

## Economics of production of Turmeric in Erode District of Tamil Nadu

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### Abstract

Turmeric is the major spice crop in India. India is the largest producer, consumer and exporter of turmeric in the world. Indian turmeric is considered to be best in world market because of its high curcumin content. Erode district is the major producer of turmeric in Tamil Nadu. The specific objectives of the study were to find the cost and returns and profitability of the turmeric in Erode district. The sample respondents were randomly selected from the Kodumudi block which accounted for 36.31 per cent of the study area. The results of the study showed that the turmeric production in Erode district was decreased gradually during the study period from 2008-2009 to 2022-2023. The compound growth rate of area under turmeric negatively significant at **-6.76** percent, where as production at **-7.68** per cent and productivity at **-0.99** per cent respectively. The study has shown that per hectare cost of cultivation of turmeric per hectare was Rs.2, 50,082.78. Since it is an annual crop, more manpower is required. The input wise analysis indicated that human labour accounted for major share of 24.19 per cent. Planting material (Rhizome) is another major cost, which accounted for 21.30 per cent and fertilizers constituted for 6.99 per cent. The result has indicated that the total cost of Production per hectare was Rs.4, 665.72 per quintal in the study area. The average Gross income was Rs.3, 55,904 and Net income was Rs.1, 05,821.22. The Benefit -Cost ratio of the Turmeric farms was 1.42. The study suggests that domestic traders have opted for eNAM portal, the turmeric farmers would get remunerative price for their produce.

**Key words :** Compound growth rate, Cost and returns & Cost of production.

**T**urmeric is scientifically known as *Curcuma longa*, is a perennial plant that belongs to the ginger family. It is native to southern Asia and has been used for centuries in traditional medicine and cooking. Since ancient times, India has grown a vast range of premium-quality spices. It is referred to as the “land of spices.” An major commercial spice

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crop is turmeric, a historic and sacred spice of India often known as “Indian saffron.” Turmeric contains a bioactive compound called Curcumin, which has been found to have various health benefits, such as anti-inflammatory, antioxidant, and anti cancer properties. Turmeric has a bright yellow color and a warm, bitter taste, making it a popular spice in many cuisines around the world.

In the months of May and June, planting takes place either on raised beds or on ridges. Turmeric comes in a number of well-known varieties, including Rajapore, karhdi (Maharashtra), Chinnanadan, Perianadan, (from Tamil Nadu), Tekkurpet, Sugandham, Amalapuram, Duggirala, Amruthapani (from Andhra Pradesh), Moovattupuzha, Wynadu, Alleppey (from Kerala), and Lakaday (Meghalaya), among others. The global production of turmeric is around 11 lakh tonnes per annum. India dominates the world production scenario contributing 80 per cent followed by China (8 per cent), Myanmar (4 per cent), Nigeria (3 per cent) and Bangladesh (3 per cent). The demand for turmeric is increasing globally due to its health benefits and its various uses. For the preparation of the manuscript relevant literature<sup>1-10</sup> has been consulted.

*Indian scenario of Turmeric production :*

Out of the total area of 349.43 thousand hectares under turmeric cultivation in India during the year 2021-2022, Maharashtra ranked first with 102.63 thousand hectares (29.37 per cent) followed by Telangana with 50.06 Thousand hectares (14.32 per cent), Odisha with 31.17 thousand hectares (8.92 per cent), Andhra Pradesh with 25.59 thousand hectares (7.32 per cent), Tamil Nadu with

24.22 thousand hectares (6.93 per cent) and others with 115.79 thousand hectares (33.13 per cent).

In India, total turmeric production was 1334.31 thousand metric tonnes. Maharashtra ranked first in production with 367.99 thousand metric tonnes (27.57 per cent), followed by Telangana with 330.26 thousand metric tonnes (24.75 Per cent), Karnataka with 130.97 thousand metric tonnes (9.81 per cent), Tamil Nadu with 104.4 thousand metric tonnes (7.82 per cent), Andhra Pradesh with 74.69 thousand metric tonnes (5.59 per cent) and others with 326 thousand metric tonnes (24.43 per cent).

*Tamilnadu scenario of Turmeric production:*

In Tamilnadu turmeric area was 24,166 thousand hectare with production of 1, 04,407 tonnes and average yield of 5169 kg per hectares during the year 2021-2022. Among the major growing districts in Tamilnadu, Dharmaburi ranked first with 7526 hectares (31.14 Per cent) followed by Erode district ranked second with 4809 hectares (19.89 per cent), Salem (17.69 per cent), Kallakurichi (9.39 per cent) and Nammakkal (6.46 per cent) (Season and Crop Report of Tamil Nadu, 2021-2022).

*Objectives of the study :*

1. To analyse the growth rates of area, production and productivity of Turmeric in the study area
2. To estimate the costs and returns of turmeric production and profitability level on the selected turmeric farms

*Research methodology :*

In Erode district, Kodumudi block has the highest area under turmeric (36.31 per cent) and it was purposively selected for the study. A multistage random sampling technique was adopted with the Erode district as universe (stage I), Kodumudi block as stage II unit, villages at stage III and farm households cultivating turmeric as the ultimate sampling units.

The total sample size was 90. Both primary and secondary data were used in this investigation. The required secondary data were gathered from various sources, which included the government's report, the Government Website, Yearbooks, Statistical Data publications of Spices Board, *Indiastat.com*, Ministry of Commerce and Industries and the Season and Crop Report of the Government of Tamil Nadu. The study covered a period of 15 years from 2008-09 to 2022-2023. The collected data were analyzed with the help of compound growth rate (CGR) and percentage analysis.

*Tools and techniques :*

The following tools were employed to analyze the data with reference to objective chosen for the study.

1. Exponential function of following form was used to estimate the growth rate for the Area under Turmeric crop.

$$Y_{it} = A_i (1+r_i)^t \quad (1)$$

Where,

$Y_{it}$  = Area, production and productivity of  $i^{\text{th}}$  crops at time  $t$  (ha)

$r$  = Compound growth rate

$A_i$  - Initial year of area, production and

productivity of  $i^{\text{th}}$  crops in time  $t$ (years)

By taking natural logarithm of (1),

$$\text{Ln } Y_{it} = \text{Ln } A_i + t \text{ Ln } (1+r_i) \quad (2)$$

Now letting

$$a_i = \text{Ln } A_i$$

$$b_i = \text{Ln } (1+r_i)$$

Equation (2) can be written as

$$\text{Ln } Y_{it} = a_i + \beta_{it} \quad (3)$$

Adding the disturbance term to (3), it can be written as

$$\text{Ln } Y_{it} = a_i + \beta_{it} + U_t$$

$Y_{it}$  = Area, production and productivity of  $i^{\text{th}}$  crops at time  $t$  (ha)

$t$  = time in years

$a_i$  = constant term

$b_i$  = regression co-efficient

This log linear function was fitted by using ordinary least square (OLS) method. The compound Growth Rate ( $r$ ) was obtained using the formula

$$r_i = (\text{Antilog } \beta_i - 1) \times 100$$

*Cost and return analysis :*

In order to assess the profitability and economic viability of turmeric cultivation various components of cost were estimated by using CACP Cost concept. For easy computations, the commission categorizes the cost components as follows:

**Cost A1:** It includes all actual expenses in cash and kind incurred in production by the farmer.

1. Value of human labour
2. Value of bullock labour
3. Value of machine power( both hired and

- owned)
4. Value of seeds (both owned and purchased)
  5. Value of insecticides and pesticides
  6. Value of manure (both owned and purchased)
  7. Value of fertilizers
  8. Depreciation on farm implements and farm buildings.
  9. Irrigation charges
  10. Land revenue, cess and other taxes.
  11. Interest on working capital
  12. Miscellaneous expenses (electricity charges, etc.,)
- Cost A2: Cost A1+Rent paid for leased in land  
Cost B1: Cost A2+Interest on value of owned
- capital assets (excluding land)  
Cost B2: Cost B1+Rental value of owned land  
Cost C1: Cost B1+Imputed value of family labour  
Cost C2: Cost B2+Imputed value of family labour  
Cost C3: Cost C2 +10% of cost C2.  
Cost of production (per unit of produce) = (Cost C3-Value of byproduct) / main product yield
- Income measures :*
- 1) Gross Income Gross income was obtained by arriving at the total value of crops, valued at harvest price in the reference period.
  - 2) Net Income The net income was computed by subtracting the total (Cost C) from the gross income.

Table-1. Area, Production and Productivity of Turmeric in Erode District from 2008-09 to 2022-23

| S.No              | Years   | Area in Ha             | Production in MT       | Productivity:MT/Hect  |
|-------------------|---------|------------------------|------------------------|-----------------------|
| 1                 | 2008-09 | 8,365                  | 52,872                 | 6.32                  |
| 2                 | 2009-10 | 9,854                  | 56,673                 | 5.75                  |
| 3                 | 2010-11 | 14,299                 | 78,215                 | 5.47                  |
| 4                 | 2011-12 | 12,857                 | 65,056                 | 5.06                  |
| 5                 | 2012-13 | 9,950                  | 41,378                 | 4.16                  |
| 6                 | 2013-14 | 5,690                  | 29,567                 | 5.2                   |
| 7                 | 2014-15 | 5,192                  | 29,300                 | 5.64                  |
| 8                 | 2015-16 | 6,293                  | 32,220                 | 5.12                  |
| 9                 | 2016-17 | 8,988                  | 43,322                 | 6.2                   |
| 10                | 2017-18 | 3,072                  | 13,148.16              | 4.28                  |
| 11                | 2018-19 | 5,625                  | 23,962.5               | 4.26                  |
| 12                | 2019-20 | 5,112                  | 24,435.36              | 4.78                  |
| 13                | 2020-21 | 4,552.175              | 22,305.66              | 4.9                   |
| 14                | 2021-22 | 4,759.075              | 24,509.24              | 5.15                  |
| 15                | 2022-23 | 4,694.435              | 23,519.12              | 5.01                  |
| CGR<br>(Per cent) |         | -6.76062**<br>(-4.009) | -7.68837**<br>(-4.581) | -0.99502*<br>(-1.642) |

(Figures in parentheses are estimated t values)

Source: Horticulture and Plantation Crops Statistics- Erode District

\*\* indicates 1 % level of significance

\*indicates 5% level of significance

## 3) Cost of production per Unit:

Cost of production per quintal of turmeric was arrived at by dividing the total cost of production per hectare by the total per hectare yield of turmeric, in quintal.

## 4) Output/Input Ratio:

Output – input ratio was obtained by dividing the gross income by the total cost of production per hectare.

*1. Growth rate analysis of area, production and productivity of Turmeric :*

An analysis was carried out to study the compound growth rate of area, production and productivity of Turmeric in Erode district for 15 years and the results are furnished in Table-1.

*Area under Turmeric cultivation in Erode District :*

It could be seen from the above table that Compound Growth Rate of area under Turmeric cultivation in Erode district was **-6.76062** reflecting the declining trend during the study period. The results indicated there have been significant changes in the area under turmeric in the study area. The Compound Annual Growth Rate of area under turmeric is found to be negatively significant at one percent level. In between the years 2008-09 to 2010-11 the area cultivated under turmeric had increase from 8,365 thousand hectares. The area under turmeric reached the maximum of 14,299 thousand hectares during the year 2010-11, while it was minimum of 3,072 thousand hectares during the year 2017-18.

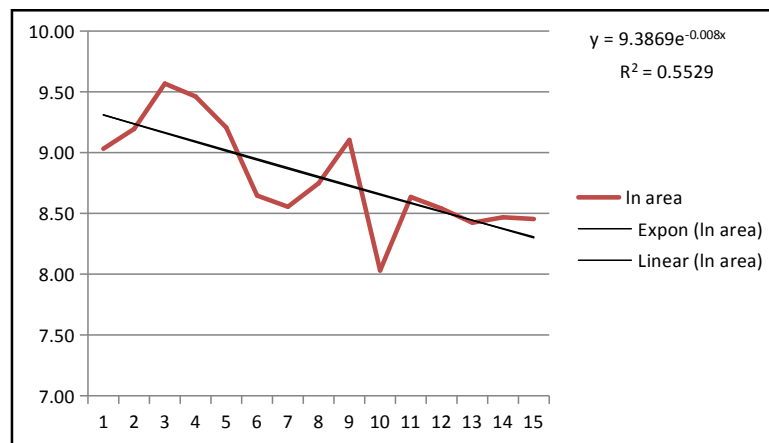


Fig. 1. Trend line in Area under Turmeric

*Production of Turmeric in Erode District :*

It could be observed from the table that the compound growth rate of production of turmeric was **-7.68837** showing the sharp decline trend in the production. It was found to be negatively significant at one per cent level

between 2008-09 to 2022-23. The results showed that the general trend of production of turmeric during fifteen years in Erode district has shown a fluctuating decline trend. The highest production of turmeric was 78215 MT in the year 2010-11 and it was minimum of 13148.16 during the year 2017-18.

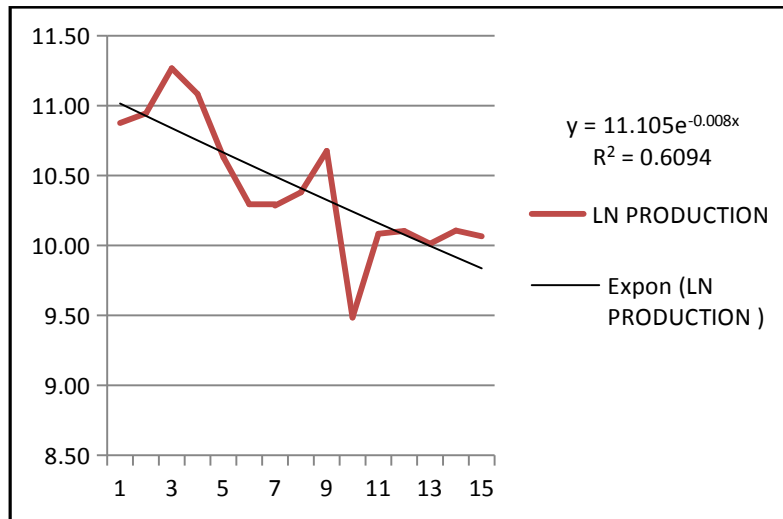


Fig. 2. Trend line in Turmeric Production

*Productivity of Turmeric :*

It could be seen from the table that the Compound Growth Rate of productivity of Turmeric was **-0.99502** per cent with negatively significant at 5 per cent level. From the above table indicated that the productivity trend of Erode district has decreased from 6.32

MT per hectare in the year 2008-09 to 5.01MT per hectare during 2022-23 with some fluctuating in the intervening years. The productivity of Turmeric reached the maximum of 6.32 MT per hectare during 2008-09. And it was minimum of 4.16MT per hectare during the year 2012-13.

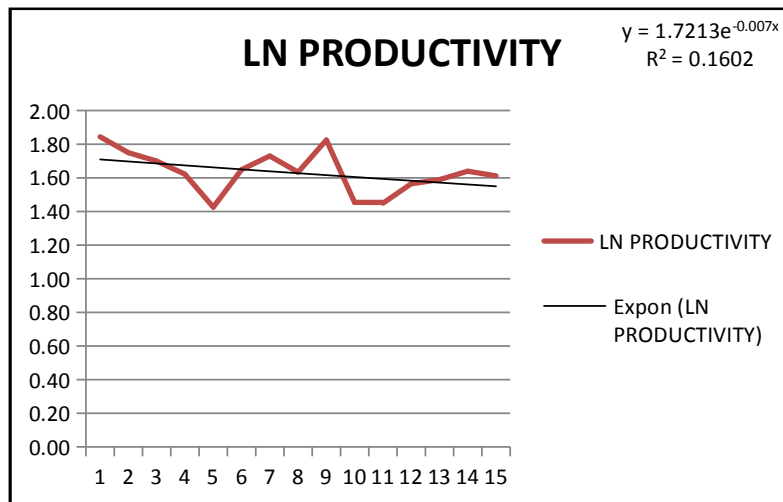


Fig. 3. Trend line in Turmeric Productivity

*Costs and returns of Turmeric :*

The estimation of per hectare cost of production and rates of returns over different

cost components of Turmeric in the sample farms were undertaken and the results are presented in Table - 2.

Table-2. Cost and Returns of Turmeric in the Sample Farms (Rs./ha)

| S.No       | Particulars                                      | Cost               | Percentage   |
|------------|--|--------------------|--------------|
| 1          | Planting Material (Rhizome)                      | 53,284.00          | 21.30        |
| 2          | Hired Human Labour                               | 60,520.00          | 24.19        |
| 3          | Machine Labour (Hired+ owned)                    | 14,450.00          | 5.77         |
| 4          | Manures  | 9,600.00           | 3.83         |
| 5          | Fertilizers                                      | 17,500.00          | 6.99         |
| 6          | Irrigation                                       | 6,000.00           | 2.39         |
| 7          | Plant Protection Chemicals and Growth Regulators | 6,500.00           | 2.59         |
| 8          | Land Revenue                                     | 500.00             | 0.19         |
| 9          | Depreciation                                     | 2,500.00           | 0.99         |
| 10         | Other Miscellaneous Cost                         | 3,700.00           | 1.47         |
| 11         | <b>Total Working Capital</b>                     | <b>1,74,554.00</b> | <b>69.79</b> |
| a.         | Interest on Working Capital @ 7% interest rate   | <b>12,218.78</b>   | 4.88         |
| <b>I</b>   | <b>Cost A1</b>                                   | <b>1,86,772.78</b> | <b>74.68</b> |
| <b>II</b>  | <b>Cost A2 (rent on leased in land- nil)</b>     | <b>1,86,772.78</b> | <b>74.68</b> |
| b.         | Interest on Fixed Capital                        | 22,500.00          | 8.99         |
| c.         | Rental value of Own Land                         | 17,250.00          | 6.89         |
| <b>III</b> | <b>Cost B</b>                                    | <b>2,26,522.78</b> | <b>90.57</b> |
| d.         | Imputed value of Family Labour                   | 23,560.00          | 9.42         |
| <b>IV</b>  | <b>Cost C</b>                                    | <b>2,50,082.78</b> | <b>100</b>   |
| 12         | Yield of dried rhizome in qls/ha                 | 53.60              | -            |
| 13         | Price of turmeric/qls                            | 6,640.00           | -            |
| 14         | <b>Gross returns</b>                             | <b>3,55,904</b>    | -            |
| 15         | <b>Net returns</b>                               | <b>1,05,821.22</b> | -            |
| 16         | <b>BCR</b>                                       | <b>1.42</b>        | -            |
| 17         | <b>Cost of production</b>                        | <b>4,665.72</b>    | -            |

| S.No | Particulars                | Amount(in Rs) |
|------|----------------------------|---------------|
| 1    | Cost of Cultivation        | 2,50,082.78   |
| 2    | Gross Income               | 3,55,904      |
| 3    | Net Income                 | 1,05,821.22   |
| 4    | Benefit cost ratio         | 1.42          |
| 5    | Cost of production/quintal | 4,665.72      |

(Figures in parentheses indicates percentage)

Source: Primary data

It could be seen from the table that per hectare cost of cultivation of turmeric per hectare was Rs.2, 50,082.78. Since it is an annual crop, more manpower is required. The input wise analysis indicated that human labour accounted for major share of 24.19 per cent. Planting material (Rhizome) is another major cost, which accounted for 21.30 per cent and fertilizers constituted for 6.99 per cent. As it requires manure and fertilizers at the initial stage itself.

Further the table indicated that the total cost of production per hectare was Rs.4, 665.72 per quintal in the study area. The average Gross income was Rs.3, 55,904 and Net income was Rs.1, 05,821.22. The Benefit-Cost ratio of the Turmeric farms was 1.42. These would indicate the profitability level on the growers was high.

The result has shown that the turmeric production in Erode district was decreased gradually during the study period. The compound growth rate of turmeric cultivation under area, production and productivity is negatively significant. Growing turmeric is essentially a profitable economic activity. However, farmers often fail to realize profitable price primarily due to inadequate formal marketing facilities and lack of collateral credit availabilities from formal sources. Cost of turmeric cultivation was Rs.2, **50,082.78** per ha, average gross income was **Rs.3, 55,904** per ha and net income was **Rs.1, 05,821.22** per ha. The probable reason for higher expenditure on cultivation of turmeric crop is due to higher cost of turmeric planting material, manure and fertilizer and expensive labour cost. The net income from the crop may be increased if they get remunerative prices of their produce and

this is possible only if they get higher share in the market price of their produce. The farmers in the study area need to be educated about the effect of timely and adequate application of fertilizers to increase the profitability of turmeric. A stable marketing infrastructure is needed to ensure the quick disposal of turmeric at remunerative prices. The National Agricultural Market (eNAM) is an electronic trading portal which networks the APMC mandis to create a unified national market for Turmeric crop. The study suggests that domestic traders have opted for eNAM portal, the turmeric farmers would get remunerative price for their produce.

#### References :

1. Angles S., A Sundarand M Chinnadurai (2011) "Impact of Globalization on Production and Export of Turmeric in India"-An Economic Analysis, Agricultural Economics Research Review, 24, July-December.
2. Bhosale P.S., A.C. Deorukhakar, R.R. Mali, S.B. Katkar and S.S. Manerikar (2020) *International Journal of Current Microbiology and Applied Sciences. Special Issue-11*: 472-476
3. Chinnadurai M., V. Kavitha, S. Angles and R. Sangeetha (2018) "Economics of Turmeric Cultivation in Erode district of Tamil Nadu" Agricultural Research Communication Centre. ISSN:0976-0547
4. Govindasamy, Tamilarasi R., R, Dhanya Sai Das (2022) "Constraints faced and socio-economic profile of turmeric cultivators with special reference to Coimbatore district" *International journal of creative research thoughts* 10(3): March.
5. Kiruthika N. (2013). *Journal of Innovative Research and Solutions (JIRAS)*. 1(1):



- 23-30
6. Paladugu Praveen Kumar, Nahar Singh, Jayant Zechariah, Deepthi Patluri and Vidya Sagar M (2018) "An economic analysis of production and marketing of turmeric in Guntur district of Andhra Pradesh" *Journal of Pharmacognosy and Phytochemistry*.E-ISSN: 2278-4136
  7. Rengaraju R., G Kokila and T Shakthivel (2022) "Comparative Economic Analysis of Cost and Returns of Organic and Inorganic Turmeric Production in Erode District of Tamil Nadu" *International Journal of Research in Engineering, Science and Management* Volume 5, Issue 9, September.
  8. Saravanan T. and L. Mothi (2019) "A Study on Cost of Cultivation and Production of Turmeric in Erode District of Tamil Nadu" *International Journal of Research in Humanities and Social Sciences*. 6(1): 41–43, January-June 2019 ISSN (Online): 2349-8900
  9. Sumathi Vand T Gayathri (2016) "A Study on the Production of Turmeric in Erode District, Tamil Nadu" *Indian journal of research* 5(12): December.
  10. Tholkappian C. and PB. Rukmanidevi (2013) "Economic Analysis of Organic and Convectional Turmeric Cultivation of Erode district in Tamil Nadu" *IBMRD's Journal of Management and Research* ISSN: 2277-7830