply during the peak harvesting period. Besides, due to lack of storage or processing facilities, farmers were compelled to sell at prevailing non-remunerative prices, wherein farmers suffered losses. The results discusses were in line with Dhenge *et al.* (2018) [3].

Malpractice in market was ranked second with a mean score of 50.80. Manipulation of weights, delayed payments, and exploitation of farmers' weak bargaining position by middlemen and commission agents were reported. These unfair practices discouraged farmers from engaging directly with markets. These findings are in line with Yadav *et al.* (2022) [10].

High commission charges were ranked as third constraint. It was reported that market intermediaries charged high commission rates, about 10-15% of the total sale value which considerably reduced farmers' net returns and limited their ability to reinvest in their orchards.

Non-availability of transport facilities and high transportation costs were the other market related constraints. Farmers reported that lack of affordable and timely transportation was reported to result in spoilage of the produce. Farmers were dependent on private vehicles at high costs, affecting profitability.

S. No.	Particulars	Score	Rank
Input Related Constraints			
1.	High cost of planting material	67.77	I
2.	Scarcity of labour	52.15	II
3.	High cost of chemicals	51.11	III
4.	Timely not availability of inputs (FYM,Fertiliers)	35.83	IV
Production related constraints			
1.	Failure of crop due to unfavourable weather	59.68	II
2.	Inadequate irrigation facilities & drainage problem	36.07	III
3.	Incidence of pest and disease and attack by monkeys	69.03	I
Knowledge related constraints			
1.	Lack of knowledge about improved technology	55.08	I
2.	Insufficient training programmes	48.78	III
3.	Lack of market information	49.13	II
Marketing problems			
1.	Price fluctuations in market	67.33	I
2.	Non-availability of transport facilities and high transportation costs during peak season	32.66	IV
3.	Malpractices in market	50.80	II
4.	High commission charges	49.20	III

Conclusion

The mango growers in the study area perceived a number of constraints in cultivation of mango. Among the input-related constraints, the most important problems were high cost of planting material, scarcity of labour, and high cost of chemicals. In the case of production-related constraints, incidence of pest and disease emerged as the major constraint, followed by failure. Among knowledge-related constraints, lack of knowledge about improved technology was ranked first, followed by lack of market information and insufficient training programmes. With regard to marketing problems, price fluctuation in the market was perceived as the most severe constraint, followed by malpractices in the market and high commission charges. Focused research on development of disease-resistant and location-specific improved mango varieties, timely supply

of quality planting material, and strengthening extension services through regular training programmes would help the farmers to overcome the major production constraints. Further, dissemination of market information and market intelligence, promotion of farmer producer organizations (FPOs), collective marketing, and establishment of storage, grading, and processing facilities in the study area would help mango growers to realize better prices, reduce marketing costs, and improve the overall profitability of mango cultivation in Telangana.

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