

Economic analysis of Organic and Convectional Turmeric Cultivation of Erode district in Tamil Nadu

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ABSTRACT

The economics analysis of organic and conventional turmeric cultivation have been examined and the under organic farming has been assessed with respect to important sustainability indicators such as conservation of soil, water, power and farmers economic well-being and livelihood security. The study is based on primary data for 2010-11 collected from 30 organic farming and 30 conventional sample households from the Erode district of Tamil Nadu. The organic farming sample households have been found younger and more educated having larger landholdings and better resources. The organic farming is labour intensive, but its cost of cultivation is lower due to saving on chemical fertilizers, irrigation, seeds and agrochemicals. The yield on organic farmer has been reported lower but it is more than compensated by the price premium received and yield and profit stability observed on the organic farming. In addition, the organic farming has been found superior in terms of economic well being and livelihood security of the farmer.

Keywords: Conventional, Economic, Livelihood, Organic, Soil, Sustainability, Turmeric

Introduction

Turmeric is rhizomatous herbaceous plants botanically know as *Curcuma longa*. Turmeric is a native of Tropical south Asia (India). The tuberous rhizomes or underground stems of turmeric are used from antiquity as condiments, a dye and as an aromatic stimulant in several medicines. Turmeric is a very important spice in India. Turmeric cultivation is confined to South East Asian countries such as India, Sri Lanka, China, Indonesia, Australia, Africa, Peru and the West Indies. The main growing states in India are Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra, Orissa, and Kerala. Turmeric requires a hot and moist climate. It thrives the best on loamy or alluvial, loose, friable and fertile soils. It grows at all places ranging from sea level to an altitude of 1220 m above MSL. It is very sensitive to low atmospheric temperature. It is grown both under rain fed and irrigated conditions. Like other tuber crops, turmeric also requires deep tilth and heavy maturing for high yields. Beds of convenient length and width are prepared based on the topography of the land. Planting is done either on raised beds or on ridges during May–June. Varieties Some of the popular

varieties of turmeric are Duggirala, Rajpuri, Erode, alem, Alleppey, Tekkurpet, Sugandham, Amalapuram (from Andhra Pradesh), Moovattupuzha, Wynadu (from Kerala) and Lakaday (Meghalaya) etc. Domestic scenario turmeric is grown as a Kharif crop in India. The crop-harvesting season starts between end of January and March in India. The country is the leading producer, consumer and exporter of turmeric in the world. It has near monopoly in this commodity. Indian turmeric has been known to the world since from ancient times. India accounts for 78 per cent in world production and 60 per cent in world export share. Major turmeric growing states are Andhra Pradesh 57 per cent Tamil Nadu 23 per cent Karnataka 6 per cent and Orissa 4 per cent. Indian turmeric is considered as the best in the world because of its high curcumin content. India exports about 40,000 to 45,000 tons of turmeric per annum. It is shipped in the form of dry turmeric after polishing, fresh turmeric, turmeric powder, dehydrated turmeric powder, oils and oleoresins. In terms of volume, turmeric oleoresin account for about 200 tons per annum and turmeric powder constitutes very small portion. Important turmeric varieties exported included Allepey finger turmeric, Rajapuri, Madras and Erode variety. Similarly this paper mainly focused an economic analysis of turmeric cultivation in Erode district.

Review of Literature

Rosegrant et. al., (2005) in his article points out that organic technologies can decrease the costs of production as chemical inputs are substituted by locally available and cheaper organic inputs and more intensive labor which the poor often have in abundance. Adoption of organic agriculture system also lowers the need for credit, which is often expensive and difficult to obtain for small farmers.

Rajendran (2008) in his article observes that organic farming is economically viable, environmentally sound and socially adaptable and the invisible positive effects of it on the farm environment are many. For example, continuous application of eco-friendly manures enhanced and enriched soil fertility and water use was scientific and the resources were stocked on the farms itself. All these helped to use the crucial resources on a more sustainable basis and to increase in yields that will sustain the farm economy in the long run. In this doctoral thesis, Siddaraju (2008) has dealt with two sets of field data on organic and conventional farms in Mysore district and neighboring region. He found that the state has extended all logistic support for providing organic agriculture. The study also revealed that organic agriculture is economically viable in the long run. Further it is revealed that the state government is proactive in supporting civil societies for promoting organic system.

Anon (2008) points out that Udhagamandalam at Jendra Medu, a small village near here, become a 100 per cent organic farming village. Thanks to the concerted efforts of the villagers and the officials. Pointing out that the residents were migrants from Mysore and Sthyamangalam region who had come in search of employment about 300 years ago. Enterprise displayed by them had made it possible to bring the entire cultivated area of 15.20 heaters under organic farming. The funds had been provided by the National Horticulture Mission (NHM). A variety of organic inputs including Panchaykavaya and dasakavya worth ₹ 1.52 lakh had been distributed to the 32 farmers during 2006-07 for cultivating cabbage, carrot, beans and peas. Further help was extended during 2007-08. Jendrmedu was a model village for promoting organic farming. It was being used to enhance awareness among others about the benefits of organic farming such as pesticides – free fresh vegetables a healthy soil and maintenance of the ecological balance. The collector point out that apart from being tasty and nourishing organically grown vegetables remained fresh for a longer period.

Anon (2008) Organic opinions that neighborhood shops and farmers market will gain currency in the coming days, as reduction in vegetable transport will help save fuel and there by help reduce global warming. The green shop in Erode, increasing as people wanted to cut transportation as well as the cost involved and also obtain fresh vegetable. In this connection transportation of food items formed a considerable part in the entire transport industry; the author suggested that shop like the Greens shop would be best answers to reduce transport cost in organic farmers.

Prabu (2008) in his article shows that organic farmers in Thanjavur district said that the investment required for an acre of farming is quite low the cost of cultivating comes to ₹ 3500 – 4000 if one were to use chemical pesticides. If the cost works out to only ₹.1300-1500 (which includes labor for weddings and harvesting) as you have all necessary inputs in the farm for marketing your own manure. In this connection “A farmer needs to spend only ₹ 200-400 for making any of these organic inputs. Compare this with chemical where one has to spend ₹ 3500-4000 to buy urea, potash, etc., ₹ 2500-3000 for sprays to prevent pest and insect attacks and ₹ 1000-1500 for labour during harvest.

Indrani Dutta (2008) points out that the Darjeeling Tea Association (DTA) has mounted efforts to increase the production of the tea so that the majority of the Champagne of teas is organically produced by 2010. In this connection the annual Darjeeling tea crop averages at about 9.5 to million kg of the brew as an organically grown product However, initially the crop would be lower as the conversion process reduces output by half. Pointing out that the movement on organic production of teas started about 15 years ago; the sources said that at

that time it commanded a huge premium in the internal market with some of them selling at ₹.10, 000 a kg Japan Germany were two of the U.K. and U.S. have also been buying this tea. In this connection beverage space as well as a nutraceutical, tea is being re-invented.

Prabu (2008) in his article paints out that the traditional crops and is growing medicinal plants such as lemon grass in 3.5 acres, Mentha in 14.5 acres, Java, Citronella and sarp gandha in the rest of his land. Farmers in the village who were earlier cultivating rice and wheat lemon grass cultivations is a boon for our farmers in Bihar and Patna district in Particular because the crop grows well in less fertilizer and marginal lands is drought resistant and is not attacked by animals and insects or pests as the crop is bitter in taste. Also sealing the harvesting produces (lemon grass oil) is not a problem because of its ever increasing demand and the large number of buyers, selling some other crops, because of well developed markets in nearby states such as Uttar Pradesh and Madhya Pradesh. Most of the produces states and so far no difficulty have been encountered by any of framers. At present he earns a net return of about ₹ 25000 to ₹ 30000 a year from an acre from lemon grass cultivation, which is significantly higher that what he was getting from conventional cropping.

Shirsagar's (2008) study reveals the impact of organic farming on economics of sugarcane cultivation in Maharashtra. The study was based on primary data collected from two districts covering 142 farmers, 72 growing organic sugarcane and 70 growing conventional sugarcane. The results concluded that cultivation enhances human labour employment by 16.9 per cent and its cost of cultivation is also lower by 14.2 per cent than the conventional crop, it is more than compensated by the price premium received and yield stability observed on organic sugarcane farms. Overall, the organic sugarcane farming gave 15.63 per cent higher profits than conventional sugarcane farms.

Realizing the export potential of organic products, the state has launched a number of programmes of which the Tamil Nadu state has developed (Anon, 2010) a website for popularizing organic agriculture in the state. Perhaps the initiative will help improve the growth performance of organic farming

Kumar and Biswas (2010) in their article observe that the organic farming systems have attracted increasing attention over the last one decade because they are perceived to offer some solution to the problems currently besetting the agriculture sector. Organic farming has the potential to provide benefits in terms of environmental protection, conservation of non-renewable resources and improved food quality. India is bestowed with lot of potential to produce all varieties of organic products due to its diverse agro-climatic regions. In several

parts of the country, the inherited tradition of organic farming is an added advantage. This holds promise for the organic producers to tap the market which is growing steadily in the domestic market related to the export market. In India, the land under certification is around 2.8 million ha. But there is considerable latent interest among farmers in conversion to organic farming. However, some farmers are reluctant to convert because of the perceived high costs and risks involved in organic farming. Despite the attention which has been paid to organic farming over the last few years, very little accessible information actually exists on the costs and returns of organic farming in India.

Research Objectives

1. The social background of organic and conventional turmeric cultivation in study area.
2. Economic viability of organic and conventional turmeric cultivation in study area.

Study Period

Relevant field data have been collected from organic betel cultivation farm for one crop year. The survey period was reported as normal agriculture year (2010-11) in the State of Tamil Nadu in general and particularly in the sample district of Erode district.

Data Source

This study is largely based on primary data. Primary data has been collected from the growers practicing modern farming system and organic farming system in selected district of Tamil Nadu. Cost of cultivation and perceptions of the growers regarding the organic agriculture. Another schedule was prepared to collect data from the selected conventional farmers around the organic farms. Schedules were pre-tested and necessary modifications were made based on the feedback. Adequate care was taken to cross check the recall bias during the investigation.

Sample Design

The present research was conducted in Tamil Nadu. The state has been purposefully selected due to the availability of data base relating to organic farmers and close proximity to the researcher Gandhi gram Trust. The located Dindugal documents the details on organic farms. The New Delhi based, Centre for Service and Environment has also documented the particulars of. These two sources were used for elucidating the farmers list. Thanjavur district selected for primary data collection. These district purposefully selected because of the highly concentration of organic farmers in these district.

Sample Size

As per the records of the Government there are 60 organic farmers, Erode (30) district. The study covered all the 30 farmers practicing organic farming system. In order to make a comparative study a control group of 30 farmers practicing conventional agriculture were selected from the neighbourhood of organic farms. The criteria for selection of these farmers are that they represent the same characters of organic farmers in terms of socio – economic background, geographical location and crops grown. Thus there are 60 farmers in both the sample district for the study.

Tools use

Cost A1 relates to owner farm situation in which the farmers cultivate own land and also contributes other resources. Since all the sample growers are owner cultivators, this cost concept is appropriate to calculate cost of cultivation. It includes the following items of costs.

1. Value of hired human labour.
2. Value of owned and hired draught animal power.
3. Value of owned and hired machinery charges including rent.
4. Value of fertilizer.
5. Value of manures (owned and purchased).
6. Value of seed (both farm produced and purchased).
7. Value of insecticides and pesticides.
8. Irrigation charges (both owned and purchased).
9. Canal water charges.
10. Land revenue, cusses and other taxes.
11. Depreciation on farm implements (both bullock-drawn and used by human labor)
12. Depreciation on farm buildings, farm machinery and irrigation structure.
13. Interest on working capital.
14. Miscellaneous expenses (repairs to farm implements and artisans).

Cobb-Douglas Production Function

Cobb-Douglas production function has been the most widely used model in many empirical studies. Therefore, this functional form is used in the present analysis. The following Stochastic Production Frontier is estimated.

$$\ln Y_{it} = \beta_{0t} + \beta_{1t} \ln X_{1it} + \beta_{2t} \ln X_{2it} + \beta_{3t} \ln X_{3it} + \beta_{4t} \ln X_{4it} + V_{it} + U_i$$

X_{1it} = Value of farm power in rupees of i^{th} farm in the t^{th} period.

X_{2it} = Value of organic nutrients in rupees of i^{th} farm in the t^{th} period.

X_{3it} = Value of seed in rupees of i^{th} farm in the t^{th} period.

X_{4it} = Irrigation charges in rupees of i th farm in the t^{th} period.

V = Random variable and Assumed to be independent and identically distributed (iid) as $N(0, \sigma_v^2)$ and independent of U_i random variables.

U_i = is firm-specific technical efficiency related variable and non-negative, Defined by the truncation (at zero of $N(0, \sigma_u^2)$).

Result and Discussion

The characteristics of organic and conventional grooving farmer been recorded in Table 1.1. The average size of holding observed on sample farms, both organic and conventional, was quite big. The ownership of livestock is vital for practicing organic farming. The major livestock owned by sample farmers included bullocks, cows, buffaloes, sheep and goats.

Table-1: Characteristics Organic and Conventional sample household in Erode Farmers

Characteristics	Organic	Conventional
Social Background		
Average Family Size (Numbers)	4.3	3.5
Average Age of Family Head (Year)	38.9	43.8
Average Education of Family Head	11.08	9.86
Farmers with Agriculture as a Main Occupation (%)	92.32	94.56
Landholding		
Size of Owned Landholding (Ha)	6.12	5.86
Major Livestock Owned (Number per Household)	30	30
Value of Major Livestock Owned (Per Household)	75,120	58,708
Major Mechniery Owned (Number per Household)	7.57	5.08
Value of Major Mechniery Owned (Per Household)	186,861	12,185
Major Crop Grown		
Turmeric	14.60	11.20

Source: Survey Data

The livestock position, depicted in table 1.1 revealed that the number as well as the value of livestock owned by organic farmers was higher than of conventional farmers. The better livestock position of organic farmers may be attributed to their higher demand for manures and other livestock products. The major machinery consisted of bullock carts, electricity pumps, drip irrigation, sprayer. The major machinery position was also better both in terms of number and value, on organic and conventional sample farmers.

Cost and Returns

Turmeric is a commercial and annual crop grown mainly in Erode district. Average costs and returns in the production of turmeric are presented in table 2. Turmeric is abundantly grown in Erode district. Turmeric growers do practices improvement farm practices and apply post harvest technology.

Table- 2: Cost and Returns of Turmeric Cultivation (in ₹ per acre)

Sr.No	Inputs	Erode	
		Organic	Conventional
1	Biological Power	22586	21950
2	Organic Nutrition	1600	1800
3	Chemical Fertilizer	-	1500
4	Seed	5600	5800
5	Irrigation	560	625
6	Land Tax	54	48
7	Charges on Implements and Machineries	2450	2550
8	Repair of Machineries	780	560
9	Total Cost of cultivation (1+2+3+4+5+6+7+8)	33630	34833
10	Yield (Quintal / per acre)	26	28
11	Value Received (₹ / Quintal)	3500	3200
12	Gross Returns (₹) (10×11)	91000	89600
13	Net Returns (₹) (12-9)	57370	54767

Source: Survey Data

According to the table 2, cultivation of turmeric with organic farming system is costing ₹ 33630 per acre. This is ₹ 1203 per acre more than the cost of cultivation under conventional agriculture. The differences are mainly due to higher cost of organic nutrients and biological power. Cost of FYM, vermin compost, green manure, salt, neem, cake, ash and cow dung which are used under organic agriculture, is more, However, higher cost is compensated by higher yield and higher prices. Net return from organic farming is ₹ 2603 more per acre. Turmeric (*Curcuma longa*) is a very important spice in India, which produces nearly the whole world's crop and uses 80 per cent of it. Turmeric forms part of most Indian curry

powders. It is a natural antiseptic. The spice is sometimes also called the 'Indian saffron' thanks to its brilliant yellow colour. Turmeric comes from the root of *curcuma longa*, a leafy plant of the ginger family. The plant is an herbaceous perennial, 60-90 cm high, with a short stem and tufted leaf. The root, or rhizome, has a tough brown skin and bright orange flesh. In fresh state, the rootstock has an aromatic and spicy fragrance, which on drying gives way to a more medicinal aroma.

Conclusion

The organic farming organic turmeric has been found quite successful in the study area and has offered several benefits as compared to those by conventional farming. Although organic requires more human labour, cost of cultivation has been found lower due to savings on chemical fertilizers, irrigation, seeds and agrochemicals. In this connection According to the table 2, cultivation of turmeric with organic farming system is costing ₹ 33630 per acre. This is ₹ 1203 per acre more than the cost of cultivation under conventional agriculture. The yields have been observed to be relatively highly on organic farming but are more than compensated by the price premium fetched by the organic farming and the yield and profit stability observed on organic farming. The organic farming has been found to conserve the soil and water resources, increases farmers' income, thereby enhancing their economic well-being and livelihood security. Thus, organic turmeric is important in achieving the goal of sustainable agriculture. It has been suggested that organic farming should receive prime attention from all the stakeholders to realize its full potential in increasing profitability and providing the much sought after sustainability of agriculture.

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