MARKET BEHAVIOUR OF IMPORTANT SPICES OF KERALA

By
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THESIS

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DECLARATION

I hereby declare that the thesis entitled **"Market behaviour of important spices of Kerala"** is a bonafide record of research work done by me during the course of research and the thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship or other similar title, of any other university or society.

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CERTIFICATE

Certified that the thesis entitled **"Market behaviour of important spices of Kerala"** is a record of research work done independently by **Miss. Divya, K.M.** under my guidance and supervision and that it has not previously formed the basis for the award of any degree, diploma, associateship or fellowship to her.

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Affectionately Dedicated
to my
Amma, Achan &
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Divya.K.M

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INTRODUCTION

INTRODUCTION

The changed economic order in the context of globalisation and liberalisation of world trade in agriculture has opened up new vistas of growth. Spices sector is one of the key areas in which India has an inherent strength to dominate the global markets. Spices not only add "spice" to food but also to the whole agricultural sector. They are the most dynamic crops of Indian agricultural sector. The world market for spice trade is valued at US $ 2.3 billion. The unique feature of spice trade is that major importers are developed nations like European Union and United States of America which import spices from developing countries. India contributes a significant amount to world spice trade. India's share in total world spices trade was 46 per cent in terms of quantity and 23 per cent in terms of value. (Behera and Indira, 2002). Indian spices are known for their excellent pungency and flavour.

India, known as "the land of spices" grows over 75 different types of spices. The annual production of spices in the country was three million tonnes, from over 2.5 million hectares (Peter and Nybe, 2002). India is the largest producer, consumer and exporter of spices in the world and 90 per cent of the spices produced in India is absorbed in the domestic market and only 10 per cent is exported to over 150 countries. About 8.5 per cent of India's export earnings from agricultural and allied products was contributed by spices which constituted 1.24 per cent of the total export earnings during 1999-2000. The major spice growing states in India are Rajasthan, Andhra Pradesh, Madhya Pradesh and Kerala. The major spices grown in Kerala are pepper, cardamom, ginger and turmeric.

Pepper is known as the" king of spices" and India accounts for 49.67 per cent of its world area, 31 per cent of world production and 21.5 per cent of world export (quantity) during the triennium ending 2000. India has been a leading producer of pepper followed by Indonesia, Malaysia, Sri Lanka, Brazil and few other countries. Of the total production in the country, 70 per cent is exported annually (Madan and Selvan, 2001). Pepper accounts for about 20 per cent of the value of total spice export from India and Kerala contributes 96 per cent of area and 92.2 per cent of production in the triennium

ending 2000. It is the major source of income and employment for rural households of Kerala.

Cardamom, "the queen of spices" enjoys a premium preference in the international market and is relished for its distinct enriching properties. India was the largest producer and supplier of small cardamom until 1979-80. The situation changed since then and Guatemala overtook India both in production and export. Tanzania, Sri Lanka, New Guinea are the other producing countries. In India Kerala is the leading producer state accounting for nearly 62.6 per cent of area and 81.6 per cent of production of small cardamom during the triennium ending 2000.

Ginger is one of the oldest known spices in the world and Indian ginger has high preference in the global market because of its characteristic lemon flavour and it is the third largest foreign exchange earning spice after cardamom and black pepper. India accounts for 50 per cent of the global output of dry ginger. The other competing countries are China, Bangla desh, Nigeria, Indonesia, Australia and Sri Lanka. In India the major ginger producing states are Kerala, Meghalaya, Arunachal Pradesh, Orissa, Mizoram and Tamil Nadu. Kerala contributed 17.5 per cent of the area and 18 per cent of the production of ginger in India during the triennium ending 2000.

Turmeric is a multipurpose crop valued for its colouring pigment, spicy flavour and medicinal properties. India is the leading producer and supplier of turmeric in the world. Indian turmeric is considered to be the best in the world market because of its high curcumin content. Japan, UAE, UK, USA, Iran and Singapore are the major markets for Indian turmeric. China, Peru and Thailand are emerging as stiff competitors to India. In India, Kerala contributes 2.5 per cent of the area and 1.4 per cent of production of turmeric during triennium ending 2000.

The last decade had witnessed two significant developments that have caused profound impact on Indian agriculture and trade. India embarked on a process of trade liberalization policies since 1991 as a part of economic reforms, which include decanalisation of the imports of agricultural commodities, removal of quantitative restrictions on all agricultural products and reduction of tariff rates. Subsequently,

liberalization in agricultural trade was institutionalized in 1995 through various agreements signed under Uruguay round agreements and formation of WTO (World Trade Organisation). The agreements that effect agricultural trade are Agreement on Agriculture, Agreement on Sanitary and Phyto Sanitary Measures, Agreement on Technical Barriers to Trade and Agreement on Trade Related aspects of Intellectual Property Rights. The agreements were aimed at promoting trade by reducing the level of protection and by removing various kinds of trade barriers and distortions in agricultural trade resulting from domestic policies.

Trade liberalization has put Indian agriculture into the framework of global competition and rule of global market. These developments have raised the question of competitiveness of Indian agriculture. India has competitive advantage in several commodities for agricultural exports because of near self-sufficiency of inputs, relatively low labour costs and diverse agro-climatic conditions. But trade opportunities for India are asymmetric because lower international price leads to import but high international price do not lead to export due to quality problems. Domestic prices cannot remain uninfluenced by the world market prices. Evidences indicate that the international prices fluctuate more than domestic prices (Nayyar and Sen,1994) and it has far reaching consequences on prices realized by the farmers in the domestic market.

India in the past had almost monopolized the world pepper trade with over 80 per cent of market share. But at present the share has dropped to less than 50 per cent owing to increased competitiveness from Vietnam, Brazil and Indonesia. The main problem faced by Indian pepper is high cost of production and low yield compared to other countries and unlike India, other producing countries do not have much domestic consumption and with a high productivity and less production cost, these have become more competitive. In the case of cardamom, India had lost its market share to Guatemala. India had once been a major exporter of cardamom but today less than four per cent of its total output is exported as compared to Guatemala's 100 per cent export of the total cardamom production. In the case of ginger, it is facing stiff competition from other producing countries with the emergence of China and Nigeria as the major competitors.

Keeping these in view, an attempt is made in the present study to analyse the market behaviour of important spices of Kerala with the following specific objectives.

- To analyse the growth in area, production and productivity of pepper, cardamom, ginger and turmeric.
- To examine the growth in export of the above spices
- To analyse the price behaviour of the selected spices
- To study the trade competitiveness of the selected spices.

Scope of the study

Spices export seems to be the engine of growth in export, for agrarian economies of developing countries like India. The exports from a country are highly dependent on production and export prices. In the context of globalisation and WTO agreements the export scenario of spices in the country is faced with competition from other spice producing countries. Kerala has a unique position in the production and export of spices in India. The analysis of export competitiveness and price behaviour of important spices would focus on the need to revitalize the spices industry. Efforts for broad basing the spices export basket by value addition and product diversification to meet global quality standards and exploring the scope for production and export of organic spices would bring about bright prospects for the spice economy of India.

Limitations

The study was based on both primary and secondary data. In the case of secondary data, often data from different sources may not agree with each other and some efforts to choose the better among them are inevitable. In the case of prices, data were not obtained from a single source, and there will be minor differences in data according to change of sources. Care has been taken to avoid personal bias in such decisions. However, the limitation in the secondary data is to be recognized. The competitiveness of spices were also studied within the specific period though the competitiveness is subject to change due to fluctuations in prices, which have a tendency to rise for 4-5 years and then decline for the same number of years. In the present study an attempt has been made to analyse the competitiveness of spices in the context of WTO. Due to the limited

number of years after WTO its exact impact on competitiveness could not be measured. In the case of primary data, selection of study area was based on purposive selection. Respondents were selected with the help of Krishi Bhavan. The data may not be fully reliable since the respondent farmers were not in the habit of maintaining records regarding marketing cost. However efforts were made to make the available data as authentic as possible.

Presentation of the study

The report of the study has been spread out under five chapters as given below. The first chapter deals with introduction, in which, the statement of the problem, objectives, the scope and limitations of the study are discussed. The second chapter covers review of related studies in the light of the present investigation. The third chapter relates to the details of the study area and methodology used in the process of investigation. The results and discussion are presented in the fourth chapter and chapter five gives the summary and conclusion of the study followed by references and abstract.

REVIEW OF LITERATURE

2. REVIEW OF LITERATURE

A comprehensive review of the past studies is useful to formulate concepts, methodology and tools of analysis to be used for any research. An attempt is made in this chapter to review the concepts used and past studies related to the objectives of this study. For the purpose of convenience and clarity this chapter is presented in four sections as given below.

2.1 Growth rate and trend analysis

2.2 Price behaviour

2.3 Trade competitiveness

2.4 Marketing studies

2.1 GROWTH RATE AND TREND ANALYSIS

Chatterji (1966) in his study on agricultural growth in India during 1950-1963 opined that linear trend fitting was the most appropriate tool to measure agricultural growth, which would avoid any effect due to seasonal and cyclical variation. He used linear model to estimate the growth rates of important cereals, pulses and non-food crops.

Dandekar (1980) preferred log linear form over the linear form for working out the compound growth rates as it was found to be more suitable for the series of agricultural production as a whole.

The growth of export of turmeric from India during 1960-61 to 1979-80, was examined by Raveendran and Aiyasamy (1982) and they found that the export prices had exhibited a much larger variation than the quantity exported. A linear function was fitted to study the relationship between export of turmeric and production of turmeric in the previous year. Ratio of export price and domestic price and time variable were used to capture the collective effect of various measures adopted to promote turmeric export. The results indicated that only time variable was found to be significant, suggesting the non-responsiveness of exports to the price variable. The highly significant trend variable 't'

which was a proxy variable for export promotion measures implied that these measures were fairly successful in promoting turmeric export with an average annual increase of 247.62 t during the two decades.

Desai and Patel (1983) in their study on growth trends in foodgrain production in Western India fitted linear and log linear functions to the data on area, production, and yield of four major foodgrains. It was revealed from the result that growth rate of wheat for the period 1965-66 to 1981-82 was much higher than that of rice.

The export performance of different pepper products between 1978-79 and 1982-83 was studied by Velappan (1984). It was found that, except for white pepper, there was an upward trend in export for all the pepper products.

Boyce (1986) developed a kinked exponential model for the calculation of growth rate and suggested that it provides a better analysis than conventional estimates for intertemporal and cross sectional growth rate comparison. He used this model to compare the estimates of growth rates of agricultural output in Bangladesh and West Bengal before and after the advent of the new seed-fertilizer technology in the mid 1960s.

Chandran (1987) in his study on the export performance of cardamom in South India observed that the export price had a positive relation with export quantum and the local price was negatively related to export quantum.

The trends in area, production and productivity of pepper in India during 1961-85, which were, estimated by Das (1988), revealed that area remained stagnant around 1.1 lakh ha and production around 0.25 lakh tonnes during this long period. But the world area under pepper showed 41.3 per cent increase in 25 years. As far as the competition to India is concerned, pepper area in Malaysia was doubled, while it was raised by two and half times in Indonesia and more than six folds in Brazil. In the world production, there was 52 per cent increase during 1976–80; but in the subsequent period it came down due to set backs in Indonesia, Malaysia and Brazil. The world pepper export showed a growth

of 120 per cent in a period of 25 years, but India's relative share slipped from a virtual monopoly position in 1940s to 20 per cent in 1981-85.

Subramanian and Vasanthi (1988) estimated period wise compound growth rates of area, yield and production of major crops in Tamil Nadu based on time series data from 1961 to 1978, using a linear function. It was found that, of all the crops studied sugarcane was the only crop which had shown positive rate of growth in area, yield and production in period I (1961-69). In period II (1970-78), the rates of growth of yield and production have been positive for all the crops indicating the impact of green revolution.

Chand (1989) in his study on growth and instability of exports and imports of agricultural commodities in India observed that for most of the agricultural commodities, exports showed less instability than the imports. The growth in exports as well as imports of the agricultural sector was much lower than the growth in total merchandise trade. The trade deficit of the agricultural sector was small and it was not rising in contrast to that of non-agricultural commodities.

George *et al* (1989) in their study of trends in area, yield, production and export of pepper during 1952-53 to 1983-84 reported that price was not a significant variable in explaining productivity change and lagged price had no influence on acreage allocation of pepper.

Export performance and prospects of India's major spices like pepper, cardamom, ginger, turmeric and minor spices were examined by Ipe (1989). The results showed that all the commodities exhibited appreciable growth both in quantities exported and export earnings, even though there was much year to year fluctuation. Among the major spices, turmeric recorded the highest growth rate and instability in export earnings followed by ginger cardamom and pepper.

Nirmala *et al* (1989) in their study found a positive compound growth rate for production, domestic and export prices, export earnings and productivity of cardamom in India during the periods 1970–80 and 1980-86. Between 1970 and 1980, the growth rates

of production and export were positive for India and negative for Guatemala. But during 1980-86 India's growth rates for the same variables were negative, while for Guatemala they were positive. For every one per cent increase in production in India, export showed an increase of 2.03 per cent.

In a study conducted by Pal and Ray (1989) on export instability and economic growth in India, it was found that there was consistency in the magnitude of instability obtained by the four measures of instability namely, instability index calculated by moving averages, coefficient of variation, corrected coefficient of variation and average percentage deviation from the trend. All the measures in general showed that export instability was considerably higher for the individual agricultural products than for manufactured products. However, export diversification had a strong stabilisation effect on the total export earnings from agriculture.

The production and export performance of Indian cardamom during 1970-71 to 1984-85 were analysed by Thomas *et al* (1989) using semilog and exponential functions. The study revealed that, India accounted for 67.3 per cent of world production in 1970–71 which declined to 40.83 per cent in 1984–85, where as the share of export of cardamom decreased from 54.98 per cent to 29.6 per cent during the same period. The negative value of trend implied that the export promotion measures taken by the government were not successful. It was also reported that export performance of Indian cardamom was mainly dependent on production of cardamom, export price and export from other countries.

The trends in total value of agricultural exports as well as the value of individual agricultural commodity export, along with change in export commodity complex, were examined by Tilekar (1989) during 1976 – 89. The results indicated that there had been a consistent increase in the total value of exports at current prices. Consistency was also observed in the trend in export of agricultural commodities during the period under study. But the share of total value of agricultural exports in total exports declined from 1976-77 to 1983-84. Export commodity basket of major agricultural commodities did not show any significant change during the period under study.

Arya and Rawat (1990) examined the magnitude of growth and fluctuations in area, production and productivity of various crops in Haryana during 1966-67 to 1980-81. Growth rates were worked out by fitting exponential function of the form $Y = AB^t$. It was inferred from the analysis that for all the districts, there was increase in area, production and productivity for wheat and rice among cereals and potato among commercial crops. The results demonstrated that crops like bajra, jowar, maize, barley and pulses had registered generally declining trends in all the districts.

Ipe (1990) analyzed the instability in production of spices in Kerala. Arithmetic mean and standard deviation of the percentage change were used to explain the instability. Higher variability in production and productivity of pepper and cardamom was observed.

The instabilities in area and production of pulses in Andhra Pradesh during 1970-71 to 1986-87 were examined by Bharathi, *et al* (1992). Coppock's instability index, coefficient of variation and standard deviation were used to work out instability. The results revealed that the contribution of area to production was more evident than yield. Moreover, the instability in yield levels was more than that of area and this caused further instability in production.

Das (1992) worked out the growth rate in area, production and yield of major crops of Kerala during 1973-74 to 1987-88 using exponential function of the type. $Y = AB^t$. To measure instability, coefficient of variation was estimated. It was found that pepper registered positive growth rate only in the districts of Idukki, Thrissur, Palakkad and Kozhikode region. It varied from -3.43 per cent in Ernakulam district to as high as 34.8 per cent in Idukki district. Coefficient of variation was also high ranging from 21 per cent in Kollam region to 62 per cent in Palakkad district. Ginger production registered a positive growth rate in all districts except Kottayam (-4 per cent), Palakkad (-1.3 per cent) and Malappuram (-9.5 per cent).

Pal (1992) analysed the magnitude of growth and instability in agricultural exports of India during the period 1970-89 using coefficient of variation. The study

revealed that exports of agricultural products were constrained by the increasing domestic demand and the volatile world prices, and policy changes have induced a very high degree of instability in the export earnings from important agricultural products. However, in the total earnings from both agricultural and non-agricultural exports was fairly stable primarily due to the stabilization effect of export diversification.

Jeromi and Ramanathan (1993b) while analyzing the growth rate and instability of pepper fitted an exponential model of the type $Y = AB^t$, to estimate the growth rate of pepper trade indicators. Decade wise growth rates were estimated by fitting kinked exponential function during the time period 1975 to 1990 and instability index was calculated from the residuals of the exponential trend equation. The study revealed that among the other countries, positive and statistically significant growth rate (3.68 per cent) was recorded only in the case of India. In terms of stability too, India's performance was better.

In his study on growth and instability of oilseed production in India, Kaushik (1993) worked out growth rates in area, production and yield of principal food crops and oilseeds from 1968-69 to 1991-92, using exponential function of the form $\ln Y_t = a + b_t t$. The results revealed that total food grains showed a significant growth rate in production and productivity, whereas in the case of total oilseeds, growth rate was significant in area, production and productivity. It was also found that fluctuation in yield was the major cause for the fluctuation in the output and hence the fluctuations in yield have to be controlled to bring stability in the output.

In an analysis of growth trends of principal crops in Kerala over the period 1965-66 to 1989-90, decadal changes in growth rate of area, production and productivity of major crops of Kerala, contribution of area and productivity towards increasing the production and the magnitude and instability for each crop was examined by Bastine and Palanisami (1994). They fitted exponential functions $Y = AB^t$ to the data to compute the compound growth rates and coefficient of variation was used as the measure of instability. The results revealed that pepper showed positive growth rates in area, production and productivity during the first decade, while during the second decade there

were negative growth rates in area, production and productivity and after that it showed substantial increase. Production instability was found to be very high. In the case of ginger growth rates were significant and positive for area, production and yield and at the same time high instability in production and yield during the period 1965-66 to1984-85. The first decade showed spectacular performance in growth and after that growth rates were somewhat low. Area effect and productivity effect had greater role in production for pepper and ginger respectively.

Jeromi (1994) in his study on growth of pepper economy of Kerala estimated the growth rates in area, production, yield and export using semilog model of the type ln y =a + bt. The instability index has been estimated by fitting an exponential time trend to the data. Decade wise growth rates were estimated by fitting kinked exponential function. The analysis of growth rate showed that the area under pepper recorded higher growth than production and the growth of yield was negative during the entire period (1950-51 to 1988-89) .It was reported that high growth rate along with high instability in production was mainly due to the instability in yield than area. The result of the component analysis showed that, area was the major contributor in production, implying that, pepper cultivation in the state was extensive rather than intensive. The analysis of the growth performance of pepper exports from India showed that quantity, export earning and unit value realization had been increasing at the annual growth rates of 2.26, 8.39 and 5.99 per cent respectively. Among the selected variables the instabilities of export earning was higher than quantity and unit value realization. He concluded that since a major chunk of pepper production was exports, higher instabilities in export earnings would adversely affect the production, employment, income and investment and there by hamper the growth of pepper economy.

The compound growth rate in area production and productivity of pepper for the period from 1956-57 to 1989-90 was analysed by Babu *et al* (1996) by fitting the functions of the type $Y= AB^t$ and magnitude of variability over time was worked out by coefficient of variation. The results revealed that over the years, pepper area increased by 0.97 per cent and production by 0.92 per cent per annum where as the productivity

declined by 0.07 per cent per annum. Variability analysis revealed that growth in pepper production was accompanied by instability in production, caused by instability in both area and productivity.

The compound growth rate of quantity, export value and unit price of pepper was estimated by Jeromi and Nagarajan (1996) during 1950-51 to 1992-93 and it was found to be 1.98, 8.12 and 6.02 per cent respectively. Among the decades, the eighties recorded the highest growth rate in these variables. It was also reported that the annual compound growth rates of price of pepper during 1965 to 1990 were 6.93, 7.54 and 6.15 per cent respectively for India, Indonesia and Malaysia.

In their study on the trends in the export of cardamom from Kerala during 1979-80 to 1993-94, Mani and Jose (1996) observed that even though the share of Kerala state in the total exports of cardamom remained high (70.55 per cent) over the years, the percentage of exports to total production in the state alarmingly came down from 69.27 per cent in 1979-80 to 8.04 per cent in 1993-94. Export performance revealed greater variability both in quantity exported and its value. A high price for cardamom was found to keep our product less competitive in the international market.

The export performance of cardamom in India was analysed by Thomas and Sundaresan (1996) based on data on exports and prices of cardamom in India over the period 1970-71 to 1992-93. The study revealed high instability in export and production and also that domestic and international prices were found to significantly affect export.

Ajithkumar and Sankaran (1998) examined the factors responsible for the instability in turmeric production in India and the results showed that yield instability increased marginally in the eighties. However, the increase in yield instability was compensated by decrease in area instability resulting in reduction of production instability. Decomposition analysis showed that yield instability was the dominant factor affecting production instability.

In a study on the economics and marketing of Indian black pepper, Madan (2000) estimated the trends in area and production of black pepper during the period from 1987-88 to 1997-98. It was observed that while area grew at the rate of 0.85 per cent, production grew at the rate of 2.38 per cent which implied that recent extension to the area was more productive or farmers gave better care to their existing plantation to increase yield.

Menon (2000) while estimating the trends in export of pepper during seventies, eighties and nineties found that during the seventies the annual average export was about 87 per cent of annual average production. In the eighties and nineties it was 81 per cent and 74 per cent respectively showing lesser growth in export compared to growth in production.

Senthilkumaran and Vadivel (2000) noticed a gradual increase in the area under cultivation of pepper from 1990 to 1998 except 1996-97, where in there was 9.32 per cent reduction from 1995-96. It was attributed to conversion of land to other crops such as rubber in Kerala due to extensive damage of pepper because of diseases. As a result of reduction in area, production also dropped by 10.08 per cent from 1995-96.

Korikanthimath and Rao (2001) estimated growth rate and instability in cardamom in India using ordinary least squares, during 1982-83 to 1997-98. The results revealed an inconsistency in the growth of area, productivity, production and exports of cardamom, positive and highly significant growth rates in productivity (539.9 per cent) and unit value of exports (1361 per cent), negative and significant growth rates in production (-66.1 per cent), quantity exported (-101 per cent) with an insignificant and negative growth rate in total value of exports and other tariffs on the foreign trade.

Madan (2001) in his work on the cardamom economy measured the long-term trends in area, production and productivity of cardamom in India during 1970-71 to 1999-2000, using semi logarithmic growth equations. The result revealed that the over all trend in area under cardamom registered an average annual growth rate of -0.6 per cent while production has grown up at the rate of 3.1 per cent per annum. The decadal growth rates

with respect to area showed that there was positive growth rate of 0.2 and 0.1 per cent respectively in seventies and eighties, while it was –1.9 in the nineties. Regarding production, growth rates were positive in all the three decades with the highest rate of 8.3 per cent in the nineties. The estimated negative growth in area and positive growth rate in production during 90's indicate the improvement in productivity *i.*e. with less area under the crop more quantity is produced.

In their study on the changing scenario of Indian black pepper, Madan and Selvan (2001) observed that there was an increasing trend in the production and area of pepper during the decade 1990-99. Area had grown at the rate of 1.96 per cent and production at the rate of 3.22 per cent per annum

In a study on the post globalization scenario of Indian fruits by Pawar and Patil *(2001a), linear and semi-log functions were fitted to the data such as* volume and value of export of fruits from India in post globalization period. The results revealed that export of fruits registered positive and significant growth of 19.42 per cent per annum and export earning of India through agricultural commodities increased significantly at a rate of 37.42 per cent per annum in post liberalization period.

The performance and prospects for export of vegetables from India in post *globalization era of agriculture* was analysed by Pawar and Patil (2001b) based on secondary time series data compiled from monthly statistics of foreign trade of India during the period 1990-1996. Linear and exponential equations were fitted to the time series data for analyzing the trend in export. The study revealed that export of green pepper both in volume and value terms exhibited upward trend significantly at a rate of 6.6 per cent and 15.05 per cent per annum. In general, most of the vegetables exported showed an increasing trend in volume.

In their study on Indian spices, Behera and Indira (2002) analysed the growth of spices export from India during the period 1994-95 to 1999-2000. The exports of Indian spices in terms of quantity has grown at the rate of 7.94 per cent while in terms of value it had grown significantly at the rate of 17.64 per cent during the period. The exports of

value added spices like spice oils and oleoresins, mint oil and curry powder had sharply increased while the share of pepper and chllies was reduced by 1.96 per cent and 10.67 per cent respectively during the same period. The growth of spices import in to India during the same period was found to be 6.69 per cent in terms of value, which was much below the growth rate of exports. It was found that India imported clove in comparatively larger quantities and nutmeg, pepper and other spices in small quantities mainly from European Union and USA.

Jain (2002) in his study examined the growth in area, production and export of spices in India during 1991-92 to 1998-99. The results revealed that the area of spices registered an increase of 24.69 per cent and production by 53 per cent. The export showed an increase of 210 per cent in quantity and 22 per cent in value.

Rajesh *et al* (2002) studied the trend in export of major spices in India and found that black pepper registered a positive annual growth rate of 2.38 per cent in export quantity and 12.78 per cent in export value. While large cardamom registered 12.76 per cent of export quantity and 21.24 per cent export value, ginger registered 4.05 per cent growth in export quantity and 10.15 per cent in export value. Turmeric export growth was at 4.14 per cent in export quantity and 13.08 per cent in export value. Export earnings was contributed by both increase in unit value and quantities in all the major spices except small cardamom which experienced negative growth rate of -8.12 per cent in export quantity and -1.71 per cent in export value. The trends in area, production and productivity of major spices in India were also estimated using exponential function of the form $Y= AB^t$. It was found that all major spices viz., black pepper, cardamom (small), cardamom (large), ginger, turmeric and chilies had registered significant positive growth rate in area, production and yield except the area of small cardamom. The area under small cardamom registered a negative growth rate of 1.01 per cent per annum, which was offset by increased productivity of 3.9 per cent through technological advancements.

Thomas *et al* (2002) in their study on export performance of black pepper in India examined the trends in export of pepper and identified the factors determining quantities of export during the period 1949-50 to 1997-1998. It was found that there was significant

growth in export of pepper during the period under study. The determinants of export were found to be production and domestic retention.

2.2 PRICE BEHAVIOUR

Short-term cyclical fluctuations in prices of small cardamom were analysed by Narayana *et al* (1985). They observed that the turning points of upswings and downswings in prices recurred alternatively at regular intervals. In the long term the prices showed a significant upward trend with a ten-fold rise in 25 years.

Das (1988) in his study on the trends in prices of pepper observed that the prevailing price in the local markets was closely related to the unit value realization, which in turn was closely associated with the international prices. Pepper being an export oriented commodity, its international price obviously influenced the domestic market price of the producing countries.

George *et al* (1989) in their work on the pepper economy of India observed that during the period 1966-67 to 1972-73 the wholesale prices of Indian pepper were low during the harvest season, that is December to March. They also found that the prices of Indian pepper in the international market were generally higher than the price of pepper from other major competing countries.

The seasonal phenomenon in the prices of small cardamom along with the seasonality in related variables like sales at auction centres and export price were analysed by Joseph and Naidu (1992). The analysis showed that the seasonal index of prices was the highest in January and the lowest in July, while the seasonal index of market sales was the highest in November and lowest in July. The extent of seasonality was higher in sales compared to prices, and compared to export prices, sales prices showed more market seasonality. An attempt was also made to quantify the extent of relationship between yearly sales price and the variables like production, quantity of sales at auction centres, export and export prices by employing multiple regression analysis.

The analysis showed that market prices would be well explained (97 per cent) by the two variables namely export and export price..

Jeromi and Ramanathan (1993a) examined the trends in pepper prices and its volatilities using an exponential model. Decade wise growth rates were estimated by fitting kinked exponential function and instability index was estimated from the residuals of exponential trend equation. The results showed that during the period 1960-61 to 1989-90, the annual compound growth rate of wholesale and export prices were around 10 per cent and in the decade wise analysis, seventies and eighties recorded highest growth at all levels of prices. However the later half of eighties witnessed significant negative growth. The instabilities in prices were pronounced during seventies and eighties and it was highest in the case of export prices. The wholesale price movements of major alternative crops of pepper in Kerala rubber, cardamom and coffee during 1960-61 to 1989-90 were analysed and compared with that of pepper. The analysis revealed that the rate of growth of pepper price was substantially higher than the corresponding growth rates of alternative crops. However, its impact was not reflected in the growth of area and production of pepper.

Baharumshah and Habibullah (1994) employed the co-integration technique to analyse the long run relationship between weekly pepper prices in six different markets in Malaysia for the period 1986-91. The empirical findings of the study indicated that regional pepper markets in Malaysia were highly co-integrated and the price of pepper, tended to move uniformly across spatial markets indicating competitive pricing behaviour.

Nayyar and Sen (1994) while discussing the various empirical estimates, concluded that domestic relative prices of agricultural commodities in India were quite different from world price relatives and dismantling existing restrictions on international trade would in general worsen the terms of trade. Further they observed that domestic price moved closer to world surplus.

Sudhakar (1996) analysed the price trends of turmeric in Andhra Pradesh markets during 1981-82 to 1993-94 by using the method of second degree parabola of the form $Y=a+bx+cx^2$. The price line showed a cyclical trend in the price of turmeric in all the selected markets. Each cycle spreads about eight year span in which recession was observed for five years and the revival was for three years.

An analysis of the price adjustment of pepper using average monthly prices for 10 years in the futures and domestic prices by Nasurudeen and Pouchepparadjou (2000) using Ravallion model revealed that last month future price, current spot price and last month spot price were highly relevant in making price adjustments.

Selvaraj *et al* (2000) opined that an increase in the degree of openness was bound to increase domestic price variability due to direct transmission of world prices. But the results of residual trend analysis showed that variability in domestic price was significant in pre-reform period where as variability in international prices were significant in the post reform period

The analysis of trends in auction, wholesale and fob prices of cardamom during 1971-72 to 1997-98 by Madan (2001) showed an overall upward trend with cyclical variations and short term fluctuations. Estimated growth equation indicated that while the auction price registered an average annual growth rate of 6.8 per cent, both the wholesale and export prices increased at the rate of 6.4 per cent. The closeness of growth rates of the three prices was indicative of the high degree of market integration at different levels of trade. The period-wise movement of cardamom prices was also examined and it showed cyclical fluctuations of prices and the period of this cycle was worked out to be around 11 years.

2.3. TRADE COMPETITIVENESS

A study conducted by Gill and Ghuman (1982) during 1970-71 to 1979-80 showed that the share of spices in the international market had been fluctuating

throughout the 1970s. This has varied between 12.7 per cent and 20.5 per cent in that period mainly due to the fluctuations in production

The committee on spices of Government of India (1988) reported that the prices of almost all spices produced in India were comparatively higher in world markets due to low productivity coupled with high proportion of consumption, so if India has to remain as a major supplier in the world market catering at the same time to the increasing domestic market it was imperative to increase production with a strong ascent on productivity of all the spices.

An analysis of the international market for pepper by George *et al* (1989) for the period 1955-56 to 1980-81 showed that Indian pepper had lost its premium to Lampung and Malaysian varieties. Its competitive position weakened during this period due to low productivity and high unit cost of production.

Based on the data on percent market share of top 20 countries exporting / importing agricultural products in the year 1980 and 1985, Pandey and Sharma (1989) reported that in the case of seven commodity groups, including spices, the market share in the export was observed to be relatively well spread among the top 20 countries. The number of new entrants and changes in the ranks of exporting countries were also fairly high in these commodity groups. The study also analysed the world market structure on agricultural products and found that the market concentration was quite high among the top five and top ten countries in both exports and imports respectively. However, there were a large number of new entrants and also changes in the ranks of the old countries between the two points of time indicating stiff competition among them. The study also revealed that in both exports and imports, the trade was dominated by the developed countries like U.S.A, U.K, Canada, France, West Germany, Belgium, Luxembourg, Netherlands, Italy, Japan and Australia. The developing countries showing dominance were Mexico and Brazil.

The export demand and income elasticities of pepper were compiled in general and in USSR market in particular by Sandhu (1989) during the eighties. The result

indicated a favourable response for exports in the markets in terms of price competitiveness and income growth, basic as well as changing consumption patterns. USSR market acted as against the adverse price fluctuations. The study also showed that Indian pepper was priced high in the U.S.A. market and the export market share was prominent relative to Brazilian and Indonesian pepper. Despite the competition, the market was favourable to Indian black pepper, because of its superior quality.

The prospects for agricultural exports from India was examined by Gill (1990) and it was revealed that exports of spices which amounted to 93,800 tones valued at Rs. 250.8 crores in 1987-88 showed a drop in value by about 19 per cent in spite of increase in volume of 12.9 per cent owing to fall in unit realization by 28.3 per cent. The exports of cardamom have suffered both because of higher prices in the domestic market and severe competition in West Asia from Guatemala. The exports of pepper have suffered due to the constraints of high standard of cleanliness expected in the major import markets.

In a neo-classical world, production was found to be determined on the basis of costs, and costs and prices were synonymous and trade would be determined by comparative advantage. However, it was generally agreed that costs of labour, land and capital especially in developing countries, did not reflect their opportunity costs with any accuracy because of market imperfections, although there was wide disagreement as to the extent of the typical discrepancies and how these might change over time. It was suggested that with the help of simplifying assumptions like two commodities, two countries, constant returns to scale and identical factors and identical production functions in both countries – a highly abstract but suggestive model of world trade could be constructed. It was also opined that trade liberations were associated with a substantial growth in the volume of trade. The developed market economies significantly increased their imports of meat and other food and in the case of rice, changed from being net exporters to net importers, which provided an indication of revealed comparative advantage (Goldin, 1990).

Reddy and Narayana (1992), argued that the exports of agricultural and agro based commodities linked with adverse effects on the domestic economy should be discouraged. Their analysis brought out that the share of agricultural exports had been declining over the years due to stagnant output, low yield rates, non competitiveness in the world markets and dependence on traditional export crops and they suggested a shift in the composition of exports in favour of non traditional; high value products like processed foods.

In a study on the agricultural exports of India, Pal (1992) opined that the comparative advantage in the production of agricultural products could not be exploited by least developed countries in the real world mainly because of poor bargaining power in the world market and tariff and non tariff protection strategy followed by developed countries. The export of least developed countries fluctuated more than that of developed countries. This was because of the fact that the export of least developed countries mainly comprised of agricultural products having erratic supply. The unstable export tended to destabilize the income of least developed countries as long as export earnings constituted a significant proportion of national income, which in turn had serious political and economic implications.

Jeromi and Ramanathan (1993) noticed significant changes in the direction of pepper exports from India for the period 1975-90. It was observed that nearly 44 per cent of India's pepper exports were directed to the former USSR, which constituted above 82 per cent of total pepper imports of that country for the same period. Country-wise annual compound growth rate of pepper exports was positive and significant only in the case of USSR (3.38 per cent). On the other hand, India not only failed to increase its exports to USA in tandem with increased consumption in that country but also could not sustain the quantity exported in the past years.

Bhatia (1994) in his study on agricultural pricing, marketing and international trade under new economic environment opined that in order to take the maximum benefit from the new world trade environment, it would be essential to properly assess the available export surplus of various commodities in the country and to give greater

emphasis to production strategy for the commodities for which the country had greater comparative advantage. The relative level of domestic and world prices would indicate the export competitiveness and possibility of export and import of agricultural commodities in the country. He opined that relatively low prices in the domestic market would indicate that the commodity had comparative advantage in the export of that commodity if the international prices were higher than the domestic price plus transport and other handling charges, in contrast to which, if international prices plus insurance and freight charges were lower than the domestic price, then the country was placed at a disadvantage in the production. He also observed that the ratio of domestic prices to world prices during 1992 was significantly lower than one in the case of wheat, rice, maize, cotton, jute, tea, coffee, rubber, tobacco, pepper and oil cakes and horticultural products like potato, mango and banana except oil seeds and sugarcane.

Paarlberg (1995) opined that export subsidies would raise the domestic price of the subsidized good for the exporting country because subsidies introduce price wedges and at the critical world price, there will be excess supply in the world market and excess demand in the domestic market.

Swaminathan (1995) emphasized the role of excellence in quality, reliability of supplies and price competitiveness in international trade and suggested ecologically sound methods of production, improved post harvest technology and maximum value addition for spices with particular attention to processing, packaging, transportation and marketing. The major challenges identified to Indian spice industry were the productivity challenge, the quality challenge and the value addition challenge.

Jeromi and Nagarajan (1996) attempted a relative price analysis of pepper in India in relation to Indonesia and Malaysia and were found that it was negatively associated with India's export. It implied that India was facing competition from these countries and any increase in our export price and/or any decline in the competitor's price tend to reduce our exports. Among the competing countries, Indonesia was found to be the dominant competitor of India followed by Malaysia.

Jhakhar (1996) was of the view that the economic liberalization policies would give Indian Agriculture a new face of confidence and strength while opening up of farm sector for foreign investment and protecting the interest of the farmers at the same time posed challenges. Another disquieting trend was the declining of government funds in the farm sector and agricultural research. The author opined that phytosanitory conditions and market access measure should be studied in depth and a good market intelligence system should be developed as well as subsidies should be continued in the better interest of our farming community.

Reddy *et al* (1998) in their study on global competitiveness of sunflower production in Karnataka during 1984-85 to 1993-94, analyzed the export competitiveness of sunflower through the Nominal Protection Coefficient (NPC) both under importable and exportable hypotheses, which is a measure of comparative advantage. The results revealed that high competitiveness of sunflower seed under importable hypothesis with a NPC of 0.73 in the post-liberalized action period where as it was 1.19 during pre-liberalization period, indicating its role as an efficient import substitute. The coefficient was more than one under exportable hypothesis during pre and post-liberalization periods, which implied its inefficiency as an exportable commodity.

Ravi and Reddy (1998) analyzed the export competitiveness of jowar, maize, groundnut, sunflower, cotton and coffee using Nominal Protection Coefficient with particular reference to Karnataka. Results revealed that Karnataka lacked comparative advantage in most of the crops except in cotton. Even though Karnataka was the leading coffee exporting state, the domestic market seemed more favorable than the export market and export potential of jowar, maize, groundnut and sunflower were significantly low.

Selvaraj *et al* (1998) examined the level of protection and comparative advantage of agriculture in Tamil Nadu during 1980-81 to 1991-92 using Nominal Protection Coefficient (NPC). NPC value was approximately 0.9 for rice and cotton and 2.5 and 2.2 for sugarcane and groundnut respectively. It was observed from the analysis that within agriculture, levels of protection were found to be very uneven among the crops. Rice and

cotton was disprotected and in contrast sugarcane and groundnut was highly protected, which had influenced allocation of resources away from commodities in which India has a comparative advantage, leading to efficiency losses and misallocations of resources, including net losses in output and foreign exchange.

In his study on problems and prospects of India's rice trade in a WTO regime, Datta (1999) indicated that India was competitive both in Basmati and non-Basmati varieties of rice. However, while Nominal Protection Coefficient (NPC) values suggested that in three out of four varieties the competition was declining, the Domestic Resource Cost Ratio (DRCR) values suggested that in two out of four cases the comparative advantage had improved and in other two cases it had deteriorated. The study however indicated that with the growing domestic demand, India's ability to export non-Basmati might be limited.

Naik (1999a) in his study on the comparative advantage of wheat reported that comparative advantage in producing wheat varied across states, along with decline in the comparative advantage over the years, if this trend continued, India could be non-competitive in exporting wheat.

Comparative advantage of Indian cotton was assessed by Naik (1999b) through Domestic Resource Cost (DRC) and suggested that in the recent years the comparative advantage was eroding due to lower productivity and declining international prices. In most of the cases DRC was greater than one.

Srinivasan (1999) mentioned that the agricultural trade liberalization measures adopted in the QR agreements were comprised of many loopholes, which provided developed countries in maintaining dirty models against the interests of non-food exporting countries. So the extent of trade liberalization actually achieved was very small and even negative in some regions like western Africa.

Damodaran (2000) opined that more than 50 per cent of our cost on exported spices (small cardamom) and flowers were accounted by freight and marketing cost. In

the case of cardamom this has resulted in withdrawal of producers from the export market and concentration on the domestic market. Any drastic reduction in export subsidies for this sensitive commodity will considerably affect our exports of this traditional, high-quality spice.

Selvaraj et al (2000) opined that developing countries with free trade specialized in labour intensive agricultural goods while developed countries specialized in capital intensive goods, which resulted in biased economic growth. Due to the lack of stability of demand for agricultural goods, developing countries had the problem of export instability. The terms of trade deteriorated in developing countries due to increase in price of imports and imperfection in international financial markets. They also estimated elasticity coefficient for testing the outward oriented trade policy during the period 1971-72 to 1984-85 and for the period 1985-86 to 1996-97. It was 0.84 in the first period and 0.87 in the second period which confirmed more importance to outward oriented agricultural trade policies in the second period to boost agricultural sector. The real agricultural exports grew exponentially at the rate of 11.14 per cent in the second period, while the per capita income grew exponentially at the rate of 1.91 per cent per annum.

An attempt was made by Jha (2001) to compare Nominal Protection Co-efficient of agricultural commodities over the years (1992-93 and 1996-97), which would indicate the impact of trade liberalization on the price competitiveness of the products. The result revealed that over the years there was marginal increase in NPCs for cereals, excluding wheat and maize. The increase in NPCs was significant for commercial crops like cotton, jute and tobacco. The increase in NPCs over the years indicated erosion in price competitiveness followed by trade liberalization. The author also opined that in India the comparative advantage is high for commercial crops like cotton, tobacco, jute, spices, tea and coffee which are produced efficiently in the country on a commercial scale. The country had also advantage in producing labour intensive crops like rice.

Export potentials and price competitiveness of Agricultural commodities of Tamil Nadu was worked out by Kannaiyan and Ramasamy (2001). The study indicated that international prices of agricultural commodities would rise once developed countries

reduce domestic support and export subsidies. In most of the commodities domestic prices were lower than the international prices showing great opportunity for promoting export. Export competitiveness depended on inter year international price fluctuations. Commodities like cotton, groundnut, gingelly, tomato, banana, onion and potato showed high competitiveness.

Export performance of Indian tea industry under the new economic environment using Nominal Protection Coefficient and domestic resource cost was analysed by Mahesh *et al* (2001). It was found that under importable hypothesis NPC and DRC were 0.71 and 0.66 respectively and under exportable hypothesis, the NPC and DRC were 0.98 and 0.93 respectively, implying moderately competitive position of Indian tea exports and also as a good import substitute.

Naik (2001) in his work on market assessment and exports of agricultural products observed that the competitiveness of countries in individual products/ commodities is expected to play a major role in the international trade. India would have to increase productivity and improve quality to compete effectively in the international market. It was found that India had high share in the low potential market and low shares in high potential market.

Nambiar (2001) in his paper on the impact of globalization and WTO agreements on the agricultural economy of Kerala observed that countries that have a competitive advantage in terms of production costs and productivity would be placed in a more advantageous position. The overall productivity of agricultural crops in India is only about one-third as compared with that of advanced countries like USA and Australia and this makes India's agriculture globally uncompetitive for exports and attractive for imports.

Export competitiveness of selected fruits was examined by Pawar and Patil (2001a) using Nominal Protection Co-efficient (NPC). Results showed that India had comparative advantage in export of banana, grapes, mangoes, orange and lemon to Kuwait. It was also concluded that our fruits were mainly exported to Arabian countries

The export competitiveness of selected vegetables was examined by Pawar and Patil (2001b) using NPC as a measure of competitiveness. It was seen from the result that NPC of onion was 0.75, which implied high comparative advantage. Indian export of potato also enjoyed slight comparative advantage. It was concluded that the export should be diverted to those countries where we have comparative advantage in terms of price.

Ravikumar *et al* (2001) conducted a SWOT analysis of agricultural export potential of Andhra Pradesh and concluded that farmers should be motivated to take up the agricultural and allied activities as a profit making business and to concentrate more on profitability rather than productivity of crops. Farmers should produce and market these products through cost effective technologies.

Singh and Asokan (2001) in their study on competitiveness of oilseeds, coconut and rubber observed that India is not competitive in many oilseeds indicating inefficiency in the processing sector. NPC of copra indicated that India was not an important competitor in copra; as domestic prices were very high compared to the international prices. However the DRCR was only 0.35 suggesting that proper byproduct utilization can help in making this crop competitive.

Verma and Singh (2001) felt that when QR of important items were being lifted, the most sensitive of the WTO affected areas would be India's primary sector, which accounted for millions of livelihoods. The maximum tariff India could impose was 100 per cent on primary sector production, 150 per cent on processed foods and 300 per cent on edible oils. These sound reasonably high, but farms would prove to be the explosive issue at WTO, because every country subsidized them heavily.

Chand (2002) examined the correlation between quantity of export of black pepper and its fob price and found that it was negative or close to zero, which showed that fluctuation in export of black pepper might have resulted from fluctuations in domestic production. He also calculated Nominal Protection Coefficient of black pepper for the period 1991-92 to 1999-2000 and the result revealed that during 1997-98 NPC was greater than one and in other years it varied between 0.84 and 0.98. It indicated that

the exporters of black pepper were operating at a very low margin and domestic prices were only slightly lower than the export prices.

The study on import liberalization and Indian spice economy by Madan and Kannan (2002) revealed that during post globalization period (1995-96 to 1999-2000) export had shown an annual compound growth rate of 3.8 per cent in quantity and 25 per cent in value. However during 2000-2001 the export had shown a decline of 3 per cent in terms of quantity and 20 per cent in rupee value. Spices export during the post QR free trade period i.e. April – August, 2001 was estimated at 91335 tonnes valued at Rs. 626.12 crores as against 67668 tonnes valued at Rs. 751.71 crores in the corresponding period of previous year.

Sai (2002) opined that in India agriculture was not a profitable proposition and farmers were losing comparative edge due to factors like non availability of credit on easy terms, constraints on critical inputs, stagnation of yield, lack of quality consciousness, imperfect domestic markets and uncertain international markets.

2.4 MARKETING STUDIES

Sikka (1976a) examined the price trend and marketing problems in ginger trade. It was found that nearly 31.51 per cent and 51.27 per cent of the consumer's price in export trade and internal trades respectively were payments for moving the produce through marketing channels. Intermediaries took a total of 36.04 per cent of the consumer's price in the internal trade against seven per cent in the export trade. Profit margins of commission agent, in the internal trade were very high. The study pointed out that price spread can be reduced and producer's income increased considerably, provided the producer retain the commodity after proper drying and cleaning and supply it to different markets according to demand and price situation. The study recommended the formation of co-operative sale societies and establishment of ginger curing and processing units.

A study on the price spread of black pepper in Kerala by Sikka, (1976b) revealed that the producer's share in the consumer's rupee was 66.92 per cent in the channel,

producer – village merchant – commission agent – exporter – consumer and it was 64.78 per cent in the channel, producer – village merchant – commission agent – wholesaler – wholesaler at consuming centre – retailer – consumer. Combined margins of intermediaries were worked out to be 6.89 per cent of the consumer's rupee in first channel and 20.06 per cent in the second channel. Maximum margin was realized by exporter in the first channel whereas it was retailer in the second channel.

In his study on dynamics of price spread components, Desai (1979) concluded that price spreads of agricultural products was influenced by endogenous as well as exogenous factors. The study led to an inference that, in the fixation of prices of agricultural products, weightage should be accorded to factors like the size of farm holding, location, and type of products, trader's margin and processing cost.

Sikka and George (1983) studied the price spread in important ginger marketing channels and found that producer received 63.18 per cent and 45.18 per cent of the price paid by the ultimate consumer in the consignment exported and that sold in the internal market respectively. The share of marketing costs ranged between 24.09 per cent in the export trade to 26.39 per cent in the internal market while that of marketing margins between 12.13 per cent in the former and 28.43 per cent in the latter. Amongst all market functionaries the margin of the wholesaler/ exporter and commission agent was more in the consignment exported while it was more for the retailer and commission agent in the internal market.

Velappan (1984) opined that proper marketing in India was traditionally a private business and needy and financially weak farmers usually disposed their produce soon after the harvest. The pepper growers got only 60 to 70 per cent of the retail price in the distributing market. Even though there were co-operative marketing societies, the quantity handled by them was only about 10 per cent of the production in Kerala.

Narayana *et al* (1985) noticed that the important aspect of cardamom marketing was that small growers sold their produce to the local dealers and merchants and therefore they got lesser price than the planters. The small quantities of produce per

cultivator at each harvest, lack of curing facilities and the need for immediate cash were the factors which compelled the small growers to go in for distress sale.

Santhosh (1985) in his study on cost of cultivation and marketing of pepper in Cannanore district analysed the marketing margin realized by different functionaries and found that maximum margin was realized by the exporter, in the case of foreign trade and internal wholesalers in the case of consignment trade.

Sambhur *et al* (1990) examined the marketing cost, marketing margin and price spread for green and dry ginger produced in Himachal Pradesh. Two pockets, one for green and another for dry ginger was selected. The study showed that higher net price for producers could be ensured by encouraging group sales through producer's co-operative. The wholesaler's net margin appeared to be high which can be reduced by creating competition at the wholesalers' level.

Jeromi and Ramanathan (1993a) analysed the price spread and price transmission of pepper during the period 1960-61 to 1989-90 and the results revealed that the farm and market shares in the export price of pepper were 81 per cent and 19 per cent respectively and the share of farmers had increased over the years. Out of the market share, 13 per cent accrued to the exporters and the remaining 6 per cent to wholesalers. The price transmission from wholesale price to farm price was found to be efficient, but transmissions from export price to farm price were less efficient.

Jayesh (1994) in his study on economics of production and marketing of ginger in Kerala with special reference to Idukki district found that the most important marketing channel identified for both green and dry ginger was producer – village merchant – commission agent – wholesaler – retailer/secondary wholesaler – consumer. In the case of dry ginger, producer sale price formed 62 per cent of the retail price. The corresponding share in the green ginger trade was 37 per cent. The combined net margins of the intermediaries were 19.6 per cent of the consumer rupee in dry ginger trade while it was 23.3 per cent in green ginger. The major problem faced by the farmers were instability in prices.

Marketing channels, marketing margins, cost and price spread of ginger in Bihar was analysed by Srivastava and Rashid (1994). They found that most of the produce passed through the channel involving producer-local trader-wholesaler-retailer-consumer. They also found that retailers were getting comparatively higher margin compared to other market functionaries and it was mainly due to the slower disposal of the produce at retail level.

Saini and Bhati (1995) conducted a study on constraints of ginger marketing in Himachal Pradesh and the results revealed that the main problems faced by ginger growers were the prevalence of the *arthiya* system of ginger marketing, the limited number of procurement centres for ginger, non-existence of co-operative societies and low prices. High transportation cost was another problem.

Madan (2000) in his study on the marketing system of pepper concluded that it was very efficient and provided increased share of consumer prices (87.7 per cent) to farmers with comparatively low marketing cost (6.74 per cent). The overall prices spread (11.06 per cent) was much low when compared to that of other export oriented agricultural products.

Mukundan and Devi (2000) opined that the village traders were ruling the rural pepper market in Kerala and most of the small farmers were selling their produce to village traders and it was mainly because of the transportation difficulties. They also found that the share of producers on the fob price of pepper was estimated to be 86.06 per cent, where as the producers enjoyed a higher share of internal consumer price (88.8 per cent) when the produce moved through the channel for domestic consumption.

A study conducted by Madan and Selvan (2001) revealed that more than 60 per cent of pepper produced moves through the most common channel of producer - village assembler - local trader – wholesaler - exporter. The marketing system for pepper was found to be more efficient by providing increased share of consumer price (87.7 per cent) to the farmers with comparatively low marketing cost (6.74 per cent) and low price spread of 11.06.

Shalendra and Singh (2001) examined the marketable surplus, marketing cost and marketing margin and producer's share in consumer's rupee under different channels in marketing of wheat in Kanpur district during 1999-2000. The results brought out a positive correlation in the marketable surplus and size of holdings. There was an increase in marketing costs and margins with the increase in length of marketing channel while producer's share in consumer's price decreased with increase in the length of marketing channels.


MATERIALS & METHODS

3. MATERIALS AND METHODS

Appropriate research design is a pre-requisite to draw meaningful inferences about any study. The present study on the market behaviour of important spices of Kerala aims to estimate trends in area, production productivity, prices and export of major spices viz, pepper, cardamom, ginger and turmeric along with price behaviour and trade competitiveness. A brief description of the area of study and methodology used is presented in this chapter.

3.1 AREA OF STUDY

Idukki district, which is declared as a spices district and stands second in the state in agricultural produce, was selected for the study "Market Behaviour of Important Spices of Kerala".

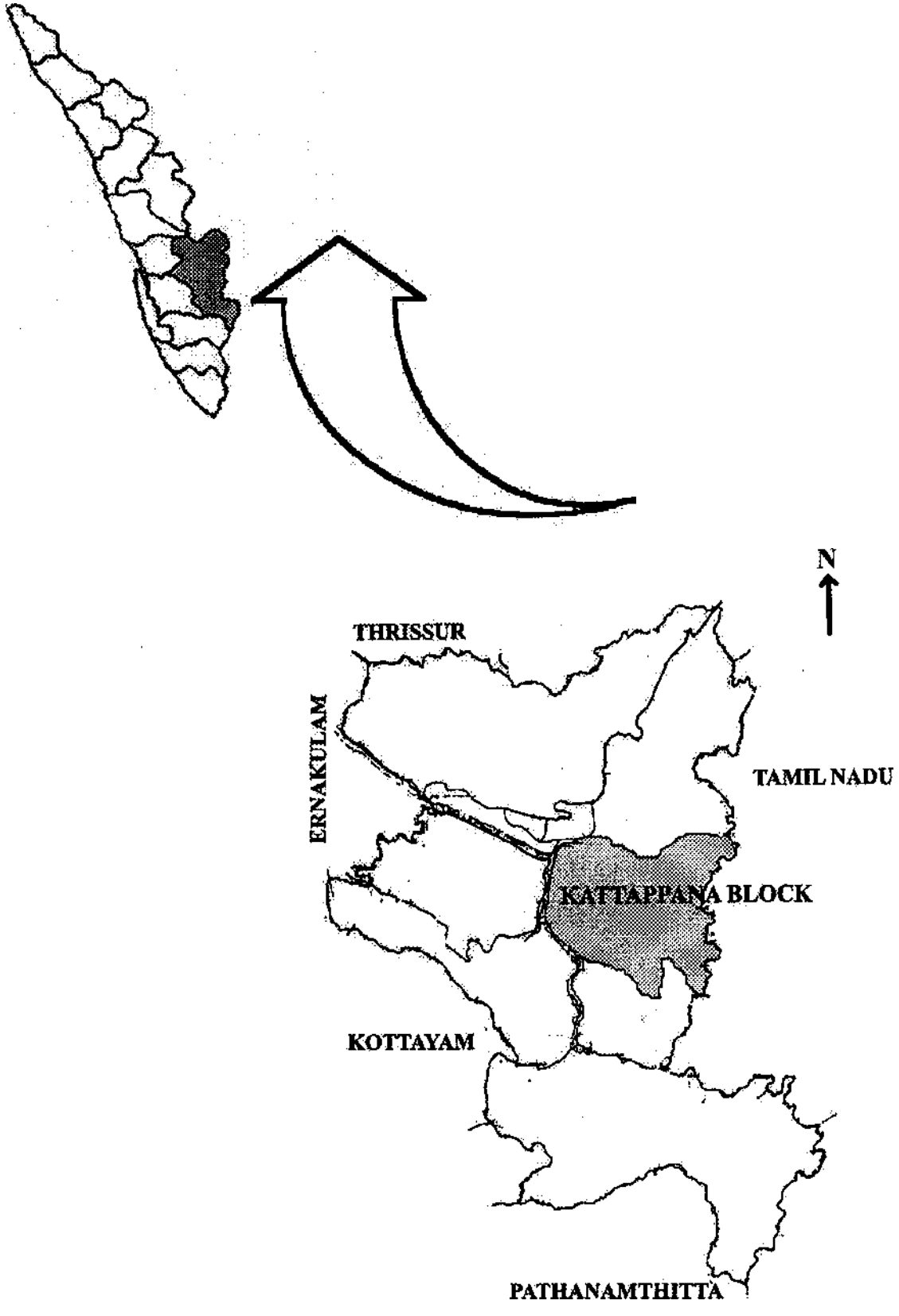
3.1.1 Idukki District

Idukki district is widely known across the country for its scenic beauty with numerous mountains and valleys. Places like Thekkady wild life sanctuary, hydro electric projects especially the Idukki dam, the Periyar river and dense forests of the district occupied a prime place in the tourist map of the country. The district is also famous for plantations and spice crops like tea, coffee, cardamom, pepper, ginger, turmeric etc in the high ranges and rubber in the middle.

3.1.1.1 *Location*

Idukki district is located in the middle part of Kerala which is bound on the east by Madurai district of Tamil Nadu and on the west by Ernakulam and Kottayam district of Kerala. In the south, it is bound by Pathanamthitta district while on the North it is bound by Trichur and Coimbatore districts of Kerala and Tamil Nadu states respectively. It lies between 9°15′ and 10°21′ of north latitude and 76°37′ and 77°25′ east longitude with an area of 5,087 square kilometers, and it contribute 13 per cent of the total area of

Fig. 3.1 Map of the study area



the state. It extends by 115 kilometers from south to north and 67 kilometers from east to west. The map of Idukki district is given in Fig.3.1

There are four taluks in the district viz, Devikulam, Thodupuzha, Udumbanchola and Peermade. The total population of the district as per 2001 census was 11,28,605 and it has a high literacy rate of 89 per cent.

3.1.1.2 Geographical features

Idukki has many unique topographical and geographical characters. Rugged mountains and forests cover a major part of the total area of district. There is only a strip of middle land (4.5 per cent) in the western part of the district. Lowland area is totally absent in the district. More than 50 per cent of the area of the district is covered by forests.

3.1.1.3. Land Pattern

As the district lies in high elevation, it is covered with dense forests, steep hills and deep valleys. Because of the undulating topography, large area of the district is not suitable for scientific cultivation. Two types of soils are predominant in the district. The highland area is covered by forest soil and other parts by laterite soil. The details about the land pattern are given in Table 3.1.

Table 3.1. Land pattern of Idukki district

Altitude (Above MSL)	Land pattern	Per cent to total
20-100 m	Midland	4.5
100-300m	Mid-upland	9.5
300-600m	Upland	12.2
600-1200m	Western Ghat high range	49.3
Above 1200 m	Top Western Ghat high ranges	24.5

Source: www.idukki.com

3.1.1.4 Land use pattern of Kerala state and Idukki district

The land use pattern of Kerala state and Idukki district is presented in Table 3.2. It is clear from the table that out of a total geographical area of 514962 ha in the district the net cropped area is 223000 ha (43 per cent), while for the state, net cropped area is 2239363 ha which accounts for 57.63 per cent of total geographical area. The cropping intensity of the state is 134 where as it is only 118.7 in Idukki district.

Table 3.2 Land use pattern of Kerala state and Idukki district, ha

Sl. No.	Item	Kerala	Idukki
1	Geographical area	3885497 (100)	514962 (100)
2	Forest	1081509 (27.8)	260907 (50.6)
3	Land put to non agricultural uses	354390 (9.14)	14982 (3.0)
4	Barren and uncultivable land	28884 (0.74)	4136 (0.83)
5	Permanent pastoral and other grazing land	253 (0.01)	155 (0.03)
6	Land under miscellaneous crops	18515 (0.5)	5888 (1.14)
7	Cultivable waste	58279 (1.5)	3132 (0.6)
8	Fallow other than current fallow	32138 (0.83)	1000 (0.12)
9	Current fallow	72166 (1.85)	1762 (0.38)
10	Net sown area	. 2239363 (57.63)	223000 (43.3)
11	Area sown more than once	762341 (19.62)	41726 (8.1)
12	Total cropped area	3001704	264726
13	Cropping intensity	134	118.7

Figures in parentheses show per cent to total geographical area.
Source: Farm Guide 2002

3.1.1.5 Climate and Rainfall

The climate in the district shows an abrupt variation as we go from west to east. The western part of the district comprising midland area experiences moderate climate, temperature varying between 21°C to 27°C with minimum seasonal variation. The district receives plenty of rain both from south- west and north - east monsoons. The normal rainfall is 3265 mm which is higher than the state average (2900 mm) even though there is wide variation in the distribution of rainfall in the district. The monthly rainfall pattern of Idukki district and Kerala state are given in Table.3.3

Table3.3 Monthly rainfall pattern of Idukki district and Kerala state, mm

Month	Idukki	Kerala
July	1025.10	625.96
August	478.80	337.06
September	616.70	329.35
October	369.50	320.61
November	120.00	97.17
December	142.90	88.42
January	18.40	12.56
February	29.30	8.37
March	13.30	13.49
April	215.10	134.34
May	89.90	71.01
June	711.30	592.10

Source: www.idukki.com

3.1.1.6 *Cropping Pattern*

The district has agro-climatic conditions suitable for the cultivation of plantation crops and spices like tea, rubber, coffee, coconut, cardamom, pepper etc. The cropping

patten of Idukki district as presented in Table3.4 revealed that pepper, rubber, tea and coffee account for more than 50 per cent of the total cropped area and cardamom occupies about 27 per cent. Paddy cultivation is comparatively less, and it comes to around 5000 hectares.

Table 3.4 Cropping pattern of Idukki district

Crop	Area (Ha)	Per cent to Total Cropped Area
Cardamom	55174	27.23
Pepper	34759	17.15
Rubber	34595	17.07
Tea	23557	11.62
Coconut	14864	7.4
Coffee	10834	5.34
Tapioca	6490	3.20
Paddy	5078	2.50
Jackfruit	3188	1.57
Sugarcane	2768	1.30
Banana & other plants	2082	1.01
Arecanut	1558	0.77
Ginger	1551	0.77
Lemon grass	1476	0.73
Cocoa	1418	0.70
Mango	1426	0.70
Cashew	848	0.42
Pappaya	379	0.19
Pineapple	188	0.09
Turmeric	192	0.09
Tamarind	168	0.08
Seasmum	146	0.07
Total	202739	100

Source: www.idukki.com

3.1.1.7 Contribution of Agriculture to Employment in the district

Agriculture is the main occupation of the people in the district; dairy is the supplementary source of income of the farmers. Recently, floriculture, mushroom cultivation, medicinal plant cultivation, vanilla cultivation and so on are being taken up by some progressive farmers. Out of the total population, 14.3 per cent depend on agriculture, which includes cultivators and agricultural labourers.

3.1.1.8 Demographic Features

According to the 2001 census, the total population of the district is 11,28,605 of which 5,66,405 are male and 5,62,200 are female. The sex ratio is 993 female per 1000 males. The literacy rate is 89 per cent. Out of the total population in the district 75, 392 (6.68 per cent) are cultivators and 86030 (7.62 per cent) are agricultural labourers.

Kattappana block panchayat was purposively selected for primary data collection and a brief description of this block is presented below.

3.1.2. Kattappana Block Panchayat

Kattappana block panchayat comes under Udumbanchola taluk, which is situated in the middle part of Idukki district. This block has Idukki block as northern and western borders, Azhutha block in the southern border and Tamil Nadu state in the east border. The panchayat selected for study in the block is Kattappana panchayat.

3.1.2.1 Geographical area

It is situated at a height of about 800-1400 m above mean sea level facing Western Ghats. The total geographical area of the block is 372.98 square kilometers and major part of this block is in high ranges.

3.1.2.2 Climate and rainfall

The block experiences moderate climate. Vandanmedu and Chakkupallam panchayats of this block experiences much cool climate compared to others. The climate is well suited for the cultivation of cardamom. Block receives well distributed rainfall with an average of 3000 mm.

3.1.2.3 Agriculture

People mainly depend upon agriculture for their livelihood and it is the backbone of the block's economy. The highland area in the block is occupied by plantation crops like tea and cardamom and in the low lying areas they follow mixed cropping with coffee, pepper and rubber. Changes in climate and fluctuations in the prices of agricultural products affect both plantation and agricultural sector. The highland area, which is occupied by large farmers, shows monocropping and they do soil conservation practices and irrigation in a better manner. Labour is not a problem in that sector and productivity is also high. The marginal and small farmers follow mixed cropping pattern in low lying areas with less soil conservation practices and irrigation. Capital investment is low in the case of these farmers and their standard of living is also relatively low.

3.1.2.4. Cropping pattern of Kattappana block and Kattappana panchayat

The cropping pattern of Kattappana block and Kattappana panchayat as presented in Table 3.5 revealed that pepper was the most important crop in both the block and panchayat, followed by tea in block and coffee in panchayat. It may be noted that though the turmeric area was not reported in the development report, some people are cultivating it in some pockets.

Table 3.5 Cropping pattern of Kattappana block and Kattappana panchayat in the year2002, ha

Crop	Kattappana block	Kattappana panchayat
Paddy	528 (1.4)	48 (0.95)
Tapioca	638 (1.66)	153 (3.02)
Pepper	11858 (30.85)	1620 (32.03)
Cardamom	8032 (20.89)	415 (8.2)
Tea	8237 (21.43)	102 (2.02)
Coffee	3335 (8.68)	765 (15.12)
Rubber	443 (1.15)	153 (3.02)
Coconut	1184 (3.08)	510 (10.08)
Areca nut	1054 (2.74)	510 (10.08)
Cocoa	432 (1.12)	153 (3.02)
Ginger	430 (1.12)	102 (2.02)
Bitter gourd	598 (1.56)	225 (4.45)
Banana	1062 (2.76)	255 (5.04)
Others	612 (1.56)	48 (0.95)
Total	38443 (100)	5059 (100)

Note: Figures in parentheses indicate per cent to total
Source : Vikasana Report, Kattappana block panchayat 2002-2007

It may be noted that though turmeric area was not reported in the Vikasana Report some people are cultivating it in some pockets.

3.1.2.5 Demographic features

According to 1991 census total population of the block is 155904 of these 78780 are male and 77124 are female. The sex ratio is 979 female per 1000 male. Out of the total population, 16075 (10.31 per cent) are scheduled castes and 2831 (1.82 per cent) are scheduled tribes. The block has a literacy rate of 80.9 per cent.

3.2 METHODOLOGY

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

3.2.1 Location of the Study and Sampling Design

The study was undertaken in Kerala state. Idukki district was purposively selected for gathering information on marketing aspects of spices, considering the importance of spices in the district. The district occupies first position in terms of area under pepper and cardamom, second in ginger and fourth in turmeric. From Idukki district, Kattappana block having the highest area under spices was selected, and from this block, Kattappana panchayat was selected since it was the typical spice growing area where representative farmers growing all the selected spices viz., pepper cardamom, ginger and turmeric. From the panchayat 30 farmers were randomly selected for each crop. In addition a few traders, auction centre officials and exporters were also selected for gathering information about marketing of spices.

3.2.2 Collection of Data

Both primary as well as secondary data have been used for the study. The secondary data on area, production and productivity of four major spices in Kerala state were collected from the various publications of State Planning Board, Trivandrum, and Directorate of Arecanut and Spices Development, Kozhikode. Domestic price, international price, exports and import data were collected from the various publications of Directorate General of Commercial Intelligence and Statistics (DGCI&S), Kolkota and Spices Board, Kochi. For analysis of trend, secondary data on area, production, productivity and export were collected for the period 1970-2000 and for analyzing price behaviour monthly domestic and international prices for the period 1980-2003 were used. For finding competitive advantage the study was based on secondary data covering 16 years, starting from 1987-88 to 2002-03. The study period was grouped in to two, viz, pre WTO (1987-88 to 1994-95) and post WTO (1995-96 to 2002-03) periods. The data on

export, import and prices of spices pertains to India, as separate data for Kerala state was not available.

To study the marketing costs, marketing margin etc primary data have been collected through sample survey. The data from the selected respondents were collected through personal interview method during April-May, 2003.

3.2.3 Analysis of Data

The analytical tools used in the present study have been presented in six sections. The first section deals with the methodology adopted for the trend analysis and estimation of growth rates in area, production, productivity and export of spices. The procedure followed in the analysis of production and export instability is presented in the second section. The third section deals with the procedure for estimation of itemwise export and import. The fourth section deals with the methodology for price behaviour followed by the procedure for the estimation of Nominal Protection Coefficient in the fifth section. The last part deals with the methodology involved in the analysis of primary data.

3.2.3.1 Trend analysis and estimation of growth rate

Growth rate of a variable is defined as the rate of change per unit of time, usually a year. Growth rates of area, production, productivity , export quantity and export value were worked out using exponential, semilog, log quadratic and kinked exponential models.

i) Exponential model

$$Y_t = AB^t$$

Where Y_t = area/production /productivity / export quantity/ export value

t = Number of years from 1 to 30

A = Constant

B = Regression co-efficient

Taking logarithms,

$$\ln Y_t = \log A + t \log B$$

$$Y_t' = a + bt$$

Where $Y_t' = \ln Y_t$, $a = \ln A$ and $b = \ln B$

Compound Growth Rate *(CGR) = (antilog b-1) x 100.*

In order to study the decadewise performance the entire period (1971-2000) was divided into three sub periods viz, period I (1970-71 to 1979-80) period II (1980-81 to 1989-90) and period III (1990-91 to 1999-2000) and compound growth rates were estimated.

ii) Kinked exponential model

Even though Exponential function is commonly employed to estimate compound growth rates, it gives only discontinuous growth rates which may not give a true picture for comparison among different periods. Hence, kinked exponential model was also adopted for the estimation. The kinked exponential model has a distinct advantage that it is possible to estimate continuous growth rate as it makes use of full set of available information from the outset of estimation exercise (Boyce, 1986)

Discontinuous growth rate estimates for the three sub periods can be derived by fitting a single equation of the following form,

$$\ln Y_t = \alpha_1 D_1 + \alpha_2 D_2 + \alpha_3 D_3 + (\beta_1 D_1 + \beta_2 D_2 + \beta_3 D_3)\, t + U_t$$

Where D_j is a dummy variable which takes the value one in the first sub period and zero otherwise, Y_t is the respective variable and U_t is the error term. In order to estimate continuous growth rates of the three sub periods, discontinuity between three

trend lines, is eliminated by a linear restriction such that they intersect at the break points, k_1 and k_2.

$$\alpha_1 + \beta_1 k_1 = \alpha_2 + \beta_2 k_1$$

$$\alpha_2 + \beta_2 k_2 = \alpha_3 + \beta_3 k_2$$

Substituting for α_2 and α_3 we obtain the two-kink exponential model.

$$\ln Y_t = \alpha_1 + \beta_1(D_1 t + D_2 k_1 + D_3 k_1) + \beta_2 (D_2 t - D_2 k_1 - D_3 k_1 + D_3 k_2) + \beta_3 (D_3 t - D_3 k_2) + U_t$$

The OLS estimates of the respective co-efficient β_1, β_2 and β_3 would give the exponential growth rates for the three sub periods. The growth rates are then computed by using the formula,

$$CGR = (\text{antilog } \beta - 1) \times 100$$

iii) Semilog model

$$\ln Y_t = a + bt$$

Where Y_t = Area/ production /productivity/ export quantity/ export value

t = Number of years from 1 to 30

a = Constant

b = Regression co-efficient

Per cent growth rate = b x 100

iv) $\ln Y_t = a + bt' + ct'^2$

Where Y_t = Area / production / productivity/ export quantity/ export value

$$t' = t - \left(\frac{n+1}{2}\right)$$

t = Number of years from 1 to 30

a = Constant

n = total number of years

b,c = parameter to be estimated

3.2.3.2 Production and export instability

Instability is expected to hamper the process of economic development. This analysis was used to find out the fluctuations in production and export of important spice of Kerala. To study the instability Coppock's instability index was used to estimate the variation which is algebraically expressed in the following form,

$$V\log = \sum \frac{\left[\log \frac{x_{t+1}}{x_t} - m\right]^2}{N}$$

The instability index is (antilog $\sqrt{V\log}$ – 1) x 100

x_t = Production or export in the year t

N = Number of years minus one

m = The arithmetic mean of the difference between the log of x_t and x_{t+1}. x_{t+2} and x_{t+3}

V log = logarithmic variance of the series.

Coefficient of variation (CV)was also used to measure variability where,

CV= (standard deviation/mean) X 100

3.2.3.3Itemwise export and import

The item wise exports and imports of major spices have been examined for the period 1988-2002. The major items of exports / imports of the above crops were identified based on their per cent share in the total value of the item. The item wise exports and imports were analysed for the two sub-periods pre WTO period (1989-1995) and post WTO period (1996-2002).

3.2.3.4 Price behaviour

Agricultural prices play a vital role in the marketing of agricultural and non-agricultural commodities. Price movements tend to affect the decisions of producers, buyers, consumers and the economy as a whole. Keeping this in view, the price behaviour of major spices of Kerala viz, pepper, cardamom, ginger and turmeric was analysed.

The method of estimating the trend in a series of annual prices involved estimating the coefficients a and b in the linear functional form,

$P_t = a + bT_t$

P_t = Price during the year t

T_t = Number of years (1 to 23)

a = Constant

b= Regression coefficient

Based on this form trend lines were fitted to both domestic and international prices. Coefficient of variation was also calculated for the period 1987-88 to 2002-2003 and also for its sub periods i.e. pre WTO (1987-88 to 1994-95) and post WTO (1995-96 to 2002-2003). Variations in prices were compared for the two periods.

3.2.3.5 Trade competitiveness of spices

Trade liberalization is expected to bring changes in the domestic as well as international prices due to removal of price distorting policies. These changes can affect the competitiveness of countries in agricultural trade. The export competitiveness of major spices have been assessed by using Nominal Protection Coefficient (NPC). It measures the actual divergence or distortion between any given commodity's domestic price and its international or border price. Such a divergence represents the response of market interventions such as taxes, subsidies, government controlled prices and other policy instrument.

The NPC of commodity is the ratio of domestic price to its border price (international price)

$$NPCi = \frac{Pdi}{Pbi}$$

NPC_i = Nominal protection coefficient for the i^{th} commodity in a given country.

Pd_i = domestic price of i^{th} commodity at the producer or wholesale level.

Pb_i = border price of the i^{th} commodity

NPC was worked out for pepper, cardamom, ginger and turmeric for the two periods, pre WTO (1988-1995) and post WTO period (1996-2003) and compared.

3.2.3.6 Primary data

The primary data collected was tabulated and analyzed using averages and percentages. For the analysis of constraints, ranks were given by respondents, based on the assumption of first rank for most important constraint, were summed up and mean was found. The constraints were prioritized based on the mean rank.

3.2.4 Concepts Used in the Study

Nominal protection coefficient (NPC): Pursell and Gupta (1998) defined NPC of a commodity as the ratio of that commodity's domestic price to its international reference price and referred to it as an estimate of the extent to which its price has been affected by government interventions in the country's international trade. NPC determines the degree of export/import competitiveness of commodities by measuring the divergence of domestic price from the international or border price.

Border Price: Pursell and Gupta (1998) defined border price as what the prices of the domestic varieties would have been during the same period under conditions of free trade at the same exchange rate.

Domestic price: Domestic prices used in the estimation of NPC are estimated to approximate as closely as possible the prices that the farmers (or mills in the case of estimates done at the level) receive during the harvest.

Trade competitiveness: Used to reflect the ability of a nation to grow successfully and to maintain its share of world trade

Instability: It is defined as the deviation from general trend (Bharathi *et al*, 1992). It is also defined as the fluctuation from trend (Mohan and George, 1993)


RESULTS & DISCUSSION

4. RESULTS AND DISCUSSION

The present study analyses the trends in production and export of selected spices (pepper, cardamom, ginger and turmeric) in Kerala along with price behaviour and trade competitiveness in the context of liberalized trade regime. Keeping the objectives in view, the data collected were subjected to statistical analysis and the results are presented and discussed in this chapter. The chapter is arranged in six sections as given below.

4.1 Trends in area, production and productivity of spices in Kerala

4.2 Trends in export of spices

4.3 Itemwise export and import of spices

4.4 Price behaviour

4.5 Trade competitiveness of spices

4.6 Marketing of spices

4.1 TRENDS IN AREA, PRODUCTION AND PRODUCTIVITY OF SPICES IN KERALA

Growth rate of a variable may be defined as the rate of change per unit of time, usually a year. Four growth models viz, exponential, semilog, log quadratic and kinked exponential were fitted to the time series data on area, production and productivity. The entire period (1970-71 to 1999-2000) has been divided into three sub periods namely Period I (1971-80), Period II (1981-90) and Period III (1991-2000). For the three sub periods as well as for the entire period, growth rates in area, production and productivity of four spices viz, pepper, cardamom, ginger and turmeric were estimated.

4.1.1 Pepper

Estimated growth rate of area, production and productivity of pepper for the entire period and sub periods using exponential, semilog, log quadratic and kinked exponential model are shown in Table 4.1.

Table 4.1 Growth and instability of area, production and yield of pepper during 1971-2000 (per cent per annum)

Growth model		Period I (1971-1980)			Period II (1981-1990)			Period III (1991-2000)			Entire Period (1971-2000)		
		Area	Production	Yield	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
Exponential		-1.55*	0.09	2.28*	5.46*	8.04*	2.85	1.06*	0.53	-0.48	2.4*	3.51*	1.04*
		(-4.29)	(0.09)	(5.62)	(6.31)	(2.88)	(1.38)	(3.38)	(0.43)	(-0.33)	(9.84)	(8.38)	(3.71)
Semilog		-0.68*	0.04	0.98*	2.31*	3.36*	1.22	0.46*	0.23	-0.21	1.03*	1.50*	0.45*
		(-4.29)	(0.09)	(5.62)	(6.31)	(2.88)	(1.37)	(3.38)	(0.43)	(-0.33)	(9.84)	(8.38)	(3.78)
Kinked		-2.54*	-1.83	0.95	5.12*	7.08*	1.72	2.12*	2.31	0.17			
		(-4.59)	(-1.15)	(0.74)	(11.76)	(5.68)	(1.74)	(4.65)	(1.79)	(0.16)			
Log quadratic	b	-0.01*	0.004	0.01*	0.23*	0.03*	0.01	0.005*	0.002	-0.002	0.10*	0.02*	0.005*
		(-4.06)	(0.08)	(5.74)	(12.79)	(4.18)	(1.63)	(3.06)	(0.48)	(-0.37)	(11.58)	(8.50)	(3.68)
	c	-0.002	0.001	0.001	0.004*	0.01*	0.01*	-9.20×10^{-5}	-0.003	-0.007	0.0004*	0.0003	-0.0001
		(-0.43)	(0.49)	(1.15)	(5.09)	(3.13)	(2.05)	(0.17)	(-1.79)	(-1.78)	(3.48)	(1.37)	(-0.07)
Coefficient of variation		5.64	9.03	7.87	18.50	33.39	18.15	4.77	13.58	15.63	25.08	37.53	17.18
Coppock's instability index											4.94	22.24	20.65

Note:

*significant at 5 percent level

Figures in parentheses indicate t values

Growth rate in area, production and productivity of pepper using exponential model showed that during the entire period under study there was significant and positive growth in area (2.4 per cent), production (3.5 per cent) and productivity (one per cent). A smaller growth rate in productivity indicated that, area rather than productivity contributed much to production. In the period wise analysis, even though period I showed a significant negative growth rate in area (-1.6 per cent), growth in production was very low (0.09 per cent) due to the significant and positive growth rate in productivity (2.28 per cent). In contrast to period I, growth rate in area was positive and significant during period II and period III. During period II there was significant increase in production (8.04 per cent) while it was stagnant in period III mainly due to the negative growth rate of productivity (-0.48 per cent).

In the semilog model, the results were similar to exponential model and there was significant positive growth in area, production and productivity during the entire period. Except in period I, growth rate in area was positive in all other periods, while in the case of productivity, it was negative only in period III and period II showed significant increase in production (3.36 per cent)

In order to estimate the period wise growth rate without any discontinuity a kinked exponential model was fitted and the results showed that growth rate in area was decreasing significantly in period I (-2.5 per cent) while in other periods it was positive and significant with growth rate of 5.12 per cent and 2.11 per cent during period I and period III respectively. Production showed significant increase only in period II while productivity growth was insignificant in all the three periods under study.

Log quadratic equation was also fitted to analyze whether there was any accelerating or decelerating trend and the results revealed significant accelerating trend during the entire period only in the case of area, while production and productivity were insignificant though productivity showed decelerating trend. The decelerating trend in productivity has been surpassed by accelerating trend in area resulting in acceleration in production, though it was insignificant. In the period wise analysis there was significant accelerating trend in area, production and productivity only in period II.

The above analysis on the growth in area, production and productivity of pepper in Kerala during 1971-2000 using different growth models revealed that area, production and productivity of pepper in Kerala had shown an increasing trend with an exception of area during period I and productivity during period III. The above result was in conformity with the findings of Babu *et al* (1996), Senthilkumaran and Vadivel (2000) and Rajesh *et al* (2002) who, using exponential model, had reported increasing trends in area, production and productivity. Growth in area was found to be higher than the growth in productivity, which was similar to the reports of Bastine and Palanisami (1994) who observed that area effect had greater role in pepper production compared to productivity. It may be concluded that growth in production was mainly through contribution of area rather than of productivity. The decreasing trend in productivity as obtained in the log quadratic model has emphasized the need for measures to increase the productivity of pepper which was found to be low compared to the competing countries.

Instability analysis was attempted by working out coefficient of variation and instability index. The results are presented in Table 4.1. It was found that during the entire period under study coefficient of variation was highest for production (37.53 per cent) and lowest for productivity (17.18 per cent). Variation in productivity and area together contributed to high variation in production. In the decade wise analysis, coefficient of variation was found to be low. In period I and III variation in area, production and productivity was lower than that in period II. Variation in production was more prominent than that in area and productivity in all the periods except period III where the coefficient of variation was more for productivity. The results of the instability index indicated, high instability in production (22.26) compared to productivity (20.64) and area (4.94). It could be due to the additive effect of productivity and area instability resulting in higher production instability.

The above results on instability analysis were in line with the findings of Jeromi (1994) where the higher instability in production was found to be due to instability in productivity rather than area. Ipe (1990) also observed a higher variability in production and productivity compared to area. This might be due to the influence of climatic factors

like availability of well distributed rainfall during the period up to fruit development and incidence of pests and diseases. Hence attempts for stabilizing productivity through use of high yielding varieties should be made, since area cannot be increased beyond a certain limit.

4.1.2 Cardamom

Growth rate in area, production and productivity of cardamom during the entire period and its three sub periods using the four models are presented in Table 4.2. The results of the growth rate analysis using exponential model showed a significant positive growth in production (0.48 per cent) and productivity (5.44 per cent) and negative growth in area (-0.53 per cent) during the entire period. A smaller growth rate in production might be due to decline in growth rate of area. In decade wise analysis period I showed significant positive growth in area (1.62 per cent), production (8.12 per cent) and productivity (6.3 per cent). In the period II, even though there was significant increase in area (2.05 per cent), growth in production was insignificant due to negative growth in productivity (-0.75 per cent). The high and significant growth in productivity (8.77 per cent) had offset the negative growth in area (-0.83 per cent) in period III resulting in a significant but high growth in production (7.97 per cent). Semilog model presented almost similar type of results with few changes in growth rates. Highest growth in area was in period II (0.88 per cent) while in production it was in period I with a growth rate of 3.39 per cent per annum. Productivity recorded maximum growth during period III with 3.65 per cent per annum.

Continuous decade wise estimation of growth using kinked model showed significant increase in area and production in period I, while growth in area, production and productivity was insignificant in period II. In period III significant decline in area (-4.1 per cent) was noted with a very high growth in productivity (13.8 per cent) and production (9.32 per cent). The increase in productivity could be due to innovative production technologies used, which resulted in a tremendous increase in production.

Table 4.2 Growth and instability of area, production and yield of cardamom during 1971-2001(per cent per annum)

Growth model		Period I (1971-1980)			Period II (1981-1990)			Period III (1991-2000)			Entire Period (1971-2001)		
		Area	Production	Yield	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
Exponential		1.62*	8.12*	6.32*	2.05*	1.32	-0.75	-0.83*	7.97*	8.77*	-0.528	0.477*	5.44*
		(3.80)	(2.98)	(2.19)	(7.23)	(0.35)	(-0.21)	(-3.41)	(4.40)	(5.04)	(-1.76)	(8.52)	(7.74)
Semilog		0.7*	3.39*	2.66*	0.88*	0.57	-0.33	-0.36*	3.33*	3.65*	0.23	0.207*	2.3*
		(3.79)	(2.98)	(2.19)	(7.23)	(0.35)	(-0.21)	(-3.41)	(4.40)	(5.04)	(-1.76)	(8.52)	(7.74)
Kinked		2.35*	7.18*	4.76	0.16	1.27	1.16	-4.10*	9.32*	13.82*			
		(2.84)	(3.04)	(1.89)	(0.29)	(0.74)	(0.62)	(-5.81)	(4.47)	(6.00)			
Log quadratic	b	0.007*	0.034*	0.027*	0.009*	0.006	-0.003	-0.004*	0.03*	0.036*	-0.003*	0.021*	0.024*
		(4.39)	(2.91)	(2.09)	(6.97)	(0.35)	(-0.21)	(-3.41)	(4.12)	(4.72)	(-3.46)	(8.589)	(9.0002)
	c	0.001	0.0037	0.002	0.000	0.006	0.006	-0.0004	$1.0745x10^{-5}$	0.0003	-0.0007*	0.0003	0.001*
		(1.93)	(0.81)	(0.48)	(0.66)	(0.93)	(0.92)	(-0.99)	(0.003)	(0.13)	(-6.19)	(1.02)	(2.90)
Coefficient of variation		6.22	35.46 .	31.54	6.64	26.36	26.30	3.26	25.64	27.29	15.3	48.65	60.31
Coppock's instability index											8.29	37.48	39.14

Note:

*significant at 5 percent level

Figures in parentheses indicate t values

A significant decelerating trend in area during the entire period was shown by log quadratic model, while there was significant acceleration in productivity. The trends in area, production and productivity were insignificant though accelerating during the three periods except for a decelerating trend in area during period III.

The results of the growth rate analysis in area, production and productivity of cardamom using different growth models revealed that during the entire period under study both production and productivity showed significant growth while it was negative in the case of area. In the first two periods area showed significant increase and there after it started declining. The above results were in line with the findings by Rajesh *et al* (2002) and Madan (2001) who reported that there was a decline in area during 1970-71 to 1999-2000 which was offset by increased productivity through technological advancements. In spite of decline in area, production showed significant positive growth due to the influence of productivity. In contrary to the above, Korikanthimath and Rao (2001) reported a declining growth in production during 1982-83 to 1997-98 due to the influence of decline in area. Though productivity growth was positive, it could not offset the negative influence of area. The results of log quadratic model supported the above findings showing significant decelerating trend in area and accelerating trend in productivity.

The instability analysis conducted for cardamom showed high variation in production and productivity during the entire period with a coefficient of variation of 49 and 60 per cent respectively. In all the three sub periods variation in area was much lesser compared to that of production and productivity. Coppock's instability index also showed same pattern with an index of 37.48 and 39.14 respectively for production and productivity whereas it was only 8.28 for area.

The above results were in conformity with the reports of Ajithkumar and Devi (1994) and Ipe (1990) where they observed a higher variability in production and productivity of cardamom compared to that of area. The area under cardamom was somewhat stable, while variation in production and productivity was higher during the sub periods and entire period under study. It may be noted that, since cardamom prefers

forest loamy soils, rich in available phosphorus and potassium for its growth, it may not be possible to increase the area under cardamom beyond a certain limit. But there is enough scope for increasing the productivity further with the introduction of high yielding varieties like PV-2, which gives a productivity of 982 kilograms per hectare.

4.1.3. Ginger

The growth rates of area, production and productivity of ginger for different periods as well as for the entire period are presented in Table 4.3. It was found that there was significant expansion in area, production and productivity of ginger during the entire period under study, with a growth of 4.42, 8.02 and 3.45 per cent respectively. The increase in area and productivity was found to contribute towards a higher growth in production. In the decade wise analysis, area, production and productivity during the three sub periods exhibited significant positive growth. The growth in area and production was found to be highest during period I with a growth of 7.47 and 11.37 per cent respectively while growth in productivity was maximum during period II (3.97 per cent).

The estimate using semilog equation showed a significant growth of 1.88 per cent in area, 3.55 per cent in production and 1.47 per cent in productivity. It was observed that growth in area was higher than growth in productivity. Among the periods, a high growth in area (3.13 per cent) and production (4.67 per cent) was reported during period I, while growth in productivity was maximum during period II (1.69 per cent) and stagnant in period III (0.72 per cent).

Kinked exponential model exhibited a different picture in which growth in productivity was insignificant during period I and II with a growth rate of 4.76 per cent and 1.16 per cent respectively. The growth in area (7.98 per cent) and production (12.38 per cent) was highest during period I where as period III exhibited highest growth in productivity (13.84 per cent).

Table 4. 3 Growth and instability of area, production and yield of ginger during 1971-2000 (per cent per annum)

Growth model		Period I (1971-1980			Period II (1981-1990)			Period III (1991-2000)			Entire Period (1971-2000)		
		Area	Production	Yield	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
Exponential		7.47*	11.37*	3.63*	3.37*	7.47*	3.97*	4.22*	5.94*	1.66*	4.42*	8.02*	3.45*
		(5.86)	(7.62)	(5.79)	(5.28)	(7.83)	(8.65)	(11.68)	(10.5)	(3.89)	(19.18)	(24.34)	(23.5)
Semilog		3.13*	4.67*	1.55*	1.44*	3.13*	1.69*	1.8*	2.5*	0.72*	1.88*	3.35*	1.47*
		(5.86)	(7.62)	(5.79)	(5.28)	(7.83)	(8.65)	(11.68)	(10.5)	(3.89)	(19.18)	(24.34)	(23.5)
Kinked		7.98*	12.38*	4.76	3.3*	7.77*	1.16	3.41*	4.86*	13.84*			
		(11.25)	(13.43)	(1.89)	(6.27)	(11.35)	(0.62)	(5.62)	(6.26)	(6.00)			
Log quadratic	b	0.0313*	0.05*	0.02*	0.014*	0.03*	0.02*	0.02*	0.03*	0.01*	0.0187*	0.03*	0.02*
		(7.74)	(7.87)	(6.00)	(9.95)	(11.67)	(8.76)	(11.03)	(10.22)	(4.18)	(24.59)	(38.59)	(33.01)
	c	0.004*	0.003	-0.001	-0.003*	-0.004*	-0.001	0.0002	-0.001	-0.001	-0.0004*	-0.001*	-0.0003*
		(2.64)	(1.24)	(-1.27)	(-4.63)	(-3.28)	(-1.099)	(0.37)	(-0.74)	(-1.49)	(-4.36)	(-6.58)	(-5.31)
Coefficient of variation		26.03	36.8	12.15	10.9	21.41	12.16	12.89	17.63	6.00	35.47	57.7	28.58
Coppock's instability index											8.07	11.72	6.56

Note

*significant at 5 percent level

Figures in parentheses indicate t values

The estimation of the nature of trend using log quadratic models revealed that there was a significant decelerating trend in area, production and productivity during the entire period. In the decade wise analysis, area showed a significant decelerating trend during period II while it was accelerating during period I. Period III showed an insignificant trend, though it was accelerating. Regarding production, an accelerating trend was noticed during period I, which was found to be insignificant, while both period II and III exhibited decelerating trend, but it was significant only during period II.

The above results showed a significant positive growth in area, production and productivity during the entire period and its sub periods, which was in conformity with the findings of Rajesh *et al* (2002). The growth in area had greater role in increasing production compared to productivity. Contrary to the above, Bastine and Palanisamy (1994) in their study concluded that productivity had greater role in increasing production.

The variability in growth of ginger as measured using coefficient of variation and Coppock's instability index showed high variability in production (58 per cent) during the entire period. The coefficient of variation was less in area (35.47 per cent) and productivity (28.58 per cent) compared to production. In the decade wise analysis maximum variability in area (26.03 per cent), production (36.8 per cent) and productivity (12.15 per cent) was exhibited during period I and variability was minimum during period III. Variability in productivity was lower compared to that in area and production in period I and III. It may be mentioned that instability in area and productivity during the entire period had contributed towards a high instability in production. Instability index estimates revealed variability was more for production (11.72) followed by area (8.07) and productivity (6.56). Higher instability in production was mainly due to instability in area and productivity.

The above analysis revealed that variability was more in area under ginger leading to a higher variability in production. This is in line with the growth rate analysis as presented earlier where area had more influence on production as compared to productivity. Ginger being an annual crop, the area under this could be varied according

to price changes. Farmers in general would expand the area under the crop in response to price increase, which in turn will lead to expansion in production. The findings of Bastine and Palanisamy (1994) for the period 1965–1990 were contradictory to the above, where variability was found to be maximum in productivity and production as compared to area. This might be due to the difference in period of study.

4.1.4. Turmeric

The estimated growth rate in area, production and productivity of turmeric for the different growth models are presented in the Table.4.4. It was observed that production and productivity during the entire period exhibited significant growth. It may be noted that growth in production (2.57 per cent) was less compared to growth in productivity (3.07 per cent) due to negative though insignificant growth in area. In the period wise analysis growth in area and production was insignificant and negative during period I and period II while it was significant and positive during period III with a growth of 3.75 per cent in area and 5.94 per cent in production. The growth in productivity was positive in all the cases, but it was insignificant in period I (1.32 per cent) and period III (2.32 per cent) but significant with a low growth during period II.

Growth rate using semilog model also exhibited similar pattern with a significant growth of 1.12 and 1.32 per cent in production and productivity respectively. Area and production was declining during period I and II, while during period III, both area and production exhibited significant growth. Regarding productivity, it was stagnant during period II (0.31 per cent) and insignificant in period III (0.99 per cent).

Continuous growth rate using kinked exponential model presented negative growth in area during period I and II while it showed significant expansion (3.07 per cent) during period III. There was insignificant though positive growth in production during the three sub periods with a growth of 2.43 per cent, 2.11 per cent and 3.47 per cent respectively. In the case of productivity, the growth was significant and positive in period I (4.78 per cent) and period II (3.62 per cent) and insignificant but stagnant (0.75 per cent) during period III.

Table 4.4 Growth and instability of area, production and yield of turmeric during 1971-2000 (per cent per annum)

Growth model		Period I (1971-1980)			Period II (1981-1990)			Period III (1991-2000)			Entire Period (1971-2000)		
		Area	Production	Yield	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
Exponential		-2.80	-1.54	1.32	-1.5	-0.8	0.71*	3.75*	5.94*	2.32	-0.36	2.57*	3.07*
		(-1.19)	(-0.39)	(0.57)	(-1.5)	(-0.64)	(2.04)	(3.68)	(4.66)	(1.82)	(-1.01)	(4.91)	(8.04)
Semilog		-1.24	-0.67	0.5674	-0.66	-0.35	0.31*	1.6*	2.51*	0.99	-0.155	1.12*	1.32*
		(-1.19)	(-0.39)	(0.57)	(-1.5)	(-0.64)	(2.04)	(3.68)	(4.66)	(1.82)	(-1.01)	(4.91)	(8.04)
Kinked		-2.26	2.43	4.78*	-1.37	2.11	3.62*	3.07*	3.47	0.75			
		(-1.79)	(1.05)	(3.02)	(-1.41)	(1.2)	(3.03)	(2.68)	(1.7)	(0.55)			
Log quadratic	b	-0.01	-0.007	0.01	-0.007	-0.004	0.003*	0.02*	0.03*	0.01	-0.002	0.011*	0.013*
		(-1.24)	(-0.49)	(0.73)	(-1.59)	(-0.69)	(2.13)	(3.85)	(4.38)	(1.72)	(-1.22)	(4.9)	(8.47)
	c	0.005	0.013*	0.01*	0.002	0.003	0.001	-0.002	0.001	0.001	0.001*	0.0001	-0.0004*
		(1.33)	(2.42)	(2.51)	(1.431)	(1.58)	(1.57)	(-1.32)	(0.26)	(0.38)	(3.38)	(0.51)	(-2.02)
Coefficient of variation		19.32	33.38	24.22	10.35	11.54	3.63	13.44	20.75	12.14	16.34	29.15	28.16
Coppock's instability index											17.565	24.39	15.92

Note

*significant at 5 percent level

Figures in parentheses indicate t values

Log quadratic model showed a significant accelerating trend in area during entire period, while the productivity showed significant deceleration. The growth in area was negative during period I and II and it turned out to be positive during period III thereby proving its accelerating trend. In the period wise analysis, area, production and productivity exhibited an insignificant accelerating trend during the three sub periods (save production and productivity in period I which were significant) except area in period III where it was decelerating.

The above analysis of growth trends in turmeric had revealed a significant and positive growth in production and yield along with a stagnant area. The accelerating trend as obtained in the log quadratic model for production and productivity also was in agreement with the above results, while area had shown a decelerating trend. The findings of Rajesh *et al* (2002) was found to be in conformity with the above with respect to production and productivity though slightly different with respect to area.

Instability in area, production and productivity of turmeric was measured using instability index and coefficient of variation. It was found from the analysis that variability in area was low and insignificant (16.34 per cent) during the entire period compared to production (29.15 per cent) and productivity (28.16 per cent), indicating that there was not much variation in area under turmeric cultivation in Kerala. In the decade wise analysis lowest variability was exhibited in productivity during period II (3.63 per cent). It was also noted that variability in area, production and productivity was less in period II compared to other decades. Variability in production was more in all the decades, which could be due to combined influence of variability in area and productivity. Instability index showed instability of 17.57 in area, 24.39 in production and 15.92 in productivity.

The results on the above instability analysis had shown that coefficient of variation was more in productivity and production compared to area which was in conformity with the findings of Ajithkumar and Sankaran (1998) who reported that instability in productivity was the dominant factor affecting production instability. As indicated earlier, the declining trend in area could be due to the high price fluctuation,

high cost of cultivation as well as emergence of other profitable crops, which has forced the farmers to shift from turmeric cultivation.

4.2 TRENDS IN EXPORT QUANTITY AND VALUE OF SPICES

The trends in export quantity and value of four major spices viz., pepper, cardamom, ginger and turmeric are presented in this section. Growth rates were calculated for the entire period and its three sub periods using exponential, semilog, log quadratic and kinked exponential model. The variability was estimated based on coefficient of variation and instability index. It may be mentioned that export data was that of the country as a whole, as state wise information on the above was not available and hence the analysis of this section is based on all India data. Moreover, it would be more appropriate if a comparison is made among the decades, taking into consideration the trade liberalisation scenario. In this context, the decadewise growth rate analysis with respect to export of spices would be discussed with special emphasis on pre and post liberalisation periods i.e. period II (1981-1990) and period III (1991-2001), since liberalisation started in the early nineties.

4.2.1 Pepper

The growth rate of export quantity and value of pepper for the entire period and the three sub periods are shown in Table 4.5

It was found from the exponential model that, during the entire period of analysis, both quantities exported and export value showed significant positive growth of 1.94 and 12.46 per cent respectively. In the decade wise analysis growth rate in quantity exported was negative but insignificant (-0.23 per cent) in period I while it was significant and positive in (6.88 per cent) in period II (pre liberalization) and positive but insignificant growth (1.39 per cent) in period III (post liberalisation). The export value showed positive and significant growth in the three decades with 12.05, 28.2 and 24.88 per cent respectively.

Table 4. 5 Growth and instability of export quantity and value of pepper during 1971-2001 (per cent per annum)

Growth model		Period I (1971-1980)		Period II (1981-1990)		Period III (1991-2001)		Entire Period (1971-2001)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Exponential		-0.23	12.05*	6.88*	28.20*	1.39	24.88*	1.94*	12.46*
		(-0.09)	(3.54)	(4.05)	(5.04)	(0.43)	(5.59)	(3.69)	(12.18)
Semilog		-0.1	4.94*	2.89*	10.79*	0.6	9.65*	0.83*	5.1*
		(-0.09)	(3.54)	(4.05)	(5.04)	(0.43)	(5.59)	(3.69)	(12.18)
Kinked		0.13	8.97	4.84*	13.16*	1.01	14.02*		
		(0.06)	(1.93)	(2.75)	(3.70)	(-0.57)	(3.81)		
Log quadratic	b	-0.001	0.05*	0.03*	0.11*	0.006	0.09*	0.008*	0.05*
		(-0.12)	(4.46)	(3.82)	(4.89)	(0.47)	(5.64)	(3.69)	(12.10)
	c	-0.01*	-0.01*	-0.001	-0.001	-0.01	-0.007	-0.0003	0.0004
		(-2.18)	(-2.39)	(-0.39)	(-0.74)	(-1.73)	(-1.07)	(-0.98)	(0.82)
Coefficient of variation		21.03	39.22	23.89	71.87	31.08	77.91	31.43	124.39
Coppock's instability index								36.77	51.56

Note

*significant at 5 percent level

Figures in parentheses indicate t values

In the semilog model growth rate during the entire period was found to be positive and significant for both quantity exported and export value. The highest and significant growth in export quantity and value was during pre liberalisation period with a growth of 2.89 per cent and 10.79 per cent per annum respectively, while that in the post liberalisation period it was 0.6 and 9.65 respectively.

In order to estimate the period wise growth rate without any discontinuity a kinked exponential model was used and results showed some what similar pattern with positive but insignificant growth in quantity exported in period I, (0.14 per cent) and period III (1.01 per cent) while it was significant and positive in period II (4.84 per cent). Export value showed significant positive growth in period II and III, and it was positive and insignificant in period I

A log quadratic equation was also fitted to analyze whether there was any accelerating or decelerating trend and the results showed that growth in quantity exported and export value exhibited significant deceleration in period I as already indicated from the earlier estimates of the other models while in the other periods and during the entire period it was insignificant.

The analysis of the export performance of pepper as presented above had revealed that the growth in export quantity and value of pepper was less in post liberalization period compared to pre liberalization period. The above findings of the study for the entire period were in line with the reports of Ipe (1989), Jeromi (1994) and Rajesh *et al* (2002) where both export quantity and value showed significant positive growth. The growth in export quantity was always less than export value, in all the growth models, which could be due to high unit value realization. The log quadratic model had revealed a decelerating trend in export quantity while export value was accelerating. It may be noted that as compared to the production growth rate of pepper presented in the previous section, export growth rate were less, probably due to high domestic consumption. The study by Thomas *et al* also reported that production and domestic retention were major determinants of export quantity, which was supported by Menon (2000) who reported that growth in export quantity was lesser compared to growth in production, probably due

to high domestic consumption. The present situation calls for export promotion measures to increase quantity of export along with emphasis on., quality so as to avoid rejection of commodities from importing countries using sanitary and phyto sanitary rules. The intrinsic quality of Indian pepper would be a favourable point in this context.

Instability analysis was worked out using coefficient of variation and Instability index and are presented in Table 4.5. It was found that the coefficient of variation of export during the entire period was 31.43 for export quantity while it was 124.39 for export value, indicating high amount of variability for export value. The coefficient of variation was higher for export value in period III (77.91 per cent) followed by period II (71.87 per cent) while period I showed a low coefficient of variation of 39.22 per cent. It may be mentioned that the quantity exported for pepper had shown low variability in all the periods with coefficient of variation below 32 per cent. The instability index was also worked out to get an approximation of the average year to year percentage variation and the results revealed that there was a high instability of 51.56 for export value compared to export quantity where instability index was 36.77 only.

The higher instability in export earning compared to export quantity was in line with the findings of Jeromi (1994) which could be due to fluctuations in price and changes in direction of export. Variation in export quantity and value was also more in post liberalization period compared to pre liberalization period.

4.2.2. Cardamom

Growth rate in export quantity and value of cardamom during 1970-2001 and its three sub periods using different models are presented in Table 4.6 The results based on exponential model showed that during the entire period under study growth rate in quantity exported had shown a significant decrease (-6.59 per cent) whereas it was insignificant for value of export (-0.07 per cent). The reduction in export quantity could be due to stagnant growth in production as indicated in the previous section and an increased domestic consumption. The decrease in export value was very less as compared to reduction in quantities due to the high price of cardamom over the years. In the period

Table 4. 6 Growth and instability of export quantity and value of cardamom during 1971-2001 (per cent per annum)

Growth model		Period I (1971-1980)		Period II (1981-1990)		Period III (1991-2001)		Entire Period (1971-2001)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Exponential		4.62	25.75*	-17.76	-18.36	7.45	14.21*	-6.59*	-0.07
		(1.18)	(5.42)	(-1.87)	(-1.92)	(1.59)	(2.92)	(-4.73)	(-0.04)
Semilog		1.96	9.95*	-8.49	-8.81	3.12	5.77*	-2.96*	-0.03
		(1.18)	(5.42)	(-1.87)	(-1.92)	(1.59)	(2.92)	(-4.73)	(-0.04)
Kinked		6.88	24.74*	-18.42*	-18.36*	3.85	15.32*		
		(1.17)	(3.88)	(-4.79)	(-4.75)	(0.86)	(3.23)		
Log quadratic	b	0.02	0.1*	-0.08	-0.881	0.03*	0.06*	-0.03*	-0.0003
		(1.24)	(6.05)	(-1.81)	(-1.91)	(2.06)	(4.61)	(-4.66)	(-0.04)
	c	0.01	0.01	-0.01	-0.02	0.01*	0.02*	0.0003	-1.087×10^{-5}
		(1.39)	(1.73)	(-0.73)	(-0.97)	(2.67)	(3.79)	(0.35)	(-0.001)
Coefficient of variation		32.15	82.05	76.69	89.47	55.67	79.11	75.96	82.76
Coppock's instability index								132.12	132.01

Note

*significant at 5 percent level

Figures in parentheses indicate t values

wise analysis significant positive growth was exhibited in the case of export value during period I (25.75 per cent). Regarding export quantity growth was positive, but insignificant. During pre liberalisation period both export quantity and value showed insignificant and negative growth of -17.76 per cent and -18.36 per cent respectively, whereas in the post liberalization period growth was positive

The semilog model indicated that there was a significant decline of -2.96 per cent in export quantity along with stagnant growth in export value (-0.03 per cent) for the entire period. Among periods export value showed significant growth of 9.95 per cent during period I along with insignificant positive growth in export quantity (1.96 per cent), while both export quantity (-8.49 per cent) and export value (-8.8 per cent) showed insignificant but negative growth during pre liberalisation period. For post liberalization period the growth in export quantity (3.12 per cent) was positive but insignificant along with significant growth in export value (5.77 per cent).

Continuous growth rate estimation in the three sub periods using kinked exponential model showed significant increase in export value during period I (24.7 per cent) and period III (15.3 per cent) while period II exhibited significant and negative growth and it was -18.4 per cent in both quantity and export value.

Log quadratic model was used for checking the acceleration or otherwise for different periods under study and the entire period. The result showed insignificant acceleration in export quantity and deceleration in value during the entire period. Export quantity and value showed significant acceleration during period III whereas it was insignificant deceleration during period II. Period I.exhibited insignificant acceleration in both export quantity and value.

By comparing the pre liberalization and post liberalization period it was observed that the export position of cardamom became better in the post liberalization period. Both quantity and value was negative during 1981-1990 which jumped to a positive growth in post liberalization period along with a significant accelerating trend

The above result was in conformity with the reports of Rajesh *et al* (2002) where there was significant reduction in export quantity (-8.12 per cent) and value (-1.71 per cent) during the same period under study (1970-2000). The negative growth in export quantity and value during pre liberalisation period was supported by the findings of Nirmala *et al* (1989) who observed that for every one per cent increase in production, export would show an increase of 2.03 per cent. It may be noted that along with a stagnant growth in production (0.47 per cent) the export quantity had declined by -6.59 per cent during the entire period., which might be due to strong internal consumption market as indicated by Joseph and Naidu (1992). Thomas *et al* (1989) suggested that the export performance of cardamom mainly depended on production of cardamom, export price and export from other countries and it is clear that during the recent years the share of export of cardamom from Guatemala has been increasing. Export promotion measures would be needed to increase India's share in the world market along with assured quality of cardamom.

Coefficient of variation showed significant variation in both quantity and value of export with a coefficient of variation of 76 per cent and 83 per cent respectively. Coefficient of variation was higher for export value compared to quantity during the three sub periods also. Highest variability in export quantity (77 per cent) and value (89 per cent) was shown during period II. From the higher variability of value it can be concluded that there was high price fluctuations during the period under study. Instability index showed a higher index value of 132 in both export quantity and values,which showed lesser stability in export quantities and value. For economic development, there should be stability in export and so government should take export stabilization measures.

In conformity with the above results Mani and Jose (1996) observed that export performance showed greater variability in both quantity and value. The variability was more in export value compared to export quantity. Compared to pre liberalization period variability was less in post liberalization period showing its favourable effect in export performance of cardamom.

4.2.3 Ginger

The growth rate in export quantity and export value of ginger during the entire period and its sub periods using different models are presented in Table 4.7. Both export quantity and value of ginger showed significant growth during the entire period under study. However growth in value (9.7 per cent) was much higher than growth in export quantity (3.6 per cent). In the decade wise analysis period I and period III showed significant positive growth in export value (25.75 per cent and 10.23 per cent respectively). Along with insignificant growth in value (8.52 per cent) there was insignificant negative growth in quantity (-17.8 per cent) during pre liberalisation period while growth in both quantity and value was positive in the post liberalisation period .

Semilog model showed significant positive growth in quantity (1.54 per cent) and value (4 per cent) of export during the entire period. Export value exhibited positive growth in all sub periods (9.95, 3.55 and 4.23 per cent respectively) though it was insignificant during the period II. There was insignificant positive growth in export quantity during period I, negative growth in period II and somewhat stagnant growth during period III.

Kinked exponential model exhibited significant positive growth in value during period I (14 per cent) and growth in both quantity (7.75 per cent) and value (15 per cent) during period III. During all other periods both quantity and value of export was insignificant though positive.

The estimates of log quadratic model showed an insignificant accelerating trend during the entire period under study. Insignificant accelerating trend was seen only during period I and in all other periods there was insignificant deceleration except export value for period III where it was significant.

Post liberalization period showed positive growth in export quantity and value compared to pre liberalization period where growth in export quantity was negative. But

Table 4. 7 Growth and instability of export quantity and value of ginger during 1971-2001 (per cent per annum)

Growth model		Period I (1971-1980)		Period II (1981-1990)		Period III (1991-2001)		Entire Period (1971-2001)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Exponential		4.62	25.75*	-17.76	8.52	1.39	10.23*	3.61*	9.67*
		(1.18)	(5.42)	(-1.87)	(1.42)	(0.43)	(2.14)	(3.49)	(9.17)
Semilog		1.96	9.95*	-8.49	3.55	0.6	4.23*	1.54*	4.01*
		(1.18)	(5.42)	(-1.87)	(1.42)	(0.43)	(2.14)	(3.49)	(9.17)
Kinked		4.66	14.05*	0.46	4.30	7.75*	15.0*		
		(0.98)	(2.92)	(0.14)	(1.25)	(2.07)	(4.01)		
Log quadratic	b	0.02	0.99*	-0.08	0.04	0.006	0.04*	0.015*	0.04*
		(1.25)	(6.05)	(-1.81)	(1.46)	(0.47)	(2.63)	(3.46)	(9.03)
	c	0.01	0.01	-0.13	-0.01	-0.007	-0.02*	0.0003	0.0001
		(1.39)	(1.73)	(-0.73)	(-1.20)	(-1.73)	(-2.39)	(0.59)	(0.32)
Coefficient of variation		51.69	77.92	30.67	55.17	55.84	58.64	71.39	103.93
Coppock's instability index								60.48	57.34

Note

*significant at 5 percent level

Figures in parentheses indicate t values

both export quantity and value was showing decelerating trend during the pre and post liberalization period.

Export of ginger in terms of quantity and value showed significant positive growth during the entire period which was in conformity with the result of Rajesh *et al* (2002). During period II there was a reduction in export quantity, which might be due to increase in export of more value added products of ginger like oils and oleoresins. Accelerating trend in both quantity and value during the entire period indicated that the export performance is exhibiting the right direction..

Variability in export quantity and value was measured using coefficient of variation and it showed significant variation of 71.4 per cent and 104 per cent for export quantity and value respectively. In the sub periods also variability was significant except export quantity (30.67 per cent) during period II. It was also noted that variability in export value was high compared to export quantity in all the sub periods. The Instability index worked out for the entire period exhibited a high but comparable instability index of 60.48 for export quantity and 57.34 for export value.

Compared to pre liberalization, variability was more in post liberalization period, and high variability in export value during the entire period indicated that fluctuation in prices would have resulted the above phenomena.

4.2.4 Turmeric

Estimated growth rate in export quantity and value of turmeric for the entire period and its sub periods using exponential, semilog, kinked and log quadratic models are presented in Table 4.8

The results using exponential model revealed that there was significant increase in export quantity (4.21 per cent) and value (13.7 per cent) during the entire period. In the period wise analysis it was observed that during period I and period II increase in export quantity was insignificant, while it was significant in value, which could be due to high

Table 4.8 Growth and instability of export quantity and value of turmeric during 1971-2001 (per cent per annum)

Growth model		Period I (1971-1980)		Period II (1981-1990)		Period III (1991-2001)		Entire Period (1971-2001)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Exponential		6.68	23.03*	2.4	13.47*	8.29*	17.17*	4.21*	13.66*
		(1.77)	(3.38)	(0.73)	(2.88)	(5.82)	(5.76)	(7.61)	(13.94)
Semilog		2.81	9.00*	1.03	5.49*	3.46*	6.88*	1.79*	5.56*
		(1.77)	(3.38)	(0.73)	(2.88)	(5.82)	(5.76)	(7.61)	(13.94)
Kinked		5.51*	16.11*	0.99	8.44*	8.27*	20.14*		
		(2.30)	(3.69)	(0.57)	(2.67)	(4.39)	(5.86)		
Log quadratic	b	0.03*	0.09*	0.01	0.05*	0.03*	0.07*	0.02*	0.06*
		(2.38)	(5.62)	(0.69)	(2.75)	(6.07)	(5.77)	(7.76)	(14.03)
	c	0.01*	0.25*	0.003	-0.005	-0.003	-0.004	0.0004	0.0006
		(2.715)	(3.88)	(0.57)	(-0.58)	(-1.34)	(-1.03)	(1.47)	(1.17)
Coefficient of variation		44.78	91.97	27.87	46.07	27.37	52.92	46.13	117.50
Coppock's instability index								46.53	69.06

Note

*significant at 5 percent level

Figures in parentheses indicate t values

unit value realization. Export value showed significant growth in all three sub periods with the highest growth of 23 per cent in period I.

Semilog analysis also showed the similar pattern of growth in export quantity and value of 1.79 and 5.56 per cent respectively during the entire period. In the period wise analysis, period I showed highest growth in export value with nine per cent per annum.

The kinked model, which showed continuous growth in the sub periods, revealed a significant positive growth in export quantity and value during the three sub periods except growth in quantity during the period II. In all the periods growth in value was much higher than growth in quantity exported.

The results of log quadratic function revealed that there was insignificant acceleration in export quantity and value during the entire period. Even though a significant accelerating trend was exhibited in both quantity and value of export during period I, a decelerating trend was observed in the subsequent periods except for export quantity during period II. Growth in export quantity and value was more significant during period III (post liberalization) compared to period II indicating a favourable effect of trade liberalization.

The positive growth in export quantity and value of turmeric during the entire period and its sub periods exhibited in the present study was in conformity with reports of Rajesh *et al* (2002) and Raveendran and Aiyasami (1982). It may be mentioned that unlike the other three crops already discussed the contribution of Kerala towards area and production is 2.45 per cent of area and 1.39 percent of production only, while Andhra Pradesh and Tamil Nadu are the major players in the export of turmeric.

The results of the instability analysis exhibited a high level of variation in export value (117.5 per cent) as compared to quantity (46.13 per cent) in the entire period. Regarding the sub periods also variation in export value was high and significant, with a coefficient of variation of 91.9 per cent during period I. The coefficient of variation with respect to export quantity varied from 27.37 per cent in period III to 44.78 per cent in

period I. Instability index showed high year to year percentage variation for export value of turmeric (69.06) compared to export quantity (46.53). The higher coefficient of variation and instability index in export value compared to quantity indicated the high fluctuation in prices of turmeric.

4.2.5 Spice Oils and Oleoresins

Spice oils and oleoresins are major value added products of spices and they include different oils and oleoresins of spices viz., pepper, cardamom, ginger, turmeric, nutmeg etc. From the Table 4.9 it was found that there was significant positive growth of 16.65 per cent in export quantity and 27.32 per cent in value during 1986-2001. In the semilog model, growth rate was 6.68 per cent in quantity and 10.49 per cent in value.

Table 4.9 Growth and instability of export quantity and value of spice oils and oleoresins (1986-2001)

Growth model	Quantity	Value
Exponential	16.65* (22.56)	27.32*(26.71)
Semilog	6.68* (22.56)	10.49* (26.71)
Log quadratic		
b	0.0668* (25.13)	0.105* (26)
c	-0.00136* (-2.09)	0.000628* (0.6)
Coefficient of variation	65.508	101.39
Coppock's instability index	14.32	17.35

To find the accelerating or decelerating trends of growth, log quadratic model was worked out and found that there was significant deceleration in quantity of export and accelerating trend in export value during 1986-2001.

In order to find out instability, coefficient of variation and instability index was found out and coefficient of variation value showed that there was significant variation in

both quantity (65.51 per cent) and value (101.39) of export. The high value showed that there is no stability in both quantity and value of export. The instability index was also high for export value (17.35) compared to export quantity. High instability and coefficient of variation for export value, compared to export quantity is showing the effect of price fluctuation.

4.3. ITEMWISE EXPORT AND IMPORT OF SPICES

4.3.1 Itemwise Export

India has a long history of over 3500 years in the spice trade. The share of spices in total export earnings from agricultural and allied products was 8.5 per cent during 1999-2000. In this section item wise export of pepper, cardamom, ginger and turmeric in pre WTO (1988-89 to 1994-95) and post WTO period (1995-96 to 2001-2002) was compared.

4.3.1.1.*Pepper*

Pepper contributes about 40 per cent of total export value of spices and it is a major foreign exchange earner. From Table 4.10, it could be seen that India exported 13 pepper items to other countries among which the most important item was black pepper garbled contributing 85 per cent of export earning from pepper during pre WTO period. The next important item was pepper oleoresin with a share of 9.4 per cent followed by dehydrated green pepper and black pepper ungarbled contributing 1.7 and 1.5 per cent of export value respectively. The major item exported during post WTO period remained the same but its share to total value of export had reduced to 66.94 per cent, which was two times of total value of export earning from pepper during pre WTO period. Light black pepper and pinheads and pepper oleoresin each contributed 11 per cent of export earning from pepper. The share of other items had increased in the post WTO period compared to pre WTO period.

Table.4.10 Item wise export of pepper during pre and post WTO periods (per cent to total value)

Items	pre WTO 1989-1995	post WTO 1996-2002
Black pepper garbled	84.99	66.94
Pepper oleoresins	9.41	10.91
Dehydrated green pepper	1.67	1.10
Black pepper ungarbled	1.51	2.00
Pepper oil	0.81	1.53
Light black pepper & pin heads	0.68	11.19
Other pepper including white	0.26	1.28
Crushed or ground pepper	0.25	1.44
Freeze dried green pepper	0.13	0.72
Pepper long	0.12	1.15
White pepper	0.07	0.10
Pepper pinheads	0.06	1.58
Frozen pepper	0.02	0.05
Total	100.00	100.00

Table.4.11 Item wise export of cardamom during pre and post WTO periods (per cent to total value)

Items	pre WTO 1989-1995	post WTO 1996-2002
Cardamom small alleppey green	51.01	41.43
Cardamom large(amomum)	38.75	46.86
Cardamom small blchd,half blchd/blchble	5.48	1.21
Cardamom oil	1.62	0.00
Cardamom small coorg green	1.45	2.66
Cardamom small seeds	0.80	0.96
Cardamom oleoresin	0.40	1.35
Others(incl. Large seeds)	0.35	2.99
Cardamom small(mixed)	0.10	1.60
Cardamom powder	0.03	0.73
Cardamom husk	0.00	0.21
Total	100.00	100.00

4.3.1.2 Cardamom

Cardamom contributed two per cent of total export value of spices from India during 1999-2000. The item wise export of cardamom (including both small and large) during pre and post WTO period is presented in Table 4.11. The major item exported was cardamom small alleppy green with a share of 51 per cent of export value, followed by cardamom large (38.75 per cent) and cardamom small bleached (5.5 per cent). Others contributed 4.75 per cent of export value, which included cardamom oil, cardamom small coorg green, cardamom small seeds, cardamom oleoresin, others including large seeds, cardamom small and cardamom powder. During post WTO period the major item was cardamom large with a contribution of 47 per cent of export value, followed by cardamom small alleppy green (41.43 per cent). Others including large seeds and cardamom small coorg contributed three per cent each.

4.3.1.3 Ginger

Ginger contributed 1.5 per cent of total export earning from spices, during 1999-2000. The itemwise export of ginger during pre and post WTO period as presented in Table.4.12. revealed that the major item exported during pre WTO period was ginger unbleached (53.95 per cent) followed by ginger fresh (21.2 per cent) and ginger oleoresin (12.12 per cent). Ginger bleached, ginger powder, ginger oil and ginger 'Nes, including dried contributed 12.75 per cent. The situation changed in the post WTO period and major item exported became ginger fresh (28.8 per cent) followed by ginger unbleached.(20.9 per cent of export earning). The next important item was ginger 'Nes including dried with a share of 18.4 per cent. The share of Ginger oleoresin increased from 12.12 per cent in pre WTO period to 14.84 per cent in post WTO period indicating high demand for oleoresin in the international market.

4.3.1.4 Turmeric

Turmeric contributed six per cent of export value of spices during 1999-2000.From the Table 4.13 It could be seen that in the pre WTO period major item of

Table.4. 12 Item wise export of ginger during pre and post WTO periods (per cent to total value)

Items	pre WTO 1989-1995	post WTO 1996-2002
Ginger unbleached	53.94	20.89
Ginger fresh	21.16	28.82
Ginger oleoresin	12.12	14.84
Ginger bleached	5.71	5.47
Ginger powder	4.57	6.19
Ginger oil	2.49	5.39
Ginger nes incl dried	0.00	18.40
Total	100.00	100.00

Table.4. 13 Item wise export of turmeric during pre and post WTO periods (per cent to total value)

Items	pre WTO 1989-1995	post WTO 1996-2002
Turmeric dry	30.15	31.67
Turmeric powder	24.31	39.34
Turmeric oleoresins	16.31	12.72
Turmeric excluding powder	15.34	0.00
Fresh	12.14	16.19
Turmeric oil	1.75	0.08
Total	100.00	100.00

turmeric exported was turmeric dry (30.15 per cent) followed by turmeric powder (24.3 per cent). Turmeric oleoresin and turmeric excluding powder contributed 16 per cent and 15 per cent respectively. But in the post WTO period the major item exported was turmeric powder with a share of 39.34 per cent. Even though turmeric dry came to second position its contribution to total export earning remained almost same i.e. 31.67 per cent. Turmeric fresh contributed 16.19 per cent and turmeric oleoresin 12.72 per cent of export earning. The share of turmeric oleoresin and turmeric oil decreased in the post WTO period, but its contribution in rupees terms increased.

It could be concluded that among the four spices under study the export earning from pepper and its products during post WTO period was about three times that of pre WTO period. Pepper was the major export earner among these four spices and in pepper, black pepper garbled was the major item. Turmeric ranked second followed by ginger and cardamom.

4.3.2 Itemwise Import of Selected Spices

A comparison of itemwise import of selected spices during pre and post WTO period is attempted here. It may be noted that we are importing spices mainly for value addition and after that it will be exported back.

4.3.2.1 Pepper

The item wise import of pepper in the pre WTO period and post WTO period are presented in Table.4.14. It was found that during pre WTO period the major items imported to India were black pepper garbled, light black pepper and pin heads and pepper long. Black pepper garbled was the major item imported to India with 66.39 per cent of total value of import of pepper items. This together with light black pepper and pin heads and pepper long constituted 92 per cent of total value of imports. But in the post WTO period, even though major imported items remained the same there was difference in their share. Black pepper garbled, though retained its first position in import its

Table.4. 14 Item wise import of pepper during pre and post WTO periods (per cent to total value)

Items	pre WTO 1989-1995	post WTO 1996-2002
Black pepper garbled	66.39	36.13
Light black pepper & pinheads	17.84	31.47
Pepper long	7.81	18.23
Other pepper including white	4.05	5.97
Black pepper ungarbled	2.81	5.86
Pepper oil	0.78	1.94
White pepper	0.29	
Crushed or ground pepper	0.23	0.13
Pepper oleoresin	0.10	0.28
Total	100.00	100.00

Table.4. 15 Item wise import of cardamom during pre and post WTO periods (per cent to total value)

Items	pre WTO 1989-1995	post WTO 1996-2002
Cardamoms large(amomum)	93.28	82.51
Others(incl. Large seeds)	3.88	0.35
Cardamom small alleppey green	2.83	15.52
Cardamom small(mixed)	0.00	0.48
Cardamom small coorg green	0.00	1.13
Total	100.00	100.00

contribution was reduced to 36.13 per cent and light black pepper and pin heads ranked second (31.47 per cent), followed by pepper long (18.23 per cent).

4.3.2.2 Cardamom

Item wise import of cardamom (both small and large) during pre WTO and post WTO period as presented in Table.4.15 showed that cardamom large was the major item imported during both the periods which contributed 93.28 per cent and 82.51 per cent of import value respectively. The second major item imported during pre WTO period was others including large seeds (3.88 per cent of import value) while the second position during the post WTO period was taken by cardamom small alleppy green (15.52 per cent of import value) .

4.3.2.3 Ginger

As shown in the Table.4.16 the import basket of ginger was constituted by four items during the pre WTO period within which ginger fresh was the major item of import (96.04 per cent of import value). The other items imported were ginger oil, ginger unbleached and ginger bleached which together contributed 3.96 per cent. The situation changed during post WTO period and some more items were introduced in the import basket even though ginger fresh retained its first position with 47.62 per cent of import value. The second position was taken by ginger 'Nes including dried with 38.56 per cent of import value. Ginger bleached, ginger unbleached, ginger oil and oleoresin and ginger powder were the other items imported which together contributed 5.45 per cent.

4.3.2.4 Turmeric

The only item of turmeric imported during the pre WTO period as shown in the Table 4.17 was turmeric fresh. But during the post WTO period some more items were included in the import basket even though turmeric fresh remained as the major import item with 63.25 per cent of import value. Turmeric oil and turmeric dried each

Table.4. 16 Item wise import ginger during pre and post WTO periods (per cent to total value)

Items	pre WTO 1989-1995	post WTO 1996-2002
Ginger fresh	96.04	47.62
Ginger oil	1.43	0.83
Ginger unbleached	1.32	3.95
Ginger bleached	1.21	8.33
Ginger powder	0.00	0.64
Ginger nes incl dried	0.00	38.56
Ginger oleoresin	0.00	0.08
Total	100.00	100.00

Table.4.17 Item wise import of turmeric during pre and post WTO periods (per cent to total value)

Items	pre WTO 1989-1995	post WTO 1996-2002
Fresh	100.00	63.25
Turmeric powder	0.00	5.04
Dry	0.00	14.78
Turmeric oil	0.00	15.08
Turmeric oleoresin	0.00	1.84
Total	100.00	100.00

constituted 15 per cent of import value. The other items imported were turmeric powder and turmeric oleoresin.

It could be concluded that even though there was some difference in items imported during pre WTO period and post WTO period, the most important item remained the same. The number of items imported increased during post WTO period and among the four spices under study cardamom contributed major value of import during pre WTO period but during post WTO period pepper contributed more. Turmeric was the least imported spice, since 80 per cent of the world export of turmeric was contributed by India.

4.4 PRICE BEHAVIOUR OF SPICES

The competitive power of traditional commodities in the international market depends crucially up on prices. Price movements tend to effect the decisions of producer, buyer, consumer and the economy as a whole. So it is expedient to analyse the price movements of commodities. Hence price behaviour of both domestic and international price of major spices in Kerala, viz, pepper, cardamom, ginger and turmeric was analysed by fitting a trend line for the period 1980-2003. Fluctuations in price were also analysed with the help of coefficient of variation estimated for the entire period 1980-2003. A comparison was also made by taking equal periods before and after WTO, i.e 1988 -1995 and 1996-2003. It may be mentioned that because of insufficient time period for comparison, trend lines were not fitted separately for the two periods.

4.4.1 Pepper

The price behaviour of pepper was analysed by fitting trend lines for both international and domestic prices. The domestic prices used here refer to price of garbled pepper in Kochi market. The trend line for international price of pepper (garbled) as shown in Figure 4.1, revealed that, up to 1984-85 the price was somewhat stagnant and thereafter it showed gradual increase and from 1987-88 it started declining. A gradual increase was found again in 1993-94 with a sharp increase during 1997-98, which

reached a peak value in the year 1999-2000, where the price was observed to be Rs. 20,000 per quintal. A drastic decline in prices could be seen thereafter and the slope of the trend line was found to be 767.69.

Domestic price (Fig 4.2) also followed a similar pattern with gradual increase in price in the early eighties and thereafter a decline up to 1992-93, which increased and reached its peak during 1999-2000, which decreased subsequently. The slope of the domestic price was 853.52 which was higher than the slope of the international price, indicating higher growth in domestic price compared to international price.

The coefficient of variation was estimated for the period 1980-2003 and shown in Table 4.18. It was found to be 86.72 per cent for international price and 88.92 per cent for domestic price showing higher fluctuation in domestic price compared to international price. A comparison of the coefficient of variation obtained for the two periods revealed that fluctuations in prices were more during post WTO period compared to pre WTO period. In the case of international price, coefficient of variation was 29.6 per cent in the case of pre WTO period, which increased to 42.45 per cent in post WTO period. For domestic price also it was 28.2 per cent in pre WTO period and 43.7 per cent in post WTO period. This indicated that fluctuations in both domestic and international prices of pepper increased in the post WTO period.

It may be concluded that growth in domestic price was higher than growth in international price and variation was also more in the case of domestic price. For both domestic price and international price fluctuations were more during post WTO period, showing its unfavorable effect. The higher growth in domestic price could be due to strong domestic market prevailed for pepper and high internal consumption. This view was supported by Das (1988) who observed that, pepper being an export oriented commodity, its international prices obviously influenced the domestic market price of producing countries. In India, together with the effect of international price high domestic consumption (90 per cent of total production, Peter and Nybe, 2002) caused higher growth in domestic price.

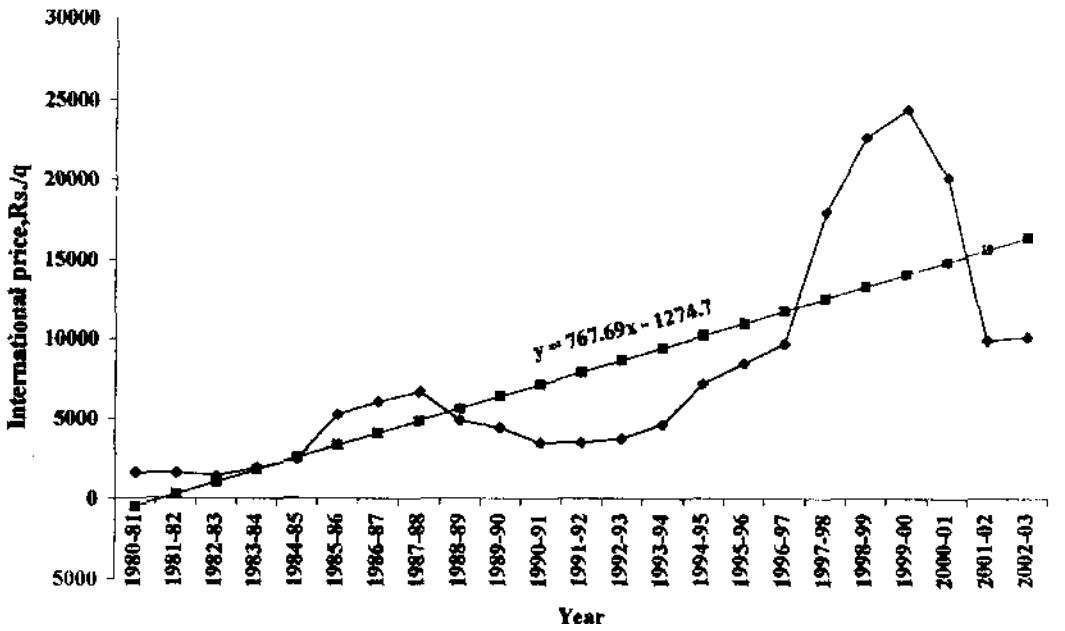


Fig.4.1 Trend line showing international price of garbled pepper in Rs./q (1981-2003)

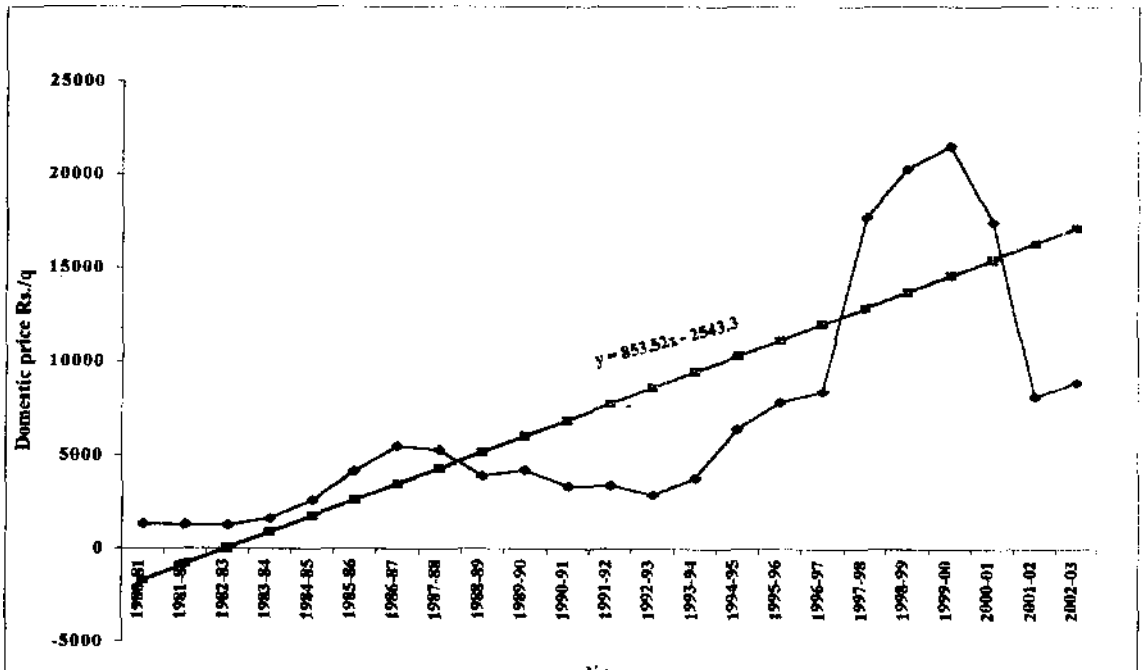


Fig.4.2 Trend line showing domestic price of garbled pepper in Rs./q (1981-2003)

Being an export oriented crop, pepper prices have a dominating role in the market for the same. If domestic prices were higher than international price competitiveness will be affected. Moreover there would be tendency for importing low quality low priced pepper and mix with superior quality and export back. In order to avoid this, focus should be to produce high quality pepper in a cost effective manner and by increasing productivity.

4.4.2 Cardamom

The analysis of price behaviour of cardamom by fitting trend line for both international prices and domestic prices are presented here. The domestic price used here refers to price in Vandanmedu auction centre. The trend line of international prices of cardamom as given in Figure 4.3 showed that during the early eighties the prices were about Rs.10000 per quintal and by 1983 -84 it increased drastically reaching its peak price of Rs. 30000 per quintal during 1984-85. Thereafter, it declined in the subsequent years up to 1988-89, and then gradually increased till 1994-95, then drastic reduction during 1995-96. Prices increased thereafter reaching a value of Rs. 80000 per quintal during 2002-03. The slope of the trend line was 3063.2.

The trend line of domestic price of cardamom as presented in the Figure 4.4 showed that price increased drastically reaching a peak during 1983-84 and then it declined sharply. Up to 1998-99 it showed some fluctuations then again increased during 1989-90. The next peak was in the year 1992-93 where the prices were more than Rs 40000 per quintal, thereafter showing some fluctuations and by 1998-99 started increasing with a gradual increase in the subsequent years where the prices were more than Rs 50000 per quintal and in the year 2002-03 the prices were 60000 Rs/q. The slope of the trend line was 2043, which was low compared to the slope of international price.

Table 4.18 Coefficient of variation in domestic and international prices of selected spices (1988-2003)

Spice crop	Domestic price			International price		
	Pre WTO (1988-1995)	Post WTO (1996-2003)	Entire period (1988-2003)	Pre WTO (1988-1995)	Post WTO (1996-2003)	Entire period (1988-2003)
Pepper	28.18	43.68	88.92	29.55	42.47	86.72
Cardamom	39.09	35.53	54.98	23.24	20.23	24.46
Ginger	36.96	23.33	59.06	25.16	16.63	58.38
Turmeric	47.65	31.32	64.39	44.39	21.57	62.99

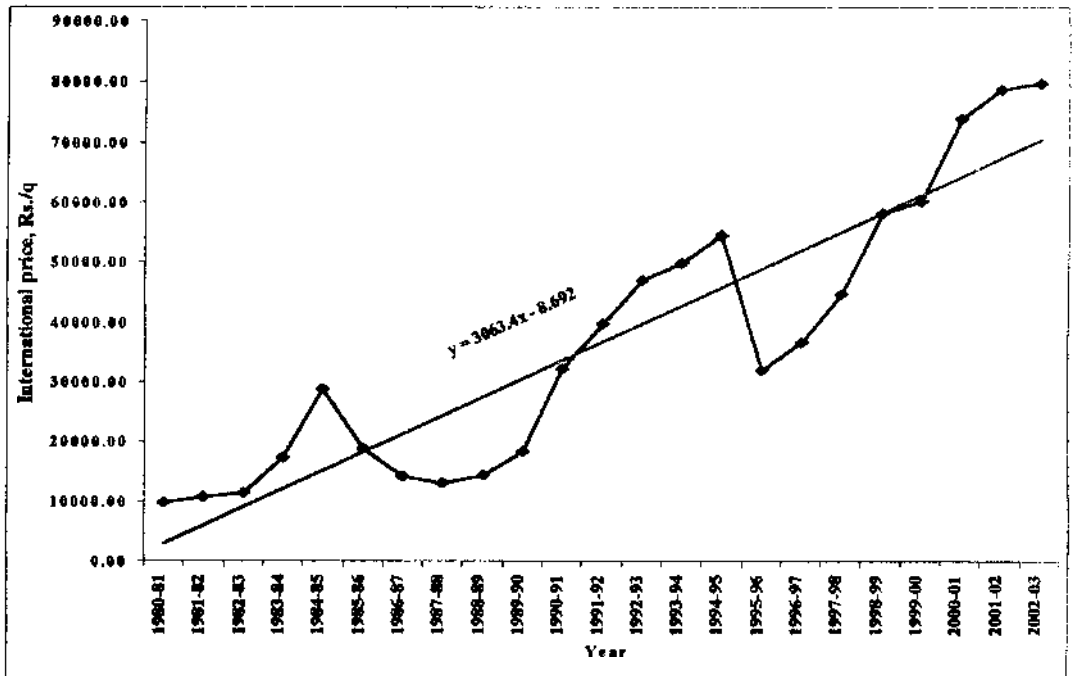


Fig. 4. 3 Trend line showing International price of cardamom In Rs./q (1981-2003)

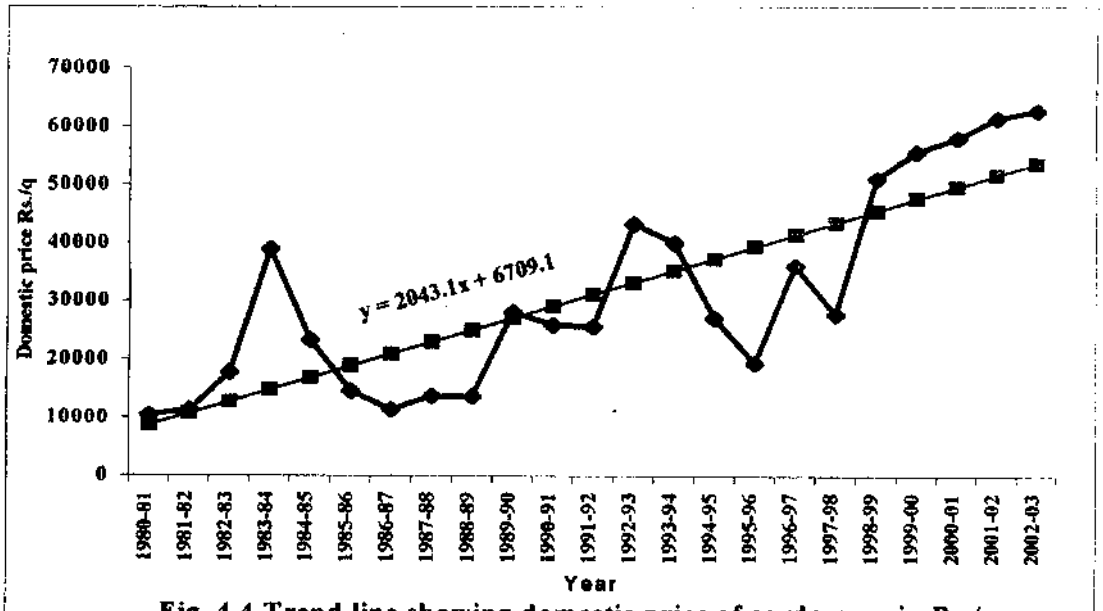


Fig. 4.4 Trend line showing domestic price of cardamom in Rs./q (1981-2003)

The coefficient of variation of price as given in Table .4.18 revealed that variation in the international prices of cardamom was very less (24.5 per cent) during the period 1980-2003, while it was 55 per cent in the case of domestic price. Comparison of coefficient of variation between pre and post WTO period showed that both in the case of international price and domestic price fluctuations were less in post WTO period (20.23 and 35.5 per cent respectively) compared to pre WTO period (23.24 and 39 per cent respectively). Fluctuations were more in domestic prices compared to international price.

Form the results of trend line and coefficient of variation it could be concluded that there was high variation in domestic prices compared to international prices, even though fluctuations were of similar pattern. The lower domestic price and international price during the period 1981-1990 had led to the low export earning during that decade, as indicated in the analysis of export growth. During that period export quantity also showed a negative growth. This was in conformity with the results of Joseph and Naidu (1992) where they reported that around 97 per cent variations in yearly prices could be explained by export and prices. The results of growth in production, export and prices showed that even with high production, prices had not decreased much which was in contrast to the opinion of Madan (2001) who reported inverse relationship between production and prices. The results of present study showed a positive relation between production and quantity exported which was supported by Thomas and Sundaresan (1996). Since cardamom was having only moderate storability, whatever produced must be sold within six months, otherwise it would lose its green colour. So even if low prices exist, cardamom has to be sold in a short period. The prices were showing an increasing pattern along with increasing export demand. So with increased production and export it would be possible to earn more profit.

4.4.3 Ginger

Trend lines were fitted for international prices as well as domestic prices for examining the price behaviour of ginger. The domestic price referred here refers to price of ginger in Kochi market. The trend line of international prices of ginger as shown in the Figure 4.5. revealed that international price was lowest during 1980-81, which increased

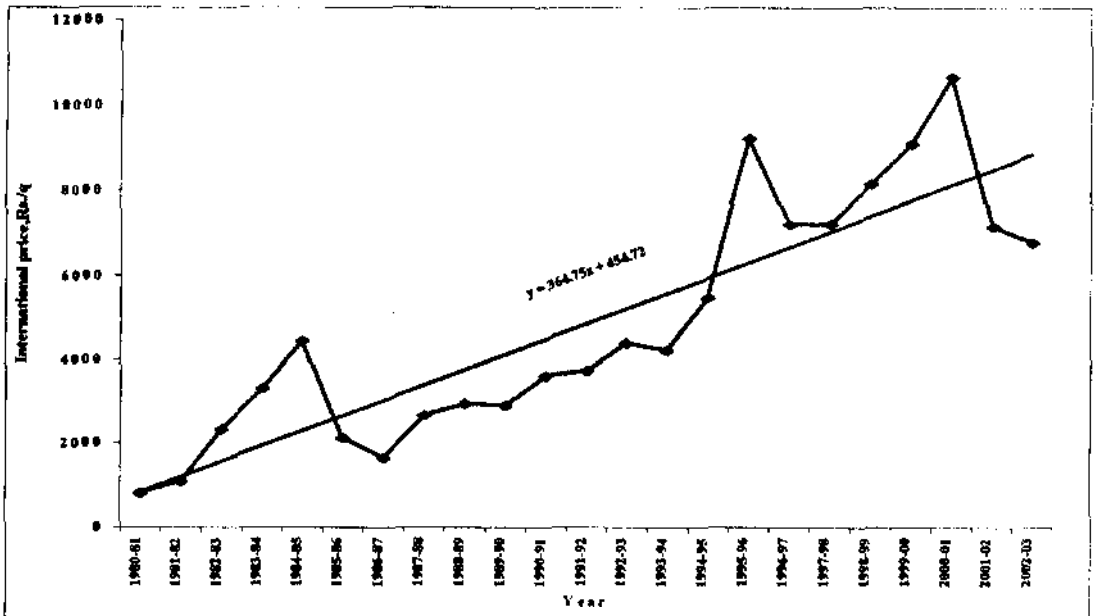


Fig. 4.5 Trend line showing international price of Ginger in Rs. /q (1981-2003)

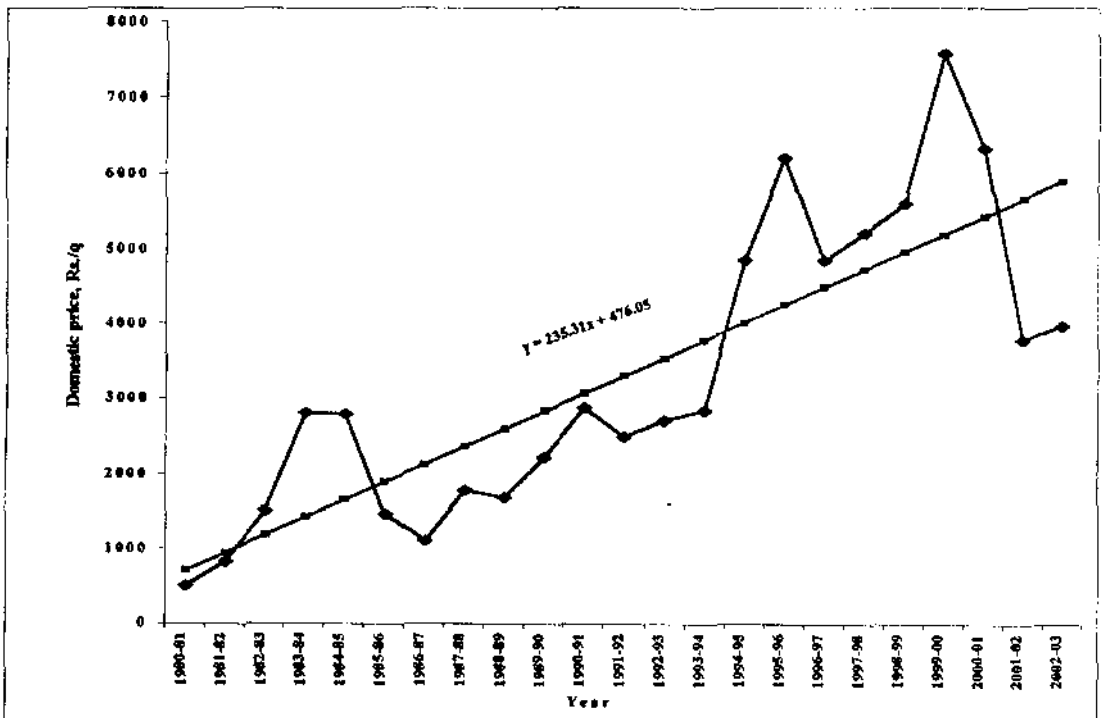


Fig.4.6 Trend line showing Domestic price of Ginger in Rs./ q (1981-2003)

and reached a value of more than Rs 4000 per quintal during 1984-85, later on showing some fluctuations. By 1995-96 the prices increased to a value of Rs 8000 per quintal then declined and again reached a peak during 2000-2001 subsequently declining. The slope of the trend line was 364.75.

Domestic price as shown in the Figure 4.6 exhibited a similar pattern with first peak during 1983-84, which then declined and there was an abrupt increase in the period 1995-96. It declined in the next year, and again reached a peak during 1999-2000. The slope of the trend line was 235.31, which was lower than the slope of international price.

The analysis of coefficient of variation (Table 4. 18) showed that coefficient of variation was 58.38 per cent in the case of international price and it was 59 per cent in the case of domestic price during 1980-2003. A comparison of variation in prices during pre and post WTO period showed a higher variation in international prices during pre WTO period (25.16 per cent) than that in post WTO period (16.63 per cent). In the case of domestic price also coefficient of variation was higher (37 per cent) during pre WTO period compared to 23.3 per cent in post WTO period. The low variation of prices in post WTO period as indicated above was in agreement with the export analysis discussed earlier. The higher export value of ginger could be due to the prevalence of stable prices during that period.

4.4.4 Turmeric

The price behaviour of turmeric was examined by fitting trend lines for international and domestic prices. The domestic price used here refers to price of turmeric in Kochi market. The trend line fitted for international prices as presented in Figure 4.7 revealed that prices were showing some cyclical fluctuations around the trend line. The international price showed gradual increase during 1983-84 and by 1985-86 it started decreasing gradually and showed stagnant price up to 1989-90. Then it increased reaching a peak during 1992-93 where the price was Rs. 6000per quintal. It declined afterwards and a peak was observed during 1998-99 with a price of Rs 9000 per quintal which declined there after. The lowest value was during 1980-81 and highest value

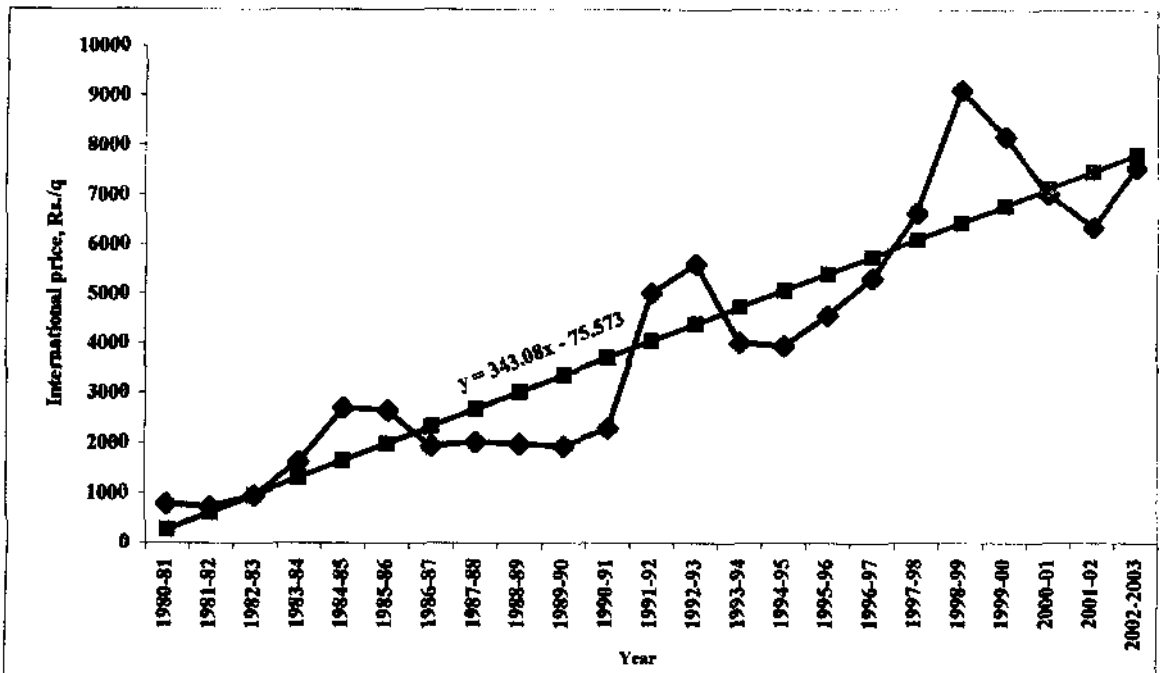


Fig.4.7 Trend line showing international price of turmeric in Rs./q(1981-2003)

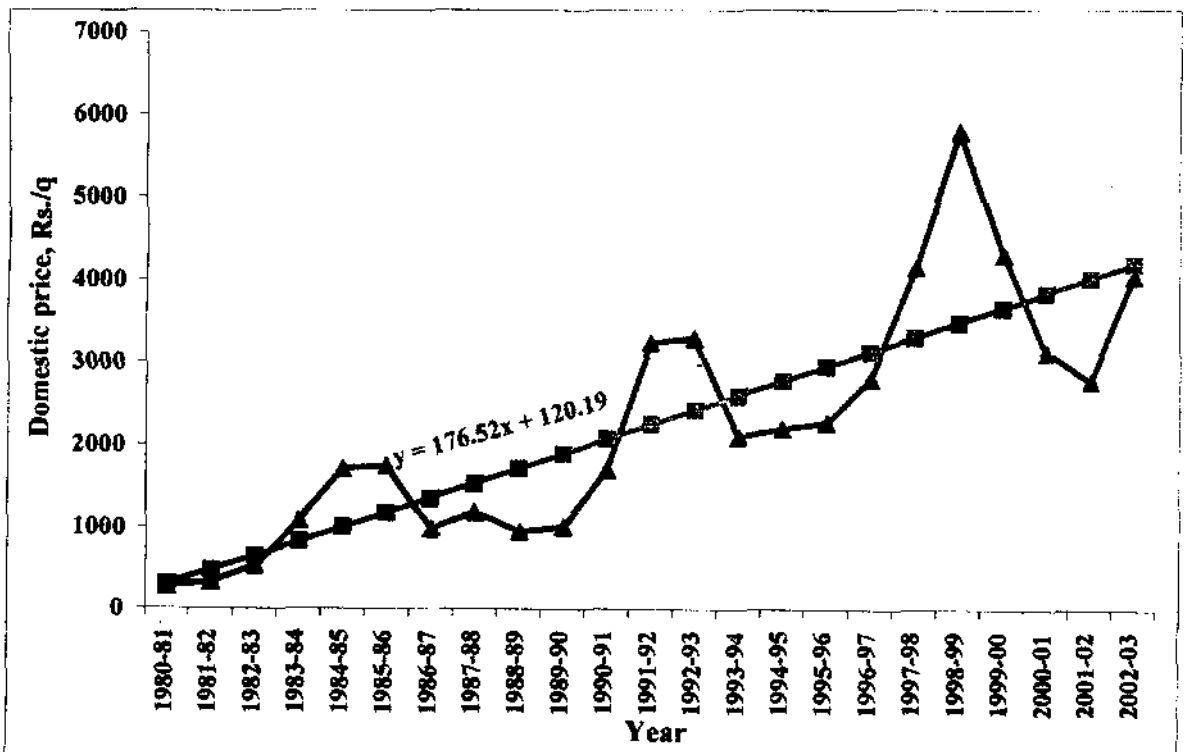


Fig.4.8 Trend line showing domestic price of turmeric in Rs./q(1981-2003)

during 1998-99. Prices showed a cyclical fluctuation with 7-8 year cycle along with a down swing for 4-5 years and upswing for 3-4 years. The slope of the trend line was 343.

The domestic price as shown in Figure 4.8 also exhibited cyclical fluctuations with a 7-8 year cycle. The domestic price was lowest during 1980-81, reached its first peak during 1984-85, then declined and the second peak was observed during 1992-93, whereas the third peak was during 1998-99. The slope of the domestic price was 176.52 which was less than the slope of international price, implying that growth in international price was higher than that of domestic price. In the early years difference in domestic prices and international prices were less but the divergence increased from 93-94 onwards showing a favourable position for export. This could be confirmed from the export performance as explained in the previous section, where quantity and value showed significant positive growth during 1991-2000. It could be concluded that higher export earning was the result of higher unit price of turmeric. The cyclical fluctuations as observed for international and domestic prices of turmeric with a 7-8 year cycle was found to be in conformity with the report of Sudhakar (1996) where he observed a cyclical pattern of prices, with an 8 year cycle in which recession was observed for 5 years and the revival was for 3 years. An increase in price would be followed by a decrease in prices in the subsequent years.

Coefficient of variation as shown in Table 4.18 revealed almost same variation in both international and domestic prices during entire period. Variation in international price during post WTO period (21.57 per cent) was just half of that during pre WTO period (44.39 per cent). In the case of domestic price too variation was less in post WTO period (31.32 per cent) compared to pre WTO period (47.65 per cent). This was in conformity with the results of growth in export as discussed in the previous section.

To conclude the above discussion, the growth in domestic price was higher than that in international price for pepper, while in the case cardamom, ginger and turmeric growth was more for international price. Fluctuation in prices was less in the post WTO period for all the selected spices except for pepper.

4.5 TRADE COMPETITIVENESS

The liberalization of Indian economy has provided enormous opportunities for agricultural exports. In this context it is important to understand the global competitiveness of various agricultural commodities. In this study trade competitiveness of four spices viz, pepper, cardamom, ginger and turmeric in India is measured by adopting the standard approach of measuring competitive advantage through the estimation of Nominal Protection Coefficient (NPC). NPC is the ratio of domestic price to international price and the divergence between these two measures the level of protection. If the NPC is greater than one, then that commodity is protected compared to the situation which would prevail under free trade and if NPC is less than one that means the commodity is less protected and it is having competitive advantage in the international market. It may be mentioned that the domestic price used for calculation of NPC refers to prices of garbled pepper in Kochi market (pepper), cardamom in Vandanmedu auction centre and prices of ginger and turmeric in Kochi market.

In this study NPCs of pepper, cardamom, ginger and turmeric were analysed during the period 1987-88 to 2002-03. In order to find out the effect of WTO on trade competitiveness of the above spices, the study period was divided in to two parts i.e. eight years before WTO (1987-88 to 1994-95) and eight years after (1995-96 to 2002-03). The first part would be referred to as pre WTO period and second as post WTO. It may be noted that here NPC was calculated based on importable hypothesis. The results are presented separately for the major spices, viz, pepper, cardamom, ginger and turmeric are discussed in what follows

4.5.1 Pepper

The Nominal Protection Coefficient for pepper for pre WTO period and post WTO period are presented in Table.4.19 and Fig.4.9 which revealed that in pre WTO, NPC was less than one in all the years except 1991-92, where it was 1.06 indicating less competitiveness or high level of protection during that year. The average value of NPC was 0.885 showing that pepper was competitive in the pre WTO period. In post WTO

Table.4.19 Nominal Protection Coefficient of Pepper during pre and post WTO periods

Pre WTO (1987-88 to 1994-95)		Post WTO (1995-96 to 2002-2003)	
Year	NPC	Year	NPC
1987-88	0.791	1995-96	0.920
1988-89	0.794	1996-97	0.857
1989-90	0.955	1997-98	0.983
1990-91	0.953	1998-99	0.895
1991-92	1.057	1999-00	0.880
1992-93	0.762	2000-01	0.863
1993-94	0.882	2001-02	0.812
1994-95	0.884	2002-03	0.870
Average	**0.885**	**Average**	**0.885**

Table.4.20 Nominal Protection Coefficient of Cardamom during pre and post WTO periods

Pre WTO (1987-88 to 1994-95)		Post WTO (1995-96 to 2002-2003)	
Year	NPC	Year	NPC
1987-88	1.052	1995-96	0.607
1988-89	0.943	1996-97	0.987
1989-90	1.532	1997-98	0.621
1990-91	0.809	1998-99	0.876
1991-92	0.648	1999-00	0.923
1992-93	0.919	2000-01	0.785
1993-94	0.802	2001-02	0.779
1994-95	0.498	2002-03	0.786
Average	**0.900**	**Average**	**0.796**

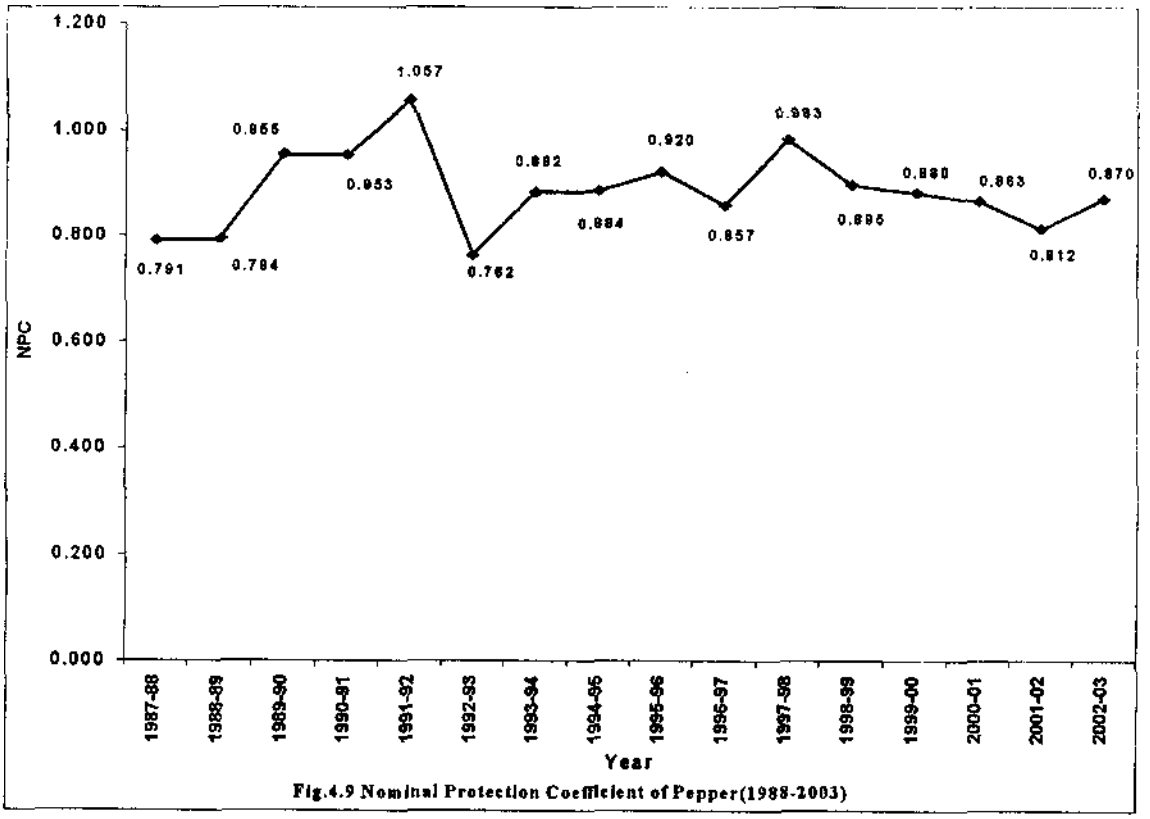


Fig.4.9 Nominal Protection Coefficient of Pepper(1988-2003)

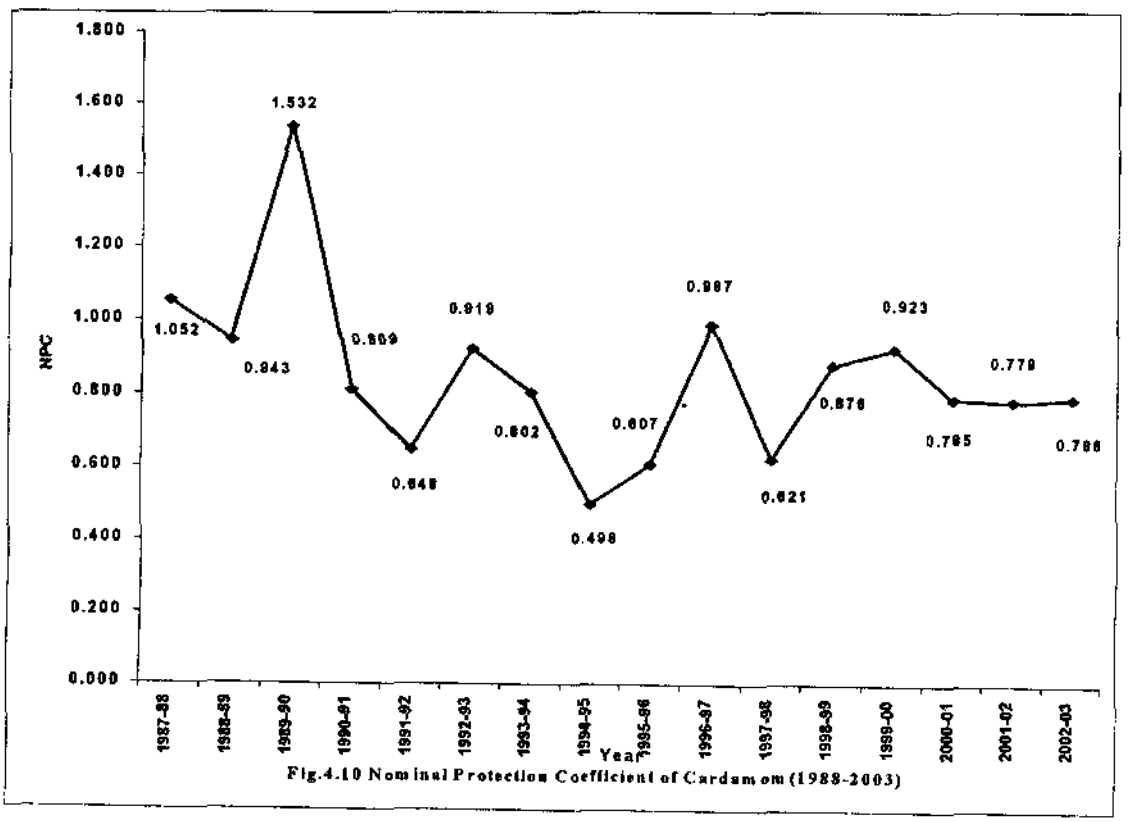


Fig.4.10 Nominal Protection Coefficient of Cardamom (1988-2003)

period, NPC was less than one in all the years and the average NPC for the entire period was 0.885, which was same as that in the pre WTO period. It would suggest that WTO had not influenced the competitiveness of pepper. It may be noted that NPC was a measure very much influenced by fluctuations in prices.

The above findings on the NPC values of less than one was in conformity with the result of Chand (2002) where NPC of pepper during 1991-92 to 1999-2000 ranged between 0.84 and 0.98 except 1997-98 where it was greater than one. Bhatia (1994) reported that the rate of domestic price to world price during 1992 was significantly lower than one in the case of pepper, indicating its competitiveness. Sandhu (1989) also reported that Indian pepper was priced high in USA market and export market share was high and he observed that even though there was competition the market was favourable to Indian black pepper because of its quality indicating India's competitiveness.

It could be concluded that even though NPC was less than one, it was closer to one and NPC of pepper during pre and post WTO period was found to be same. As NPC values are influenced by fluctuations in prices, which was related to the quantity of production, the measure of competitiveness based on this alone might be questionable. The scope for increasing the competitiveness of pepper, by increasing productivity and use of low cost production technology would be highly relevant.

4.5.2 Cardamom

In the export of cardamom, India stands in the second position next only to Guatemala. The NPC of cardamom, for the two periods as shown in the Table 4.20 and Fig.4.10 indicated that NPC was more than one during 1987-88 and 1989-90 and it reached closer to one during 1988-89 and 1992-93. The average value of NPC during pre WTO period was found to be 0.9. In post WTO period, NPC was less than one in all the years and the average NPC was 0.796. A comparison of NPCs during the pre WTO period and post WTO period indicated that NPC values were better in the post WTO period compared to pre WTO period which would indicate the high level of competitiveness of cardamom in the post WTO period .

The high NPC value during 1987-88 to 1989-90 was supported by Gill (1990) who in his study on prospects of agricultural export from India reported that exports of cardamom had suffered both because of higher prices in the domestic market and also severe competition in the west Asia and from Guatemala.

4.5.3 Ginger

India contributes 50 per cent of world's ginger production and Kerala and Andhra Pradesh are the major states growing ginger. The NPC of ginger as shown in Table 4.21 and Fig 4.11 revealed that during pre WTO period the NPC value ranged between 0.886 during 1994-95 and 0.570 during 1988-89. The average value of NPC for the pre WTO period was 0.705 indicating lesser protection and more competitiveness. In post WTO period, NPC ranged from 0.721 in 1997-98 to 0.528 in 2001-02 and the average value of NPC was 0.661, which was lesser than that during pre WTO period indicating that India's competitiveness had increased during post WTO period.

4.5.4 Turmeric

India accounts for 80 per cent of the world trade in turmeric and it was in a competitive position with a lower domestic price compared to international price. The NPC of turmeric during pre WTO period was less than one in all the years and the average NPC for the period was 0.579. In the post WTO period competitiveness had increased with a lower NPC of 0.527. The NPC ranged between 0.434 to 0.635 (Table 4. 22 and Fig. 4.12)

It could be concluded that the level of protection would vary with commodity and consequently competitiveness. It was 0.885 for pepper,0.796 for cardamom while for ginger and turmeric it was0.661 and 0.52 respectively. Among the crops studied, turmeric was found to be the most competitive followed by ginger, cardamom and pepper. It may be noted that with respect to Kerala, pepper and cardamom are the predominant crops which would call for efforts to improve the competitiveness of these crops. Except pepper NPC of all other spices had decreased in the post WTO period compared to pre WTO

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Table.4.21 Nominal Protection Coefficient of Ginger during pre and post WTO periods

Pre WTO (1987-88 to 1994-95)		Post WTO (1995-96 to 2002-2003)	
Year	NPC	Year	NPC
1987-88	0.666	1995-96	0.672
1988-89	0.570	1996-97	0.673
1989-90	0.764	1997-98	0.721
1990-91	0.796	1998-99	0.686
1991-92	0.668	1999-00	0.832
1992-93	0.617	2000-01	0.593
1993-94	0.672	2001-02	0.528
1994-95	0.886	2002-03	0.586
Average	**0.705**	**Average**	**0.661**

Table.4.22 Nominal Protection Coefficient of Turmeric during pre and post WTO periods

Pre WTO (1987-88 to 1994-95)		Post WTO (1995-96 to 2002-2003)	
Year	NPC	Year	NPC
1987-88	0.589	1995-96	0.494
1988-89	0.479	1996-97	0.524
1989-90	0.522	1997-98	0.625
1990-91	0.737	1998-99	0.635
1991-92	0.645	1999-00	0.525
1992-93	0.587	2000-01	0.445
1993-94	0.522	2001-02	0.434
1994-95	0.555	2002-03	0.534
Average	**0.579**	**Average**	**0.527**

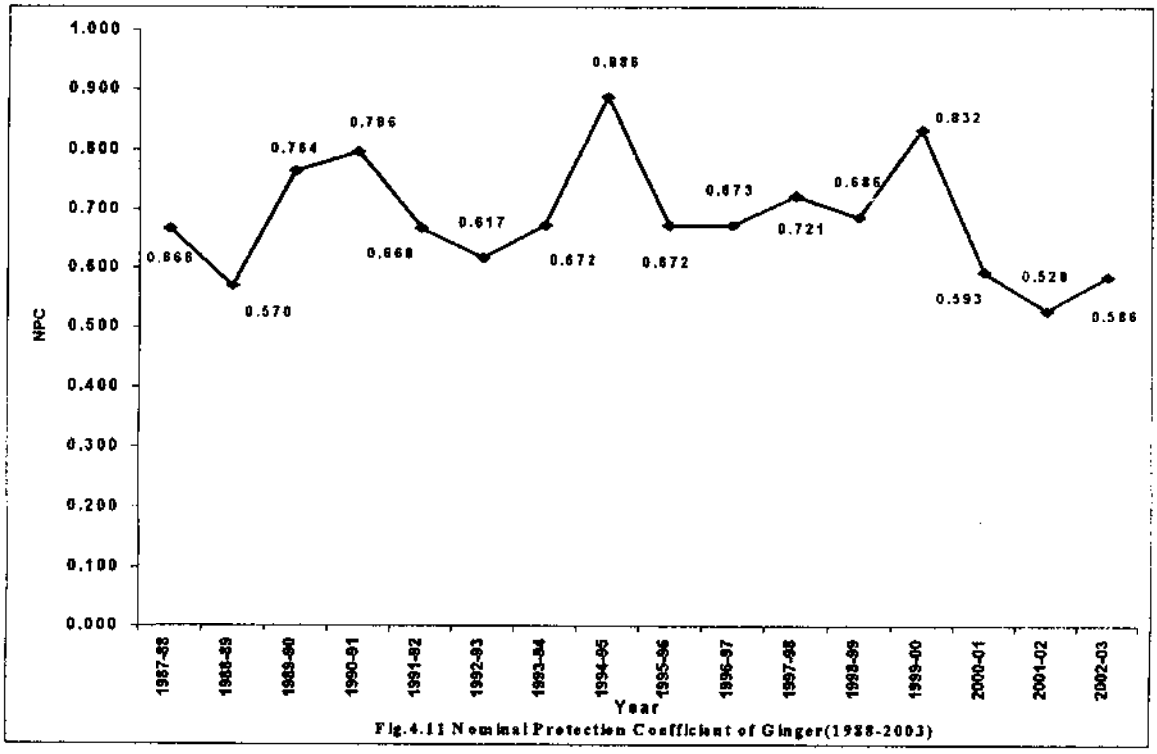

Fig.4.11 Nominal Protection Coefficient of Ginger(1988-2003)

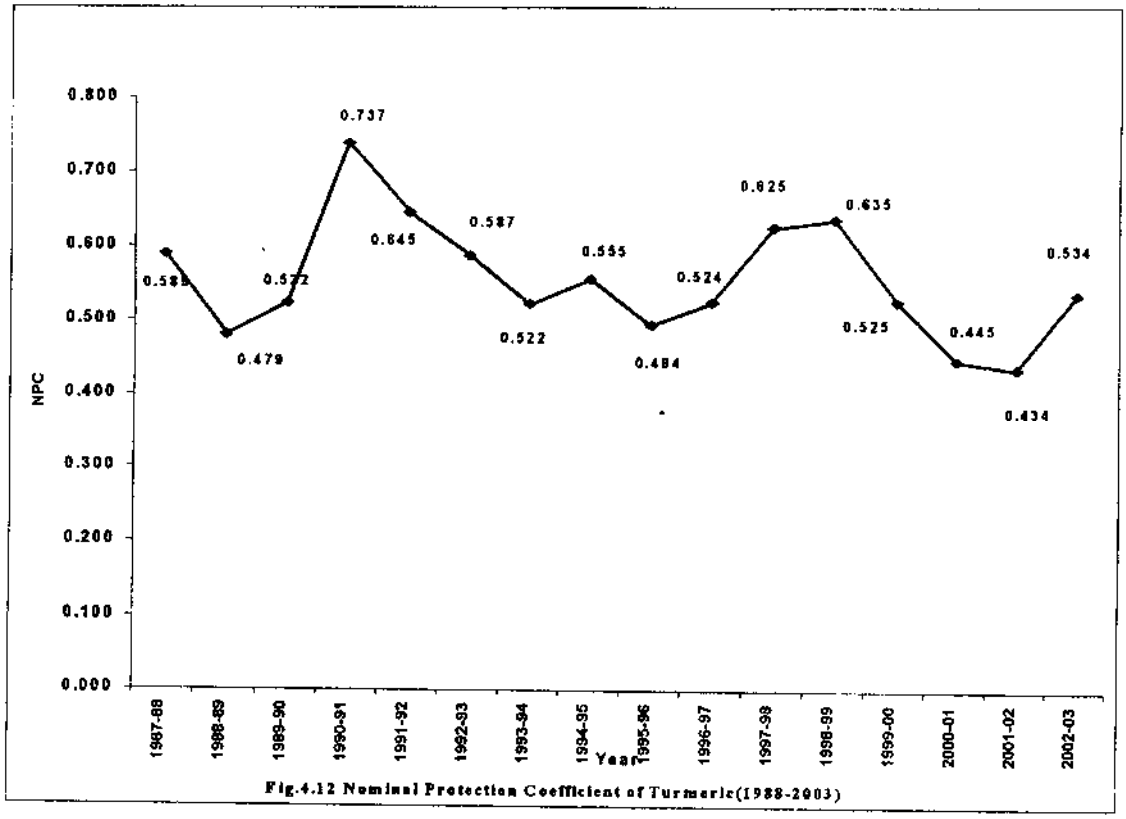

Fig.4.12 Nominal Protection Coefficient of Turmeric(1988-2003)

period, showing high competitiveness in the WTO regime. Low value of NPC measures high divergence between domestic and international prices or low level of protection which would favour international market.

Even though NPC values are less than one it may be noted that it may change according to fluctuations in international market since most of the spices are export oriented and any set back in markets in major exporting countries will affect the farmers in remote villages in Kerala and upset our economy. It is therefore a matter of survival for us to increase productivity and also maintain the marketability of the produce through improved quality.

Swaminathan (1995) emphasized the role of excellence in quality, reliability of supplies and price competitiveness in international trade and suggested ecologically sound methods of production include post harvest technology and maximum value addition for spices with particular attention to processing, packaging, transportation and marketing. The major challenges identified to Indian spice industry were productivity, quality and value addition challenge. In black pepper national average is only 316 Kg per hectare whereas in Thailand it is 3352 Kg per hectare, so also Guatemala is producing cardamom at the rate of 250 Kg per hectare as compared to 150 Kg per hectare in India. The productivity of ginger was 3391 Kg per hectare in India as against 8116 Kg per hectare in Indonesia. So India has to use high yielding varieties, appropriate production technologies and all the more highly conducive climate for spices production. Thus, in order to compete and retain India's position in the world spice market ability to meet the quality expectations in the areas of pesticide residues, mycotoxins and microbial load should be strengthened. Global demand for value-added spices is on the increase. Convenience in consumption is the characterization of new market and shift towards quick food habits placed enormous demand in value added spices. Mainly due to lack of adequate processing facilities the share of value added spices export from India is very less. So we have to concentrate on product diversification and value addition to be more competitive in the international market.

4.6 MARKETING SYSTEMS OF SPICES

The development of an efficient marketing system is important in ensuring the scarce and essential commodities reach different classes of consumers. Efforts to increase production may go waste unless the product is efficiently marketed. Marketing should therefore be rightly considered as an essential aspect like good seeds and fertilizers in modern agriculture. Marketing system as a whole is divided in to three broad segments viz, producers, consumers and middlemen, each with apparently conflicting interests. The producer wants the marketing system to purchase the product without loss of time and provide the highest possible price. Consumer's interest is to get required quantity of quality goods at lowest possible price while middlemen aim at realizing maximum profit from the deal. An efficient marketing system ought to aim at balancing this conflicting interest in such a way that each segment gets a fair deal.

Spices are high value crops and their efficient marketing is essential to ensure good price to the farmer producer. In this section, marketing system of four major spices of Kerala viz, pepper, cardamom, ginger and turmeric were analysed based on information collected from sample farmers of Kattappana panchayat in Idukki district. The results on the marketing channels, marketing cost of farmers and their constraints are presented and discussed here. It may be noted that the marketing costs and margins of various intermediaries were not estimated due to non availability of data.

4.6.1 Distribution of respondents according to area under crop

The distribution of respondents according to area under each crop as presented in Table.4.23 revealed that about 15.25 percent of the respondents were operating in an area of more than two acres ,51.5 percent in an area of 1-2 acres and 33.33 percent were having area less than one acre. But in the case of cardamom more than half of the farmers (61 percent) were having less than one acre area, 32 percent were having an area of one to two acres and seven percent who were large farmers were operating in an area of more than two acres. All the respondent farmers of ginger and turmeric were doing cultivation in an area of less than one acre.

Table.4. 23 Distribution of respondents according to area under crop

Holding size	Pepper	Cardamom	Ginger	Turmeric
>2 acre	5 (15.15)	2 (7.14)	00.00	00.00
1-2 acre	15 (51.51)	10 (32.14)	00.00	00.00
<1 acre	10 (33.33)	18 (60.71)	30(100)	30(100)
Total	30 (100)	30 (100)	30 (100)	30 (100)

Note: Figures in parentheses indicate per cent to total

4.6.2 Pepper

The marketing system of pepper prevalent in the study area was selling of pepper as black pepper and none of the sample farmers was found to convert black pepper to white pepper. The black pepper was made ready for market by spreading the harvested spikes on the threshing floor for drying, and separating the berries from the spikes by rubbing and then drying in the sun for seven to ten days. By the above treatment the moisture level was reduced to about 12 per cent and the outer skin would become black in colour and get shrinkled .

4.6.2.1 Marketing Channel

The marketing channel is the route through which agricultural produce move from the producer to the consumer.

The different marketing channels identified for pepper were,

- Producer – village merchant– wholesaler – exporter – consumer
- Producer –co-operative society – wholesaler – exporter – consumer
- Producer – village merchant – commission agent – wholesaler – exporter – consumer
- Producer – village merchant– processor – retailer – consumer
- Producer – village merchant– wholesaler – retailer – consumer

The most important channel was producer-village merchant-wholesaler-exporter-consumer channel with 88 per cent of the sample farmers selling their produce to village merchant, while remaining 22 per cent sold through co-operative society. After the produce bought by the wholesalers, the cleaning and grading was done by them and sold to exporters through auction. The exporters would export it to the foreign countries either through ship or flight.

4.6.2.2 Marketing cost incurred by farmers

The marketing cost incurred by the farmers as shown in Table.4.24 were drying charges, loading and unloading charges and transportation costs. Only six per cent of the farmers were doing grading and cleaning operations and with a cost of Rs.1.5 per Kg. The drying charges came to Rs.2 per kg while the loading and unloading charges on an average was Rs. 0.14 per kg. Even though the farmers were located at different places, the average distance to the main market (Kattappana market) was 2.7 kilometers for which the farmers had incurred a cost Rs.0.30 per kg.

Table.4.24. Marketing cost of pepper incurred by respondent farmers

Sl No	Items of cost	Rupees/Kg
1	Drying charge	2 (51)
2	Cleaning and grading	1.5(38)
3	Loading and unloading	0.144(3.5)
4	Transportation	0.30(7.5)
	Total	3.94(100)

Note: Figures in parentheses indicate per cent to total

4.6.2.3Constraints in production and marketing

The major constraint faced by the farmers as presented in Table 4. 25 was price fluctuations. Prices would change according to world market prices and if there was a boom in production in any other countries naturally the prices would fall. Eventhough

pepper could be stored for a long time the immediate need for money will force the farmers to sell the produce even if price is low. The cultivation of pepper requires large amount of labour. So high labour wage and availability of labour in required time were other problems faced by farmers. Prevalence of pests and diseases was another problem, which reduced productivity of pepper.

Table.4. 25 Constraints in production and marketing of pepper

Sl No	Constraints	Mean score	Rank
1	Price fluctuation	2.69	I
2	High labour wage	3.03	II
3	Unavailability of labour	3.21	III
4	Prevalence of pest and diseases	3.47	IV

To sum up, majority of the farmers in the study area were found to sell their produce to village merchants, which was in conformity with the findings of Mukundan and Devi (2000) who opined that the village traders were ruling the rural pepper markets in Kerala and most of the small farmers were selling their produce to village traders, mainly because of transportation difficulties. It was also observed that because of the immediate need for money, farmers usually disposed their produce to village traders soon after harvest which was supported by Velappan (1984) who opined that the quantity handled by co-operative society was only 10 per cent of the production in Kerala. The marketing system of pepper was found to be very efficient and they provided increased share of consumer price to farmers with comparatively low market cost, which was in line with the reports of Madan (2000).

4.6.3 Cardamom

Cardamom capsules with green colour fetch a premium price in foreign countries, so much care should be taken to preserve the green colour during curing and subsequent

storage. Capsule should be preserved within 24 to 36 hours after harvest to prevent deterioration. By curing, moisture of green cardamom would be reduced to eight to 12 per cent at an optimum temperature, so as to retain the green colour to the maximum extent.

4.6.3.1 Market Structure

An important aspect of market structure was the existence of an efficient auction system, which ensures fair price to the target planters, who take their produce to the auction centre. There are at present 11 auction centers in India. Though the auction system is efficient, the quantity flowing through the auction centers were only about 70 per cent of the production. The licensed auctioneers conduct weekly auction during harvesting season in the production tracts/ assembly centers on particular dates as approved by the board and as per the conditions/directions issued from time to time. A sizeable quantity (about 30 per cent) flows from the producer to the dealer outside the auction centre.

4.6.3.2 Marketing Channel

The marketing channels identified for cardamom were,

- Producer – village merchant – wholesaler – exporter
- Producer – auction centre – wholesaler – exporter
- Producer – auction centre – exporter
- Produce – village merchant – exporter

The most common channel was the Producer – village merchant – wholesaler – exporter channel and around 92 per cent of the farmers were marketing their produce through this. The wholesalers would auction the produce to exporters ,who will export to foreign countries.

4.6.3.3 Marketing costs incurred by farmers

The major cost incurred by farmers after harvesting as shown in the Table.4.26 was curing charges. Most of the farmers were not having (96 per cent) their own curing houses and they had to depend on others. The curing charges per Kg of green cardamom were ranging between six to seven rupees. The curing centres were located within two kilometers and the average curing charge was Rs 6.28 per Kg where as for those who were having their own curing facility the cost was only four rupees per Kg of green cardamom. The other charges incurred were loading and unloading charges and transportation cost, which were Rs 0.61 per Kg and Rs 0.89 per Kg respectively.

Table. 4. 26 Marketing cost of cardamom incurred by respondent farmers

Sl No	Items of cost	Rupees/Kg
1	Curing	6.28(81)
2	Loading and unloading	0.61(7.8)
3	Transportation	0.89(11.2)
	Total	7.78(100)

Note :Figures in parentheses indicate per cent to total

4.6.3.4 Constraints in production and marketing of cardamom

The major constraints faced by farmers as shown in Table.4.27 revealed that fluctuating market prices was the most important problem followed by monopolized auction market in which only large farmers were putting their produce for auction. High curing charges, which accounted for 81 per cent of the cost incurred by farmer after harvesting and lack of irrigation facility were the other problems faced by farmers.

Table.4.27 Constraints in production and marketing of cardamom

Sl No	Constraints	Mean score	Rank
1	Oscillating market price	1.5	I
2	Monopolized market	1.58	II
3	High installation cost of curing unit	2.9	III
4	Lack of irrigation facility	4.0	IV

The marketing system of cardamom as given above revealed that the small farmers were not able to put their product for auction because of small quantity produced and they had to depend on village traders for selling their produce. This was in line with the findings of Narayana *et a l* (1985) who reported that the important aspect of cardamom marketing was that the small growers sold their produce to the local dealers and merchants and therefore they got lesser price than the planters. The major cost incurred by the farmers were curing charges, which was about Rs. 6.28 per Kg of green cardamom. The small quantity of produce at each harvest, lack of curing facilities and the need for immediate cash were the factors which compelled the small growers to go in for distress sale. Farmers were mostly afraid of the price fluctuation, which will vary according to international situation. But in the instability analysis it was found that fluctuation in price had decreased in the post WTO period, so it could be expected that farmers would get a stable price in future.

4.6.4. Ginger

Ginger is a cash crop and is mainly grown for the purpose of sale. In India, Kerala leads in ginger production. Small and marginal farmers constitute the bulk of the ginger producers in the state. Though ginger is cultivated through out the state, the produce from specific localities of Kerala such as Kuruppam padi (Ernakulam), Parakkodu (Quilon), Vadakkumchery (Palakkad), Nedumangad (Trivandrum) Santhan para (Idukki) and Waynad are considered to be superior. The superiority of the produce is attributed to the geographical peculiarities rather than varietal aspects.

4.6.4.1 Marketing channel

The marketing channels identified were,

Green ginger

- Producer – retailer – consumer
- Producer – wholesaler – retailer – consumer
- Producer – village merchant – wholesaler – retailer – consumer
- Producer – commission agent – wholesaler – retailer – consumer

Dry ginger

- Producer – village merchant - commission agent – wholesaler – retailer – consumer
- Producer – village merchant – wholesaler – export
- Producer – village merchant – wholesaler – retailer – consumer

In the study area, all the respondent farmers were selling their produce through the Producer – Village merchant - commission agent – wholesaler – exporter – consumer channel. The farmers sold the produce to local trader and based on the quality market price would be fixed. The village merchants had a prominent role in marketing, as it was uneconomical for the marginal farmers to take their produce to distant wholesale markets. The wholesalers bought the produce from village merchants and then exported

4.6.4.2 Marketing cost of farmers

In the study area, most of the respondents were selling their produce in the fresh form (65 per cent) due to high cost of pealing (Table 4. 28). The average cost of pealing was Rs 1.25 per Kg and drying charge was Rs 1 per Kg. Loading and unloading charges and transportation costs were Rs 0.13 per Kg and Rs 0.26 per Kg respectively.

Table.4. 28 Marketing cost of ginger incurred by respondent farmers

SI No.	Item	Cost Rs /Kg
1	Drying	1 (38)
2	Pealing	1.25 (47.3)
3	Loading and unloading	0.13 (5)
4	Transportation	0.26 (9.9)
	Total	2.64 (100)

Note: Figures in parentheses indicate per cent to total

4.6.4.3Constraints in production and marketing of ginger

The major constraint faced by farmers in ginger cultivation and marketing as presented in the Table.4.29 was high cost of cultivation. Ginger crop requires good amount of labour for planting and due to high labour charge cultivation will become expensive. In the study area, the crop was mainly rainfed and highly dependent on weather. Another problem was price fluctuation. The price of ginger was not stable and it will fluctuate widely from year to year and also within a season. Due to the perishability of produce it cannot be stored for long time. Diseases like soft rot and bacterial wilt, perishability of the produce and high seed material cost compared to harvested one were the other constraints faced by the farmers.

Table.4. 29 Constraints in production and marketing of ginger

Sl No	Constraints	Mean score	Rank
1	High cost of cultivation	1.86	I
2	Price fluctuation	2.31	II
3	Soft rot and bacterial wilt	2.54	III
4	Perishability of the product	4.09	IV
5	High seed material cost	4.18	V

It could be concluded that most of the farmers were selling their produce in fresh form and sold it to local merchant. The major constraint faced by farmers were high price fluctuation along with high cost of cultivation. Since perishability was a problem, they had to market it in short time. In conformity to the above result, Jayesh (1994) also identified price instability as a major problem for ginger cultivation. Saini and Bhati (1995) in their studies on ginger marketing in Himachal Pradesh and Sikka (1996) had stressed the need for co-operative marketing society in their state. The other problems faced by the farmers were low price and high transportation cost. But in the study area there was co-operative society and transportation was not a problem. So in order to tackle the major problem i.e. price fluctuation government should take some measures to stabilize price.

4.6.5 Turmeric

Turmeric has been used as a spice from the very early period of recorded history, because of its colouring, flavouring and digestive properties. India constitutes about 80 per cent of the world export. Turmeric can be marketed in fresh form or in cured form. For curing fingers and mother rhizomes were boiled separately and boiling was done in MS pans of suitable size. The whole mass was boiled till the rhizomes became soft. The cooked rhizomes were then taken out of the pan and dried in sun by spreading them as a thin layer on bamboo mats or drying floor. In order to smoothen the rough and harder outer surface and to improve its colour it was subjected to polishing. Boiled, dried and half polished turmeric fingers were taken in bamboo baskets and shaken with turmeric powder and when fingers are uniformly coated with turmeric powder they are dried in the sun to get dry turmeric

4.6.5.1 Marketing channel

The marketing channels identified for turmeric were

- Producer – village merchant – wholesaler – exporter
- Producer – – village merchant - commission agent – wholesaler – retailer – exporter
- Producer – co-operative society - commission agent – wholesaler – exporter

- Producer – co-operative society – wholesaler – exporter
- Producer – commission agent – wholesaler – exporter

The most prevalent channel among the respondents were the first one, where producers sold their produce to village merchant. Wholesalers collected the produce and would export it to other countries.

4.6.5.2 Marketing cost

As revealed from the Table 4.30, most of the farmers (72 per cent) were selling their turmeric after curing and drying and only 28 per cent sold their produce in fresh form. The major cost incurred were boiling and curing charges, drying charge and polishing charges. Among this, pealing charge was the most cost consuming item and it was Rs1.5 per Kg. Pealing was an expertised work and everybody could not do it. The drying charge was Rs 1 per Kg. The loading and unloading charges and transportation costs were Rs 0.11per Kg and Rs 0.48 per Kg respectively.

Table.4.30 Marketing cost of turmeric incurred by respondent farmers

Sl. No.	Item	Cost Rs/Kg
1	Drying	1 (29.5)
2	Curing	0.30 (8.8)
3	Pealing	1.5 (44.2)
4	Loading and unloading	0.11 (3.3)
5	Transportation	0.48 (14.2)
	Total	3.39 (100)

Note: Figures in parentheses indicate per cent to total

4.6.5.3 Constrains in production and marketing of turmeric

The most important constraint faced by the farmers in cultivation and marketing of turmeric as presented in Table.4.31 was high labour charges followed by high cost of curing and low price. Most of the farmers were not aware of the value added products like curcumin that could be produced. Varieties having high amount of curcumin would fetch good price in the market.

Table.4. 31 Constraints in production and marketing of turmeric

Sl No	Constraints	Mean score	Rank
1	High labour requirement	1.08	I
2	Curing charge	2.08	II
3	Marketing	2.81	III
4	Lack of varieties having high curcumin content	4.0	IV

To sum up, most of the farmers sold their produce in dried form, even though pealing and drying charges were more. All the respondent farmers sold their produce to village merchant and major problem faced by the farmers were high labour wage and high curing charges.

4.6.6 Response of farmers about prices, marketing system and export quality standards.

As a result of being a member of World Trade Organisation, the Indian market opens to all other countries. There are certain provisions under WTO like sanitary and phyto sanitary measures and technical barriers to trade, which can be used against India to prevent her export. Different countries are setting their own export quality standards

and if our lots are not satisfying such standards they will restrict import from our country. So we should prepare clean spices to win the export market.

Table.4.32 Response of farmers about prices, marketing system and quality standards for export

Item	Pepper	Cardamom	Ginger	Turmeric
Farmers satisfied with present marketing system	14 (45.5)	16 (54)	4 (14)	10(33)
Farmers experiencing difficulty in marketing produce	2(6)	4 (12.5)	3(9)	2(5.5)
Farmers satisfied with price	5(18)	20 (67)	0	7 (22)
Farmers aware of export quality standards	10 (33)	4 (12.5)	11 (36)	18 (61)
Farmers following export quality standards	9 (30)	2 (8)	8(27)	17(56)

Note: Figures in parentheses indicate per cent to total

The results as presented in Table 4.32 revealed that among the respondent farmers 45.5 per cent were satisfied with present marketing system and they had relatively less difficulty in marketing pepper. Only 18 per cent were satisfied with price while 33 per cent of the respondents were aware of the quality standards for pepper and 30 per cent were trying to follow these standards by using less amount of pesticides and using cement floor for drying spices (instead of mat pasted with cow dung).

Regarding cardamom, majority of the respondents were satisfied with marketing system and prices (67 per cent) and only 12.5 per cent experienced some difficulty in marketing their produce. There were no strict rules on export quality of cardamom and farmers were using inputs like fertilizers and plant protection measures for better

productivity. Only 12.5 per cent of the farmers were aware of quality requirements while 8 per cent of them were trying to follow organic method of cultivation.

In the case of ginger, only 14 per cent were satisfied with present marketing system. Even though only 9 per cent of the farmers were experiencing difficulty in marketing, none were satisfied with the price. The price of ginger was showing much fluctuation and was not sufficient to meet the cultivation cost. Moreover, the crop is highly dependent on weather. Farmers were operating in an area of less than one acre and so it would not be economical for them to take their produce to distant market, where they would get good price. About 36 per cent of the farmers were aware of quality requirements, while 27 per cent were using organic fertilizers with minimum plant protection chemicals.

For turmeric 33 per cent of farmers were satisfied with present marketing system and 22 per cent of them were satisfied with price. Only 5.5 per cent of the farmers were experiencing difficulties in marketing their produce. Around 61 per cent of farmers were aware of export quality standards with 56 per cent of them following organic method of cultivation even though it was not sold as organic.

It was observed that cardamom was fetching fairly good price and its marketing was also satisfactory. But the quality stipulations were not followed by the farmers and they were using chemical fertilizers and plant protection chemicals to a great extent. In the case of turmeric farmers were turning towards organic cultivation which would fetch good price. But since most of them were having mixed cropping system of growing ginger and turmeric in between pepper and cardamom cent per cent organic farming would not be practically possible.


SUMMARY & CONCLUSION

5. SUMMARY

India is the foremost country with regard to production, consumption and export of a wide range of spices. Besides earning substantial foreign exchange to the country, it also provides employment to millions of farmers, traders and agricultural labourers. Spices not only add 'spice' to food but also to the whole agricultural sector. Kerala contributes about 92 per cent of production of pepper, 82 per cent of cardamom, 18 percent of ginger, 1.4 per cent of turmeric produced in our country, which are the major export earners. The agro-climatic conditions of Kerala are well suited for the cultivation of above spices. The present study on export performance of important spices of Kerala was an attempt to examine the growth in production and export of spices, to analyze the price behavior and to measure the trade competitiveness of major spice crops in Kerala in the context of liberalized trade regime.

The study was based on both primary and secondary data. Secondary data have been used to study the trends in area, production and productivity in Kerala and export by India of the four important spices viz, pepper, cardamom, ginger and turmeric, along with analysis of price behaviour and examination of competitiveness. The data was collected from various publications of State Planning Board, Trivandrum, Spices Board Kochi, Directorate of Arecanut and Spices Development, Kozhikkode and Monthly Statistics of Foreign Trade of India, Kolkata.

Idukki district which occupied the largest area under pepper and cardamom was purposively selected as the study area for collection of primary data. From Idukki district Kattappana block having largest area under spices was selected purposively and from that, Kattappana panchayat was selected. From the panchayat 30 farmers were randomly selected for each crop.

The growth rates in area, production and productivity of pepper, cardamom, ginger and turmeric in Kerala were estimated using four functions viz, exponential, semilog, kinked exponential and log quadratic model. Coppock's instability index and co-efficient of variation were used to find out instability. The entire period under study (1971-2000) has been divided in to three sub periods namely period I (1971-1980), period

II (1981-1990) and period III (1991-2000) and growth rates were estimated for entire period and also for each sub period. The results of growth rate analysis using different functions revealed that during the entire period, both area and production of pepper in Kerala exhibited significant positive growth of 2.4 and 3.51 per cent respectively showing an accelerating trend in growth whereas growth in productivity was insignificant. Barring the area in period I and productivity in period III, area, production and productivity growth during all the periods were positive. Coefficient of variation and instability index showed lesser variability in area, production and productivity during the entire period and its sub periods.

In the case of cardamom, production and productivity showed significant positive growth during the entire period under study, while it was negative for area. The decelerating trend in area started only during period III and in the previous two periods growth in area was positive and significant. Coefficient of variation and instability index was high for production and productivity indicating their high variability. Ginger exhibited positive growth in area, production and productivity during the entire period and sub periods. Positive growth in productivity and area contributed to higher growth in production. But area, production and productivity were showing a significant decelerating trend during the entire period under study. Coefficient of variation and instability index was high for production compared to area and productivity. In the case of turmeric, production and productivity exhibited an increasing trend whereas the area was stagnant during the entire period . Growth in area and production was negative during period I and II, which revived in period III with a significant positive growth. Log quadratic model showed an accelerating trend in area and production while productivity was decelerating significantly. Instability index and coefficient of variation was high for production compared to those for area and productivity.

The trends in export quantity and value of the above said four spices were analyzed using different growth models during the entire period and three sub periods. Here period II has been mentioned as pre liberalization period and period III as post liberalization period for easy comparison of the effect of trade liberalization

Growth in export quantity and value of pepper during the entire period under study was positive and significant. In the pre liberalization period, both quantity and value showed significant positive growth, while during post liberalization, growth in quantity was insignificant. During the entire period, export quantity exhibited a decelerating trend. The fluctuations in export value were very high compared to export quantity. Growth in export quantity was negative and significant while growth in value was stagnant during the entire period in the case of cardamom. In period II both quantity and value showed negative growth but both were positive in period III. Variability was more during period II. Positive and significant growth in both export quantity and value was exhibited for ginger during the entire period. In period II growth was negative in export quantity while both quantity and value showed positive growth during period III along with decelerating trend and high variability. For turmeric, export quantity and export value showed significant positive growth and accelerating trend during the entire period and it was positive in the sub periods too. Variability was more for export value compared to that for export quantity indicating high fluctuation in prices.

Itemwise export and import was analysed to find out the export and import basket of spices in India. It was found that pepper items were the major items exported from India, in value terms followed by turmeric, ginger and cardamom. There was not much change in items exported to other countries and export earnings from the spices increased three folds to that in the post WTO period (1996-2002) to that of in the pre WTO period (1989-1995). In the case of import cardamom contributed major value of import during pre WTO period but during post WTO period that place was taken by pepper. Turmeric was the item imported least since we are the largest producer and exporter of turmeric in the world. The spices were imported mainly for value addition and to export back.

Price behaviour of the four spices was analyzed by fitting trend line for both domestic price and international price. Variability in prices was estimated for the entire period 1988-2003 and also by splitting it to sub periods i.e. 1988-1995 (period I or pre WTO period) and 1996-2003 (period II or post WTO period). It was found that the slope of the trend line for domestic price of pepper was higher than international price indicating higher growth in domestic price. Fluctuation in both domestic and international

prices of pepper was high during the entire period. Comparison of fluctuation in prices during pre and post WTO periods showed that fluctuation was more in post WTO period. In the case of cardamom variation in international price was just half of that of the domestic price during the entire period indicating more or less stable price in international market. Fluctuation in prices was almost same before and after WTO even though it was more for domestic price. For cardamom, ginger and turmeric, growth in international price was more than the growth in domestic price and fluctuation was also less for international price than that for domestic price as against the case of pepper. Fluctuations in prices were less in post WTO period compared to pre WTO period.

Trade competitiveness was measured by using Nominal Protection Coefficient (NPC). For easy comparison NPC was calculated for a period of 8 years before WTO (1988-95) and 8 years after WTO (1996-2003). The NPC of pepper showed no difference in pre and post WTO periods. NPC was less than one showing the competitiveness of pepper during both the periods. In the case of cardamom, ginger and turmeric NPC was lesser in post WTO period compared to that in pre WTO period indicating low level of protection or high competitiveness in the post WTO period.

The marketing aspects of above spices were analysed based on primary data collected from farmers of Idukki district. The important marketing channels, marketing cost incurred by farmers and the constraints faced by them were examined. It was found that for the marketing of pepper, cardamom, ginger and turmeric most of the farmers were dependent on village merchant, even though there were cooperative markets and auction centres. The immediate need for money and small quantity produced, forced the farmers to sell their produce to village merchant. Drying charge was the major cost item incurred by farmers for pepper, whereas peeling charge was the major cost for ginger and turmeric. The major cost was incurred for curing in the case of cardamom. The major constraint faced by farmers was high price fluctuation.

The response of farmers about constraints related to price, marketing system and export quality standards for spices showed that pepper and cardamom farmers were somewhat satisfied with the present marketing system and very few experienced

difficulties in marketing. Most of the cardamom farmers were satisfied with the price received by them. Farmers were aware of export quality standards and they were trying to keep these standards by using lesser amount of chemicals for turmeric cultivation.

The main findings of the study are,

- Growth in production and productivity of pepper, cardamom, ginger and turmeric had increased during entire period.
- Growth in area was decreasing in the case of cardamom and turmeric.
- Export performance of cardamom, ginger and turmeric had improved in the post WTO period, while in the case of pepper growth was slower during post WTO period.
- Growth in domestic price was higher than international price in the case of pepper, whereas growth was more for international price in cardamom ginger and turmeric, which is a good sign.
- Average Nominal Protection Coefficient value of all the selected spices during pre and post WTO periods were less than one showing its competitiveness. Except for pepper competitiveness had increased in post WTO period compared to pre WTO.

Based on the above findings the following suggestions were put forth.

- ✓ Productivity of pepper ,cardamom, ginger and turmeric are less in India .India has high yielding varieties, appropriate production technologies and all the more a highly conducive climate for spices production, which should be exploited.
- ✓ About 85-90 per cent of the spices are exported as primary products. So broad basing the spices export basket by value addition and product diversification to meet global quality standards is a must.

- ✓ Quality is the key to spices export. We have to harmonise the quality of our products to internationally accepted standards. Inorder to compete and retain our position in the world spices market, our ability to meet the quality expectations through drastic reduction in pesticide residues, mycotoxins and microbial load should be strengthened.

- ✓ Organic spices are gaining great momentum in the world market. There is good scope for production and export of organic spices from India.

- ✓ The growth in export quantity and value of pepper was slower during post WTO period . So more emphasis should be given to promote its export.

The maxim 'produce, process and prosper' holds true in the case of exports of spices from India. The message is eloquent-we have to produce more spices through improved production technologies and high yielding varieties, to meet the demands of the domestic and the export markets, and should process it adopting good processing practices creating value addition, and of course have to export the product meeting the requirements of the importing countries which in turn would lead to significant growth in exports. In a world where further concessions are not likely to be expected, competition including economic reforms may act as an effective catalyst to revitalize the spices industry.


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MARKET BEHAVIOUR OF IMPORTANT SPICES OF KERALA

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ABSTRACT OF THE THESIS

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ABSTRACT

The present study on the "Market behaviour of important spices of Kerala" was aimed to examine the trends in production and export of major spices, analyze the price behaviour and to measure trade competitiveness of major spice crops in Kerala viz. *pepper, cardamom, ginger and turmeric* in the context of liberalized trade regime. Both primary and secondary data had been used for the study.

Growth rate analysis during the entire period (1971-2000) using different growth model revealed significant and positive growth in area, production and productivity of pepper and ginger. But in the case of cardamom and turmeric growth in production and productivity was significant and positive while in area it was negative though insignificant. Variability measurement using Coppock's instability index and coefficient of variation exhibited higher variation in production compared to area and productivity in all the crops studied except cardamom where productivity variation was high.

A significant positive growth was shown in export quantity and value of pepper, ginger and turmeric during the entire period. In cardamom, growth was negative in both export quantity and value. Coefficient of variation exhibited a higher variation in export value compared to export quantity in all the spices. Comparison of growth in export performance during pre and post liberalization periods indicated a higher growth in export quantity and value during post liberalization period except for pepper.

The comparison of item wise export and import during pre WTO (1989-1995) and post WTO period (1996-2002) in value terms indicated that pepper was the major foreign exchange earner in both the periods followed by turmeric, *ginger and cardamom. In* pepper products, black pepper garbled was the major exporting item with a share of 65 per cent. Export earning from spices has increased three folds during post WTO period as that of pre WTO. The item wise import of all the spices increased in post WTO period and pepper contributed major value of import whereas it was cardamom during the pre WTO period. Since India contributed 80 per cent of world trade of turmeric its import to India is very less.

Price behaviour of spices was analyzed by fitting linear trend for both domestic and international prices. Variability in prices were measured using coefficient of variation by splitting the time period as pre WTO (1988-1995) and post WTO (1996-2003) period. The results showed a higher growth in international prices compared to domestic prices in cardamom, ginger and turmeric. Comparison of coefficient of variation exhibited a lower variation in prices in post WTO period except for pepper.

The measurement of trade competitiveness using Nominal Protection Coefficient during pre WTO (1988-1995) and post WTO (1996-2003) periods exhibited a value of less than one during the two periods and NPC was lesser in post WTO period indicating high competitiveness in cardamom, ginger and turmeric. In the case of pepper NPC remained the same in both the periods.

The study on marketing aspects of the above spices among respondent farmers in Kattappana panchayat of Idukki district revealed that most of the farmers were depending on village merchant to sell their produce even though co-operative marketing societies and auction centres were there. The immediate need for money forced the farmers to sell their produce to village merchant. The farmers did not face much difficulty in marketing their produce and the major constraint faced by them was price fluctuation. Most of the farmers were aware of the quality standards stipulated for exporting of spices and were trying to reduce the level of chemicals used. The emphasis on value addition for export promotion as well as use of organic cultivation of spices appears to be a green signal for the bright future of spice trade in India.