PRODUCTION AND MARKETING SYSTEMS OF VETIVER: A MICRO-LEVEL ANALYSIS IN THRISSUR DISTRICT

By

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THESIS

Submitted in partial fulfillment of the requirement for the degree of

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2002

DECLARATION

I hereby declare that the thesis entitled "Production and marketing systems of vetiver: a micro-level analysis in Thrissur district" is a bonafide record of research work done by me during the course of research and that the thesis has not previously formed the basis for the award to me of any degree, diploma, fellowship or other similar title, of any other University or Society.

Vellanikkara
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CERTIFICATE

We, the undersigned members of the Advisory Committee of **Mr. Deepakumar, V. S.,** a candidate for the degree of **Master of Science in Agriculture,** agree that the thesis entitled **"Production and marketing systems of vetiver: a micro – level analysis in Thrissur district "** may be submitted by **Mr. Deepakumar, V. S.** in partial fulfillment of the requirement for the degree.

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DEEPAKUMAR V. S.

Dedicated

To

My ACHAN AND AMMA

CONTENTS

LIST OF FIGURES

wide fluctuations in the price of copra and oil and spread of small producers over a wide area were the bottlenecks affecting marketing efficiency.

Radhakrishna (1969) employed a discriminant function analysis to identify efficient farmers across size groups using data from the "Studies in the Economics of Farm Management" in Andhra Pradesh. The study revealed that efficient farmers were well distributed over all the size groups while inefficient farmers were concentrated in the lower classes, especially the marginal, small and medium groups. The study conclusively proved that efficiency could not be measured by the size of holding alone.

On the owner-cultivated holdings, the degree of misallocation of resources declined as the size of the holding increased. This was what normally expected. Larger farms were more market-oriented simply because they have to depend much on the market by way of purchase of inputs as well as sale of farm output (s). However, in the case of tenant-cultivated holdings, the degree of misallocation increased as the size of holding increased (Soni, 1970).

The study of Desai and Naik (1971) conclusively proved that the extent of participation in the high yielding variety (HYV) programme tended to increase with the enlargement of the size of the holding. One of the reasons for the non-adoption of HYVs by a large proportion of relatively small farmers could be their inability to meet higher cash outlays on cultivation of HYVs from their owned resources. They were also not able to obtain institutional credit, especially co-operative credit, because of a large number of them were not enrolled as members of credit co-operatives.

The traditional inverse relationship between farm size on the one hand, and the use of inputs and per acre productivity on the other, gave way to a new and direct relationship between the two, technological changes encouraging the bigger farmers to use costly inputs more and more while the use of such inputs

on the part of the smaller ones due to severe limitation of their investable surplus (Bagchi and Saini, 1976).

It is recognised that with the adoption of improved farm technology, there was a general tendency among the farmers to increase the size of their holdings. In fact, an ideal land tenure is the one, which contributes towards the establishment and maintenance of a rational farm size in relation to other physical and technical resources (Singh and Kahlon, 1976).

Suryaprakash *et al.* (1979) in a comparative study of price spread of agricultural commodities in Karnataka reported that the price spread of coconut was from 5.23 to 21.73 per cent and for copra it was 5.86 per cent of traders sale price in Tiptur and Arsikere markets in Karnataka. The four marketing channels identified for coconut were (1) Producer – Commission Agent – Trader, (2) Producer – Village Merchant – Commission Agent – Trader, (3) Producer – Village Merchant – Trader, (4) Producer – Trader. They concluded that profit margin as well as profit as a percentage of purchase price of intermediaries was maximum for the village merchants.

Bal (1982) concluded from his Punjab study that major part of the farm inequality was due to the farm size. He emphatically concluded that speedy implementation of land reforms was not likely to affect aggregate agricultural production adversely as productivity and farm size was negatively related.

Sirkar and Heady (1983) analysed the relationship between farm size and productivity in Birbhum district, West Bengal. After collecting random sample of 76 farms spread over 11 villages relating to the 1975-76 crop season, they examined the inter-farm as well as intra-farm input-output relationship and optimality of farm resource allocation. Cobb Douglas production function was estimated for the observed data and it was found net farm size and distribution of holdings had a significant bearing on farm productivity.

per hectare was Rs. 20,088.. Input wise cost of cultivation per hectare of ginger showed that human labour was the largest single item of expenditure accounting for 45.60 per cent of total cost. Operation wise cost of cultivation of ginger per hectare showed that seed and sowing constituted the largest item accounting for 34.46 per cent of total cost followed by fertilizers, manures and manuring, preparatory cultivation, harvesting, weeding and earthing up and mulching. The most important marketing channel was found to be Producer – Village Merchant. Commission Agent – Wholesaler – Retailer / Secondary Wholesaler – Consumer. In the case of dry ginger, producer's share formed 62 per cent of the retail price. The corresponding share in the green ginger trade was 37 per cent. The combined net margin of the intermediaries was 19.60 per cent of the consumer rupee in dry ginger trade while it was 23.30 per cent in green ginger. The study suggested the formation of co-operative societies to arrest price fluctuations.

Haridoss and Chandran (1996) studied the coconut marketing systems in Tamil Nadu and found that the major marketing channel was wholesaler/ mandiholder to local markets and oil miller. The producers' share in consumer price was as high as 80.93 per cent, with a low price spread of 19.07 per cent. The low margin to intermediaries, in turn, resulted in high marketing efficiency as is evidenced by the high Shepherd's index of 4.24.

Singh *et al.* (1996) evaluated the potato marketing systems in Amritsar, Jalandhar and Faridkot districts of Punjab. The study revealed that there was a cyclical pattern in the market arrivals of potato that left the market structure incapable of handling the peak glut in the goods, leading to unremunerative prices to the growers. The study also illustrated that there was an inverse relationship between prices and market arrivals. The disposal pattern of marketable surplus showed that a major portion was sold in the local regulated markets. Only a small fraction was either sold to the itinerant traders on the farm, or direct sale to the consumers. The producers share in consumer rupee was 83.76 per cent when sale

was carried on the farm. It dropped to 37.81 per cent when sold in the local market.

Sheena (1997) studied the economics of production and marketing of tuber crops in Palakkad district and concluded that cost A_1, A_2, B_1, C_1 and C_2 per hectare were Rs. 10101.74, Rs. 13016.86, Rs. 10101.74, Rs. 17593.80, Rs. 10743.99 and Rs. 18236.03 respectively for coleus, while it was Rs. 8124.94, Rs. 8124.94, Rs. 13304.05, Rs. 8852.50 and Rs. 14031.61 respectively for tapioca. The above costs for sweet potato were Rs. 6733.13, Rs. 6733.13, Rs. 6733.13 and Rs. 9079.94, Rs. 7311.04 and Rs. 9654.84 respectively. The benefit-cost ratios for the crops coleus, sweet potato and tapioca at cost C_3 level were 1.25, 1.21 and 1.85 respectively. The net income was Rs.4648.67, Rs. 2076.20 and Rs. 11863.95 respectively for the crops tapioca, sweet potato and coleus. More than 95 per cent of the produce was sold to wholesalers through commission agents. The producer's share was only 34.53 per cent and 31.76 per cent of the consumer's rupee for coleus and sweet potato respectively. The index of marketing efficiency was 0.53 for coleus and 0.47 for sweet potato. In the case of tapioca the tubers were sold by farmers after processing to the local traders who performed the role of commission agents and from them produce was taken by mill owners of Salem and Dindigal. Since there is a produce diversification, the marketing of tapioca tubers was studied only up to the intermediary level.

The costs and returns of banana production and marketing in Gorakhpur district of U. P. were estimated by Singh *et al.* (1997). There was great variation in the marketing cost which primarily depended on the distance, mode of transportation and other charges to be paid in the mandi. The study also revealed that the producers through pre-harvest contractors sold major part of the produce. As much as 77 per cent of the produce was sold in this way. The village traders played a significant role in the marketing of banana. The results of the study indicated that banana cultivation in the study area would prove more profitable if

the farmers start selling their produce by forming some organisation on voluntary basis to realise the benefits of large scale business.

The vegetable marketing systems in the hill region of Uttar Pradesh were studied by Arora and Saxena (1999). The study pointed out that despite the Agricultural Produce Market Act, 1964, the markets functioned inefficiently on account of many lacunae. The market committees were devoid of elected representatives on one pretext or the other. Open auction was not at all carried out in the primary markets and in the secondary markets, it was carried out for a selected few vegetables. A large numbers of market functionaries were found to operate in the regulated markets without renewing the licence. The storage infrastructures were virtually non-existent, and in the absence of scientific grades, farmers and traders continued to grade vegetables based on conventional methods. The study also revealed that the produces of tomato, cabbage, cauliflower and cucumber received less than 50 per cent of price paid by consumer, the range being 37.26 per cent for tomato to 49.16 per cent for cauliflower. Producer's share exceeded 50 per cent for carrot (51.96 per cent), ginger (59.14 per cent), potato (59.90 per cent), radish (65.77 per cent), onion (67.10 per cent). The producer's share for green peas ranged from 80.52 per cent to 93.47 per cent, depending upon the marketing channel.

The economics of commercial production of anthurium in Karnataka state was worked out by Gajanana and Subrahmanyam (1999). It was found that commercial production of anthurium was financially feasible with a net return of Rs. 5.65 / stem for small growers and Rs. 6.54 / stem for large growers. Non-availability of required quantity and quality of planting materials, followed by high cost of seedlings and the high incidence of pests and diseases were the major production constraints experienced in the study area. Producer – Local Buyer – Florist – Consumer, and Producer – Florist – Consumer were the two predominant market channels. The major items of marketing costs were incurred

in packing and transportation of flowers from the production centre at Coorg to Bangalore, which was the nearest market centre.

The marketing channels of orchid and anthurium in Kerala were studied by Karn (1999). He identified that the most important marketing channel in Kerala for orchid and anthurium was Producer - Local Florist - Consumers, which accounted for 56.4 per cent of total production. The most important marketing problem faced by the small sized units was that of irregular markets.

Korikanthimath *et al.* (1999) in their study on the feasibility of vanilla cultivation with coconut indicated that cost of establishment of vanilla including the maintenance cost during gestation period was Rs. 1,62,129 per hectare. The cost of cultivation of vanilla and coconut during bearing period worked out to Rs. 30,480 per hectare and Rs. 9793. 50 per hectare per year respectively. The average gross return of 94218.50 per hectare and net returns of Rs. 36,247.25 per hectare were observed. The financial feasibility measures namely NPW (Rs.61835.12) and BCR (1.34) indicated the viability of mixed cropping of vanilla in the coconut gardens in lower elevations and low rainfall areas under assured irrigation.

The farm size-marketed surplus relationship and the determinants of marketed surplus were studied by Kumar (1999) through a field survey of 400 households in Kaithal and Sirsa districts in Haryana, covering rice, bajra, cotton, wheat, oilseeds, gram and other pulses. It was observed that while farm size and marketed surplus were directly related, family size and marketed surplus were inversely related. Among the factors affecting the marketed surplus, value of marketed surplus, household size, net operated area and the area under tenancy tuned out to be significant. The percentage of marketed surplus was higher in the case of cash crops like cotton, oilseeds and paddy as compared to food crops like wheat, pulses, and coarse cereals.

aggregate level were Rs. 223818.00, Rs. 170802.00 and Rs. 89124.90 for *Nendran, Poovan* and *Palayamkodan* respectively. The cost of production of one quintal of *Nendran, Poovan* and *Palayamkodan* were Rs. 937.48, Rs. 1045.22 and Rs. 418.00 respectively at cost C_2. The benefit-cost ratios for *Nendran, Poovan* and *Palayamkodan* were 1.20, 1.37 and 1.16 respectively at cost C_2. The most important marketing channel was Producer – Kerala Horticultural Development Programme (KHDP) Market – Retailer – Consumer. The producer's share in this channel was 70 per cent of *Nendran* and *Poovan* and 55 per cent for *Palayamkodan*. Indices of marketing efficiency for these varieties were found to be 2.37, 2.33 and 1.23 respectively.

An economic analysis of production and marketing of mushrooms in Thiruvananthapuram district was conducted by Raja (2000). The study revealed that material inputs accounted for about 82.85 per cent of the total working capital requirement for mushroom cultivation. Of the total working capital requirement of Rs. 3738.51 (17.15 per cent) accounted for hired labour component. Explicit costs accounted for 45.77 per cent of the total cost. Implicit cost accounted for 54.23 per cent of the total cost. Costs A_1, B_1, C_1 and C_3 per crop cycle for the sample as a whole was Rs. 4144.95, Rs. 4522.91, Rs. 7425.30 and Rs. 8167.83 respectively. The total working capital requirement for producing one kilogram of spawn was Rs. 12.83. Gross income from mushroom and spawn production was Rs.12118.6 and Rs. 40.00 per kilogram respectively. Benefit-cost ratios for mushroom and spawn production were 1.48 and 2.23 respectively. The major marketing channel was Producer – Consumer. The Producers – Retailer – Consumer was the second one in which the producers share was 75 per cent. The unawareness of consumers about the nutritive value, improper marketing facilities and perishability of mushroom were the major marketing problems faced by the growers.

Narayanan (2001) studied marketing of coconut in central region of Kerala. The major marketing channel was identified as Producer – Copra Maker – Oil Miller - Wholesaler - Retailer – Consumer. The share of producer in

consumer's rupee was 60.58 per cent. Price spread was estimated to be 39.42 per cent of consumer's rupee.

2. 2. Studies relating to production and marketing - medicinal and aromatic plants

With respect to the maturity of vetiver roots at harvest time, Murti and Moosad (1949) found that oil content increased progressively upto 21 months (yield 0.87 per cent). At 10 months it was 0.1 per cent, at 15 months 0.50 per cent and at 17 months 0.79 per cent. The study also found that period of maturity of 15-18 months for the roots as the optimum. A reduction of oil percentage to 0.25 and 0.20 for 24 and 23 months old roots was also noticed in their experiment. It was concluded that harvesting of vetiver roots before a minimum maturity of 15 months as well as after 21 months was uneconomical.

The quality of vetiver varied from to locality to locality even in the same district with similar agro-climatic conditions. The roots extracted from the area that had lesser clay content and lesser water-logged condition produced better quality oil. It had further been noticed that with decrease in clay content in the soil there was a marked improvement in the oil yield but an appreciable fall in quality of oil (Singh and Sankhala, 1957).

Chandra *et al.* (1966) found the yield of vetiver as between 2.7 and 3.7 tonnes per hectare which in turn depended on a number of factors like amount of rainfall in the preceding mansoon, the off-season rainfall during winter, the moisture retaining capacity of the soil and the age of the crop.

Virmani and Dutta (1975) suggested that the best time for harvest of vetiver is 18 months after planting so that it would give the maximum percentage of essential oil. It is also found that delayed harvesting i.e., after 18 months, was

totally uneconomical both for yield and quality. According to them the root yield and oil content was maximum between 15-18 months after planting for vetiver.

Multilocational trials conducted at six centres with 11 hybrids of vetiver by Sethi *et al.* (1978) showed that there was variation in oil content in all the centres with the change in soil condition.

Trials with 12 hybrid clones of vetiver were carried out at Aromatic and Medicinal Plants Research Station, Odakkali to identify a high yielding variety with regard to root and oil yield suitable to Kerala condition and the results indicated that the hybrid clone ODV-13 (a North Indian hybrid) was superior to all other vetiver with regard to the root yield (Nair *et al.*, 1983). The study also revealed that ODV-13 was superior to all other hybrid clones used for the trial with regard to oil yield, oil recovery and quality of oil. It gave 30 per cent more oil over the local variety *Nilambur.*

Pilot scale cultivation of vetiver taken up at four types of problem soils viz., water logged soil, alkali soil with pH 9 and pH 10 and sandy soils at the Research Farm CIMAP, Lucknow during 1982-85 showed that vetiver could be very well grown in these soils. The crop produced 4.56 tonnes per hectare of root and 27.3 kg of oil per hectare, in water logged soil, which was on par to the yield obtained from normal soil (Morris, 1984). Alkali soils with pH 9 and 10 gave 2.72 and 1.99 tonnes per hectare root yield and 16.3 and 11.3 kg of oil. The lowest root yield and oil yield were from sandy soil (1.48 tonnes per hectare 8.9 kg per hectare, respectively) (Singh *et al.*, 1978).

Punia *et al.* (1989) based on the multilocational trial to study the performance of hybrids, found that from among the nine hybrids of vetiver used for the trial, hybrid-4 showed the highest root yield followed by hybrid-2 and hybrid-26. The overall performance varied from 1.67 tonnes per hectare at Delhi

and 1.51 tonnes per hectare at Kanpur to 0.84 tonnes per hectare at Indore indicting variability in root yield at different locations.

Subha (1990) in her study on effect of spacing and planting material on the growth, yield and active ingredient in *Plumbago rosea*, worked out the economics of cultivation of Plumbago rosea for one hectare under experimental conditions. It was found that the cost of cultivation was Rs. 23,646, yield of dry roots was 2.56 tonnes and total income generated was Rs. 38,400. Net income was found to be Rs. 14,754 and BCR 1: 1.62 at cost A_1 level.

A study by Radhakrishnan (1991) indicated that warm and damp climate along with adequate water were the two main requirements for the successful growth of vetiver. He also reported that in the coastal areas of Kerala, vetiver is usually harvested after one year and the root is marketed as such without the extraction of oil. This was in contrast to commercial cultivation of vetiver in North India, where the harvested roots are utilised for the extraction of vetiver oil. The distillation of vetiver root is beset with considerable difficulties due to the viscid nature the oil, low volatility and high boiling point constituents. The separation of oil is also troublesome owing to its specific gravity, which almost approximates to that of water. The economic worth of the crop is dependant on high root production and high essential oil content.

Latha (1994) in her study on evaluation of kacholam (*Kaempferia galanga* L.) types for morphological variability and yield showed that fresh rhizome yield per hectare varied from 9.11 tonnes to 13.99 tonnes and the dry rhizome yield varied from 2.44 tonnes to 3.68 tonnes under open conditions. Under shaded conditions, the yield varied from 5.82 tonnes to 9.6 tonnes per hectare and dry rhizome yielded 1.9 tonnes per hectare to 3.31 tonnes per hectare.

The production of medicinal and aromatic plants in Asia is still widely unorganized as compared to production in the west, which is dominated by

specialised herbal horticulturists who are financially strong and with well-developed inter linkages with the industrial users and research institutes. The South East Asian producers, on the other hand, are based on small family based units, spread over large areas who thrive on individual incentives and marketing skills and lower overheads (Henle, 1995).

A major bottleneck in the cultivation of medicinal and aromatic plants is that their cultivation is localised in ecological niches where no marketing facilities exist. The demand is often inconsistent and hence any large scale cultivation often brings down the prices. Large scale fluctuations in demand and supply act as a damper to research and development efforts, especially those aiming at efficient cropping systems based on medicinal and aromatic plants in the South East Asian region (Paroda, 1995).

Mayadevi (1996) studied the economics of production and marketing of kacholam and koduveli in Thrissur district based on a sample of 120 farmers. It was found that the cost incurred for kacholam cultivation was Rs. 75609.30 and for koduveli cultivation it was Rs. 56550.59 on per hectare basis. The benefit cost ratios for kacholam and koduveli on cost C_2 were 1.71 and 2.40 respectively. Among the marketing channels for the two crops, the Producer – Dealer - Manufacturer was the major one. Non - availability of good planting materials, high post - harvest losses and unorganized trade were the main constraints encountered in the cultivation of the two crops.

A field experiment was carried out during the period from 1994 – 96 at CIMAP field station, Hyderabad with the objective of evaluating the productivity and profitability of some agricultural crops followed by an aromatic crop with that of continuous cropping of aromatic crops under semi-arid tropical climatic conditions. The results revealed that continuous cropping of rose scented geranium intercropped with cluster bean and green-gram was the most productive

and profitable (Rs. 149330 and Rs. 147230 gross returns / ha in the first and second years, respectively) compared to all other treatments (Rao *et al.*, 1998).

A study conducted by Birendrakumar *et al.* (1999) on the area and production versus market trend of the crop menthol mint identified tarai and central part of Uttar Pradesh as predominating areas for menthol mint where it is being cultivated by 60-70 per cent farmers contributing about 72 per cent of the total world production of menthol mint oil. During 1996 – 97 India exported nearly 8000 tonnes of menthol mint oil, becoming leading producer and exporter in the world. The study indicated that the major problem faced by mint growers is the fluctuation in oil price, which directly affects the area of cultivation.

India has potential to cultivate on a large scale the following essential oil yielding crops: menthol mint, carvone mint, citronella, lemongrass, patchouli, vetiver, rose, eucalyptus and sandalwood. To compete with the major exporters of the above essential oils, viz., China, Brazil, Indonesia, Turkey, Bulgaria – the cost of cultivation and processing must come down, and high quality of the produce must be ensured (Harlalka, 1999)

An evaluation of the current status of production and trade of major essential oils was made by Singh *et al.* (1999). They identified that the present pattern of production and trade of essential oils and aroma chemicals is characterized by the factors such as fluctuations in demand and prices, competitiveness and in supplies with progressive increase in the number of producers.

MATERIALS AND METHODS

CHAPTER III

MATERIALS AND METHODS

3.1 AREA OF STUDY

Knowledge on agro-climatic conditions and socio-economic background of the study area is of paramount importance to analyse the data appropriately and draw meaningful conclusions. Hence, the present chapter describes the agro-climatic; and socio-economic backdrop necessary for the study entitled "Production and Marketing Systems of Vetiver: A Micro Level Analysis in Thrissur District" in Kerala. Thrissur has a major vetiver-growing tract. Chavakkad taluk in Thrissur district is the major vetiver growing area. Other districts, where vetiver is cultivated on a significant scale are Wayanad and Idukki.

3.1.1 Location

Thrissur district is located at the centre of the state of Kerala, between north latitude 10 ° and 10 ° 4' and east longitude 75 ° 57 ' and 76 ° 54'. Malappuram district bound the district on the north. Palakkad district forms the eastern boundary of Thrissur district. Ernakulam and Idukki districts form the southern boundary and Arabian Sea forms the western boundary. The map of the Thrissur district is given in Figure 3.1

The district has a geographical area of 299390.0 hectares, which forms 7.8 per cent of the total area of the state. Thrissur district consists of five taluks viz., Kodungallur, Chavakkad, Thalappily, Mukundapuram and Thrissur. There are seven municipalities, 17 community development blocks spread over 98 panchayats, 251 revenue villages and 1074 wards in the district.

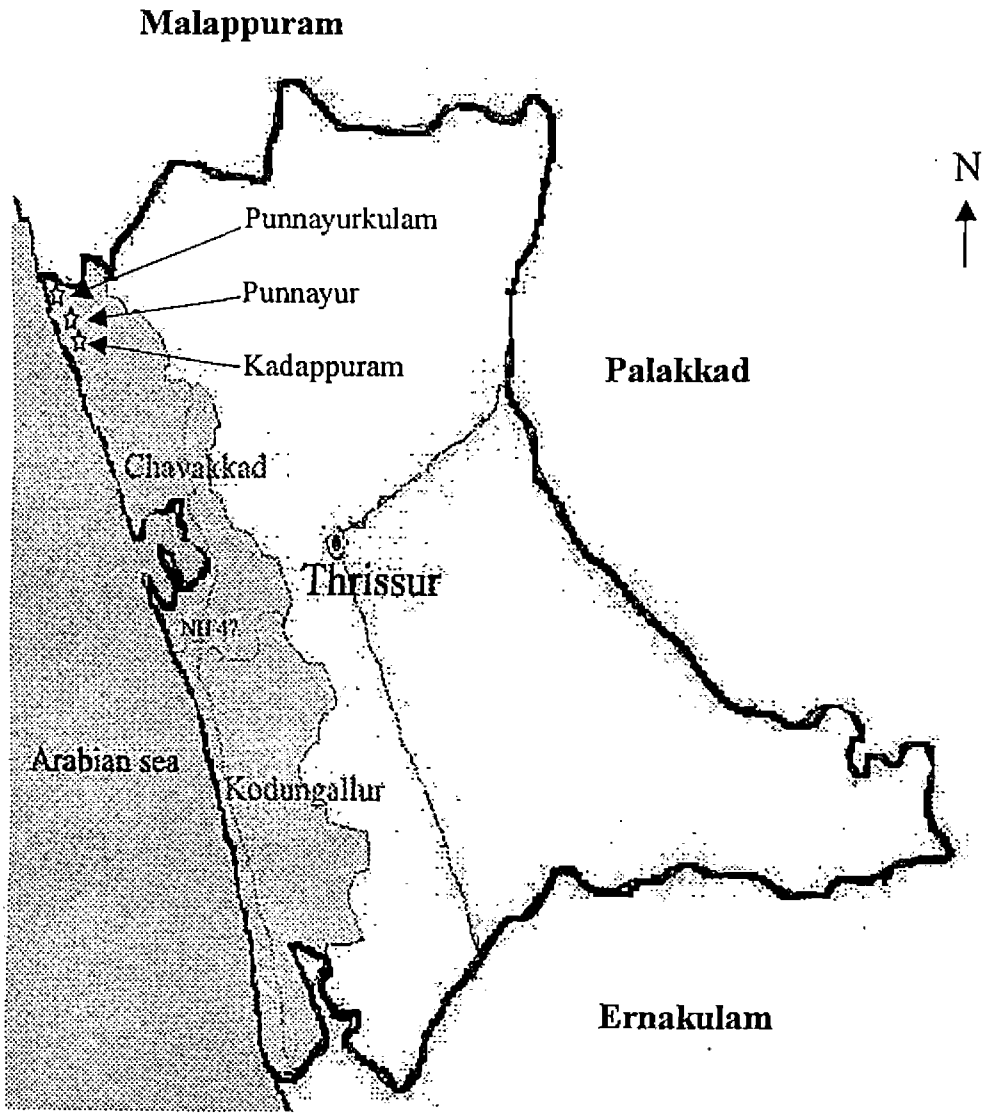

Figure 3.1 Map of Thrissur district showing the study area

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PLATES

INTRODUCTION

CHAPTER I

INTRODUCTION

From time immemorial, mankind all over the world depended upon the plant kingdom to meet their needs of medicines, fragrances and flavour. India, being endowed with varying soil and climatic conditions, is suitable for the growth of a large number of aromatic plant species. Aromatic plants and their products (essential oils) have a rapidly expanding market segment, especially in the wake of the current resurgence in the use of plant-based flavouring agents and fragrants as against synthetics.

1.1 Current status of production and trade

The international situation in the production and trade of essential oils is very complex and volatile. The developing countries have a dominant position in the world production of essential oils, accounting for 55 per cent of the world production and 60 per cent of the earnings. India's position in the production and trade of essential oils is significant (Table 1.1). She accounts for nearly 16 per cent of total world production of essential oils and 22 per cent of trade earnings.

The diverse agro-climates in India enable her to produce a wide array of aromatic plants. Their cultivation is localised in ecological niches. The commonly cultivated aromatic and medicinal plants in India are menthol mint, pepper mint, spear mint, basil, citronella java, lemon grass, palmorosa, geranium, tagetes, vetiver, lavender and damask rose.

Vetiver (*Vetiveria zizanioides* (L) Nash), popularly known as *khus*, is an aromatic, densely tufted perennial grass with branching rootstock. The

Table 1.1. Country wise production of essential oils (in volume and value)

Sl. No.	Country	Production (in tonnes)	Value (in million US $)
1	Australia	400 (0.39)	12 (1.36)
2	Argentina	1600 (1.55)	28 (3.16)
3	Brazil	42000 (40.78)	70 (7.91)
4	China	8000 (7.77)	65 (7.34)
5	France	1300 (1.26)	46 (5.20)
6	Haiti	200 (0.19)	6 (0.68)
7	India	16000 (15.53)	195 (22.03)
8	Israel	1500 (1.46)	22 (2.49)
9	Italy	1000 (0.97)	20 (2.26)
10	Madagascar	2000 (1.94)	23 (2.60)
11	Mexico	800 (0.78)	16 (1.81)
12	Paraguay	500 (0.49)	12 (1.36)
13	Spain	900 (0.87)	25 (2.82)
14	Sri Lanka	300 (0.29)	15 (1.69)
15	USA	21500 (20.87)	240 (27.12)
16	Others	5000 (4.86)	90 (10.17)
	Total	103000 (100.00)	**885** (**100**.00)

Figures in parentheses indicate percentage to the respective totals

Source: Singh *et al.*, 2000

commercially important part of the plant is its roots, which yields the fragrant vetiver or khus oil. The roots are used for making mats, fans, baskets, curtains, pillows etc. It also forms a major constituent in many ayurvedic formulations. They are also kept in wardrobes for perfuming clothes and as an insect repellent. The vetiver oil is in considerable demand, and is mainly used as a fixative in perfumery for blending in cosmetics and soap industry. It blends well with sandalwood, patchouli and rose oils. Two types of vetiver are commercially cultivated in India. The cultivated peninsular crop is based on *cv. Nilambore*, a selection from south Indian genotype, yielding 14 kg oil per hectare. However, the North Indian genotype represented by Bharatpur genepool is more fragrant (Gupta, 2000).

Mediculture i.e., the cultivation of medicinal and aromatic plants, in the west is organized in the corporate sector or by contract farming by the pharmaceutical or industrial sectors. These enterprises have no comparison with non-organized, family-based, smallscale production in the Asian countries (Henle, 1995). Against the high-tech production units in the west, the production units in Asia are indigenous and traditional. In spite of the wide use of vetiver and its products, very little information is available on the financial feasibility of growing vetiver, and its marketing system in the humid tropics of peninsular India.

1.2. Objectives of the study

With this background, the present study entitled, "Production and Marketing Systems of Vetiver: A micro-level analysis in Thrissur district" is undertaken with the following specific objectives:

1. To work out the cost of production and returns of vetiver cultivation.
2. To study the marketing channels, and

wide fluctuations in the price of copra and oil and spread of small producers over a wide area were the bottlenecks affecting marketing efficiency.

Radhakrishna (1969) employed a discriminant function analysis to identify efficient farmers across size groups using data from the "Studies in the Economics of Farm Management" in Andhra Pradesh. The study revealed that efficient farmers were well distributed over all the size groups while inefficient farmers were concentrated in the lower classes, especially the marginal, small and medium groups. The study conclusively proved that efficiency could not be measured by the size of holding alone.

On the owner-cultivated holdings, the degree of misallocation of resources declined as the size of the holding increased. This was what normally expected. Larger farms were more market-oriented simply because they have to depend much on the market by way of purchase of inputs as well as sale of farm output (s). However, in the case of tenant-cultivated holdings, the degree of misallocation increased as the size of holding increased (Soni, 1970).

The study of Desai and Naik (1971) conclusively proved that the extent of participation in the high yielding variety (HYV) programme tended to increase with the enlargement of the size of the holding. One of the reasons for the non-adoption of HYVs by a large proportion of relatively small farmers could be their inability to meet higher cash outlays on cultivation of HYVs from their owned resources. They were also not able to obtain institutional credit, especially co-operative credit, because of a large number of them were not enrolled as members of credit co-operatives.

The traditional inverse relationship between farm size on the one hand, and the use of inputs and per acre productivity on the other, gave way to a new and direct relationship between the two, technological changes encouraging the bigger farmers to use costly inputs more and more while the use of such inputs

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2. To study the marketing channels, and

3. To identify the production and marketing problems encountered by vetiver growers of the area.

1.3 Limitations

The data was collected by survey method by interviewing sample farmers. Hence, the objectivity of the data is limited to the extent the respondents were able to recollect from without recall bias as most farmers, except a few, did not maintain any farm records. Secondly, generalisations have to be drawn carefully and selectively to such areas where similar agro-climatic and socio-economic conditions prevail.

1.4 Organization of the thesis

Besides the introductory chapter, the study is organised into six chapters. Chapter two is a review of literature relevant to the study. Chapter three describes the profile of the study area, the methodological framework, analytical tools, and conceptual issues. The results of the study are presented in chapter four. The discussion of the findings is attempted in chapter five. The sixth chapter summarises the main findings and conclusions drawn from the analysis, along with the policy implications.

REVIEW OF LITERATURE

CHAPTER II

REVIEW OF LITERATURE

This chapter presents a comprehensive review of past studies relevant to the present study. An attempt has been made to throw light on the present status, strengths and weakness of the existing studies on the topic, from the point of view of methodology as well as relevance. The review of literature is categorized into three sections.

1. Studies relating to production and marketing - general
2. Studies relating to production and marketing - medicinal and aromatic plants

2. 1 Studies relating to production and marketing - general

Marketing plays both allocative and distribution roles. The conduct and performance of agricultural produce markets depend on the structure, which varies from commodity to commodity. Not withstanding the direct intervention by the government, the markets for agricultural products in India have remained in the private sector, accounting for 80 per cent of the marketed surplus of agricultural products in India (Acharya, 1998).

Khusro (1964) subjected the farm management data to statistical analysis and confirmed the existence of an inverse relationship between farm size and productivity.

Kuttappan (1969) examined the working of coconut processing and marketing co-operatives in Kerala. The study revealed that inadequate working capital, lack of co-ordination among different types of societies, poor organisation,

on the part of the smaller ones due to severe limitation of their investable surplus (Bagchi and Saini, 1976).

It is recognised that with the adoption of improved farm technology, there was a general tendency among the farmers to increase the size of their holdings. In fact, an ideal land tenure is the one, which contributes towards the establishment and maintenance of a rational farm size in relation to other physical and technical resources (Singh and Kahlon, 1976).

Suryaprakash *et al.* (1979) in a comparative study of price spread of agricultural commodities in Karnataka reported that the price spread of coconut was from 5.23 to 21.73 per cent and for copra it was 5.86 per cent of traders sale price in Tiptur and Arsikere markets in Karnataka. The four marketing channels identified for coconut were (1) Producer – Commission Agent – Trader, (2) Producer – Village Merchant – Commission Agent – Trader, (3) Producer – Village Merchant – Trader, (4) Producer – Trader. They concluded that profit margin as well as profit as a percentage of purchase price of intermediaries was maximum for the village merchants.

Bal (1982) concluded from his Punjab study that major part of the farm inequality was due to the farm size. He emphatically concluded that speedy implementation of land reforms was not likely to affect aggregate agricultural production adversely as productivity and farm size was negatively related.

Sirkar and Heady (1983) analysed the relationship between farm size and productivity in Birbhum district, West Bengal. After collecting random sample of 76 farms spread over 11 villages relating to the 1975-76 crop season, they examined the inter-farm as well as intra-farm input-output relationship and optimality of farm resource allocation. Cobb Douglas production function was estimated for the observed data and it was found net farm size and distribution of holdings had a significant bearing on farm productivity.

Kumar and Mruthyunjaya (1989) reported that there existed inter-crop difference in the response of price and non-price factors on marketed surplus even within the same group of crops. For instance, even though the effects of non-price factors were found to be significant for paddy and wheat, it was found to be quite higher for wheat among the cereals. Among the non-price factors, the effect of productivity on marketed surplus was quite high for wheat as compared to paddy.

The cost and return structure of jaggery production and marketing in East Godavari district of Andhra Pradesh was studied by Raju and Ramesh (1989). In jaggery marketing two channels were found to be important. The channel consisting of Farmers – Commission Agents at regulated market – Wholesalers – Retailers - Consumers was the predominant one, accounting for 87 per cent of the producer's share in consumer's rupee. The second major channel was consisting of Farmers – Village Merchants – Wholesalers at unregulated markets – Retailers – Consumers.

Reddy (1993) has recorded the following structural changes in the post-green revolution phase of Indian agriculture in the specific context of Andhra Pradesh. Firstly, the inverse relationship between farm size and land productivity could not be considered universal. It has weakened due to the advent of the new technology in many regions. The existing inverse relationship between farm size and productivity was mainly due to the higher labour intensity on small farms. Secondly, the use of family labour declined and that of hired labour increased with increase in farm size. Thirdly, the small farms were not able to convert their out put advantages into higher net profits due to their higher total expenditure.

Jayesh (1994) in his study on economics of production and marketing of ginger in Kerala with special reference to Idukki district reported that average cost of ginger was Rs. 13,783. per hectare and average cost of cultivation

per hectare was Rs. 20,088.. Input wise cost of cultivation per hectare of ginger showed that human labour was the largest single item of expenditure accounting for 45.60 per cent of total cost. Operation wise cost of cultivation of ginger per hectare showed that seed and sowing constituted the largest item accounting for 34.46 per cent of total cost followed by fertilizers, manures and manuring, preparatory cultivation, harvesting, weeding and earthing up and mulching. The most important marketing channel was found to be Producer – Village Merchant. Commission Agent – Wholesaler – Retailer / Secondary Wholesaler – Consumer. In the case of dry ginger, producer's share formed 62 per cent of the retail price. The corresponding share in the green ginger trade was 37 per cent. The combined net margin of the intermediaries was 19.60 per cent of the consumer rupee in dry ginger trade while it was 23.30 per cent in green ginger. The study suggested the formation of co-operative societies to arrest price fluctuations.

Haridoss and Chandran (1996) studied the coconut marketing systems in Tamil Nadu and found that the major marketing channel was wholesaler/ mandiholder to local markets and oil miller. The producers' share in consumer price was as high as 80.93 per cent, with a low price spread of 19.07 per cent. The low margin to intermediaries, in turn, resulted in high marketing efficiency as is evidenced by the high Shepherd's index of 4.24.

Singh *et al.* (1996) evaluated the potato marketing systems in Amritsar, Jalandhar and Faridkot districts of Punjab. The study revealed that there was a cyclical pattern in the market arrivals of potato that left the market structure incapable of handling the peak glut in the goods, leading to unremunerative prices to the growers. The study also illustrated that there was an inverse relationship between prices and market arrivals. The disposal pattern of marketable surplus showed that a major portion was sold in the local regulated markets. Only a small fraction was either sold to the itinerant traders on the farm, or direct sale to the consumers. The producers share in consumer rupee was 83.76 per cent when sale

was carried on the farm. It dropped to 37.81 per cent when sold in the local market.

Sheena (1997) studied the economics of production and marketing of tuber crops in Palakkad district and concluded that cost A_1, A_2, B_1, C_1 and C_2 per hectare were Rs. 10101.74, Rs. 13016.86, Rs. 10101.74, Rs. 17593.80, Rs. 10743.99 and Rs. 18236.03 respectively for coleus, while it was Rs. 8124.94, Rs. 8124.94, Rs. 13304.05, Rs. 8852.50 and Rs. 14031.61 respectively for tapioca. The above costs for sweet potato were Rs. 6733.13, Rs. 6733.13, Rs. 6733.13 and Rs. 9079.94, Rs. 7311.04 and Rs. 9654.84 respectively. The benefit-cost ratios for the crops coleus, sweet potato and tapioca at cost C_3 level were 1.25, 1.21 and 1.85 respectively. The net income was Rs.4648.67, Rs. 2076.20 and Rs. 11863.95 respectively for the crops tapioca, sweet potato and coleus. More than 95 per cent of the produce was sold to wholesalers through commission agents. The producer's share was only 34.53 per cent and 31.76 per cent of the consumer's rupee for coleus and sweet potato respectively. The index of marketing efficiency was 0.53 for coleus and 0.47 for sweet potato. In the case of tapioca the tubers were sold by farmers after processing to the local traders who performed the role of commission agents and from them produce was taken by mill owners of Salem and Dindigal. Since there is a produce diversification, the marketing of tapioca tubers was studied only up to the intermediary level.

The costs and returns of banana production and marketing in Gorakhpur district of U. P. were estimated by Singh *et al.* (1997). There was great variation in the marketing cost which primarily depended on the distance, mode of transportation and other charges to be paid in the mandi. The study also revealed that the producers through pre-harvest contractors sold major part of the produce. As much as 77 per cent of the produce was sold in this way. The village traders played a significant role in the marketing of banana. The results of the study indicated that banana cultivation in the study area would prove more profitable if

the farmers start selling their produce by forming some organisation on voluntary basis to realise the benefits of large scale business.

The vegetable marketing systems in the hill region of Uttar Pradesh were studied by Arora and Saxena (1999). The study pointed out that despite the Agricultural Produce Market Act, 1964, the markets functioned inefficiently on account of many lacunae. The market committees were devoid of elected representatives on one pretext or the other. Open auction was not at all carried out in the primary markets and in the secondary markets, it was carried out for a selected few vegetables. A large numbers of market functionaries were found to operate in the regulated markets without renewing the licence. The storage infrastructures were virtually non-existent, and in the absence of scientific grades, farmers and traders continued to grade vegetables based on conventional methods. The study also revealed that the produces of tomato, cabbage, cauliflower and cucumber received less than 50 per cent of price paid by consumer, the range being 37.26 per cent for tomato to 49.16 per cent for cauliflower. Producer's share exceeded 50 per cent for carrot (51.96 per cent), ginger (59.14 per cent), potato (59.90 per cent), radish (65.77 per cent), onion (67.10 per cent). The producer's share for green peas ranged from 80.52 per cent to 93.47 per cent, depending upon the marketing channel.

The economics of commercial production of anthurium in Karnataka state was worked out by Gajanana and Subrahmanyam (1999). It was found that commercial production of anthurium was financially feasible with a net return of Rs. 5.65 / stem for small growers and Rs. 6.54 / stem for large growers. Non-availability of required quantity and quality of planting materials, followed by high cost of seedlings and the high incidence of pests and diseases were the major production constraints experienced in the study area. Producer – Local Buyer – Florist – Consumer, and Producer – Florist – Consumer were the two predominant market channels. The major items of marketing costs were incurred

in packing and transportation of flowers from the production centre at Coorg to Bangalore, which was the nearest market centre.

The marketing channels of orchid and anthurium in Kerala were studied by Karn (1999). He identified that the most important marketing channel in Kerala for orchid and anthurium was Producer - Local Florist - Consumers, which accounted for 56.4 per cent of total production. The most important marketing problem faced by the small sized units was that of irregular markets.

Korikanthimath *et al.* (1999) in their study on the feasibility of vanilla cultivation with coconut indicated that cost of establishment of vanilla including the maintenance cost during gestation period was Rs. 1,62,129 per hectare. The cost of cultivation of vanilla and coconut during bearing period worked out to Rs. 30,480 per hectare and Rs. 9793. 50 per hectare per year respectively. The average gross return of 94218.50 per hectare and net returns of Rs. 36,247.25 per hectare were observed. The financial feasibility measures namely NPW (Rs.61835.12) and BCR (1.34) indicated the viability of mixed cropping of vanilla in the coconut gardens in lower elevations and low rainfall areas under assured irrigation.

The farm size-marketed surplus relationship and the determinants of marketed surplus were studied by Kumar (1999) through a field survey of 400 households in Kaithal and Sirsa districts in Haryana, covering rice, bajra, cotton, wheat, oilseeds, gram and other pulses. It was observed that while farm size and marketed surplus were directly related, family size and marketed surplus were inversely related. Among the factors affecting the marketed surplus, value of marketed surplus, household size, net operated area and the area under tenancy tuned out to be significant. The percentage of marketed surplus was higher in the case of cash crops like cotton, oilseeds and paddy as compared to food crops like wheat, pulses, and coarse cereals.

aggregate level were Rs. 223818.00, Rs. 170802.00 and Rs. 89124.90 for *Nendran, Poovan* and *Palayamkodan* respectively. The cost of production of one quintal of *Nendran, Poovan* and *Palayamkodan* were Rs. 937.48, Rs. 1045.22 and Rs. 418.00 respectively at cost C_2. The benefit-cost ratios for *Nendran, Poovan* and *Palayamkodan* were 1.20, 1.37 and 1.16 respectively at cost C_2. The most important marketing channel was Producer – Kerala Horticultural Development Programme (KHDP) Market – Retailer – Consumer. The producer's share in this channel was 70 per cent of *Nendran* and *Poovan* and 55 per cent for *Palayamkodan*. Indices of marketing efficiency for these varieties were found to be 2.37, 2.33 and 1.23 respectively.

An economic analysis of production and marketing of mushrooms in Thiruvananthapuram district was conducted by Raja (2000). The study revealed that material inputs accounted for about 82.85 per cent of the total working capital requirement for mushroom cultivation. Of the total working capital requirement of Rs. 3738.51 (17.15 per cent) accounted for hired labour component. Explicit costs accounted for 45.77 per cent of the total cost. Implicit cost accounted for 54.23 per cent of the total cost. Costs A_1, B_1, C_1 and C_3 per crop cycle for the sample as a whole was Rs. 4144.95, Rs. 4522.91, Rs. 7425.30 and Rs. 8167.83 respectively. The total working capital requirement for producing one kilogram of spawn was Rs. 12.83. Gross income from mushroom and spawn production was Rs.12118.6 and Rs. 40.00 per kilogram respectively. Benefit-cost ratios for mushroom and spawn production were 1.48 and 2.23 respectively. The major marketing channel was Producer – Consumer. The Producers – Retailer – Consumer was the second one in which the producers share was 75 per cent. The unawareness of consumers about the nutritive value, improper marketing facilities and perishability of mushroom were the major marketing problems faced by the growers.

Narayanan (2001) studied marketing of coconut in central region of Kerala. The major marketing channel was identified as Producer – Copra Maker – Oil Miller - Wholesaler - Retailer – Consumer. The share of producer in

consumer's rupee was 60.58 per cent. Price spread was estimated to be 39.42 per cent of consumer's rupee.

2. 2. Studies relating to production and marketing - medicinal and aromatic plants

With respect to the maturity of vetiver roots at harvest time, Murti and Moosad (1949) found that oil content increased progressively upto 21 months (yield 0.87 per cent). At 10 months it was 0.1 per cent, at 15 months 0.50 per cent and at 17 months 0.79 per cent. The study also found that period of maturity of 15-18 months for the roots as the optimum. A reduction of oil percentage to 0.25 and 0.20 for 24 and 23 months old roots was also noticed in their experiment. It was concluded that harvesting of vetiver roots before a minimum maturity of 15 months as well as after 21 months was uneconomical.

The quality of vetiver varied from to locality to locality even in the same district with similar agro-climatic conditions. The roots extracted from the area that had lesser clay content and lesser water-logged condition produced better quality oil. It had further been noticed that with decrease in clay content in the soil there was a marked improvement in the oil yield but an appreciable fall in quality of oil (Singh and Sankhala, 1957).

Chandra *et al.* (1966) found the yield of vetiver as between 2.7 and 3.7 tonnes per hectare which in turn depended on a number of factors like amount of rainfall in the preceding mansoon, the off-season rainfall during winter, the moisture retaining capacity of the soil and the age of the crop.

Virmani and Dutta (1975) suggested that the best time for harvest of vetiver is 18 months after planting so that it would give the maximum percentage of essential oil. It is also found that delayed harvesting i.e., after 18 months, was

totally uneconomical both for yield and quality. According to them the root yield and oil content was maximum between 15-18 months after planting for vetiver.

Multilocational trials conducted at six centres with 11 hybrids of vetiver by Sethi *et al.* (1978) showed that there was variation in oil content in all the centres with the change in soil condition.

Trials with 12 hybrid clones of vetiver were carried out at Aromatic and Medicinal Plants Research Station, Odakkali to identify a high yielding variety with regard to root and oil yield suitable to Kerala condition and the results indicated that the hybrid clone ODV-13 (a North Indian hybrid) was superior to all other vetiver with regard to the root yield (Nair *et al.*, 1983). The study also revealed that ODV-13 was superior to all other hybrid clones used for the trial with regard to oil yield, oil recovery and quality of oil. It gave 30 per cent more oil over the local variety *Nilambur*.

Pilot scale cultivation of vetiver taken up at four types of problem soils viz., water logged soil, alkali soil with pH 9 and pH 10 and sandy soils at the Research Farm CIMAP, Lucknow during 1982-85 showed that vetiver could be very well grown in these soils. The crop produced 4.56 tonnes per hectare of root and 27.3 kg of oil per hectare, in water logged soil, which was on par to the yield obtained from normal soil (Morris, 1984). Alkali soils with pH 9 and 10 gave 2.72 and 1.99 tonnes per hectare root yield and 16.3 and 11.3 kg of oil. The lowest root yield and oil yield were from sandy soil (1.48 tonnes per hectare 8.9 kg per hectare, respectively) (Singh *et al.*, 1978).

Punia *et al.* (1989) based on the multilocational trial to study the performance of hybrids, found that from among the nine hybrids of vetiver used for the trial, hybrid-4 showed the highest root yield followed by hybrid-2 and hybrid-26. The overall performance varied from 1.67 tonnes per hectare at Delhi

and 1.51 tonnes per hectare at Kanpur to 0.84 tonnes per hectare at Indore indicting variability in root yield at different locations.

Subha (1990) in her study on effect of spacing and planting material on the growth, yield and active ingredient in *Plumbago rosea*, worked out the economics of cultivation of Plumbago rosea for one hectare under experimental conditions. It was found that the cost of cultivation was Rs. 23,646, yield of dry roots was 2.56 tonnes and total income generated was Rs. 38,400. Net income was found to be Rs. 14,754 and BCR 1: 1.62 at cost A_1 level.

A study by Radhakrishnan (1991) indicated that warm and damp climate along with adequate water were the two main requirements for the successful growth of vetiver. He also reported that in the coastal areas of Kerala, vetiver is usually harvested after one year and the root is marketed as such without the extraction of oil. This was in contrast to commercial cultivation of vetiver in North India, where the harvested roots are utilised for the extraction of vetiver oil. The distillation of vetiver root is beset with considerable difficulties due to the viscid nature the oil, low volatility and high boiling point constituents. The separation of oil is also troublesome owing to its specific gravity, which almost approximates to that of water. The economic worth of the crop is dependant on high root production and high essential oil content.

Latha (1994) in her study on evaluation of kacholam (*Kaempferia galanga* L.) types for morphological variability and yield showed that fresh rhizome yield per hectare varied from 9.11 tonnes to 13.99 tonnes and the dry rhizome yield varied from 2.44 tonnes to 3.68 tonnes under open conditions. Under shaded conditions, the yield varied from 5.82 tonnes to 9.6 tonnes per hectare and dry rhizome yielded 1.9 tonnes per hectare to 3.31 tonnes per hectare.

The production of medicinal and aromatic plants in Asia is still widely unorganized as compared to production in the west, which is dominated by

specialised herbal horticulturists who are financially strong and with well-developed inter linkages with the industrial users and research institutes. The South East Asian producers, on the other hand, are based on small family based units, spread over large areas who thrive on individual incentives and marketing skills and lower overheads (Henle, 1995).

A major bottleneck in the cultivation of medicinal and aromatic plants is that their cultivation is localised in ecological niches where no marketing facilities exist. The demand is often inconsistent and hence any large scale cultivation often brings down the prices. Large scale fluctuations in demand and supply act as a damper to research and development efforts, especially those aiming at efficient cropping systems based on medicinal and aromatic plants in the South East Asian region (Paroda, 1995).

Mayadevi (1996) studied the economics of production and marketing of kacholam and koduveli in Thrissur district based on a sample of 120 farmers. It was found that the cost incurred for kacholam cultivation was Rs. 75609.30 and for koduveli cultivation it was Rs. 56550.59 on per hectare basis. The benefit cost ratios for kacholam and koduveli on cost C_2 were 1.71 and 2.40 respectively. Among the marketing channels for the two crops, the Producer – Dealer - Manufacturer was the major one. Non - availability of good planting materials, high post - harvest losses and unorganized trade were the main constraints encountered in the cultivation of the two crops.

A field experiment was carried out during the period from 1994 – 96 at CIMAP field station, Hyderabad with the objective of evaluating the productivity and profitability of some agricultural crops followed by an aromatic crop with that of continuous cropping of aromatic crops under semi-arid tropical climatic conditions. The results revealed that continuous cropping of rose scented geranium intercropped with cluster bean and green-gram was the most productive

and profitable (Rs. 149330 and Rs. 147230 gross returns / ha in the first and second years, respectively) compared to all other treatments (Rao *et al.*, 1998).

A study conducted by Birendrakumar *et al.* (1999) on the area and production versus market trend of the crop menthol mint identified tarai and central part of Uttar Pradesh as predominating areas for menthol mint where it is being cultivated by 60-70 per cent farmers contributing about 72 per cent of the total world production of menthol mint oil. During 1996 – 97 India exported nearly 8000 tonnes of menthol mint oil, becoming leading producer and exporter in the world. The study indicated that the major problem faced by mint growers is the fluctuation in oil price, which directly affects the area of cultivation.

India has potential to cultivate on a large scale the following essential oil yielding crops: menthol mint, carvone mint, citronella, lemongrass, patchouli, vetiver, rose, eucalyptus and sandalwood. To compete with the major exporters of the above essential oils, viz., China, Brazil, Indonesia, Turkey, Bulgaria – the cost of cultivation and processing must come down, and high quality of the produce must be ensured (Harlalka, 1999)

An evaluation of the current status of production and trade of major essential oils was made by Singh *et al.* (1999). They identified that the present pattern of production and trade of essential oils and aroma chemicals is characterized by the factors such as fluctuations in demand and prices, competitiveness and in supplies with progressive increase in the number of producers.

MATERIALS AND METHODS

CHAPTER III

MATERIALS AND METHODS

3.1 AREA OF STUDY

Knowledge on agro-climatic conditions and socio-economic background of the study area is of paramount importance to analyse the data appropriately and draw meaningful conclusions. Hence, the present chapter describes the agro-climatic; and socio-economic backdrop necessary for the study entitled "Production and Marketing Systems of Vetiver: A Micro Level Analysis in Thrissur District" in Kerala. Thrissur has a major vetiver-growing tract. Chavakkad taluk in Thrissur district is the major vetiver growing area. Other districts, where vetiver is cultivated on a significant scale are Wayanad and Idukki.

3.1.1 Location

Thrissur district is located at the centre of the state of Kerala, between north latitude 10 ° and 10 ° 4' and east longitude 75 ° 57 ' and 76 ° 54'. Malappuram district bound the district on the north. Palakkad district forms the eastern boundary of Thrissur district. Ernakulam and Idukki districts form the southern boundary and Arabian Sea forms the western boundary. The map of the Thrissur district is given in Figure 3.1

The district has a geographical area of 299390.0 hectares, which forms 7.8 per cent of the total area of the state. Thrissur district consists of five taluks viz., Kodungallur, Chavakkad, Thalappily, Mukundapuram and Thrissur. There are seven municipalities, 17 community development blocks spread over 98 panchayats, 251 revenue villages and 1074 wards in the district.

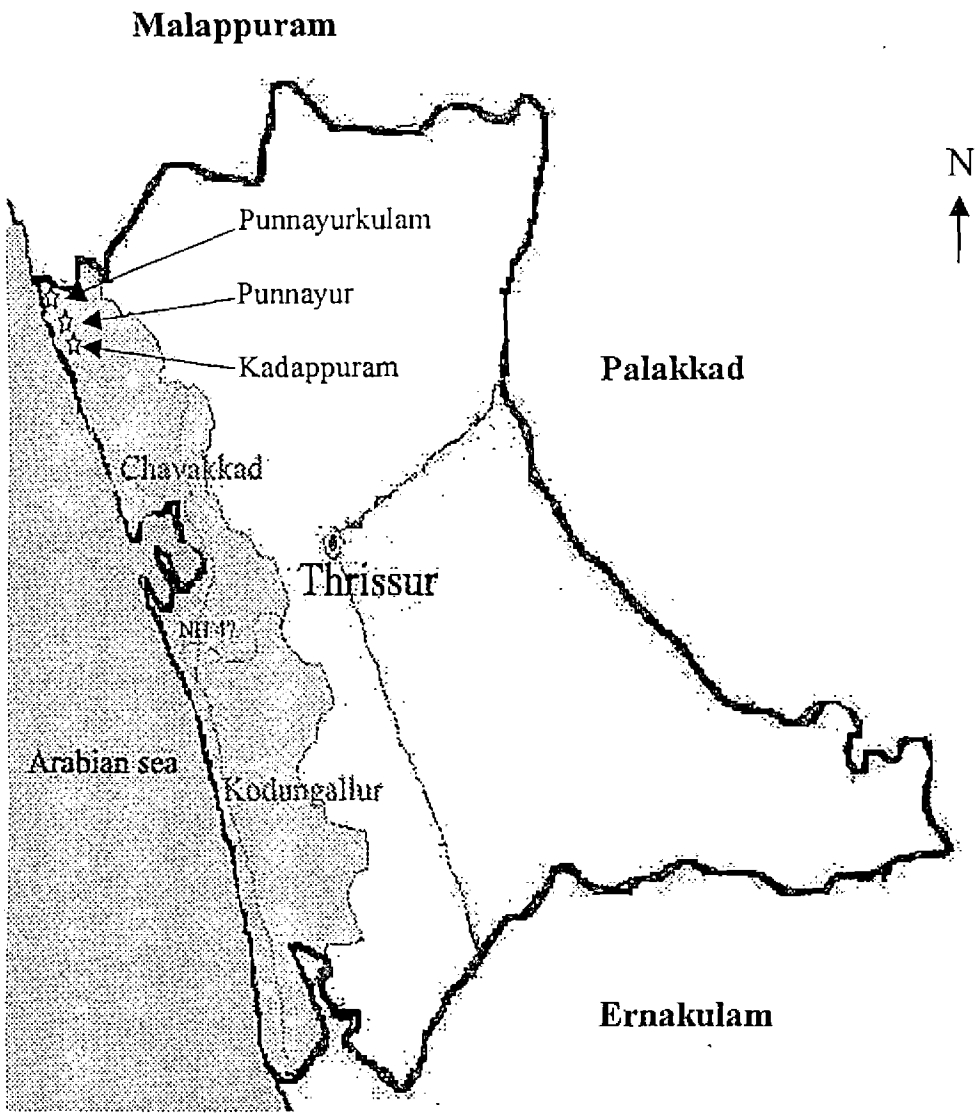


Figure 3.1 Map of Thrissur district showing the study area

Based on the natural physiography, the district is divided in to high land, mid land and low land. The land utilisation pattern in Thrissur district is presented in Table 3.1. The district has a forest cover of almost 35 percent of geographical area. Nearly 62 percent of the geographical area is put under cultivation, and nearly 11 percent of the area is cropped more than once, putting the cropping intensity at 121 percent.

Table 3.1 Land utilisation pattern in Thrissur district during the year 2000

Description	Area (in ha)	As percentage to the total
Geographical area	299390	100.00
Forest	103619	34.61
Land put to non-agricultural uses	27377	9.14
Barren and uncultivable land	296	0.10
Permanent pastures and grazing land	46	0.02
Land under miscellaneous tree crops not included in net area sown	622	0.21
Cultivable waste land	2807	0.94
Fallow other than current fallow	3209	1.07
Current fallow	7450	2.49
Net area sown	153913	51.41
Area sown more than once	32448	10.84
Total cropped area	186412	62.26
Cropping intensity	-	121.12

Source: Government of Kerala, 2001

3.1.2 Population

Thrissur district, according to the 1991 census report, supports a total population of 27.34 lakhs. Out of this 13.09 lakhs are males and 14.25 lakhs are females. During the last decade, the district showed a population growth rate of 12.00 per cent. Density of population is 902 persons per square kilometre. The sex ratio of the district indicates there are 1088 females for 1000 males. Literacy rate is 79.3 per cent. Educational status of males and females revealed that, literacy was more among males (81.7 per cent) than females (77.09 per cent).

The total working population of the district is 804378 of which 74064 are cultivators and 183588 are agricultural labours. So agriculture provides employment to 32.0 per cent of the working population and contributes 42.0 per cent of the total income. Household industry workers and other workers are 35898 and 511188 respectively. Occupational distribution of population in Thrissur district is given in the Table 3.2.

Table 3.2 Occupational distribution of population in Thrissur district

Particulars	No. of persons	As percentage to the total
Total main workers	804738	100
Cultivators	74064	9.2
Agricultural labours	183588	22.8
Household industry workers	35898	4.5
Other workers	511188	63.5

Source: Government of Kerala, 2001

3.1.3 Climate and rainfall

Thrissur district experiences humid tropical climate. Average daily maximum temperature was 35.6^{0}C in the month of May and 21.9^{0}C in the month of August (Figure 3.2). Annual rainfall of 2177.3 mm was received during 2000.

Table 3.3 Monthly average temperature and rainfall distribution in Thrissur district in the year 2000

Month	Temperature (^{0}C)	Rainfall (mm)	Relative Humidity (%)
January	28.05	0.0	59.5
February	28.05	4.6	68.5
March	29.75	0.0	66.5
April	29.3	67.9	74.0
May	29.05	117.2	72.0
June	26.2	602.0	85.5
July	25.35	354.0	81.5
August	25.85	518.8	86.5
September	26.85	198.1	80.5
October	26.7	262.2	79.5
November	28.2	41.3	65.5
December	26.5	11.2	59.0

Source: Department of Agricultural Meteorology, College of Horticulture, Vellanikkara

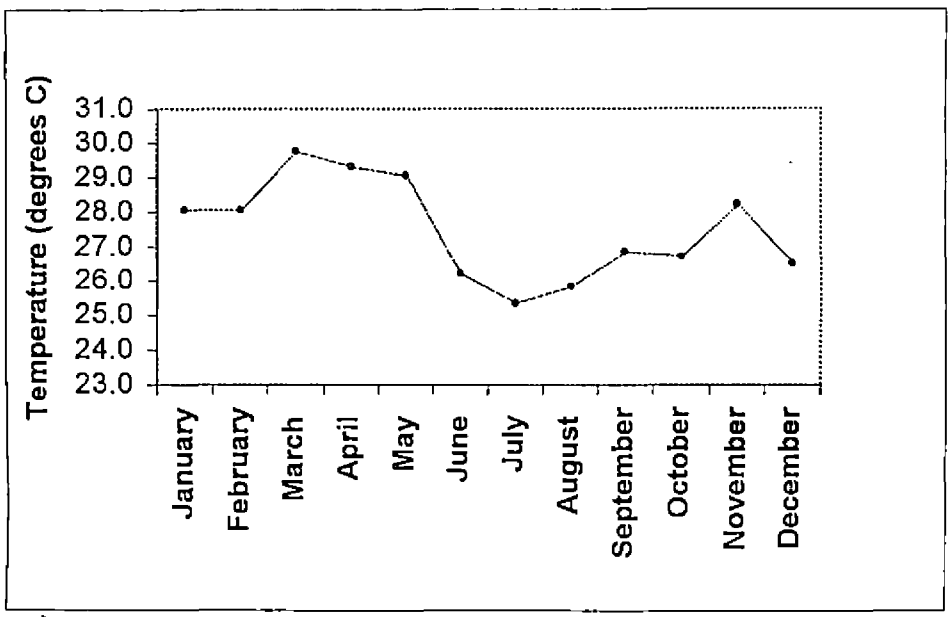


Figure 3.2 Monthly average temperature for the year 2000

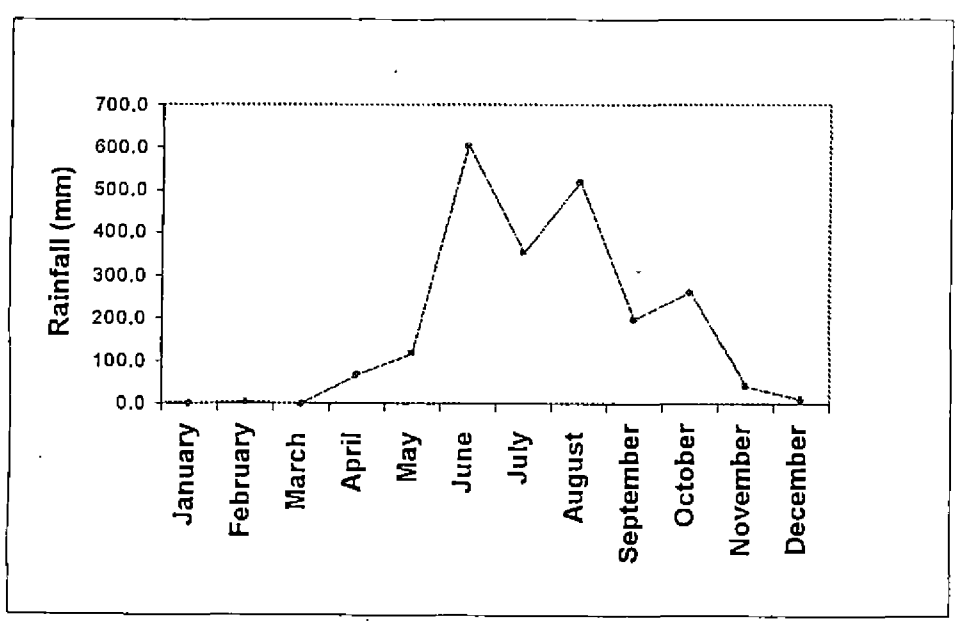


Figure 3.3. Monthly average rainfall for the year 2000

Most of the annual precipitation is received during the South West monsoon from June to September. Rainfall was maximum in the month of June. The monthly average distribution of rainfall for the district during the year 2000 is given in Table 3.3.and figure 3.3. Relative humidity was found to be highest (86.5) in August and lowest in December (59.0).

3.1.4 Soil

The major soil type of Thrissur district is laterite. But sandy, alluvial and forest soils are also seen in certain belts. The soil type of the study area is of sandy in nature, which is deficient in almost all major plant nutrients. Forest soil is confined to parts of Thalappilly, Thrissur and Mukundapuram taluks. Alluvial soils rich in organic matter are generally seen in the low-lying areas of Thrissur and Mukundapuram taluks.

3.1.5 Water resources

The district has many water resources such as canals, tanks, ponds, wells, tube wells and major and minor lift irrigation projects. Canoli canal, Shanmugham canal and Puthenthode canals are the three main canals in the district. Important rivers flowing through the districts are Chalakkudy, Karuvannur and Kecheri rivers. Bharthapuzha flows westwards at the northern boundary and Periyar flows westwards at the southern boundary. Major irrigation projects operating in the district are Peechi dam, Mangalam dam, Chalakudy Diversification scheme, Vazhani scheme and Chalakudy irrigation project. The source wise irrigation area in the district is given in Table 3.4.

Table 3.4 Source-wise irrigated area in Thrissur district during the year 1999-2000

Particulars	Irrigated area (in hectares)
Government canals	17730
Private canals	60
Government tanks	124
Private tanks	9963
Government wells	9
Private wells	36136
Minor lift irrigation	3304
Other sources	16749
Total	84075

Source: Government of Kerala, 2001

3.1.6 Cropping pattern

The cropping pattern of the district is shown in Table 3.5. Major crops grown in the district are paddy, coconut, arecanut, vegetables, rubber and banana. Rice is cultivated in 40977 hectares of land, which is 15.7 per cent of the total cropped area. Coconut is grown in 76656 hectares of land, which is 29.37 per cent of the total cropped area, and is the main crop in the sandy coastal belts, which stretches over a length of 51.5 km from Kodungallur to Chavakkad. Seasonal crops like tapioca, banana and vegetables are grown in the mid land regions where the soil is laterite in nature.

Table 3.5 Cropping pattern in Thrissur district during the year 2000

Crop	Area (ha)	As percentage to total cropped area
Paddy	40977	15.7
Pulses	626	0.24
Sugar cane/ palmyrah	298	0.15
Spice and condiments	13370	5.13
Fruits	21006	8.05
Vegetables	86101	32.95
Coconut	76656	29.38
Oil seed crops	447	0.17
Drugs and narcotics	72	0.03
Tea	529	0.20
Rubber	13105	5.02
Cocoa	164	0.06
Fodder crops	17	0.007
Green manure crops	905	0.35
Others	6678	2.56
Total	260951	100.00

Source: Government of Kerala, 2001

Vetiver requires loose soil, and hence its cultivation is limited to the coastal areas having sandy soil. The acreage under vetiver is not reported separately, and hence the details are not readily available. Based on the discussion

with the officials of the Department of Agriculture, Government of Kerala, it is estimated that vetiver grass covers about 60 ha in Thrissur district.

3.1.7 Description of selected panchayats

Chavakkad and Kodungallur are two taluks in Thrissur where vetiver is widely cultivated. However, over the years, cultivators from Kodungallur have started migrating to Chavakkad, which is gaining more prominence as a vetiver production and marketing centre. Hence, the consolidated list of growers contained more farmers from Chavakkad taluk. Most of farmers, who had dwellings at Kodungallur, had their cultivation at Chavakkad, and hence Table 3.6 presents the list of panchayats and municipal areas in Chavakkad taluk.

The Punnayurkulam, Punnayur and Kadappruram panchayats were found to have maximum area under vetiver. Majority of the respondents belonged to these three panchayats. The details of the panchayats are shown in Table 3.7.

The cropping pattern of the three panchayats is depicted in Table 3.8. Coconut accounted for more than two third of the total cultivated area. However, the coastal sandy soil tract, having marginal lands, which may not support any other crop, are devoted to either vetiver or cashew. Kadappuram panchayat had the minimum area under vetiver, while Punnayur and Punnayurkulam had four and nearly 11 percentage of the cropped area under vetiver cultivation.

Table 3.6 List of panchayats and municipal areas in Chavakkad taluk

Panchayats	Municipal areas
Valappad	Guruvayoor
Nattika	Chavakkad
Talikulam	
Vatanappilly	
Engandiyoor	
Orumanayur	
Pookod	
Vadakkekkad	
Pavarattani	
Thaikkad	
Elavally	
Mullassery	
Venkidangu	
Kadappuram	
Punnayur	
Punnayurkulam	

Source: Taluk office, Chavakkad

Table 3.7 Details of panchayats selected for study

Particulars	Punnayurkulam	Punnayur	Kadappuram
No. of wards	15	18	16
Area	18.71 km^2	20.82 km^2	16.6 km^2
Population	29795	37064	33065
Sex ratio	1000:1133	1000:1014	1000:966

Source: Registers of the respective panchayats offices, 2000

Table 3.8 Cropping patterns of the selected panchayats during the year 1999-2000

Crop	Punnayurkulam		Punnayur		Kadappuram	
	Area (ha)	Percentage to gross cropped area	Area (ha)	Percentage to gross cropped area	Area (ha)	Percentage to gross cropped area
Paddy	252	22.3	280	25.2	240	17.3
Coconut	750	66.4	7802	70.1	1125	81
Vetiver	120	10.6	45	4.0	10	0.72
Others	8	0.7	7.5	0.7	14	0.98
Total	1130	100	1112.5	100	1389	100

Source: Department of Agriculture, Government of Kerala, 2000

3.2 METHODOLOGY

The study of production and marketing systems of vetiver was conducted in Thrissur district. Chavakkad and Kodungallur taluks of the district have been purposively selected for the study as the major vetiver growing areas of the district after discussion with the officials of the Department of Agriculture, Government of Kerala.

Vetiver is an annual grassy medicinal and aromatic plant, which can only be cultivated in sandy areas exclusively for root yield. The present study aims at collecting data on the cost of cultivation and marketing of dry roots. Very little information is available on the financial feasibility of growing vetiver and its marketing systems, despite the fact that its dry aromatic roots are used for a wide range of products. Hence, the present study is an attempt in this direction.

3.2.1 Agricultural systems approach

Systems are a number of logically related components for attaining some common objective or function (Spedding, 1977). Agricultural systems are simply sets of farm components that interact with each other for achieving an agricultural purpose by behaving as a whole entity (Spedding, 1977). They have one or more living components.

A farming system can be viewed conceptually as a set of spatially definable areas in which crops, animals or both are produced, and a homestead area where the farm house is located. The crop or animal production areas form units, analogous to the ecosystem unit in ecology, and can be defined as agro ecosystems. The farmhouse area, in which the farm family is fed, clothed, and the economic transactions and management decisions that occur on a farm can be combined to form a socio-economic subsystem. The agro-ecosystem and the socio-economic subsystem interact to form the farming system (Hildebrand, 1983). This interaction is governed and influenced by the biophysical subsystems like agroclimate, natural resources; socio-economic subsystems like credit, market, institutions etc., component technology and the prevailing policy environment (Figure 3.4).

Production is the transformation of input(s) to output(s). The agricultural production system includes all the activities, resource flow and peoples related to performing the primary function of producing agricultural outputs of various economic value (Spedding, 1977 and Haines, 1982). Eventhough, the role of marketing has been identified as critical to the performance of agriculture as production itself; the systems approach to marketing is new. The adoption of concepts that view marketing at different levels has made it necessary to apply a hierarchical perspective to understand the structure and functioning of marketing organizations. This perspective is the systems approach

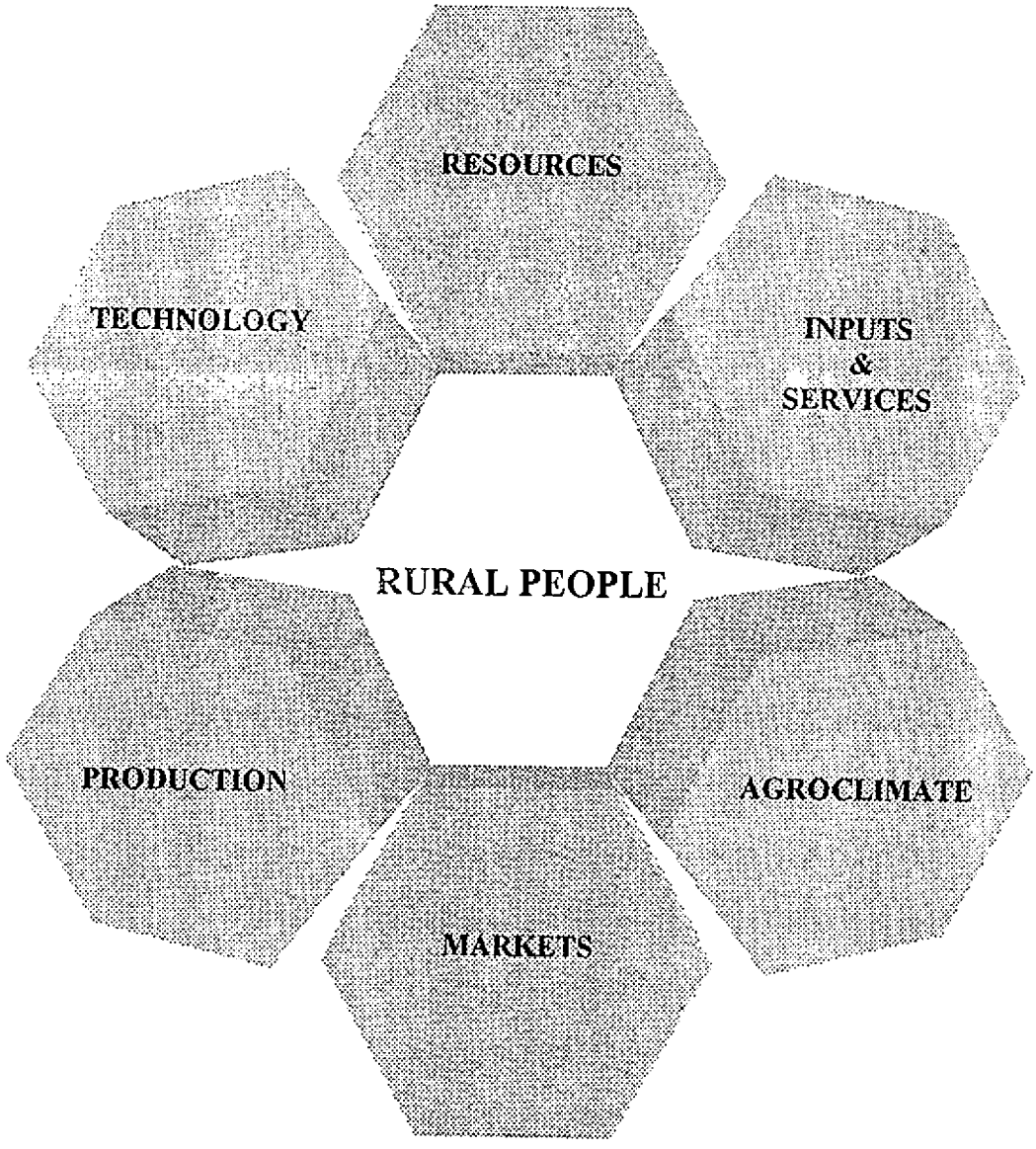
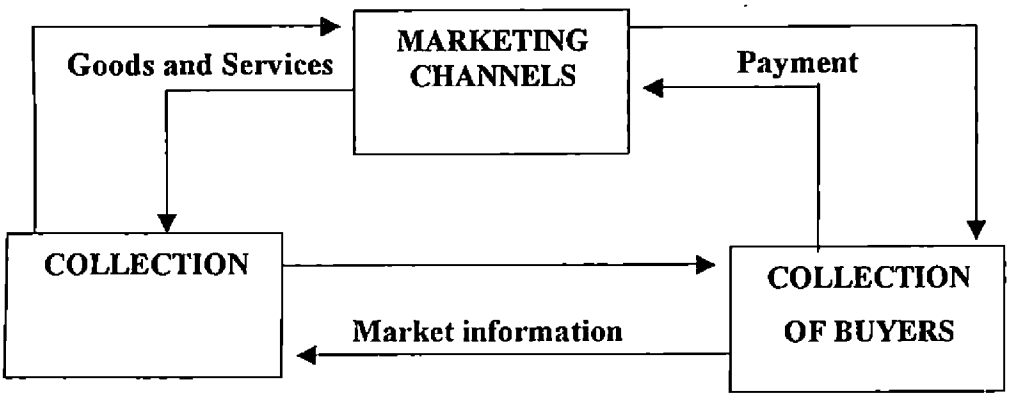


Fig. 3.4 A simple agricultural system

(Adapted from Hildebrand, 1983 and FAO, 1983)

to marketing (Bell, 1979). A simple marketing system consists of economic agents like producers, consumers, the government, marketing channels and a hierarchy of market functionaries for storage, transportation, market finance and market information. A simple marketing system is depicted in Figure 3.5.



(Adapted from Bell, 1979)

Figure 3.5 A simple marketing system

The subsistence-oriented production systems are less integrated with the marketing systems. The commercialisation of the production systems leads to greater market orientation for input as well as output marketing (Pingali, 1997). Vetiver is basically a cash crop grown to be marketed for cash income. Hence, an efficient marketing system is a vital factor determining the sustained interest of the farmers in this crop enterprise. Hence the present study attempts to focus on the production and marketing systems of vetiver in Thrissur district with a view to evaluate the economic efficiency of the production and marketing systems, to identify constraints, and to suggest policy measures to improve these systems.

3.2.2 SAMPLING FRAMEWORK

3.2.2.1 Selection of study area and Sampling design

The major vetiver growing areas of Thrissur district were identified in consultation with the officials of the Department of Agriculture, Government of Kerala. They were Kadappuram, Orumanayur, Punnayoor, and Punnayurkulam panchayats of Chavakkad taluk; and Kaipamangalam and Edathiruthy panchayats of Kodungallur taluk. A list of commercial farmers who were cultivating vetiver for more than three years was prepared in consultation with the local Krishi Bhavans, processors, traders, and the Association of Medicinal Plants Growers. A sample of 80 farmers was selected at random from the list.

The sample consisted of 48 farmers from Punnayurkulam panchayat, 22 from Punnayur and 10 from Kadappuram. From the survey it was found that almost all of the farmers were small scale farmers. Hence, the farmers were post-stratified into farmers having less than 0.5 hectare of land, 0.5 – 1 hectare of land and more than one hectare of owned land. Distribution of selected farmers is given in Table 3.9

Table 3.9 Distribution of different class of farmers in selected panchayats.

Category	Group	Number of farmers		
		Punnayurkulam	Punnayur	Kadappuram
Category –I	< 0.5 ha	41	16	9
Category –II	0.5-1 ha	5	3	1
Category- III	> 1 ha	2	3	0
Total		48	22	10

3.2.2.2 Collection of data

Only primary data were used for the study. The required data were gathered through personnel interview method using well-structured and pre-tested schedule of enquiry (Appendix I).

The information regarding marketing aspects were collected from six village traders and six wholesalers and three commission agents operating in the area. For increasing the efficiency, a separate schedule (Appendix II) was developed for collecting data on marketing aspects such as marketing costs, marketing margins, taxes, etc.

3.2.2.3 Period of study

The data collected pertains to the period from January 2000 to December 2000.

3.2.3 THE MAIN ITEM OF OBSERVATIONS

The main items of observations are:

a) Major socio-economic characteristics of the farmers such as size of land holding, family size, level of education, farm and non-farm income and nature of farm investments.
b) Cultivar used, sources of planting material
c) Production expenses of vetiver cultivation covering:
   - Labour use pattern – family as well as hired labour, gender aspects of labour use

- Machinery / animal use pattern
- Soil amendments – types, quantity, and value
- Manures and fertilizers – types, quantity and value
- Plant protection chemicals – types, quantity and value
- Miscellaneous expenses (if any)

d) Yield in terms of root – quantity, price and income

e) Post harvest handling undertaken

f) Marketing systems – mode of sale and form of produce disposal, marketing channels, marketing assistance (if any) received from market functionaries, marketing costs and margin

g) Physical, social, economic and institutional constraints in the production and marketing

3.2.5 ANALYTICAL FRAME WORK

The cost and returns were worked out as is being done in the Comprehensive Cost of Cultivation Scheme of the Government of India (Acharya, 1998) and the efficiency of production was estimated using the farm business income, family labour income, farm investment income and net income. The break even out put was determined following Dillon (1993) as:

$$\text{Breakeven output} = \frac{\text{Fixed cost / ha}}{\text{(Selling price / kg – variable cost / kg)}}$$

Margin of safety is the amount by which the scale of activity exceeds the breakeven point. It is worked out by the formula:

$$\text{Margin of safety (\%)} = \frac{\text{(Total sales – breakeven sales)} \times 100}{\text{Total sales}}$$

The efficiency of operation indicates scale of activity above the breakeven output in percentage. It is estimated by the formula:

$$\text{Efficiency of operation (\%)} = \frac{(\text{Realised output} - \text{breakeven output}) \times 100}{\text{Breakeven output}}$$

3.2.5.1 Concepts and Working Definitions

The farm costs has been categorised by the estimation committee on cost of cultivation (Government of India, 1981) in to six groups viz., cost A_1, A_2, B_1, B_2, C_1 and C_2. Further cost C_3 has been added in 1991 to account for the management input of the farmers (Acharya and Agarwal, 1994).

The various cost components constituting this above cost concepts are explained below:

i) Cost A_1

Cost A_1 consists of all actual expenses in cash and kind incurred in production by the owner operator. It includes cost of planting materials, cost of manures and fertilisers, cost of plant protection chemicals, cost of hired labour, cost of hired machinery and animals, operating cost of machinery and animals, irrigation cost, land revenue, depreciation on fixed farm assets and interest on working capital.

ii) Cost A_2

Cost A_2 is worked out by adding Cost A_1 to the rent paid for leased in land. The rent prevailing for leased in land in the area was Rs. 24,700 / ha. (i.e. Rs. 10,000 / acre)

iii) Cost B_1

It is arrived by summing up Cost A_2 and interest on own fixed investments. The fixed capital items used in vetiver cultivation are implements, pumpset and hose.

iv) Cost B_2

Cost B_2 is calculated by adding the rental value of owned land (net of land revenue) to Cost B_1. The rental value of owned land was reckoned at the prevailing market rate.

v) Cost C_1

Cost C_1 is calculated by adding Cost B_1 and imputed value of family labour. Family labour accounts for the farming operations performed by the members of the particular family. This is measured on the basis of the prevailing wage rate of the cultivated area. The prevailing wage rate was Rs. 150/- for male worker and Rs. 80/- for female worker at the time of survey

vi) Cost C_2

This is estimated by adding Cost B_2 and imputed value of family labour.

vii) Cost C_3

This is the sum of Cost C_2 and cost of management. The cost of management on the other hand is reckoned as 10 per cent of cost C_2.

3.2.5.2 C

a) Cost of land preparation

The vetiver crop requires a well-levelled, loose soil with a fine tilth and devoid of stubble and debris of the pervious crop. So the cost on land preparation accounts a remarkable component of cost. Generally, the male labourers carry out these. A handful of farmers employed mechanical power for land preparation. No farmer reported animal power for land preparation

b) Cost of planting material

The planting material, otherwise known as slips, is prepared from the pervious crop by hired female labourers or on contract basis.

c) Cost of planting

Hired female labourers are employed for the planting operation. They are paid Rs. 80 /- per day while the male labourers are paid Rs. 150 /- per day as wages.

d) Cost of organic manures

Groundnut oil cake, fishmeal (grade I & II) and wood ash are the items of organic manures used by the farmers of the area for vetiver cultivation. These were valued at the prevailing market rates and shadow prices for the locality. The actual costs of these items were calculated considering the transportation and preparation costs.

e) Fertilizer costs

The cost of fertilizers used was calculated based on the actual prices plus transportation cost paid by the sample farmers.

f) Cost of irrigation

Irrigation cost includes the cost of installing shallow tube well, the cost of hired and household male labour, depreciation of pump set and hose, rent of pumpset (if hired), price of kerosene, lubricant and petrol (for starting the pump set).

g) Cost of intercultural operations

Intercultural operations required for the cultivation are pruning, weeding and pesticide application. The costs under intercultural operations include cost of pesticide, cost or rental charges of sprayer and male & female labour charges.

h) Cost of fertilizer application

It includes both male and female labour costs incurred in the application of fertilisers. As the soil is sandy, the farmers apply chemical fertilizers in split doses. Hence, this cost component varies from farmer to farmer.

i) Harvesting costs

Harvesting operation is highly labour intensive. The crop is characterised by its long aromatic roots having economic value. So the uprooting from the deeper layers of soil is a labour intensive process. The harvesting requires both male and female labourers. The uprooting, and chopping of roots from stem is done by male labourers, while the females have the responsibility of cleaning and bundling of roots.

j) Land rent

Most of the farmers cultivate in rented land. So the rent paid by each farmer for the land also is an additional cost component.

k) Land revenue

The land revenue paid was reckoned at the actual payments made. The land revenue for garden land in the area was Rs. 105 / ha

l) Interest on working capital

Interest on working capital was worked out at 11.5 per cent per annum, which was the prime lending rate prevailing at the time of survey for production credit. The interest was calculated for half of the production period.

m) Interest on fixed capital

Interest on fixed capital is estimated @ 9 per cent per annum on the book value of the fixed investments.

n) Depreciation

In the present study, straight-line method was employed for working out the depreciation. The average economic life of the depreciable items were taken as follows:

Permanent farm buildings	– 20 years
Temporary farm buildings	– 5 years
Pumpsets	– 15 years
Light implements	– 5 years

The amount of depreciation to be charged during a year is estimated as:

$$\text{Depreciation} = \frac{\text{(Purchase cost – salvage value)}}{\text{Life of the asset}}$$

Depreciation on individual items of fixed capital is added together to get the total value of depreciation.

3.2.5.3 Income measures

The following income measures associated with different cost concepts were also used to measure the efficiency.

i) Gross income

Cross income represents the total value of the produce (roots), which is valued at the prevailing market price.

ii) Farm business income

The farm business income is computed by deducting cost A_1 from gross income.

iii) Own farm business income

Own farm business income is obtained by deducting Cost A_2 from gross income.

iv) Family labour income

It was arrived by subtracting cost B_2 from gross income.

v) Net income

It was computed by subtracting the total cost (cost C_3) from gross income.

vi) Farm investment income

This is worked out by adding up the net farm income, interest on fixed capital and rental value of owned land.

3.2.5.4 Benefit-cost ratio

The benefit-cost ratio indicates the return on an investment of one rupee. It is the ratio between the benefits realised from an enterprise and that of costs incurred (Kahlon and Singh, 1980, Dhondyal, 1989 and Johnson 1991). The total market value of the root bundles was divided by the total cost of production to arrive at the benefit – cost relationship.

3.2.6 MARKETING

The study employed various concepts of marketing which are described below:

a) Market

The market can be viewed from two angles, that of an economist and that of a marketer (Kotler, 1983). The market for an economist is referred to the aggregation of buyers and sellers interested or potentially interested in a product group. But, for a marketer, the market embraces all persons or business units who buy or induce to buy a product or service. Thus, market would indicate an organization or institution that performed the function of marketing which in turn is a process by which goods and services are directed from the primary producer to the ultimate consumer.

b) Marketing

Marketing has various definitions in literature. However, the present study employs the concept given by Hansen (1967).

Hansen (1967) defined marketing as the process of discovering consumer needs and translating wants into product and service.

c) Marketing channel

According to Cundiff *et al.* (1982), marketing channel is the path traced in direct or indirect transfer of title to a product is it moves from a producer to ultimate consumer or industrial user.

d) Marketing cost

It is the actual expense incurred for bringing goods and services from the producers to the consumers (Jain, 1971).

e) Marketing margin

According to Takur (1975) marketing margin is the returns on marketing cost received by the marketing intermediaries for their service.

Marketing margin refers to the difference between price paid by a marketing intermediary and the price received on resale of an equivalent quantity of farm produce. All the cost incurred and profits unvalued in moving the produce from the initial point of production till it reaches the ultimate consumer is termed as total marketing margin. (Acharya and Agarwal, 1987).

Each intermediary have a net margin in the marketing process which is the margin received by them over their cost in the disposal of a unit equivalent quantity of produce. There are two types of marketing margins viz., concurrent and lagged margins. Concurrent margin indicates the difference between the prices prevailing at successive stage of marketing at a given point of time. While, lagged margins refers to the difference between the price received by a seller at a particular stage of marketing and the price paid by him at the preceding stage of marketing during an earlier period. The present study employs the method of concurrent margin for the estimation of price spread by taking into account the prevailing price at successive stages of marketing at a given point of time.

f) Price spread

It is the difference between the price paid by the consumer and the price received by the producer for an equivalent quantity of farm produce (Acharya and Agarwal, 1987).

g) Marketing efficiency

The economic efficiency of a marketing system can be measured as the ratio of the total value of goods marketed to the total marketing cost (Acharya and Agarwal, 1987).

The Shepherd's Index as modified by Acharya and Agarwal (1987) is used to measure the economic efficiency of marketing.

$$ME = \frac{V}{I} - 1 \text{ , where}$$

ME = marketing efficiency
V = total value of goods marketed
I = marketing costs including the marketing margins

A higher ratio usually denotes higher marketing efficiency.

3.2.7 CONSTRAINTS IN PRODUCTION AND MARKETING

The constraints in production and marketing were enumerated and ranked from the farmer's point of view in the order of importance assigned by them. The ranks were assigned scores, depending upon the relative importance, and the total scores of each constraint were worked out.

RESULTS

CHAPTER IV

RESULTS

An analysis of the socio-economic characteristics of the sample farmers will throw light on the biophysical, organisational and institutional environments within which the farming systems function and the farming practices are being carried out. Hence, the present chapter attempts to analyse the socio-economic parameters that have a direct or indirect bearing on the systems design and functioning.

4.1GENERAL PRACTICES OF VETIVER CULTIVATION IN CHAVAKKAD

Vetiver is grown in a variety of problem soils in India. It includes water logged saline, alkaline as well as sandy soils. The crop was very popular as capable of fetching lucrative returns from marginal and sub-marginal lands in the coastal sandy belts of Kerala till late seventies and eighties. Thereafter a combination of problems including large inter-year fluctuations in price made its cultivation unattractive. As a result, the acreage under this crop has been steadily declining. However, in the absence of published data on area, production and productivity of vetiver the same could not be verified.

Chavakkad is famous for vetiver cultivation for more than 60 years. Even though the area under this crop has decreased over a period of time, the farmers of this locality are still depending on vetiver for income. The cultivation is aimed mainly for its long dry aromatic roots, which are having commercial value. The sandy soil of the area is a favourable factor for the deep and lengthy growth of roots and easy harvest.

Plate 4.1 Land preparation for planting

Plate 4.2 Irrigation using flexible hose

4.1.1 Planting season and duration

Vetiver when cultivated for oil extraction is harvested 18 months after planting, i.e. during the dry season from December to February. However, the farmers of Chavakkad are cultivating vetiver for roots and not for oil extraction. The planting season hence starts with field preparation in December - January. The harvesting is completed in November - December, by the 11th month of planting.

4.1.2 Field preparation

Most of the vetiver growing land in the area has been under vetiver cultivation for a long period. As the soil is sandy and loose, mechanical or animal power is generally not used for the field preparation. The stubbles and crop residues from the previous harvest are heaped at various parts of the field and burned. The ash is spread along with levelling done with the help of spades (Plate 4.1). However, when lands are brought under vetiver cultivation for the first time, field preparation and levelling are carried out more rigorously.

4.1.3 Planting

Planting is done in December-January months for the next crop immediately after the harvest of the previous crop. The planting material, otherwise called slip, is prepared from the suckers of previous crop. A single sucker is cut short to 3"- 4" in length to form a slip. Approximately two lakh slips are required for planting one hectare. Close planting with a plant-to-plant distance of 2"- 3" is followed to gain optimum yield and to suppress the weed growth.

Plate 4.3 Established sprouted slips

Plate 4.4 Vetiver crop ready for harvest

4.1.4 Irrigation and water management

Irrigation is an important component of vetiver cultivation in the sandy soils. As the planting is done during the dry months immediately after harvest of the previous crop, surface irrigation is given using flexible hose (Plate 4.2). The source of water is shallow tube wells. For the first one week after planting, irrigation is done daily. Then for the next two weeks, irrigation is given at an interval of 3-4 days. After the establishment of the sprouted slips (Plate 4.3), the frequency of irrigation is reduced to once in a week. For irrigating one hectare, 20 hours of irrigation is required on an average. There is no problem of water stagnation as the sandy soils provide excellent drainage. The irrigation is stopped with the onset of South-West Mansoon. By this time, the crop establishes well.

4.1.5 Manuring

Being sandy soil, the application of organic source of plant nutrients is very common. The slow releasing nature of organic source of plant nutrients minimises loss due to leaching as against inorganic sources of plant nutrients. Wood ash is applied @ 500-750 kg/ ha with the on set of summer rains. This is followed by the application of grounded oilcakes @ 1000-1500 kg per hectare. Groundnut cake is the most common oil cake used. Plant nutrients are supplemented through fishmeal also, subject to availability. Though farmyard manure (FYM) is a cheaper source of nutrients, farmers were averse to its use on account of higher root rot incidence after its application.

Chemical fertilizers are applied with the onset of South-West Mansoon. Factomphos @ 250 kg/ ha and Muriate of Potash @ 125 kg/ ha are applied usually in two split doses. The first fertilizer application is generally given 150 days after planting. The second dose of fertilizer application is given one

Plate 4.5 Harvesting of vetiver roots

Plate 4.6 Cleaning and separation of roots

month after the first dose. Some farmers applied a third dose of fertilizers one month after the second dose.

4.1.6 Weeding and Pruning

After the second dose of fertilizer application, pruning of the leaf tips is done to avoid lodging and to increase the root growth. Pruning is done using sickles. Weeding is also done during this period along with pruning. Female labourers are engaged for pruning and weeding.

4.1.7 Plant protection

The main pest problem reported was the defoliators. Systemic organochlorine insecticides are sprayed to control this problem. No other major pest and disease incidences were reported.

4.1.8 Harvest

As the farmers of Chavakkad are cultivating vetiver for the dry roots, and not for oil extraction they harvest the crop by November – December. The crop is therefore, ready for harvest by the 11^{th} month of planting (Plate 4.4). Harvesting operations begin in the month of November. Vetiver roots are the economically important output. Deep digging of the top layers of soil is done using spade to dig out the plants with minimum damage to the roots (Plate 4.5). It is a skilled and laborious process carried out by male labourers. The dug out plants are then cleaned and roots separated (Plate 4.6). The dried roots are then stored as bundles of approximately 50 kg each (Plate 4.7) till it is finally disposed off.

Plate 4.7 Dry root bundles ready for disposal

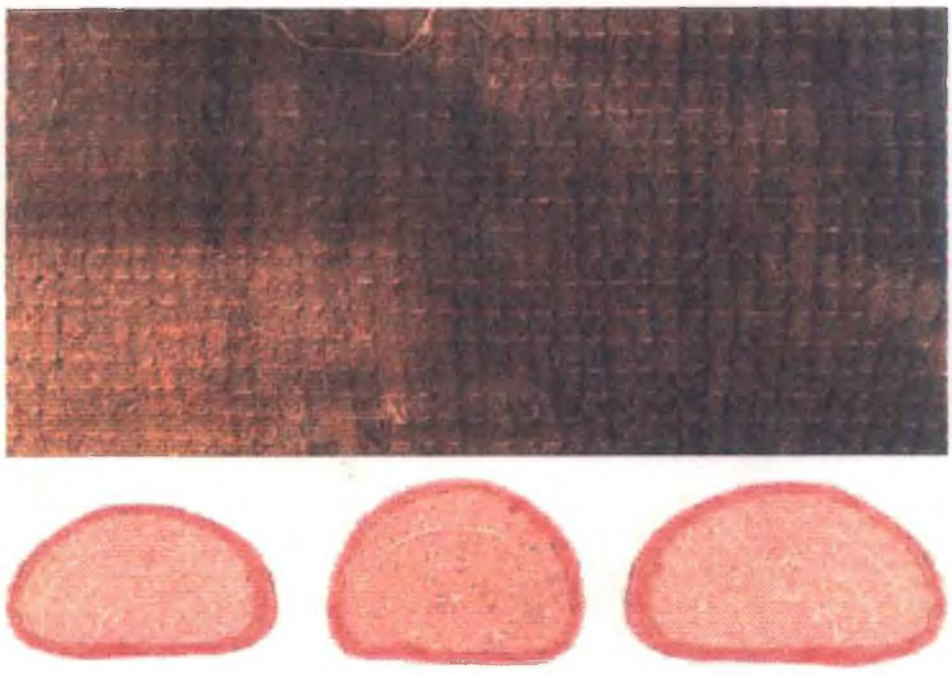


Plate 4.8 Fans and mat made from vetiver roots

4.2 SOCIO - ECONOMIC CHARACTERISTICS

4.2.1 Farm size status

As the size of operational holding is a major barrier to achieve economy of scale in farm operations, an analysis of the farm size assumes importance in understanding the decision making process in a farm household. The farmers were classified in to three categories based on their size of holding (Table 4.1).

Table 4.1 Classification of sample farmers based on their holding size

Category	Criteria for categorisation	No. of farmers under the category	Average size of holding (ha)
Category I	< 0.5 ha	66 (82.50)	0.15
Category II	0.5 – 1.00 ha	9 (11.25)	0.72
Category III	> 1.00 ha	5 (6.25)	1.58
Total		80 (100.00)	0.31

Figures in parentheses indicate percentage to the respective totals

The first category (category I) denotes the farmers who possess below 0.50 hectares of land holding. It is found that majority (82.50 per cent) farmers belonged to this category. The second category (category II) farmers comprised of those who have a land holding size between 0.50 – 1.00 hectare. They constituted 11.25 per cent of the respondents. Finally there were farmers having a holding size more than one ha of land (Category III). There were less than 10 per cent of respondents under this category. It can be noted that the average holding size of the sample farmers was just 0.31 hectare. It varied from 0.15 hectare for the category I to 1.58 for category III. Nearly 94 per cent of the

respondents belong to the category of marginal farmers, leaving a mere six percentage to small farmers. Just one respondent belonged to the category of large farmers having a land holding size (2.5 ha) more than two hectares.

4.2.2 Family size status

Vetiver cultivation is labour intensive, and hence the involvement of family labour is significant. The data on size and the composition of family are collected and presented in Table 4.2

Table 4.2 Average family size of respondents (number per household)

Category	Average family size	Average male members	Average female members
CI	4.05	2.20	1.85
CII	4.22	2.44	1.78
CIII	3.40	1.60	1.80
Overall mean	4.03	2.19	1.84

It was observed that the average family size in the study area was 4.03. It consisted of 2.19 males and 1.84 females. The average family size was the highest (4.22) for the farmers who fall under the category II. Category III showed the lowest family size of 3.4. The average number of male members in each category were 2.2, 2.44 and 1.6 under the categories I, II and III respectively. While, the average number of female members were 1.85, 1.78 and 1.8 respectively under the I, II and III categories.

4.2.3 Labour force status

Table 4.3 shows the family members in labour force as percentage to the total family members. In farm management definition, all family members who belong to the age group of 15-59 years are included in this category.

Table 4.3 Members in the labour force per household (number per household)

Category	Children	Members in labour force	Old age members	Total family members
Category I	0.56 (13.86)	3.09 (76.40)	0.39 (9.74)	4.05 (100.00)
Category II	0.44 (10.56)	3.44 (81.58)	0.33 (7.89)	4.22 (100.00)
Category III	0.40 (11.76)	2.20 (64.71)	0.80 (23.53)	3.40 (100.00)
Overall mean	0.54 (13.35)	3.08 (76.40)	0.41 (10.25)	4.03 (100.00)

Figures in parentheses indicate percentage to the respective totals

4.2.4 Working force status

Even though many family members belonging to the age group 15-59 are available in a household, all of them need not participate in the farm operations directly. The opportunity cost of family labour will be high when alternate employment opportunities are available. This coupled with aversion to manual labour results in low participation in farm operations. That is why in spite of a good percentage of labour force available per household; actual working members among them were just 30.19 per cent. The actual working force was found to be the maximum. (45.45 per cent) for the category III. The figure was

the lowest, 25.87 per cent for the category II. While the respondents under category I have 29.77 per cent actual working force among working force per household (Table 4.4).

Table 4.4 Members in the working force per household (number per household)

Category	Labour force	Working force
Category I	3.09 (100.00)	0.92 (29.77)
Category II	3.44 (100.00)	0.89 (25.87)
Category III	2.20 (100.00)	1.00 (45.45)
Overall mean	3.08 (100.00)	0.93 (30.19)

Figures in parentheses indicate percentage to the respective totals

4.2.5 Educational status

The educational level of the farm household members and the adoption of the modern cultivation practices are known to be positively related. When the educational status of sample respondents were analysed, it was noted that 50 per cent of them were having High School level education only. Around eight per cent of the respondents were illiterate. Nearly 30 per cent of the respondents had primary school education while 12 per cent of the respondents obtained degree or above (Table 4.5).

For the respondents under category I, illiterates were minimum (7.92 per cent). While 51.69 per cent of them were High School educated.

Primary and degree educational status were 30.69 per cent and 9.66 per cent respectively. For the category I and III also High School Level education was high with 51.73 and 47.06 per cent respectively. But it was noted that illiterates were the highest (23.53) in category III compared to other categories.

Table 4.5 Educational status of sample respondents (number per household)

Category	Illiterates	Primary	High School	Degree and above	Total
category I	0.32 (7.92)	1.24 (30.69)	2.09 (51.73)	0.39 (9.66)	4.04 (100.00)
category II	0.11 (2.63)	1.22 (28.95)	1.67 (39.47)	1.22 (28.95)	4.22 (100.00)
category III	0.80 (23.53)	0.60 (17.65)	1.60 (47.06)	0.40 (11.76)	3.40 (100.00)
Overall mean	0.33 (8.07)	1.20 (50.00)	2.01 (50.00)	0.49 (12.11)	4.03 (100.00)

Figures in parentheses indicate percentage to the respective totals

4.2.6 Farming status

Analysis of the farming status of sample farmers becomes relevant when the majority of the operators are marginal and small farmers. As the holding size diminishes, they become economically non-viable, compelling the operators to take up non-farm employment to supplement the farm income (Gassan, 1967, Haque, 1985, and Pingali, 1997). This leads to part time farming.

Table 4.6 Farming status of the sample farmers

Category	Full time farmers	Part time farmers	Total
CI	7 (10.61)	59 (89.39)	66 (100.00)
CII	0 (0.00)	9 (100.00)	9 (100.00)
CIII	2 (40.00)	3 (60.00)	5 (100.00)
Total	9 (11.25)	71 (88.75)	80 (100.00)

Figures in parentheses indicate percentage to the respective totals

Nearly 89 per cent farmers were part time farmers. About 11.25 per cent farmers only were full time farmers. Even among the category III, who had a relatively higher farm size, 60 per cent of the respondents were part time farmers. (Table 4.6)

4.2.7 Economic status

The farming status, i.e., whether the operators belong to the category of part time or full time farmers will influence their income pattern, thereby their economic status also. In the study, a farmer who derives his income from farming alone is treated as full time farmers. Table 4.7 reveals the income pattern of sample respondents. Around two third of the income was contributed by agricultural income. It varied from 66 per cent for Category II to 90 per cent for Category III. Income from vetiver accounted for more than 50 per cent of the total agricultural income, indicating the dependency of the sample farmers on this crop enterprise. Income from non- agricultural activities was highest for category II and III.

Table 4.7 Economic status of the sample farmers (Rs./ household)

Category	Gross agricultural income excluding Vetiver	Gross income from vetiver	Gross agricultural income	Gross non-agricultural income	Gross income
Category I	10635.82 (9.76)	69968.08 (64.18)	80603.90 (73.94)	28407.27 (26.06)	109011.17 (100.00)
Category II	10400.00 (9.58)	61634.00 (56.67)	72034.00 (66.35)	36533.33 (33.65)	108567.33 (100.00)
Category III	19320.00 (9.13)	171830.00 (81.23)	191150.00 (90.36)	20400.00 (9.64)	211550.00 (100.00)
Overall mean	11152.05 (9.67)	75396.86 (65.35)	86548.91 (75.02)	28821.00 (24.98)	115369.91 (100.00)

Figures in parentheses indicate percentage to the respective totals

4.2.8 Tenurial status

Farm operators in an area can be owner-cultivators or tenant-cultivators. Tenant is a person who pays rent to a landlord for the use of land. Economic theory suggests that leasing of land is conducive to its more rational use especially in labour surplus economies with skewed distribution of land holdings (Raj, 1975). Various types of tenancy existed in Kerala, ranging from formal tenancy to tenancy at will. However, the Kerala Land Reforms Act, 1963 (as amended in 1969) abolished landlordism in the state and conferred ownership rights to cultivating tenants. Since then, only informal leasing is in vogue in the state (Kumar, 1991). Here, the land is leased strictly for a short period out of the landowner's fear of further protective legislations in favour of tenants in future.

Table 4.8 Land leasing status of respondent farmers

Category	Owned	Rented	Total
Category I	10 (15.15)	56 (84.85)	66 (100.00)
Category II	6 (66.67)	3 (33.33)	9 (100.00)
Category III	3 (60.00)	2 (40.00)	5 (100.00)
Total	19 (23.46)	61 (76.54)	80 (100.00)

Figures in parentheses indicate percentage to the respective totals

The tenurial statuses of sample farmers are depicted in Table 4.8. It can be seen that hardly 24 per cent of the farmers were owner – cultivators, whereas three fourth of the growers were tenant – cultivators. It indicated the wide prevalence of leasing in the area. Nearly 85 per cent of the farmers belonging to category I leased in land for vetiver cultivation. The percentages of leasing were 33 and 40 respectively for category II and III.

4.3 Cropping pattern under owned land

When the cropping pattern under owned land was analysed (Table 4.9), the average area under coconut was found maximum, 0.14 hectares, corresponding to 48.27 percentage to the total land holding. This was followed by area under vetiver, 0.11 hectares (37.93 per cent). But the area under vetiver occupied first position (0.73 hectares) for the category III and coconut had second position (0.58 hectares). The area under vetiver and coconut occupied equal position for the category II (0.31 hectares each)

Table 4.9 Important crops under owned land (in hectares)

Sl. No.	Crops	Category and area under each category			
		Category I	Category II	Category III	Overall
1	Coconut	0.06 (51.72)	0.31 (45.59)	0.58 (40.00)	0.14 (48.27)
2	Cashew	0.00 (0.00)	0.03 (4.41)	0.07 (4.83)	0.01 (3.45)
3	Banana	0.004 (3.45)	0.01 (1.47)	0.05 (3.45)	0.01 (3.45)
4	Tapioca	0.002 (1.72)	0.01 (1.47)	0.00 (0.00)	0.01 (3.45)
5	Vetiver	0.04 (34.48)	0.31 (45.59)	0.73 (50.34)	0.11 (37.93)
6	Others	0.01 (8.62)	0.01 (1.47)	0.02 (1.38)	0.01 (3.45)
	Total	0.12 (100.00)	0.68 (100.00)	1.45 (100.00)	0.29 (100.00)

Figures in parentheses indicate percentage to the respective totals

4.4 Cropping pattern under owned and leased land

As leasing was prevalent in the study area, the cropping pattern was reworked out by including the leased in land also and the details are presented in Table 4.10.

Table 4.10 Important crops under operated holding (in hectares)

Sl. No.	Crops	Category and area under each category			
		Category I	Category II	Category III	Overall
1	Coconut	0.09 (13.04)	0.31 (34.45)	0.58 (35.15)	0.14 (18.11)
2	Cashew	0.00 (0.00)	0.03 (3.33)	0.07 (4.24)	0.01 (1.29)
3	Banana	0.004 (0.58)	0.01 (1.11)	0.05 (3.03)	0.01 (1.29)
4	Tapioca	0.002 (0.29)	0.01 (1.11)	0.00 (0.00)	0.003 (0.39)
5	Vetiver	0.58 (84.64)	0.53 (58.89)	0.93 (56.37)	0.60 (77.63)
6	Others	0.01 (1.45)	0.01 (1.11)	0.02 (1.21)	0.01 (1.29)
	Total	0.69 (100.00)	0.90 (100.00)	1.65 (100.00)	0.77 (100.00)

Figures in parentheses indicate percentage to the respective totals

It can be seen that in general, vetiver accounted for nearly 78 percentage of the total cultivated area. It was followed by coconut (18.11 per cent). Vetiver accounted for 84.64, 58.89 and 56.37 percentage respectively for category I, II and III. Coconut was the next important crop that appeared in the cropping pattern of all the category of farmers.

4.5 Fixed farm investments per household

Table 4.11 Book value of fixed farm investments (Rs./ household)

Category	Farm buildings	Machinery and implements	Irrigation system	Total investments
Category I	1028.03 (19.67)	163.86 (3.14)	4034.00 (77.19)	5225.48 (100.00)
Category II	1733.33 (34.99)	120.33 (2.43)	3100.00 (62.58)	4954.04 (100.00)
Category III	2460.00 (37.04)	64.00 (0.96)	4117.00 (62.00)	6641.40 (100.00)
Overall mean	1196.88 (22.65)	152.72 (2.89)	3934.00 (74.46)	5283.44 (100.00)

Figures in parentheses indicate percentage to the respective totals

The fixed investment of vetiver growers consisted mainly of farm buildings (temporary as well as permanent), machinery and implements (such as spade, sprayer, root cutting knife, pruning sickle, etc) and irrigation system. Being a sandy soil tract, farmers on being conferred the tenancy rights for one year, may usually sink shallow tube wells and install portable pumpsets during the early crop growing season. This will be used till the onset of Mansoon (usually upto the last week of May) and will be dismantled and taken back once the Mansoon sets in. Only those farmers who cultivate in owned land will install deep tube well. The average investment pattern by various categories of farmers is presented in Table 4.11.

The book value of fixed investments was estimated by deducting the annual depreciation from the purchase price or installation cost (as the case may be). On an average, a farm household invested Rs. 5283 on fixed farm

investments. It varied from Rs. 4954 among the category II farmers, to Rs.6641 for the category III farmers. Nearly 75 per cent of the investments were made on irrigation system. This was followed by investments on farm buildings (22.65 per cent). The investments on tools and machinery were minimum (2.89 per cent).

4.6 Fixed farm investments per cultivated area.

Table 4.12 Book value of fixed farm investments (Rs. / ha)

Category	Farm buildings	Machinery and implements	Irrigation system	Total
Category I	1247.55 (19.67)	198.85 (3.14)	4894.92 (77.19)	6341.32 (100.00)
Category II	1033.97 (34.99)	71.88 (2.43)	1849.43 (62.58)	2955.18 (100.00)
Category III	721.86 (37.04)	18.78 (0.96)	1208.21 (62.00)	1948.85 (100.00)
Total	1149.95 (22.65)	146.73 (2.89)	3779.61 (74.46)	5076.29 (100.00)

Figures in parentheses indicate percentage to the respective totals

As the farm investment pattern of a firm is related with the area under plough, fixed farm investments made per cultivated area are more important than the investments made per household. Hence, analysis of fixed farm investment pattern made per cultivated area was made, and the results are presented in Table 4.12.

The farmers in the study area made a fixed farm investment of Rs. 5076 per hectare cultivated. It varied from Rs. 1948 for category III to Rs. 6341 for category I. The nature of farm investment was more on irrigation investments (nearly 75 per cent of total farm investments). This was followed by investment on farm buildings (Rs. 1150 / ha) and investment on machinery and implements (Rs. 147 / ha).

4.7 Explicit costs of cultivation

Explicit cost is the out of pocket expenses made by the farmer. The major item of paid out cost is on organic manures. It accounted for nearly 29 per cent of the explicit cost incurred by the vetiver growers (Table 4.13). On an average, Rs. 25182 per hectare was incurred on organic manures. Groundnut cake, fish meal and wood ash were the three widely used organic manures in the study area. This was followed by expenditure on hired human labour. (Rs. 22500 / ha). Hired labour accounted for about 26 per cent of the explicit cost. This was followed by rental value paid for leased in land for which an amount of Rs. 19354 was incurred accounting for 22 per cent of the explicit cost. The expenditure on fuel and lubricants for the irrigation system was estimated to be Rs. 17282 per hectare. It was also a major item of explicit cost, accounting for nearly 20 per cent of paid out cost. The category I farmers, being sub-marginal had old and inefficient pumps, and had to incur higher operating cost for irrigation on this account. The expenditure on chemical fertilizers and plant protection chemicals were Rs. 2570 and Rs.307 per hectare respectively.

The category I farmers incurred the highest explicit cost on a per hectare basis (Rs. 93560 / ha). This was followed by category II farmers who paid out Rs. 67905 per hectare for growing vetiver. The farmers belonging to category III incurred the least paid out cost (Rs. 61389 / ha).

Table 4.13 Explicit costs incurred by various categories of farmers (Rs. / ha)

Sl.No.	Item	Category I	Category II	Category III	Overall mean
1	Hired labour				
	Male	12500.55 (13.36)	13532.67 (19.93)	12790.30 (20.83)	12632.40 (14.38)
	Female	9986.30 (10.67)	9423.68 (13.88)	9347.34 (15.23)	9867.40 (11.24)
	Total	22486.64 (24.03)	22956.35 (33.81)	22137.64 (36.06)	22499.80 (25.62)
2	Planting material	652.00 (0.70)	625.00 (0.92)	429.35 (0.70)	605.87 (0.69)
3	Organic manures	26218.69 (28.07)	19545.44 (28.78)	22457.24 (36.58)	25181.62 (28.67)
4	Chemical fertilisers	2627.24 (2.81)	2545.36 (3.75)	2126.56 (3.46)	2570.08 (2.93)
5	Plant protection chemicals	305.62 (0.33)	263.75 (0.39)	359.76 (0.59)	306.71 (0.35)
6	Fuel and lubricants	18921.58 (20.22)	12803.18 (18.85)	8427.00 (13.73)	17281.96 (19.68)
7	Rental value of leased land	22341.01 (23.88)	9105.51 (13.41)	5369.57 (8.75)	19354.35 (22.04)
8	Land revenue	7.38 (0.01)	60.51 (0.09)	82.17 (0.13)	20.02 (0.02)
	Subtotal	93560. 16 (100.00)	67905. 10 (100.00)	61389. 29 (100.00)	87820. 41 (100.00)

Figures in parentheses indicate percentage to the respective totals

4.8 Implicit costs of cultivation

Table 4.14 Implicit costs of cultivation (Rs. / ha)

Sl.No.	Item	Category I	Category II	Category III	Overall mean
1	Interest on working capital	5379.71 (22.04)	3904.54 (11.53)	3529.88 (10.98)	5049.67 (19.38)
2	Depreciation	194.01 (0.79)	232.01 (0.69)	168.97 (0.53)	195.37 (0.75)
3	Interest on fixed capital	570.72 (2.34)	265.97 (0.79)	175.40 (0.54)	456.87 (1.75)
4	Family labour	5186.11 (21.24)	4607.18 (13.61)	435.85 (1.36)	4663.26 (17.89)
5	Rental value of owned land	2358.99 (9.66)	15594.49 (46.06)	19330.43 (60.14)	5345.65 (20.51)
6	Supervisory cost	10724.97 (43.93)	9250.93 (27.32)	8502.98 (26.45)	10353.12 (39.72)
	Total	24414.51 (100.00)	33855.12 (100.00)	32143.51 (100.00)	26063.94 (100.00)

Figures in parentheses indicate percentage to the respective totals

Implicit costs are not actually incurred by the farmers (Table 4.13). They are imputed values. As a few farmers only could avail credit facilities, interest on working capital was estimated at 11.50 per cent per annum, which was the prime lending rate prevailing at the time of survey. Hence, this item of expenditure was treated as an implicit cost. The analysis on implicit costs yielded the following results. On an average, the supervisory cost was found to be the highest among the implicit costs. It accounted for an amount of Rs. 10353 per hectare, which is 39.72 per cent of the total implicit costs. The lowest amount of

Rs. 195 (0.75 per cent) was towards the cost of depreciation. For the three categories, supervisory cost was found to be Rs.10725, Rs.9251 and Rs. 8503 respectively. The category I incurred the maximum cost on supervisory cost. The cost on depreciation was found minimum for all categories. Among the three, category I showed the minimum cost of Rs. 194 towards depreciation.

Table 4.15 Cost A, B and C in vetiver cultivation for different categories of farmers (Rs. / ha)

Sl.No.	Item	Category I	Category II	Category III	Overall mean
1	Cost A_1	76792.87 (65.09)	62936.14 (61.85)	59718.57 (63.86)	73711.10 (64.84)
2	Cost A_2	99133.88 (84.03)	72041.65 (70.80)	65088.14 (69.61)	93065.45 (81.72)
3	Cost B_1	99704.60 (84.51)	72307.62 (71.06)	65263.54 (69.80)	93522.32 (82.12)
4	Cost B_2	102063.59 (86.51)	87902.11 (86.38)	84593.97 (90.44)	98867.97 (86.81)
5	Cost C_1	104890.71 (88.91)	76914.80 (75.58)	65699.39 (70.27)	98185.58 (86.22)
6	Cost C_2	107249.70 (90.91)	92509.29 (90.91)	85029.82 (90.91)	103531.23 (90.91)
7	Cost C_3	117974.67 (100.00)	101760.22 (100.00)	93532.80 (100.00)	113884.35 (100.00)

Figures in parentheses indicate percentage to the respective totals

For understanding the cost of production of vetiver, the cost concepts used were cost A_1, cost A_2, cost B_1, cost B_2, cost C_1, cost C_2, and cost C_3. The detailed figures are given in Table 4.15. The average values for the sample as a whole were Rs. 73711, Rs. 93065, Rs. 93522, Rs. 98868, Rs. 98186, Rs.

103531 and 113884 for the Cost A_1, Cost A_2, Cost B_1, Cost B_2, Cost C_1, Cost C_2 and Cost C_3 respectively.

The cost C_3 was highest for the category I (Rs. 117975 / ha) followed by category II (Rs. 101760 / ha). The category III represented for the lowest cost C_3 value of Rs. 93533 per hectare.

4.9 Yield per hectare of various category of farmers

The output estimates include the recovered root only, whether stored or sold. These estimates have been made at the post harvest price actually received or the average price prevailing in the area, as the case may be. Table 4.16 gives the per hectare yield of vetiver root in kilogram for the various categories of farmers.

Table 4.16 Yield of various categories of farmers (Kg / hectare)

Category	Yield
Category I	9611.23
Category II	7968.19
Category III	13649.43
Over all mean	9841.18

The average yield was 9841 kilogram per hectare. The highest yield was recorded for the category III, who produced 13649 kilogram per hectare of vetiver root. This was followed by category I who produced 9611 kilogram per hectare. The category II recorded the least yield of 7968 kilogram per hectare.

4.10 Breakeven output

Breakeven output is an important critical level output at the given cost and price levels. It is the level of output at which the firm is incurring neither a profit nor a loss. Any firm operating above the breakeven output will be making a profit. While any firm operating below the breakeven output will be incurring a loss. Expenditure on human labour, planting materials, manures and chemical fertilizers, plant protection chemicals, fuel and lubricants, rental value of leased in land and interest on working capital are included as variable cost items, while depreciation, interest on fixed capital and rental value of owned land are included as fixed capital items.

Table 4.17 Breakeven output and percentage efficiency levels.

Category	Break-even area (ha)	Cultivated area (ha)	Breakeven output (Kg / ha)	Realised output (Kg / ha)	Efficiency (%)	Margin of safety (%)*
C I	0.96	0.58	7398.10	9611.23	29.91	20.45
C II	0.66	0.53	7677.27	7968.19	3.97	14.04
C III	0.24	0.93	3500.27	13649.43	289.95	75.34
Total	0.62	0.60	5887.78	9841.18	67.15	58.52

* At a selling price of Rs. 13.00 / Kg of vetiver root

The breakeven output for various categories of farmers and the level of efficiency levels are presented in Table 4.17. It can be seen that the farmers belonging to the category I are operating below the required breakeven output level, exhibiting an efficiency level of – 37.84 per cent. The farmers belonging to other two categories were operating much above the required breakeven output

level. Except category III, all other farmers were operating below the breakeven area required.

Margin of safety is the difference between the value of sales and the breakeven value. The margin of safety was positive for all the categories.

4.11 Cost of production of vetiver

The cost of cultivation tried to estimate the various expenses incurred from field preparation till harvesting on a per hectare basis. The cost of production indicates the various expenses incurred per unit output i.e., per kilogram vetiver root produced. The cost of production of vetiver per kilogram based on various cost concepts is presented in Table 4.18.

Table 4.18. Production cost of vetiver (Rs./ Kg.)

Sl. No.	Category I	At Cost A_1	At Cost A_2	At Cost B_1	At Cost B_2	At Cost C_1	At Cost C_2	At Cost C_3
1	Category I	7.99	10.31	10.37	10.62	10.91	11.16	12.27
2	Category II	7.90	9.04	9.07	11.03	9.65	11.61	12.77
3	Category III	4.38	4.77	4.78	6.20	4.81	6.23	6.85
	Total	7.49	9.46	9.50	10.05	9.98	10.52	11.57

On an average, result on per kilogram cost of production at cost C_3 level pointed a value of Rs. 11.57. The category II represented for the highest cost of Rs. 12.77 for producing one kilogram of ultimate marketable vetiver root. While, category III possessed the least value of Rs. 6.85 towards the production of one kilogram of vetiver root.

4.12 Income measures in connection with vetiver production

Table 4.19 Income measures regarding vetiver cultivation (Rs. / ha)

Sl. No.	Income measures	Category I	Category II	Category III	Total
1	Gross income	120905.19	116112.19	184530.48	126644.17
2	Farm business income	44112.32	53176.05	124811.91	52933.07
3	Own farm business income	21771.31	44070.54	119442.34	33578.72
4	Family labour income	18841.60	28210.08	99936.51	27776.20
5	Farm investment income	5860.23	30212.43	110503.51	18562.34
6	Net income	2930.52	14351.97	90997.68	12759.82

The profitability of crop production can be judged in a better way from the income measures, which include farm business income, farm family labour income, farm investment income and net income. To measure the profitability of crop production, income measures were worked and the results are given in Table 4.19.

The gross income per hectare amounted to Rs. 126644 per hectare. The category III possessed a maximum gross income of Rs. 184530 per hectare followed by category I, whose gross income per hectare was Rs. 120905 per hectare. The least value was shown by second category whose figure was Rs. 116112 per hectare.

The net income was positive for all categories of farmers. The values for net income were Rs. 2931, Rs. 14352 and Rs. 90998 for the categories I, II and III respectively.

4.13 Benefit-cost ratios for the various categories under different cost levels.

Table 4.20 Benefit-cost ratio measures for vetiver cultivation

BCR at	Category I	Category II	Category III	Total
Cost A_1	1.57	1.84	3.09	1.72
Cost A_2	1.22	1.61	2.84	1.36
Cost B_1	1.21	1.61	2.83	1.35
Cost B_2	1.18	1.32	2.18	1.28
Cost C_1	1.15	1.51	2.81	1.29
Cost C_2	1.13	1.26	2.17	1.22
Cost C_3	1.02	1.14	1.97	1.11

Benefit-cost ratio (BCR) is worked out by dividing the gross income realised by the cost incurred. It will indicate the returns per rupee invested in the enterprise. Benefit-cost ratios for the various categories under different cost levels were presented in Table 4.20.

It can be seen that the BCR was more than unity for all the categories at the paid out costs (at cost A_1, as well as Cost C_1). However, the BCR lowers while the implicit costs are also taken into account. The BCR was 1.02, 1.14, and 1.97 at cost C_3 for category I, II and III respectively.

4.14 Source of fund for vetiver cultivation

As the vetiver production units were small, family-based systems, own fund may not be sufficient to meet the cultivation expenses. It was in this context that the flow of debt capital into the production system was analysed. The details of external financing to the production system are presented in Table 4.21.

Table 4.21 Details of institutional and non-institutional supply of credit for vetiver cultivation

Category	Institutional credit	Non-institutional credit	Total
A) No. of borrowers			
Category – I	18 (75.00)	26 (96.30)	44 (86.27)
Category – II	3 (12.50)	0 (0.00)	3 (5.88)
Category – III	3.00 (12.50)	1 (3.70)	4 (7.84)
Total	24 (100.00)	27 (100.00)	51 (100.00)
B) Amount of loan (Rs./ha)			
Category – I	12781.16 (72.96)	4736.70 (27.04)	17517.86 (100.00)
Category – II	15690.35 (100.00)	0.00 (0.00)	15690.38 (100.00)
Category – III	11802.57 (73.33)	4291.85 (26.67)	16094.42 (100.00)
Total	12977.37 (75.47)	4217.82 (24.53)	17195.19 (100.00)

Figures in parentheses indicate percentage to the respective totals

4.15 MARKETING SYSTEMS

Agricultural marketing systems play a pivotal role in the socio-economic welfare of the predominantly cash crop growing farmers.

Government and co-operative marketing systems were not operating in the study area, leaving the marketing activities entirely to the private marketing systems. The producers were small, family-based and unorganised farmers. The private traders were mostly pre-harvest contractors, local traders and wholesalers operating on personal relations. The local traders were neither connected with the distribution of production inputs, nor provide any sort of production or investment credit. The cash requirement for raising the next crop immediately after the harvest of previous crop and the pressure to repay moneylender credit compelled the farmers to dispose off the vetiver roots immediately after the harvest. The pre-harvest contractors provided some advance amount as credit. No norm was followed for this. The amount depends upon the discretion of the pre-harvest contractor based on past experience, acreage and rating of the farmers.

As the price is fixed on weight basis, the farmers were afraid of loss of weight due to retention for longer period and thereby income loss. All the sample farmers sold the dried roots as such, without undertaking any processing activity, product development or value addition. Vetiver root meant for oil extraction is to be harvested between the 18^{th} an 24^{th} as the oil content is maximum at this time. Since the harvesting is completed within 12 months, the vetiver cultivated in Chavakkad is not utilised for oil extraction; but for mat weaving, making fans (Plate 4.8), as a packing material in air coolers and for ayurvedic formulations only. Thus the farmers were virtually operating in a buyers market. There were no institutional arrangements for market information or market intelligence. The producers depended upon the traders entirely for the price quotations. The traders were well organised, and the farmers felt that they were acting in concert in fixing prices.

4.15.1 Marketable surplus

Table 4.22 Estimation of marketable surplus

Category	Production (Kg /ha)	Farm retention (Kg /ha)	Marketable surplus (Kg /ha)
Category I	9611.23 (100.00)	0.27 (0.003)	9610.96 (99.997)
Category II	7968.19 (100.00)	0.04 (0.001)	7968.15 (99.999)
Category III	13649.43 (100.00)	0.75 (0.005)	13648.68 (99.995)
Over all mean	9841.18 (100.00)	0.29 (0.003)	9840.89 (99.997)

Figures in parentheses indicate percentage to the respective totals

Marketable surplus refers to the surplus available for sale over the farm retentions. Generally, farm retentions of households consist of seed requirements, family consumption requirements and kind wages. However, in the present case there were no retentions for seed requirement. There were also no kind payment systems. The payments of hired labourers were settled fully in cash. So, the farm retentions constituted only a small portion of the vetiver root retained by the households for preparing indigenous medical formulations for household use in which vetiver is a component. It is well known that proper disposal of marketable surplus helps to realise higher returns. Table 4.22 presents the marketable surplus estimated for the various categories of farmers.

It may be noted that more than 99 per cent of the output is marketed, leaving a negligible proportion as farm retention. Category wise also, the same

trend is visible. This is understandable also. Vetiver is a cash crop, and hence raised mainly for the market.

4.15.2 Marketing channels and the disposal pattern of marketable surplus

Marketing channels are the routes through which the product moves from the primary producers to the consumers. The choice of marketing channels depends mainly upon the quantity of the produce to be sold and the availability of facilitating services. The following marketing channels were identified in the marketing of vetiver roots:

1. Producer → Wholesaler → Processor → Consumer
2. Producer → Wholesaler → Retailer → Consumer
3. Producer → Village Trader → Retailer → Consumer
4. Producer → Pre-harvest Contractor → Processor → Consumer
5. Producer → Wholesaler → Drug Dealer → Consumer
6. Producer → Drug Dealer → Consumer
7. Producer → Commission Agent → Wholesaler → Processor / Drug Dealer / Retailer → Consumer

The major channels were the 1st and 5th channels. Around 45 per cent of the produce were accounted by these channels (Table 4.23). This was followed by 3rd and 4th channels. The village traders could procure 29 per cent of the produce while the pre-harvest contractors handled 25 per cent of the produce.

Table 4.23 Disposal pattern of marketable surplus

Sl. No.	Sale of produce to	No. of sellers	quantity sold (kg)
1	Pre-harvest contractors	17.00 (21.25)	98622.00 (24.52)
2	Village traders	29 (36.25)	116850.00 (29.05)
3	Commission agents	7.00 (8.75)	7036.00 (1.75)
4	Wholesalers	33.00 (41.25)	179235.00 (44.56)
5	Drug dealers	1.00 (1.25)	500.00 (0.12)
	Total	87.00* (108.75)	402243.00 (100.00)

Figures in parentheses indicate percentage to the respective totals

* The difference in total is on account of seven farmers selling simultaneously to the village traders and wholesalers

4.15.3 Marketing costs and margins

Marketing costs and margins assume particular importance in a predominantly agricultural country like India, where the agricultural price policy aims at safeguarding the interest of both producers as well as consumers. Generally, high marketing costs and margins are considered to be indicators of inefficiency of the marketing system. Therefore, a lower price spread, viz., the difference between the price paid by the consumer and the price received by the

producer for an equivalent quantity of farm produce is desirable (Acharva and Agarwal, 1987). This will result in higher producer's share.

Table 4.24 Marketing costs and margins in rupees per kilogram for dry vetiver roots in the local market at Thrissur

Sl. No.	Particulars	Amount in Rs./kg	Percentage
1	Price received by the producer	13.00	72.22
2	Marketing cost incurred by the producer	0.68	3.78
3	Net price received by the producer	12.32	68.44
4	Marketing cost incurred by the village trader	1.78	9.89
5	Price received by the village trader (price paid by the retailer)	15.44	85.78
6	Marketing margin to the village trader	0.66	3.67
7	Marketing cost incurred by the retailer	1.00	5.56
8	Price paid by the consumer (price received by the retailer)	18.00	100.00
9	Retailer's Margin	1.56	8.66
10	Price spread	5.00	27.78

Table 4.24 depicts the marketing costs and margins in the movement of dry vetiver roots from the producers to the consumers at the local market in Thrissur through the most common market channel of Producer - Village Trader – Retailer - Consumer. The gross producer's share was 72.22 per cent of the consumer rupee while the net producer's share was 68.44 per cent. This is a reasonably good share. Among the marketing costs incurred by the intermediaries, the village trader incurred nearly 10 per cent of the consumer price,

while the retailer incurred nearly six per cent of the consumer's price. However, the marketing margin earned by the retailer (8.67 per cent) was higher than that of village trader (3.67 per cent).

Table 4.25 Marketing costs and margins in rupees / kilogram for dry vetiver root at Bangalore market

Sl. No.	Particular	Amount in Rs. / kg	Percentage
1	Price received by the producer (price paid by the commission agent)	12.33	56.04
2	Marketing costs incurred by the producer	0.68	3.09
3	Net price received by the producer	11.65	52.95
4	Marketing cost incurred by the commission agent	0.73	3.32
5	Price received by the commission agent (price paid by the wholesaler)	13.67	62.14
6	Marketing margin to the commission agent	0.61	2.77
7	Marketing cost incurred by the wholesaler	1.50	6.82
8	Price received by the wholesaler	19.58	89.00
9	Marketing margin by the wholesaler	4.41	20.05
10	Marketing cost incurred by the retailer	1.00	4.55
11	Price received by the retailer (price paid by the processor)	22.00	100.00
12	Marketing margin by the retailer	1.42	6.45
13	Price spread	9.67	43.95

In the interstate trade of dry vetiver root, the wholesalers from Bangalore, Pondichery, Madras and Bombay arrange the procurement through the commission agent. As the bulk of the produce was moving to the Bangalore market, the marketing costs and margins involved in the movement of dry vetiver roots from production centres at Chavakkad to the Bangalore market was traced and depicted in Table 4.25

The gross as well as net producer's share in this channel was low (56.04 and 52.95 percentages respectively). Among the marketing costs incurred by the intermediaries, the wholesaler incurred the highest cost (13.23 per cent of consumer's price). The wholesaler and the retailer incurred a marketing cost to the tune of 6.82 and 4.55 percentages respectively of the consumer's price. The highest marketing margin was realised by the wholesaler (20.05 per cent of the consumer's price). This was followed by the margin to the retailer (6.45 per cent), and to the commission agent (2.77 per cent).

4.15.4 Marketing efficiency

Table 4.26 Marketing efficiency indices for Thrissur and Bangalore markets.

Sl. No.	Particular	Thrissur	Bangalore
1	Value of good sold / consumer's price (V)	18.00	22.00
2	Total marketing cost including margin (I)	5.00	9.67
3	Marketing efficiency index (V / I) – 1	2.60	1.28

It can be seen that both marketing channels were operating efficiently, because both had a marketing efficiency index of more than unity. However, the marketing efficiency index of domestic market was higher (2.60) than that of the inter-state market (1.28).

4.16 CONSTRAINTS IN VETIVER PRODUCTION AND MARKETING

Constraints can be broadly defined as limiting factors (Barker *et al.*, 1985). Some constraints in agricultural production are governed by biological laws and hence beyond the control of human intervention. On the other hand, technological, physical, economic and social constraints are within the control of human intervention. The constraints in production and marketing of vetiver are presented in Table 5.28.

Among the production related constraints, non-availability of production credit from institutional sources (commercial banks, co-operative societies or regional rural banks) was perceived to be the most important one by the vetiver growers. Being a capital –intensive crop, this naturally led the marginal and small producers into the clutches of the private moneylenders, who charged an interest rate as high as 84 per cent per annum. Farmers reported other malpractices like charging of advance interest. 21 farmers from category I (32 per cent) perceived this as a major problem. The second major constraint reported was the system of demanding high rental charges for the leased in land based on previous year prices. The average price of dry vetiver root during 1999-2000 was fluctuating between Rs.20 and Rs.25. So a higher rental charge of Rs. 24700 per hectare was quoted for the planting season 2000-2001 as against the previous year charge of Rs.18,000 per hectare. But the price of dry vetiver root fell to Rs.13.00 / kg during the year 2000-2001. This problem was also felt more acutely by category I farmers. The third problem was the escalating cost of irrigation fuel, particularly that of kerosene. The high labour wages and lower labour productivity were the other two important production constraints.

Table 4.27 Constraints in vetiver production and marketing

Sl. No	Constraints	As perceived by farmers (No.)				Total score	Rank
		Category I	Category II	Category III	Overall		
1	**Production related**						
A	High labour wages	6	2	0	8	63	IV
B	Non availability of labour during peak season	1	0	2	3	16	VIII
C	Low labour productivity	4	1	0	5	47	VI
D	Escalating prices of manures and fertilizers	4	0	0	4	35	VII
e	Escalating cost of fuel charges for the irrigation system	11	1	1	13	97	III
f	Increasing rental charges for land	15	1	0	16	126	II
G	Non availability of production credit and dependency on private money lender	21	0	1	22	180	I
H	Location of leased in land far away from dwelling unit and resultant supervision risk	6	0	0	6	54	V

2	**Marketing related**						
A	Low price and price risk due to inter year price fluctuation	55	9	5	69	282	I
B	Delayed payment for the settlement of transaction	25	3	5	33	104	II
C	Loss of weight during storage	15	1	3	19	62	III
D	Lack of group efforts in marketing including the absence of marketing co-operatives	4	3	5	12	13	IV
3.	**Physical constraints**						
A	Water logging	1	0	0	1	-	-
4.	**Institutional constraints**						
A	Absence of linkage with Krishi Bhavans	1	0	0	1	-	-

Price risk due to yearly fluctuation was the major marketing constraint reported. 86 per cent of the farmers pointed out this as a major problem. Needless to mention, the category I farmers felt the severity more. The second major marketing problem was the system of payment in which the settlement of the transaction is made in instalments. Traders or their agents would come in contact with the producers, make a nominal advance payment and take possession of the marketable surplus. The payment to the producers is made after

the traders finally dispose off the produce. This delay was leading to liquidity problem, compelling the farmers to depend upon the private money lenders or agricultural demand loan against gold (ADLG) for meeting the cash expenses connected with raising the next crop immediately after harvest. The risk associated with loss in weight during storage and lack of group efforts in marketing including the absence of the functioning of marketing co-operatives were the next two constraints reported.

One farmer reported physical constraint of water logging during rainy season because his plot was close to the seacoast. The absence of linkage with Krishi Bhavans was an institutional constraint perceived by another farmer. As two respondents only indicated these constraints, they could not be ranked.

DISCUSSION

CHAPTER V

DISCUSSION

The analyses carried out in the previous chapter are discussed in this chapter under the following heads.

5.1 Socio-economic characteristics of the sample households
5.2 Economic aspects of vetiver production system
5.3 Economic aspects of vetiver marketing system
5.4 Constraints in the production and marketing of vetiver
5.5 Policy implications

5.1 Socio-economic characteristics of sample households

An understanding of the socio-economic background of sample households would be very useful for a proper understanding of their farming systems. Hence, the results with regard to the socio-economic characteristics of the sample farmers are discussed below.

Majority of the growers were sub-marginal (below 0.50 ha) and marginal farmers (0.50 – 1 ha). They constituted nearly 94 per cent of the growers studied. The average holding size was just 0.31 ha, thereby illustrating that vetiver enterprise in the study area was basically a small-holder venture. The farmers were mostly (77 per cent) tenant cultivators, who leased in land from large land owners, annually by paying rent in cash.

Nearly one fourth of the growers were owner-cultivators (Fig. 5.1). The extend of leasing was more prevalent among the sub-marginal farmers and relatively less among the marginal and small farmers. The average family size

was four. Although 76 per cent of the family members were in the labour force, a mere 30 per cent of them formed the working force. Half of family members had the educational attainment of High School, while 30 per cent had attended the Primary School only.

The farming status analysis indicated that nearly 89 per cent of the farmers were part-time farmers (Fig. 5.2). Their dependency on agriculture was low except for vetiver cultivation. On an average agricultural gross income constituted a lion's share (three-fourth of the total household income) (Fig 5.3). While non-farm income had a relatively lesser share (one fourth of the gross household income), income from vetiver provided 65 per cent of the annual gross household income. The sub-marginal and marginal farmers had higher dependency on non-farm income. This was expected also as the extremely small size of the farms made them non-viable units, and they had to look for employment elsewhere to supplement the household income. Many of the cultivators were working as agricultural labourers or running some petty business.

The cropping pattern on owned holding showed the dominance of vetiver and coconut. The cropping pattern had a low share of food crops, indicating the farmer's strategy of optimising higher farm income per unit area successfully integrating cash crops. As the leased lands were sandy, suitable for marginal crops like vetiver, the cropping pattern owned as well as the leased in land showed a still higher share of vetiver (78 per cent) in the crop mix.

The fixed investments on farm assets were very low per household as well as per hectare cultivated land because of the prevalence of leasing in the area. Interestingly, the small farmers (category III) had larger investment per household while; the marginal farmers had larger investments per cultivated area. Investment on irrigation system dominated the farm investments, covering nearly 75 per cent of the fixed farm investments. It indicated the need for irrigation

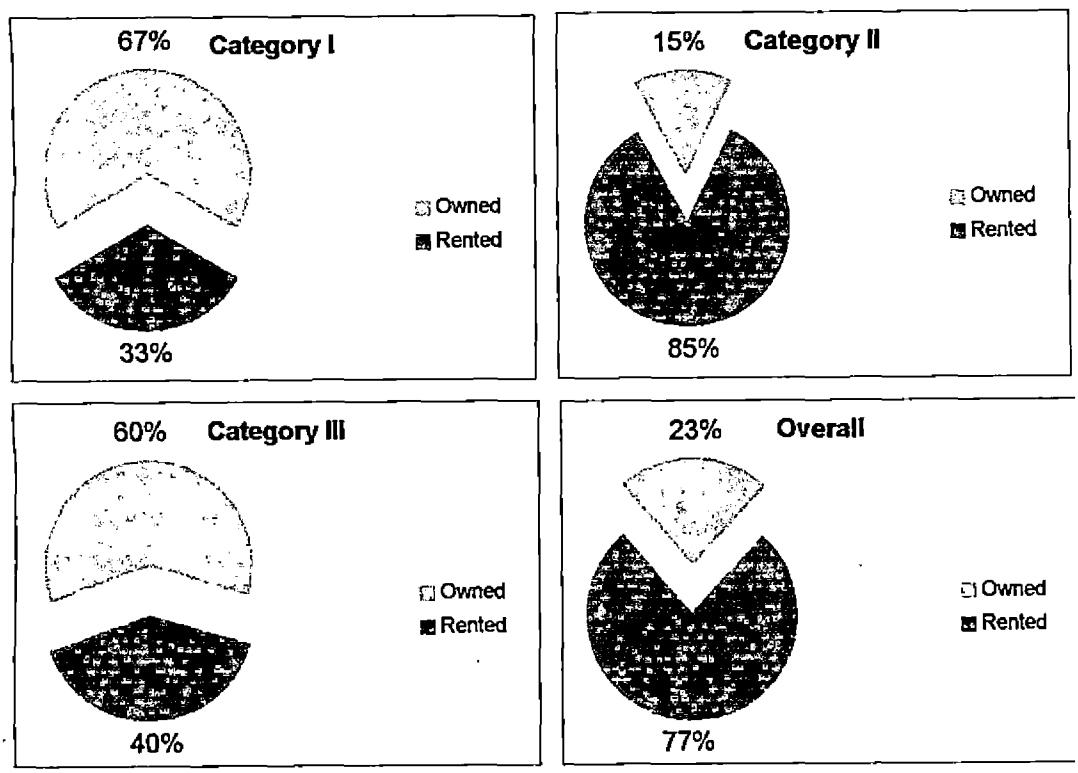


Fig. 5.1 Tenurial status of the sample farmers

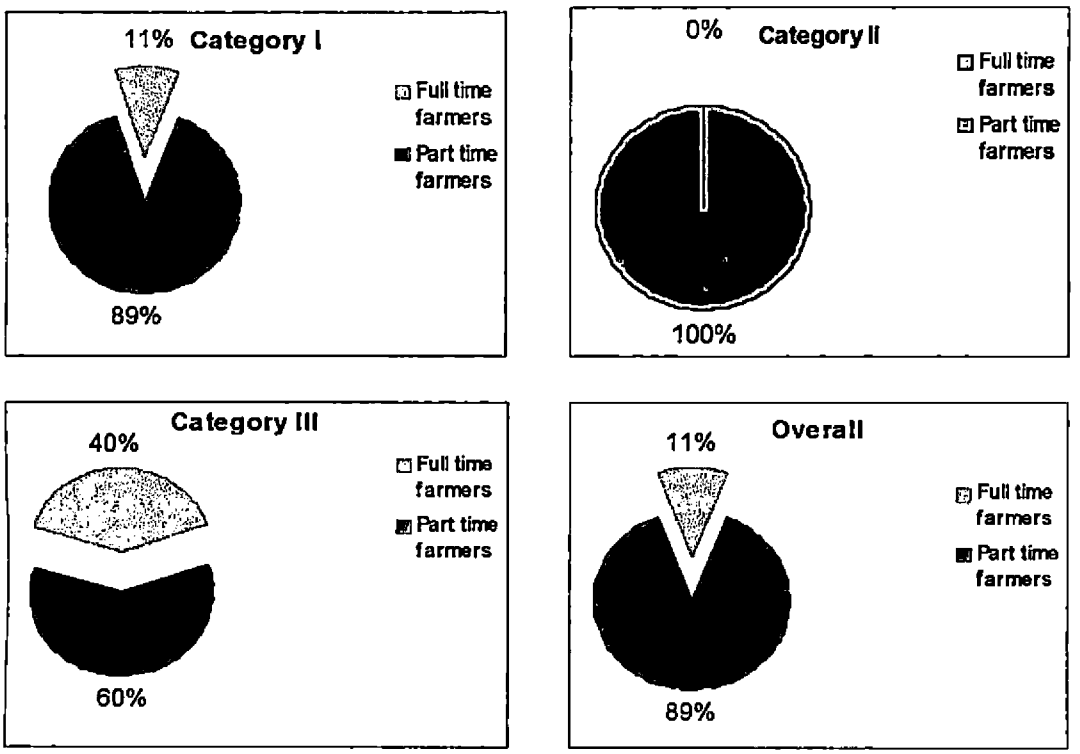


Fig. 5.2 Farming status of the sample farmers

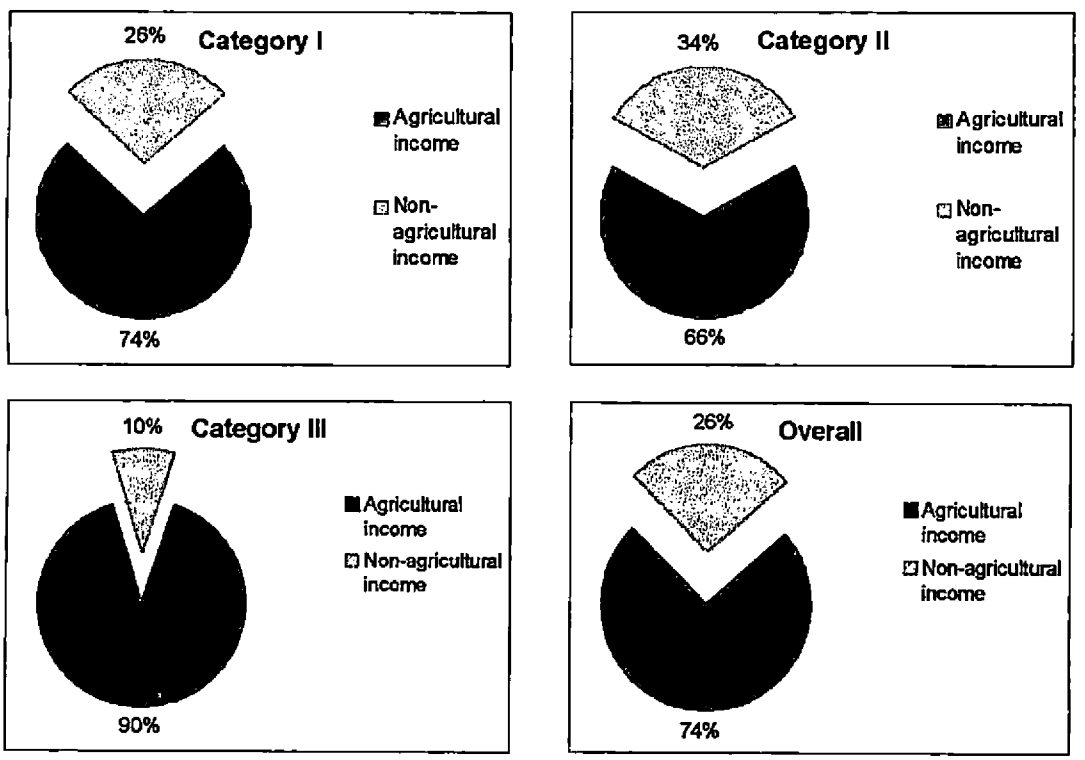


Fig. 5.3 Economic status of the sample farmers

system for successful cultivation of vetiver in the sandy tracts, with low water holding capacity.

5.2 ECONOMIC ASPECTS OF VETIVER CULTIVATION SYSTEM

5.2.1 Explicit and implicit costs

The analysis of the explicit cost indicated a declining cost pattern with increasing farm size, i.e., the explicit cost was exhibiting an inverse relationship with the farm size. The paid out costs were mostly on working capital items in which economy of large size was visible. The economies of size are more common and occur when growth in the scale of production results in increased output with les than proportionate production costs, by spreading the overhead costs over greater output (Johnson, 1991). The major component of explicit cost was organic manures (Fig. 5.4). Growers, irrespective of the size status relied upon this critical input for better performance of crop, grown in the sandy soil with a low nutrient status, and lower nutrient holding capacity. The small farmers used this input more intensively than the sub-marginal and marginal farmers. Even though farm yard manure was a cheaper substitute for ground nut cake, farmers were averse to its use because of high incidence of root rot after its use. The second major component was hired human labour. As the operated holding size increased, there was more intensive use of hired human labour. The findings of Rudra (1982), Jayesh (1994) and Raja (2000) also support this. Expenditure on chemical fertilisers was nominal, registering four per cent of the total paid out cost. Expenditure on fuel and lubricants as well as the rental value of leased land decreased absolutely as well as proportionally with increase in size group.

Implicit cost was lowest for category I, and was found to increase for category II and then decrease for category III, exhibiting an inverted 'U' shape. Major items of implicit costs were accounted by rental value of owned land and

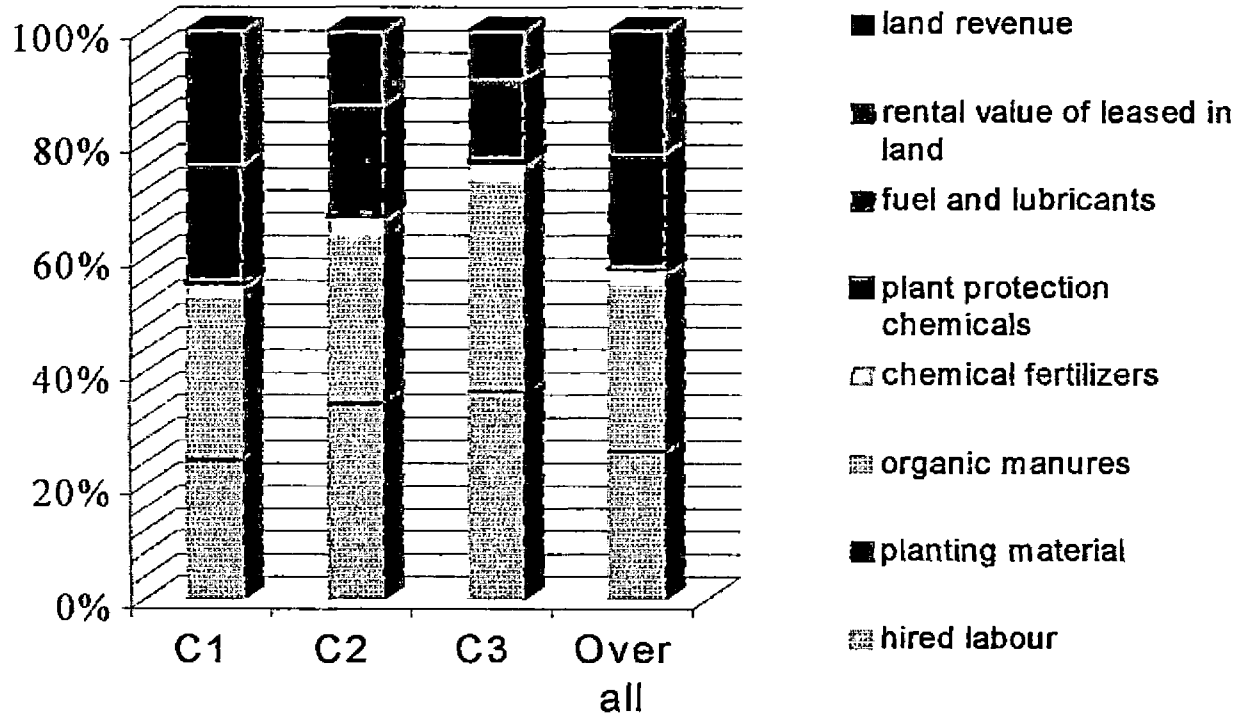


Fig 5.4 Explicit costs of cultivation for various category of farmers

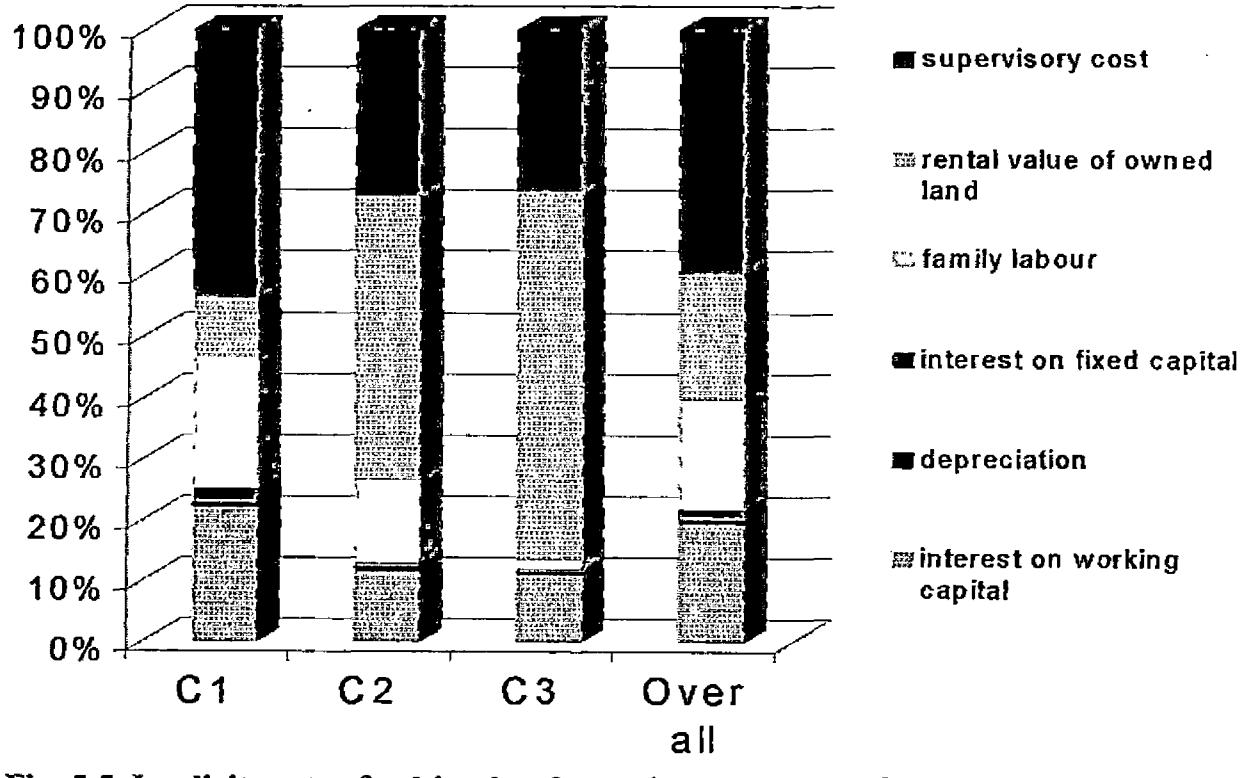


Fig 5.5 Implicit costs of cultivation for various category of farmers

supervisory cost (Fig. 5.5). These two accounted for 60 per cent of the implicit cost. Unlike the pattern of hired human labour utilisation, the intensity of family labour decreased with increase in holding size, exhibiting an inverse relationship. This is natural, and in concurrence with the results of Natarajan (1982) and Barker *et al.* (1985) for paddy crop and Raja (2000) for mushroom production.

5.2.2 Cost concepts in vetiver production

The cost of cultivating one hectare of vetiver at various cost concepts are presented in Table 4.15. On an average, cost A_1 accounted for nearly 65 per cent of the total cost (Fig. 5.7). The cost A_1, A_2, B_1, B_2, C_1, C_2 and C_3 were Rs.73711, Rs.93065, Rs.93522, Rs.98868, Rs. 98186, Rs.103531 and Rs.113884 per hectare respectively. The cost at different levels revealed a declining trend with the increase in farm size, thereby indicating an inverse relationship. This was in line with the observations of Karn (1999) and Balakrishnan (2000).

5.2.3 Yield per hectare and breakeven output

The yield of dry vetiver root for the sample farmers as a whole was 9841 kilogram per hectare. Across the size groups, the yield revealed 'U' shape, whereby the sub-marginal farmers had productivity higher than that of marginal farmers, but less than that of small farmers (Fig. 5.6). Such productivity pattern though not common for Indian agriculture as a whole has been reported for Kerala by Rudra (1982), Chadha and Sharma (1982) and Babu (1983) for paddy crop. Sub-marginal and marginal farmers were operating less than the required breakeven area at the given cost and price levels (Table 4.17). Only the small farmers were operating above the breakeven acreage. However, the marginal and small farmers were realising output above the breakeven level while the sub-marginal farmers were realising output below the breakeven level. The analysis

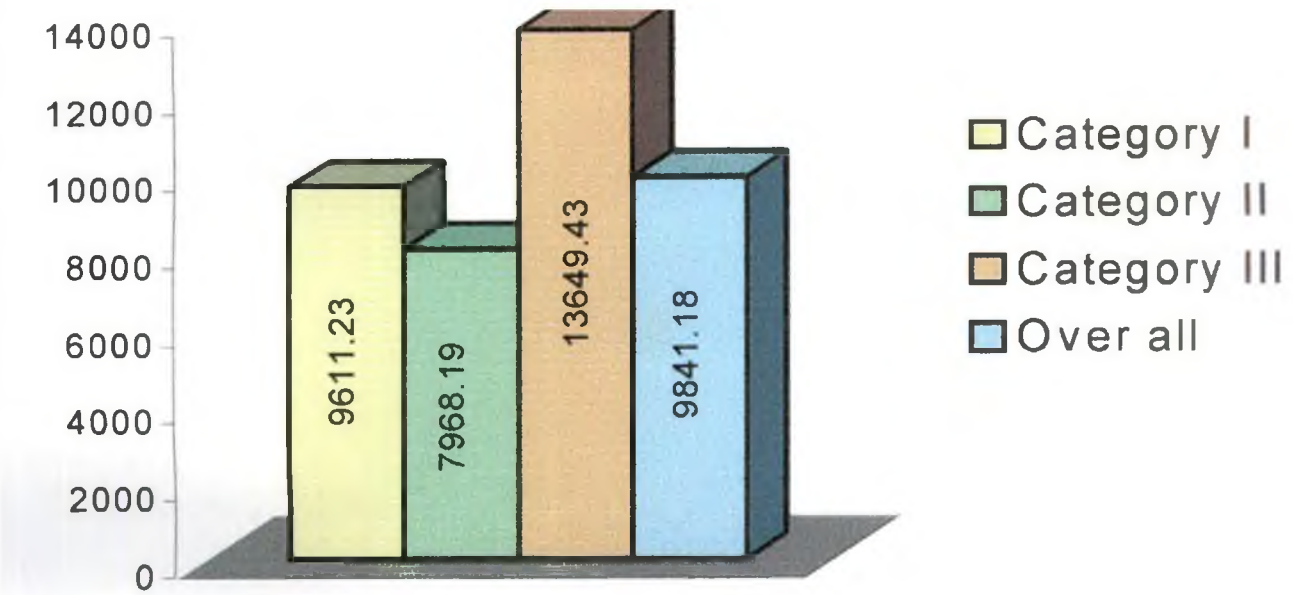


Fig. 5.6 Yield (Kg) per hectare of cultivation by various category of farmers

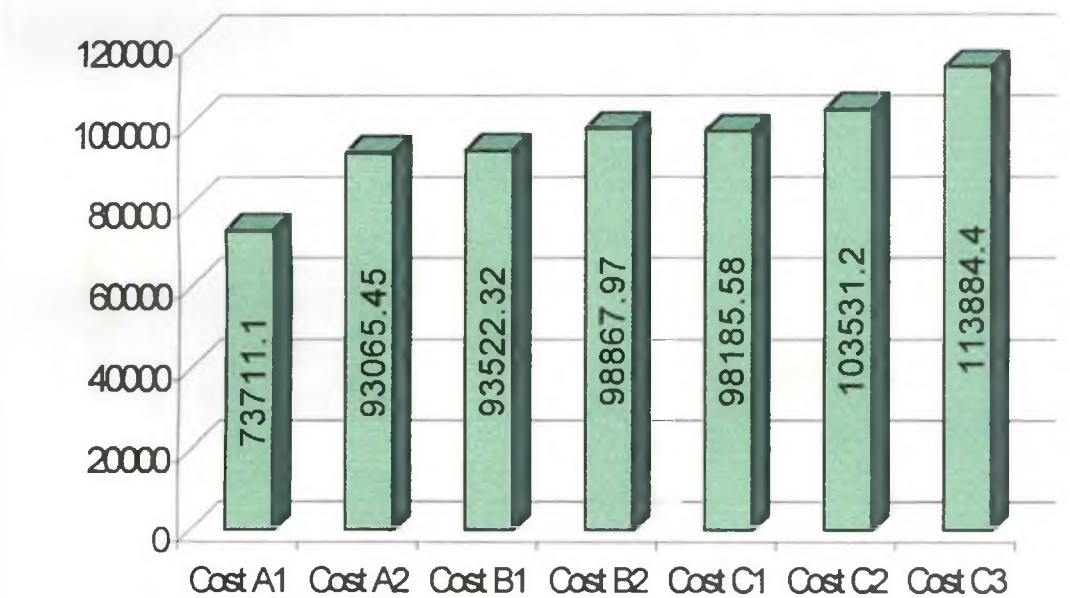


Fig. 5.7 Costs A, B and C per hectare of cultivation

conclusively proved that the vetiver cultivation is a sustainable proposition only for the small farmers. Any fall in price may result in inefficient production for both sub-marginal and marginal farmers as their cost of production is already very close (Rs. 12.27 / kg and Rs. 12.77 / kg respectively) to the market price of Rs. 13 / kg

5.2.4 Income measures in vetiver production

The gross income of the various categories of farmers also showed a 'U' shaped pattern, whereby gross income of sub-marginal farmers were higher than marginal farmers, but less than that of small farmers. The 'U' shaped yield levels probably contribute this trend across the size groups (Table 4.19). Such a trend was visible for farm business income and farm family labour income. The same trend was reported earlier by Jayesh (1994) for ginger crop. The net income was positive for the entire category of farmers. In general, the benefit – cost ratio (BCR) at cost A_1 was 1.72 while it was 1.11 at cost C_3. The BCR was above unity at the various cost levels for the entire category of farmers. (Table 4.20).

5.2.5 Source of fund for cultivation

Vetiver production units in the area were small, family-based systems. Own fund was always found insufficient for raising the crop for one season. Hence, the dependency on debt capital was prevalent in the area. Both non-institutional and institutional credits supported the farmers for crop production. More than half of the farmers depended upon debt capital for vetiver production. Just 24 per cent of the sample respondents could avail institutional credit and 27 per cent depended upon non-institutional sources of credit like private moneylenders and pre-harvest contractors operating in the area.

The quantum of loan made available was too inadequate compared to the working capital requirements.

5.3 Economic aspects of vetiver marketing system

The discussion on marketing aspects covers marketable surplus, marketing channels, and the marketing efficiency.

Government and co-operative marketing systems were not operating in the study area, leaving the marketing activities entirely to the private marketing systems. The producers were small, family-based and unorganised farmers. The private traders were mostly pre-harvest contractors, local traders and wholesalers operating on personal relations. The local traders neither distributed production inputs, nor provided any sort of production or investment credit.

As the price is on weight basis, the farmers were afraid of loss of weight due to retention for longer period and loss of income thereby. All the sample farmers sold the dry roots as such, without undertaking any post harvest processing activity, product development or value addition. The vetiver cultivated in Chavakkad is mainly used for mat weaving, making fans and ayurvedic formulations and as a packing material in air coolers. Thus the farmers were virtually operating in a buyer's market.

There is no institutional arrangement for market information or market intelligence. The producers depend entirely upon the traders for the price quotations.

5.3.1. Marketable Surplus

The quantity of dry vetiver roots retained for farm and household use was negligible. This is because the dry roots are not required for seed purpose

or daily consumption. Besides, there were no kind payment systems. Hence, the farm retentions constituted only a small portion of the vetiver roots retained for preparing indigenous medical formulations for household use in which vetiver is a component.

The marketable surplus was estimated for the various categories of farmers (Table 4.22). It was noted that more that 99 per cent of the out put was marketed (Fig 5.8). The same trend was noted category wise also. Vetiver is a cash crop and hence is raised mainly for the market. There was no on farm processing or value addition except cleaning and solar drying. The entire marketable surplus was disposed as dry roots.

5.3.2 Marketing channels and disposal pattern

Among the seven marketing channels identified, Producer – Wholesaler – Processor – Consumer and Producer – Wholesaler – Drug Dealer – Consumers were found to be the most predominant channels operating in the study area. The wholsalers procured 45 per cent of the total production (Fig 5.8). Village traders also could procure 29 per cent of the produce while the pre-harvest contractors handled 25 per cent of the produce. These marketing intermediaries together accounted for 98 per cent of the produce handled at the farm level.

5.3.3. Marketing efficiency

The procured dry roots were either sold in the local markets at Thrissur or transported to the interstate market at Bangalore. Hence, the producer's share and price spread were studied with respect to these two markets. The results are presented in Table 4.24 and 4.25. It was found that for the local market, the net producer's share was 68.44 per cent of the consumer rupee. The

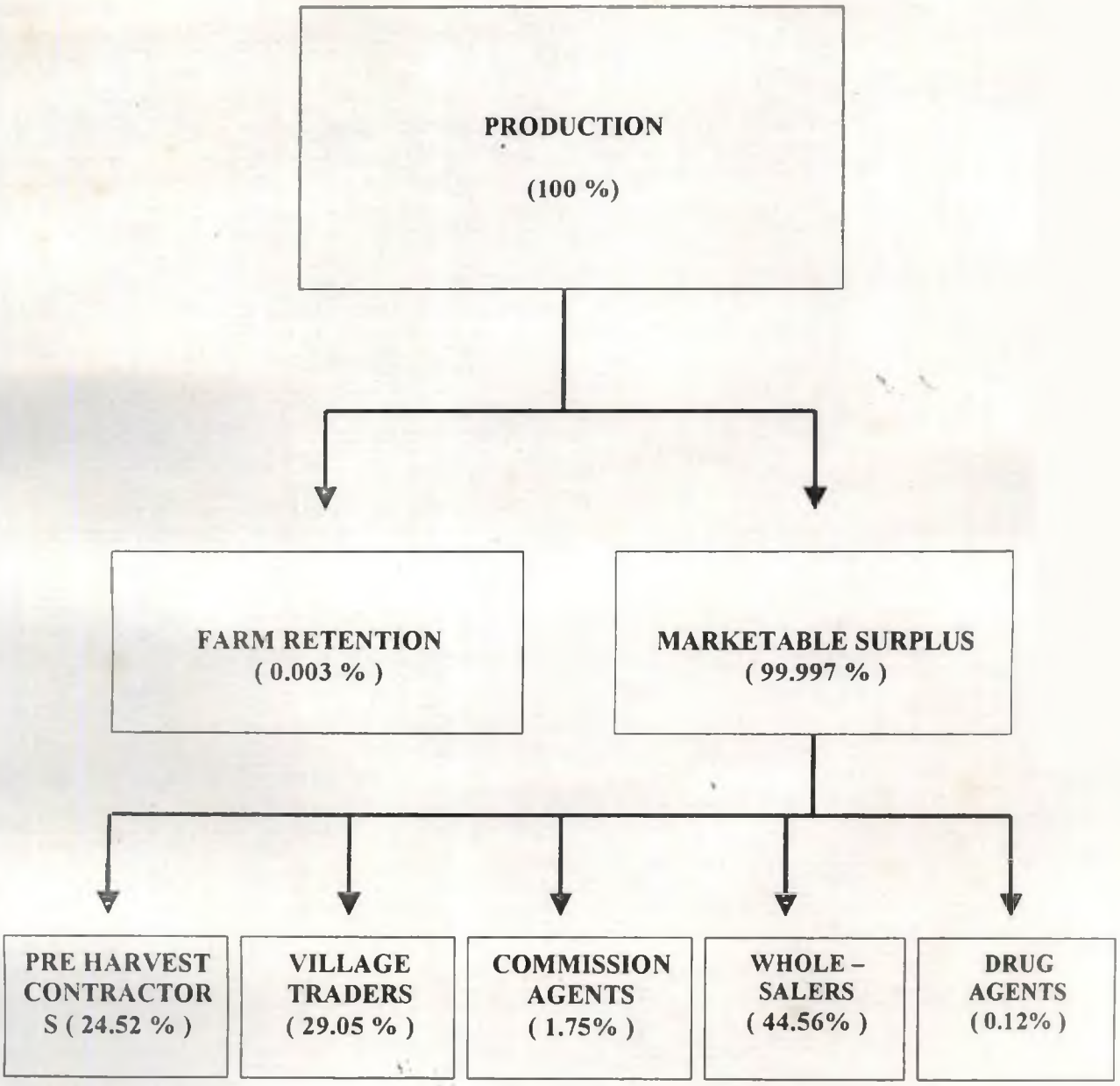


Fig. 5.8 Estimated flow of vetiver root through different marketing channels

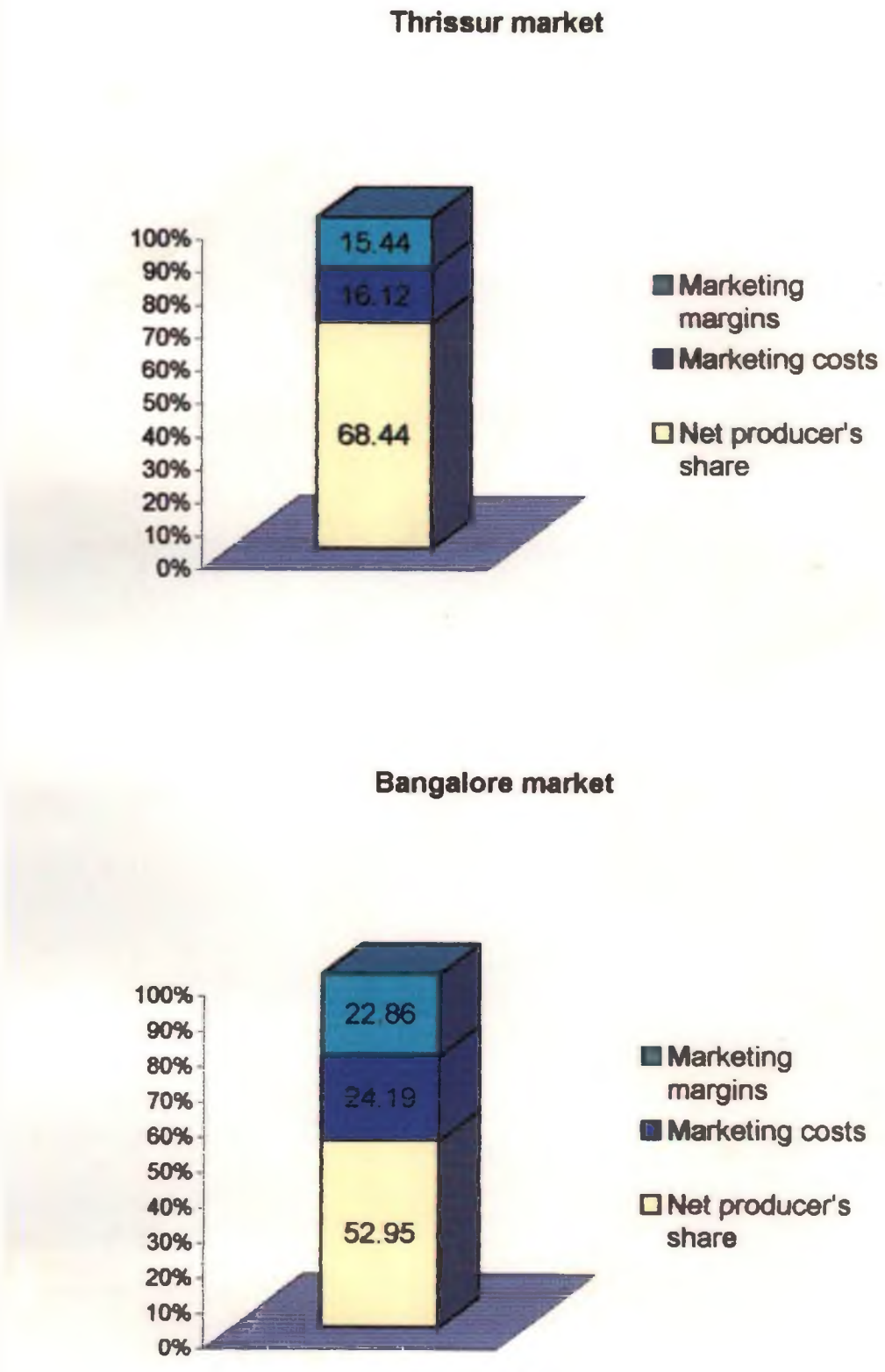


Fig. 5.9 Producer's share and price spread under local market at Thrissur and inter-state market at Bangalore

total price spread was found to be 27.78 per cent. The margin of the village traders (9.89 per cent) was found to be highest (Fig. 5.9).

In the interstate trade of dry vetiver root, the wholesalers from Bangalore arranged procurement through commission agents. The net producer's share was low (52.95 per cent) in the interstate market. The wholesalers had to meet the transportation cost of carrying the dry roots to the distant centres like Bangalore. So his marketing cost was higher. The wholesaler realised the highest marketing margin also. Hence, the marketing efficiency in terms of producer's share was higher for the domestic market.

The economic efficiency for the two markets were also analysed using the Shepherd's index. It was found that both the local and interstate markets were efficient with an index value of more than unity. However, the marketing efficiency index was higher (2.60) in domestic market than that of the interstate market (1.28). But the domestic market could not absorb the entire supply, and hence the producers as well as market intermediaries had to depend upon the interstate market for avoiding glut in the local market.

5.4 Constraints in vetiver production and marketing

The vetiver growers of Chavakkad area were found to be facing many production and marketing constraints. The constraints were analysed and ranked in Table 4.27. The major production constraint related to the non-availability of production credit from institutional sources. Being a capital-intensive crop, this was driving farmers into the folds of private moneylenders to meet the working capital requirements. Secondly, in the absence of formal leasing, oral leasing was very prevalent. This, in turn resulted in landowners hiking rental charges every year without considering the output prices. Thirdly, the cultivators felt that the escalating cost of fuel was beyond their control. As a result the

irrigation cost was scaling up the production cost considerably. Many farmers considered the high labour wages coupled with the low availability of labour during the harvesting season as production limiting constraints. Though the early harvest fetches higher price, non-availability of labour during this critical juncture resulted in income loss to the farmers. Many experienced farmers in the area were of the view that labour productivity was much less at present than in the past.

The main marketing problem encountered by vetiver growers was wide price fluctuation in a year-to-year basis. There were problems due to traders not settling the full amount after sale. This caused liquidity problems, making farmers dependent upon private moneylenders for carrying out timely field operations during the next cropping season. There was also the risk of weight loss during storage of roots. This together with the lack of staying power compelled the farmers to dispose off the produce even at low price levels. The farmers were not at all organised. There were hardly any group efforts for marketing, though some of them were aware of the advantages of pooling marketable surplus, and organising marketing co-operatives to store, process and handle the produce on a more cost effective manner.

5.5 POLICY IMPLICATIONS

Based on the findings of the study, the following policy interventions are identified:

i. Vetiver is cultivated mainly for dry roots. This perennial grass has excellent potential in soil conservation as a vegetative barrier. However, this potential is not harnessed at present. The development agencies like the Department of Agriculture, Government of Kerala are also not giving any emphasis on this aspect now.

ii. At present, the local Krishi Bhavans do not render any technical advice in the cultivation of vetiver. They shall place more attention on this crop

iii. Many farmers had installed kerosene-run motor and pumpsets for irrigating the crop. The pumps were old, and inefficient as compared to diesel-operated pumps. At a time when kerosene was heavily subsidised, it posed no problem. However, with the slashing of subsidy on kerosene, the cost of kerosene as a fuel for irrigation system has gone up many folds. There shall be provision for investment credit for the farmers to phase out those inefficient pumps with more efficient diesel pumps.

iv. As the vetiver production units were small, family-based systems, own fund was not sufficient to meet the cultivation expenses. No sample respondents reported the receipt of crop loan for vetiver from institutional sources of credit. The reluctance of the financial institutions was due to the practice of cultivation on leased in lands. This compelled the growers to avail agricultural demand loan against gold security (ADLG). As this loan amount was depending on the quantum of gold offered as security, farmers ended up with inadequate loan amount vis-à-vis their working capital requirements. Many growers were driven to the clutches of the private moneylenders also. Crop loan is not an asset-oriented lending programme. It is a lending programme based on productive activities of the borrower, where the crop itself is the security. Reserve Bank of India norms permit crop loan to crops cultivated on leased land on the basis of possession certificate. However, since the leasing was oral, many cultivators could not produce possession certificate. Hence, they were denied the benefit of crop loans. Considering the importance of this niche crop, special schemes can be drawn by the financial institutions to provide access to the small holders.

v. There are at present no organised marketing efforts by the cultivators, most of whom are sub-marginal or marginal farmers. They do not have a sizeable quantity of marketable surplus to influence the market trends also. Due to the lack of staying power and fear of loss in weight, they dispose off the roots at the farm itself without any on-farm processing or value addition. The organisation of a marketing co-operative can take care of these problems very effectively. There shall be initiatives from the Department of Agriculture, Department of Co-operation and the growers themselves to organise an integrated co-operative society that provides production credit, undertake transportation and processing or product development and marketing on a collective basis. If that does not materialise, farmers may think about organising Self Help Groups (SHGs) on these lines. Organised processing and product development can reduce the annual fluctuations in the price of vetiver root to a considerable extent. It can also result in employment generation locally.

SUMMARY AND CONCLUSION

CHAPTER VI

SUMMARY AND CONCLUSION

The present study entitled "Production and Marketing Systems of Vetiver: a micro-level analysis in Thrissur district" was carried out during the year 2000-2001.Thrissur district was purposively selected for the study because it had a sizeable vetiver growing area. A list of commercial farmers who cultivated vetiver for more than three years was prepared, and a sample of 80 farmers was selected at random from the list.

The study was based on primary data. The data from the respondents were gathered through personal interview method using well-structured and pre-tested schedule of enquiry. All the growers were post- stratified into three viz. category I (farmers having less than 0.5 hectares of owned land), category II (farmers having land holding size between 0.5-1.0 ha) and category III (farmers having more than one hectare of land holding). The information regarding marketing aspects was collected from a sample of six village traders and six wholesalers and three commission agents.

Tabular analysis was used to study the socio-economic characteristics of the respondents and to estimate the cost and returns, marketing costs and margins of vetiver cultivation. The income measures were estimated using cost concepts. Benefit-cost ratios and breakeven analysis were carried out to measure the efficiency of enterprise.

The study revealed that vetiver cultivation in Chavakkad taluk was a small-holder venture, organized at the farm household level. Tenancy was widely prevalent in the area, 77 percent of the growers were tenant cultivators. Cash rent was the mode of payment.

The farmers as a whole made a fixed farm investment of Rs.5076 per hectare cultivated. It varied from Rs.1949 for category III to Rs.6341 for category I. The major item of investment was on irrigation investments (75 percent of total farm investment).

Explicit costs incurred by various categories of farmers were Rs.93560, Rs.67905, Rs.61389 and Rs.87820 respectively for the categories I, II, III and for the sample as a whole. Among these costs, the major item of paid out cost was on organic manures (29 percent of the total). This was followed by expenditure on hired human labour (Rs.22500/ha), which accounted for about 26 percent of the explicit costs.

The analysis of implicit costs indicated that it accounted an amount of Rs.26064 per hectare for the sample as a whole. The costs for the three categories were Rs.24415, Rs.33855 and Rs.32144 per hectare respectively. The supervisory cost was found to be highest among the implicit costs. It accounted Rs.10353 (40 percent of the total) for the sample as a whole. The lowest amount of Rs.195 was towards the cost of depreciation.

Total cost incurred for vetiver cultivation at C_3 level was Rs.117975, Rs.101760, Rs.93533 and Rs.113884 respectively for the three categories of farmers and the sample as a whole on per hectare basis.

The output estimates consists entirely of the recovered vetiver root only. The average yield was 9841 kilogram per hectare. The highest yield was recorded for the category III, who produced 13649 kilogram per hectare of vetiver root. This was followed by category I who produced 9611 kilogram per hectare. The category II recorded the least yield of 7968 kilogram per hectare.

The breakeven analysis indicated that all the farmers were operating above the required breakeven output level. The entire categories of farmers were

operating below the breakeven area required. It indicated that the entire category of farmers organized production efficiently. The cost of production of one kilogram of vetiver root based on cost C_3 were Rs.12.27, Rs.12.77, Rs.6.85 and Rs.11.57 respectively for the categories I, II, III and the sample as a whole.

The gross income per hectare worked out to Rs.126644 per hectare. The category III possessed a highest gross income of Rs.184530 per hectare followed by category I whose gross income per hectare was Rs.120905. The least value was shown by second category whose figure was Rs.116112 per hectare. The values for net income were Rs. 2931, Rs. 14352 and Rs. 90998 for the categories I, II and III respectively.

It can be seen that the benefit-cost ratios (BCR) were more than unity for all the categories at different cost concepts. The BCR were found to be 1.02, 1.14, 1.97 and 1.11 at cost C_3 level respectively for the categories I, II, III and the sample as a whole.

The analysis of the marketing system revealed that private traders carried out the entire marketing activity. No Government or Co – operative marketing systems were found to be operating in the area. The private traders were mostly pre-harvest contractors, local traders and wholesalers operating on personal levels. The following marketing channels were identified in the marketing of vetiver roots.

1. Producer → Wholesaler → Processor → Consumer
2. Producer → Wholesaler → Retailer → Consumer
3. Producer → Village Trader → Retailer → Consumer
4. Producer → Pre-harvest Contractor → Processor → Consumer
5. Producer → Wholesaler → Drug Dealer → Consumer

6. Producer → Drug Dealer → Consumer
7. Producer → Commission Agent → Wholesaler → Processor / Drug Dealer / Retailer → Consumer

The major channels were 1st and 5th channels. Nearly 45 per cent of the produce was accounted for these channels. This was followed by 3rd and 4th channels. The village traders could procure 29 per cent of the produce while the pre-harvest contractors handled 25 per cent of the produce. Drug dealers accounted for the least procurement of 0.12 per cent of the produce.

For estimating marketing efficiency, two channels viz. local market in Thrissur and inter-state market at Bangalore were analysed. In Thrissur market, the gross producer's share was 72.22 per cent. Among the marketing costs incurred by the intermediaries, the village trader incurred nearly six per cent of the consumer's price. However, the marketing margin earned by the retailer (6.87 per cent) was higher than that of village trader (3.67 per cent).

But the gross as well as net producer's income in the Bangalore market was low, 56.04 and 52.95 percentages respectively. Among the marketing costs incurred by the intermediaries, the wholesaler incurred the highest cost (13.23 per cent of the consumer's price). The wholesaler and the retailer incurred a marketing cost to the tune of 6.82 and 4.55 percentages respectively of the consumer's price. The highest marketing margin was realised by the wholesaler (20.05 per cent of the consumer's price). This was followed by the margin to the retailer (6.45 per cent), and to the commission agent (2.77 per cent).

The marketing efficiency estimated by the modified Shepherd's index showed that both markets were operating efficiently as both had a marketing efficiency index of more than unity. The marketing efficiency index of domestic market at Thrissur (2.60) was higher than that of the inter-state market at Bangalore (1.28).

The constraints faced by the vetiver growers in production and marketing were also analysed. The production related constraints were as follows.

1. High labour wages
2. Non availability of labour during peak season
3. Low labour productivity
4. Escalating prices of manures and fertilizers
5. Escalating cost of fuel charges for the irrigation system
6. Increasing rental charges for land
7. Non availability of production credit and dependency on private money lender
8. Location of leased in land far away from dwelling unit and resultant supervision risk

The marketing related constraints were:

1. Low price and price risk due to inter year price fluctuation
2. Delayed payment for the settlement of transaction
3. Storage risk associated with loss in weight during storage
4. Lack of group efforts in marketing including the absence of marketing co-operatives

Based on the findings of the study the following policy implications emerged:

1. The importance of vetiver in soil conservation needs much more attention.

2. The local Krishi Bhavans shall have more linkage with vetiver farmers in the technical aspects of vetiver cultivation.

3. There shall be provision for phasing out obsolete and inefficient kerosene based irrigation systems with more efficient diesel operated irrigation systems.

4. At present financial institutions operating in the area are not providing crop loan to the cultivators. This invites special attention by the district level banker's committee (DLBC) and state level banker's committee (SLBC) to persuade the financial institutions to provide access to marginal and sub-marginal farmers to institutional credit based on the norms of Reserve Bank of India for provision of crop loan on leased in land.

5. There shall be collective efforts to organise the production and marketing of vetiver. The Department of Agriculture, Department of Co-operation and the growers themselves shall have initiative to organise an integrated Co-operative society that provides production and marketing credits along with provision for vetiver root processing. If that not materialises, farmers shall volunteer to organise Self Help Groups (SHGs) on these lines. There shall be more awareness campaign among the farmers on the advantages product development and diversification of raw material viz. dry vetiver root.

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APPENDICES

APPENDIX I

QUESTIONNAIRE OF THE SURVEY FOR THE PROJECT: PRODUCTION AND MARKETING SYSTEMS OF VETIVER- A MICRO LEVEL ANALYSIS IN THRISSUR DISTRICT

1. Name and Address of the farmer :

2. Village and panchayath :
3. Date of interview :
4. Family composition

Sl. No.	Name	Sex	Age	Educational Qualification	Involved in farm operations Y/N	If employed else where give details	Family labour compo-nent

5. No. of years engaged in vetiver cultivation
6. Details of land holding in (acres)

Particulars	Owned	Leased in	Leased out	Area available for cultivation	Current fallow	Area available for cultivation more than once
a) Wet land						
b)Garden land						

7. Cropping pattern

a) owned

Crops		Area (acres)/ No.
Seasonal		
Annual		
Perennial		

b) leased in

	Crops	Area (acres)/ No.
Seasonal		
Annual		
Perennial		

8. Income pattern

Sl. No.	Family member	Service	Business	Labour	Crops	Livestock	Others

9. Investment on vetiver cultivation

Item	Year of Purchase/ installation	Purchase price/ unit	Maintenance cost (fuel, repair, hire charges)
a) Building			
i) Permanent			
Ii) Temporary			
b) Equipment, machinery			
c) Tools			
d) Farm development			
i) Land reclamation			
Ii) Bunding			
Iv) Irrigation system			
1) Construction of tube well /others			
2) Motor pump set			
3) Hose			
4) Springer/ drip			
v) Others			

10. Operating expenses Variety adopted: Sowing time:

Operations	Human labour days					Machinery		Materiel costs		
	Permanent		Casual		Wage rate	Hrs	Operating charges	Hem	Qty	Price/ unit
	M	F	M	F				Seed		
Land preparation										
Soil amendment application								Org.manure 1 2 3		
O.M. application								Fertilizers 1 2 3 4		
Preparation of slips								N P K		
Planting								Herbicides		
Fertilizer application								P.P. Chemicals		
i) Basal										
ii) Top dressing 1) 2) 3) 4) 5)								Soil amendments		
								Fuel/ electricity		
Irrigation								Water charges		
1.								Miscellaneous		
2.										
3.										
4.										
5.										
Intercultural Operations										
1.pruning										
2.										
3.										
4.										
5.										

10. Harvesting

Operations	Human labour days					Machinery		Materiel costs		
	Permanent		Casual		Wage rate	Hrs	Operating charges	Item	Qty	Price/ unit
	M	F	M	F				Seed		
Uprooting										
Separating roots										
Cleaning										
Making bundles										
Others (specify)										

Storage charges

Main product	Qty (kg)	Price:	(Rs.)
Bye product	Qty (kg)	Price:	(Rs.)
(Slips for planting)			

11) Is there any seasonal variation in price: Y/N
If yes give details:
Peak and Low price and time:

12) Sources of fund for cultivation

Sl. no.	Source of fund	Amount Rs.	Period of loan	Interest

13) Constraints/ Problems faced in vetiver cultivation

MARKETING ASPECTS

1) Name of the nearest primary market :
2) Distance :
3) Name of the nearest wholesale/ secondary market:
4) Distance :
5) Total quantity produced :
6) Quantity retained for home consumption :
7) Quantity retained for on- farm uses :
8) Quantity spoiled due to
a) perishability :
b) physical handling :
Total :

9) Marketable surplus[5- (6+7+8)] :
10) Method of sale (unprocessed form)

Sl. No	Method of sale	Quantity	Price per unit
1	Pre- harvest contract		
2	Village trader		
3	Commission agents/ brokers		
4	Primary/ retail markets		
5	Secondary / wholesale markets		
6	Direct sale to consumers		
7	Other modes (specify)		

11) Quantity retained for processing :
12) Cost of processing :

Items	Qty.	Labour	Material
Weaving cost for mat Weaving cost for fan Others (specify)			

13) Method of sale (processed form)

Sl. No	Method of sale	Quantity	Price per unit
1	Pre- harvest contract		
2	Village trader		
3	Commission agents/ brokers		
4	Primary/ retail markets		
5	Secondary / wholesale markets		
6	Direct sale to consumers		
7	Other modes (specify)		

14) Cost of marketing:

Sl. no.	Particulars	Rs. Per unit	Total
1	Preparation for market		
2	Loading and unloading		
3	Transportation charges		
	a) Mode of transport		
	b) Distance from the market		
	c) Tranport/unit/trip		
4	Cleaning and grading charges		
5	Cost incurred by the farmer at the market		
	a) Gate / entry fee		
	b) Stall fee		
	c) Commission		
	d) Brokerage		
	e) Taxes		
	f) Other payments if any (specify)		

15) Sources of fund for business

Sl. no.	Source of fund	Amount Rs.	Period of loan	Interest

16. Problems in marketing :

APPENDIX II

QUESTIONNAIRE FOR INTERMEDIARIES

A) Village traders

1. Name and address :

2. Form of produce handled :

3. Fixed costs :

Sl. No.	Particulars	Amount per month	Present value	Depreciation
1.	Building/ godown			
2.	Rent paid			
3.	Furniture			
4.	Permanent staff			
5.	License fee			
6.	Other costs (specify)			

4) Operational expenses

Sl. No.	Particulars	Amount per month	Total during the year
1.	Labour charges		
2.	a) Wages paid		
	b) Pre-requisites (if any)		
3.	Electricity per month		
4.	Water charges per month		
5.	Taxes		
	a) professional tax		
	b) sales tax		
	c) income tax		
	d) local tax		

5) Annual volume of business (specify the quantity):

6) Sources of fund for business

Sl. no.	Source of fund	Amount Rs.	Period of loan	Interest

B. Other intermediaries (specify)

1. Name and address :

2. Form of produce handled :
3. Fixed costs :

Sl. No.	Particulars	Amount per month	Present value	Depreciation
1.	Building/ godown			
2.	Rent paid			
3.	Furniture			
4.	Permanent staff			
5.	License fee			
6.	Other costs (specify)			

4) Operational expenses

Sl. No.	Particulars	Amount per month	Total during the year
1.	Labour charges		
2.	c) Wages paid		
	d) Pre-requisites (if any)		
3.	Electricity per month		
4.	Water charges per month		
5.	Taxes		
	e) professional tax		
	f) sales tax		
	g) income tax		
	h) local tax		

5) Annual volume of business (specify the quantity)
6) Sources of fund for business

Sl. no.	Source of fund	Amount Rs.	Period of loan	Interest

C. Other intermediaries (specify)

1. Name and address :

2. Form of produce handled :
3. Fixed costs :

Sl. No.	Particulars	Amount per month	Present value	Depreciation
1.	Building/ godown			
2.	Rent paid			
3.	Furniture			
4.	Permanent staff			
5.	License fee			
6.	Other costs (specify)			

4) Operational expenses

Sl. No.	Particulars	Amount per month	Total during the year
1.	Labour charges		
2.	e) Wages paid		
	f) Pre-requisites (if any)		
3.	Electricity per month		
4.	Water charges per month		
5.	Taxes		
	i) professional tax		
	j) sales tax		
	k) income tax		
	l) local tax		

5) Annual volume of business (specify the quantity)
6) Sources of fund for business

Sl. no.	Source of fund	Amount Rs.	Period of loan	Interest

APPENDIX III

OPERATION-WISE COST OF CULTIVATION OF VETIVER (Rs./ha)

Sl. No.	Operations	Labour days	Expenses	Per cent
1	Field preparation Male labour	21.5	3225.00	4.41
2	Planting a) Planting material b) Female labour Sub total	17	605.87 1360.00 1965.87	2.69
3	Manure and fertilizer application a) Cost of manures and fertilizers b) Male labour c) Female labour Sub total	3 2	27751.70 450.00 160.00 28361.70	38.79
4	Irrigation and water management a) Cost of fuel and lubricants b) Male labour Sub total	15.5	17281.96 2325.00 19606.96	26.82
5	Weeding and pruning Female labour	10.5	840.00	1.15
6	Plant protection a) PP Chemicals a) Male labour (contract) Subtotal	-	306.71 103.00 409.71	0.56
7	Harvesting a) Male labour b) Female labour Subtotal	102 42.5	15300.00 3400.00 18700.00	25.58
	Total		**73109.24**	**100.00**

PRODUCTION AND MARKETING SYSTEMS OF VETIVER: A MICRO-LEVEL ANALYSIS IN THRISSUR DISTRICT

By

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ABSTRACT OF THE THESIS

Submitted in partial fulfillment of the requirement for the degree of

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ABSTRACT

The present study entitled " Production and marketing systems of vetiver : a micro-level analysis in Thrissur district " was conducted with the objective of working out the cost of production and returns of vetiver cultivation, to study the marketing channels, and to identify production and marketing problems encountered by vetiver growers of the area. The data pertains to the period from January 2000 to December 2000. Eighty commercial farmers who cultivated vetiver for more than three years were selected at random, and the information required for the study were collected by personal interview using a structured, pre-tested schedule of enquiry.

The cost of cultivating one hectare of vetiver was worked out to Rs. 117975, Rs. 101760 and Rs. 93533 at cost C_3 for the category I (less than 0.50 ha), category II (0.50 - 1.0 ha) and category III (more than 1.0 ha) farmers respectively. Organic manures constituted the major item of expenditure, constituting 29 per cent of the paid out cost. This was followed by expenditure on hired human labour, which accounted for 26 per cent of the explicit cost. The cost of production of one kilogram of dry vetiver root at cost C_3 were Rs. 12.27, Rs. 12.77 Rs. 6.85 and Rs. 11.57 respectively for the categories I, II, III and the sample as a whole. On an average vetiver farmer had a gross income of Rs. 126644 per hectare. The net income for the three categories of farmers were Rs. 2931, Rs. 14352 and Rs. 90998 per hectare for the categories I, II and III respectively. The BCR estimated at cost C_3 were found to be more than unity for the entire category of farmers.

The entire marketing system was organized in the private sector. The Producer – Wholesaler – Processor – Consumer, and Producer – Wholesaler – Drug Dealer – Consumer were the two major marketing channels identified in the area.

The economic efficiency of marketing measured by the modified Shepherd's Index indicated that both local and interstate markets were efficient, with a value of more than unity.

The main production related constraints were non-availability of institutional credit and dependency on private money lenders, increase in rental charges of land and escalating fuel charges for the irrigation system. Year-to-year fluctuation of vetiver root price, delayed settlement of transactions and risk of losing weight during storage were the major marketing related problems.