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An Economic Analysis Of Sesame (Sesamum Indicum L.) Cultivation In Jawadhu Hills Of Tamil Nadu

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Abstract:
Sesame is one of the most ancient oilseed crops, cultivated widely in marginal and tribal regions for its adaptability, nutritional value, and economic potential. In Tamil Nadu's Jawadhu Hills, tribal farmers rely on sesame as a key cash crop. However, despite its potential, sesame cultivation is often constrained by several technical, economic, and infrastructural challenges that hinder productivity and profitability. The present study was conducted to estimate the costs and returns of sesame cultivation and to identify the major production constraints faced by tribal farmers in the region. A multi-stage stratified random sampling method was adopted to select 320 sesame-growing farmers from 16 villages in the Jawadhu Hills block of Tiruvannamalai district. Primary data were collected through pre-tested interview schedules, and appropriate analytical tools were employed. The cost concept approach was used to analyze economic viability, while Garrett's Ranking Technique was applied to assess constraints. The results revealed that the total cost of cultivation per acre was Rs. 14,379.80, with a net return of Rs. 8,870.20 and a return per rupee of Rs. 1.62, indicating moderate profitability. The key production constraints identified were lack of industrial support, poor seed quality, labour shortages, and limited irrigation facilities. These findings highlight the need for policy interventions, including quality input supply, irrigation development, and agro-industrial linkages. This study underscores the importance of targeted support mechanisms to enhance sesame cultivation and tribal livelihoods in marginal ecosystems like the Jawadhu Hills.
Keywords: *Sesame cultivation, tribal farmers, cost and returns, garrett ranking technique.*

1. INTRODUCTION:

Sesame (Sesamum indicum L.) is one of the oldest oilseed crops known to humanity and holds significant economic and nutritional value. It is highly adaptable to various agro-climatic conditions and is commonly cultivated in marginal and tribal areas, including the hilly regions of Tamil Nadu. In the Jawadhu Hills, sesame serves as a key cash crop for tribal farmers, contributing substantially to their livelihoods and local agricultural economy. Alongside other traditional crops like paddy, little millet and horse gram, sesame cultivation forms an integral part of the tribal farming system in the region. However, the profitability of sesame cultivation among tribal farmers has been adversely affected by numerous constraints. According to Vasanthapriya R. et al. (2017), studies conducted in the Jawadhu Hills reveal that sesame farmers face a wide array of challenges such as, Technical constraints, such as water scarcity, lack of good quality seeds and inadequate training; Labour-related issues, including non-availability of labour and high labour costs and Economic constraints, such as the high cost of fertilizers and absence of a minimum support price policy. These challenges severely impact sesame yields and reduce farm profitability, thereby undermining the economic stability of tribal households. In this context, the present study was undertaken to analyze an economic analysis on sesame (Sesamum indicum L.) Cultivation in Jawadhu Hills of Tamil Nadu. The specific objectives of the study are:

1. To estimate the costs and returns of sesame cultivation in the study area.
2. To identify the constraints faced by tribal farmers in sesame cultivation in the study area.

2. LITERATURE REVIEW:

Sesame cultivation has demonstrated promising profitability for smallholder farmers, particularly in regions like India and Nigeria. Studies have consistently reported positive net returns from sesame

farming, though labour costs remain the dominant component of total production expenses (Tahir et al., 2021).

The adoption of improved agricultural technologies and high-yielding varieties has been found to significantly enhance both yield and profitability when compared to traditional cultivation methods (Vijay Kumar et al., 2023).

In Tamil Nadu, India, for example, the TMV 7 variety has shown superior performance over other varieties in terms of yield as well as the benefit-cost ratio, indicating its economic advantage for farmers (Kathiravan et al., 2024).

In Kerala, farmers frequently report challenges such as high labour costs, unpredictable rainfall patterns including drought and excessive rain, along with serious weed infestation and pest and disease outbreaks (Sreepriya & Girija, 2020).

Similarly, in the Onattukara region, constraints like limited access to quality seeds, high input costs, consistently low yields, and price volatility significantly hinder both sesame production and marketing (Kumar Charan Krishna et al., 2024).

Additionally, studies focusing on tribal farming communities in Tamil Nadu reveal constraints that extend beyond sesame cultivation, including insufficient pasture land, limited access to credit, and unremunerative prices for livestock products, thereby affecting the broader agricultural economy (Meganathan et al., 2010).

3. MATERIALS AND METHODS:

3.1. Sampling Design:

A multi-stage stratified random sampling procedure was employed for the present study. In the first stage, the district was selected; the blocks within the district formed the second stage. The villages within the selected blocks represented the third stage, and the sesame-growing farmers in the selected villages constituted the fourth and final stage of sampling. Tiruvannamalai district of Tamil Nadu was purposively selected, as it is one of the districts with a considerable area under sesame cultivation by tribal farmers. Within the district, Jawadhu Hills block was chosen due to its prominence in sesame cultivation. From this block, villages with sesame cultivation area above the mean were identified and listed. Out of these, sixteen villages were randomly selected for the study. From the selected villages, a total of 320 sesame-growing farmers were chosen using a probability proportionate sampling method with the aid of random number tables. Primary data related to the cost of cultivation and socio-economic characteristics of the sample farmers were collected through a comprehensive and pre-tested interview schedule.

3.2. Tools and techniques:

The collected data were systematically processed and tabulated for further analysis. Based on the objectives of the study, suitable analytical tools were employed. The Cost Concepts prescribed by the Commission for Cost and Prices method was adopted to estimate the cost of cultivation. To examine the constraints faced by farmers, the Garrett Ranking Technique was used.

3.2.1. Estimation of Costs and Returns

The cost concept approach is widely used in India for evaluating crop profitability in production. The cost concept approach is widely used to assess crop profitability. In a study conducted on groundnut cultivation in Tamil Nadu, the researchers used the above cost concept framework (Cost A1, A2, B, and C) to evaluate profitability (Ramamoorthy, K., et al., 2025). For this study, the cost components considered include Cost A_1, A_2, B and C which capture both paid-out and imputed costs relevant to production economics.

The cost concepts in brief, are Cost A_1, A_2, Cost B and Cost C.

Cost A_1 = This gives the total cash expenses incurred by the owner or operator.

Cost A_2 = Cost A_1 + Rent paid for leased in land, if any

Cost B = Cost A2 + interest on the value of owned fixed capital assets such as machinery, implements, and farm buildings (excluding land).

Cost C = Cost B + imputed value of family labour.

3.2.2. Garrett Ranking

Garrett's Ranking Technique has been extensively used to analyze constraints in various agricultural studies. For example, it was applied in a recent study to identify and prioritize constraints faced by sesame farmers in the Onattukara region (Krishna et al., 2025). To analyze the problems encountered by respondents in the production of sesame at Jawadhu hills, the Garrett Ranking Technique was employed.

This method involves converting the ranks assigned by respondents into scores using the following formula:

$$\textbf{Percent position} = \mathbf{100} \times \frac{\mathbf{(Rij - 0.5)}}{\mathbf{Nj}}$$

Where, Rij = rank given to i^{th} constraint by the j^{th} individual and Nj = number of constraints ranked by the j^{th} individual.

The calculated percent positions were then converted into corresponding Garrett scores using the standard Garrett conversion table. For each factor, the scores from all respondents were summed and then averaged to obtain the mean Garrett score. Based on these mean scores, the constraints were ranked in descending order, thereby identifying the most significant problems faced by farmers.

4. RESULT AND DISCUSSION:

4.1. Cost and Returns of Sesame Cultivation

The cost incurred in the cultivation of sesame and returns obtained are presented in Table 1. The findings from the above table clearly show that the variable cost (Cost A_1) for cultivating one acre of sesame was Rs.10,486.80, accounting for 72.93 per cent of the total cost of cultivation. Among the various components, organic manure constituted the highest share at 25.52 per cent, followed by machine labour (16.34 per cent), harvesting and threshing (13.49 per cent), seeds (5.63 per cent), transport cost (3.34 per cent) and miscellaneous expenses (3.20 per cent).

Table 1. Cost of Cultivation of Sesame

(in Acre)

S. No	Inputs	Cost (Rs. /acre)	Per cent
I.	**Cost A_1**		
1)	Land preparation		
1.	Machine labour	2,350.00	16.34
2.	Seeds	810.00	5.63
3.	Organic manure	3,670.00	25.52
4.	Harvesting and Threshing	1,940.00	13.49
5.	Transport cost	480.00	3.33
6.	Miscellaneous expenses	460.00	3.20
	Sub Total	**9,710.00**	**67.52**
7.	Interest on working capital @8 per cent	776.00	5.40
	Cost A_1	**10,486.00**	**72.93**
8.	Rent paid for leased – in land	-	
II.	**Cost A_2**	**10,486.00**	**72.93**
9.	Rental value of owned land	1,550.00	10.78
10.	Land revenue	35.00	0.25
11.	Interest on fixed capital @ 10 per cent	158.00	1.09
III.	**Cost B**	**12,229.00**	**85.05**
12.	Family labour	2150.00	14.95
IV.	**Cost C**	**14,379.00**	**100.00**

13.	Price per kg	75.00/kg	
14.	Yield	310 kg	
15.	Gross return	23,250.00	
VI.	**Net return**	**8,871.00**	
VII.	**Return per rupee investment**	**1.61**	
VIII.	**Cost of production (Rs. / Kg)**	**46.38**	

Note: Figures in the parentheses represent percentages to the respective totals

An interest of Rs.776.80 on working capital (8 per cent) was also included, contributing 5.40 per cent to the total cost. As only an insignificant number of farmers were cultivating sesame on leased-in land, rent paid was not considered in the cost calculation. Most of the farmers cultivated sesame on owned land, and the average imputed rental value of owned land was Rs.1,550.00 (10.78 per cent). Along with land revenue (Rs.35.00) and interest on fixed capital (Rs.158.00), the Cost B was estimated at Rs.12,229.80, accounting for 85.05per cent of the total cost of cultivation. The imputed value of family labour was Rs.2,150.00 (14.95 per cent), bringing the total cost of cultivation (Cost C) to Rs.14,379.80.

The average yield of sesame obtained was 310 kg per acre, and the average price received by the farmers was Rs.75.00 per kg, resulting in a gross return of Rs.23,250.00 per acre. After deducting the total cost, the net return stood at Rs.8,870.20 per acre. The cost of production was estimated at Rs.46.39 per kg, and the return per rupee of investment was Rs.1.62, indicating that sesame cultivation in the study area was economically viable and profitable under current conditions.

4.2. Problems Encountered by tribal farmers in production of Sesame

Table 2. Constraints in Production of Sesame faced by Tribal Farmers.

S. No	Constraints	Mean Score	Rank
1.	Inadequacy of Labour	61	III
2.	Lack of irrigation facility	52	IV
3.	Lack of availability of good quality seed	67	II
4.	Lack of Industrial support	78	I
5.	High cost of seed	48	V

The constraints faced by tribal farmers in sesame production, as identified through Garrett's Ranking Technique, reveal several key challenges. Lack of industrial support emerged as the most critical issue (mean score: 78), indicating the absence of processing units, institutional backing, or value chain linkages to support sesame cultivation. This was followed by the unavailability of good quality seeds (mean score: 67), which limits yield potential and crop performance. The shortage of labour (mean score: 61) further hampers timely field operations, while the lack of irrigation facilities (mean score: 52) highlights the dependence on rainfall in these tribal hilly regions. Though comparatively less severe, the high cost of seeds (mean score: 48) still adds to the input burden for smallholder farmers. These constraints collectively emphasize the need for policy support in seed distribution, irrigation infrastructure, labour solutions, and development of sesame-based agro-industries to improve the viability of sesame farming in tribal areas.

CONCLUSION:

The present study has highlighted both the economic potential and critical challenges associated with sesame cultivation by tribal farmers in the Jawadhu Hills of Tamil Nadu. With an average net return of Rs. 8,870.20 per acre and a return per rupee investment of Rs. 1.62, sesame farming demonstrates moderate profitability under existing conditions. However, this potential is significantly constrained by systemic issues such as the lack of industrial support, unavailability of quality seeds, limited irrigation,

and labour shortages. These barriers restrict yield improvements and discourage wider adoption among tribal farmers, ultimately affecting their income and livelihood security. The findings call for strategic interventions including strengthening seed distribution systems, enhancing irrigation infrastructure, promoting rural labour support programs, and facilitating value chain linkages through agro-industrial development. Addressing these constraints can greatly enhance sesame productivity and farm incomes in tribal regions. Therefore, policies must be tailored to the socio-economic realities of tribal communities to make sesame cultivation a more sustainable and profitable enterprise.

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