



Economic Analysis on the Production of Turmeric in Mamit District of Mizoram

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

The present study was conducted in Mamit district of Mizoram. Totally 90 respondents were randomly selected and interviewed from the district. The data was gathered in the form of a pre-structured interview schedule. The study revealed that the average cost of cultivation of turmeric per hectare was incurred Rs. 74929.55 which was found to be Rs. 78857.73, Rs. 74003.41, and Rs. 71927.53 per hectare on Small, Semi-medium, and Medium respectively. Input-output ratio related to cost C was (1:1.49) (1:1.66) and (1:1.89) on Small, Semi-medium, and Medium farmers respectively. When compared to medium farmers small farmers employed laborers for longer hours which resulted in a higher total cost of cultivation per ha.

Keywords: Turmeric; production cost; input-output ratio; cost.

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1. INTRODUCTION

Turmeric (*Curcuma longa*) is a perennial herbaceous plant belonging to the family Zingiberaceae, which is native to Southeast Asia [1]. For centuries, turmeric has been used in traditional medicine as a natural remedy for a variety of health conditions due to its anti-inflammatory, antioxidant, and antimicrobial properties [2]. The active ingredient in turmeric, curcumin, has been extensively studied for its potential therapeutic effects on various diseases, including cancer, arthritis, Alzheimer's disease, and diabetes [3]. Apart from its culinary uses, turmeric has been extensively studied for its potential health benefits. Curcumin, the active ingredient in turmeric, has been shown to have anti-inflammatory, antioxidant, and antimicrobial properties [1]. These properties make turmeric a potential natural remedy for a variety of health conditions. In addition to its potential therapeutic effects, turmeric has also been studied for its effects on cognitive function and mental health. A study published in the American Journal of Geriatric Psychiatry found that taking a daily dose of curcumin improved memory and mood in older adults [4]. Turmeric is an important medicinal and spice crop cultivated in India. Despite the potential health benefits of turmeric, it is important to note that it may interact with certain medications and may not be suitable for everyone [5]. India is the largest producer, consumer, and exporter of turmeric in the World. The marketing channels of turmeric in India have been the subject of much research in recent years. Several studies have examined the various aspects of the turmeric supply chain, including production, processing, distribution, and marketing [6-8]. These studies have focused on understanding the dynamics of the turmeric market, identifying the key players in the supply chain, and analyzing the factors that affect the efficiency and effectiveness of marketing channels [9,10]. Since it is a crop with a short gestation period, turmeric can be harvested within eight to nine months of being sown. Because of this, it is an appealing cash crop for marginal and poor farmers. Reiek, which is in the western part of Aizawl, has hills that have a gradual slope and good monsoon rains from May to September. More farmers are switching to turmeric cultivation as a result of the successful turmeric farming experiment in Reiek and the villages nearby. One of the most important cash crops of North East India is turmeric with Mizoram leading the way in terms of the highest productivity [11,12].

2. RESEARCH METHODOLOGY SAMPLING PROCEDURE

- 1st stage selection of districts
- 2nd selection of block
- 3rd selection of villages
- 4th selection of farmers/ respondents

2.1 Selection of Districts

Out of 11 districts present in the state of Mizoram, Mamit district was selected purposively, because of its major contribution towards the state's turmeric production. The district topography also favors the cultivation of turmeric as the soil and climate are best suited for the cultivation of turmeric.

2.2 Selection of Block

There are only 3 blocks in the district viz Reiek and west phaileng and zawlnuam. Reiek block was selected purposively for this study because of its climatic conditions and production of turmeric and moreover, it was easily accessible for the researcher to visit the block.

2.3 Selection of Villages

A complete list of all the villages was prepared with the help of Block Development Officer. Reiek, Khawrihnim, Chungtlang, and Ailawng villages were selected randomly for this study.

2.4 Selection of Sample Respondents

A comprehensive record of all individuals who cultivate turmeric was obtained from Reitlang Organic Producer Company Limited. Subsequently, the individuals were sorted in ascending order based on their turmeric cultivation practices and then categorized into different groups based on their cultivation. Based on turmeric cultivation for the study the size of the land holding farmers were classified into different groups.

Marginal farmers	: 0-1 hectare
Small farmers	: 1-2 hectare
Semi-medium farmers	: 2-4 hectares
Medium farmers	: 4-10 hectare
Large farmers	: above 10 hectares

3. ANALYSIS OF DATA

3.1 Measures of Cost Concept

The different cost items that are included under each cost concept are detailed below with their procedures.

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- Plantation cost: land preparation + cost of plant +planting material + Tools and other input. •
- Fixed cost: Land revenue + Depreciation + Interest on fixed capital + Plantation cost+ Rental value of land.
- Variable cost: Cost of input used including labour + Interest on Working capital + Maintenance cost
- Maintenance cost: After the establishment cost turmeric growers incur expenditure on year regular basis for maintenance.

Total cost = Fixed cost + variable cost

3.2 Measures of Farm Profitability

Gross income = per quintal price X yield per hectare in quintal

Net income = Gross income – Cost C

Input-output ratio (cost-benefit ratio) = Cost C - Gross income

4. RESULTS AND DISCUSSION

The economic analysis on turmeric production in Mamit district revealed that the average cost of

cultivation per hectare was Rs. 74929.55. The cost of cultivation varied among different categories of farmers, with small, semi-medium, and medium farmers incurring Rs. 78857.73, Rs. 74003.41, and Rs. 71927.53 per hectare, respectively. The study also found that the input-output ratio related to cost C was 1:1.16, indicating that for every rupee spent on cultivation, the farmers received a return of Rs. 1.16.

The study highlights the importance of turmeric cultivation in the district, as it provides a source of income for the farmers and contributes to the local economy. The findings of the study can be used to develop strategies to improve the profitability of turmeric cultivation and to promote the use of turmeric as a natural remedy for various health conditions.

In conclusion, the economic analysis on turmeric production in Mamit district provides valuable insights into the cost of cultivation and the input-output ratio related to cost C. The study emphasizes the need for further research to explore the potential benefits of turmeric cultivation and to develop strategies to improve the profitability of turmeric farming in the region.

Table 1. Cost of cultivation of turmeric per hectare for Small farmers

Sl. No.	Items of Expenditure	Rs/ha
A	Operational cost	
1.	Labor Cost	19850.00
(i)	Land preparation	7000.00
(II)	Irrigation	350.00
(III)	Harvesting	10000.00
(Iv)	Drying	1250.00
(v)	Crushing	1250.00
2.	Machinery Labour	3500.00
	Total operational cost	23350.00
B.	Material cost	
1.	Rhizomes	27500.00
2.	Fertilizers	625.00
3.	Plant protection	650.00
	Total material cost	28775.00
C.	Other costs	
1.	Land revenue paid	395.00
2.	Miscellaneous charges	350
3.	Interest on working capital @7.5 p.a	3151.53
4.	Depreciation on fixed resources	1150.50
5.	The rental value of Land	19714.28
6.	Interest on fixed capital @10 %	1971.42
	Total other cost	26732.73
	Total cost (A+B+C)	78857.73

Table 2. Cost of cultivation of turmeric per hectare for Semi-medium farmers

Sl. No.	Items of Expenditure	Rs/ha
A	Operational cost	
1.	Labor Cost	17839.00
(i)	Land preparation	6000.00
(II)	Irrigation	339.00
(III)	Harvesting	9500.00
(IV)	Drying	1000.00
(v)	Crushing	1000.00
2.	Machinery Labour	3000.00
	Total operational cost	20839.00
B.	Material cost	
1.	Rhizomes	24750.00
2.	Fertilizers	610.00
3.	Plant protection	630.00
	Total material cost	25990.00
C.	Other costs	
1.	Land revenue paid	379.00
2.	Miscellaneous charges	350
3.	Interest on working capital @7.5 p.a	2816.85
4.	Depreciation on fixed resources	1000.00
5.	The rental value of Land	20571.42
6.	Interest on fixed capital @10 %	2057.14
	Total other cost	27174.41
	Total cost (A+B+C)	74003.41

Table 3. Cost of cultivation of turmeric per hectare for Medium farmers

Sl. No.	Items of Expenditure	Rs/ha
A	Operational cost	
1.	Labor Cost	15799.00
(i)	Land preparation	5500.00
(II)	Irrigation	299.00
(III)	Harvesting	8400.00
(IV)	Drying	800.00
(v)	Crushing	800.00
2.	Machinery Labour	2600.00
	Total operational cost	18399.00
B.	Material cost	
1.	Rhizomes	23100.00
2.	Fertilizers	605.00
3.	Plant protection	600.00
	Total material cost	24305.00
C.	Other costs	
1.	Land revenue paid	360.00
2.	Miscellaneous charges	350
3.	Interest on working capital @7.5p.a	2577.33
4.	Depreciation on fixed resources	950.50
5.	The rental value of Land	22714.28
6.	Interest on fixed capital @10 %	2271.42
	Total other cost	29223.53
	Total cost (A+B+C)	71927.53

The data revealed that per ha cost of cultivation of turmeric Rs. 78857.73 which included Rs 23350.00 operational cost and Rs. 28775.00 material cost. The highest investment was done in rhizomes (Rs 27500.00) and labor costs (Rs 19850.00). The cost of cultivation estimated

Table 4. Profitability of cultivation of turmeric per hectare in different farm groups

Sl. No	Particulars	Size of farm Groups			Average
		Small	Semi-medium	Medium	
1.	Production (quintals)	27.6	28.8	31.8	29.4
2.	Total Cost (Rs)	78857.73	74003.41	71927.53	74929.55
3.	Gross Return (Rs)	118285.71	123428.57	136285.71	125999.99
4.	Net Return (Rs)	39427.98	49425.16	64358.18	51070.44
5.	Benefit Cost Ratio (B.C Ratio)	1:1.49	1:1.66	1:1.89	1:1.68

per ha for turmeric by semi-medium farmers was Rs. 74003.41. The operational cost amounted to Rs. 20839.00 and the material cost was determined to be Rs 25990.00. For semi-medium farmers, the major portion of Profitability in the cultivation of Turmeric. investment was attributed to rhizomes and rental value of land and the cost of cultivation per ha for turmeric in the case of medium farmers was Rs. 71927.53 in which the operational cost and material cost was calculated to be Rs. 18399.00 and Rs. 24305.00 respectively. The expenditure of medium farmers was found to be high in rental value of land and rhizomes.

In this research overall estimated Gross Return of turmeric was Rs/ha 125999.99 and obtained Net Return was Rs/ha 51070.44. The benefit received on per rupee investment was 1:1.68. Across farm size of holdings, the Gross Return of Turmeric was varied from Rs/ha 118285.71 to Rs/ha 136285.71 of small to medium farmers. The obtained Net Return was ranging from Rs/ha 39427.98 to Rs/ha 64358.18 of small to medium farmers. The Benefit-Cost ratio was 1:1.49, 1:1.66 and 1:1.89 for small, semi-medium and medium farmers respectively. The average of Net Return was found to be Rs 51070.44 per hectare. It is conforming from the findings that medium farmers were more efficient than that of small and semi-medium farmers because of good management and supervision in the cultivation of turmeric.

5. CONCLUSIONS

The study of the production of turmeric in Mamit district, Mizoram, revealed some interesting findings. The total costs of production of turmeric per hectare are Rs. 78857.73, Rs. 74003.41, and Rs71927.53 for small, semi-medium, and medium farmers respectively, and the estimated net return was higher for semi-medium and medium farmers when compared to small farmers owing to the fact that they made a higher expenditure on quality rhizomes and yield

enhancing resources like manure and fertilizers. Due to the availability of resources, semi-medium and medium farmers applied irrigation more times as opposed to small farmers who were mostly dependent on rainfall for irrigation purposes. From this, it is clear that medium farmers earn more profit than small and semi-medium farmers.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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