

Original Research Article

An Economic Analysis on Production of Hill Banana in Dindigul District of Tamil Nadu

ABSTRACT

This study was primarily concentrated on the hill banana cultivation. The purpose of this study is to find the economics of the hill banana cultivation and the problems faced by the hill banana farmers during the production of hill banana in the Dindigul district of Tamil Nadu. Economics of the hill banana cultivation was done by finding the cost and returns associated with the hill banana cultivation and constraints faced by the hill banana farmers with the Garrett's ranking technique. Many previous research on the production of various agricultural commodities were focused on a specific area and/or a specific commodity. There was little study on banana production and limitations in some regions in Tamil Nadu. As a result, the focus of this research will be on hill banana production in the Dindigul district. Purposive and convenience sampling technique was used in this study. Primary data were collected by the personal interview with a well-structured interview schedule. The cost and returns of hill banana were calculated per hectare. The average cost of production of hill banana was estimated to be ₹2.04 lakh/ha. Average gross return was ₹5.04 lakh/ha and average net return was estimated to be ₹2.99 lakh/ha. The result of the study shows that hill banana cultivation was highly profitable and the benefit cost ratio (BC Ratio) was more than unity (2.46). The major constraints faced by hill banana farmers in the cultivation of hill banana were pest attack (insects) followed by disease attack, lack of labour availability, animal attack and drought. The findings will assist policymakers in developing appropriate programmes and adjusting strategies for improving hill banana production in Tamil Nadu.

Keywords: hill banana, economic analysis, cost and returns, production constraints and Garrett's ranking.

1. INTRODUCTION

India is one of the world's largest producers of agriculture goods, second only to china in terms of fruits and vegetables. India has a variety of agroclimatic conditions that are ideal for producing nearly all types of horticulture crops, including tropical, subtropical, and temperate crops. Globalization has created several possibilities and difficulties for Indian trade. India produced 145.8 million tonnes of horticultural crops in 2002 and 311.7 million tonnes of horticultural crops in 2018, demonstrating the country's remarkable rise in horticulture production. In 2018, India's fruit crops contributed around 31.2 per cent of overall horticulture production. Based on the area under cultivation in 2018, mango (2.258 million ha) ranks first, followed by citrus (1.003 million ha) and banana (0.884 million ha). Based on production amount, banana (30.81 million tonnes) ranks first, followed by mango (21.82 million tonnes) and citrus (12.55 million tonnes) [1]. India, being the world's top producer of fruits and vegetables, plays a significant role in the commodity commerce on a global scale.

In India, banana is the most important horticultural crop. It is a significant crop in India and across the world, with a unique growing technique and trading procedures developed by various types of farmers (small, medium, large size). In India, mostly they belonged to fertile land. At current scenario, India is the largest banana producing country in the world and has produced about 30.81 million tonnes of banana in the year 2018. India contributes about 27% to the total world banana production and followed by China (9.7%) and Indonesia (6.3%). Brazil, Ecuador, Philippines, Gautemala, Colombia, Angola and Tanzania are some of the leading banana producing countries in the world [2].

1.1 Production Status of Banana in India and Tamil Nadu

In India, Andhra Pradesh stands first in the banana production with 5.01 million MT. Andhra Pradesh (16.24 per cent), Gujarat (14.52 per cent), Maharashtra (13.66 per cent), Tamil Nadu (10.41 per cent) and Uttar Pradesh (10.3 per cent) are the top five states account for 65 per cent of the country's total banana production. With 0.11 million hectares under banana production, Karnataka ranks top in India, accounting for 12.51 per cent of overall banana cultivation. followed by Kerala (12.36%), Andhra Pradesh (10.1%), Tamil Nadu (9.35%) and Maharashtra (9.15%). India has witnessed a 2.1% and 4.8% growth in the area under cultivation and production of banana respectively in 2018 over the year 2017. Among the states growing banana Madhya Pradesh has the highest productivity of 69.54 MT/Ha. In Tamil Nadu, banana is one of the trinity of fruits (the others being mango and jackfruit). The state's banana crop covers 0.089 million hectares and produces 3.21 million tonnes. In Tamil Nadu, banana productivity is 38.79 MT/ha. The major banana-growing districts in Tamil Nadu include Trichy, Coimbatore, Tuticorin, Erode, Kanniyakumari, Dindigul, Theni, Tiruvannamalai, and Tirunelveli [1].

1.2 ABOUT HILL BANANA

Hill banana (AAB) is only found in the lower Pulney hills of Tamil Nadu. This is a rain-fed horticulture crop that grows between 3000 and 4500 feet above mean sea level. The most unique feature of this fruit is that it only thrives on virgin soil with a neutral to slightly acidic Ph range and a high humus content. It grows on the slopes and valleys of mountains. Another distinguishing trait of this fruit is that it retains clusters and takes only 18 months to produce. The crop is generally farmed organically, and it requires at least 110 days of equally distributed rainfall every year, with a total volume of 1500 mm.

Here this hill banana is very important crop to the farmers in the hilly and tribal areas. Profit from the hill banana cultivation is the main and major income for the farmers who are all involved in this cultivation, which is used for the upliftment of their livelihood. It is important to know whether they are either profited or not? What are all the problems they facing during production?

So thereby this study is carried out with the following objectives

- i) To know the cost and returns associated with the hill banana cultivation and
- ii) To know the constraints faced by farmers in the hill banana cultivation

1.3 RESEARCH GAP

Many previous research on the production of various agricultural commodities were focused on a specific area and/or a specific commodity. There was little study on banana production and limitations in some regions in Tamil Nadu. As a result, the focus of this research will be on hill banana production in the Dindigul district and to fill the void.

2. LITERATURE REVIEW

More AD (1974) in his study found that the total cost required for banana cultivation in the Parbhani district was Rs.2,423.63 when cost concepts A, B, and C were considered. The average yield per acre was 142.25 quintal, valued at Rs.4,271.60, with a net return of Rs.1,848.05. [3]

Arputharaj et al. (1986) in their study on economics of banana cultivation in Kerala discovered that an average of Rs.36,252 per hectare was spent on plantain cultivation costs. Human labour was the most expensive item of expenditure, accounting for nearly 23 per cent of total cultivation expenses. The average yield per hectare was 14,991 kgs of plantain bunches worth Rs.56,205. [4]

Latha bastine et al. (1988) found that the cost of cultivation per hectare was Rs.36,249 in their study on the economics of plantain production in Kerala. The revenues amounted to Rs.45,088 after deducting the costs of the family, hired labour, and manure per acre of plantain farming. According to the findings of the study, family labour accounts for 30.50 per cent of total labour cost. As the size of the estate grew larger, the contribution of family labour shrank.[5]

Maurya et al. (1996), estimated that the cost of banana farming is Rs.20,160.7 per hectare. The gross return was Rs.49,958.75 and the net profit was Rs.29,798.05. Human labour, manures and fertilizers, and plant protection were the most expensive components. [6]

Balaji et al. (2003) used Garrett's ranking method to rank the constraints to groundnut production and marketing, which included pest and disease incidence, erratic rainfall, water scarcity, forest animals, a lack of good quality seeds, insufficient labour supply coupled with a high wage rate, a low level of adoption of recommended technologies, and a lower marketed surplus. [7]

Kathirvel N (2007) found out that the average total cost of production for per acre of banana was Rs.61,320, the average gross return was Rs.71,638 and the average net income was Rs.10,318 in his study on the cost and returns of banana cultivation in Tamil Nadu with special reference to Karur district. [8]

Sidhu et al. (2010) calculated onion and cauliflower production costs to be Rs.49,563 and Rs.34,840 per hectare, respectively. Onion and cauliflower produced gross returns of Rs.1.24 lakh per hectare and Rs.72,912 per hectare, respectively, and net returns of Rs.74,597 and Rs.38,072 per hectare, respectively. [9]

Umagouri et al. (2011) in their study on an economic analysis of value chain of banana in western Tamil Nadu calculated the economics of different banana varieties Nendran, Poovan, Kathali and Robusta. Find that the total cost of cultivation per hectare for these varieties ranged between Rs.86,624.62 and Rs.113,596.18. The net income per hectare ranged from Rs.74,975.38 to Rs.101,016.70. [10]

Karthikeyan et al. (2015) in their study on production and marketing of banana in Tamil Nadu – a study on problems faced by cultivators found that labour scarcity was the most significant problem faced by farmers at their production level, followed by irrigation issues, drought, and pest attack. It was also discovered that the lack of market awareness was a major issue for banana growers in the study area, followed by a high rate of commission, not receiving a fair price, and a lack of storage facilities. [11]

3. MATERIAL AND METHODS

Designing an effective approach and selecting appropriate analytical tools are critical for conducting a meaningful study of any research topic. To achieve the objectives of this study primary data as well as secondary data were collected from the hill banana farmers. Dindigul district was purposively selected for undertaking the study in the Tamil Nadu, where large number of farmers are engaged in hill banana cultivation and production takes place in a

larger scale. In this regard Sirumalai hill banana variety was purposively selected for the study because of more popular and large scale production in the existing hill banana varieties. Convenience and purposive sampling technique was used for the selected study. Totally 64 farmer respondents were selected from 8 villages of Sirumalai region of Dindigul district and eight respondents from each village were selected. Primary data was collected by personal interview with a well-structured interview schedule for the cost and return structure as well as problems incurred in hill banana production.

The cost of hill banana growing was evaluated using several cost concepts often employed in farm management studies [12]. Kumar *et al.* (1997) divided cost into three categories: Cost A, Cost B, and Cost C. Cost A accounted for all cash expenditures that were paid out. Cost B is the sum of Cost A plus the rental value of owned land and the imputed interest on owned capital, whereas Cost C is the sum of Cost B plus the imputed value of family labour [13]. The benefit-cost ratio criterion indicates the rate of return on investment in hill banana cultivation per rupee invested. It was calculated by dividing the gross returns by the total cost of production [14]. Garrett's ranking technique was used to analyse the problems associated with the hill banana production [15]. Major problems faced during the production of hill banana production were identified and listed in the interview schedule. Sample farmers were asked to rank the given problems that were listed in the interview schedule.

4. RESULTS AND DISCUSSION

Costs and returns structure determine the profitability of any operation. In this study costs are divided into three categories as Cost A, Cost B and Cost C. Hired human labour, Suckers, fertilizers, manures, irrigation, plant protection chemicals and interest on working capital were costs that came under the type of Cost A. Adding the Cost A with the Rental value of land and interest on fixed capital is Cost B. Adding Cost B to the value of the imputed family labour gives the Cost C. This is the total cost of hill banana production per hectare. Table 1 shows the details of average total costs and returns of hill banana cultivation, including the share of various costs per hectare.

Table 1. Cost and returns of hill banana cultivation per hectare

S.no	Cost component	Cost in Rupees	% of Total cost
Cost A			
1	Hired human labour	73,750	36.00
2	Suckers	39,375	19.22
3	Fertilizers and manures	14,250	6.96
4	Plant protection chemicals	4,750	2.32

5	Interest on working capital @7%	9,248.75	4.51
	Total Cost A	1,41,373.75	69.01
	Cost B		
6	Cost A	1,41,373.75	69.01
7	Rental value of land	50,000	24.41
8	Interest on fixed capital @12%	6000	2.93
	Total cost B	1,97,373.75	96.34
	Cost C		
9	Cost B	1,97,373.75	96.34
10	Imputed value of family labour	7500	3.66
	Total Cost C	2,04,873.75	100
	Returns of hill banana		
11	Yield in fingers	84000	
12	Price per finger	6	
13	Gross return	5,04,000	
14	Cost of production (per ha)	2,04,873.75	
15	Net return	2,99,126.25	
16	BC ratio	2.46	

Source: primary data

From Table 1 we come to know that the average total cost of hill banana production per hectare was Rs.2,04,873.75. In this the labour cost was the major cost component which contributes 36 per cent to the total cost followed by rental value (24.41%), suckers cost (19.22%). Average Gross returns per hectare of the hill banana production was Rs.5,04,000 and net return was Rs.2,99,126.25. Benefit cost ratio for the production of hill banana was 2.46.

Table 2. shows that pest attack was ranked first among the constraints during the production of hill banana by the farmers with the score of 74.53. Disease attack (67.83), non-availability of labour in time (67.30), animal attack (60.88) and drought (52.83) were ranked second third fourth and fifth respectively. Lack of quality planting material (41.53), heavy wind (37.80), high rainfall (36.63), lack of other inputs (36.05) and lack of irrigation facilities (22.64) were the constraints which are ranked sixth seventh eighth ninth and tenth, respectively.

Table 2. constraints faced while the production of hill banana by respondents

S.no	Constraints	Score	Rank
1	Non availability of labour in time	67.30	3
2	Lack of irrigation facilities	22.64	10
3	Lack of quality planting material	41.53	6
4	Lack of other input materials	36.05	9
5	Heavy wind	37.80	7
6	High rainfall	36.63	8
7	Drought	52.83	5
8	Pest attack	74.53	1
9	Disease attack	67.83	2
10	Animal attack	60.88	4

5. CONCLUSION

The average total cost of cultivation per hectare of hill banana was Rs.2,04,873.75. Average gross return was Rs.5,04,000 and average net return was Rs.2,99,126.25 per hectare of hill banana cultivation with respect to the Sirumalai hill banana growers. Benefit Cost Ratio was 2.46. From this study it could be concluded that the hill banana cultivation in the selected study area was highly profitable where BC Ratio was more than unity (2.46). labour cost was the major cost component (36 per cent) in this. Banana cultivation requires an increase in labour force. Human labour was also a significant aspect in hill banana production. Because there was an insufficient supply of labour in hilly areas, farmers hired workers from the plains region to complete farm activities on time in their hill banana farms. Farmers must plan transportation and manage the costs associated with hiring human labourers. Otherwise,

banana farmers will have to pay higher rates to keep local labourers avoid migrating to other areas. Because of this, human labour was the most expensive component of hill banana cultivation.

The major constraints faced by the hill banana farmers were pest attack followed by disease incidence, non availability of labour in time, animal attack, drought and lack of quality planting material.

pest attack includes damages made by the insects such as borers and sap feeders. pseudostem borer and rhizome weevil are major borers. Aphids and lacewing bugs are the major sap feeders which cause some serious damages to the hill banana trees. disease incidence in the form of banana bunchy top virus (BBTV) and other Wilt diseases. animal attack in the forms of monkeys and porcupines.

Aside from money, producers perceive insect attacks and disease outbreaks to be more of a problem than managing labour force while farming hill banana. They lack scientific understanding as well as technological breakthroughs for pest and disease management. Furthermore, most hill banana producers were thinking about how we might grow hill banana with less use of plant protection chemicals. Due to the above mentioned factors, farmers were less efficient in managing pest and disease assault, hence they rated pest attack first among the other key constraints in hill banana production, followed by disease attack. The findings will assist policymakers in developing appropriate programmes and adjusting strategies for improving hill banana production in Tamil Nadu.

REFERENCES

1. Horticulture statistics at a glance 2018. Horticulture Statistics Division, Ministry of Agriculture and Farmers Welfare, Govt. of India, New Delhi; 2020. www.agricoop.nic.in
2. FAO (Food and Agricultural Organisation) (2019) Statistical database: [www. faostat. Org.](http://www.faostat.org)
3. More AD. Economics of production and marketing of banana in Parbhani district. M. Sc.(Agri.) Thesis. 1974.
4. Arputharaj C, Kesavan Nair. Economics of Banana Cultivation in Kerala. Indian Journal of Agricultural Economics. 1986;(1):25-37.
5. Bastine L. C, Radhakrishnan. V., "Economics of Banana Cultivation in Irinjakkuda Block and Trissur District of Kerala". Indian Journal Agricultural Economics. 1988 Jul;43(3):514.
6. Maurya OP, Singh GN, Kushwaha RK. Profitability of Banana Plantation in Hajipur District of Bihar. The Bihar Journal of Agricultural Marketing. 1996;4(1):68-70.
7. Balaji P, Raveendran N, Kumar DS. Production and Marketing of Groundnut in Tamil Nadu-Problems and Prospects. Agricultural situation in India. 2003;60(1):35-40.
8. Kathirvel N. Cost and Returns of Banana Cultivation in Tamil Nadu with Special Reference to Karur District. Journal of Contemporary Research in Management. 2007;2(1):11-19.
9. Sidhu RS, Kumar S, Vatta K, Singh P. Supply chain analysis of onion and cauliflower in Punjab. Agricultural Economics Research Review. 2010;23(347-2016-16938):445-454.
10. Umagowri M, Chandrasekaran M. An Economic Analysis of Value Chain of Banana in Western Tamil Nadu. IUP Journal of Supply Chain Management. 2011 Sep 1;8(3).
11. Kalaiyarasu M, Karthikeyan S. Production and Marketing of Banana in Tamil Nadu - A study on Problems Faced by Cultivators. Indian Streams Research Journal. 2015;4(12): 1-7
12. Sen's committee report on various costs. CACP, New Delhi. 1979

13. Kumar S, Patel CB, Bhatt RI. Studies on seasonal cyclicity of *Bactocera correctus* Bezzi in Mango and Sapota orchards using methyl eugenol trap. Gujarat Agricultural University Research Journal. 1997;22:68-74.
14. Junaid NA, Ali A. Economic analysis based on benefit cost ratio approach for rice varieties of Malakand division. Economic Analysis. 2015;6(19).
15. Garrett HE. Woodworth. RS. Statistics in psychology and education. 1969.

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