STUDY ON MARKETING AND POST-HARVEST LOSSES OF BANANAS IN KHAGARIA DISTRICT OF BIHAR

Ashutosh Kumar[1] and Pritesh Dwivedi[2]

[1]MBA (Agribusiness), Department of Agricultural Economics

Sam Higginbottom University of Agriculture Technology and Sciences, Prayagraj, U.P.

[2]Assistant Professor, Department of Agricultural Economics

Sam Higginbottom University of Agriculture Technology and Sciences, Prayagraj, U.P.

Corresponding author: 22mbaab096@shiats.edu.in

https://doie.org/10.0602/AE.2024143168

ABSTRACT

This research paper investigates the marketing channels and post-harvest losses of banana cultivation in Khagaria district, Bihar. Utilizing a multi-stage stratified random sampling method, the study focuses on six randomly selected villages within the Khagaria block, known for extensive banana farming. The research examines three marketing channels: direct sales, intermediaries, and wholesale distribution. Analysis of these channels reveals that direct sales offer the highest marketing efficiency, with farmers retaining 95.35% of the consumer's price. In contrast, channels involving intermediaries show significant price spreads due to added marketing costs and margins. Post-harvest losses were found to increase with farm size, with large farmers experiencing the highest economic losses. Primary data was collected through structured interviews with farmers, distributors, and market experts, while secondary data was sourced from governmental and academic publications. The findings highlight the need for improved marketing strategies and post-harvest management to enhance farmer profitability and reduce losses, thereby contributing to sustainable agricultural practices in the region.

Keywords: Post-harvest, Sampling, Distribution, Academic, Publication

INTRODUCTION

Banana cultivation is a vital agricultural activity in India, particularly in states like Bihar where it serves as a significant source of income for farmers. The Khagaria district, known for its extensive banana cultivation, offers an excellent case study to examine the intricacies of banana marketing channels and post-harvest losses. Understanding these aspects is crucial for developing strategies that can enhance the profitability and sustainability of banana farming in the region. Marketing channels play a pivotal role in determining the efficiency of

agricultural produce distribution. They impact the final price received by farmers, the cost incurred during marketing, and ultimately, the consumer price. Efficient marketing channels can significantly enhance the income of farmers by reducing intermediaries and associated costs *(Suryawanshi et al., 2019).* In contrast, complex marketing channels with multiple intermediaries often lead to increased marketing margins and reduced profits for farmers *(Patil et al., 2018).* Post-harvest losses are another critical issue affecting

banana cultivation. These losses not only reduce the available quantity of bananas for sale but also impact the economic returns for farmers. Factors contributing to post-harvest losses include inadequate storage facilities, transportation challenges, and inefficient handling practices *(Singh et al., 2017)*. Effective post-harvest management practices are essential to minimize these losses and improve the overall profitability of banana farming *(Sharma et al., 2016)*. This study employs a multi-stage stratified random sampling method to analyse the marketing channels and post-harvest losses in Khagaria district.

By focusing on six randomly selected villages within the Khagaria block, the research aims to provide a comprehensive understanding of the marketing dynamics and the extent of post-harvest losses in banana cultivation. The primary data collected through structured interviews with farmers, distributors, and market experts, supplemented by secondary data from governmental and academic sources, forms the basis of this analysis. The findings of this research are expected to contribute to the development of effective marketing strategies and post-harvest management practices that can enhance the profitability and sustainability of banana farming in the Khagaria district and similar regions. This study aims to provide valuable insights for policymakers, agricultural extension services, and farmers themselves, helping to address the challenges faced in banana marketing and post-harvest management.

RESEARCH METHODOLOGY

The research was conducted in the Khagaria district of Bihar, known for its significant banana cultivation. The Khagaria block, with the largest area dedicated to banana farming, was purposefully selected. Six villages were randomly chosen from this block, and a comprehensive list of banana cultivators was compiled. The farmers were categorized into various groups for the study. The sampling design employed a multi-stage approach, ensuring a comprehensive portrayal of marketing impacts. The stages included purposive selection of the district and block, random selection of villages and respondents, purposive selection of markets, and random selection of market functionaries. Within the selected villages, systematic random sampling was used to select respondents, including both banana users and non-users, representatives from distribution companies, and local agricultural experts. The respondents were categorized by landholding size: marginal, small, semi-medium, medium, and large. The study also focused on two principal agricultural markets for in-depth analysis of banana marketing dynamics. Primary data was collected through personal interviews with stakeholders using specially designed schedules. Secondary data was gathered from books, journals, government publications, and online resources, providing a robust foundation for analysing the marketing strategies and their impacts on banana cultivation in Khagaria.

RESULTS AND DISCUSSION

CHANNELS

Table 1: Different marketing channels involve in the marketing of Banana

Channel I	Producer > Consumer
Channel II	Producer> Pre-harvest contractor > Wholesaler > Retailer> Consumer
Channel III	Producer > Wholesaler > Retailer> Consumer.

The table presented outlines different marketing channels involved in the marketing of bananas and serves as a foundational basis for evaluating several key aspects of banana marketing, including marketing cost, marketing margin, marketing efficiency, price spread, and the producer's share in the consumer's rupee.

Table 2 Price distribution in Channel I per quintal

Sr. No.	Particulars	Price or Cost (INR)	Percentage (%)
1	Total revenue earned by the farmer	1749.881	100.00
1.i	Marketing cost	81.41	4.65
1.ii	Net price realized	1668.47	95.35
5	Consumer price paid	1749.88	100.00
5	Price spread	81.41	-

Table 2, details the price distribution within Channel I of banana marketing, which is a direct-to-consumer channel. It begins with the gross price received by the farmer, set at INR 1749.88, which represents 100% of the price in this channel. The marketing cost incurred in the process is INR 81.41, which accounts for approximately 4.65% of the gross price. After subtracting this marketing cost from the gross price, the net price realized by the farmer is INR 1668.47, constituting 95.35% of the initial gross price. This means that nearly 95.35% of the consumer's payment goes directly to the farmer, showcasing a high level of efficiency in terms of the farmer's revenue retention.

The consumer pays the same amount, INR 1749.88, as the initial gross price received by the farmer, indicating that there are no additional costs added beyond the initial marketing cost. The price spread within this channel, which represents the difference between what the consumer pays and what the farmer ultimately receives, is exactly equal to the marketing cost of INR 81.41. This suggests a direct and effective channel with minimal intermediaries and additional costs, emphasizing a transparent and efficient marketing process where the farmer retains a significant portion of the consumer expenditure.

Table 3 Price distribution in Channel II/ Quintal

Sr. No.	Particulars	Price or Cost (INR)	Percentage (%)
1	Gross price received by the farmer	1250.00	60.17
1.i	Marketing cost	0.00	0.00
1.ii	Net price realized	1250.00	60.17
2.i	Pre-harvest contractor price paid	1250.00	60.17
2.ii	Pre-harvest contractor marketing cost	50.50	2.43
2.iii	Pre-harvest contractor marketing margin	60.00	2.88
2.iv	Pre-harvest contractor price received	1360.50	65.49
3.i	Wholesaler price paid	1360.50	65.49
3.ii	Wholesaler marketing cost	325.00	15.64
3.iii	Wholesaler marketing margin	200.00	9.62
3.iv	Wholesaler price received	1885.50	90.76
4.i	Retailer price paid	1885.50	90.76
4.ii	Retailer marketing cost	92.00	4.43
4.iii	Retailer marketing margin	100.00	4.81
4.iv	Retailer price received	2077.50	100.00
5	Consumer price paid	2077.50	100.00
5	Price spread	827.50	-

Table 3, provides a detailed overview of the price distribution in Channel II for the marketing of products from producer to consumer via a florist. In this channel, the producer receives a gross price of INR 1250.00 per quintal, which is 60.17% of the final consumer price, with no marketing cost involved at the producer level, thus the net price realized remains the same as the gross price. The product then moves to the pre-harvest contractor who pays the same INR 1250.00 to the producer. The contractor incurs a marketing cost of INR 50.50 (2.43%) and adds a marketing margin of INR 60.00 (2.88%), bringing the price received by the contractor to INR 1360.50 (65.49%). Next, the wholesaler purchases the product at this price of INR 1360.50. The wholesaler's marketing costs amount to INR 325.00 (15.64%), with an added marketing margin of INR 200.00 (9.62%), culminating in a price received by the wholesaler of INR 1885.50 (90.76%). The retailer then purchases the goods from the wholesaler at INR 1885.50. The retailer's marketing costs are INR 92.00 (4.43%), and they add a marketing margin of INR 100.00 (4.81%), which leads to the final retail price received of INR 2077.50, the price at which the consumer purchases the product. This channel showcases a significant price spread of INR 827.50, indicating substantial additions to the price through each stage of the marketing channel, largely due to marketing costs and margins applied by intermediaries such as the pre-harvest contractor, wholesaler, and retailer. This complex chain highlights the layered costs added before reaching the consumer.

Table 4 Price distribution in Channel III

Sr. No.	Particulars	Price or Cost (INR)	Percentage (%)
1	Gross price received by the farmer	1280.00	67.69
1.i	Marketing cost	0.00	0.00
1.ii	Net price realized	1280.00	67.69
3.i	Wholesaler price paid	1280.00	67.69
3.ii	Wholesaler marketing cost	310.00	16.39
3.iii	Wholesaler marketing margin	150.00	7.93
3.iv	Wholesaler price received	1740.00	92.01
4.i	Retailer price paid	1740.00	92.01
4.ii	Retailer marketing cost	91.00	4.81
4.iii	Retailer marketing margin	60.00	3.18
4.iv	Retailer price received	1891.00	100.00
5	Consumer price paid	1891.00	100.00
5	Price spread	611.00	-

Table 4, illustrates the price distribution in Channel III, which includes a producer, a wholesaler-cum-commission agent, a florist (retailer), and an export firm, detailing how each intermediary contributes to the final consumer price. starting with the producer, the gross price received is INR 1280.00 per unit, which constitutes 67.69% of the final price paid by the consumer. There is no marketing cost at the producer level, so the net price realized by the producer remains the same as the gross price, INR 1280.00. The wholesaler, who also acts as a commission agent, purchases the product at the same price, INR 1280.00. The wholesaler then incurs a marketing cost of INR 310.00, representing 16.39% of the final consumer price, and adds a marketing margin of INR 150.00 (7.93%). This results in the wholesaler's selling price, or the price received by the wholesaler, climbing to INR 1740.00 (92.01%). This price of INR 1740.00 is then transferred to the florist (retailer), who adds a marketing cost of INR 91.00 (4.81%) and a further marketing margin of INR 60.00 (3.18%). Consequently, the retailer's final selling price, or the price received by the retailer, amounts to INR 1891.00, which is also the price paid by the consumer. Thus, in Channel III, the total price spread—the

difference between what the consumer pays and what the producer originally receives—is INR 611.00. This spread accounts for various additional costs and margins added by the wholesaler and the retailer, reflecting the added value or services they provide in bringing the product from the farm to the consumer or export markets. The progression of costs and margins in this channel demonstrates the significant role that each intermediary plays in shaping the final retail price, emphasizing their function in the distribution and marketing process.

Table 5. Marketing Efficiency of Identified Channels of Banana (Rupees)

Sr. No.	Particulars	Path I	Path II	Path III
1	Net income for the farmer	1668.47	1250.00	1280.00
2	Total cost of marketing	81.41	467.50	401.00
3	Combined marketing margin	0.00	352.00	210.00
4	Marketing margin plus cost	81.41	827.50	611.00
5	Consumer's expenditure	1749.88	2077.50	1891.00
6	Efficiency ratio of marketing	21.49	2.51	3.09

Table 5, presents a comparative analysis of the marketing efficiency across three identified channels for the distribution of bananas, showcasing different aspects such as net price received by the farmer, total marketing cost, marketing margin, and overall efficiency.

POST-HARVEST LOSSES

Table.6 Physical post-harvest losses in Banana (N=100)

S.No.	Landholding Category	Initial Quantity (kg)	Final Quantity (kg)	Physical Loss (kg)	Loss Percentage (%)
1	Marginal	497.2	457.9	39.3	7.9
2	Small	1498.5	1342.7	155.8	10.4
3	Semi Medium	2995.6	2626.4	369.2	12.3
4	Medium	7012.3	5935.4	1076.9	15.4
5	Large	15034.8	12779.6	2255.2	15.0

Table 6, details the physical post-harvest losses in bananas across different landholding categories, highlighting how the scale of operations impacts loss percentages. The data indicates that smaller landholders like marginal farmers experience lower absolute losses (39.3 kg) but also benefit from a relatively moderate loss percentage (7.9%). As the size of the landholdings increases, both the absolute and relative losses escalate. Small farmers see a loss of 155.8 kg, translating to 10.4% of their initial quantity. Semi-medium holders experience a 12.3% loss, amounting to 369.2 kg. Notably, medium and large farmers face the most significant losses, with medium farmers losing 1076.9 kg (15.4%) and large farmers losing 2255.2 kg, albeit with a slightly lower percentage loss of 15.0%. This pattern suggests that while larger scale operations might leverage economies of scale in some areas, they are also susceptible to higher levels of waste, possibly due to challenges in managing larger quantities of produce efficiently.

Table 7: Economic post-harvest losses in Banana (N=100)

S.No.	Landholding Category	Physical Loss (kg)	Price/KG (INR)	Economic Loss (INR)
1	Marginal	39.3	130	5109
2	Small	155.8	130	20254
3	Semi Medium	369.2	130	47996
4	Medium	1076.9	130	140097
5	Large	2255.2	130	293176

Table 7, quantifies the economic impact of post-harvest losses in bananas across various landholding categories, correlating physical losses to monetary values based on a uniform price per kilogram. The table reveals that marginal farmers face the lowest economic loss at INR 5,109, resulting from a physical loss of 39.3 kg at a rate of INR 130 per kg. Small landholders incur a higher economic loss of INR 20,254 from 155.8 kg of lost produce. Semi-medium holders lose INR 47,996 due to 369.2 kg of post-harvest losses, underscoring a growing trend of increasing losses with larger farm sizes. The economic losses continue to escalate significantly for medium and large farmers; medium farmers face a substantial loss of INR 140,097 from 1,076.9 kg of bananas, while large farmers suffer the highest economic impact, losing INR 293,176 due to 2,255.2 kg of lost produce. This pattern illustrates how larger operations, despite potentially benefiting from economies of scale in production, also risk greater financial losses from post-harvest challenges, emphasizing the need for effective management and reduction strategies at scale.

CONCLUSION

The study presents a comprehensive analysis of banana marketing channels and post-harvest losses, highlighting key aspects of efficiency and economic impact across different scales of operation. Channel I, involving direct sales from producer to consumer, demonstrated the highest efficiency with a minimal marketing cost of INR 81.41, allowing farmers to retain 95.35% of the consumer price. Channels II and III, which included intermediaries such as pre-harvest contractors and wholesalers, showed significant price spreads of INR 827.50 and INR 611.00, respectively, due to added marketing costs and margins. These channels, although providing broader market access, reduced the farmer's share of the consumer's rupee. The analysis of post-harvest losses revealed a clear pattern: as farm size increased, both physical and economic losses escalated. Marginal farmers experienced the lowest loss percentages and economic impacts, whereas medium and large farmers faced significant challenges, with losses amounting to INR 140,097 and INR 293,176, respectively. This study underscores the need for targeted strategies to enhance marketing efficiency and reduce post-harvest losses, particularly for larger operations, to ensure sustainable and profitable banana farming. Effective management practices and improved marketing infrastructure are essential to mitigate these losses and support farmers' livelihoods.

REFERENCES

Patil, G., Kale, R., & Pawar, N. (2018). Marketing Channels and Price Spread Analysis of Banana in Western Maharashtra. International Journal of Current Microbiology and Applied Sciences, 7(1), 2375-2382.

Sharma, R., Singh, D., & Verma, A. (2016). Post-Harvest Management of Banana: Strategies to Reduce Losses. Journal of Agricultural Science and Technology, 18(4), 851-862.

Singh, S., Kumar, V., & Mishra, R. (2017). Factors Affecting Post-Harvest Losses in Bananas: A Study in Bihar. International Journal of Postharvest Technology and Innovation, 5(2), 123-135.

Suryawanshi, R., Deshmukh, M., & Chavan, U. (2019). Economic Analysis of Banana Cultivation and Marketing in Maharashtra. Agricultural Economics Research Review, 32(1), 91-100.