ORGANIC FARM PRODUCE IN KERALA - AN ECONOMICANALYSIS

By

DANA.K

THESIS

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DECLARATION

I hereby declare that the thesis entitled **"Organic farm produce in Kerala - An economic analysis"** is a bonafide record of research work done by me during the course of research and the thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship or other similar title, of any other University or Society.

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CERTIFICATE

Certified that the thesis entitled **"Organic farm produce in Kerala - An economic analysis"** is a record of research work done independently by **Mrs. Dana. K,** under my guidance and supervision and that it has not previously formed the basis for the award of any degree, diploma, associateship or fellowship to her.

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Introduction

INTRODUCTION

The Green revolution technologies involving greater use of synthetic agrochemicals such as fertilizers and pesticides with adoption of nutrient-responsive, high- yielding varieties of crops have boosted the productivity in most of the cases. However, this increase in production has been slowed down and in some cases there are indications of decline in growth of productivity and production. Priorities in agriculture research are gradually moving from a focus on individual crop performance to total system productivity with due attention on product quality and environment safety. Environmental and health problems associated with agriculture have been increasingly well documented, but it is only recently that the scale of the costs has attracted the attention of planners and scientists.

In the rapid pace of development we have inflicted serious damage to the natural resources and consequently we are now searching for clean water, healthy crops and refreshing air. These have given rise to a process of serious thinking to safeguard the environment and the quality of natural resources for sustainability. As a result more and more emphasis is being given towards returning to nature and adoption of organic agriculture.

Organic farming is not new to Indian farming community. Several forms of organic farming are being successfully practised in diverse climate, particularly in rainfed, tribal, mountainous and hilly tracts of the country. Much of the forest produce of economic importance like herbs, medicinal plants, honey etc., by default come under this category. Among all farming practices, organic farming is gaining wide attention among farmers, entrepreneurs, policy makers and agricultural scientists for varied reasons like minimization of the dependence on chemical inputs (fertilizers, pesticides, herbicides and other agro-chemicals) thus safeguarding the quality of resources, and environment. Though it is labour

intensive it provides an opportunity to increase the rural employment and to achieve long term improvement in the quality of resource base.

The popularity of organic farming is gradually increasing and now organic agriculture is practiced in almost all countries of the world, and its percentage share in agricultural farms is expanding. The concept of organic farming originated in the U.K. during 1930s and certified organic produce has been available since 1970s. According to the latest survey by Foundation for Ecology and Agriculture (SOEL, 2006), more than 31 million hectares are currently managed organically by at least 6.23 lakh farms worldwide (approximately 130 countries). This includes certified forest and wild harvested plants, which adds at least another 19.7 million hectares, summing up to more than 51 million hectares in total and the area under organic management is continually growing. Although production of organic crops is increasing across the globe, sales are concentrated in the industrialized parts of the world only.

With organic production and trade growing globally, there was also a growing interest in organic agriculture in India, specifically amongst non-governmental organizations working in marginal and tribal areas and private companies. Motivations for conversion to organic farming were: (a) to reach self-sufficiency in food; (b) to improve soil fertility and (c) to engage in export trade. Environment friendly agriculture was considered to be more important because environmental degradation of the rural areas in India was alarmingly increasing. Recognizing this, the Government of India had set up a special cell for export of certified organic products under the Agricultural and Processed Food Products Export Development Authority (APEDA), Ministry of Commerce and Industry (MCI). In 2000, MCI had launched the National Program of Organic Production (NPOP). In the same year, the Ministry of Agriculture created a Task Force for Organic Agriculture as part of the government's plan to promote organic agriculture from 10th Five Year Plan onwards, which commenced in 2002.

The market for organic products is growing, not only in Europe and North America but also in many other countries. The global market for organic food was around US$ 29 to 31 billions during 2005. The demand for organic food is steadily increasing both in developed and developing countries, with annual average growth rate of 20-25 percent. Asia alone has about 6 lakh hectares under organic production, which accounts for 2.6 per cent of all organic area worldwide and 15.1 per cent of all organic farms worldwide. India has 76000 hectare under organic farming, which is only 0.03 percent of all agricultural land in India (Yussefi and Willer, 2006)

In India the total value of certified organic produce was estimated to be, approximately US$ 18.5 million, producing 1.2 lakh tonnes with 31 organic products. APEDA has estimated the value of non-certified organic crops, other than tea, coffee, spices and cotton, to be approximately US$ 3.5 million. Certified organic products are predominantly exported to Europe. It has been estimated that 6792 tonnes of organic products have been exported from India with an approximate value of Rs.7123 lakhs (NPOP, 2006) where the maximum product came from Kerala (1232 tonnes). The maximum price premium farmers received was 25-30 percent and a domestic market was virtually non-existent. It is observed that there was an absence of consumer awareness regarding health and environmental benefits of organic products, as the marketing and information services available in India would relate to conventional products only.

There is a growing demand for organic foods driven primarily by the consumer's perceptions of the quality and safety of these foods and by the positive environmental impact of organic agriculture practices. Consumers are willing to pay premium prices for organic products up to 10 percent in countries like USA and even in India as evidenced by many studies in the late 1990s. In Baroda and Ahmedabad, more than 70 percent of the consumers with income above Rs. 5,000 per month were ready to pay 15-20 per cent premium for organic food items. This premium is required to make initial returns from organic farming

comparable to that from conventional agriculture (Naik, 1999). But, only about 20 per cent of the consumers in India were aware of organic produce.

Kerala, known for its high literacy and awareness on issues concerning health, is apparently accepting the concept. In the past 10-15 years, many farmers in Kerala other than those who continued the traditional methods have taken up organic farming quite earnestly. Some have succeeded, others are in the process of evolution and yet others have failed but new options are being tested out. Those who reverted from modern intensive agriculture to organic farming faced many short – run problems. Sudden withdrawal of the external inputs led to steep fall in yield. Indigenous varieties replaced the high yielding ones. The gap of 30 - 40 years created a vacuum in the knowledge of traditional agricultural practices. The prevalence of modern agriculture in the majority of the cultivable areas makes it difficult to maintain organic purity in the soil and atmosphere. Moreover, the organic farmers are scattered all over the state with a few pursuing it seriously. Wayanad district is one among the serious adopters. The area under organic farming in Kerala has increased from less than 500 hectares to about 6200 hectares during the recent years indicating the growing importance of the system in the state.

In this background, the present study was taken up with the following objectives.

- To examine the supply pattern and marketing practices
- To evaluate the constraints of production and marketing, and
- To study the consumer preference of organic produce in Kerala.

Scope of the study

At present, the world trade of organic produce is about US$ 32 billion. It is increasing at a rate of 20- 25 percent every year. It was predicted that the world

organic market would cover US$ 100 billion by 2008. (Thakur and Sharma, 2003). The demand for organic food is increasing both in developed and developing countries and currently there are over 200 million people who can afford to buy organic foods worldwide. Considering the potential environmental benefits of organic production and its compatibility with integrated agricultural approaches to rural development, organic agriculture may be considered as a development vehicle for developing countries like India, in particular. The present study would throw light on the economics, marketing and supply pattern of organic products in Kerala, which would be helpful for planning appropriate strategies for organic production and exploring the scope for export of organic products in the state. The study on consumer willingness to pay for organic produce will prove helpful in identifying suitable crops for organic farming and evolving appropriate strategies for their marketing.

Limitations

The availability of secondary data on the area, production and supply of organic produce in Kerala was found to be a major limitation for the study. In the absence of published data on the above aspects, the data that was available at organic cell, Government of Kerala and the concerned non-governmental organisations were used. The results of the study are based on farm level data, which were collected from farmers through personal interview method. The data may not be fully reliable and accurate, as the respondent farmers were not recording the cultivation details regularly, though they have to maintain farm records. Some farmers were recording it just before the time of inspection. Some of the data were drawn from their memory and may be subjected to recall bias. However every effort was made to minimize the error by cross verification and cross checking.

Plan of the thesis.

The thesis consists of five chapters as given below. The first chapter deals with introduction wherein objectives of the study, the scope and limitations are discussed. The second chapter covers review of related studies in the light of the present study. The third chapter relates to the details of study area and methodology used in the process of investigation. The results and discussions are presented in the fourth chapter and chapter five gives the summary and conclusion of the study followed by references and abstract.

Review of Literature

2. REVIEW OF LITERATURE

A comprehensive review of the past studies is useful to formulate concepts, methodologies and tools of analysis to be used for any research. In this chapter an attempt has been made to review important past studies relevant to the present study. As the study attempts to examine the supply pattern, marketing aspects, constraints in production and marketing as well as the consumer awareness regarding organic farm produce, studies relating to these aspects are given in four sections namely

2.1. Costs and returns in organic agriculture
2.2. Marketing of organic produce
2.3. Constraints in production and marketing of organic produce
2.4 Consumer awareness and willingness to pay for organic produce

2.1 Cost and returns in organic agriculture

An attempt was made to compare the economics of four crops of banana grown in natural way with those produced in conventional way by Save *et al* (1991). In the first round organic farm yielded 18 kg banana, while conventional one gave 25 kg and during the second round both farms yielded 30 kg. However in the third round, the natural farm gave 25 kg and conventional farm yielded only 20 kg. The aggregate output was 88 kg on the natural farm and 75 kg on the conventional one. When natural banana commanded a price of Rs 2.5 per kg, the conventional could fetch only Rs 1.75 per kg: The expenses incurred were Rs 66 and Rs 105 for the organic and conventional bananas respectively.

In a study of ecological agriculture in South India, Jager and Werf (1992) compared the agronomic and economic performance of seven farm pair of one ecological and one conventional. It was observed that ecological farms achieved similar economic results as conventional farms, for gross margin per hectare (Rs

10620 and Rs 11515 respectively) as well as net farm income per labour day (Rs 32). In ecological farms trees and livestock were numerous than in conventional (7: 1 and 4: 1 respectively).

Rahudkar and Phate (1992) analyzed individual farms cultivating sugarcane and grapes in Maharastra and the net profit from both sugarcane and grapes were found to be higher in organic farms. The sugarcane quality was also found to increase in organic farms.

In a study on natural farming in Somani area of Rajasthan, Save (1992) found that after three years of switching over to organic cultivation, the soil was not recovered from the ill effects of chemical cultivation. It was observed that, when the soil regained its health, production was increased. The farm, which yielded 200-250 coconuts per tree in the chemical farming, yielded 350-400 nuts per tree per annum, with organic farming.

Organic farming was found to be more viable than conventional farming in the United States of America (USA) and the European countries due to either higher yield, lower cost or higher market prices (Lampkin, 1994).

Rajput and Trifle (1994) analyzed the return and benefit cost ratio of conventional and mixed organic farms in Jabalpur. The data obtained from both types of farms were processed and analyzed. The lowest cost of cultivation of soybean and potato crops was found to be Rs 410 and Rs 1072 per hectare respectively with mixed organic farming. Overall cost of cultivation of soyabean- potato cropping sequence was found 27.3 percent lower in mixed organic farming than conventional. The average return was also higher in mixed organic farming. It was Rs 9338 per hectare for soybean and Rs. 20308 per hectare for potato. The respective B:C ratio of soybean and potato were 1: 3.27 and 1: 2.89 and found to be highest in mixed organic farming. The increased production was 53.6 percent in soyabean and 58.2 percent in potato. It was also observed that the overall cost

benefit ratio of soyabean- potato sequence were 1:3 in mixed organic farming and 1: 1.9 in conventional.

Wheat production levels in eight paired adjacent fields managed organically and conventionally in Western Australia were monitored and analyzed for three years (Deria *et al*, 1996). It was found that grain yield of both systems were comparable at four sites, but grain yield of organic wheat was significantly depressed at the other four.

Gopimony *et al* (1996) conducted a study on early impact of organic farming on crop productivity in Kerala and reported that comparative yields of bhindi in different organic plots were higher than conventional. They observed a reduced yield of organic bhindi (only one seventh of conventional) in the first year, but the subsequent years it was increased.

A study on benefit cost (B: C) analysis of organic farming in Puthukottai district in Tamilnadu by Margasagayam and Norman (1997) revealed that B: C ratio of organic farming was high, but the yield didn't show much difference in comparison with conventional agriculture. They studied the impact of organic farming on yield, income, expenditure, ecology, debt and health of 300 organic farmers and the results were encouraging.

A project of growing organic banana in Dominican republic in an area of 100 hectares revealed that production of organic bananas were higher (29 tonnes per hectare) compared to conventional (16 tonnes per hectare). Gross income was also found much higher in organics (12460 US$) than traditional (727 US$). Higher labor input and cost for organic bananas were compensated by much lower cost of external inputs and premium price (Palaniappan and Annadurai, 1999). In another study on organic tea cultivation they observed that operational cost for organic field was five times more than that of conventional and the price for organic tea was about 80 percent higher.

While studying the organic farming practices in Japan, Hui-lian *et al* (2000) found that fruit yield was 62 percent higher for organically farmed pear orchard compared to chemical based farms.

Reganold *et al* (2000) in a comparative study of profitability in organic, conventional and integrated apple production system in Germany revealed that, after two years of establishment, fruit yield was found higher in organic production compared to conventional system, but compared to integrated it was less in organic.

Singh *et al* (2001) examined rice-chick pea cropping sequence using organic farming and observed that yield was substantially higher in organic farming compared to control group. Similar results were obtained for rice, ginger, sunflower, soybean and sesame.

In a study on organic production and marketing in Italy, Giuseppe (2003) found out a drastic 31 percent decline of average yield in organic cultivation compared to traditional. The average value per unit of total production cost came to about $6331.6 per hectare for organic cultivation and about $5939.5 per hectare for traditional, while cost per tonne was about $ 301.5 and $ 216.0 per hectare respectively for organic and traditional. The material cost was found to be the most expensive item (42 percent for organic and 41.3 percent for traditional) followed by work and services (36.4 percent for organic and 36.8 percent for traditional) and shares and other function (21.7 percent and 21.9 percent).

Kutkar *et al* (2003) in a study on organic marketing in Haryana, revealed that organic farming decreased the cost of cultivation per acre by three to nine percent and cost of production per quintal by 12-14 percent in four major crops of paddy, soybean, arhar and wheat. Net return earned by the farmer was increased manifold by reduction in cost and farmers were able to fetch a price premium of 10-20 percent for all the crops.

Ramasundaram *et al* (2003) conducted a study on potential and constraints of production and marketing of organic cotton in Yavatmal district in Maharastra. The data collected from 40 organic cultivators revealed that cost of production was decreased by 28 percent with decreased yield of 20 percent. But they received a premium price ranged between 130-701 per quintal. It was also reported that cost benefit ratio in organic cotton was 1: 1.63 against 1: 1.47 in inorganic.

A study was conducted to analyze the effect of organic farming on the vegetable quality in Poland by Rambialkowska (2003) revealed that organic potatoes showed better storage quality and an increase in yield by 33 percent.

Rao (2003) analysed the marketing of organic wheat in Rajasthan and reported that the total production of wheat was more (150.4 quintal per farm) for organic farming areas than inorganic areas (30.7 quintal per farm) resulting higher (125 quintal per farm) marketed surplus than inorganic production (15 quintal per farm). He also indicated that the producer-selling price was found low in the case of organic produce (Rs 638.84 per quintal) than inorganic wheat (Rs 645.5 per quintal).

Rathi *et al* (2003) focused on the diversified nature of organic farming in Maharastra, where farmer's were cultivating horticultural crops and undertook allied activities. They found that cost of production was lower and net return higher because of premium price on organic produce.

In Himachal Pradesh the net income per hectare from organic farming was found to be 2-3 times higher both in case of maize and wheat. This was not only due to good yields but also the higher prices obtained by organic produce as well as by products, which were 2-3 times higher in case of wheat and various pulses and vegetables due to taste and freshness. In Haryana, the cost of production was lower and net returns higher (2-3 times) in basmati rice, soyabean, arhar and wheat because of 25-30 per cent price premium on organic produce and lower cost

of production and marketing. The farmer's net returns ranged from a low of Rs. 8-9 thousand on traditional vegetables and as high as Rs. 17-28 thousand in the case of baby corn and exotic vegetables like broccoli and red and Chinese cabbages. The major factors in the success of organic farmers were found to be marketing of vermicompost and contractual marketing of produce (Singh, 2003).

Thakur *et al* (2003) in their study examined the comparative economies of organic produce vis- a - vis inorganic produce and opined that cost of production was lower under organic farming system (OFS) than under inorganic farming system (IFS). The study was conducted in 100 farms in Himachal Pradesh for a period of three years and found that total cost of production of maize and wheat was lower under OFS and net income was two to three times higher. Both productivity and premium price contributed to increased profitability.

Yadav *et al* (2003) studied 100 organic and inorganic farms in Karnataka and observed that cost benefit ratio of Organic Farming System was higher compared to conventional. The cost benefit ratio of organic groundnut was 1: 1. 26 compared to 1: 1.31 for inorganic; for jowar it was 1: 1.36 against 1: 1.28 and for cotton 1: 1.34 against 1: 1.24. The cost benefit ratio for coconut and banana were found to be significantly high for organic (1: 1.7 and 1: 1.366) compared to inorganic (1:1.3 and 1: 2.8). About 50 percent of the farmers reported that organic yield was higher compared to inorganic. The cost of cultivation in organic farming was also found to be lowered by 80 percent and produce quality was good in all cases, but only 40 percent of them got higher price for organic.

In a study on the status of organic farming in Kerala, Balachandran (2004) worked out the profitability of the farms using Total Factor Productivity method (TFP). Out of 11 regions selected for the study only one region showed loss (TFP= 0.92) in organic farming, due to the effect of large-scale virus infection. 10 regions showed profitability in organic farming (TFP= more than one). The TFP of organic farming sample farmers in farming Pokkali, Kuttanad, Onattukara,

South, Attapadi, Wayanad, Central-1, Central -2, North-1, North -2 were estimated to be 0.92, 1.46, 2.64, 3.94, 2.83, 3.78, 4.72, 3.45, 5.34 and 4.99 respectively.

The study conducted by United Nations Conference on Trade and Development (2004) among 28 organic spice growers in Idukki district of Kerala revealed that cost of production was higher in conversion period and reduced in the post conversion period. 18 out of 28 farmers reported a decline in output of 30 percent or more in post conversion period and 10 reported a decline of 10-20 percent. It was also reported that 20 farmers among the study group got higher price for organic produce.

Ramesh *et al* (2005) in a study on organic farming revealed that replacement of external inputs by farm derived sources normally lead to reduction in variable cost under organic management. Expenditure on fertilizers and sprayers were substantially lower in organic farming than in conventional. The most expensive item was found to be the input cost followed by organic manure and the average profit was 48.5 percent higher in organic farming.

An economic analysis on organic farming was conducted by Thakur and Sharma (2005) who compared the economics of maize and wheat under organic farming system (OFS) and inorganic farming system (IFS). They found that the yield, total production, income and profit of crops increased by three times under OFS as compared to IFS over the years. The cost of production was low under OFS in comparison. They also reported that organic products fetched high premium in the market by 2- 3 times than the inorganic products. The linear regression model employed to quantify the technical relation of farm income with size of holdings, farm labour and organic manures showed that these three factors were significantly related to the return.

The economics of organic and inorganic sugarcane farming in Maharastra was examined by Kshirsagar (2006). The organic sugarcane farming (OSF) was found labour intensive, but cost of cultivation was lowered by 15.39 percent due to savings on chemical fertilisers, irrigation, seeds and agrochemicals. The yield on OSF has been reported lower (by 7.17 percent), but it was compensated by the price premium received and profit stability. The results revealed that OSF increased farmer's income by 10.82 percent and thereby enhanced their economic well being and livelihood security.

Singh *et al* (2006) analysed the present scenario about adoption and awareness of organic farming as well as cost and returns of organic and inorganic farming systems in Utharanchal. The study had revealed a fairly good adoption status with 36.51 percent of sample farmers engaged in organic farming. Cost of cultivation for organic paddy over cost A1 was Rs 18786 per ha and for non-organic paddy as Rs 19106 per ha. The yield from organic and non-organic paddy was found as 26.86 quintal per hectare and 32.74 quintal per hectare, respectively. However, farmers could realize relatively higher prices for organic (Rs 1380 per quintal) than non-organic (Rs1161 per quintal) paddy. Net returns over cost A1 from organic and non organic paddy was Rs 20144 per hectare and Rs 21323 per hectare respectively. For organic and non-organic wheat, cost over A1 has been recorded as Rs 8653 per hectare and Rs 12220 per hectare respectively. The wheat yield was lower for organic (19.85 quintal per hectare) than non-organic (28.12 quintal per hectare) farming.

In a study on economics of organic farming in pepper in Kerala, Madan (2007) reported that total returns in terms of money value from a unit area were almost same for both organic and conventional pepper. The major cost item identified in organic pepper production was labour cost followed by certification cost. Majority of the surveyed organic producers reported that they were not getting a premium price for their produce.

Experiments on ginger at Indian Institute of Spice Research, Calicut revealed that yield under organic management was lower compared to chemical and integrated farming by 25 percent and 28 percent respectively. In the case of turmeric, high yield was noticed in integrated farming (33.38 tones per hectare) followed by organic management (23.68 tones per hectare) and lowest yield was recorded (22.44 tones per hectare) in inorganic. (Parthasaradhy *et al*, 2007).

2.2 Marketing of organic produce

A study on marketing and export potential of organically grown products in Bangalore, by Chengappa and Prakash (1996) revealed that, consumer concern over high level of saturated fats, sugar and salt in foods as well as the risk from food additives and pesticide residues had stimulated the demand for organic foods. There was an increasing awareness of the environmental damage associated with the use of agrochemicals and the development of market for organic food was largely consumer led. They also reported that survey results in European Union and USA market showed an upsurge in demand for organic food.

Karen and Laura (1996) in a study in California market observed that a total of 1159 organic farmers sold more than 70 individual commodities. Gross sales for organic products were reported to be $ 75.4 million. Vegetables, fruits and nuts dominate the industry with respect to number of farmers. Flowers showed highest gross return per acre ($ 3333 per acre), followed by vegetables ($ 3250 per acre). Farm produced field crops showed highest annual gross sales ($15000) followed by mixed commodities ($ 13000) and flowers ($10000). The average organic farm area was five acre and total sales came to about $ 7500 annually.

Marketing and export potential of organic products were examined by Kaushal and Thakur (1996) and they found that there was a world of opportunity for export of the produce officially labeled as “organic”. Growing demand for

healthy nutrition, environmental effects and human health hazards associated with synthetic chemicals encouraged several growers of fruits and vegetables to shift towards organic farming. They also opined that proper marketing of organic produce requires sales and delivery to specific markets, certification procedure, separate packaging and special labeling.

During the 1990s, organic food sales in U.S grew at an average rate of 24 percent per annum. Although a quarter of the consumers in USA purchased organic food, the market share was quite small (1 - 1.5 per cent in 1996). The U.S. was the largest single country market for organic food with sales worth $ 4.2 million in 1997. The other major markets for organic foods are Japan, Germany, China, France, the United Kingdom (7 per cent of total food sales), Austria, Netherlands, Sweden and Denmark (3-4 per cent of retail food market). (Thompson, 1998).

In analyzing requirement and potential for trade in organic spices, Birgitt (2000) came out with the finding that Europe, USA and Japan were the largest markets for organic products. With highest turn over of 5.6 billion $, USA ranked first in organic market. Germany was considered the biggest market in Europe (2.24 billion $), but only half of the produce consumed in Germany were produced there, the rest has to be imported. She also prognosticates that organics will reach a market share of 10 percent of total food market in Europe within next five to ten years.

The International federation of Organic Agricultural Movement (IFOAM, 2000) estimated that an area of about 41000 hectare in India was under organic farming, representing about 0.17 percent of the world organic acreage. IFOAM also predicted that India and China have great potential in organic farming and marketing.

A study by Government of India (2001) observed that, there were no separate markets for organic products in many commodities like wheat and hence the market did not offer any incentive for the production of organic produce. Some agencies created separate market outlets for organic produce like the Maharashtra Cotton Marketing Federation, which purchased organic cotton from growers separately for export.

Mahale (2002) reported that domestic organic market and consumer awareness were underdeveloped in India and organic food was sold directly by the farmer or through specialized shops in the domestic market. He also observed an increasing interest for organic food in Indian domestic market.

Rudy (2002) found that organic food sales varied between one percent and three percent of total food sales in the world major market, and thus indicated strong potential for growth. She analyzed the types of organic products needed by US consumers and found out an increased demand for the products such as tea, coffee, cocoa, vegetables, fruits and novelty / specialty products like organic wines and ethnic food products.

Italian organic market was found to be fast spreading. It was found that the major organic market share came from direct sales in the open market places and at the farms in early 1980s. After 1990s the picture was reversed and specialized markets, supermarkets, franchises and school canteens became the major organic marketing channel. Studies have shown that dairy products ranked first in organic sales with a share of 26 percent followed by fruits and vegetables with 13 percent share and breads and biscuits with 12 percent. People in a few countries even want to wear clothes made from organic cotton. (Dhaliwal, 2003)

Kumar and Jain (2003) examined Indian organic export and found that it was worth around $ 0.32 million (11925 tonnes) in the year 2002. Domestic sales

of organic products account only 7.5 percent. Rice, wheat, tea, coffee, pulses, fruits and vegetables, cashew nuts, cotton, oilseeds and medicinal herbs were found to be the products available for export. European Union, USA, Middle East Asian countries and Australia were major destination countries for Indian organic products.

In a study on organic market potential, possibilities with promise for eco balance, Sharma (2003) analyzed the world market for organic products and it was found to have expanded, but the growth was mainly concentrated in EU, USA and Japan markets. The three markets had recorded an annual growth rate of 15 – 30 percent in the year 2002 and expected to increase in the coming years. In another study Youssefi and Willer (2003) reported that the market for organic products were not only concentrated in Europe and America, but also in many other countries including developing countries.

According to Andrewmonk (2004), the value of the organic industry was $ 250 million in the year 2003 and the growth in demand (20-25 percent) continued to outstrip the supply (10-15 percent). New farmers entered the industry at 10 percent growth rate at a time when conventional farmers continued to leave the land. Number of processors was also found to increase. He observed it as a reflection of the mature market and demand for more "ready to eat" organic products.

In a study on the status of organic farming in Kerala, Balachandran (2004) conducted a survey among 151 organic farmers in different regions of Kerala. The results indicated that out of 151, only 39 farmers sold their products as organic. 17 opined that they didn't get enough produce for the sale, and 87 farmers were not all selling their produce. The major problem cited by many farmers was the poor marketing prospects of organic products. They emphasized on the need to develop marketing strategies as well as government level policy support for organic produce marketing.

Narayanan (2004) in a study on organic farming in India, problems and constraints, found that India was known in the world organic market as a tea supplier and there was good potential to export coffee, vegetables, sugar, herbs and vanilla. He also observed that the demand for organic products were high in advanced countries, while the supply was unable to match it. He predicted that India could export almost 85 percent of the production, as the demand was not a constraint in the international market.

The production of organic commodities on a commercial scale was reported in 90 countries with more than 20 in Asia, Latin America, Africa and Middle East each with thousands of enterprises producing variety of crops and agricultural produce over lakhs of hectares. There were global commodity chains and networks in organic trade as well, which was largely driven by buyers and certification agencies (Raynolds, 2004).

Ruby (2004) examined the growth of organic market in Brazil and reported that the country has shown an enormous growth rate in organic agriculture. About 8000 hectare area were certified as organic with a sales value of 200 million US$ in the year 2003.

A study on organic farming in banana in South India by Sathyamoorthy and Musthafa (2004) revealed that organic banana gained acceptance in the foreign markets and fetched premium price. They observed that organic banana became important food item in Europe and US and the growth came to about 5- 10 percent.

In a nation wide survey in organic farmers, Walz (2004) observed that about 80 percent of respondents who produced vegetable, herb, flowers, mushroom and honey products sold through consumer-direct channels, 54 percent of respondents sold these products through direct-to-retail channels and sale of products through wholesale markets was around 69 percent. 41 percent of

respondents said they were able to obtain organic price premiums on 100 percent of their organically grown products, 86 percent of respondents indicated that they received a premium price for some portion of their organically grown products but 8 percent of respondents were unable to obtain price premium on any of their organically grown products.

Battacharya and Chakraborthy (2005) analysed the current status of organic farming in India and other countries and reported that all India total organic export was 6472 tonnes in the year 2004-2005, with approximate value of Rs 80-90 crores, where the maximum products came from Kerala (1232 tones). It was estimated that the present organic area, which is certified as "organic" was found 76000 hectare with 35 export oriented products.

Kovacs and Richter (2005) analysed the current status and prospects of domestic organic market development in selected countries with emerging organic markets (The Czech Republic, Poland, Hungary, Ukraine, Mexico and India). In all countries studied, supply was growing faster than domestic demand. The growing supply was driven mostly by the economic situation of the conventional agriculture sector, which was affected by declining prices and a lack of financial resources to invest in intensive conventional production. The organic production structure in the countries studied was mostly concentrated on cereals, oilseeds and tea.

Thomas *et al* (2005) in a study on organic food manufacturing and marketing observed that organic market growth was dynamic. When the supply side is secure, market will have unlimited growth potential. He also reported that organic raw materials, ingredients, and qualified processing aids would cost 10 to 100 percent more than their counter parts.

In a study conducted on organic spice marketing in Kerala, Madan (2007) analyzed the marketing aspects of organic pepper and found that majority of

organic pepper growers were not getting price premium. It was observed that only first quality products were sold with price premium and there was no demand for second quality products. Hence the farmers found it convenient to sell the entire lot (without sorting) in the open market at the same price fetched by conventional produce in the absence of specialized markets for organic produce.

While studying the organic farming in spices, possibilities and problems, Nair and Rajesh (2007) reported that India exported 3.2 lakh tonnes of spices valued at 517.9 million $ in the year 2006. They observed that organic farming was a market demanding specialized sector especially in foreign exchange earner crops like spices.

Nambiar (2007) in his study on organic spices exports in India revealed that the growth rate of organic market was found to be 20-30 percent annually and India has emerged as a major supplier of organic products in the world market. The supply was increased and health conscious global consumers have started consuming the organic products and demand was also found to be increasing.

While studying processing of organic spices and their export, Sunil (2007) observed that organic spices constituted only 0.5 of the total value of spice export by India and the export of organic spice was found to be increasing at nearly 25 percent per annum, over the past five years (from 2001 to 2006). He also revealed that India was considered as a leading global supplier of quality organic spices in the world market.

2.3 Constraints in production and marketing

The major problems identified for organic farming and marketing were complicated production technology, alienation of farmers from the concept, lack of standards, and lack of large market opportunities comparable to those for non-organic produce markets (Levin and Panyakul, 1993).

In a study on problems of organic farming under different agro climatic conditions, Balasubrahmaniam and Arunachalam (1996) reported that certification, non-availability of package of practices for organic farming, non-availability of organic resources and high production cost were the major constraints.

A study conducted in Bangalore to analyse the critical problems of organic food movement by Vanaja (1996), found that deciding cropping pattern according to market demand, input supply, consumer involvement in market function and quality of food were the major problems.

Sriram (1997) in a study on ecofriendly agricultural practices in cotton cultivation: attitude and adoption of farmers in Tamilnadu stated that scarcity of labour, lack of assured irrigation, lack of technical guidance on the use of bio control agents, non availability of inputs, lack of knowledge to identify pest and disease and difficulty in maintaining pheromone traps were considered as the major constraints faced by farmers in adoption of eco friendly agricultural practices.

In a study of sustainable agriculture appropriate to homestead farming in Kerala, Sherief (1998) reported that lack of information, low yield, high cost of organic inputs, high labour cost, problems of pest and diseases, skilled labour requirement, lack of credit facilities, lack of government support and low premium for organic products were the major problems. In another study, Sharma (2000) reported that difficulty to obtain reliable market information, lack of consumer acceptance in developing countries, lack of awareness, higher price, ecological dumping and bio colonialism were the major problems in organic farming.

While analysing the adoption status of organic farming in Karnataka, Ranganatha *et al* (2001) observed that more cost and risk involved in getting organic manures, transportation of green manures, lack of ready packages for

growing rice organically, lack of knowledge on crop rotation, water management and biological control of pest and disease were the major constraints in organic production.

According to Klonsky and Smith (2002) the hindrances to organic farming, in general, included high initial cost (15-20 per cent) and high cost of certification especially for relatively small farmers.

Kumar and Jain (2003) in a study on marketing of organic products and minor forest produce in India observed that the high price expectation, low quality, low shipment, import restrictions, lack of national certification, lack of marketing intelligence, poor customer service, lack of proper marketing network, low involvement of government and lack of subsidies were the critical constraints in organic marketing.

Ramasundaram *et al* (2003) reported that non-availability of suitable varieties and packages, standards, domestic certification agencies and delayed procurement and payment made by the organizers were the major problems in organic farming and marketing. Inability to obtain a premium price for organic wheat was the major problem cited by the organic farmers in Rajasthan. (Rao, 2003)

Sharma (2003) analysed the challenges in organic farming in India and found that management was a critical factor at farmer's level. He observed that the minimum scale of operations needed to run an export business was far beyond the scope of small and often isolated farmer. Restrictive trade policies and perverse subsidies were the serious barriers to southern producers.

While studying the status of organic farming in Kerala, Balachandran (2004) reported that the problems faced by the farmers were the unavailability of labour and exorbitant wage rate, pest and disease infestation, lack of support

during transition to organic farming, unavailability of good and indigenous seeds, artificially created price slump in the harvest season, lack of markets and consumer awareness about organic products.

Jaganathan (2004) analysed the organic farming practices in vegetable cultivation in Thiruvananthapuram district in Kerala and reported that non availability of inputs, lack of information, lack of sufficient good quality seeds, high input cost, extensive prevalence of pest and disease and lack of credit facilities were the major constraints in organic farming.

Narayanan (2004) studied the problems and prospects of organic farming in India and pointed out that the most important constraint felt in the progress of organic farming was the instability at government policy making level to take a firm decision to promote organic agriculture. Other major problem areas were found to be the lack of awareness, output marketing problem, shortage of biomass, inadequate supporting infrastructure, high input cost, marketing difficulties of organic inputs, absence of an appropriate agricultural policy, lack of financial support, low yield at the time of transition, inability to meet the export demand, vested interest, lack of quality standards for bio manures, improper accounting methods and political and social factors.

A study of awareness and adoption of organic farming among cultivators in Maharastra revealed that risk and confusion in organic farming was the major constraints for 53.73 percent of respondents while 34.4 percent experienced high input cost as major constraint, followed by lack of technical know- how and unavailability of inputs. (Navadkar *et al*, 2004).

Sidhuraju and Rajendran (2006) in a study on organic farming system in Karnataka, reported that non availability of latest scientific knowledge, lack of technical know how, problems of pest and disease control, unavailability of good

seed varieties, scarcity of FYM and other organic manures were the major problems faced by the farmers in organic farming.

Nambiar (2007) analysed the organic spice export in Kerala and reported that barriers in organic farming were non availability of organic inputs, loss in production, high price of organic produce, doubt in genuineness of produce, lack of domestic market, high cost of certification, fragmented and small holdings which make organic conversion difficult, oversupply which reduces premium and long conversion time.

In a study on constraints in adoption of organic farming in India, Saravanane *et al* (2007) revealed that availability, transportation and application of bio manures, slow release of nutrients from bio manures, intensive pest attack, chance of yield loss in initial years and lack of financial help were the major problems.

While studying the challenges and opportunities in organic spice production, Veeresh (2007) opined that increased pest and disease attack and marketing problems due to quality aspects, competition from other countries like China, Madagascar, Vietnam etc. were the challenges in organic spice production and marketing.

2.4 Consumer awareness and willingness to pay

Greene and Zepp (1989) reported that a growing number of consumers have become concerned about the health effects of chemical residue on produce. In a nation wide survey in USA in 1988, nearly 18 percent of consumers polled were concerned enough to change their buying habits. They indicated that some super markets and food retailers were responding by adding organic sections to their produce departments and by providing information for the consumer on safe levels of pesticide residues.

Consumer surveys in USA revealed that Americans want improvement in the safety of foods they ate and were willing to pay more for it. Consumer surveys carried out by the food marketing institute in USA since 1983 indicated that a majority of consumers expressed a high degree of confidence in the foods they bought. More than 73 percent consistently expressed apprehension over pesticide residues. (Smallwood, 1989)

A study conducted on marketing and export potential of organic products by Chengappa and Prakash (1996) revealed that 29 percent of the respondents in a survey in Germany considered organic foods as better than other foodstuffs, while 24 percent considered organic food as a fashion or trend and only 1.2 percent of households were identified as committed purchasers. It was also found that the consumers expressed willingness to pay a premium, but were sensitive if the price exceeds 25 percent. Nearly 50 percent of the respondents indicated a willingness to pay a premium of 10 percent.

Demographic variables such as age, marital status, number of children and education were important variables in explaining consumer demand for organic products. The place of purchase of food and habit persistence related to age and household composition were also important in understanding where potential growth in organic food might occur. With 40 per cent of retail food expenses made on food away from home, it can also be an important determinant of demand for organic products (Thompson, 1998).

A study was conducted to analyse the willingness to pay (WTP) premium price for pesticidefree fresh fruits and vegetables in Italy using an ordered logit analysis. The results indicated that WTP is significantly and positively related to income and risk concern and negatively related to education. It was found that 11 per cent of the respondents were willing to pay as much as 20 per cent above

regular prices to avoid pesticide risk, indicating relevant market niche for these safe products (Boccaletti and Nardella, 2000)

Loureiro *et al*. (2002) assessed the mean willingness to pay (WTP) for eco-labeled apples using a double-bounded logit model. They found that farmers and other producers responded well to consumer concerns about pesticides by creating new marketing opportunities for products grown with environmentally sound practices. The eco-labeled apples analysed in this study was certified by The Food Alliance, a non-profit third-party certifying organization based in Portland, Oregon, U.S.A. The data was collected from 285 apple-buying consumers. It was seen that female respondents with children and strong environmental and food safety concerns were more likely to pay a premium for eco-labeled apples. However, the estimated premium was small (about 5 cents per pound over an initial price of 99 cents) which reflected the overall difficulty in garnering a premium based on "environmentally sound" practices.

The quality attributes perceived by producers and consumers for vegetables and fruits in Western Pennsylvania were analysed by Borsai (2003). Taste, seasonality and freshness appear to be the quality attributes in priority ranking by farmers. Consumers prioritized taste, freshness, price and shelf life, when fruit and vegetable quality was evaluated. It was seen that there was an increasing mutual interest among producers and consumers in valuing fruit and vegetable quality, when produce were grown organically.

The study on sensitivity of the consumers on the quality of fresh organic tomato in Italy was carried out by Mario *et al* (2003) using conjoint analysis. The result showed that 52 percent of the respondents had never consumed organic produce, while rest of the respondents had consumed at least once. The main factors, which aroused interest in organic produce, were found to be health consciousness (24.8 percent), nutritive quality (19 percent), taste (18.2 percent), desire to help the environment (16.4 percent), and curiosity (15.2 percent).

In a customer intercept survey in central Ohio food shop in Columbus, Mervin *et al* (2003) found that 42 percent of consumers had purchased organic food. Nearly half of them purchased weekly or more frequently, which indicated that organics became a regular part of their food. Most commonly purchased food items include fresh produce, processed food, meat and poultry. It was observed that nutritional factors and desire for pesticide free food were the motivating factors to choose organic food. 82 percent ranked high price as the most important problem in buying organics, followed by inferior taste and poor appearance. The consumer's willingness to pay (WTP) for organic products was also analysed using multivariate statistical analysis. Majority of the consumers were willing to pay a 39 percent premium per box of breakfast, 32.5 percent premium for 100 percent organic ingredients and 30.6 percent premium for locally grown products.

The factors that influence the consumers purchasing decision and the evaluation of their willingness to pay (WTP) for environmentally friendly produced vegetables (EFPV) in Thailand were identified by Anunchai and Schmidt (2004). The double bounded contingent valuation method was used in surveying 1320 respondents. The results indicated that WTP was positively related to the frequency of purchasing EFPV. The respondents were willing to pay a price premium of almost 100 per cent compared to an average price increment of only 78 per cent observed in retail shop. It was suggested that there was a relatively high potential demand for EFPV in Thailand.

Thakur and Sharma (2005) in their study on organic farming for sustainable agriculture and meeting the challenges of food security in 21st century: an economic analysis ranked the organic produce with respect to peculiar traits. They observed that taste, freshness, attractiveness and toxic chemical free nature were the most important traits as perceived by the consumers. The weighted mean of rank score revealed the need for imparting

more knowledge and awareness of other useful traits and qualities of organic products.

While studying the consumer attitude for organic food, Arunprabhu and Sanguttuval (2006) reported that a growing number of consumers have become aware of organic produce. The survey ranked better taste as important criteria perceived by consumers followed by genetically modified organism (GMO) free, fair play and sustainability.

James (2006) conducted a survey among Australian organic consumers and found that 42 percent of consumers bought organic products from organic food stores, compared with 20 percent from large supermarkets and 10 percent from farmers markets. Farmers markets had strong appeal for organic consumers aged 35- 49, while those aged under 35 tended to reject farmers market in preference for organic food stores and supermarkets. The two main reasons why consumers buy organic products were health consciousness (93 percent) and pesticide free nature.

A survey of 10000 households in Central Coast region of California revealed that respondents were more interested in food safety and nutrition. The median price that people were willing to pay was 71 percent higher than regular price. It was found that 84 percent were willing to pay (WTP) a three percent premium, while 67 percent were WTP 17 percent more, 56 percent ready to pay 33 percent more and 42 percent were ready for 100 percent increase (Howard, 2006). Sidharaju and Rajendran (2006) conducted a study in organic farming systems, issues and concerns and reported that the demand for organic foods was growing. The findings revealed that high nutritional value, good taste and use of organic nutrients were the important factors, which motivated the consumers to buy organics.

The willingness to pay premium (WTPP) for pesticide residue free bitter gourd was studied by Chithra (2006). She found that 82.5 per cent of the consumers were aware of the pesticide residues. On an average, the consumers were willing to pay Rs. 12.21 per kg as price for pesticide free bitter gourd. The price premium formed 52.63 per cent above the retail price. A logistic regression was estimated to analyse the factors influencing the consumer WTP for pesticide residue free bitter gourd and found that consumers who were aware of the pesticide residues and who had higher income level were willing to pay more as the price premium for pesticide free bitter gourd. However, the education level did not show significance in determining the willingness to pay.

Materials and Methods

3. MATERIALS AND METHODS

Appropriate research design is a pre-requisite for successful completion of a research study. The present study on the economic analysis of organic farm produce in Kerala aims to estimate cost and returns of organic farms, supply pattern, marketing and the consumer awareness regarding organic produce. In this section a brief description of the study area and the methodology used for the study are discussed in detail.

3.1 AREA OF STUDY

The study was undertaken in Wayanad district where organic farming is undertaken on a commercial basis. The consumer survey was conducted in Kozhikode corporation area, where the organic produce from Wayanad is mainly marketed.

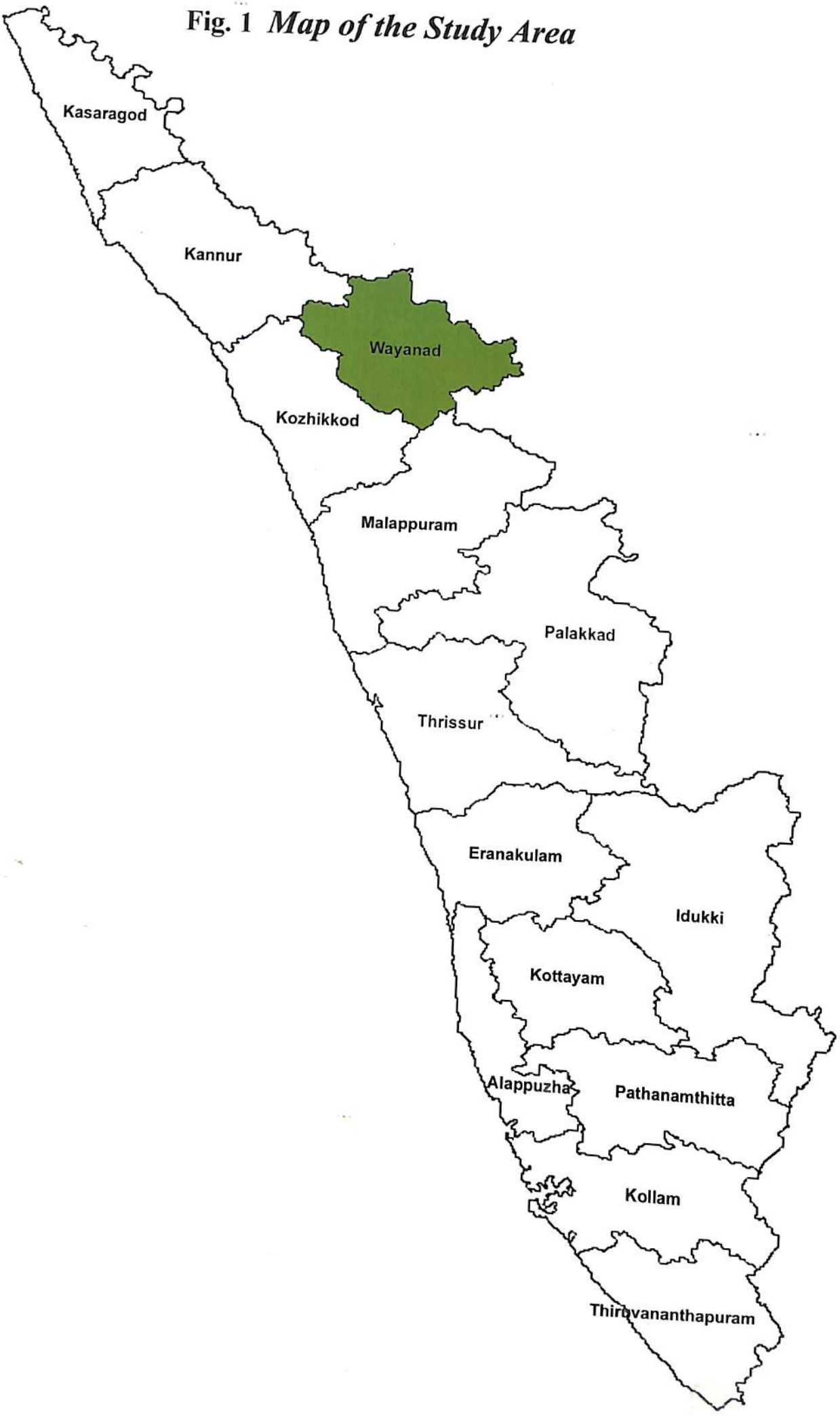
3.1.1 Wayanad district

"The land of forests" Wayanad, is situated on the southern tip of the Deccan plateau, and was inhabited by only tribals till 17th century. The youngest district in the state is blessed with its luxuriant vegetation, mountains, and fertile valleys with perennial irrigation from streams and rivers. The headquarter of the district is Kalpetta.

3.1.1.1 Location

It is bounded on the east by Nilgiris and Mysore districts of Tamilnadu and Karnataka respectively, on the north by Coorg district of Karnataka, on the south by Malappuram and on the west by Kozhikode and Kannur. Wayanad lies between north latitude 11^0 27' and 15^0 58' and east longitude 75^0 47 ' and 70^0 27'. The total geographical area of the district is 2132 sq. kms, representing 5.5 per cent of the state's geographical area.

Fig. 1 ***Map of the Study Area***



For the purpose of administration, the district is divided into three taluks, Vythiri, Sulthan Bathery and Mananthavady. The district has three blocks and twenty six Panchayaths. There are 49 villages in the district.

The most important river originating from the district is Kabani, which is one of the tributaries of Kavery River. This river has its origin from Mananthavady at Kalvatti. Another important river, which also originates from Mananthavady taluk, is Mahe. It flows westwards and falls in Arabian Sea near Mahe. The district has some key irrigation projects and dams at various stage of implementation. The Karappuzha irrigation project envisages construction of a dam at Vazhavatta across Kabani river. It is expected to irrigate 4650 hectares in Kalpetta and Sulthan bathery blocks. A second project aims at the construction of a dam at Mananthavady river. Banasurasagar, a dual purpose project is proposed to construct across Choornipuzha. This project is expected to provide irrigation in an area of 2800 hectares in Wayanad.

3.1.1.2 Geographical features

Geologically the area falls under the category of residual laterites. The geological formation has originated from crystalline rocks of archean age and include granite charkonite and schist. Physiographically the area is hilly with an undulating terrain with altitude ranging from 700-1200 meters above MSL. Wayanad district represent south eastern and Deccan plateau. Though contour profiles of Vythiri taluk does not show depression in any direction, Mananthavady and North Eastern parts of Sulthan Bathery exhibits a gradual depression in West east direction.

3.1.1.3. Demographic features

As per 2001 census, Wayanad is the least populated district in Kerala with 780619 persons, which constitute 2.09 per cent of the population of the state. The density of the population is 367 per sq.k.m. The sex ratio of the district is 1010 females for 1000 males. This is in consonance with the unique

pattern of the state, which is contrary to the all India figure of 929 females per 1000 males. The literacy rate of the district is 89 per cent and during 1990-91, the district has been declared as fully literate.

3.1.1.4 Climate and rainfall

The climatic condition of the district is similar to those experienced in other hilly tracts of the state. It has a tropical humid climate. The southwest monsoon lasting from June to August or sometimes nearly September is the main rainy season in Wayanad. Roughly about 75 percent of the district's rainfall is during this season. In September, the Northeast monsoon starts which lasts up to November, accounting for about 25 percent of rainfall. Average annual rainfall of the district is 2915 mm. The temperature of the district ranges from 20°C to 45° C.

3.1.1.5 Soil

Soil of the district can be broadly classified under the forest soil, which is characterized by a surface layer of humus and other organic matter at the various stage of decomposition. Soil profile is immature with shallow soil followed by gneissic parent materials. It is dark reddish to black in color with loam to silky loam texture. Laterite soil is also found.

3.1.1.6. Land utilization pattern

The land utilization pattern of the district is given in Table. 3.1. The total geographical area of Wayanad district is 212560 ha. The total cropped area accounts for about 98 percent of the total area. The forest area accounts to about 78787 ha which comes to about 37 percent of the total area. The net area sown in the district is about 55 percent.

Table: 3.1. Land utilization pattern of Wayanad district

Sl no:	Particulars	Area in hectares
1	Total geographical area	212560 (100)
2	Forest	78787 (37.06)
3	Land put to non-agricultural use	14210 (6.60)
4	Barren and uncultivable land	248 (0.11)
5	Permanent pastures and other grazing land	45 (0.02)
6	Land under miscellaneous tree crops	489 (0.23)
7	Cultivable waste	1051 (0.49)
8	Fallow other than current fallow	400 (0.18)
9	Current fallow	1438 (0.67)
10	Net area sown	115892 (54.52)
11	Area sown more than once	92038 (43.29)
12	Total cropped area	207930 (97.82)

*Figures in parenthesis indicate percentage to total
Source: Farm guide, 2007

3.1.1.7. Cropping pattern

The district has agro climatic condition suitable for the cultivation of crops like pepper, coffee, arecanut and spices. The cropping pattern of Wayanad district as presented in Table 3.2, revealed that major share in the area was contributed by coffee (25.28 percent) followed by spices (23.24 percent). Pepper

contributed about 15.59 percent of the total share and coconut and paddy contributed equally ie. 4.25 percent.

Table: 3.2. Cropping pattern of Wayanad district

Crop	Area in Hectares	Percentage
Coffee	67389	25.28
Pepper	41573	15.59
Coconut	11337	4.25
Paddy	11331	4.25
Tea	5503	2.06
Fruits	30416	11.41
Rubber	6820	2.56
Spices and condiments	61960	23.24
Vegetables	2045	0.77
Ginger	5731	2.15
Areca nut	10204	3.83
Banana	12278	4.61
Total	266587	100

Source: Farm guide, 2007

3.1.2. Non Governmental Organizations (NGO)

Two major NGO's (non governmental organizations) involved in certification of organic farms in the district are Wayanad Social Service Society (WSSS) and Organic Wayanad. A brief description of the NGO's is presented below.

3.1.2.1 Organic Wayanad (Wayanad organic development society)

Organic Wayand is a non- profit charitable society to protect the better interest of the organic farmers and end users. The society's vision is to conserve the nature and ecosystem by promoting organic farming and to transform organic destination of Kerala. Ensure the ecological, social sustainability and economic prosperity of the farmers through promotion of the concept and practice of organic farming is the mission.

The year 2003 was declared as the "organic year" by the society and 700 awareness programmes were conducted at grass root level towards promotion of organic farming. The present coverage is more than 5000 organic farmers in Wayanad and among them 1200 organic farmers got organic certification. An internal control system has been developed to achieve the certification of the farmers. Under this internal control system 13 inspectors are working in the field level and four staff in the office. INDOCERT, Aluva is doing certification for the society.

3.1.2.2. Wayanad Social Service Society (WSSS), Mananthavady

WSSS is a registered charitable society and a secular voluntary organization established in the year 1974. It is the official social service organization of the Catholic Diocese of Mananthavady. It aims at socio economic empowerment of the target group consisting of tribal, women, small and marginal farmers through participatory development interventions. Its area of operation comprises of districts of Wayanad, Kannur and Gudallur taluk in Nilgiri district of Tamil Nadu.

The society has a mission of organizing and empowering the target groups consisting of small and marginal farmers, women, tribal, youth, and children

through participatory development process aimed at sustainable and integrated development. The activities for organic farming includes training, supply of farm inputs, organic certification and organic spices promotion through quality control, processing and marketing. SKAL international (Netherlands) is undertaking certification programmes for the society. About 2769.78 acres are under organic farming and certified farms come to about 906.03 acres.

3.1.3. Profile of selected panchayaths

Two panchayaths, Panamaram and Poothadi (Nadavayal) were selected for the study, as the number of organic farms is more here. A brief description of the panchayaths is given below.

3.1.3.1. Panamaram panchayath

The panchayath is on the south east of the district and covers an area of 85 sq.kms. There is around 60 hectare area under organic cultivation with 80 organic farm families. The panchayath is bounded on the north by Pulpally and Mananthavady, on the south by Poothady, on the east by Kaniyambatta and on the west by Vellamunda panchayaths. The total population of the panchayath is 36815. The land utilization pattern of the panchayath as given in Table 3.3 showed that the total area of the panchayath was 7274 hectares with a cultivable land of 5274 hectares. The forest area comes to around 428 hectares and land put to non agricultural uses was 583 hectares. The organic farming area was about 60 hectares

Agriculture is the main source of income in the panchayath. Pepper, coffee, vanilla, coconut, banana, arecanut, vegetables, ginger and turmeric are cultivated in the panchayath. The cropping pattern of the panchayath is given in Table 3.4. The major share in total area was occupied by coffee (30.95 percent) followed by pepper (27.52 percent) and paddy (26.66 percent). Other major crops include coconut (3.87 percent) and arecanut (3.01 percent).

Table: 3.3. Land utilization patterns of selected panchayaths

Sl no:	Particulars	Area in hectares	
		Poothady	Panamaram
1	Total geographical area	8300	7274
2	Forest	1120	428
3	Land put to non-agricultural use	1160	583
4	Cultivable land	6120	5274
5	Organic farming area	105	60
6	Wetland	2200	1800
7	Cultivable waste	45	50

Source: Krishibhavan, Poothadi and Panamaram

3.1.3.2 Poothady panchayath

The panchayath is on the south of the district and covers an area of 83 sq.kms. There is around 105 hectare area under organic cultivation with 115 organic farm families. The panchayat is bounded on the north by Pulpally, on the south by Kaniambatta and Meenangadi, on the east by Sulthan bathery and on the west by Panamaram panchayaths. The total population of the panchayat is 36544 and the density of population is 440.

The land utilization pattern of the panchayath as given in the Table 3.3 shows that the total area of the panchayath is 8300 hectares. The forest area comes to around 1120 hectares. Cultivable land comes to around 6120 hectares and organic farming area about 105 hectares.

The major crops cultivated in the panchayath as shown in Table 3.4 are pepper, coffee, vanilla, coconut, arecanut, vegetables etc. The major share in

cropped area is occupied by coffee (33 percent) followed by pepper (30 percent) and paddy (16 percent). The other major crops include coconut and ginger (both 5.7 percent), rubber (5 percent) and banana (2 percent).

Table: 3.4. Cropping pattern of selected panchayaths

Crop	Area in hectares	
	Poothady	Panamaram
Paddy nancha	750 (9.53)	1550 (26.66)
Puncha	450 (5.72)	-
Coconut	453 (5.75)	225 (3.87)
Pepper	2400 (30.48)	1600 (27.52)
Coffee	2600 (33.02)	1800 (30.95)
Areca nut	120 (1.52)	175 (3.01)
Vanilla	30 (0.38)	-
Rubber	400 (5.08)	-
Vegetables	15 (0.19)	70 (1.20)
Banana	175 (2.22)	95 (1.63)
Ginger	450 (5.72)	150 (2.58)
Turmeric	30 (0.38)	-
Rubber	-	150 (2.58)
Total	7873 (100.00)	5815 (100.00)

Source: Krishibhavan, Poothadi and Panamaram

3.2. Methodology

The procedure used in the selection of sample, collection of data, analytical techniques employed and the concepts used in the study are presented below.

3.2.1 Selection of study area

The Wayanad district was chosen for the study, as it has the largest number of organic farms in Kerala. Poothadi and Panamaram panchayats of

Wayanad district were identified as the panchayaths having largest number of organic farmers, and hence selected for the study.

3.2.2 Sampling Design

The list of the farmers practising organic farming and who have certification was collected from the NGOs working in the area for organic certification. From the list of growers a sample of 50 farmers was selected randomly. The sample growers were further grouped into three classes based on the area of certified organic farms as Class-I, Class -II and Class - III as shown in Table. 3.5

Table: 3.5. Classification of sample farmers

Class	Area (in hectare)	Number of farmers
I	0 -1	15
II	1- 2	16
III	Above 2	19
Total		50

3.2.3 Collection of data

Both primary and secondary data have been used for the study. The secondary data on area, production and number of organic farmers in Kerala were collected from organic cell, Government of Kerala, Thiruvanathapuram. The primary data were collected from the farmers through personal interview method using a well structured and pre tested interview schedule. A pilot study was conducted during December 2006, and the constraints in organic production and marketing were identified. A separate schedule for consumer survey was prepared and the data on the consumer awareness regarding organic farm produce and willingness to pay was collected from a sample of 90

consumers in Kozhikode corporation area. The data were collected during March- April 2007.

3.2.4 Analysis of data

The collected data were analysed in order to estimate cost and returns of the farms, study the marketing structure, constraints in production and marketing and consumer awareness regarding organic produce.

3.2.4.1 Cost of Cultivation

The cost of cultivation was worked out using inputwise approach by employing the ABC cost concepts in farm management

Input wise costs were worked out for different crops in the two Panchayaths and for the three classes**.** The major inputs for which the costs were worked out include, labour, organic pesticides, organic manures and propping materials for the crops including pepper, coffee, arecanut, coconut, vanilla, banana and ginger.

The analysis was also carried out by making use of the cost concepts, Cost A, Cost B, and Cost C. Various cost concepts studied are,

1. Cost A_1

For each crop ie, pepper, coffee, arecanut, coconut, banana, vanilla and ginger input wise cost were worked out. It approximates the actual expenditure incurred in cash and kind and includes the following items of costs.

a) Hired human labour

The actual paid wage labour engaged in crop production was considered as value of hired labour. Hired labour charge included that incurred in land preparation, application of organic manures and organic pesticides after cultivation, other cultural operations includes weeding, pruning, propping,

irrigation and harvesting. Hired human labour was valued at the prevailing wage rates in the area, which was Rs.125 for male labourers and for female labourers it was Rs. 70.

b) Organic Manures (farm produced and purchased)

Expenditure on purchased quantities of manures has been evaluated by multiplying the physical quantities of different organic manures used with their respective prices. Farm produced items were also evaluated at their market prices. Cow dung, neem cake, oil cake, compost, vermicompost and bone meal were the different organic manures used.

c) Plant protection – organic pesticides

Expenditure on organic pesticides has been calculated by multiplying the physical quantities of pesticides used by their respective market prices. Pseudomonas and trichoderma were the bio pesticides used by the sample farmers.

d) Propping material for banana

The materials used for propping are coir and bamboo poles

f) Depreciation of farm implements

Depreciation was worked out by straight-line method. Cost of motor, sprayer, spade, axe, sickle and vermicompost tank were included as depreciation, the life spans of which were 10, 3, 3, 3, 3 and 20 years respectively.

g) Interest on farm loan

Interest on farm loan was calculated at 8.5 percent rate of interest per annum.

h) Interest on working capital

Interest on working capital was charged at the rate of 3.5 percent per annum.

i) Land revenue

Land tax was uniform through out the district and was computed on the basis of actual amount paid to the government.

j) Miscellaneous expenses

These include items such as cost of sacks and bamboo baskets, which were used for transporting the harvested produce from farm to market.

2. Cost A_2

Cost A_2 is equal to cost A_1 plus rent paid for leased in land. Since all the sample farmers were owner cultivators, and hence the value was taken as zero.

3. Cost B_1

It is equal to cost A_1 plus interest on own fixed capital. The item fixed capital included iron and wooden implements and equipments such as sprayer and motor.

4. Cost B_2

It is equal to cost B_1 plus rent paid for leased in land plus rental value of owned land. Rent was imputed, in the case of owned land based on the prevailing rent of Rs.10000 per hectare in the Panamaram and Poothadi panchayaths

5. Cost C_1

It is equal to cost B_1 plus imputed value of family labour. The cost of family labour was imputed based on the prevailing wage rates paid to hired labour in the area during the period.

6. Cost C_2

It is equal to cost B_2 plus imputed value of family labour.

7. Cost C_3

Cost C_3 is equal to cost C_2 plus 10 per cent of cost C_2 that is accounted as allowance given for management of farm.

3.2.4.2 Gross income

Gross income refers to the total returns obtained from the sale of organic produce. The total yield obtained for each crop was multiplied by the market price to arrive at the gross income from farm.

3.2.4.3 Farm efficiency measures

Income measures are used as one of the measures of efficiency in the present study. Different income measures are associated with different cost concepts. They are as follows:

1. Farm business income: It is Gross income minus cost A_1
2. Own farm business income: Gross income minus cost A_2
3. Family labour income: Gross income minus cost B_2
4. Net income: Gross income minus cost C_3
5. Farm investment income: Farm business income minus imputed value of family labour minus management expenses
6. Benefit cost ratio: It is the ratio of benefits to the costs. It indicates the return on a rupee of investment. The ratio will serve as a measure, which would indicate whether the costs are proportionate with the returns obtained. This has been worked out at Cost A_1, Cost B_1, Cost B_2, Cost C_1, and Cost C_2 and Cost C_3 basis.

3.2.4.4 Resource productivity analysis

A Cobb-Douglas production function was fitted to analyze the effect of different variables on gross income. The functional form is given as

Y= a0 *X1^ b1 *X2^ b2* X3^ b3 *X4^ b4 + E

Y= gross income (Rs)

X_1= cropping intensity

X_2= expenditure on organic manure per farm (Rs.)

X_3= expenditure on bio pesticides per farm (Rs.)

X_4= human labour per farm (man days)

The above function was estimated using the package 'statistica' based on Quasi – Newton method. The optimum return for each variable was also estimated.

3.2.4.5 Market structure

Market structure for practical purposes, means those characteristics of a market, which seems to influence strategically the nature of competition and pricing within the market. The information on marketing aspects such as market structure, marketing channels and marketing costs were collected and analysed.

3.2.4.6 Constraints in production and marketing

The constraints were identified during the preliminary survey and the responses of the farmers regarding the constraints were collected during the main survey. For the analysis of constraints the response regarding each constraint was obtained on a five point continuum as most important, important, somewhat important, less important and least important with scores of 5, 4, 3, 2 and 1. For each constraint the frequency of response under each category was multiplied with its respective score and added to get a cumulative

score for that particular constraint. The constraints were ranked based on this cumulative score.

3.2.4.7 Consumer awareness regarding organic produce

Contingent valuation is a direct method of valuing the environmental good or bad for which a proper market does not exist. In that case valuation is done by creating a hypothetical or surrogate market like situation and eliciting the consumers' preference and their value for an environmental change. In the present study, consumers' preference for organic product was elicited by asking their Willingness to Pay (WTP) for a hypothetical organic produce.

3.2.4.8 Willingness To Pay Premium (WTPP) for organic produce

WTPP is the difference between willing to pay for organic produce and the prevailing market price. In order to analyse the factors that affect the WTPP of the consumer for organic produce a logistic function was fitted as follows

$$WTPP = a + b_1X_1 + b_2X_2 + b_3X_3$$

Where, WTPP is dichotomous in nature where it takes a value of 0 if WTPP is less than or equal to Rs. 3, 4, 8 and 1 per kg of vegetables, fruit, spices and milk over the prevailing market prices or else it takes value of 1 if WTPP is more than the above mentioned values over prevailing market prices.

The variables used for fitting the regression were,

X1 = education level (scores are given as primary = 1, Secondary = 2, College and above =3)

X2 = income (Rs.)

X3 = dummy for awareness of market availability organic produce (0 if not aware and 1 if aware)

Results and Discussion

4. RESULTS AND DISCUSSION

The data collection for the present study was carried out during the period March to April 2007. The survey was undertaken among organic farms in Wayanad district of Kerala. The organic farming status in Kerala for the major crops in the district, viz pepper, coffee, arecanut, coconut, banana, ginger and vanilla were examined in detail in order to analyse the production and marketing of organic farm produce. The results obtained from the study are presented and discussed under the following headings.

4.1. Organic farming status in Kerala
4.2. General economic and social conditions of the sample farms
4.3. General practices of cultivation
4.4. Economics of organic farms
4.5. Resource productivity analysis
4.6. Marketing of organic produce
4.7. Constraints in production and marketing
4.8. Consumer awareness with respect to organic produce.

4.1 Organic farming status in Kerala

With organic production and trade growing globally, there was also a growing interest in organic agriculture in India, specifically amongst non-governmental organizations working in marginal and tribal areas and private companies. Currently India has 76000 hectare area under organic farming with a total production of 1.2 lakh tonnes. It was also estimated that 6792 tonnes of organic products have been exported from India. The contribution of states in organic export from India as presented in Table 4.1 revealed that Kerala accounted for a major share in export (1232 tonnes) followed by West Bengal (937 tonnes) and Punjab (541 tonnes). The other major contributors were,

Himachal Pradesh (521 tonnes), Karnataka (476 tonnes), Tamilnadu (471 tonnes) and Maharastra (375 tonnes).

Table 4.1. Export of organic produce from India

Sl No	State	Export (Tonnes)
1	Kerala	1232
2	West Bangal	937
3	Karnataka	476
4	Tamilnadu	471
5	Punjab	541
6	Himachal Pradesh	521
7	Maharastra	375
8	Others	2239
	Total	6792

Source: NPOP, 2006

4.1.2 Area under organic farming in Kerala

Diverse agricultural systems had evolved in Kerala, as diverse as its landscape, and very recently farmers in Kerala were found to be in favour of organic farming because of the awareness on issues concerning health and environmental hazards.

It was found that more than 6000 hectares are currently managed organically by around 9780 farms in Kerala, including the area of certified tea estates and POABS group. As presented in Table 4.2. Idukki district followed by Wayanad and Kannur occupied major area. The larger concentration of organic farmers is in Wayanad followed by Idukki and Kannur.

Table 4.2 Area and Number of farmers under organic farming in Kerala

Sl No	District	Area (hectare)	Number of farmers
1	Idukki	2700	3150
2	Wayanad	2000	3800
3	Kannur	400	1875
4	Thiruvananthapuram	200	820
5	Palakkad	30	35
6	Calicut	25	65
7	Eranakulam	15	35
8	Tea estate	300	-
9	Poabs group	500	-
	Total	6170	9780

Source: Organic cell, Government of Kerala, 2006

Area under organic farming in selected crops in Kerala viz vegetables, banana and pepper for three years was examined during the period 2004 - 07 and is presented in Fig 4.1. The area under organic cultivation showed a continuous increase during the years from 2004–20005 to 2006 –2007. It was found that pepper was the predominant crop, the area of which increased from 1500 hectare in 2004 – 20005 to 2150 hectares in 2006 – 2007. Vegetables and banana also showed a similar trend during the period. The area under vegetables increased from 100 hectares in 2004 – 05 to 288 hectares in 2006-2007 and for banana the increase was from 65 hectares to 185 hectares during the period.

The districtwise area under the above crops for the period from 2004 – 05 to 2006- 07 was also examined. In the case of vegetables, as indicated in Table 4.3 Wayanad district occupied largest area (65 hectares) followed by Idukki (40

hectares) and Kozhikode (18 hectares). It was also found that there was an overall increase in area under vegetables during the period.

Table 4.3 Districtwise area under organic vegetables (in hectares)

District	2004-05	2005-06	2006-07
Thiruvananthapuram	10	25	15
Kollam	10	25	15
Idukki	10	38	40
Thrichur	15	30	15
Palakkad	15	30	15
Malappuram	10	20	15
Kozhikode	10	30	18
Wayanad	20	50	65
Eranakulam	-	-	15
pathanamthitta	-	-	15
Alappuzha	-	-	15
Kottayam	-	-	15
Kannur	-	-	15
Kasargode	-	-	15
Total	100	248	288

Source: Organic cell, Government of Kerala, 2007

Wayanad district had the largest area under banana also (40 hectares in 2006- 07) followed by Idukki (25 hectares), Thrichur and Thiruvananthapuram (20 hectares each) and area had shown a continuous increase over the period. (Table 4.4)

Fig 4.1 Area under selected crops in organic farming

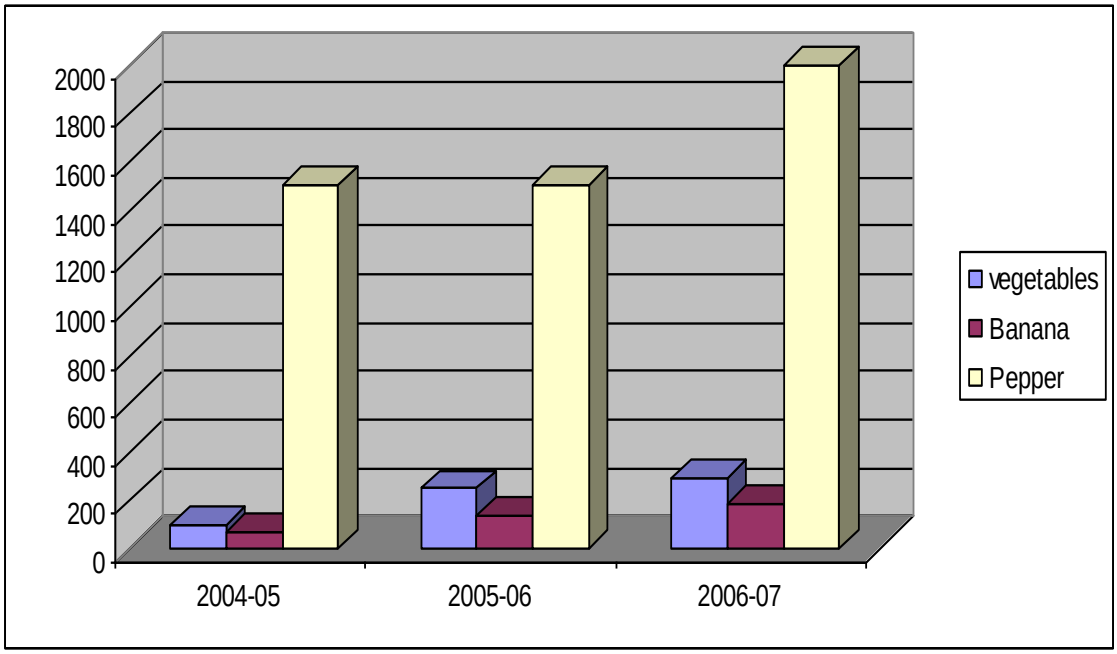


Table 4.4 Districtwise area under organic banana (in hectares)

District	2004-05	2005-06	2006-07
Thiruvananthapuram	10	20	20
Kollam	15	-	10
Idukki	10	20	25
Thrichur	10	20	20
Palakkad	-	20	10
Malappuram	-	10	10
Kozhikode	-	10	10
Wayanad	20	35	40
Eranakulam	-	-	10
Pathanamthitta	-	-	10
Alappuzha	-	-	10
Kottayam	-	-	10
Total	65	135	185

Source: Organic cell, Government of Kerala, 2007

Regarding pepper, the organic cultivation was taken up only in four districts and Idukki and Wayanad occupied the major area (750 hectares) followed by Kannur (350 hectares) and Kasargode (300 hectares). As in the case of vegetables and banana a significant increase in area was observed in pepper also during the years.

Table 4.5 Districtwise area under organic pepper (in hectares)

District	2004-05	2005-06	2006-07
Idukki	500	500	750
Wayanad	500	500	750
Kannur	250	250	350
Kasargode	250	250	300
Total	1500	1500	2150

Source: Organic cell, Government of Kerala, 2007

4.1.3 Production of major organic produce in Kerala

Despite its relatively small size and high density of population, Kerala accounts for several important agricultural commodities like pepper (95 percent of India's production), rubber, ginger, coconut, cashew etc. Similar is the case observed in organic farm produce also. Pepper was found to be the major organic produce in Kerala with a share of 130 tonnes, followed by coffee (60 tonnes) and ginger (30 tonnes). Other minor produces include elephant foot yam, turmeric, vanilla, cardamom and tea. (Table 4.6)

Table 4.6 Production of major organic produce in Kerala

Sl No	Crop	Production (tonnes)
1	Pepper	130
2	Coffee	60
3	Ginger	30
4	Elephant foot yam	10
5	Turmeric	9
6	Vanilla	1
7	Cardamom	0.4
8	Tea	400

Source: Organic cell, Government of Kerala, 2006

4.1.3 Non governmental organizations and organic farming

Non-governmental organizations play a major role in promotion of organic farming in Kerala. The two major NGOs in Wayanad district are Organic Wayanad and Wayanad Social Service Society. A brief description of the area under organic farming and major organic produce procured by them are given below.

The panchayathwise area under organic farming managed by Organic Wayanad as given in Table 4.7 revealed that Mullankolly panchayath has the highest area (635 acre) followed by Thondanad (172 acre) and Kaniambatta (169 acre).

The quantity of different organic produce procured by the Organic Wayanad as presented in Table 4.8 revealed that coffee was found to be the major produce procured by the society (300 tonnes) followed by pepper (200 tonnes). A considerable amount of production of arecanut was also there, but there is no international market for the produce, hence the society has not yet started procuring arecanut.

Table 4.7. Area under organic farming in different Panchayaths

Sl no	Panchayath	Area in acre
1	Ambalavayal	37
2	Kottathara	20
3	Manathavady	80
4	Meenangadi	5
5	Meppadi	144
6	Mooppanad	50
7	Muttil	135
8	Mullankolly	635
9	Vythiri	33
10	Vellamunda	50
11	Bathery	14
12	Thondanad	172
13	Thirunelli	62
14	Thadinchal	76
15	Thariyod	26
16	Kothadi	62
17	Pulpally	98
18	Panamaram	48
19	Padinajrethara	40
20	Noolppuya	13
21	Nenmeri	37
22	Kaniyambatta	169
23	Nadavayal	90
24	Edavaka	155
25	Kottathara	20.56
26	Kalpetta	25

Source: Organic Wayanad, 2007

Table 4.8. Procurement of major organic produce by NGOs

Sl: no	Crop	Procurement (tonnes)	
		Wayanad Social Service Society	Organic Wayanad
1	Coffee	1240	300
2	Pepper	660	200
3	Vanilla (dry)	1.5	5
4	Ginger	60.43	10
5	Turmeric	8.22	6
6	Cardamom	1.89	1
7	Clove	0.308	0.1
8	Cocoa	1.04	-
9	Banana	138.8	-
10	Tamarind	2.98	-
11	Citrus	2.79	-
12	Amorphophallus	96.76	-
13	Colocasia	29.48	-
14	Chilly	0.72	-
15	Tapioca	56.215	-
16	Nutmeg	0.943	-
17	Jackfruit	88821(no)	-
18	Mango	66.86	-

Source: Organic Wayanad, 2007

The quantity of major organic produce procured by WSSS as given in Table 4.8 revealed that coffee (1240 tonnes) followed by pepper (660 tonnes) and banana (139 tonnes) were the major produces. Amorphophallus contributed about 97 tonnes to the total procurement and mango 67 tonnes.

In the background of the organic farming status of Kerala discussed above, the analysis of data collected from certified organic farms in Wayanad district are presented and discussed in the following sections.

4.2 General economic and social conditions of the sample farmers

A brief description of the general socioeconomic features of the respondent farmers with respect to land holding, age, education, occupation, cropping pattern and crop diversity has been included in this section in order to serve as a background to the study.

4.2.1 Land holding

A sample of 50 organic farmers, randomly chosen from Poothady and Panamaram panchayaths of Wayanad districts were selected for the present study. The selected respondents were classified according to the size of land holding, into three categories, viz class I (less than 1 hectare), class II (one to two) and class III (more than two hectare), hereinafter referred to as class I, class II and class III.

The distribution of sample farmers according to the size of land holding as presented in Table 4.9 revealed that out of the total respondents 30.0 percent had less than one hectare under cultivation (Class I), 32 per cent had an area between one hectare and two hectare under cultivation (Class II) and 38 per cent had more than two hectare under cultivation (Class III).

Table 4.9 Distribution of sample farmers according to the size of land holding

Particulars	Holding size			
	< 1 hectare (Class I)	1-2 hectare (Class II)	>2 hectare (Class III)	Total
No: of farms	15 (30.00)	16 (32.00)	19 (38.00)	50 (100)
Area (hectares)	8.42 (10.29)	20.9 (25.56)	52.43 (64.13)	81.75 (100)

*Figures in parenthesis show percentage to total

It was found that 70 per cent of the total farmers operated an area of more than one hectare. With respect to area owned and operated by the respondents, only 10 percent of the area was occupied by class I, 25 percent by class II and 64 percent by class III, indicating that 90 percent of area was held by 70 percent of the respondents.

4.2.2 Age

The distribution of the sample farmers according to the age is given in Table. 4.10. It was found that 36 percent of the total respondents were under the age group of 50 to 60 years and 32 percent between 40 to 50 years. About 14 percent and 18 percent came under the age group of less than 40 years and more than 60 years respectively. Classwise analysis revealed that 40- 50 years age group were dominating in class III and 50-60 years group in class II and class I.

Table 4.10 Distribution of sample farmers according to age

Class	Age				
	< 40 years	40-50 years	50-60 years	> 60 years	Total
Class I	3 (20.00)	4 (26.66)	7 (46.66)	1 (6.66)	15 (100)
Class II	3 (18.75)	4 (25.00)	5 (31.25)	4 (25.00)	16 (100)
Class III	1 (5.26)	8 (42.10)	6 (31.58)	4 (21.05)	19 (100)
Total	7 (14.00)	16 (32.00)	18 (36.00)	9 (18.00)	50 (100)

*Figures in parenthesis show percentage to total

4.2.3 Educational status

Classification of the respondents according to their educational status is given in Table 4.11. It was observed that none of the respondents in the area were illiterate. About 46 per cent of the total respondents were educated up to the high school level, 16 percent up to the pre-degree level and 10 percent educated up to degree level while 28 percent of the total sample farmers had only primary education. Class wise analysis pointed out that majority of respondents of class I and class III had SSLC qualification (53.3 percent and 47.36 percent respectively), while 37.5 percent each of class II respondents had primary level education and SSLC.

Table 4.11 Distribution of sample farmers according to educational status

Class	Educational status				
	Primary	SSLC	Pre degree	College	Total
Class I	5 (33.30)	8 (53.30)	2 (13.33)	0 (0.00)	15 (100)
Class II	6 (37.50)	6 (37.50)	2 (12.50)	2 (12.50)	16 (100)
Class III	3 (15.78)	9 (47.36)	4 (21.05)	3 (15.78)	19 (100)
Total	14 (28.00)	23 (46.00)	8 (16.00)	5 (10.00)	50 (100)

*Figures in parenthesis show percentage to total

4.2.4 Occupation

The occupationwise classification of respondents presented in Table 4.12 revealed that agriculture was the only occupation of 66 percent of the total respondents. About 14 percent of the respondents took up agriculture as the main occupation along with subsidiary occupation. Agriculture turned out to be subsidiary occupation for 10 per cent of the sample farmers who took up jobs in public sector and private sector. Among the three classes 80, 62.5, 57.89 percent in class I, II and III respectively were engaged in agriculture only. Agriculture was the main occupation for 13.30 percent of class I, 18.75 percent of class II and 10.52 percent of class III. It was also observed that 31.57 percent respondents in class III were taking agriculture as subsidiary occupation, while it is 18.75 and 6.7 percent respectively for class II and class I respectively.

Table 4.12 Classification of respondents according to their occupation

Class	Agriculture as the only occupation	Agriculture as the main occupation	Agriculture as subsidiary occupation	Total
Class I	12 (80.00)	2 (13.30)	1 (6.70)	15 (100)
Class II	10 (62.50)	3 (18.70)	3 (18.70)	16 (100)
Class III	11 (57.80)	2 (10.50)	6 (31.50)	19 (100)
Total	33 (66.00)	7 (14.00)	10 (20.00)	50 (100)

*Figures in parenthesis show percentage to total

4.2.5. Cropping pattern

The cropping pattern of sample farms presented in Table 4.13 showed that the major crops grown by the respondents were arecanut, coffee and pepper. The gross cropped area of the respondents was 121.23 hectare. Among the different crops, arecanut occupied the major share (40.27 percent) followed by coffee (16.81 percent) and pepper (15.85 percent). Classwise analysis showed that in Class I, coffee contributed major share to total area (37.86 percent) followed by arecanut (29.82 percent). Arecanut was the major crop in Class II and Class III farms with a share of 35.7 percent and 45.56 percent respectively. Cropping intensity at the aggregate level was 148 percent. Class I showed an intensive cropping with a cropping intensity of 229 percent followed by Class II (152 percent) and Class III (135 percent).

Plate 1. Farmer's field in study area

Table 4.13 Cropping pattern of sample farms (area in hectares)

Crops	Class I	Class II	Class III	Total
Pepper	2.63 (11.92)	4.47 (14.95)	12.12 (17.49)	19.22 (15.85)
Coffee	8.36 (37.86)	5.79 (19.37)	6.23 (8.99)	20.381 (16.81)
Arecanut	6.58 (29.82)	10.67 (35.70)	31.57 (45.56)	48.82 (40.27)
Vanilla	1.19 (5.39)	3.15 (10.54)	6.29 (9.07)	10.63 (8.76)
Coconut	2.9 (13.14)	4.31 (14.42)	10.01 (14.44)	17.22 (14.20)
Banana	0.21 (0.95)	0.79 (2.64)	1.33 (1.91)	2.33 (1.92)
Ginger	0.19 (0.86)	0.71 (2.37)	1.75 (2.52)	2.65 (2.18)
Gross area	22.06 (100)	29.88 (100)	69.29 (100)	121.23 (100)
Net area	8.42	20.90	52.43	81.75
Cropping intensity	228.73	152.11	135.20	148.29

*Figures in parenthesis show percentage to total

4.2.6 Crop diversity of Organic farms

A detailed list of planted crops was collected, which include major crops grown in the selected farms, medium and minor crops, and are shown in Table 4.14. It was found that major crops in the organic farms were arecanut, coffee and pepper. Among the medium crops coconut, vanilla, banana and ginger were included. In addition large numbers of minor crops like turmeric, vegetables, cassava, yams etc were grown in the farms. It may be noted that the plants, which are naturally generated have not been included here. However, the rich bio diversity of the organic farms has been clearly evident from the above.

Table: 4.14. Crop diversity in organic farms

Major crops	Medium crops	Minor crops
Areca nut	Coconut	Turmeric
Coffee	Vanilla	Dioscorea
Pepper	Banana	Vegetables
	Ginger	Sapotta
		Elephant foot yam
		Rubber
		Cassava

4.3 GENERAL PRACTICES OF CULTIVATION

Typical of the homesteads in Kerala, farmers grew a number of crops including cash crops, fruit trees, and vegetables. Most common crops include pepper, coffee and arecanut. Almost all the farms are self sufficient in vegetables and most of the seeds they used are of indigenous in nature. Those who have cattle grew fodder grasses. All the respondents in the area have been practicing organic farming for the last 4 - 5 years and the farms were certified as organic a year ago.

Fertilizer management is one of the crucial factors, which distinguish organic farms from the modern farms. The type and quantity of manures vary according to farms and crops to which they are applied. Common methods adopted for the fertilizer management are application of organic manures (cow dung, bone meal), green manuring, recycling organic matter, cow dung slurry, mulching, composting, vermi composting, maintenance of tree crops as source of green manures etc. The cultivation practices followed by the selected farmers are explained in this section.

Plate 2. A view of vermicompost unit

Plate 3. A view of biogas plant

4. 3.1 Organic manures and bio pesticides

The organic manures and bio pesticides were given in split doses in the selected area. Farmyard manures were applied more often and monthly or bimonthly application of cow dung slurry was also practiced. Other manures, which were found to be used by the sample farmers, were neem cake, oil cake, bone meal, compost, vermicompost and mixed biomanure (Palazhi). The respondents also used bio pesticides like pseudomonas and trichoderma. Other commonly available leaf extracts were also used as plant protection measures. The organic manures and bio pesticides used for the selected crops are presented in what follows.

4.3.1.1 Pepper

All farmers in the area are cultivating the crop, as it was the most remunerative crop. Karimunda, Arakkalmunda, Kottanadan and Panniyur were the common varieties in the area. Arecanut, jack, mango, coconut and glyrecidia are grown as pepper climbers. The quantity and cost of organic manures and bio pesticides used in pepper are given in Table.4.15. It was found that farmers varied in the application of manures, but in the entire classes cow dung was found to be the major component, followed by vermicompost. Dry cow dung was applied three to four times a year followed by the application of cow dung slurry, vermicompost, neem cake, oil cakes, and compost. The source of cow dung was either from their own farms or from nearby organic farms. It was also found that class III farmers were using more quantity of organic manures followed by class II and class I. Though pseudomonas was found to be the major cost item in all the three classes, it was obtained free of cost from the krishibhavans.

Table. 4.15. Quantity and cost of organic manures and bio pesticide - Pepper

Item	Class I		Class II		Class III	
	Quantity (Kg)	Cost (Rs)	Quantity (Kg)	Cost (Rs)	Quantity (Kg)	Cost (Rs)
Cowdung	593.33	1483.33	784.38	1960.94	1650.00	4125.00
Bonemeal	11.50	69.00	12.94	77.63	53.95	323.68
Neem cake	114.27	1142.67	79.19	791.88	180.26	1802.63
Oil cake	22.33	379.67	8.44	143.44	6.05	102.89
Compost	28.33	226.67	65.63	525.00	107.89	863.16
Vermi compost	231.67	1853.33	190.63	1525.00	452.63	3621.05
Palazhi	6.67	43.33	15.63	101.56	5.26	34.21
Trichoderma	7.00	350.00	21.25	1062.50	32.89	1644.74
Pseudomonas	7.00	2800.00	20.00	8000.00	47.37	18947.37

4.3.1.2 Coffee

Almost all farmers in the study area were cultivating coffee as a main crop and Robusta was the main variety. The quantity and cost of organic manures and bio pesticides used in coffee as shown in Table.4.16 revealed that cow dung was the major component in all the three classes, followed by vermi compost. The quantity of manures applied was found to be the highest in class III followed by class II and class I. Bio pesticides were not used in coffee as the disease and pests were low compared to other crops.

Table: 4.16. Quantity and cost of organic manures - Coffee

Items	Class I		Class II		Class III	
	Quantity (Kg)	Cost (Rs)	Quantity (Kg)	Cost (Rs)	Quantity (Kg)	Cost (Rs)
Cow dung	896.67	2241.67	1326.56	3316.40	2067.11	5167.76
Bone meal	13.67	82.00	2.18	13.12	15.79	94.74
Neem cake	95.07	950.67	87.18	871.87	172.37	1723.68
Oil cake	30.66	521.333	4.68	79.68	13.94	237.10
Compost	61.66	493.33	125	1000	165.78	1326.31
Vermi compost	211.66	1693.33	389.06	3112.5	619.73	4957.85
Palazhi	8.33	54.16	3.12	20.31	71.05	461.84

4.3.1.3 Arecanut

Arecanut is being cultivated by majority of farmers in the area and they were growing Mangala, Kasargodan and other local varieties. The major organic manures used, their quantity and cost in arecanut are given in Table. 4.17. It was found that farmers varied in the application of manures, but in all the three classes cow dung was found to be the major component, followed by vermi compost. The class I farmers were found to prefer vermicompost, while class II and class III farmers were using more cow dung as compared to vermi compost as was evident from the cost of organic manure. The application of manures was found to be the highest in class III followed by class II and class I. It may be noted that bio pesticides were not applied for arecanut.

Table. 4.17. Quantity and cost of organic manures - Arecanut

Items	Class I		Class II		Class III	
	Quantity (Kg)	Cost (Rs)	Quantity (Kg)	Cost (Rs)	Quantity (Kg)	Cost (Rs)
Cow dung	620.33	1550.83	1448.44	3621.09	1581.58	3953.94
Bone meal	12.83	77.00	9.38	56.25	26.32	157.89
Neem cake	76.00	760.00	77.19	771.88	109.21	1092.10
Oil cake	18.00	306.00	10.94	185.94	5.26	89.47
Compost	35.00	280.00	96.88	775.00	180.26	1442.10
Vermicompost	278.33	2226.67	396.88	3175.00	450.00	3600
Palazhi	6.67	43.33	9.38	60.94	57.89	376.31

4.3.1.4. Coconut

Coconut was grown only in a small area in all the farms, as it is not recommended for high altitude area. There were only few plants in farms and in most of the farms, nuts were used for home consumption only. No apparent care was given to the palms and whatever manures left in the farm were applied here. Cow dung, neem cake, compost and vermi compost were used. No bio pesticide was being used here. Table.4.18 shows the quantity and cost of organic manures used in Coconut. It was found that farmers varied in the application of manures, but in all the three classes cow dung was found to be the major component, followed by vermi compost. The quantity applied was found to be highest in class III followed by class II and class I.

Table. 4.18. Quantity and cost of organic manures - Coconut

Items	Class I		Class II		Class III	
	Quantity (Kg)	Cost (Rs)	Quantity (Kg)	Cost (Rs)	Quantity (Kg)	Cost (Rs)
Cow dung	150.67	376.67	396.88	992.19	588.16	1470.39
Bone meal	0.00	0.00	0.00	0.00	3.95	23.68
Neem cake	21.67	216.67	22.19	221.88	27.63	276.32
Oil cake	8.33	141.67	1.56	26.56	6.58	111.84
Compost	6.67	53.33	10.94	87.50	50.00	400.00
Vermi compost	26.67	213.33	26.56	212.50	176.32	1410.53
Palazhi	6.67	43.33	28.13	182.81	26.32	171.05

4.3.1.5. Banana

Banana was cultivated by only few of the respondents. Nendran, Palayam kodan and Njalipoovan were the varieties used by farmers. Cowdung slurry, vermi compost and neem cake were the manures used. The quantity and cost of organic manures and bio pesticides used in Banana as shown in Table. 4.19 revealed that farmers varied in the application of manures, but in all the three classes cow dung was found to be the major component, followed by vermi compost. Vermi compost contributed the largest expense for class I and class III, where as cowdung was the major cost item for class III. Bio pesticides were also found to be used by class II and class III farms but in very negligible amount, and it was not used by class I farmers.

Table. 4.19. Quantity and cost of organic manures and bio pesticide - Banana

Items	Class I		Class II		Class III	
	Quantity (Kg)	Cost (Rs)	Quantity (Kg)	Cost (Rs)	Quantity (Kg)	Cost (Rs)
Cow dung	96.67	241.67	353.13	882.81	503.95	1259.87
Bone meal	0.67	4.00	12.19	73.13	11.84	71.05
Neem cake	2.00	20.00	35.00	350.00	44.74	447.37
Oil cake	0.00	0.00	9.38	159.38	7.11	120.79
Compost	3.33	26.67	0.00	0.00	76.32	610.53
Vermi compost	33.33	266.67	87.50	700.00	161.84	1294.74
Trichoderma	0.00	0.00	0.94	46.88	1.32	65.79
Pseudomonas	0.00	0.00	0.94	375.00	0.53	210.53

4.3.1.6 Ginger

The selected farmers did not cultivate ginger extensively. Cow dung slurry, neem cake and vermi compost were the manures used. Another important and extensively used item was green and dried leaves which were not included in calculations. Class II and Class III farms also used the mixed bio manure palazhi. The quantities of organic manures used in ginger are described in Table. 4.20. It was found that in all the three classes cow dung was the major component both in quantity and cost, followed by vermi compost. Other manures were applied in negligible amount. The quantity of manures applied was found to be highest in class III followed by class II and class I. Bio pesticides were not at all used in ginger.

Table: 4.20. Quantity and cost of organic manures - Ginger

Items	Class I		Class II		Class III	
	Quantity (Kg)	Cost (Rs)	Quantity (Kg)	Cost (Rs)	Quantity (Kg)	Cost (Rs)
Cow dung	30.33	75.83	280.63	701.56	578.95	1447.37
Bone meal	0.00	0.00	0.94	5.63	8.68	52.11
Neem cake	1.67	16.67	8.75	87.50	49.74	497.37
Oil cake	0.00	0.00	6.25	106.25	3.95	67.11
Compost	0.00	0.00	0.00	0.00	21.05	168.42
Vermi compost	13.33	106.67	26.56	212.50	114.47	915.79
Palazhi	0.00	0.00	3.13	20.31	52.63	342.11

4.3.1.7. Vanilla

The farmers in the study area grew vanilla as an inter crop in the farm. Glyricidia was found to be the supporting climber used by all of them. The farmers adopted the practice of applying cowdung slurry as one of the important manure for the crop. Other manures used were bonemeal, neem cake, vermicompost etc. In addition to this they were using bio pesticides in a considerable amount. The quantity of organic manures and bio pesticides used in vanilla as presented in Table 4.21 revealed that farmers varied in the application of manures, but in all the three classes cow dung was found to be the major component, followed by vermi compost. Other manures were applied in negligible amount. The quantity of manures applied was found to be highest in class III followed by class II and class I. Bio pesticides like trichoderma and pseudomonas

were used and pseudomonas was found to be the major cost component in all the classes.

Table: 4.21. Quantity and cost of organic manures and bio pesticide - Vanilla

Items	Class I		Class II		Class III	
	Quantity (Kg)	Cost (Rs)	Quantity (Kg)	Cost (Rs)	Quantity (Kg)	Cost (Rs)
Cow dung	206.33	515.83	240.62	601.56	1422.11	3555.26
Bone meal	7.67	46.00	1.87	11.25	3.68	22.11
Neem cake	21.67	216.67	23.75	237.5	51.05	510.53
Oil cake	4.33	73.67	3.12	53.12	7.89	134.21
Compost	23.33	186.67	12.50	100.00	43.42	347.37
Vermi compost	156.67	1253.33	109.37	875.00	201.32	1610.53
Palazhi	3.33	21.67	0.00	0.00	0.00	0.00
Trichoderma	5.33	266.67	9.06	453.12	24.21	1210.53
Pseudomonas	6.33	2533.33	10.00	4000	16.58	6631.58

4.3.2 Pest management

As the respondents include only the certified organic farms, pest management is mainly by letting nature take care of the pests and diseases. However bio pesticides like trichoderma and pseudomonas was applied in the farms, which were supplied free from krishibhavans. The details of bio pesticides used have been given along with the organic manure use for various crops. Some other bio- treatments used in the area (commonly available plant extracts) were neem leaves, garlic, tobacco, oscimum, mimosa, nattappochedi, wild sunflower, lantana etc. Weeding was done manually and the weeds were used for mulching or as cattle feed.

4.3.3 Water management

Farmers depend on natural resources like rain, well, ponds and streams for irrigation. The method of irrigation prevalent in all the farms was lift irrigation with electric pumpsets. In addition, the farmers have adopted the water management techniques like rain pits, terracing, percolation trenches, rain channels, mulching farm yard waste, ground cover by grass, shrubs, green manure trees and minimal soil disturbance.

4.4. Economics of organic farms

Based on the analysis of general cultivation practices followed in the organic farms and the extent of use of organic manures and bio pesticides as discussed in the previous section, an attempt was made to work out the economics of organic farms. The computation of economics includes an analysis of the inputwise expenses for the selected crops, crop wise yield and returns, cost component analysis and farm efficiency measures for the organic farms. The results obtained for the selected crops and for the farm as a whole are presented class wise and at the aggregate level and are discussed in what follows.

4.4.1. Inputwise expenses of selected crops

Organic agriculture is the kind of diversified agriculture wherein crops and livestock are managed through use of integrated technologies with preference to resources available either at farm or locally. It emphasizes more on optimising the yield potential of crops and livestock under given set of farming conditions rather than maximization. Hence the inputs used for cultivation of crops mainly include organic manures (cowdung, compost, vermicompost, neem cake, oil cake etc.), bio pesticides (trichoderma, pseudomonas etc.), bio fertilisers (azolla, acetobacter etc.) and labour for various operations (including hired and family labour). As already mentioned, bio pesticides were used in crops for controlling

pest and diseases, but it was not accounted as an expense to the farmer. The results on the inputwise expenses for the selected crops viz, pepper, coffee, arecanut, coconut, vanilla, banana and ginger for the three classes and at the aggregate level are presented cropwise and discussed in this section.

4.4.1.1. Pepper.

Pepper was found to be one of the important crops grown by the selected respondents. The input wise expenses as presented in Table 4.22 revealed that the per farm cost for pepper was Rs. 11652 at the aggregate level. It was found to be increasing from Rs. 7736 in Class I to Rs. 8376 in Class II and Rs. 17504 in Class III.

Inputwise expenses for different items revealed that organic manures contributed the largest share of expenses (62.92 percent) in total cost followed by labour (37.08 percent) at the aggregate level. Class wise analysis showed that organic manure contributed the largest share of expenditure in Class I (67.2 percent) followed by Class III (62.12 percent) and Class II (61.19 percent). The share of labour in total cost was 38.81 percent in Class II, followed by Class III (37.88 percent) and Class I (32.8 percent). Even though biopesticides were applied by the farmers in sufficient quantities for the control of pest and diseases, it was not accounted in cost calculations as it was supplied from krishi bhavans free of cost.

The result obtained on the economics of pepper as explained above is in conformity with the findings of the past studies on other crops. Kshirsagar (2006) got similar results while analyzing the economics of sugarcane farming. An analysis of economics of spices by United Nations (2004) reported a 30 percent share of labour in total cost for the production of spices, which is in conformity to the above results.

Table 4.22 Input wise expenses of selected crops (Rs per farm)

crop	Items	Class I	Percentage	Class II	Percentage	Class III	Percentage	Aggregate	Percentage
pepper	organic manures	5198	67.20	5125.43	61.19	10872.63	62.12	7331.14	62.92
	Labour	2537.67	32.80	3250.31	38.81	6631.31	37.88	4321.3	37.08
	Total	7735.67	100.00	8375.74	100.00	17503.94	100.00	11652.44	100.00
Vanilla	Organic manures	2313.83	69.50	1878.43	41.95	6180	77.06	3643.65	66.50
	Labour	1015.58	30.50	2599.06	58.05	1839.86	22.94	1835.525	33.50
	Total	3329.41	100.00	4477.5	100.00	8019.86	100.00	5479.175	100.00
Banana	Organic manures	559	60.50	2165.31	63.78	3804.34	62.39	2306.25	62.66
	Propping material	15	1.62	80.31	2.35	101.84	1.60	68.9	1.87
	Labour	350	37.88	1148.43	33.82	2191.57	35.95	1305.3	35.46
	Total	924	100.00	3394.06	99.95	6097.76	99.94	3680.45	99.99
Coffee	Organic manures	6036.50	72.27	134622.50	59.00	265417.50	65.13	9811.75	64.47
	Labour	2316.17	27.73	93555.00	41.00	142090.00	34.87	5407.75	35.53
	Total	8352.67	100.00	228177.50	100.00	407507.50	100.00	15219.50	100.00
Arecanut	Organic manures	5243.83	59.81	8646.09	55.18	10711.84	60.94	8410.40	58.72
	Labour	3523.33	40.19	7021.88	44.82	6865.53	39.06	5912.90	41.28
	Total	8767.17	100.00	15667.97	100.00	17577.37	100.00	14323.30	100.00
Coconut	Organic manures	1045.00	75.82	1723.44	82.75	3863.82	88.28	2333.25	85.05
	Labour	333.33	24.18	359.38	17.25	513.16	11.72	410.00	14.95
	Total	1378.33	100.00	2082.81	100.00	4376.97	100.00	2743.25	100.00
Ginger	Organic manures	199.17	36.62	1133.75	49.83	3490.26	50.33	1748.85	49.59
	Labour	344.67	63.38	1141.56	50.17	3445.00	49.67	1777.80	50.41
	Total	543.83	100.00	2275.31	100.00	6935.26	100.00	3526.65	100.00

4.4.1.2 Vanilla

Vanilla could be successfully grown as an intercrop in homestead gardens and this provided additional revenue to the farmer. The input wise expenses as given in Table 4.22 revealed that the per farm cost for vanilla was Rs.5479 at the aggregate level. It was found to be Rs. 3329 in Class I, Rs. 4477 in Class II and Rs. 8019 in Class III.

An analysis of inputwise expenses for vanilla showed that at the aggregate level cost on organic manures contributed the largest share of expenses (66.50 percent) in total cost followed by labour (33.50 percent). Class wise analysis showed that, in class III and class I, organic manures contributed the largest share of expenditure, to an extent of 77 percent and 69 percent respectively, followed by Class II (42 percent). The share of labour was highest in Class II (58 percent), while for Class I and Class III it was 30 percent and 23 percent respectively.

It may be mentioned that use of bio pesticides was high in the case of vanilla due to incidence of diseases associated with the vines, but it was not accounted in calculations. The major share in labour cost was contributed by pollination and bio pesticides application. The contribution of labour towards the total cost in the case of class I (30 percent) was in conformity with results reported for spices by United Nations (2004).

4.4.1.2. Banana

Banana was not extensively grown by sample farmers. At the aggregate level the per farm cost for banana as given in Table 4.22 was found to be Rs 3680 per farm and it was Rs 924, Rs 3394 and Rs.6097 per farm respectively for Class I, II and III.

Analysis of input wise expenses in banana revealed that at the aggregate level organic manures contributed the largest share of expenses (62.66 percent)

followed by labour cost (35.46 percent) and propping material (1.87 percent). Class wise analysis also revealed a similar pattern, with organic manures contributing 60.50 percent, 63.78 percent and 62.39 percent respectively in Class I, Class II and Class III, while the share of labour varied from 37.88 percent in Class I to 33.80 percent in Class II, and 35.95 percent in Class III. The use of bio pesticides was very low and it was not accounted in calculations.

The above findings on the contribution of labour are in line with the results obtained for pepper and vanilla in the present study and the reports of Kshirsagar (2006) and United Nations (2004). Though it is an annual crop, the planting material was not included as a cost item, because last year's suckers from the farm itself were used for planting next season. As described earlier very few were cultivating the crop and the harvested produce in small farms (less than one hectare) was mainly used for home consumption.

4.4.1.4. Coffee

Coffee was found to be one of the most remunerative crops in the area and almost all the farms were cultivating the crop. The input wise expenses as shown in Table 4.22 revealed that the per farm cost for coffee was Rs. 15219 at the aggregate level. It was found to be increasing from Rs. 8352 in Class I to Rs. 228177 in Class II, and Rs. 407507 in Class III.

Input wise expenses in coffee for different items pointed out that at the aggregate level cost of organic manures contributed the largest share of expenses of about 64.49 percent followed by labour cost (35.53 percent). Class wise analysis also showed a similar trend. It was observed that the manures contributed 72.27 percent in Class I, 59 percent in Class II and 69.13 percent in Class III and labour contributed a share of 27.73, 41 and 34.87 percentage respectively for Class I, Class II and Class III. It may be noted that the per farm cost were found to be very low for Class I farms as coffee was grown to a large extent by medium

to large farms and in relatively lesser area by small farms. Cost toward organic manure formed major component in all the classes and it was highest in Class III. The higher expense on labour was due to pruning operation done once or twice in a year. It was observed that farmers were not using bio pesticides for coffee.

The above findings on a larger share of organic manures for coffee cultivation was contrary to the report of United Nations (2004) based on a study in Idukki district, where the major share in the total cost was contributed by labour. The differences could be due to the differences in study area and cultivation practices.

4.4.1.5. Arecanut

Arecanut was found to be the most important commercial crop in the study area. At the aggregate level the per farm cost for arecanut was found to be Rs. 14323 as given in Table 4.22. It was found to be highest in Class III (Rs 17577) followed by Class II (Rs.15667) and Class I (Rs. 8767).

An analysis of input wise expenses in arecanut revealed that at the aggregate level cost of organic manures contributed a share of 58.72 percent and labour occupied 41.28 percent. Class wise analysis showed that manures contributed 59.81 percent, 55.18 percent and 60.94 percent in class I, II and III respectively. The share of labour ranged from 39.05 percent in class III to 44.81 percent in class II and 40.19 percent in class I.

It may be noted that there was not much variation in the contribution of the two items, and labour cost was high in arecanut compared to other major crops, mainly due to the higher expenses for harvesting. Class II recorded the highest contribution on labour. It was observed that bio pesticides were not used in the crop. The above results are comparable with the findings obtained for coffee as reported by United Nations (2004), which brought out the importance of labour cost to the total cost.

4.4.1.6 Coconut

Although coconut is not recommended for high altitude areas, most of the farmers were cultivating the crop, though in a small area mainly for home consumption. The input wise expenses as presented in Table 4.22 revealed that the per farm cost for coconut was Rs. 2743 at the aggregate level. It was found to be increasing from Rs. 1378 in class I to Rs. 2082 in Class II and Rs. 4376 in Class III.

It was found that at the aggregate level cost of organic manures occupied the largest share of expenses (85 percent) in total cost and expenses on labour was found to be 15 percent. Class wise analysis also showed a similar trend. Manure cost was found as 75.82 percent, 82.75 percent and 88.28 percent respectively for Class I, II and III. Among the classes labour contributed 24.18 percent of the total cost in class I, while for Class II and Class III, it was 17.26 percent and 11.72 percent respectively. It may be noted that there was no bio pesticides use in the crop. These results are in line with the findings on coffee in the present study, where a larger share of organic manure was reported.

4.4.1.7. Ginger

Ginger was found to be one of the most remunerative crops in the study area as it fetches a premium price (20-30 percent) in the market due to a good demand in the market. But most of the farmers were not cultivating the crop, as it is a nutrient – depleting crop. At the aggregate level the per farm cost for ginger was found to be Rs. 3526 as presented in Table 4.22. The input wise expenses were found to be highest in Class III (Rs 6935) followed by Class II (Rs.2275) and Class I (Rs. 543).

The input wise expenses revealed that in the case of ginger labour cost (50.41 percent) and organic manure cost (49.59 percent) was found to be almost equal. Class wise analysis also showed a similar trend with labour contributing for

50.18 and 49.67 percent of total cost respectively for Class II and Class III. The share of manures was also found to be about 50 percent in each case. But in the case of Class I, 63 percent of total share was contributed by labour and rest 37 percent by manures. The respondents were not using bio pesticides for the crop. It may be mentioned that in comparison to other crops, the share of labour input in the total cost was found to be substantial. The higher expense for labour was mainly due to the use of green leaf manures as the source of organic manure, the cost of which was accounted as labour expenses.

The results obtained above are comparable with the findings on pepper, vanilla and arecanut in the present study and the report of United Nations (2004) on spices, where labour cost was having major share.

4.4.2. Yield and returns of organic farms

The crop wise yield and return per farm for the three classes and aggregate level were worked out and the results are presented and discussed in this section. The average yield and returns per farm for different classes and crops are shown in Table 4.23. It was found that arecanut contributed the major share in return followed by pepper and coffee at the aggregate level and the total return per farm was Rs.126707. Among the classes, total return was the highest for Class III (Rs. 207863) followed by Class II (Rs.101742) and Class I (Rs. 50539). Arecanut was the prominent crop in all the classes in terms of return followed by coffee and pepper in Class I and pepper and coffee in Class II and III.

The results are similar to the findings of past studies on productivity of organic farms. Rajendran *et al.* (2000), in their study on organic farming found that change from conventional to organic farming reduced the yield during the initial years and in subsequent years the farms were able to reduce the yield gap and sometimes given higher yields also.

Table: 4.23. Yield and Returns of Organic farms (per farm)

Crop	Class I		Class II		Class III		Aggregate	
	Yield (Kg)	Return (Rs)	Yield (Kg)	Return (Rs)	Yield (Kg)	Return (Rs)	Yield (Kg)	Return (Rs)
Pepper	65.67	9850.00	137.50	20625.00	341.05	51157.89	193.30	28995.00
Coffee	967.36	14510.33	543.75	17615.63	1257.11	41606.58	786.05	25800.60
Arecanut	1311.90	19678.53	1005.56	40078.13	1743.95	69691.58	1132.72	45211.36
Coconut	67.00	1005.00	455.94	4102.81	755.21	6776.63	466.38	4189.52
Vanilla	106.33	1595.00	191.56	4848.44	139.37	3828.95	129.30	3485.00
Banana	153.33	2300.00	538.63	6701.56	565.68	7860.53	442.52	5821.50
Ginger	106.67	1600.00	161.88	7770.00	561.26	26940.63	275.08	13203.84
Total		50538.87		101741.56		207862.79		126706.82

The average output obtained for pepper, ginger and banana were comparable with the results obtained by the study by Balachandran (2004), who reported that the average output were 185 kg, 100 kg and 600 kg per farm respectively in the district of Wayanad.

It was found that, in the case of pepper and ginger the farmers were getting a premium of 20-30 percent and for coffee it was about 10 percent. However the result obtained was not in line with the results of Madan (2007), who reported that organic pepper growers were not getting price premiums. But it was in line with the findings of Khutkar *et al*. (2003), Thakur and Sharma (2005) and Kshirsagar (2006), who reported an average price premium of 30, 25- 30 and 15 percentages respectively. The net returns in organic farming were found to be 2- 3 times higher in the case of production of rice, wheat and soyabean, as reported by Khutkar *et al*. (2003)

4.4.3 Analysis of organic farm economy

4.4.3.1 Cost component analysis

Based on the findings on the inputwise expenses and returns of the selected crops, it would be worthwhile to look in to the costs per hectare in the organic farms and to examine the economies of scale based on the comparative economics of different classes of respondents. The Cost A_1, Cost A_2, Cost B_1, Cost B_2, Cost C_1, Cost C_2 and Cost C_3 were worked out for the three classes and at the aggregate level and the results as presented in Table 4.24 revealed that, at the aggregate level, the costs were Rs 34114, Rs. 34187, Rs. 44188, Rs. 37823, Rs.47825 and Rs. 49116 respectively for Cost A_1, Cost B_1, Cost B_2, Cost C_1, Cost C_2 and Cost C_3. It was found that the total cost of cultivation at Cost A_1, Cost B_1, Cost B_2, Cost C_1, Cost C_2 and Cost C_3 were Rs. 53088, Rs. 53239, Rs. 63239, Rs. 60881, Rs. 70881 and Rs. 72374 respectively for Class I farmers and they were Rs.37724, Rs.37806, Rs.47810, Rs.42256, Rs.52260 and Rs.53584 respectively for Class II farmers. The costs were found to be Rs.29628,

Rs.29684, Rs.39685, Rs.32353, Rs.42354 and Rs.43599 respectively for Class III farmers. It may be noted that Cost A_1 and Cost A_2 were same, as there was no land taken on lease by the sample farmers in the area for cultivation.

An analysis of the cost components revealed that at the aggregate level the operating expenses constituted the largest share (63.11 percent) followed by the rental value of owned land, contributing 20.36 percent, while expenses on family labour was 7.4 percent. The other items of expense considered were interest on farm loan (2.78 percent) and the management expenses (2.63 percent).

Class wise analysis showed similar trend as above. In the case of Class I, operating expenses was the largest item of expenditure (65.80 percent) followed by rent on own land (13.82 percent), family labour (10.56 percent), interest on farm loan (2.94 percent) and depreciation (2.32 percent). For Class II also operating expenses constituted the largest share of expenses (63.89). Rent on own land contributed 18.67 percent, which was followed by family labour (8.30 percent) and interest on farm loan (1.71 percent). With respect to Class III farmers too, similar trend was observed with operating expenses contributing 62 percent. As observed in Class I and Class II, here also rent on own land was the second largest item occupying 22.94 percent followed by family labour (6.12 per cent).

Based on the above results it could be concluded that the per hectare expenses were found to decrease with the increase in size of holdings indicating economies of scale. This could be due to the fact that the per hectare usage of manures and bio pesticides was found to decrease when the cultivation is taken up on a large scale. It was also noted that the share of family labour showed a declining trend from Class I to Class III, which clearly indicated that small sized farms use more of family labour as compared to large sized farms.

Table 4.24 Cost component analysis (Rs. per hectare)

Table 4.24 Cost component analysis (Rs. per hectare)

Items	Class 1	Percentage	Class II	Percentage	Class III	Percentage	Aggregate	Percentage
Operating expenses	47639.25	65.82	34236.94	63.89	27031.89	62.00	30996.43	63.11
Land revenue	100.00	0.14	100.04	0.19	100.01	0.23	100.02	0.20
Depreciation	1676.56	2.32	917.07	1.71	619.40	1.42	804.38	1.64
Interest on farm loan	2128.56	2.94	1512.53	2.82	1187.94	2.72	1367.81	2.78
Interest on working capital	876.47	1.21	622.81	1.16	489.15	1.12	563.21	1.15
Miscellaneous cost	668.05	0.92	334.93	0.63	200.27	0.46	282.87	0.58
Cost A1/A2	53088.90	73.35	37724.31	70.40	29628.67	67.96	34114.71	69.46
Interest on fixed capital	150.89	0.21	82.54	0.15	55.75	0.13	72.39	0.15
Cost B1	53239.79	73.56	37806.84	70.56	29684.42	68.08	34187.11	69.60
Rental value of own land	10000.00	13.82	10003.83	18.67	10001.14	22.94	10001.71	20.36
Cost B2	63239.79	87.38	47810.67	89.23	39685.56	91.02	44188.82	89.97
Imputed value of family labour	7641.78	10.56	4449.76	8.30	2669.03	6.12	3636.47	7.40
Cost C1	60881.57	84.12	42256.60	78.86	32353.45	74.21	37823.57	77.01
Cost C2	70881.57	97.94	52260.43	97.53	42354.60	97.14	47825.29	97.37
Allowance given for farm management	1493.25	2.06	1323.88	2.47	1245.34	2.86	1290.95	2.63
Cost C3	72374.81	100.00	53584.31	100.00	43599.93	100.00	49116.24	100.00

The above results have been substantiated by the findings of Giuseppe (2003) who reported that material cost was the most expensive item in organic farming followed by labour cost. The findings of Balachandran (2004) also were in line with the above result, who reported a cost of Rs 28825 per hectare (Cost A_1) of organic farms in Wayanad area. Singh *et al* (2006) reported a cost of Rs 31651 per hectare for organic paddy, which was in conformity with the above findings.

4.4.3.2 Farm efficiency measures of organic farms

The profitability of the crop production can be judged better from the income measures, namely, farm business income**,** own farm business income, family labour income, net income and farm investment income. Income measures in relation to various cost concepts were worked out for organic farms and are presented and discussed below. It may be noted that farm business income and own farm business income were the same as the Cost A_1 and Cost A_2 were same. The benefit cost ratio in relation to different cost concepts was also worked out to examine the profitability in the farms.

4.4.3.3 Income measures

The different income measures were analysed for the farms and presented in Table 4.25. The farm business income, farm investment income, family labour income and net income and at the aggregate level for organic farms were Rs 43381, Rs 38453.87, Rs. 33307 and Rs. 28379 respectively. Class wise analysis showed that all the income measures ie farm business income, farm investment income, family labour income and net income were highest for Class III farmers followed by Class II farmers and Class I. Net income at Class I, Class II and Class III were Rs. 17658, Rs. 24303 and Rs. 31726 in the respective order.

Table.4.25 Farm income measures (Rs. per hectare)

Farm efficiency measures	Income			
	Class I	Class II	Class III	Aggregate
Gross income	90033.61	77888.00	75326.02	77496.00
Farm/ Own farm business income	36944.71	40163.69	45697.33	43381.29
Farm investment income	27809.68	34390.05	41782.96	38453.87
Family labour income	26793.82	30077.33	35640.44	33307.18
Net income	17658.80	24303.69	31726.07	28379.76

The results obtained on the income measures as explained above are substantiated by the findings of past studies on other crops. Balachandran (2004) reported a gross income of Rs 90520 per hectare in organic farms in Wayanad, which is line with the results of the present study. Singh (2003) reported a net return of Rs. 28000 per hectare of organic vegetables, while Singh *et al.* (2006) reported a net income (over Cost C_3) of Rs 7279 per hectare for paddy.

The benefit cost ratio indicates value of output per rupee of input cost. This ratio will serve as a measure, which would indicate whether the cost incurred is commensurate with the returns obtained. Benefit cost ratio of organic farms was estimated separately for various cost concepts and the results are presented below.

The analysis of benefit cost ratio of organic farms as given in Table 4.26 revealed that investment of one rupee yielded more than one rupee for all the classes. On an average organic farm sustained a benefit cost ratio of 1.58 at Cost C_3 level. BC ratio at Cost A_1, B_1 and B_2 were highest for Class III followed by Class II and Class I. On Cost C_3 basis, BC ratio of Class I, Class II and Class III farms were 1.24, 1.45 and 1.73 respectively. It was observed that the BC ratio

increased with the size of holdings from 1.24 to 1.73, which clearly brings out the economies of scale.

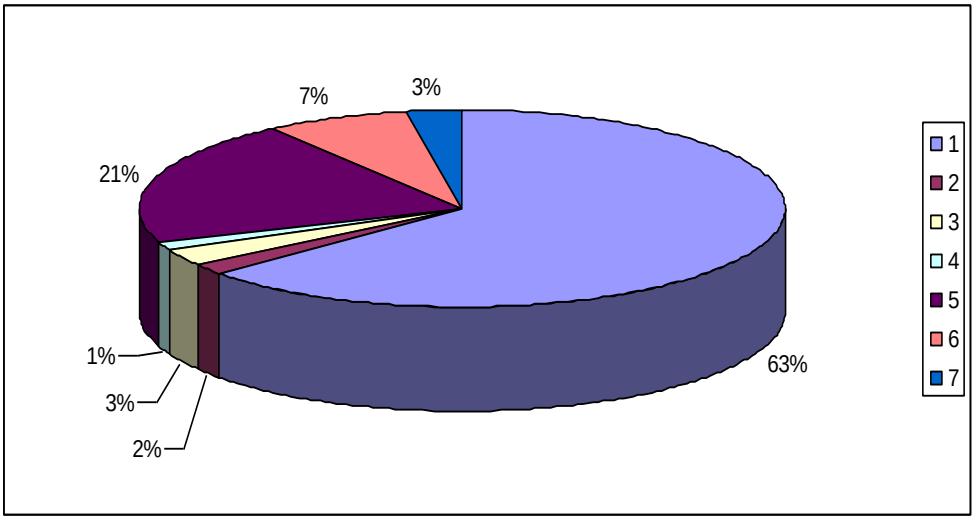
The above results on the farm efficiency measures of organic farms indicate the profitability of organic farming in the area. All the income measures were positive along with benefit cost ratio of more than one even after considering the management expense of the farmer.

Table 4. 26 Benefit cost ratio of organic farms

Cost	Benefit cost ratio			
	Class I	Class II	Class III	Aggregate
Cost A_1/ A_2	1.70	2.06	2.54	2.27
Cost B_1	1.69	2.06	2.54	2.27
Cost B_2	1.42	1.63	1.90	1.75
Cost C_1	1.48	1.84	2.33	2.05
Cost C_2	1.27	1.49	1.78	1.62
Cost C_3	1.24	1.45	1.73	1.58

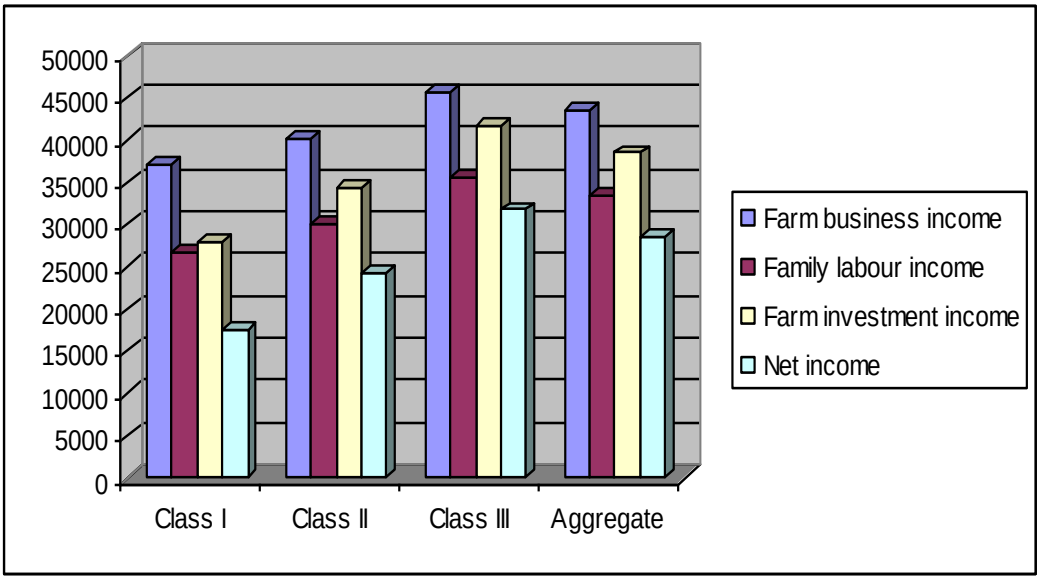
An analysis of cost benefit ratio of organic cotton by Ramasundaram *et al*. (2003) indicated that CB ratio of organic cotton was 1:1.63. The results obtained by Kshirsagar (2006) indicated a high profit from organic sugarcane farming, which was found to be 10.82 percent higher than the conventional. These findings were also found to be in line with the results obtained by Rajput and Trifle (1994) and Yadav *et al* (2003) where a benefit cost ratio of 1.3 was reported. Margasagayam and Norman (1997) also reported that the cost benefit ratio was high in organic farms compared to inorganic.

Fig. 4.2 Cost components analysis



1. Operating expenses 2. Depreciation
3. Interest on farm loan 4. Interest on working capital
5. Rental value of owned land 6. Imputed value of family labour
7. Allowance given for farm management

Fig. 4.3 Farm efficiency measures



The high profitability of the organic farms in the study area have also been substantiated by the results of Balachandran (2004), who reported a cost benefit ratio of 1: 3.7 of organic farms in Wayanad.

4.5 Resource productivity analysis

The most important objective of any enterprise is to realize optimum output through co-ordination and utilization of the farm resources. The optimization reflects the resource productivity. The economic analysis of organic farms as discussed in the previous section highlighting the overall profitability of the farms based on cost and return analysis calls for an analysis of the factors contributing to the profitability. Hence an attempt has been made to fit suitable production function in order to examine the contribution of selected variables to the gross income of the farm and to estimate the optimum return from the significant variables.

4.5.1 Gross income function

The productivities of the resources used for organic farms obtained by using the Cobb- Douglas production function are presented in Table 4.27. The variables chosen were cropping intensity, organic manures, bio pesticides, and human labour.

Table: 4.27 Coefficients of Gross income function

Variables	Coefficients	Standard error
Constant	1.386	-
Cropping intensity X1	0.336	0.98*
Organic manures (Rs) X2	0.139	0.63
Organic pesticides (Rs) X3	0.639	2.94**
Labour (man days) X4	0.404	1.48**
R2 (adjusted)	0.627	-

**Significant at 1 percent level, * Significant at 5 percent level

The results revealed that R^2 was found to be 0.63 indicating that 63 percent of the variations were attributed to the variables included in the model. The estimated Cobb – Douglas function revealed that the variables chosen were highly significant to the model. It could be seen that variables considered in the regression analysis ie bio pesticides, cropping intensity and human labour were influencing the farm income.

The elasticity coefficient 0.63 for bio pesticides indicated that when the expenditure on bio pesticides increased by 100 percent the gross income increased to the tune of 63 percent. The elasticity of less than unity reflected that the increase in income was less than proportional to the increase in bio pesticides. The other factors such as human labour, cropping intensity and organic manures were also influencing the income positively (0.40, 0.33 and 0.13 respectively).

The above results showing the importance of selected factors in determining the gross income of organic farms was in conformity with the findings of Thakur and Sharma (2005) who reported that farm labour and organic manures were highly significant in determining the gross income of organic farms. They found that, the use of bio pesticides and manures could bring an increased productivity of land. It may be noted that the major inputs identified in the present study were labour and organic manures as already indicated in the previous section.

4.5.2 Optimum returns for different variables

The optimum returns for each variable were estimated using Cobb-Douglas estimation methods and are presented in Table.4.28. For each variable the optimum returns were found out by keeping all the other variables constant and these variables were fitted in a model and optimum return was found out as

$$Y = a0 * X1^{.336} * X2^{.139} * X3^{.639} * X4^{.404}$$

Table: 4.28 Optimum returns for different variables

Variables	Geometric mean	Optimum return (Rs)
Cropping intensity (X1)	133	119820
Organic manures (Rs) (X2)	23850	118923
Bio pesticides (Rs) (X3)	16250	127800
Labour (man days) (X4)	151	118589

This optimum return will be the return obtained for the farms, if these inputs were used in an optimum amount. Each additional unit of input used will not produce any extra benefit for the farms.

4.6 Marketing of organic produce

Development of an efficient marketing system is important in ensuring that scarce and essential commodities reach different class of consumers. Unless the product is efficiently marketed efforts to increase production may go waste. Marketing should therefore be considered as an essential aspect like good seed and manures. Marketing system as a whole is divided in to three broad segments viz, producers, consumers and middle man, each with apparently conflicting interest. The producer wants the marketing system to purchase the product without loss of time and highest possible price. Consumers' interest is to get required quantity of quality goods at lowest possible price while middleman aims at realizing maximum profit from the deal. An efficient marketing system ought to aim at balancing this conflicting interest in such a way that each segment gets a fair deal. Organics are high value produces and an essential marketing system is essential to ensure good price to the producer.

4.6.1 Marketing structure

Indian Organic Producer's Company working in collaboration with the NGO Organic Wayanad is the major marketing agency working in the study area. The company procures the produce from shareholders only. The company directly collects the produce from farmers plot. Each farmer will be given one lot number and with this number only the produce will go to export market. If the produce needs processing like coffee, pepper, vanilla etc, after processing (separate processing centres are there for the company) it will go to the export market with farmer's lot number. If quality problem occurs, the produce will be returned to the respective farmers.

Every year just before the harvest, NGO officials will visit the farms and record the details about average quantity of produce in each farm, in order to get an idea about how much they can market in the particular year. Based on this data the company will make arrangements or make contract with exporters. After this the NGO will prepare a list of farms with their respective quantity of different organic produce for a particular year. According to the list, each farmer will get a transaction certificate, which will show the quantity of organic produce he has to sell. This is done to avoid malpractices by selling inorganic produce as organic produce.

4.6.2 Marketing costs

It was found that no marketing cost has been involved for the producers in marketing of produce in the study area. As the produce require quality control in all the stages including marketing, such as provision of good quality bags, avoidance of contaminants, pesticide residue and fake products, the procuring agency itself directly collects the produce from the farmer's fields.

4.6.3 Marketing channel

The sequence of stages involved in moving the produce from the producer's farm to the consumer is generally referred to as marketing channel. From the study it was observed that there existed three channels of marketing of organic produce.

Producer - Indian Organic Producers Company - Exporter

Producer – Private company – Organic market

Producer – Local market

In the channel I, the farmers sold the produce to the Indian Organic Producers Company (working under NGO Organic Wayanad), which arranges for exporting the produce. Those farmers who are shareholders of the organic producers company can only sell the produce to the company and receive premium prices. The company directly collects the produce from farmers plot. Each farmer will be given one slot number and with this number only the produce will go to export market. This channel was found to be the most prevalent channel among the respondents.

In channel II farmers were selling their produce to some private companies working in Wayanad and Kozhikode districts. These companies would make a contract with farmers regarding the price of the produce (margin percentages) before harvest. The company would directly procure produce from the farms and they would sell the produce in their own markets in the urban areas of the districts.

In channel III, farmers sold their produce in the local market, just like conventional produce and they would not get a price premium.

The channels identified are similar to the findings of past studies on organic marketing by Rathi *et al*. (2003). In their study on diversified organic farming, they found out as many as three channels involved in the marketing of organic produce, where wholesalers, retailers and NGOs were involved in the channel.

4.7 Constraints in the production and marketing of organic produce

The organic farmers faced a number of constraints both in production and marketing. The major constraints experienced by the respondents were identified and analysed. The constraints were lack of proper market facilities, lack of fixed price premiums, scarcity of quality organic manures, lack of financial support during transition, competition from fake products, pest and disease control and lack of consumer awareness. The response of the organic farmers regarding these problems was gathered in order of their importance and classified as most important, important, somewhat important, less important and least important. The scores assigned to these classes were 5, 4, 3, 2 and 1 in order of their importance. The cumulative rank score for each constraint was estimated and the results are presented in Table 4.29.

It was found that problem regarding price premium in the market and its instability was the most important constraint faced by the farmers in the study area with a score of 234. High premium for the organic produce was one of the major incentives for the farmers to switch over to organic cultivation. But due to many reasons such as underdeveloped infrastructure and marketing channels, quality parameters, certification and labels, price premium advantage was not available to majority of the growers. But the produce such as pepper, ginger and coffee enjoy a high price premium.

Table 4.29 Major constraints perceived by respondents

Constraints	Most important (5)	Important (4)	Some what important (3)	Less important (2)	Least important (1)	Cumulative score
No fixed price premium	34	16				234
Lack of markets	19	21	10			209
Scarcity of quality organic manures	13	17	20			193
Lack of Govt support		23	14	13		160
Competition from fake products			19	21	10	109
Lack of consumer awareness			13	17	20	93
Pest and disease control			9	16	25	84

Next important constraint was the lack of marketing facilities with a total score of 209. Lack of assured market for the organic produce was a major deterrent in organic farming. The market structure for organic produce was highly segmented. There was more of direct marketing in the study area with individual producers selling their produce in the open market at the price of conventional produce. At present retail outlets for the produce were small in number and were seen only in towns and cities. Some agencies such as M.S. Swaminadhan research foundation, Kissan Pvt Ltd and Elements have come in to the procurement and marketing of organic produce. A farmer's co- operative organic producers company was also now engaged in the marketing. All the above agencies involved in the marketing of organic produce have brought out the expansion of market for organic produce.

Lack of quality organic manures was also found to be an important problem with a score of 193. The farmers in the area were finding extremely difficult to get the required quantum of various organic inputs. Inputs like organic manures, bio pesticides and bio fertilizers could be prepared in the farm itself, but as organic farms require large amount of inputs as bio manures the farm level production would pose great difficulties.

Lack of government support during transition was another problem faced by the farmers with a score of 160. At the time of transition a drastic reduction in yield was observed which would lead to reduced income in the farm families. It was observed that limited positive intervention and without any financial outlays for bio inputs from the part of government, was posing difficulties for the organic farmers

Another important problem faced by the farmers was fake products in market with a score of 109. Conventionally produced food was also repacked and sold as organic. Such instances were happening in the market, along with deceptive products with labels on the pack as 'grown with organic manure'. Such

deceptions were harmful to the genuine organic producers, because they distort the market and confuse the consumer.

Lack of consumer awareness regarding organic produce and pest and disease control were also found as a major problem by farmers in the study area with a cumulative score of 93 and 84 respectively. Consumer involvement in the market function was an important factor to be considered. To promote organic food production, protect the health of consumer and producer and to conserve the fast eroding genetic diversity of the country, much commitment was required on the part of the consumer to honor the benefit of chemical free food.

The above result was in conformity with the findings of Arunachalam (1996), Sherief (1998), Thakur and Sharma (2003), Balachandran (2004) and Narayanan (2004), which revealed the existence of similar constraints, including lack of fixed price premium, lack of assured market, scarcity of quality organic manure and lack of financial support from the part of government.

4.8 Consumer awareness regarding organic produce

The willingness to pay premium (WTPP) for selected organic produce was elucidated from the consumers. It was hypothesized that consumer would pay a premium for organic produce. The difference between the maximum Willingness To Pay (WTP) and market price can be considered as the premium for the organic produces.

The consumers were classified according to the different income groups and the WTPP was separately analyzed for selected organic produce, viz vegetables, fruits, spices and milk. In each group 30 consumers were surveyed and the WTPP for organic produce was estimated. The results are given in Table 4.30.

Table4.30. Consumer's WTPP for organic produce (Rs per Kg)

Class	Vegetables	Fruits	Spices	Milk
High	6.6	10.7	20.0	3.5
Medium	4.5	7.5	11.3	2.3
Low	2.6	3.9	4.4	1.6
Average	4.6	7.4	11.9	2.5

It was found that the WTPP increased as the income of the consumers increased. About 53 per cent of the consumers were aware that organic produce was available in the market. On an average, the consumers were willing to pay Rs. 4.6, 7.4, 11.9, and 2.5 per kg as price premium for organic vegetables, fruits, spices and milk respectively.

4.8.1 Factors affecting Willingness to pay premium for organic produce

A logistic regression equation was estimated to study the factors influencing the consumer's WTP for organic produce and the results are presented in Table 4.31. The independent variables chosen were the income of the consumers, awareness of the consumer with regard to the organic produces available in market, and the education level of the consumers.

Using the model, the probability of WTPP more than Rs. 3 per Kg of vegetables, WTPP more than Rs. 4 per Kg of fruits and WTPP more than Rs. 8 per kg of spices over the prevailing price were worked out considering the independent variables as explained above. Both income and awareness were found to be significant at 0.2 and 1 per cent level respectively, indicating that the willingness to pay premium was directly related to these variables. This means that the consumers were aware of the organic produce and those who had higher

income level were willing to pay more as the price premium. However, the education did not show significance even at 5 per cent level.

Table: 4.31. Coefficients of consumer's WTPP function

Sl No:	Independent variables	Estimated coefficient			
		Vegetable	Fruits	Spice	Milk
1	Education level (scores)	0.416	0.148	0.124	0.840**
2	Income	0.184*	0.922*	0.081*	0.179*
3	Awareness about market availability of organic produce	0.282**	0.439**	0.436**	0.506

*Significant at 0.2 percent level

** Significant at 1 percent level

Using the model, the probability of WTP a premium of more than one rupee per litre over the prevailing price of milk was also worked out. Both income and education were found to be significant at 0.2 and one per cent level respectively, indicating that the WTP premium was directly related to these variables. This means that the consumers were educated and those with higher income were willing to pay more as the price premium for organic milk. However, the awareness did not turn out to be significant even at 5 per cent level.

The results obtained on the WTPP as explained above are in conformity with the findings of past studies on other crops. Poornima (1999) obtained similar results while analyzing the results of consumer awareness regarding pesticide residue free grapes. On an average, the consumers were willing to pay a premium of Rs.11.42 per kg for pesticide -free grapes and the income of the consumer and awareness of pesticide residues were found to be significant and positive. An analysis of the willingness to pay premium for pesticide free cabbage by Arunkumara (1995) indicated that the average WTPP was Rs. 1.60 per kg of pesticide- free cabbage and it was 50 per cent higher than the market price.

The results were also in conformity with the findings of Piyasiri and Ariyawardana (2002) and Chithra (2006) which revealed similar results while analyzing consumer awareness regarding organic produce and the willingness to pay was Rs 12 per Kg of organic vegetables. The logistic regression function also gave similar results where income of the consumer and awareness regarding organic produce were found to be significant.

Summary and Conclusion

SUMMARY AND CONCLUSION

The popularity of organic farming is gradually increasing and now organic agriculture is practised in almost all countries of the world, and its share of agricultural land and farms is growing. According to the latest survey by Foundation Ecology and Agriculture (SOEL, 2006), more than 31 million hectares are currently managed organically by at least 6.23 lakh farms worldwide (approximately 130 countries). There was also a growing interest in organic agriculture in India, specifically amongst non-governmental organizations working in marginal and tribal areas and private companies.

India has 41000 acres under organic farming and total value of certified organic produce was estimated at approximately US$ 18.5 million producing1.2 lakh tonnes with 31 organic products. It was estimated that 6792 tonnes of organic products have been exported from India with an approximate value of Rs.7123 Lakhs (NPOP, 2006) where the maximum product came from Kerala (1232 tones). The area under organic farming in Kerala has increased from less than 500 hectares to about 6200 hectares during the recent years indicating the growing importance of the system in the state. Hence there is a need for promoting organic farm produce, which has a strong demand all over the world as the produce is considered to be eco friendly.

The study was undertaken in Wayanad district and from the district Poothadi and Panamaram panchayaths were selected purposively. From the list of organic farms, a sample of 50 farms were selected randomly from the above panchayats, which were post stratified into three groups based on the area under organic farming as Class I (<1 hectare), Class II (1-2 hectare) and Class III (>2 hectare). The data was collected from the farmers through personal interview method using well structured and pre tested interview schedule. A separate schedule for consumer survey was prepared and the data on the consumer awareness regarding organic produce and their willingness to pay for organics

from 90 consumers belonging to different income groups in urban areas of Kozhikode district was collected. The cost of cultivation was worked out using input wise approach for the selected crops by employing the ABC concepts of farm management. Resource productivity analysis was carried out and gross income function and optimum returns for the farms were worked out. A lay out plan for organic farms were suggested by using proportionate allocation method. The consumer awareness regarding the organic produce was analysed by assessing the Willingness To Pay Premium (WTPP) for organics by using logistic regression.

The different inputs for each crop in organic farms were identified and the input wise costs were worked out for the organic farms in the area. At the aggregate level, the total cost of cultivation at Cost C_3 was found to be Rs. 49116. Class wise analysis revealed that the cost was highest in Class I followed by Class II and Class III. Expenses on crops accounted for the highest share among the input cost. At the aggregate level, the contribution was found to be 63 per cent. Per hectare expenses were found to decrease with the increase in size of holdings indicating economies of scale.

At the aggregate level, arecanut contributed the major share in return followed by pepper and coffee and the total return per farm was Rs.126706. Among the classes, total return was highest for Class III (Rs.207862) followed by Class II (Rs.101741) and Class I (Rs.50538). Arecanut itself contributed highest yield (1132 kg per farm) followed by coffee (786 kg). It was found that, while switching over to organic farming yield was reduced considerably and it was found increased in subsequent years.

Income measures in relation to various cost concepts were worked out viz, farm business income, own farm business income, family labour income, net income and farm investment income. At the aggregate level gross income was found to be Rs. 77496, while the net income was Rs. 28379 per hectare. The

analysis of benefit cost ratio of organic farms revealed that investment of one rupee yielded more than one rupee for all the classes. On an average organic farm sustained a benefit cost ratio of 1:1.58 at Cost C_3 level. The higher benefit cost ratio in class III as compared to other classes pointed out a higher profitability of large organic farms.

In order to examine the contribution of selected variables to the gross income of the farm and to estimate the optimum return from the significant variables, resource productivity analysis was carried out by using Cobb-Douglas function. The results showed that the use of bio pesticides was influencing the income positively. The analysis also revealed that the factors such as labour and cropping intensity also played a significant role in the gross income of the farmer.

The major marketing channels for organic produce were Producer - Indian organic producer's company – exporter; Producer – private company – organic market and Producer – local market. It was found that the first channel was the most prevalent channel among the sample farmers. It was also found that no marketing cost has been involved for the producers in marketing of produce in the study area

Indian Organic Producers Company working in collaboration with NGO Organic Wayanad was the major marketing agency working in the study area. The company will procure the produce from shareholders only. The company directly collects the produce from farmers plot. The produce having price premiums such as pepper, coffee, ginger etc were procured.

The major constraint faced by the farmers were lack of fixed price premium, lack of markets, scarcity of quality organic manures, lack of Government support, competition from fake products, lack of consumer awareness and pest and disease control. Problems regarding price premium in the market was the most important constraint faced by the farmer. The market

structure for organic produce is highly segmented. There is more of direct marketing in the study area with individual producers selling their produce in the open market at the price of conventional produce. At present retail outlets for the produce are small in number and are seen only in towns and cities.

A consumer survey was conducted in order to analyse the awareness among them with regard to the organic produce and their willing to pay premium (WTPP) for organic produce. About 53 per cent of the consumers were aware that organic produce was available in the market. On an average, the consumers were willing to pay Rs. 4.6, 7.4, 11.9, and 2.5 per kg as price premium for organic vegetables, fruits, spices and milk respectively. A logistic regression was estimated to analyse the factors influencing the consumer WTPP for organic farm produce and the results showed that awareness with respect to organic produce and income were highly significant indicating that the WTPP was directly related to these variables. This means that the consumers who were aware of the produce and who had higher income level were willing to pay more as the price premium for organic produce.

The major findings of the study are summarized as follows

- The total cost of cultivation of organic farms at aggregate level was Rs. 49116.

- Among the classes, the cost was highest in Class I followed by Class II and Class III.

- The small farms, compared to medium and large farms efficiently utilized family labour.

- The gross income was found to be Rs.77496 per hectare and net farm income was Rs. 28379 per hectare.

- Large holding were found to have higher profitability compared to small and medium farms.

- The B: C ratio was found to be 1.58 at cost C_3

- Organic farmers were benefited by existing price premium in the market for some of the organic produce such as pepper, ginger and coffee.

- Bio pesticides, labour and cropping intensity were found to be significantly influencing the gross income.

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- Lack of fixed price premiums and lack of assured markets were the major constraints faced by the organic farmers.

- The average willingness to pay premium was Rs. 4.6, 7.4, 11.9, and 2.5 per kg for organic vegetables, fruits, spices and milk respectively.

- The factors significantly influencing the willingness to pay premium were income and awareness regarding availability of organic produce.

Based on the findings the above suggestions were put forth

- As Kerala was found to be one of the major exporters of organic produce, which has distinct market appeal, technologies for scientific management of organic farms have to be developed.

- There is a need of large quantum of organic manures and bio pesticides in organic farming, hence availability of quality organic manures at reasonable prices must be ensured.

- ❖ In order to avoid reduction in farm income and related problems during transitional period, financial support may be provided to organic farmers during transition to organic farming.

- ❖ Establish public warehouses for storage of organic produce using organic methods.

- ❖ Price premium for organic produce to ensure better production and incentive to farmers.

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- ❖ Strategies for promotion of alternative markets for organic produce with no intervention of middleman should be evolved in domestic as well as export market.

- ❖ Considering the profitability and growing demand of organic produce, farmers must lay more emphasis on organic methods of cultivation, certification and processing.

The government, private sector and producer associations each have a necessary role to play in promoting and facilitating marketing of organic produce. How the various pieces fit together in order to increase value and marketability of farmers' produce is a challenge and will require additional work to make the system function properly. Technical advice on how these processes function in other places and the roles of the different players would be very helpful. Under no circumstances food self-sufficiency and security should be comprised in our genuine needs for organic farming. With that full potential of organic farming can be harnessed and country's commitment on food and other economic activity can be sustained.

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ORGANIC FARM PRODUCE IN KERALA - AN ECONOMICANALYSIS

By

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ABSTRACT OF THE THESIS

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ABSTRACT

The present study on the "Organic farm produce in Kerala – An economic analysis" was conducted to analyse supply pattern, marketing practices, constraints in production and marketing and to study the consumer awareness regarding organic produce. The study was based on the data collected from Poothadi and Panamaram panchayaths in Wayanad districts, where organic farming is taken up on a commercial scale.

The general cultivation practices followed in organic was examined and the input wise expenses for selected crops were worked out. Among the inputs organic manure contributed the largest share in most of the crops followed by labour. The yield and return were worked out and the per hectare expenses estimated based on cost component analysis by employing ABC cost concepts. Total cost at C3 level in organic farms was found to be Rs.49116 per hectare and it ranged from Rs. 72374 in Class I farms to Rs 53584 and Rs. 43599 per hectare in Class II and Class III farms respectively. The returns from the organic farms at the aggregate level were worked out to Rs 126706 per farm and it was Rs 50539, Rs. 101742 and Rs 207862 for Class I, Class II and Class III farms respectively.

The farm efficiency measures for organic farms were worked out and the benefit cost ratio was found to be 1.58. At the aggregate level, the gross income was found to be Rs. 77496 per hectare and net farm income was Rs. 28379 per hectare.

Resource productivity analysis revealed that, bio pesticides, labour and cropping intensity was significantly influenced the gross income. Optimum returns for selected variables were worked out based on the above analysis

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The important marketing channels for organic produce were, Producer - Indian organic producer's company – exporter; Producer – private company – organic market and Producer – local market and the first channel was found to be widely adopted by the farmers. It was found that no marketing cost was involved in the

marketing of organic produce in the study area. The major constraints faced by the farmers were lack of fixed price premium, lack of assured markets, scarcity of quality organic manures, lack of financial support during transitional period, competition from fake products, pest and disease control and lack of consumer awareness.

The study revealed that 53 per cent of consumers were aware of the market availability of organic produce and the Willingness To Pay Premium (WTPP) was found to be Rs. 4.6 per kilogram of organic vegetables, Rs 7.4 per kilogram of fruits, Rs. 11.9 per kilogram of spices and Rs. 2.5 per kg as price for milk. Logistic regression analysis revealed that awareness with respect to organic produce and income were highly significant and it indicated that the willingness to pay premium was directly related to these variables