THE ECONOMICS OF PRODUCTION OF TURMERIC IN INDIA: A CASE STUDY OF ERODE DISTRICT OF TAMIL NADU

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ABSTRACT

Turmeric (Curcuma longa) is native to Asia and India. India has monopoly in turmeric trade at world level. Although India is the largest producer of turmeric in the world (846700 tons) but it exported only 6% of the total production. In view of the economic importance of turmeric in both national and farm economy and the problems faced by farmers in production and marketing of turmeric the present study was taken up with the specific objective to study the economics and input use efficiency in production of turmeric in Erode district of Tamil Nadu. The results indicated that as the size of the farms increased the net returns per hectare also increased. It was Rs.99380, Rs.135317 and Rs.167556 respectively in marginal, small and large size farms. The net returns/kg of turmeric was also high for large farmers with Rs.20.35 when compared with small (Rs.17.51) and marginal (Rs.13.18) farmers.

Key Words: Turmeric, Economics, Production, Input use efficiency

INTRODUCTION

India shares around 90 per cent of the global turmeric production. India has more than 180 thousand hectares under turmeric cultivation with a total production of 701.66 thousand tones during the year 2006-07 Andhra Pradesh topped both in area and production with 73.93 thousand hectares and 375.77 thousand tonnes respectively. According to market estimates, turmeric production for the coming season is expected to be around 337,500 tonnes against 333,750 tonnes last year. Tamil Nadu occupies second position with 30 thousand hectares with 175 thousand tonnes (2006-07). Productivity was highest in Tamil Nadu at 6118 Kg/ha. Erode is the major turmeric belt in the state. This district is well known for turmeric production and turmeric market in the entire country.

Turmeric is grown in 7731 hectares, which occupies the first position in area under turmeric in the state of Tamil Nadu. Turmeric produced in Erode is sent throughout the country. This district occupies the first position in the state in area and second position in productivity next to Coimbatore District. The area under turmeric in Erode district is 7731 hectares and total production is 61,813 tonnes with a productivity of 7995 kg per hectare. Hence, the present study aims to analyze the production and constraints in production of the turmeric in Erode district of Tamil Nadu.
This study is taken up with the following specific objectives:

**OBJECTIVE OF THE STUDY**

- To study the economics of production of turmeric in Erode district of Tamil Nadu,
- To understand the efficiency of input use in production of turmeric in Erode district of Tamil Nadu

**REVIEW OF LITERATURE**

Varghese (2007) in his study viewed that the cost of cultivation covered both the paid out cost and the imputed cost. The paid out cost included hired labour, maintenance expenses on owned animals and machinery, expenses on material inputs, depreciation on implements, farm building, land revenue, interest on working capital. The imputed costs consists of value of family labour, rent of owned land and interest on owned fixed capital for which the farmers does not incur any cash expense.

Nalini *et al.*, (2008) reported that the cost of production in potato included cost on production inputs like seed tuber, manures and fertilizers, irrigation, owned and hired machinery, labour charges and interest on working capital.

Lokesh and Chandrakanth (2004) stated that the cost of production in turmeric cultivation included human labour, bullock labour, planting material, farm yard manure, fertilizer, fuel wood cost, plant protection chemicals, hire charges of machine for polishing, interest on working capital and rental value of land for one year.

Rohit *et al.*, (2006) worked out gross return by multiplying the total output with price received by farmers and the net returns calculated by deducting the total costs from gross returns.

Smitha *et al.*, (2008) in his study included only the number of flowers produced and sale prices realized by the growers to calculate the gross returns, net returns per hectare of anthurium flower cultivation.

Ram Singh (2008) calculated the gross return based on the actual prices received by the growers. Net returns obtained by deducting the respective cost from gross returns.

Lokesh and Chandrakanth (2004) showed that the gross return of local and improved varieties of turmeric was Rs. 55000 and Rs. 73160 respectively per acre. The higher gross return in improved variety was due to higher yield by 25 per cent compared to local variety.

**DATA AND METHODOLOGY**

A. Data and Survey Design

(i). **Sampling Design**

Tamil Nadu state which occupies the second position in both production of and area under turmeric among all the states in India was selected for the study. Among the districts of Tamil Nadu state, Erode district stands first in both area and production of turmeric. The district-wise area and production of turmeric in Tamil Nadu are presented in Appendix III.

In the year 2006-07, turmeric was cultivated in 7731 hectares in Erode district and the total production was 61813 tonnes. Among the taluks in Erode district,
Erode taluk was selected purposively for the present study, since both production and processing are concentrated in this taluk. There are three blocks in Erode taluk.

Among the three blocks, based on the maximum area under turmeric two blocks viz., Kodumudi and Modakurichi were selected. The villages of the selected two blocks were listed and three villages were selected at random. The details of sample villages and number of turmeric farmers selected for the study are given in the table 1. Thirty farmers were selected from each of the three selected villages and thus the total sample size is 90.

Table 1. Distribution of sample farmers

<table>
<thead>
<tr>
<th>S. No</th>
<th>Name of the block</th>
<th>Name of the village</th>
<th>Number of the farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Kodumudi</td>
<td>Vadakkupudhupalayam</td>
<td>30</td>
</tr>
<tr>
<td>2.</td>
<td>Kodumudi</td>
<td>Periyasemmandapalayam</td>
<td>30</td>
</tr>
<tr>
<td>3.</td>
<td>Modakurichi</td>
<td>Pachampalayam</td>
<td>30</td>
</tr>
</tbody>
</table>

(ii). Study period

The primary data were collected from the sample respondents during the month of January, 2008 and the data collected in respect of production and marketing of turmeric pertain to the agricultural year 2006-2007.

(iii). Collection of Data

Both primary and secondary data were collected for the study. The primary data required for the study were collected through personal interview with the help of a comprehensive interview schedule. Two separate sets of interview schedules were prepared, one for farmers and another one for the intermediaries. The questionnaires for the study were designed considering physical, cultural and socio-economic environment of turmeric production and marketing in the study area and the questionnaires were pre-tested and finalized. The interview schedule for farmers covered aspects such as general farm and household characteristics, details on cultivation practices adopted in turmeric cultivation and cost of cultivation, details on marketing of turmeric, problems in production and marketing, etc.

B. Methodology

(i). Measurement of variables: Turmeric production

Planting material

Turmeric is propagated through rhizomes. The quantity of seed material has been
obtained directly from the farmers. The cost of rhizomes was arrived at by multiplying the quantity of rhizomes used by the sample farmer and the price of the rhizomes.

a) Human labour

Human labour was measured in terms of number of days separately for men and women. The amount of permanent and hired labour was treated alike and converted to common physical unit (man days of eight hours). Family labour were considered separately and added to the hired labour to calculate the total labour requirement.

b) Machine power

Machine power was valued using the prevailing rates of custom-hiring in the selected villages.

c) Manures, fertilizers and plant protection chemicals

The data on chemical fertilizers were collected on individual fertilizers used in turmeric production. Fertilizers and plant protection chemicals were valued at the actual price paid and farm produced manure was valued at the prevailing market rates.

d) Irrigation

The irrigation variable was quantified in terms of the number of irrigation since the depth of irrigation does not show much variation across farms. Irrigation cost included labour cost for irrigating the field (mostly family labour) as well as other costs pertaining to operation and maintenance of pumpsets and other irrigation structures used by the sample farmers for irrigating turmeric field.

(ii). Cost analysis

The cost concepts followed are given below:

a. Cultivation Costs

It included operational and material costs in cultivating turmeric in a year. The various costs included were costs of labour, manures, chemicals, depreciation, land revenue and interest on working capital.

b. Cost of labour

It included both hired labour and family labour for the operations like manuring, application of chemicals, cultural operations like forming of ridges and furrows, trimming of ridges and furrows, planting of rhizomes, manuring, weeding, earthing up, irrigation and spraying of chemicals. It also included the labour required for removing the leaves and harvesting of rhizomes. The labour costs were calculated based on the wage rates prevailed in the study area during the reference year for the data collection, i.e., Rs 130 for male and Rs 80 for female per day of eight hours.

c. Cost of seed material (rhizomes)

It included the cost of rhizomes at the rate of Rs 1000/kg.

d. Cost of organic manure

It included the cost of farm yard manure at the rate of Rs. 1000 per tonne and also it included the other organic manures viz, neem cake, panchakavya at the rate of Rs 500 per bag and Rs 50 per litre respectively.
e. Cost of fertilizers and plant protection chemicals

It included the cost of different forms of fertilizers and plant protection chemicals used. All the fertilizers and plant protection chemicals used by the farmers were valued at their respective market prices to calculate the total cost.

f. Depreciation

Depreciation for fixed capital items such as farm machinery and irrigation structures used in turmeric cultivation was calculated at the rate of five percent for buildings and ten percent for implements.

g. Interest on working capital

The interest rate for agricultural loans was calculated at the rate of twelve percent.

RESULTS

(i) Economics of turmeric cultivation

In order to understand the economics of turmeric production in Erode district, the cost of production for turmeric was estimated and discussed in this section. Out of 90 respondents in Erode district, 27 farmers were marginal land holders, 31 were small and 32 were large farmers. Cost of cultivation was calculated on per hectare basis separately for these three groups of farmers.

Source: Primary Survey

From the Table 3 it could be observed that the total cost of production varied considerably and it was lower for large farmers. The total cost of production was Rs 202,220 for marginal farmers, Rs 173,883 for small farmers and Rs 161,644 for large farmers. Cost of production per kg also showed a decreasing trend as the size of the farms increased. It was Rs. 26.81, Rs. 22.49 and Rs. 19.64 respectively.

This is probably due to increase in the efficiency in use of resources in large farms together with economies of scale in production. Gross returns per hectare was the highest for large farmers (Rs. 301,600) when compared with small (Rs. 309,200) and marginal (Rs. 329,200) farmers. The net returns per hectare showed an increasing trend as the size of the farms increased. It was Rs. 99380, Rs. 135317 and Rs. 167556 respectively in these farms. The net return per hectare was the highest for large farmers because the cost of production per hectare was less for large farms when compared with small and marginal farms. The gross return obtained by the large farm was also high. This can be inferred to arise from economies of scale in production in large farms.
### Table 2: Cost of cultivation of Turmeric for sample farmers

(Rs./ha)

<table>
<thead>
<tr>
<th>S. No</th>
<th>Cost Components</th>
<th>Marginal (n=27)</th>
<th>Small (n=31)</th>
<th>Large (n=32)</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(Rs.)</td>
<td>(Rs.)</td>
<td>(Rs.)</td>
<td>(Rs.)</td>
</tr>
<tr>
<td>1.</td>
<td>Labour</td>
<td>84955 (42.01)</td>
<td>80910 (46.53)</td>
<td>73123 (45.24)</td>
<td>79354 (44.57)</td>
</tr>
<tr>
<td>2.</td>
<td>Cost of rhizomes</td>
<td>24785 (12.26)</td>
<td>24785 (14.25)</td>
<td>24785 (15.33)</td>
<td>24785 (13.92)</td>
</tr>
<tr>
<td>3.</td>
<td>Transportation charge</td>
<td>7214 (3.57)</td>
<td>7214 (4.15)</td>
<td>7214 (4.46)</td>
<td>7214 (4.05)</td>
</tr>
<tr>
<td>4.</td>
<td>Organic manure</td>
<td>29785 (14.73)</td>
<td>19785 (11.38)</td>
<td>14785 (9.15)</td>
<td>21007 (11.80)</td>
</tr>
<tr>
<td>5.</td>
<td>Fertilizers and plant</td>
<td>20214 (10.00)</td>
<td>15214 (8.75)</td>
<td>24214 (14.98)</td>
<td>19914 (11.19)</td>
</tr>
<tr>
<td></td>
<td>protection chemicals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Herbicide</td>
<td>5321 (2.63)</td>
<td>2821 (1.62)</td>
<td>1821 (1.13)</td>
<td>3215 (1.81)</td>
</tr>
<tr>
<td>7.</td>
<td>Interest on working</td>
<td>19236 (9.51)</td>
<td>16716 (9.61)</td>
<td>14497 (9.82)</td>
<td>16683 (9.37)</td>
</tr>
<tr>
<td></td>
<td>capital</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Depreciation+ Interest</td>
<td>10705 (5.29)</td>
<td>6433 (3.70)</td>
<td>1201 (0.74)</td>
<td>5854 (3.29)</td>
</tr>
<tr>
<td></td>
<td>on fixed capital+ Land</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>revenue</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total variable cost</td>
<td>191510</td>
<td>167445</td>
<td>160439</td>
<td>172172</td>
</tr>
<tr>
<td></td>
<td>Total fixed cost</td>
<td>88955</td>
<td>45121</td>
<td>9812</td>
<td>47962</td>
</tr>
<tr>
<td></td>
<td>Total Cost</td>
<td>202220 (100.00)</td>
<td>173882 (100.00)</td>
<td>161643 (100.00)</td>
<td>178026 (100.00)</td>
</tr>
</tbody>
</table>

### Table 3: Summary of output and returns

(Cost and returns in Rs/ha)

<table>
<thead>
<tr>
<th>S. No</th>
<th>Output and Returns</th>
<th>Marginal</th>
<th>Small</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total cost of production</td>
<td>202220</td>
<td>173883</td>
<td>161644</td>
</tr>
<tr>
<td>1.</td>
<td>Average production quintal / ha</td>
<td>75.4</td>
<td>77.3</td>
<td>82.3</td>
</tr>
<tr>
<td>2.</td>
<td>Gross returns @ Rs 4000/quintal</td>
<td>301600</td>
<td>309200</td>
<td>329200</td>
</tr>
<tr>
<td>3.</td>
<td>Net returns</td>
<td>99380</td>
<td>135317</td>
<td>167556</td>
</tr>
<tr>
<td>4.</td>
<td>Cost of production / kg</td>
<td>26.81</td>
<td>22.49</td>
<td>19.64</td>
</tr>
<tr>
<td>5.</td>
<td>Net returns/kg</td>
<td>13.18</td>
<td>17.51</td>
<td>20.35</td>
</tr>
</tbody>
</table>

### Table 4: MVP/MIC Ratio for inputs used

<table>
<thead>
<tr>
<th>S. No</th>
<th>Inputs</th>
<th>MPP</th>
<th>MVP</th>
<th>MIC</th>
<th>MVP/MIC Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Quantity of rhizome</td>
<td>0.012972</td>
<td>51.88847</td>
<td>10</td>
<td>5.18</td>
</tr>
<tr>
<td>2.</td>
<td>Labour</td>
<td>0.055553</td>
<td>222.2136</td>
<td>105</td>
<td>2.11</td>
</tr>
<tr>
<td>3.</td>
<td>Quantity of organic manure</td>
<td>0.000373</td>
<td>1.492767</td>
<td>1</td>
<td>1.49</td>
</tr>
<tr>
<td>4.</td>
<td>Quantity of inorganic manure</td>
<td>0.008346</td>
<td>33.38547</td>
<td>5</td>
<td>6.67</td>
</tr>
</tbody>
</table>

*Source: Primary Survey*
The marginal value product (MVP), marginal input cost (MIC) and the ratio between these two were worked out for each input to understand the efficiency of input use. The results are given in Table 4. The input is used efficiently if the ratio between MVP and MIC is one. A ratio of more-than-one and less-than-one would indicate under-utilization and over-utilization respectively. From the Table 5 it could be seen that the ratio was found to be greater than one for quantity of rhizome, quantity of organic manure, labour and quantity of inorganic fertilizer, which indicated the under utilization of these inputs.

CONCLUSION

Turmeric is extensively used as a spice, food preservative and colouring material in India, China and South East Asia. It also considered as auspicious and is a part of religious rituals. It has been used in traditional medicine as a household remedy for various diseases. India contributes about 78 per cent of the world production and 60 per cent of the world trade in turmeric. The increasing demand for natural product as food additives makes turmeric an ideal producer as a food colourant. India is a dominant player in the global market as far as turmeric is concerned.

Cost of cultivation per hectare was estimated separately for marginal, small and large farmers among the sample respondents. The total cost of production was Rs.202220 for marginal farmers, Rs. 173883 for small farmers and Rs.161644 for large farmers. Cost of production per kg also showed a decreasing trend as the size of the farms increased. It was Rs.26.81, Rs.22.49 and Rs.19.64, respectively. Gross returns per hectare was the highest for large farmers (Rs329200) when compared with small (Rs. 309200) and marginal (Rs 301600) farmers. The net returns per hectare showed an increasing trend as the size of the farms increased. It was Rs.99380, Rs.135317 and Rs.167556 respectively in these farms. The net returns/kg of turmeric was also high for large farmers with Rs.20.35 when compared with small (Rs.17.51) and marginal (Rs.13.18) farmers. MVP/MIC ratio was found to be greater than one for inputs of rhizome, labour, quantity of organic manure and quantity of inorganic fertilizer which indicate the under utilisation of these inputs.

The study was found that the cost of production was higher in the case of marginal farmers followed by small and large farmers respectively which reflected the economies of scale. Production function analysis results indicated that an increase in quantity of rhizome, labour, quantity of organic manure, irrigation and quantity of inorganic fertilizer would attribute towards an increase in yield. It was also found that quantity of rhizome, labour, quantity of organic manure and quantity of inorganic fertilizers were under utilized. High labour cost, low price, water scarcity, price fluctuation, storage cost, low price were some of the production and marketing constraints faced by the sample farmers.

Policy implications

The findings of the study and the conclusions drawn have got certain specific implications for the policy issues. The results of the study on economics of production showed that the net returns per hectare received from turmeric were relatively high for all the three category of farmers. So, the agricultural extension system should take appropriate steps to promote scientific methods of turmeric cultivation. The results of production function analysis suggested that an increase in quantity of planting material, labour, quantity of organic manure and quantity of inorganic fertilizer would increase the yield of turmeric. Hence, the agriculture department of the state
government and the development agencies have to arrange for training programmes to make the farmers aware of appropriate use of inputs.

References