Research Note

Indian Journal of Extension Education
Vol. 60, No. 4 (October–December), 2024, (144-148)

ISSN 0537-1996 (Print)
ISSN 2454-552X (Online)

Economic Viability and Marketing Networks of Finger Millet in North Coastal Andhra Pradesh

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HIGHLIGHTS

- The study recommends reducing intermediaries and marketing costs to boost farmers' profits, making finger millet cultivation more profitable.
- Despite a higher benefit-cost ratio most of farmers receive smaller net prices.
- Most of the farmers were not aware of the MSP set by the Department of Agriculture and Farmers Welfare.

ARTICLE INFO

Keywords: Finger millet growers, Cost of cultivation, Trader, Wholesaler, Consumer.

https://doi.org/10.48165/IJEE.2024.604RN5

Conflict of Interest: None

Research ethics statement(s):
Informed consent of the participants

ABSTRACT

Finger millet (*Eleusine coracana*) is vital in global agriculture for its nutritional value, adaptability, & capacity to tackle food security challenges. Data was gathered during 2024 from farmers, local traders, wholesalers and retailers in three districts of the North coastal region of Andhra Pradesh, i.e., Srikakulam, Vizianagaram, & Visakhapatnam, to know the major marketing channels of finger millet. This study analyzes the cost structure and marketing margins in finger millet production across three channels, detailing each stage from farmers (net price Rs. 3300-3320 per quintal) to retailers. Channel 1 had a final retail price of Rs. 5000 with a margin of Rs. 1681, Channel 2 reached Rs. 5500 with a margin of Rs. 2000, and Channel 3 peak at Rs. 6500 with a margin of Rs. 3170. Additionally, it details the costs per acre, with a gross return of Rs. 37950 and a net return of Rs. 1471, revealing a return per rupee of 1.04. The findings highlight the impact of each marketing stage on consumer prices.

INTRODUCTION

India is one of the world's leading millet producers (Kumar et al., 2021 & Singh et al., 2024). Millets are renowned for their nutritive qualities, containing significantly higher amounts of protein, fiber, and minerals compared to rice and wheat (Sah et al., 2021). As "smart crops" and "Harbingers of the Ever Green Revolution," millets are praised for their nutrition, drought resistance, and environmental benefits, offering solutions for climate change, food security, and rural development (Rafi et al., 2023). Millet's nutritional value and resilience make it essential in semi-arid tropics, thriving with limited resources, high productivity, and minimal inputs (Singh et al., 2018). Finger millet, scientifically acknowledged as *Eleusine coracana* L., is an ancient and nutritious cereal (Gupta et al., 2017). Finger millet exemplifies the resilience and nutritional value of traditional crops (Nagaraja et al., 2024). It is a virtuous source of calcium, containing three times more calcium than milk and ten times more than wheat, maize, or rice (Jagati et al., 2021). In India, finger millet is commonly cultivated as a rabi crop due to its high heat tolerance (Tandel, 2018). The majority of Finger millet is cultivated and produced in the southern states of Karnataka, Andhra Pradesh, Tamil Nadu, and the mountainous regions of Uttarakhand in northern India (Karki et al., 2020). Finger millet, often denoted as the "Poor man's crop," can be safely stored for several years without the risk of infestation by insects or other pests (Rathore et al., 2019; Tamilselvan et al., 2023). Cultivated

Received 03-09-2024; Accepted 29-09-2024

for thousands of years, these grains are primarily grown in Africa and Asia and serve as a crucial food source in the Asia Pacific (APAC) region, mostly in nations like India and China. As their lower cost compared to other grains, finger millets are expected to drive market growth in APAC. Globalization has opened up new opportunities in the agricultural sector, especially for cereal crops and millets, fostering growth and development (Reddy et al., 2015 & Trolio et al., 2016). India has emerged as one of the top five millet exporters worldwide, with the global export value of millets rising from $400 million in 2020 to $470 million in 2021, according to the ITC trade map. In the fiscal year 2022-23, India's millet exports reached $75.46 million, up from $62.95 million in the previous fiscal year 2021-22 (Angamuthu, 2022). During 2022-24, Karnataka saw declines in area (8.12 to 6.82), production (11.48 to 8.65), and productivity (1414 to 1268). Tamil Nadu's area and production slightly decreased, but productivity improved. Andhra Pradesh maintained a constant area at 0.27 but significantly increased production from 0.13 to 0.28 and improved productivity from 1185.00 to 1222.00. These fluctuations underscore the diverse agricultural challenges and outcomes across India (Ministry of Commerce & Industry, 2022).

METHODOLOGY

Cost of Cultivation method advocated by the Directorate of Economics and Statistics was adopted for this study.

Cost A1, encompasses all the real costs, both in cash and in kind that a farmer incurs during production. This includes expenditures on human labour, bullock labour, instrument labour, seeds, fertilizers and manures, plant protection chemicals, irrigation fees, interest on working capital, depreciation of capital assets, miscellaneous expenses, and land taxes. Cost A2 is Cost A1plus rent paid for leased land, whereas, Cost B1 pertains to Cost A2 plus interest on value of owned capital assets (excluding land). Cost B2 is Cost B1 plus rental value of owned land.

Cost C1 is Cost B1 plus imputed value of household labour, Cost C2 is Cost B2 plus imputed value of household labour and Cost C3 is Cost C2 X 1.10 (10% of cost C2 added to Cost C2). Whereas Cost C3 is a newly introduced concept designed to account for the administrative roles performed by the farmer.

$$\text{Cost of Production} = \frac{\text{Cost C3-By product value}}{\text{Yield/acre}}$$

Gross Return = Yield in kg X Price/kg

Net Return = Gross Return – Cost C3

$$\text{Return per Rupee} = \frac{\text{Gross Return}}{\text{Total Cost C3}}$$

Price spread generally refers to the difference among the price paid by the end consumer and the amount received by the growers for each unit of a commodity. Analyzing the price spread helps determine the share of different market participants in the consumer's expenditure, which can highlight the efficiency of various marketing channels. In this study, the concurrent margin method is used to examine the price spread. Data on prevailing prices and marketing costs for banana leaves across dissimilar stages of all recognized marketing channels were composed from farmers and market participants.

Additionally, the Farmer's share of the consumer rupee was determined using the following formula.

$$Fs = (Fp/Cp) \times 100$$

Where, Fs= Farmer's share of the consumer rupee in percentage, Fp = Farmer's price, Cp = Consumer's price

Marketing Margin refers to the difference between the overall payments (Comprising cost and purchase price) and the receipts (sale price) received by the middleman.

Middleman's profit margin as a percentage = $S_P - (P_p + C_{mi})$

Where, S_P= Total amount received per unit (selling price), P_P= Unit purchase price, C_{mi} = Cost per unit spent on marketing.

RESULTS

Finger millet cultivation offers promising returns despite moderate initial costs. Its adaptability to diverse climates mitigates risks, enhancing profitability. With rising awareness of its nutritional benefits, demand is increasing, further bolstering its economic viability. Farmers exploring finger millet cultivation stand to benefit from both financial and nutritional perspectives.

Marketing channels of Finger millet from farmers to consumers

In the study area, farmers opt for three marketing channels. In Channel-I, producers sell their yield to local traders, who in turn vend to local wholesalers, retailers, and eventually to consumers. Approximately 70 per cent of farmers choose this channel.

In Channel-II, farmers sell directly to local traders, who then distribute to distant wholesalers, retailers, and consumers. Channel-III involves farmers selling to local traders, who pass it to small enterprises, then wholesalers, retailers, and finally consumers.

DISCUSSION

Despite achieving decent yields, these costs significantly reduce profit margins, leading to a low return on investment. The financial strain on farmers is exacerbated by the narrow gap between the expenses they incur and the revenue they generate from their

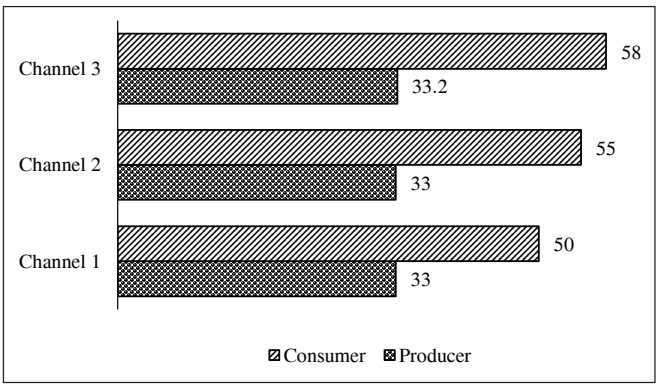

Figure 1. Producer-consumer price gaps in three channels

Table 1. Cost and returns of farmers in Finger millet cultivation

S.No.	Inputs	Particulars	Price(Rs)/acre
I.	CostA1		
1.	Land Preparation	Tractor Ploughing-1 hr 15 mins	1500
2.	FYM	2 tractor loads × 3000 (used for 2 Seasons or entire year)	3000
3.	Seed Cost	Rs. 60 × 6 kgs	360
4.	Seed Sowing (Broad casting)	1 ML × 500	500
5.	Irrigation	3 irrigtions × 1 ML × 500	1500
6.	Inorganic Fertilizer	DAP- 25 kg = 800, MOP-15 kg = 600, Urea- 90 kg = 560	1960
7.	Pesticides	Carbendazim + Mancozeb = 300 Tricyclazole = 250, Profenophos = 300, Pendimethalin = 450, 2-4-D = 200	1500
8.	Hand Weeding	3WL × 400	1200
9.	Harvesting	12WL × 300	3600
10.	Machine Threshing	Machine rent–15001ML × 500, 3WL × 350	3050
11.	Miscellaneous Expenses		700
12.	Total (Working Capital)		18870
13.	Interest on working capital @ 12 per cent		2120
14.	Depreciation on fixedassets		1283
15.	Land taxes		200
Total Cost A1	Interest on working capital + Depreciation on fixed assets	22473	
II. Cost A2			
1.	Rent paid for leased inLand		Nil
Total Cost A2	Total cost A1 + Rent paid forLeased in land	22473	
III. Cost B1			
1.	Interest on owned fixed capital assets @ 10%		1462
Total Cost B1	Total cost A2 + Interest on Onward fixed capital assets @ 10 %	23935	
IV. Cost B2			
1.	Rental value of ownedland		7578
Total Cost B2	Total cost B1 + Rental value of Owned land	31513	
V. Cost C1			
1.	Imputed value of householdlabour		1650
Total Cost C1	Cost B1 + Imputed value of Household labour	25585	
Cost C2	Cost B2 + Imputed value of Household labour	33163	
Cost C3	Cost C2 + 10% of C2	36479	
Yield	1100 kgs		
Output Price	34.50 Rs/kg		
By product (Straw)	2600 kgs × 2.70	7020	
Gross Return		44970	
Net Return		8491	
Return per Rupee		1.23	

produce. This situation highlights the vulnerability of small-scale farmers, who must navigate substantial costs with limited financial returns, often leading to minimal overall profits. Labor costs play a crucial role in Finger millet production. Sowing, irrigation, and weeding all require considerable labor input, often involving multiple rounds of work, each adding to the total cost. The use of inorganic fertilizers and pesticides, necessary for maintaining crop health and yield, further increases the financial outlay. These inputs, while essential for successful cultivation, contribute to the high variable costs that characterize Finger millet farming. Despite these efforts, the return on investment for Finger millet remains low. The revenue from selling produce often just covers the high production costs, leaving farmers with minimal profits. This narrow margin highlights the struggle small-scale farmer's face in balancing costs with the need to sustain their livelihoods. On the consumer side, the final price of agricultural products like Finger millet is prejudiced by an intricate set of influences throughout the supply chain. From the moment the product leaves the farm, it begins a journey that involves multiple stages, each contributing to the final price that consumers pay. Marketing costs, such as packaging, transportation, and maintenance, are incurred at each stage, adding to the initial purchase price set by the farmer. These costs are necessary to ensure that the product reaches the market in good condition, ready for sale. Intermediaries play a critical role in the supply chain, facilitating the product's journey from producer to consumer. However, their involvement comes with additional costs. To cover the risks, efforts, and investments associated with handling the product, intermediaries add their own profit margins. These margins, while necessary for their business operations, further increase the final price of the product. Logistical expenses, including the costs

Table 2. Marketing channel-I

Particulars	Price (Rs.)/kg		
	Channel I	Channel II	Channel III
Net price received by farmer	33	33	33.2
Marketing cost for the farmer			
Gunny bags for packaging	0.10	0.10	0.10
Loading and unloading	0.20	0.20	0.20
Transportation	0.20	0.30	0.30
Total marketing cost	0.50	33.5	33.5
Selling price for farmer	33.50	33.5	33.5
Purchase price of local trader	33.50		
Marketing cost of local trader		0.10	
Labour for loading	0.10	0.50	0.10
Transportation	0.20	0.60	0.50
Godown maintenance	0.14	6.90	-
Total marketing cost	0.44	41	0.60
Marketing margin of local traders/ small enterprise	6.06	41	6.90
Selling price of local trader/ small enterprise	40	42	41
Purchasing price of Local wholesaler/ small enterprise	40	42	41
Marketing cost of Local wholesaler/ Small enterprise			
Labour for unloading	0.10	0.10	0.10
Maintenance cost	0.25	0.30	0.30
Packaging	0.50	0.50	0.03
Total marketing cost	0.85	0.90	0.43
Marketing margin of Local Wholesaler	5.15	6.10	15.57
Selling price of Local wholesaler	46	49	57
Purchasing price of retailer	46	49	57
Marketing cost of retailers			
Transportation	0.20	0.40	0.40
Maintenance cost	0.20	0.20	0.35
Total marketing cost	0.40	0.60	0.75
Market margin of retailers	5.60	5.40	6.25
Selling price of retailers to consumers	50	55	58

of fuel, labor, and moving goods, are another significant factor driving up prices. Transporting agricultural products from rural farms to urban markets requires substantial resources, which are reflected in the final price consumers pay. These logistical costs are compounded by the need for multiple rounds of handling, as products are loaded, unloaded, and stored at various points along the supply chain. Value addition is another key factor in the price increase from producer to consumer. As the product moves through the supply chain, enhancements such as improved packaging, quality assurance, and other modifications are made to increase its marketability.

CONCLUSION

The economic challenges in Finger millet cultivation, coupled with rising consumer prices, reveal the complexities of agricultural supply chains. Farmers face high production costs, particularly in labor, inputs, and land preparation, leading to minimal profit margins despite decent yields. This underscores the vulnerability of small-scale farmers, who must navigate significant expenses with limited revenue. The final price of Finger millet is driven by multiple factors throughout the supply chain. Each stage adds costs, such as packaging, transportation, and marketing, while intermediaries include profit margins to cover their risks and investments. Logistical expenses, including fuel and labor, further increase the price. Value addition, such as improved packaging and quality assurance, justifies further price hikes. Market dynamics, including supply and demand, competition, and pricing strategies, also influence the final price, resulting in a significant increase from the producer to the consumer. This reflects the intricate processes involved in delivering a market-ready product.

REFERENCES

Angamuthu. M. (2022). *E-catalogue for export of Indian Millets: MOROCCO*. Agricultural and Processed Food Products Export Development Authority Ministry of commerce and industry, Government of India. https://apeda.gov.in/milletportal/files/Morocco_APEDA_Millets_Catalogue.pdf

Gupta, S. M., Arora, S., Mirza, N., Pande, A., Lata, C., Puranik, S., & Kumar, A. (2017). Finger millet: a "certain" crop for an "uncertain" future and a solution to food insecurity and hidden hunger under stressful environments. *Frontiers in Plant Science*, *8*(643), 1-11.

Jagati, P., Mahapatra, I., & Dash, D. (2021). Finger millet (Ragi) as an essential dietary supplement with key health benefits: a review. *International Journal of Home Science*, *7*(2), 94-100.

Karki, A., Chandra, A. Joshi, S. Rawat, P., & Sharma, S. (2020). An Overview of Finger millet (*Eleusine coracana* L.). *Journal of Pharmacognosy and Phytochemistry, 9*(4), 866-869.

Kumar, A., Tripathi, M. K., Joshi, D., & Kumar, V. (Eds.). (2021). *Millets and millet technology.* Singapore: Springer, 438.

Nagaraja, T. E., Parveen, S. G., Aruna, C., Hariprasanna, K., Singh, S. P., Singh, A. K., & Kumar, S. (2024). Millets and pseudo cereals: A treasure for climate resilient agriculture ensuring food and nutrition security. *Indian Journal of Genetics and Plant Breeding*, *84*(1), 1-37.

Rathore, T., Singh, R., Kamble, D. B., Upadhyay, A., & Thangalakshmi, S. (2019). Review on Finger millet: Processing and value addition. *The Pharma Innovation Journal*, *8*(4), 283-291.

Rafi, D., Laxmi, B., Charishma, E., & Babu, K. S. (2023). Strengthening millet value chain through farmer producer organizations. *Indian Journal of Extension Education*, *59*(3), 26-31.

Reddy, V. V., Venkataramana, M. N., Swamy, P. D., & Kumar, H. H. (2015). Economic analysis of marketing channels and efficiency of marketing of finger millet (Ragi) in Karnataka. *International Research Journal of Agricultural Economics and Statistics*, *6*(1), 27-31.

Sah, U., Dixit, G. P., Kumar, H., Ojha, J., Katiyar, M., Singh, V., & Singh, N. P. (2021). Performance of millets in Bundelkhand region of UP State. *Indian Journal of Extension Education*, *57*(4), 120-125.

Singh, K., Kumar, A., & Singh, R. (2018). Formulation of popped pearl millet (Pennisetum glaucum) bar and their nutritional and sensory attributes. *Indian Journal of Extension Education*, *54*(4), 153-158.

Singh, S., Mugdha, D., & Maya, D. (2024). Consumer demand, export and entrepreneurial opportunities of millets: An overview. *International Journal of Agricultural Extension & Social Development, 7*(4), 530-534.

Tamilselvan, T., Sharma, S., & Prabhasankar, P. (2023). Finger Millet (Eleusine coracana). *Nutri-Cereals: Nutraceutical and Techno-Functional Potential*.

Tandel, V. B. (2018). Cost structure and profitability of finger millet in south Gujarat Region. *International Journal of Agriculture Science, 10*(4), 5196-5198.

Trolio, J., Eckman, M., & Mehta, K. (2016). Leveraging globalization to revive traditional foods. *Journal of Sustainable Development*, *9*(6), 212.

Ministry of Commerce & Industry. (2022, February 8). Exports of millets to increase exponentially as Indian exporters find new markets. Government working aggressively to facilitate and boost exports. India is the fifth largest exporter of millets [Press Release]. https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1796514