



# **Economics of Mundu Chilli Cultivation in Ramanathapuram District of Tamil Nadu, India**

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## **Author's contribution**

*The sole author designed, analyzed, interpreted and prepared the manuscript.*

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## **ABSTRACT**

Globally Indian chillies dominates the international chilli market. India holds the title for being the world's biggest producer, consumer, and exporter of chili. Indian chilli is considered to be world-famous for important commercial qualities of colour and pungency levels. In Tamil Nadu chilli is being cultivated as rainfed and irrigated conditions in many of the districts. In 2021-22 Tamil Nadu cultivated chilli in 0.5 lakh ha and produced 26,380 MT. In Tamil Nadu Ramanathapuram district alone cultivate Mundu type chilli which is unique in nature. In this study, economics of ramanathapuram mundu chilli is analyzed and discussed. The study uses both primary data and secondary data. Primary data collected from chillies cultivators in Ramanathapuram district during 2019-20. Based on the secondary data Kadaladi, Paramakudi and Ramnad blocks were purposively selected based on the area cultivated. The primary data with respect to costs and returns, marketing cost were collected using pre tested schedule through personnel interview method. Data pertaining to traders, processors retailers and exporters were also collected. The study says that chilli farmers incurs Rs.84,550 per hectare to cultivate mundu chilli in Ramanathapuram district and Rs.55,450 as net return and the BCR is 1.65.

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## 1. INTRODUCTION

Indian chillies have been dominating the international chilli market. India is not only the largest producer but also the largest consumer and exporter of chilli in the world. Chilli alone contributes 42% of the total spice export quantity of the country and is predominantly exported to countries like China, Vietnam, Thailand, Sri Lanka, Indonesia and Malaysia [1,2]. Indian chilli is considered to be world-famous for important commercial qualities of colour and pungency levels. India is the largest producer with 1.98 million tonnes and contributes 43% of world chilli production, followed by China, Ethiopia, Thailand, Pakistan and Bangladesh. FAO Statistical Yearbook, [3].

Globally Indian chillies dominates the international chilli market. India holds the title for being the world's biggest producer, consumer, and exporter of chili. Chilli alone contributes 42% of the total spice export quantity of the country and is predominantly exported to countries like China, Sri Lanka, Vietnam, Indonesia Thailand, and Malaysia. Indian chilli is considered to be world-famous for important commercial qualities of colour and pungency levels. Raghunatha Reddy, Crop outlook reports of Andhra Pradesh [4,5,6].

In India, in the year of 2021-22 Andhra Pradesh tops the list in dry chilli production of 4.17 lakh tonnes covered under 2.25 lakh ha with 1809 kg/ha productivity followed by Telangana, Madhya Pradesh, Karnataka and West Bengal (Ministry of Horticulture, Gol) [7,8,9].

The country's output accounts for 36.00% of the global production with almost 50 varieties totalling 13 million MT Ram Singh et al. [10]. China produces 3 million MT (8.30%) Patel, Sahu, and Siwana [11] Horticulture Statistics

Division 2018). Chilli is grown over 31,647 hectares in India, the largest area cultivated with chilli worldwide Rao and Rao [5]. India has a variety of agroclimatic zones, and it is a prominent producer of many types of spices Bhardwaj et al. [6]. Spices are a low-volume, export-focused item that are very important to India's economy. Sugasini et al. [14]. Chillies flourish in tropical and subtropical regions with warm, humid climates, as well as at elevations of up to 2,000 meters [11].

Chilies are exported as pickled, powdered, dried, and oleoresin forms. While meeting international quality standards can enhance exports, few growers really add value to their products[15,16].

In Tamil Nadu chilli is being cultivated as rainfed and irrigated conditions in many of the districts. In 2021-22 Tamil Nadu cultivated chilli in 0.5 lakh ha and produced 26,380 MT. In Tamil Nadu Ramanathapuram district alone cultivate Mundu type chilli which is unique in nature. In this study, economics of ramanathapuram mundu chilli is analyzed and discussed.

## 2. METHODOLOGY

### 2.1 Study Area

The study uses both primary data and secondary data.

Chilli is cultivated in almost all the districts of Tamil Nadu with an area ranging from 1000 hectares to 15000 hectares. The analysis on area distribution across the districts where chilli is cultivated revealed that chilli is cultivated on more than 15000 hectares in Ramanathapuram and Thoothukudi districts. Among these, in Ramanathapuram district Mundu chilli is cultivated uniquely.

**Table 1. Area distribution across the districts -Chilli**

Area in ha	Number of Districts	Name of the districts
Less than 1000	9	Kanchipuram, Chengalpattu, Tiruvallur, Cuddalore, Villupuram, Vellore, Ranipet, Namakkal, Coimbatore, Erode, Tirupur, Trichy, Karur, Ariyalur, Perambalur, Pudukottai, Thanjavur, Madurai, Tirunelveli, Tenkasi
1000 to 2000	3	Sivaganga, Tiruvannamalai, Salem, Dharmapuri, Krishnagiri, Dindigul, Virudhunagar
More than 15000	2	Ramanathapuram, Thoothukudi

Primary data collected from chillies cultivators in Ramanthapuram district during 2019-20. Based on the secondary data Kadaladi, Paramakudi and Ramnad blocks were purposively selected based on the area cultivated. The primary data with respect to costs and returns, marketing cost were collected using pre tested schedule through personnel interview method. Data pertaining to traders, processors retailers and exporters were also collected. Identification of players was done using a generic worksheet crossing function which included input supply, production, assembling, processing, transportation and export. The data collected were tabulated, processed and subjected to economic analysis.

Ramanathapuram District as a whole is very dry, mitigated to some extent by the sea breeze in the coastal areas.

## 2.2 Sampling Design and Data Sources

Sample size can be determined by using various methods. To determine the sample size, the purpose of the study, the population size, the level of precision, the level of confidence or risk and the degree of variability in the attributes being measured were considered (Miaoulis & Michener, 1976). The level of precision, sometimes called sampling error, is the range in which the true value of the population is estimated to fall. The confidence or risk level is based on the Central Limit Theorem which says that when a population is repeatedly sampled, the average value of the attribute obtained by those samples is equal to the true population value.

There are several approaches to determine sample size. These include using a census for small populations, repeating a sample size of similar studies, using published tables, and applying formulas to calculate the sample size.

Yamane (1967: 886) provides a simple formula to calculate sample sizes. The necessary sample size can be calculated for various combinations of levels of precision, confidence and variability by using following formula:

$$n = \frac{N}{1+N(e)^2}$$

n – Sample size

N – Population size

e – Level of precision

The sample size was derived based on the confidence interval method. Sample size was fixed with 10% precision levels and a 95% confidence level with a 0.5 probability. The details of sample size for the targeted villages are presented in Table 3.

As shown in Table 2, primary data has been collected from 187 farmers. Traders, processors, retailers and exporters were also selected at the rate of five from each category making the total sample size twenty. Thus the total sample included 187 farmers and 20 intermediaries.

## 2.3 Cost Benefit Analysis

**Cost:** Costs refer to the money value of effort extended or sacrifice made in producing an article or rendering a service or achieving a specific purpose. Costs thus are the expenses incurred in organizing and carrying out the production process. They include outlays of funds for inputs and services used in production. Money value of all inputs used in the production process is termed as the total cost.

**Variable Cost:** Variable cost is the cost that varies with the level of output. i.e., higher the level of output higher will be the variable cost and vice versa. These include expenditure on labour, bullock, machinery charges, seeds, manures, fertilizers, plant protection chemicals, irrigation charges, value of other miscellaneous inputs and interest on working capital.

**Fixed Cost:** Fixed cost is the costs that do not vary with the level of output. They have to be incurred whether cultivation has been done or not. It includes the value of services provided by the fixed inputs such as land revenue, taxes, rental value of land, depreciation on building and machinery and interest on fixed capital.

**Table 2. Sample size for the surveyed villages (No)**

S. No	Block	Sample
1.	Kadaladi	54
2.	Paramakudi	61
3.	Ramnad	72
	<b>Total</b>	<b>187</b>

**Table 3. Cost of cultivation of Ramanathapuram mundu chilli for sample farmers (Rs./ha)**

S. No	Cost Components	Cost (in Rs)
1.	Human Labour	42250 (49.97%)
2.	Machine Labour	15000 (17.74%)
3.	Cost of seeds	1600 (1.89%)
4.	Fertilizers and plant protection chemicals	7250 (8.57%)
5.	Interest on working capital (9%)	5950 (7.04%)
6.	Rent value of owned land	12500 (14.78%)
	Total cost	84550

\*Figure in parenthesis shows the share of each factor cost to total

## 2.4 Output and Returns

It included output and returns obtained in chilli cultivation. An analysis of cost would enable the farmers to examine the efficiency of allocations of farm resources and reallocate them efficiently.

## 3. RESULTS AND DISCUSSION

In order to understand the economics of Mundu chilli production in Ramanathapuram district, the cost of production for Mundu Chilli for Ramanathapuram was estimated and discussed in this section.

Table 3 reveals the different cost involved in mundu chilli cultivation in Ramanathapuram district. Among all the cost human labour has the major share (49.97%) which costs about Rs.42,250/ha, followed by machine cost (17.74%) which comes around Rs.15,000/ha. Thus, totally a farmer incurs Rs.84,550/ha to cultivate mundu chilli in Ramanathapuram district.

From the Table 4. it could be observed that the total cost of production is Rs. 48/kg of mundu chilli cultivation. The total cost of cultivation was Rs.84,550. Gross returns per hectare was Rs.1.4 lakh rupees and the net returns would be Rs.55,450/ha. The BCR also 1.65 revealed that cultivation of mundu chilli would be profitable to the farmers.

The study also observes that Ramanathapuram Mundu Chilli is a round-shaped chilli, grown in Ramanathapuram district in Tamil Nadu, India. It is known to the trade as Ramnad S9 red mundu chilli and very popular in south Indian cuisine. Unique flavor and aroma of this mundu type chilli has acquired national and international praise. It is exported to China, America, Europe, Thai, Italy and Japan. It also used as food colorant.

**Table 4. Summary of output and returns (Rs. / ha)**

S. No	Output and Returns	Cost and returns
1.	Total cost of cultivation	84550
2.	Average production Quintal/ ha	17.5
3.	Gross returns @ Rs 80/kg	1,40,000
4.	Net returns	55450
5.	Cost of production / kg	48
6.	Net returns/kg	32
7.	BCR	1.65

## 4. CONCLUSION

The study was conducted to study the economics of Ramanathapuram Mundu Chilli. Both primary data and secondary data were used for the study. Based on the secondary data Kadaladi, Paramakudi and Ramnad blocks were purposively selected based on the area cultivated. The primary data with respect to costs and returns, marketing cost were collected using pre tested schedule through personnel interview method. Data pertaining to traders, processors retailers and exporters were also collected. Analysis revealed that chilli farmers incurs Rs.84,550 per hectare to cultivate mundu chilli in Ramanathapuram district and Rs.55,450 as net return and the BCR is 1.65.

## COMPETING INTERESTS

Author has declared that no competing interests exist.

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