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An Economic Analysis on Little Millet (*Panicum sumatrense*) Cultivation in Jawdhu Hills of Tamil Nadu

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Minor millets are most important crop in semi- arid tropics of Asia and Africa (especially in India, Nigeria and Niger), with 97 per cent of production in developing countries. These minor millets are grown in almost all the regions of India but their distribution is not uniform. Among them, little millet which is widely cultivated in Tamil Nadu, Karnataka, Andhra Pradesh, Orissa, Bihar, Madhya Pradesh and Maharashtra especially in hilly areas by tribal farmers. According to recent studies carried out by [1-3], the cultivated area of little millet has been decreasing for the past 30 years due to various constraints related to production. The lack of availability of good quality seed, lack of irrigation facilities, lack of adequate trainings, lack of availability of specific plant protections recommendation are some of the constraints affecting production of little millet. At the same time, the demand for little millet has been increasing every year due to increasing awareness about nutritional benefits of little millet among consumers [4]. At this juncture, the study on economic analysis on production of little millet was carried out with the following specific objectives:

1. To estimate costs and returns of little millet cultivation in the study area.
2. To identify the constraints in production of little millet and offer policy suggestion based on the results of the study.

Sampling design

A multi-stage stratified random sampling procedure was adopted for the study. The district forms the first stage unit and the blocks in the district form the second stage of sampling. The villages in the selected blocks from the third stage and the little millet growers in the selected villages form the fourth and the ultimate unit of the sampling. Tiruvannamalai district of Tamil Nadu was purposively selected because it is one of the districts in the state where the area under little millet cultivation by tribal farmers is high.

Jamunamarathur block of Tiruvannamalai district was selected because it has maximum area under little millet cultivation in the district. From the selected block the villages which were having the little millet cultivated area above the mean were listed and among them sixteen villages were identified randomly. From the selected villages, 320 farmers were identified as sample farmers based on probability proportionate method by using random numbers tables. The primary data related to cost of cultivation and socio-economic details were collected through the comprehensive pre- tested interview schedule. The secondary data for the study were collected from Office of the Joint Director of Agriculture and District Statistical Office, Tiruvannamalai.

Tools of analysis

The data collected were processed and tabulated for subsequent analysis. Keeping in view the objectives of the study, appropriate tools were employed to analyze the data. The CCPC method of cost of cultivation was followed for the study and to analyse constraints, Garrett ranking technique was followed.

Garrett Ranking Technique

Garrett's ranking technique was used to analyze the problems, expressed by the respondents in the production of little millet. The order of merit given by the respondents was converted into ranks using the formula:

$$\text{Per cent position} = \frac{100 (R_{ij} - 0.5)}{N_j}$$

Where;

R_{ij} - rank given for i^{th} factor by the j^{th} respondent

N_j - Number of factors ranked by j^{th} respondent

The per cent position of each rank thus obtained was converted into scores by referring to the table given by Garrett. Then for each factor, the scores of individual respondents were added together and divided by total number of respondents from whom the scores were added. These mean scores for all the factors were arranged in ascending order and ranks were assigned and important constraints identified were:

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1. Inadequacy of labour
2. Lack of availability of good quality seed
3. Lack of irrigation facility
4. Lack of institution support
5. Lack of awareness on plant protection method and
6. Yield loss due to inconsistent climate condition.

Table 1 Cost of cultivation of little millet (in Acre)

S. No	Inputs	Cost (Rs. /acre)	Per cent
I.	Cost A ₁		
1)	Land preparation		
1.	Machine labour	2,250.00	16.60
2.	Seeds	780.00	5.76
3.	Organic manure	3,600.00	26.56
4.	Harvesting and Threshing	1,800.00	13.28
6.	Transport cost	400.00	2.95
7.	Miscellaneous expenses	250.00	1.84
	Sub Total	9,080.00	
8.	Interest on working capital @ 8 per cent	694.00	5.12
	Cost A ₁	9,774.00	72.12
9.	Rent paid for leased – in land	-	-
II.	Cost A ₂	9,774.00	72.12
10.	Rental value of owned land	1,500.00	11.07
11.	Land revenue	25.00	0.18
12.	Interest on fixed capital @ 10 per cent	152.00	1.13
III.	Cost B	11,451.00	84.50
13.	Family labour	2,100.00	15.50
IV.	Cost C	13,551.00	100.00
14.	Price per kg	39.00/kg	
15.	Yield	440kg	
16.	By- products	150.20	
17.	Gross return	17,160.00	
VI.	Net return	3,609.00	
VII.	Return per rupee investment	1.27	
VIII.	Cost of production (Rs. / Kg)	30.80	

Cost and returns of little millet cultivation

The cost incurred in the cultivation of little millet and returns obtained are presented in (Table 1). From the above table, that the findings of the analysis showed clearly that the one-acre variable cost of little millet was Rs. 9774/acre (cost A₁). The organic manure cost is a major variable cost accounted with 26.56 per cent followed by machine labour (16.60 per cent), harvesting and threshing (13.28 per cent), seeds (5.76 per cent), interest on working capital (5.12 per cent), Transport cost (2.95 per cent), miscellaneous expenses (1.84 per cent) and the total variable cost of little millet (Cost B) was 72.12 per cent to the total cost [5-6]. Only insignificant number of farmers in the study area cultivating leased in land, hence it was not considered as factor to work out in cost of cultivation. Most of the farmers were cultivating their owned land and average imputed rental value of owned land was Rs. 1,500 (11.07 per cent) in the study area [7-8]. The cost B included with rental value of owned land, land revenue and interest on fixed capital was Rs. 11,451 which was 84.50 per cent to the total cost of cultivation. The average imputed value of family labour was Rs. 2, 100 (15.50 per cent) and the total cost of cultivation total cost C was Rs. 13,551 [9]. The

average yield of little millet obtained was 440 kgs per acre and the average price received by the sample farmers in the study area was Rs. 39/kg. The one-acre gross return was Rs. 17,160 and the net return was Rs. 3,609. Hence cost of production per kg of little millet was 30.80 per kg. Thus, the return per rupee of investment was work out to be 1.27 [10].

Problems encountered by farmers in production of little millet

An attempt was made to identify the problems in production of little millet and results are presented in (Table 2) along with the ranks assigned to them by the Garret's ranking technique. Among the constraints is production of little millet faced by farmers in the study area, inadequacy of labour ranked first with the mean score of 65, followed by lack of availability of good quality seed (mean score: 60), lack of irrigation facility (mean score: 48), lack of institution support (mean score: 44) [12]. Among the identified constraints, lack of awareness on plant protection methods and yield loss due to inconsistent climate condition were the least factors affecting production at the same level (Rank V) with the mean score of 41.

Table 2 Constraints in production of little millet faced by tribal farmers

Constraints	Mean Score	Rank
Inadequacy of Labour	65	I
Lack of availability of good quality seed	60	II
Lack of irrigation facility	48	III
Lack of institution support	44	IV
Lack of awareness on plant protection methods	41	V
Yield loss due to inconsistent climate condition	41	V

SUMMARY

Little millet (*Panicum sumatrense*) which is widely cultivated in Tamil Nadu, especially in hilly areas by tribal farmers. But, the cultivated area of little millet has been decreasing for the past thirty years due to various constraints related to production. At this juncture, the study on economic analysis on production of little millet was carried out with the specific objectives of; (i) to estimate costs and returns of little millet cultivation in the study area and (ii) to identify the constraints in production of little millet and offer policy suggestion based on the results of the study. Jamunamarathur block of Tiruvannamalai district was selected for the study and 320 farmers were identified as sample farmers based on probability proportionate method. The CCPC method of cost of cultivation was followed and to analyze constraints, Garrett ranking technique was followed. From the results, it was concluded that average cost of cultivation as well as their returns were low among the sample farmers and most of the farmers were utilizing family labour to minimizing total cost

of cultivation. Among the constraints, inadequacy of labour ranked first followed by lack of availability of good quality seed. This study suggested that by providing suitable machineries, irrigation facilities and good quality seed through subsidized credit, the production of little millet in the study area may be enhanced. In the study area, little millet was cultivated as rain fed crop, hence average cost of cultivation as well as their returns were low among the sample farmers. Most of the farmers were utilizing family labour to minimizing total cost of cultivation. But still the result of constraints analysis showed that inadequacy of labour is a major constraint affecting production of little millet in the study area. The major reason behind is most of the farmers want to maintain their social status among their tribal communities. By providing suitable machineries, irrigation facilities and good quality seed through subsidized credit, the production of little millet in the study area may be enhanced. By strengthening institutional support through agricultural department, the production knowledge especially related to plant protection will be improved in the study area.

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