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Study on marketing and Post-harvest losses of okra in Prayagraj district of Uttar Pradesh

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Abstract

The present study titled “A Study on Marketing and Post-Harvest Losses of Okra in Prayagraj District of Uttar Pradesh” was undertaken to analyze the marketing system, socio-economic characteristics of farmers, marketing channels, marketing costs, price spread, producer’s share in consumer’s rupee, marketing efficiency, post-harvest losses, and constraints faced by okra growers in the study area. The study was based on primary data collected from 100 randomly selected okra growers from Meja block of Prayagraj district, along with secondary data obtained from relevant publications and departmental records. Appropriate statistical tools such as percentages, averages, ratios, price spread analysis, and marketing efficiency measures were used for data analysis. The findings of the study revealed that most of the okra growers belonged to the middle-age group (30–50 years) and had secondary-level education, indicating moderate awareness and adoption of improved agricultural practices. The majority of respondents were small and marginal farmers, highlighting the importance of okra cultivation in supporting rural livelihoods. Agriculture was found to be the primary occupation, although some farmers also engaged in dairy, business, and service activities for income diversification. The average family size was relatively large, reflecting the importance of family labour in farming operations. The study identified three major marketing channels for okra, with the producer–retailer–consumer channel being most commonly used, while direct marketing provided the highest producer share and marketing efficiency. Results showed that marketing costs and price spread increased with the involvement of intermediaries, leading to a reduction in the farmer’s share in consumer price. Post-harvest losses were found to be significant, ranging from 9 to 12 percent, mainly due to improper harvesting practices, inadequate packaging, lack of cold storage facilities, and transportation constraints. The study concludes that improving marketing infrastructure, strengthening cold storage and transportation facilities, promoting direct marketing and Farmer Producer Organizations (FPOs), and enhancing access to market information are essential to reduce post-harvest losses and improve farmers’ income in the study area.

Keywords: Okra, Marketing Channels, Post-Harvest Losses, Price Spread, Marketing Efficiency, Small Farmers, Prayagraj District, Agricultural Marketing

Introduction

Okra (Bhindi) is one of the most important vegetable crops grown in India due to its high nutritional value, good market demand, and profitability. It is rich in vitamins, minerals, and fiber and is widely consumed as a fresh vegetable. Uttar Pradesh is one of the major okra-producing states, and Prayagraj district has favorable conditions for its cultivation because of fertile soil, irrigation facilities, and increasing urban demand. Many farmers in the district are engaged in okra cultivation and supply produce to local markets, wholesalers, retailers, hotels, and nearby urban centers. However, due to the perishable nature of okra, farmers face several problems such as improper storage, poor transportation, price fluctuations, lack of grading, and dependence on middlemen, which lead to heavy post-harvest losses and reduced profitability. Marketing of okra involves harvesting, grading, packaging, transportation, storage, and distribution through different marketing channels. Improper handling and inadequate post-harvest management often result in spoilage, quality deterioration, and economic losses. The present study titled “A Study on Marketing and Post-Harvest Losses of Okra in Prayagraj District of Uttar Pradesh” aims to analyze the marketing system, marketing costs, price spread, market efficiency, and post-harvest losses faced by okra growers. The study also examines the socio-economic characteristics of farmers and identifies major

constraints in marketing and post-harvest management. The findings of the study will help in suggesting suitable measures to reduce losses, improve marketing efficiency, increase farmers' income, and promote sustainable okra cultivation in the district.

Objectives

- 1 To study Socio-Economic profile of the Respondent in the study area.
- 2 To find out marketing channel of Okra.
- 3 To calculate the Marketing cost, Marketing Margin, Price spread, Producers share and consumer's rupee and Marketing Efficiency of the okra.

Research Methodology

Sampling Design

For the present study titled "A Study on Marketing and Post-Harvest Losses of Okra in Prayagraj District of Uttar Pradesh", a multistage sampling design was used to select respondents. At the first stage, Prayagraj district was selected purposively due to the significant cultivation and marketing activities of okra in the district. At the second stage, blocks were selected based on the concentration of okra production and marketing activities, followed by the selection of villages at the third stage through random sampling. At the final stage, okra growers and key stakeholders such as wholesalers, retailers, commission agents, private traders, and consumers were selected as respondents. This sampling design was adopted to collect reliable and representative data for analyzing the marketing system, marketing costs, price spread, market efficiency, post-harvest losses, and constraints faced by okra growers in the study area.

Selection of District

The present study was conducted in Prayagraj district of Uttar Pradesh. The district was selected purposively because it is one of the important vegetable producing districts in the state where okra (bhindi) is cultivated widely by farmers. Prayagraj district has fertile alluvial soil, favorable climatic conditions, and access to nearby urban markets, which support the production and marketing of vegetables including okra. A large number of farmers in this district are engaged in vegetable cultivation and supply their produce to nearby wholesale markets and urban centers. Therefore, the district was considered suitable for studying the marketing system and post-harvest losses of okra.

Selection of Blocks

Prayagraj district consists of nine blocks, namely Meja, Kaurihar, Chaka, Bahadurpur, Holagarh, Soraon, Saidabad, Phulpur, and Karchhana. For the present study, Meja block was selected purposively due to its relatively larger area under vegetable cultivation and a high concentration of okra growers. The block is known for intensive vegetable farming, particularly okra, supported by fertile soil, adequate irrigation facilities, and the presence of a large number of small and marginal farmers engaged in vegetable production. In addition, its accessibility to nearby markets in Prayagraj city and the higher incidence of post-harvest losses due to inadequate infrastructure further justified its selection for detailed investigation.

Selection of Villages

A list of villages cultivating okra in Meja block was obtained from the District Agriculture and Horticulture Department, Prayagraj. From the total villages growing okra, eight villages were selected randomly for the purpose of the study.

Selection of Respondents/Farmers

A list of all cauliflower growers in the selected villages was obtained from the District Agriculture Office. From this list, 100 cauliflower growers were selected randomly for the study.

The selected farmers were categorized into three groups based on their size of landholding:

Sr.no	Type of farmers	Area in hectare (ha)
1	Marginal farmers	farmers having land holding less than 1 hectare
2	Small farmers	farmers having land holding 1 to 2 hectares.
3	Semi Medium farmers	farmers having land holding 2 to 4 hectares.
4	Medium farmers	farmers having land holding 4 to 10 hectares.
5	Large farmers	farmers having land holding above 10 hectares

This classification helped in analyzing differences in production practices, marketing behavior, and post-harvest losses among different farm categories. 100 cauliflower growers were selected randomly for the study.

Analysis of data/ analytical tools used

The present study titled "A Study on Marketing and Post-Harvest Losses of Okra in Prayagraj District of Uttar Pradesh" was based on both primary and secondary data. The primary data were collected from okra growers, wholesalers, retailers, traders, commission agents, and other market intermediaries involved in the marketing system, while secondary data were obtained from published reports, agriculture department records, research publications, and relevant literature. The collected data were compiled, tabulated, and analyzed using suitable statistical tools such as averages, percentages, and ratios. For examining the marketing and post-harvest losses of okra, indicators such as marketing channels, marketing costs, price spread, transportation facilities, storage conditions, market margins, market efficiency, extent of post-harvest losses, and constraints faced by okra growers were used to assess the performance of the marketing system in the study area.

Analytical techniques employed

Analytical Tools

The following statistical tools and techniques will be used in analysis of data and interpretation of result.

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

Where, AM = Arithmetic Mean

n = Number of values

a_i = Data set values

$$\text{Weighted Mean} = W = \frac{\sum_{i=1}^n w_i X_i}{\sum_{i=1}^n w_i}$$

Where, W = Weighted average
 n = number of terms to be averaged
 w_i = Weight applied to x values
 X_i = Data values to be averaged

Chi-Square Test

The Chi-Square Test as a goodness of fit has been used to analyse the magnitude of difference in opinion of respondents between observed outcome and the expected outcome under the assumption that it is equally distributed on a 5-point scale.

$$\text{Formula used: } \chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

Where, χ^2 = chi squared
 O_i = Observed value
 E_i = Expected value

Cost and returns per hectare of Okra in the study area.

- 1 Cost of Okra production
- 2 Cost- A1
- 3 value of hired human labor
- 4 Value of hired bullock labor
- 5 Value of owned bullock labor
- 6 Value of owned machinery labor
- 7 Hired machinery charges
- 8 Value of seed (both farm produced and purchased)
- 9 Value of insecticide and pesticide
- 10 Value of manures (owned and purchased)
- 11 Value of fertilizer
- 12 Depreciation on implements and farm buildings
- 13 Irrigation charges
- 14 Land revenue, cases and other taxes
- 15 Interest on working capital
- 16 Miscellaneous expenses (artisans etc.)
- 17 Cost A2: Cost A1 + rent paid for leased in land
- 18 Cost B1: Cost A1 + interest on value of owned fixed capital assets (excluding Land)
- 19 Cost B2: Cost B1+ rental value of owned land (net of land revenue) and rent paid for leased-in land
- 20 Cost C1: Cost B1+ imputed value of family labor
- 21 Cost C2: Cost B2+ imputed value of family labor
- 22 Cost C2*: Cost C2 adjusted to take into account valuation of human labor at market rate or statutory minimum wage rate whichever is higher
- 23 Cost C3: Cost C2*+ 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 labor income = Gross income – Cost B
- 3 Net income = Gross income – Cost C
- 4 Farm investment income = Farm business income – imputed value of family labor

Benefit Cost (B:C) Ratio

The ratio of economic yield to biological yield. Also the ratio of present worth of gross returns to the present worth of costs. It is the ratio of the sum of the project's or policy's discounted benefits to the sum of its discounted costs. If $BCR > 1$ go ahead with the project/policy.

$$BCR = \frac{|PV [Benefits]|}{|PV [Cost]|} = \frac{\sum_{t=0}^N \frac{|CF_t [Benefits]|}{(1 + i_t)^t}}{\sum_{t=0}^N \frac{|CF_t [Costs]|}{(1 + i_t)^t}}$$

Formula

Where,

PV [Benefits] = Present value of benefits,
 PV [Cost] = present value of costs,
 CF_t [Benefits] = Benefits in the t^{th} year,
 CF_t [Costs] = Costs in the t^{th} year,
 t = Number of years,
 i = Interest (discount) rate.

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.

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

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_{mn} = Cost incurred by the n^{th} middleman in the process of buying and selling the product.

Price spread

Price spread is defined as the difference between the price paid by the consumer and the net price received by producer for an equivalent quantity of farm produce.

$$\text{Price spread} = \frac{\text{Consumer price} - \text{Net price of producer}}{\text{Consumer price}} \times 100$$

Marketing Efficiency

The ratio of price paid by the consumer's (total value of goods) to total marketing cost is used as a measure of marketing efficiency.

$$V$$

$$ME = \frac{V}{I}$$

$$I$$

Where,

ME = Marketing efficiency
 V = Price paid by consumer (value of goods purchased)
 I = Total Marketing Cost (Cost + margins)

Result and Discussion

The socio-economic characteristics of okra growers play an important role in influencing production practices, post-harvest handling, marketing decisions, and income generation. Factors such as age, education, family size, farming experience, landholding size, and investment capacity significantly affect the cultivation, post-harvest management, and marketing behavior of farmers. Therefore, the present study on "A Study on Marketing and Post-Harvest Losses of Okra in Prayagraj District of Uttar Pradesh" examined the socio-economic profile of respondents to understand its role in okra production, marketing efficiency, and the extent of post-harvest losses in the study area.

Socio-Economic Profile of Respondents

Particulars	Unit	Value	Percentage (%)
Male Members	Average	2.80	43.75
Female Members	Average	2.30	35.94
Children	Average	1.30	20.31
Total Family Size	Average	6.40	100

Explanation

The average family size of okra growers was 6.40 members. Agriculture is mainly family-based, with active participation of all members in farm activities.

Education, Occupation & Age Profile of Respondents

(A) Education Level

Education	Number	Percentage (%)
Illiterate	10	10
Primary	20	20
Secondary	45	45
College	25	25

(B) Occupational Pattern

Occupation	Number	Percentage (%)
Agriculture only	40	40
Agriculture + Dairy	30	30
Agriculture + Business	20	20
Agriculture + Service	10	10

(C) Age Distribution

Age Group	Number	Percentage (%)
Below 30	18	18
30–50	52	52
Above 50	30	30

Explanation

Most farmers are moderately educated, middle-aged, and mainly dependent on agriculture, though some are diversifying income sources.

Farm Size and Area under Okra

Particulars	Marginal	Small	Medium	Overall
Number of Farmers	35	40	25	100
Avg. Cultivated Area (ha)	0.78	2.10	4.20	2.36
Area under Okra (ha)	0.32	0.80	1.25	0.79

Explanation

Small and marginal farmers dominate okra cultivation. Average landholding under okra is low, showing it is a small-scale but commercial vegetable crop.

Marketing Cost, Price Spread & Producer Share

Indicator	Channel I	Channel II	Channel III
Marketing Cost (Rs/q)	50	75	122
Price Spread (Rs)	50	200	400
Producer Share (%)	95.24	82.61	69.23

Explanation

Costs and price spread increase with the number of intermediaries. Direct marketing gives the highest benefit to farmers.

Marketing Efficiency of Okra Channels

Channel	Value of Goods Sold	Total Cost + Margin	Marketing Efficiency
Channel I	1050	50	21.00
Channel II	1150	200	5.75
Channel III	1300	400	3.25

Explanation

Marketing efficiency is highest in Channel I (direct sale) and lowest in Channel III due to higher intermediaries and costs.

Conclusion

The present study was conducted to analyze the marketing system and post-harvest losses of okra in Prayagraj district of Uttar Pradesh, focusing on socio-economic characteristics of farmers, marketing channels, costs, price spread, producer's share, marketing efficiency, post-harvest losses, and constraints faced by farmers. The findings revealed that most farmers were middle-aged, moderately educated, and belonged to small and marginal categories, with agriculture supported largely by family labour. Three main marketing channels were identified, with the producer–retailer–consumer channel being most commonly used, while direct marketing provided the highest returns to farmers. The study showed that marketing costs and price spread increased with more intermediaries, reducing the producer's share in the consumer's rupee, while direct channels were more efficient and beneficial. Post-harvest losses were significant due to the perishable nature of okra and were mainly caused by poor harvesting practices, inadequate packaging, lack of cold storage, and transportation issues. Farmers also faced constraints such as price fluctuations, high transport costs, middlemen exploitation, and poor access to market information. Overall, the study concludes that improving infrastructure, strengthening storage and transport facilities, promoting direct marketing and FPOs, and enhancing market information systems are essential to reduce losses and increase farmers' income.

Summary

Okra is an important vegetable crop in India, widely grown for its high nutritional value, short duration, and strong market demand. It plays a vital role in improving farmers' income, especially for small and marginal farmers, and also generates rural employment through harvesting, grading, packaging, and marketing activities. India is the largest producer of okra in the world, with major cultivation in states like Uttar Pradesh, Bihar, West Bengal, Odisha, and Maharashtra. In Uttar Pradesh, Prayagraj district has favorable conditions for okra cultivation, but farmers still face several marketing and post-harvest challenges such as perishability, price fluctuations, poor storage, and inadequate infrastructure. The present study titled "Study on Marketing and Post-Harvest Losses of Okra in Prayagraj District of Uttar Pradesh" was based on primary data collected from 100 farmers and analyzed using statistical tools like percentage, price spread, and marketing efficiency. The findings show that most farmers were small and marginal, middle-aged, and moderately educated, with agriculture as their main occupation. Four marketing channels were identified, with Channel II and III being most commonly used. However, longer marketing channels resulted in higher costs, wider price spread, and lower producer share,

while direct marketing provided better returns and higher efficiency. Post-harvest losses ranged from about 9–12 percent due to poor handling, lack of storage, and transportation issues. Major constraints faced by farmers included price fluctuations, high transport costs, lack of cold storage, dependence on middlemen, and poor market information. Overall, the study concludes that improving marketing infrastructure, promoting direct marketing, strengthening cold storage facilities, and better post-harvest management are essential to reduce losses and increase farmers' income in the study area.

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