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Economics and constraints faced by the finger millet growers in Ranchi district of Jharkhand

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Abstract

The present study was conducted pertaining to the agricultural year 2024-2025 with 120 finger millet farmers. The purposive simple stratified random sampling technique was adopted for the selection of total 120 farmers and further divided into three categories viz; marginal (below 1 ha), small (1.01 - 2.00 ha), semi-medium (2.01 - 4.00 ha) based on land size holding. Accordingly maximum number of respondents were in the category of marginal farms (72.50 per cent). The study reveals the total cost of cultivation per ha incurred by marginal farmers recorded lowest of Rs 6234.26/-, followed by small farms and it was highest for semi-medium farms and it comes to B: C ratio recorded highest for semi-medium farms 1.50 followed by marginal farms 1.40 and lowest by small farms 1.40; lack of irrigation facilities was found to the major constraints, followed by high cost of production, incidence of pests and disease, high weed infestation, high labour charge, damaging crop by wild animal non-availability of labour, lack of knowledge, high transportation charges, low market price.

Key words: Finger millet, trends, value addition, economics, constraints

Introduction

Finger millet is widely grown as a cereal in the arid areas of Africa and Asia. In India, it is commonly referred to as ragi. It is recognized for its health benefits and is considered rich in nutrients such as calcium, dietary fibre, protein and slow-releasing carbohydrates when compared to rice and wheat, which are regarded as essential for maintaining good health. In Jharkhand, finger millet-locally called Madua-is a crop deeply rooted in tribal and rural communities, where it's still widely grown as part of their traditional farming practices (Sharma, 2013; Das and Sharma, 2018; Sharma and Sharma, 2023). It is deeply rooted in the local food culture and continues to be a staple in many indigenous households. Due to its adaptability to Jharkhand's dry terrain, it serves as an important crop for food availability and nutritional support. In terms of economic and market dynamics, the market integration of finger millet crops will be studied to understand the interconnection of regional markets (Sharma and Kalita, 2004; Bahshi *et al.*, 2022).

Beyond its agricultural advantages, finger millet is also valued for its exceptional nutritional profile. It is one of the richest plant sources of calcium, and also provides iron, dietary fibre, antioxidants, and essential amino acids. With its low glycaemic index, it supports blood sugar control, making it ideal for people with diabetes. Value chain

analysis is conducted to examine the various stages in the supply chain where value can be added to a food product (Benjamen and Krishna, 2020). All the activities involved in taking a product from concept through production to delivery to consumers and disposal afterward are analyzed. These activities, along with influencing factors, significantly determine the product's overall value. Value chain analysis has increasingly been used as an important tool in recent research. The relationships involved in the production, exchange, transportation and distribution of a product are analyzed and described through this approach (Anon., 2024).

In rural areas, trade linkages are often found to be more complicated than those in traditional sectors like agriculture or horticulture, which limits the benefits that are received by collectors. To promote fair benefit-sharing, a value chain needs to be created. In terms of economic and market dynamics, the market integration of finger millet crops will be studied to understand the inter connect of regional markets. (Bey and Sharma, 2014a; Sharma, 2018). Forecasting and cross-analysis will be carried out to predict future trends in crop area and production, offering insights for better decision-making. Moreover, a SWOC analysis will be undertaken to identify the strengths, weaknesses, opportunities and threats in Jharkhand's agriculture, with suitable measures proposed to overcome infrastructural and related challenges. Similar studies were conducted by Dimashree *et al.*, 2023.

Research Methodology

For the selection of the present research study a ex-post facto research design was used critically analyse the economic and value addition performance of input deals in the study area. Jharkhand has 24 districts. Out of these, Ranchi has considerable area under finger millet cultivation. Ranchi district is one of the major contributors of finger millet production in Jharkhand. Therefore, Ranchi district was purposively selected for this research. As Ranchi district is one of the leading producers of finger millet in Jharkhand, so it was selected purposive for the study. There is total 14 (fourteen) blocks in Ranchi district of Jharkhand out of which five blocks are selected for this study viz; Angara, Bero, Bundu, Burmu and Ormanjhi. These blocks are further divided into 305 panchayats and numerous villages. Out of these 5 blocks were selected purposively namely Bundu, Burmu, Angara, Ormanjhi, and Bero. There is total 83, 84, 88, 77 and 91 villages in Angara, Bero, Bundu, Burmu and Ormanjhi block respectively. The respondents will be selected from each household engaged in finger millet cultivation whether for commercial purpose or substantial purpose. The study will be based on both primary and secondary data The Primary data will be directly collected with the help of interview schedules developed for the research purpose. The secondary data will be collected from the secondary sources viz; KVK, Directorate of Economics and Statistics Jharkhand, Statistical Handbook, journals, etc.;

Cost of cultivation

The cost of cultivation Finger millet will be worked out by using various cost-concept and the cost of production will be worked out by using following formula (Sharma, 2011) defined below:

Cost A_1 =Value of hired human Labor, value of hired and owned animal labor, value of hired and owned machine labor, value of seed (both farm seed and purchased), value of manures, (owned and purchased), and fertilizers, depreciation on fixed assets, irrigation charges (owned and purchased), land revenue, interest on working capital and miscellaneous expenses.

Cost A_2 = Cost A_1 + rent paid for leased in land,

Cost B_1 = Cost A_1 + interest of fixed capital (excluding land),

Cost B_2 = Cost B_1 + rental value of owned land + rent for leased in land ,

Cost C_1 = Cost B_1 + imputed value of family labor,

Cost C_2 = Cost B_2 + imputed value of family labor,

Cost C_3 = Cost C_2 + 10 per cent of cost C_2 as management cost.

It is the ratio of total cost incurred on finger millet production and physical output obtained on the sample farms. (Sharma, 2012; Dhakre and Sharma, 2009)

Cost of production (Rs/ha) =

Cost of cultivation (q /ha)/quantity of main product (q /ha)

Results and Discussion

Table 1 reveals the total cost incurred ranged from Rs 6,234.26/- for marginal farmers to Rs 38,521.38/- for semi-medium farmers. The cost was primarily driven by land preparation, sowing, and harvesting activities. Semi-medium farmers had the highest cost due to their larger scale of operations, while marginal farmers operated with minimal inputs and limited mechanization. The gross income was directly influenced by production. Semi-medium farmers earned the highest income of Rs 60,055.00/-, followed by small and average farmers. Marginal farmers, despite limited production (2.83 quintals), earned a modest Rs 9,309.42/-, respectively. Similar findings were reported by Vishandass *et al.*, 2018; Kumar and Sharma, 2023.

Table reveals the net return was highest for semi-medium farmers (Rs 21,533.62/-), reflecting economies of scale and better resource utilization. In contrast, marginal farmers earned Rs 3,075.16/-, showing that even with low input levels, they managed to achieve a positive return. B: C ratio indicates economic efficiency. Semi-medium farmers had the best ratio of 1.50, suggesting a return of Rs 1.50/- for every Rs 1.00/- spent. Marginal and small farmers also maintained profitable ratios of Rs 1.40/- and Rs 1.30/-, respectively. Similar findings were reported by Bey and Sharma, 2024b.

Table 2 reveals the constraints faced by farmers in cultivating finger millet. According to the table, the most significant challenge for farmers is the lack of irrigation, which has been ranked as the number one constraint with a mean score of 61.34. Jharkhand is a state where irrigation facilities are limited, and farmers largely depend on rainfall for agriculture. The second major constraint identified is the high cost of production, with a mean score of 57.86. Most of the farmers in Jharkhand are smallholders with very limited land. As a result, their cost of production tends to be higher. The third most important constraint, with a mean score of 57.44, is the incidence of pests and diseases. Farmers in Jharkhand usually grow finger millet for their own household consumption. Because of this, they often avoid using pesticides in their fields, which leads to a high occurrence of insect pests. The fourth constraint, with a mean score of 56.55, is the incidence of weeds. This too is related to the fact that finger millet is mainly grown for personal use and farmers typically don't invest in proper weeding or herbicide applications. Similar findings were reported by Sharma, 2015; Sharma, 2018; Sharma and Sharma, 2023.

Conclusion

The main conclusion of the finding is that the cultivation and promotion of finger millet in Jharkhand have been significantly constrained by various socio-economic and infrastructural challenges. Despite its recognition as a nutritionally

Table 1: Production Cost on different farm size groups (n = 120)

S.No.	Particulars	Marginal	Small	Semi-medium	Average
1.	Total Cost (Rs)	6234.26	23177.98	38521.38	22644.54
	i. Land Preparation	2893.90	10400.00	12481.25	8591.71
	ii. Seed Rate	143.22	342.08	1615.12	700.14
	iii. Sowing	1628.96	3197.92	9330.00	4718.95
	iv. Harvesting	1568.18	9238.00	15095.25	8633.81
2.	Profit (Rs)	3075.16	9108.22	21533.62	11239.00
3.	Production (q)	2.83	9.13	18.48	10.14
4.	Gross Income	9309.42	32286.21	60055.00	33883.54
5.	Net Return (Rs)	3075.16	9108.12	21533.62	11238.97
6.	B: C Ratio	1.40: 1	1.30: 1	1.50: 1	1.04: 1

Table 2: Constraints faced by the respondents (n = 120)

S.No.	Constraints	Garrett Mean Score	Rank
1.	Lack of irrigation facilities	61.34	I
2.	High cost of production	57.86	II
3.	Incidence of pest and disease	57.44	III
4.	High weed infestation	56.55	IV
5.	High labour charge	54.60	V
6.	Damaging crop by wild animal	48.83	VI
7.	Non-availability of labour	45.73	VII
8.	Lack of knowledge	45.29	VIII
9.	High transportation charges	40.81	IX
10.	Low market price	30.40	X

rich and climate-resilient crop, finger millet has not been widely adopted or supported in the region. Its production has been hindered by the lack of irrigation facilities, high cost of cultivation, pest and weed infestations, and poor access to markets and infrastructure. Limited awareness among farmers and consumers, as well as inadequate government support, has also contributed to the crop being underutilized. The value chain for finger millet has remained underdeveloped, with minimal involvement in value-added processing and marketing activities. However, initiatives undertaken by research institutions and government agencies-such as awareness campaigns, processing innovations, and entrepreneurship training-have shown potential to revive interest in millet cultivation. If these efforts are scaled up and supported with proper policy interventions, enhanced infrastructure, and capacity-building measures, finger millet's role in addressing nutritional security, climate resilience, and rural livelihoods can be significantly strengthened in the future.

Policy recommendation

1. Creating awareness about the importance of crop insurance to the farmers and encouraged the farmers to ensure their crops.
2. The government should establish high-capacity storage facilities in every block and create awareness among farmers about its use and benefits.

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