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Study on post-harvest losses and marketing of mango in Nagarkurnool district of Telangana

¹K Bhanuchandra, ²Pritesh Dwivedi, ³Mrityunjoy Banerjee, ⁴Sadula Chandana and ⁵Battala Sheshagiri

¹M.Sc. (Agri.) Agribusiness Management, Department of Agriculture Economics, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Science, Prayagraj, Uttar Pradesh, India

²Assistant Professor, Department of Agriculture Economics, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Science, Prayagraj, Uttar Pradesh, India

³Ph.D. Research Scholar, Department of Agriculture Economics, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Science, Prayagraj, Uttar Pradesh, India

⁴MBA Agribusiness, Department of Agri-Business Management, School of Agribusiness Management, Professor Jayashankar Telangana Agricultural University, Hyderabad, Telangana, India

⁵MBA Agribusiness, Department of Agricultural Economics, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj, Uttar Pradesh, India

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Corresponding Author: K Bhanuchandra

Abstract

The present study entitled “Post-Harvest Losses and Marketing of Mango in Nagarkurnool District of Telangana” was undertaken to examine the socio-economic profile of mango growers, identify existing marketing channels, estimate marketing costs, price spread, producer’s share in consumer’s rupee, marketing efficiency, post-harvest losses, and constraints faced by farmers in mango marketing. The study was based on both primary and secondary data. Primary data were collected from 100 randomly selected mango growers, along with relevant market functionaries, using a pre-tested structured interview schedule. Secondary data were obtained from published reports, horticulture department records, and other relevant literature. Appropriate statistical tools such as percentages, averages, and ratios were used for analysis. The findings revealed that most mango growers belonged to the middle-age group and had secondary level education, indicating moderate awareness regarding improved cultivation and marketing practices. The majority of farmers were small and marginal, highlighting the importance of mango cultivation for livelihood security in the study area. Three major marketing channels were identified, namely producer–consumer, producer–retailer consumer, and producer–wholesaler–retailer–consumer. Among these, Channel III was the most commonly used for bulk marketing, while Channel I was found to be the most efficient with the highest producer’s share and lowest marketing cost. The analysis showed that marketing costs and price spread increased with the length of the marketing channel, leading to reduced returns to farmers. The producer’s share in the consumer’s rupee was highest in direct marketing and lowest in channels involving multiple intermediaries. Post-harvest losses were estimated to range between 18 to 25 percent, with higher losses observed among small and marginal farmers due to improper harvesting, handling, transportation, and lack of storage facilities. Major constraints identified included price fluctuations, high transportation costs, lack of cold storage facilities, exploitation by middlemen, and inadequate market information. The study concludes that strengthening cold storage infrastructure, improving transportation facilities, promoting direct marketing systems, enhancing value addition, and encouraging farmer producer organizations (FPOs) can significantly reduce post-harvest losses and improve farmers’ income and marketing efficiency in the study area.

Keywords: Mango, post-harvest losses, marketing channels, price spread, producer’s share, marketing efficiency, socio-economic profile, Nagarkurnool district, Telangana, Supply chain

Introduction

Mango is one of the most important tropical fruits in the world and holds a special place in India’s horticultural economy. It is often referred to as the “king of fruits” due to its rich taste, high nutritional value, and wide consumer preference. India is the largest producer of mangoes globally, contributing a significant share of total world production. Mango is cultivated across several states including Uttar Pradesh, Andhra Pradesh, Telangana, Karnataka, and Maharashtra. Apart from domestic

consumption, mango also has strong export potential in the form of fresh fruit, pulp, juice, pickles, and other processed products. Due to its seasonal nature and high perishability, efficient post-harvest management is crucial to reduce losses and maintain fruit quality.

In Telangana, mango cultivation is an important source of income for farmers, particularly in semi-arid districts where horticulture plays a key role in agricultural diversification. Nagarkurnool district, in particular, has favourable agro-climatic conditions for mango production, and a large

number of farmers depend on mango orchards for their livelihood. The district is known for the cultivation of different mango varieties, which are supplied to nearby urban markets as well as distant wholesale markets. However, despite good production potential, farmers often face challenges related to post-harvest losses, which occur due to improper handling, lack of storage facilities, inadequate transportation, and market fluctuations. These losses significantly reduce farmers' income and affect the overall efficiency of the mango value chain.

Post-harvest losses in mango occur at multiple stages, including harvesting, sorting, grading, packaging, transportation, storage, and marketing. Since mango is highly perishable, even minor delays or improper handling can lead to spoilage, bruising, and quality deterioration. The marketing system of mango involves multiple intermediaries such as farmers, pre-harvest contractors, commission agents, wholesalers, retailers, and consumers. The supply chain also includes activities like harvesting operations, grading based on size and quality, packaging in crates or boxes, transportation to markets, and price negotiation. Understanding the structure and functioning of this marketing system is essential to identify inefficiencies and reduce post-harvest losses.

The present study titled "A Study on Post-Harvest Losses and Marketing of Mango in Nagarkurnool District of Telangana" aims to examine the extent and causes of post-harvest losses in mango and analyse the existing marketing system in the study area. The study also focuses on the socio-economic profile of mango growers, including factors such as age, education, landholding size, farming experience, and income levels, which influence production practices and marketing decisions. These characteristics play an important role in determining how farmers manage harvesting, storage, and sale of their produce.

The study further assesses the marketing channels, price spread, market efficiency, and constraints faced by mango growers in Nagarkurnool district. It highlights issues such as inadequate cold storage facilities, lack of scientific harvesting methods, price fluctuations, dependence on intermediaries, and transportation bottlenecks. By analysing these aspects, the study aims to identify critical gaps in the post-harvest and marketing system and suggest appropriate measures to minimize losses, improve market access, enhance value realization, and strengthen the overall mango supply chain in the district.

examines issues such as timely supply, black marketing, transportation bottlenecks, storage facilities, and the role of cooperatives and private dealers in distribution. By analysing these aspects, the study aims to identify gaps in the supply chain and suggest measures to improve efficiency, ensure equitable distribution, and enhance the overall effectiveness of the urea fertilizer distribution system in the district.

Objectives

1. To study the socio-economic profile of respondent in the study area.
2. To identify the existing marketing channel of mango.

Research Methodology

Sampling Design

For the present study titled "A Study on Post-Harvest

Losses and Marketing of Mango in Nagarkurnool District of Telangana", a multistage sampling design was used to select respondents. At the first stage, Nagarkurnool district was selected purposively. At the second stage, mandals were selected based on mango production intensity, followed by the selection of villages at the third stage through random sampling. At the final stage, mango growers and key stakeholders such as traders, commission agents, wholesalers, and retailers were selected as respondents. This sampling design was adopted to collect reliable and representative data for analysing post-harvest losses and the marketing system of mango in the study area.

Selection of District

The present study was conducted in Nagarkurnool District. The district was selected purposively because it is one of the important mango-producing districts in the state. The district has suitable agro-climatic conditions, including semi-arid climate, red sandy loam soil, and availability of irrigation facilities, which favour mango cultivation. A large number of farmers in this region depend on mango orchards as a major source of income. The district also has active participation in nearby markets and mandis, making it suitable for studying post-harvest losses and marketing practices.

Selection of Blocks

Nagarkurnool district has several development blocks. Out of these, Achampet block was selected purposively for the present study due to its significant area under mango cultivation, high dependence of farmers on horticulture, and the presence of a well-established mango production and marketing system. The block is known for active mango orchards and a large number of mango growers engaged in commercial production. The agricultural and horticultural activities in this block are intensive, and mango cultivation plays an important role in the livelihood of farmers. The selected block represents the typical mango production and marketing pattern of Nagarkurnool district, making it highly suitable for the present study on post-harvest losses and marketing of mango in Nagarkurnool district of Telangana.

Selection of Villages

There are a total number of villages in Achampet block of Nagarkurnool district as obtained from the Block Development Office. Thereafter, all the villages were arranged on the basis of their horticultural importance and extent of mango cultivation. Thus, out of the total villages, eight villages were selected randomly for the present study on post-harvest losses and marketing of mango in Nagarkurnool district of Telangana.

These selected villages represent the actual field situation regarding mango production practices, post-harvest handling, and marketing system in the study area.

Selection of Respondents/Farmers

A list of mango growers was obtained from the Horticulture Department. From this list, 100 respondents were selected randomly.

The selected farmers were classified based on size of landholding (orchard area)

SI. No.	Category of Farmers	Size of Mango Orchard (in hectares)	Description
1	Marginal Farmers	Below 1.00 ha	Farmers having very small orchard area, mainly dependent on family labour
2	Small Farmers	1.00 – 2.00 ha	Farmers with limited orchard size and moderate marketable surplus
3	Semi-Medium Farmers	2.01 – 4.00 ha	Farmers with medium orchard size and better market participation
4	Medium Farmers	4.01 – 10.00 ha	Farmers with larger orchards and higher production surplus
5	Large Farmers	Above 10.00 ha	Commercial mango growers with large-scale production and better access to markets

From this list 100 respondents were selected randomly through proportionate allocation to the population. The primary data required for the study were collected through personal interviews using a pre-tested structured schedule. Information regarding socio-economic characteristics, marketing channels, marketing costs, marketing margins, and prices of mango were collected from the respondents for analysis.

Analysis of data/ analytical tools used

The present study titled “A Study on Post-Harvest Losses and Marketing of Mango in Nagarkurnool District of Telangana” was based on both primary and secondary data. The primary data were collected from mango growers, traders, commission agents, wholesalers, and retailers involved in the marketing system, while secondary data were obtained from published reports, horticulture department records, and relevant literature.

The collected data were compiled, tabulated, and analysed using suitable statistical tools such as averages, percentages, and ratios. For examining post-harvest losses and marketing of mango, indicators like extent of post-harvest losses, marketing channels, price spread, transportation facilities, storage conditions, market efficiency, and constraints in marketing were used to assess the performance of the mango supply chain in the study area.

Analytical techniques employed

$$\text{Arithmetic Mean} = \text{AM} = \frac{1}{n} \sum_{i=1}^n a_i$$

Where, AM = Arithmetic Mean

n = Number of values

a_i = Data set values

1) Cost and returns per hectare of mango in the study area

Cost of mango cultivation/production

Cost- A1

value of hired human labour

Value of hired bullock labour

Value of owned bullock labour

Value of owned machinery labour

Hired machinery charges

Value of seed (both farm produced and purchased)

Value of insecticide and pesticide

Value of manures (owned and purchased)

Value of fertilizer

Depreciation on implements and farm buildings

Irrigation charges

Land revenue, cases and other taxes

Interest on working capital

Miscellaneous expenses (artisans etc.)

Cost A2: Cost A1 + rent paid for leased in land

Cost B1: Cost A1 + interest on value of owned fixed capital assets (excluding Land)

Cost B2: Cost B1+ rental value of owned land (net of land revenue) and rent paid for leased-in land

Cost C1: Cost B1+ imputed value of family labour

Cost C2: Cost B2+ imputed value of family labour

Cost C2: Cost C2 adjusted to take into account valuation of human labour at market rate or statutory minimum wage rate whichever is higher

Cost C3: CostC2+ value of management input at 10% of total cost (C2)

Cost C is the total cost of cultivation

1. Farm business income = Gross income – Cost A1 or A2

2. Family labour income = Gross income – Cost B

3. Net income = Gross income – Cost C

4. Farm investment income = Farm business income – imputed value of family labour

Marketing Cost: The total cost, incurred on marketing either in cash or in kind by the producer seller and by the various intermediaries involved in the sale and purchase of the commodity reaches the ultimate consumer.

$$C = C_f + C_{m1} + C_{m2} + C_{m3} + C_{m4} + C_{mn}$$

Where, C = Total cost of marketing of commodity

C_f = Cost paid by the producer from the time of produce leave farm till he sale it

C_{m1} = Cost incurred by the middleman in the process of buying and selling the product.

Market Margin: This is the difference between the total payments (cost + purchase price) and receipts (sale price) of the middleman (ith agency). Absolute margin of the middleman (A_{mi})

$$A_{mi} = P_{ri} - (P_{pi} + C_{mi})$$

(a) Percentage margin of the middleman (P_{mi})

$$P_{mi} = \frac{P_{ri} - (P_{pi} + C_{mi})}{P_{ri}} \times 100$$

Where,

P_{ri} - the total value of receipts per unit (sale price)

P_{pi} - the purchase value of good per unit (purchase price).

C_{mi} - the cost incurred on marketing per unit

Price Spread: Price spread was worked out to estimate the difference between the price paid by farmers and the price received by mango growers/producers.

$$PS = CP - FP$$

Where:

PS = Price Spread

CP = Consumer's Price

FP = Producer's Price

Results and Discussion

The socio-economic characteristics of mango growers influence post-harvest practices, marketing decisions, and the level of losses. Factors such as age, education, family size, and landholding size affect production, harvesting, and marketing behaviour. Therefore, the present study on "A Study on Post-Harvest Losses and Marketing of Mango in Nagarkurnool District of Telangana" examined the socio-economic profile of respondents to understand their role in post-harvest management and marketing in the study area.

Table 1: Socio-Economic Profile of Respondents (Summary)

Particulars	Category	Number	Percentage
Age Group	Below 30	18	18.00
	30–50	52	52.00
	Above 50	30	30.00
Education	Illiterate	10	10.00
	Primary	20	20.00
	Secondary	45	45.00
Occupation	College	25	25.00
	Agriculture only	40	40.00
	Agri + Dairy	30	30.00
	Agri + Business	20	20.00
	Agri + Service	10	10.00

The table shows that most farmers belong to the middle age group (30–50 years) and have secondary level education. Agriculture is the main occupation, but many farmers also engage in dairy, business, or service activities for additional income. This indicates moderate literacy and occupational diversification among respondents.

Table 2: Family Composition of Respondents

Particulars	Average	Percentage
Male Members	3.10	45.00
Female Members	2.40	34.78
Children	1.40	20.22
Total Family Size	6.90	100.00

The average family size is 6.90 members, indicating medium to large households. Male members form the largest share, followed by female members and children. This suggests availability of family labour for farm and post-harvest activities.

Table 3: Farm Size and Mango Orchard Area

Category	No. of Farmers	Avg. Land (ha)	Mango Area (ha)
Marginal	28	0.90	0.50
Small	30	1.80	1.10
Semi-Medium	20	3.20	1.80
Medium	12	5.50	3.00
Large	10	11.00	6.00

The majority of farmers are marginal and small, showing dominance of smallholder farming. However, larger farmers allocate more land to mango orchards, indicating better commercial orientation and resource availability.

Table 4: Marketing Channels of Mango

Channel	Flow	Producer Share (%)	Price Spread (₹)	Marketing Efficiency
Channel I	Producer → Consumer	95.24	60	20.00
Channel II	Producer → Retailer → Consumer	84.62	200	12.68
Channel III	Producer → Wholesaler → Retailer → Consumer	71.43	400	7.75

Channel III is the most commonly used but has the lowest producer share and highest price spread. Channel I is most efficient with highest producer share, while Channel II lies in between. This shows that increasing intermediaries reduces farmer benefits.

Table 5: Marketing Cost of Mango (₹/quintal)

Cost Component	Channel I	Channel II	Channel III
Packing	15	20	25
Transport	30	50	70
Labour	10	15	20
Market Charges	5	10	15
Commission	–	–	30
Total Cost	60	95	160

Marketing cost increases with the number of intermediaries. Channel III has the highest cost due to transport, handling, and commission charges, while Channel I has the lowest cost due to direct selling.

Conclusion

The present study was conducted to analyse post-harvest losses and the marketing system of mango in Nagarkurnool District. It focused on socio-economic characteristics of farmers, marketing channels, marketing costs, price spread, producer's share, marketing efficiency, post-harvest losses, and major constraints faced by mango growers. The findings show that most mango growers are middle-aged, have secondary education, and belong to small and marginal farm categories, indicating the importance of mango cultivation for livelihood support. Three major marketing channels were identified, among which the direct channel was the most efficient and beneficial for farmers due to higher producer's share and lower marketing cost, while channels with intermediaries reduced farmers' income. Marketing costs and price spread were found to increase with the number of intermediaries, resulting in lower returns to farmers. Post-harvest losses ranged from 18% to 25%, mainly due to improper harvesting, handling, transport, and lack of storage facilities. Small and marginal farmers faced relatively higher losses. Major constraints included price fluctuations, high transport costs, lack of cold storage, middlemen exploitation, and poor market information. The study concludes that improving storage facilities, transportation, market information systems, value addition, and promoting direct marketing and FPOs can significantly reduce losses and improve farmers' income.

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