The study concludes that there are several problems in the marketing of pepper and the Board has to solve the problems.

The Spices Board is likely to float a public limited enterprise dedicated to marketing and retailing in a move that could have a major bearing on the consumer price of pepper. In this regard, a new company capitalized by the board will offer equity stake to be offered to cultivators once operations stabilize and huge trade margins may offer lucrative business model.

CHAPTER VII

EXPORT PERFORMANCE OF PEPPER

The present chapter highlights the export performance of pepper in India. Since 98 per cent of India’s pepper production is from Kerala, an attempt is made in this chapter to analyze the growth rate of export and export prices of pepper in India and its impact on liberalisation.

This chapter includes analysis on

(i) Export performance of pepper in India;
(ii) Trend analysis on the export of pepper in India;
(iii) Factors that determine export of pepper in India;
(iv) Performance and trend analysis of export price of pepper in India;
(v) The co-integration between domestic and international prices.
(vi) The decomposition of the growth in the export value of pepper in India

7.1 EXPORT PERFORMANCE OF PEPPER IN INDIA

In this section, an attempt has been made to analyse the share of India's pepper export in the world.

7.1.1 India's Export Share of Pepper in the World

Food and Agricultural organization of United Nations estimated that the global demand of black pepper during 2006-07 will be 1,25,360 tonnes. India dominates world pepper market given its consumption and production pattern. However, Asian countries such as Vietnam, Indonesia, and Malaysia are the major exporting countries.

India exports about 10 per cent of the global pepper demand. US is the largest importer of pepper in the world followed by European market. Export from Asian region accounts for 78 per cent of the total export market, which is estimated at 1,94,000 tons.

India with more than 40 per cent share of the world area under pepper, contributes about 23 per cent of the total production of pepper in the world.
Given the high domestic demand due to internal consumption and high FOB prices, export has fluctuated between 36,908 tons, in 1988-89 to 14,150 tons in 2004-05.

TABLE 7.1
INDIA'S EXPORT SHARE OF PEPPER IN THE WORLD FROM 1970 TO 2005

<table>
<thead>
<tr>
<th>Year</th>
<th>India</th>
<th>Indonesia</th>
<th>Malaysia</th>
<th>Singapore</th>
<th>Vietnam</th>
<th>Brazil</th>
<th>Sri Lanka</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971-72</td>
<td>15.39</td>
<td>19.71</td>
<td>23.00</td>
<td>25.67</td>
<td>0.00</td>
<td>13.85</td>
<td>0.04</td>
</tr>
<tr>
<td>1972-73</td>
<td>15.29</td>
<td>19.91</td>
<td>21.30</td>
<td>25.82</td>
<td>0.00</td>
<td>10.95</td>
<td>0.08</td>
</tr>
<tr>
<td>1973-74</td>
<td>25.51</td>
<td>20.88</td>
<td>19.50</td>
<td>18.49</td>
<td>0.00</td>
<td>11.09</td>
<td>1.65</td>
</tr>
<tr>
<td>1974-75</td>
<td>20.77</td>
<td>12.55</td>
<td>23.84</td>
<td>22.09</td>
<td>0.00</td>
<td>12.21</td>
<td>0.27</td>
</tr>
<tr>
<td>1975-76</td>
<td>18.58</td>
<td>11.69</td>
<td>24.78</td>
<td>24.32</td>
<td>0.00</td>
<td>13.76</td>
<td>0.07</td>
</tr>
<tr>
<td>1976-77</td>
<td>13.28</td>
<td>19.95</td>
<td>25.76</td>
<td>22.36</td>
<td>0.00</td>
<td>13.10</td>
<td>0.05</td>
</tr>
<tr>
<td>1977-78</td>
<td>17.00</td>
<td>23.02</td>
<td>20.23</td>
<td>19.40</td>
<td>0.00</td>
<td>12.20</td>
<td>0.63</td>
</tr>
<tr>
<td>1978-79</td>
<td>8.90</td>
<td>21.39</td>
<td>20.74</td>
<td>23.42</td>
<td>0.00</td>
<td>16.97</td>
<td>0.68</td>
</tr>
<tr>
<td>1979-80</td>
<td>12.82</td>
<td>15.47</td>
<td>24.73</td>
<td>23.90</td>
<td>0.00</td>
<td>15.46</td>
<td>0.65</td>
</tr>
<tr>
<td>--------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td></td>
<td>0.00</td>
<td>0.06</td>
<td>0.18</td>
<td>0.18</td>
<td>0.24</td>
<td>0.90</td>
<td>1.77</td>
</tr>
<tr>
<td></td>
<td>0.57</td>
<td>1.27</td>
<td>0.77</td>
<td>0.78</td>
<td>1.68</td>
<td>0.84</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The leading exporters of pepper are India, Brazil, Indonesia and Malaysia. Indian spices exports, which at present accounts for 45 to 50 percent of the global share, seem to be facing a threat from the new entrants, especially Vietnam. In fact other pepper exporting countries like Indonesia, Malaysia and Brazil, succumbed to crop failure, Vietnam was able to hold its own and eat into India's export share.

Vietnam ships 90-95 per cent of its crop. Vietnam is coming up in the big way in the pepper market and hence the farmers in India should raise their productivity so as to compete in the domestic and international market. In terms of quality, the Indian variety is perceived to be superior. This alone might not ensure India's continued domination.

India could export 42,803 MT of pepper in 1999-2000, which declined to 24,000 MT in 2001-02. Export performance dissipated further and quantum of exports declined to 20,000 MT in 2002-03. The value realization was also lower at Rs.166.10 crores compared to Rs.211.93 crores in 2001-02 and unit value realization declined from Rs.88.30 per kg to Rs.83.05 per kg in the corresponding period. The unit value realization had slightly improved to Rs.88.85 in April to July 2003.
**TABLE 7.2**

**COUNTRY WISE EXPORT OF BLACK PEPPER**

**FROM COCHIN PORT**

(in Tones)

<table>
<thead>
<tr>
<th>Country</th>
<th>Export of Black Pepper</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2001-02</td>
</tr>
<tr>
<td>USA</td>
<td>10680</td>
</tr>
<tr>
<td>Canada</td>
<td>1871</td>
</tr>
<tr>
<td>UK / Continent</td>
<td>4285</td>
</tr>
<tr>
<td>East European Countries</td>
<td>796</td>
</tr>
<tr>
<td>Africa / Middle East</td>
<td>711</td>
</tr>
<tr>
<td>Far East</td>
<td>2225</td>
</tr>
<tr>
<td>Total export</td>
<td>20568</td>
</tr>
</tbody>
</table>
During 2002-03, India exported 15,637 metric tones of black pepper from Cochin port as against 20,568 metric tones during the previous year 2001-02. U.S.A is the major export market for India according for 45 per cent followed by Canada (11 per cent) in 2002-03. Vietnam is the leading exporters with 31 per cent followed by Indonesia with 22 per cent, Brazil with 20 per cent and India with 13 per cent. Vietnam exports around 83 per cent of its production, while Indian exports account for only 32 per cent of its production. The worsening export performance continued during April – July 2003 also.

7.2 TREND ANALYSIS ON EXPORT OF PEPPER IN INDIA

An attempt is made in this chapter to analyse the trends in export of pepper in India before and after liberalisation. In order to have a clear picture on the trend of export of pepper, semi-log quadratic function are used for the data from 1970-71 to 2004-05.

7.2.1 Trend in the Export of Pepper in India

Black pepper is the foremost export oriented spice produced in India. The export of pepper fluctuated since 1970’s ranging between a minimum of 15,719 tones in 1978-79 to a maximum of 48,743 tones in 1993-94. The export of pepper was found to be the highest during the period, 1993-94 and 1996-97,
which accounted for 48,743 tones and 47,893 tones respectively. The export of pepper maintained its highest growth rate till 1999 to 2000 accounting for 42,824 tones. The exports unit value of pepper was found to be the highest ranging between Rs.138.23 per kg to Rs.206.73 per kg during the period from 1997-98 to 1999-2000.

The export of pepper started to decline after 2000 and reached a minimum of 14,150 tones accounting for a unit value of Rs.85.80 per kg. The overall export performance of pepper showed a declining growth. At present India accounts for less than 5 per cent of world output of pepper and is also one of the largest producer, consumer and exporter of pepper.

7.2.2 Growth Analysis in the Export of Pepper in India

By applying semi-log quadratic functions for the analysis of the growth rate of export of pepper in India from 1970 to 2005, the following results have been obtained for the overall data.

TABLE 7.3

ESTIMATION OF GROWTH RATE OF EXPORT OF PEPPER
The growth rate of export of pepper in India has been decreasing from a positive value with a significant growth rate of 1.43 per cent per annum to a negative value of -0.12 percent per annum. According to the export of pepper from India, the log quadratic function reveals that, the independent variable explained about 31 per cent of variations in the export of pepper in India from 1970 to 2005. The results indicate that the growth rate of export pepper was decelerating during the overall period.

### 7.2.3 Impact of Liberalisation on Export of Pepper in India

Agricultural commodities are attached immense importance with the liberalization of trade in India during the nineties. However spices such as pepper, precisely black pepper, enjoy open trade status since the colonial period. As a result, such tradable constitute a significant proportion of total spices export from India.
India; although the importance of spices in export composition has been on decline from 2.65 per cent in 1960-61 to 0.72 per cent in 1990-91.

But after liberalization from 1990’s onwards the international trade in spices has grown by nearly 4 per cent per annum in volume and 15 per cent in value. An estimated 50,000 tones of spices and herbs valued at 1500 million US dollars is now imported to various countries globally every year from different countries. An impressive 20.47 per cent of this supply comes from India, but the recent data shows that the share has declined to 7.5 per cent in the export of spice.

During the year 2002-2003, the exports quantity touched an all time high of 2.64 lakh tones. However, during 2003-04 spices export declined to 2.47 lakh tones valued at 415 million dollars. The decline was mainly due to the drop in export of mint products and also because of lower export of pepper coupled with the fall in international price of pepper.

Varied agro-climatic situations prevailing in India are suitable to grow almost all spices. India is ideal for production of tropical black pepper to temperate saffron. India is a major producer and exporter of pepper, ginger, turmeric and seed spices. Whenever there is a wide gap in demand and production of spices, India can favourably exploit the situation because of varied agro-climactic situations.

The pressure on land in the major spice producing state of Kerala could be overcome by introducing spices as intercrops in coconut and areca nut gardens.
Most of the spices like pepper, ginger, turmeric and tree spices could be successfully grown in coconut and areca nut gardens. Pepper could also be trailed on shade trees in tea and coffee plantations.

Globalization and trade liberalization have posed unprecedented challenges to Indian spices, which is the major export-earning commodity. The world trade Agreement leading to the establishment of the world trade organization came into effect in January 1995. India has removed all quantitative restrictions on all agricultural and other trade related commodities in 2001.

All these resulted in a unified world market without quantitative restrictions, strong competition among producing and exporting countries and demand of high standard of quality and sanitary on regulations by importing countries. In the pre era of World Trade Organization, there was only one – way movement of spices from producing countries to consuming countries. But after removal of quantitative restrictions, spice trade between producing countries, also came into existence due to restriction and reduction of import duties.

Though Vietnam is not a member of International pepper community, it has emerged as the largest exporter of pepper in the world market because of free trade. The tariff for import of pepper from Sri Lanka has been reduced to nil, due to bilateral agreement. This resulted in the flow of low quality Sri Lankan pepper to the Indian domestic market, leading to low demand of high priced Indian pepper.
As a result of free trade agreements, there is strong competition among exporting countries. This has lowered the price of major spices in the world market. Import duty from other countries is retained at 70 per cent. Recently Government of India abolished the system of advanced licensing where nil import duty was levied to facilitate export as value added item.

The Government of India has enacted “Geographical Indication Good Registration and protection Act” in 1999. As a major producer and exporter of spices, India has to gain from this act. Eligibility of GI registration is based on certain specific quality, Reputation (or) other characters including appearance of the commodity or goods, which are exclusively due to geographical elements.

Malabar pepper, Cochin ginger, Alleppey Cardamom, Alleppey finger turmeric, Nizamabad turmeric and Guntur chilies, which are known for their intrinsic quality associated with specific regions, can be protected by giving an official stamp of Government of India. More number of spices has to be ordered to the list to create a brand name. However the international prices of these brands also are factors to be taken into consideration to get maximum advantage out of GI.

India will have to strengthen import-monitoring mechanisms so that domestic food and phytosanitary laws are effectively applied to imported food
items as well. India enjoys the monopoly in the export of spice Oils and oleoresins with a contribution of 2 per cent of the total export quality and 24 per cent of the total export earnings from spices. Most of the spices are hygroscopic and need specialized packaging to maintain quality considering the strong competition in the world spice market, building up of brand image is essential in case of packed spices.

After 2004 clampdown on the input – output norms for export of value added pepper products the DGFT took step on January 3rd 2006 to check the duty free import for the purposes of export production. Now the axe has fallen on import of all spices including pepper for export production.

For the export of spices and spices products the exporting countries have to comply with the specifications laid down by the regulatory agencies in importing countries. Before liberalization, exporters had to comply with the pre-shipment inspection and Quality control as per the Ag-mark Grade specification prescribed by the directorate of marketing and Inspection. Export Inspection Agency under the Export Inspection council of India also has the mandate for Pre-shipment Inspection and Quality control certification. With the liberalisation, Pre-shipment Inspection and Quality control were withdrawn and the exporters are free to export spices and spice products as per the specifications prescribed by the importing countries.
As per the memorandum of understanding signed between Ministry of Commerce and Industry, Government of India and the United States Food and Drug Administration, export of black pepper to U.S. can be made with the pre-shipment inspection and Quality control certification by the Export Inspection Agency. The most popular specification for spices and herbs the world over is the “ASTA Cleanliness Specifications for spices seeds and Herbs”. Major producing Countries have built up their facilities to meet the requirements as per ASTA cleanliness specification. Importing countries, which do not have specifications for spices request the exporting countries to supply spices as per the ASTA specification. The Importing countries insist on the specification for parameters like pesticide residues aflatoxin, raw metal contamination and microbial contamination.

Though India is the homeland of many spices, productivity of many of the spices are low, when compared to other competing countries. As the international market become increasingly competitive, it is imperative to enhance production and productivity and bring down the cost of cultivation and price of the produce to make Indian spices globally competitive India has lost its competitiveness for pepper, cardamom, ginger, fennel and fenugreek due to low productivity and high cost of production.

India can sustain and recapture the international market by attaining reduction in unit cost of production by increasing productivity. Farm
mechanization will be promising since there is shortage of agricultural labour in Kerala and labour has become very costly.

In the U.S there is 6 per cent countervailing duty on oils and oleoresin while there is no duty for raw spices. This discourages developing countries like India from developing their processing industry. Even though the demand for organic spices is on the increase, cost of certification is prohibitively high for an average Indian farmer. This situation should change.

Spice Board of India should focus attention in this matter: Import of low grade and low priced spices from other counter and re-export under Indian label may destroy the image of Indian spices. The recent intervention by the govt by way of lifting the provision of advance licensing for spices is an encouraging decision in the direction.

This section analyses the export performance of pepper in India from 1970 to 2005 and its impact on liberalization. In order to analyse the trend break in the export of pepper in India, the trend break analysis using dummy variables and kinked exponential functions were used.

(I) Trend break analysis in the export of pepper in India before and after liberalization
In order to estimate the presence of trend breaks in the export of pepper in India after liberalization, trend break function using dummy variable has been estimated and the results have been presented in Table 7.4.

TABLE 7.4
ESTIMATION OF TREND BREAKS ON THE EXPORT OF PEPPER IN INDIA BETWEEN THE PRE AND POST LIBERALIZATION PERIOD

Trend Break using Dummy variable \( \log Y = a + b t + c (D_1 t) + u \)

<table>
<thead>
<tr>
<th>Country</th>
<th>Regression Co-efficient</th>
<th>( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a</td>
<td>b</td>
</tr>
<tr>
<td>India</td>
<td>9.846</td>
<td>0.02947*</td>
</tr>
</tbody>
</table>

Source: Computed Data

Figures in brackets indicates t-value

*Indicates significance at 5 per cent level

The growth rate of export of pepper in India shows that there is no trend break in 1990, as far as the liberalization policy is concerned. The results indicate that the export of pepper in India has been decelerating from pre-liberalization period to post-liberalization period.

According to the export of pepper in India, the trend break analysis under liberalization reveals that the independent variable explained about a
very low of 28 per cent of variations in the export of pepper from 1970-2005.

(II) Structural Break analysis in the Export of Pepper in India During Pre and Post Liberalization Period

In order to list the kink, at which the trend assumes a structural break, kinked exponential function, which is an appropriate and advanced model when compared to tend break analysis using dummy variable is applied and the estimated results are presented in the Table 7.5.

**TABLE 7.5**

**STRUCTURAL BREAK IN THE EXPORT OF PEPPER IN INDIA DURING PRE AND POST LIBERALIZATION PERIOD**


Kinked exponential function: \[- \log Y = a + b (D_1 t + D_2 k) + c (D_2 t - D_2 k) + u\]

<table>
<thead>
<tr>
<th>Country</th>
<th>Regression Co-efficient</th>
<th>( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( a )</td>
<td>( b )</td>
</tr>
<tr>
<td>India</td>
<td>9.81712</td>
<td>0.03083*</td>
</tr>
<tr>
<td></td>
<td>(0.00841)</td>
<td>(0.01329)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Computed Data

Figures in brackets indicates t-value

*Indicates significance at 5 per cent level.
The results indicate that there is no structural break in the export of pepper during the liberalization period. The growth rate of export of pepper in India shows that, there has been a decelerating growth rate from pre-liberalization period to post liberalization period.

According to the export of pepper in India under the kinked exponential function during liberalization period, the independent variable explained about 34 per cent of variations in the export of pepper.

Both the results of trend break using dummy variable and kinked exponential function prove that there is no trend break after liberalization. The results indicate that the growth rate of pepper was decelerating during the over all period. And the Share of pepper export in India has been decelerating from pre to post liberalization period to a greater extent.
It is concluded from the results that the contributions to the world export of competitive countries has been increasing after liberalization. Given the high domestic demand due to internal consumption and high free on
board (FOB) Prices, export has been fluctuating between 36,908 tones in 1988-89 to 21,609 tonns in 2002-03.

The above result concludes that the government has not intervened in promoting the export of pepper. The export of pepper in India has been found to be decelerating. For the past 33 years the government has not taken any measures to promote the export of pepper. This has encouraged more of import of pepper into India and the exporters re-export the produce for a higher price. The recent intervention of Vietnam, and Sri Lankan pepper being imported into India, created loss for the Indian farmers.

Only after 2003 the government has decided to check the problems of pepper farmers. The Ministry of Finance is taking steps to control import and encourage more of export.

7.3 FACTORS DETERMINE THE EXPORT PERFORMANCE OF PEPPER IN INDIA

There exists a vast potential for Indian pepper in overseas and this could be enchased devising an appropriate export marketing strategy. Under the above context the present study is attempted to analyze the export performance of pepper with a view to explore potentials and the related issues in pepper exports.
In order to study the international trade performance of pepper the time series data for the period from 1970 to 2005 were collected from F.A.O year book spices Board statistical year book and Hand book of statistics on the Indian Economy by RBI.

The table shows the trend of exports of pepper in India and the trend of various factors that influences export such as Export prices of pepper, India’s percentage share of pepper in the world production, total world import of pepper, Ratio of domestic consumption to availability of pepper and Exchange value of Indian Rupee against US dollars.

7.3.1 Estimation of Demand Function for Export of Pepper in India

It was intended to identify the factors affecting demand for export of pepper in India. For this purpose, the demand function i.e. multiple linear regressions type model was fitted.

\[
\log Y = b_0 + b_1 \log X_1 + b_2 \log X_2 + b_3 \log X_3 + b_4 \log X_4 + b_5 \log X_5 + u
\]

where

- \( Y \) = India's export of pepper in MT
- \( X_1 \) = Export Prices of pepper in Rs. per kg.
- \( X_2 \) = Total world import of pepper in MT
\[ X_3 = \text{India's percentage share of pepper in the world} \]
\[ \text{Production (\%)} \]

\[ X_4 = \text{Ratio of domestic consumption to availability of pepper in} \]
\[ \text{India} \]

\[ X_5 = \text{Exchange rate of India Rupee per U.S. Dollar} \]

\[ b_0 = \text{intercept} \]

\[ b_1, b_2, b_3, b_4 \text{ and } b_5 = \text{Regression co-efficient of the independent variable.} \]

Table 7.6 shows the estimated results of the factors that determine export of pepper in India.

**TABLE 7.6**

**ESTIMATED RESULTS OF DEMAND FUNCTION FOR EXPORTS OF PEPPER**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Estimate of Parameters (b)</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-3.214*</td>
<td>-0.793</td>
</tr>
<tr>
<td>Export price ((X_1))</td>
<td>0.237*</td>
<td>3.271</td>
</tr>
<tr>
<td>World import ((X_2))</td>
<td>0.954*</td>
<td>2.929</td>
</tr>
<tr>
<td>India's percentage share in the world production ((X_3))</td>
<td>0.894*</td>
<td>4.810</td>
</tr>
<tr>
<td>Ratio of domestic consumption to</td>
<td>-0.267*</td>
<td>-6.653</td>
</tr>
</tbody>
</table>
It is seen from the results that high value of $R^2$ was noticed in export of pepper (0.85), which indicates the best fit of equation. All the factors that determine the demand for export was observed to be highly significant at 5 per cent. F value (23.479) indicates that the mean difference between the variations of the sample is significant.

The Regression co-efficient explains that all the factors that determine export such as export price of pepper, world import of pepper, India’s percentage share of pepper in the world production, ratio of domestic consumption to availability of pepper and exchange rate were statistically significant at 5 per cent level. The export of pepper was observed to be highly influenced by three factors such as export price of pepper, total world important of pepper and the India’s percentage share of pepper in the world production.

The regression results indicate that holding all other factors constant an increase in the export of pepper is about 0.237 for a unit increase in export price.
Similarly holding other factor constant, the average exports of pepper increases by about 0.954 for a unit increase in world import and by about 0.894 for a unit increase in India's percentage share of world production.

Critical examination of demand equation for export indicated the Ratio of Domestic consumption to availability of pepper in India and exchange rates had significantly affected the export demand of pepper in India. This indicates that holding other factors constant, the average export of pepper decreases about 0.267 for a unit increase in the ratio of domestic consumption to availability of pepper and decreases by about 0.334 for a unit increase in the exchange rate.

Thus, we can conclude that among all the significant factors, export prices of pepper, world import of pepper and India's percentage share of pepper in world production have highly influenced the export of pepper and the ratio of Domestic consumption to availability and exchange rate have highly affected the export of pepper in India.

7.3.2 A Comparative Study on the Factors that Determine Export of Pepper in India Before and After Liberalisation

The researcher has made an attempt to analyze the factors that determine export of pepper in India before and after liberalization.
The factors that determine export were analyzed using multiple linear regressions model classifying the period into two divisions such as pre-liberalization period (1970-71 to 1989-90) and post liberalization period (1990-91 to 2004-05). The estimated results of the factors that determine export of pepper during the pre and post liberalization period are presented in the Table 7.7.

| TABLE 7.7 |

<p>| FACTORS THAT DETERMINE DEMAND FOR EXPORT |
| OF PEPPER IN INDIA DURING PRE AND POST LIBERALIZATION PERIOD |</p>
<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-Liberalization Period</th>
<th>Post- Liberalization Period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimator of Parameter (b)</td>
<td>t</td>
</tr>
<tr>
<td>Intercept</td>
<td>-1.169</td>
<td>-.0.337</td>
</tr>
<tr>
<td>Export price ($X_1$)</td>
<td>0.182$^*$</td>
<td>2.257</td>
</tr>
<tr>
<td>World Import ($X_2$)</td>
<td>0.688$^*$</td>
<td>2.494</td>
</tr>
<tr>
<td>India percentage share in the world production ($X_3$)</td>
<td>0.915$^*$</td>
<td>5.216</td>
</tr>
<tr>
<td>Ratio of domestic consumption to availability ($X_4$)</td>
<td>-0.167$^*$</td>
<td>-4.995</td>
</tr>
<tr>
<td>Exchange rate ($X_5$)</td>
<td>0.179</td>
<td>0.767</td>
</tr>
<tr>
<td>$R^2$</td>
<td></td>
<td>0.97</td>
</tr>
<tr>
<td>F</td>
<td></td>
<td>47.732$^*$</td>
</tr>
<tr>
<td>Number of observation</td>
<td>35</td>
<td>35</td>
</tr>
</tbody>
</table>

$^*$ Indicate significant 5 per cent level.

The $R^2$ value was observed to be 0.97 for the pre liberalization period and 0.90 for the post liberalization period indicating the best fit of equations during both the periods. The F value 47.732 and 12.506 indicate that the mean difference between the variations of the sample are significant for pre-liberalization period and post liberalization period.
The results indicate that except exchange rate, all the factors were statistically significant at 5 per cent level during the pre-liberalization period. But only two factors such as export prices and ratio of domestic consumption was statistically significant at 5 per cent level during the post liberalization period. The regression results indicate that holding other factors constant, the average export of pepper increases by about 0.182 unit for a unit increases in the export price; increases by about 0.688 unit for a unit increase in world import, and increases by about 0.915 unit for a unit increase in India's percentage share in the world production during the pre liberalization period.

The average export of pepper decreases by about 0.167 unit during the pre-liberalization period and by about 0.346 unit during the post-liberalization period for a unit increase in the Ratio of domestic consumption to availability of pepper in India. It is interesting to note that the export prices of pepper are the only factor that has highly influenced the export of pepper in India after liberalization. The average export of pepper increases by about 0.258 units for a unit increases in export prices of pepper in India after liberalization.

It is noted that the exchange rate was observed to be an independent factor and was statistically insignificant during both the periods. Thus, we can confirm that the export of pepper was highly influenced by export prices of pepper, world import of pepper and India's percentage share of pepper in world production during the pre-liberalization period and highly influenced by the export price alone during the post liberalization period. The export of pepper was
highly affected by the ratio of domestic consumption to availability during the pre and post liberalization period.

On the overall, it is concluded that pepper has a very good export potential in future. It is necessary to explore the possibility of expansion of pepper in the backward hilly tracts of non-traditional area. To achieve the breakthrough in exports, it becomes necessary to initiate a systematic and long-term export planning at the state as well as national levels.

7.4 PERFORMANCE OF EXPORT PRICE OF PEPPER IN INDIA

India has raised its over all black pepper exports by more than 16 per cent of 9,835 tones in the first five months of `05-06` compared to 9,300 tones in the corresponding period last year. The average ASTA -GRADE black pepper originating from India had been ruling at $ 1,750 to 1,800 per tones in international markets. Compared to this, the same grade pepper originating from Vietnam had been ruling at $ 1,300 to 1,350 per tones.

The upswing in Indian prices had been mainly triggered by lower production of the spice in 2004, which declined to about 60,000 tones. Such a huge price differential of $ 450 a tones between Indian pepper and that of Vietnam forced global imports to lean more on Vietnam to meet their domestic requirement even though Indian black pepper is a much sought after item in the world market for its superior quality and special flavor.
7.4.1 Trend Analysis on the Export Prices of Pepper in India

From 1970-71 to 2004-2005

Generally around 75 per cent of production is exported. India consumes 30,000 to 40,000 metric tones of pepper. World export of pepper has also shown increasing trend. Supplying portion has increased considerably, whereas demand remained static or achieved only nominal increase. As such the gap between the supply-demand has widened. As a result, the price has declined sharply in the recent years.

The price of pepper normally comes down after the harvesting season when the supply increases. However, there are other factors also which affect the pepper prices.

The export prices of pepper has been fluctuating since 1970’s ranging between a minimum of Rs.77.17 per kg in 1972-73 to a maximum of Rs.206.73 per Kg in 1999- 2000. The export value of pepper in India attained the highest value of Rs.88,528 lakhs during the year 1999-2000 due to the highest export price of Rs.206.73 per Kg. The export prices of pepper was observed to be the highest and increased from Rs 138.23 per Kg to Rs.206.3 per Kg from the period 1997-98 to 2000-2001. The export prices of pepper declined from 2001 onwards reaching a minimum of Rs.82.78 per Kg.
during 2002-03. With the Indian pepper prices, it is observed that the variability has increased substantially during the recent periods.

Pepper prices over the year have been declining following the heavy output and high ending stocks. Consumption on the other hand, has failed to keep up pace with the growth in production. As a result, pepper price have plunged considerably.

Origin and variety are the two factors that determine pepper price. High preference is given to pepper produced in India, but abundant production of other quality pepper at cheaper rate has always played on the price of this commodity.

More over recently the state farmers are being forced to sell the spice at low price due to Sri Lankan imports. To safeguard farmers from dipping pepper prices, the state government had recently stated procuring the commodity at Rs.75 per kilogram. However, due to huge import from Sri Lanka, pepper price has fallen to Rs.55 per kilogram.

In order to check imports into the country, which was pushing the domestic price down; the centre had banned duty-free import of pepper for export promotion, under the advance license scheme. India's annual pepper output is pegged at 75,000 tones against the demand for 55,000 tones.
Increasing efforts at encouraging Agro-commodity exports and value addition products are expected to boost trading activity in India. The Indian spices board has formulated three tier quality certification programmes towards encouraging exports.

7.4.2 Growth Analysis on Export Prices of Pepper in India

In order to analyze the trend and growth of export prices of pepper in India, semi-log quadratic function, trend break using dummy variable and kinked exponential functions were applied. The model is similar to that of the models applied for growth rate of export quantity.

By applying semi-log Quadratic functions for the analysis of the growth rate of export prices of peppier in Indian from 1970 to 2005, the following results have been obtained for the overall data.

TABLE 7.8

GROWTH RATE OF EXPORT PRICES OF PEPPER
IN INDIA FROM 1970-2005

Log Quadratic Function \( \log Y = a + b_t + c_t^2 + u \)
<table>
<thead>
<tr>
<th>Year</th>
<th>Regression Co-efficient</th>
<th>R²</th>
<th>NGR</th>
<th>Percentage of Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a</td>
<td>b</td>
<td></td>
<td>c</td>
</tr>
<tr>
<td>1970 To</td>
<td>3.458</td>
<td>0.09230*</td>
<td>(0.00679)</td>
<td>0.00037*</td>
</tr>
<tr>
<td>2005</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Computed Data.

Figures in brackets indicates t-value

*Indicate significant at 5 per cent level.

The growth rate of export prices of pepper in India has been stagnating with a significant growth rate of 9.23 per cent per annum from 1970 to 2005. According to the export price of pepper from India, the independent variable explained about 85 per cent of variations in the export of pepper in India from 1970 to 2003.

The results indicate that the growth rate of export prices of pepper shows a stagnation during the overall period.

7.4.3 The Impact of Liberalization on Export Prices of Pepper in India

The impact of liberalization on the performance of export prices of pepper is analyzed for before and after liberalization through Structural break analysis.
(I) Trend Break Analysis in the Export Prices of Pepper in India Before and After Liberalization

In order to estimate the presence of trend break in the export prices of pepper in India after liberalization from 1970 to 2005, trend break function using dummy variable has been estimated and the results have been presented in the Table 7.9.

<table>
<thead>
<tr>
<th>TABLE 7.9</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ESTIMATION OF TREND BREAK IN THE EXPORT PRICE OF PEPPER IN INDIA BETWEEN THE PRE AND POST LIBERALIZATION PERIOD</strong></td>
</tr>
<tr>
<td>Trend break using dummy variable: $\log Y = a + b t + c (D_1 t) + u$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Regression Co-efficient</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a</td>
<td>b</td>
</tr>
</tbody>
</table>
The growth rate of export prices of pepper in India shows that there is no trend break after 1990, as far as the liberalization policy is concerned. The results indicate that the export price of pepper in India maintained a stagnating growth rate during the pre liberalization period and post liberalization period.

According to the export prices of pepper in the trend break analysis, under liberalization, the independent variable explained about 85 per cent of variations in the export prices of pepper from 1970 to 2005.

(II) Structural Break Analysis on the Export Prices Pepper in India

During Pre and Post Liberalization Period

In order to test the kink at which the trend assumes a structural break, kinked exponential function is applied and the estimated results are presented in Table 7.10.

<table>
<thead>
<tr>
<th></th>
<th>1.84268</th>
<th>0.10182* (0.01404)</th>
<th>-0.00771NS (0.00998)</th>
<th>0.85</th>
</tr>
</thead>
</table>

Source: Computed data.

Figures in brackets indicates t-value

*Indicate 5 per cent level of significance.
The results indicate that there is a significant structural break in the export prices of pepper in India during the liberalization period.

The growth rate of export prices of pepper increased with a significant growth rate of 8.63 per cent per annum during the pre-liberalisation period to 10.30 per cent per annum during the post-liberalisation period.

According to the export price of pepper in India under the kinked exceptional function during the liberalisation period, the independent variable
explained about 85 per cent of variations in the export price of pepper before and after liberalisation.

Figure 7.2
Export Price of Pepper in India
The structural analysis reveals that there is an accelerating growth rate in the export price of pepper from the pre to post liberalisation period. The result indicates that the export price of pepper has increased drastically after liberalization.

The results testify to the that the export price of pepper in India has been maintaining a constant growth rate of 9.23 per cent per annum during the overall period of 35 years from 1970 to 2005. There has been a structural break after liberalization.

The growth rate of export prices of pepper increased from 8.63 per cent per annum during the pre liberalization period to 10.30 per cent per annum during the post –liberalization period.

From the trend analysis it is observed the export prices of pepper increased from 1970-71 to 1987-88 and reached the highest in 1987-88 with export prices of Rs.58.66 per Kg and started to decline there after to Rs.38.9 per Kg till 1993-94. The export prices of pepper declined after liberalization and also after 2000 showing a greater fluctuation in the export prices of pepper from 1990 to 2005.

The declining of export prices of pepper indicates that the competitive cost advantage was low and the major issue to be addressed was the low
productivity of pepper in the country. Our national average yield of pepper was only 316Kg per hectare whereas in Thailand it was 3352 Kg per hectare.

Price competition in the global market is a major challenge for the Indian pepper industry. A realistic price reduction to offer healthy competition to our major competitors like Vietnam should be seriously considered. Though the tight supply has made Indian pepper costlier than the Sri Lankan varieties, the price differential with Vietnam matters most to India, which with a huge production of 1,15,000 tones, is the main competitor of India in the global pepper market.

However, with the spice production bouncing back to 70,000 tonnes in 2005, Indian pepper price started softening from February 2005. The slow decline in its price has gradually brought down the price differential between Indian pepper and Vietnamese pepper to around $150-175 per tones by August 2005. This has again prompted India’s traditional buyers to pick up their black pepper imports from India.

7.5 CO-INTEGRATION TESTS FOR DOMESTIC AND INTERNATIONAL PEPPER PRICE VARIATIONS

With Indian pepper price, it is often observed that the variability has increased substantially during the recent period. Here variations in domestic as well as international prices are with respect to the long run equilibrium trend.
Often it is proposed that there exists a proportional relationship between domestic and international prices of Indian pepper and latter varies with demand-supply mismatch in the world market; in periods of supply shortage, price rises and vice versa.

However, the study fails to establish the long-run conveyance of different prices in the presence of short-run variations. This study attempts to examine whether the domestic price of pepper moved synchronously with the international price. This section presents the stylized fact on pepper price movements in the international and domestic markets.

The international prices of most primary commodities were observed during the period 1970 to 1990 and particularly eighties. Throughout the period, the Indian pepper price in the world market was lower than the international (London spot) price, though with considerable fluctuations. The functions were more intense during the eighties. The prices peaked in 1987: the international reference market price (i.e. London spot) was US $8.05 per metric ton whereas; the peak in supply price of different economic was lower clustering around the average of US $4.52 per metric ton. The prices declined sharply thereafter till 2005.

The estimated test statistics from the DF and ADF test for the prices in levels and first difference are reported in Table 7.11.
### TABLE 7.11

**TEST FOR STATIONARITY**

<table>
<thead>
<tr>
<th>Price</th>
<th>DF</th>
<th>ADF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level</td>
<td>I Difference</td>
</tr>
<tr>
<td>Domestic Price</td>
<td>-2.657$^*$</td>
<td>-6.763$^*$</td>
</tr>
<tr>
<td>International Price</td>
<td>-5.062$^{NS}$</td>
<td>-3.838$^*$</td>
</tr>
</tbody>
</table>

*Indicates significant at 5 per cent level.

All the price series are transferred in natural logarithm. The lag length is selected using the Akaike Information criterion (AIC). It can be seen that the null hypothesis of non-stationarity cannot be rejected for the prices in level, but can
be rejected for all the prices in first difference. The price is therefore non-stationary in their levels but stationary in first differences. Thin implies that all the prices series contain a single unit root and are integrated of order one.

Given that all the price series are integrated of the same order, we may now proceed to conduct the co integration tests. We have investigated the long run relationship between domestic and international prices of pepper. The results of the co integration test are reported in the below Table 7.12.

TABLE 7.12

COINTEGRATION RESULTS FOR INTERNATIONAL SPATIAL INTEGRATION OF PEPPER MARKET

<table>
<thead>
<tr>
<th>Eigen value</th>
<th>Trace test</th>
<th>Maximum Eigen value test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Null</td>
<td>λ. Trace</td>
</tr>
<tr>
<td>0.43323</td>
<td>r = 0</td>
<td>29.33734*</td>
</tr>
</tbody>
</table>
The table test indicates that there is one cointegrating equation and the equation is presented below:

\[ DP_t = 0.239t - 0.451EP_t - 0.518\Delta DP_t + 0.1381\Delta EP_t + u \]

where

- \( DP_t \) = domestic price
- \( EP_t \) = export price
- \( \Delta DP_t \) = change in domestic price
- \( \Delta EP_t \) = change in export price
- \( u \) = error term

The equilibrium 'error' is tested for stationarity and the error is found to be integrated of order zero. The second step involves the dynamic representation of the model by plugging in the cointegrating error. The vector error correction estimated equation is given below:

\[ DP_t = -2.926 - 0.124t - 0.451EP_t + [0.194 - 0.518 - 0.082 \Delta DP_{t-1} \\
- 0.607 \Delta EP_{t-1}] \Delta DP_t + [0.065 + 0.138 - 0.087 \Delta DP_{t-1}] \]
The results thus obtained, highlight that the condition for error correction as specified in equation is satisfied. This shows that the international price of pepper for India has moved synchronously in the long run, despite short-run drifts. The short run variations in the price level corrected to attain a long-run equilibrium. The oligopolistic nature of the world market of pepper does not allow prices to deviate much. For example, during recession with excess supply there might be temporary price cuts initially but over a period of time exporting nations are likely to avoid “mutual and versity”. However as there does not exist any open cartelization among the exporting economies, tacit agreement on markets sharing and price parity may be existing. Thus, the results indicate that the error correction specification in this case is correct and thus the errors rectify in the long run.

The above examination points to the fact that due to the open trade status for pepper, prices have moved synchronously indicating integration of world pepper market. This result is quite striking when the market for Indian pepper is considered as against that of other countries.

The fact might reveal a kind of tacit collusion among exporters on market sharing price parity. The results are not likely to vary even if stock adjustment and forward trading in pepper are considered. The integration process also implies...
that the domestic supply variables are responsive to international market conditions.

7.5 DECOMPOSITION OF THE GROWTH IN EXPORT VALUE OF PEPPER IN INDIA

It is evident from the foregoing discussion that the increase in export quantity of pepper and increase in their export prices have been contributing to enhancement in export value of pepper in India. Since both the components have been fluctuating at a different rate, and in order to estimate the contribution of each of these components, decomposition exercise was carried out. The decomposition model is similar to the model employed for decomposing the growth in pepper production. The rate of growth in value of export of pepper was decomposed into two components namely, export quantity effect and export price effect.

Decomposition Model

The multiplicative decomposition model is used to estimate the contribution of the components element in the over all increase in export value of pepper through the following equation.

\[ E = P \cdot Q \]

............... (1)

where,
E is the value of Total export
P is the price of export
Q is the quantity of export

\[ \Delta E = \Delta P \cdot Q + \Delta Q \cdot P + 2 \cdot \Delta P \cdot \Delta Q \]

where,

\[ \Delta E \] is the change in value of total export
\[ \Delta P \] is the change in price of export
\[ \Delta Q \] is the change in quantity of export

Export Price Effect

Contribution of export price to total value of export

\[ \frac{\Delta P \cdot Q}{\Delta E} \times 100 \]

Export Quantity Effect

Contribution of export quantity of total value of export

\[ \frac{\Delta Q \cdot P}{\Delta E} \]
Interaction Effect

Contribution of both export price and export quantity to total value of exports

\[ 2\Delta P \cdot \Delta Q \]

\[ \frac{--- \times 100}{\Delta E} \]

This analysis is confined to the period between pre and post liberalization period. The results of the decomposition model for the growth of export value of pepper in India for both the periods are presented in the Table 7.13.

TABLE 7.13

RELATIVE CONTRIBUTION OF DIFFERENT FACTORS IN THE GROWTH OF PEPPER EXPORT VALUE IN INDIA

<table>
<thead>
<tr>
<th>SL. No.</th>
<th>Sources of Growth</th>
<th>Liberalization Period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre</td>
</tr>
</tbody>
</table>


It is evident from the table that the dominant factors contributing to the growth in export value of pepper for the liberalisation periods are the interaction between contribution of export price and export quantity. This is true in the sub periods. The contribution to this factor has shown an increase in the case of export price and export quantity from pre liberalization to post-liberalization period.

Whereas the interaction effect of both export price and export quantity on the value has been very high, it has shown a sharp decline during the pre and post liberalisation periods.

The growth of export prices and export quantity are consistent with this result.

TABLE 7.14

GROWTH IN EXPORT PRICE AND EXPORT QUANTITY
### PEPPER IN INDIA

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Export Price</td>
<td>56.80</td>
<td>89.00</td>
<td>12140</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(10.30)</td>
<td></td>
<td>(9.23)</td>
</tr>
<tr>
<td>1.</td>
<td>Export Quantity</td>
<td>17,970</td>
<td>29,985</td>
<td>14150</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3.08)</td>
<td></td>
<td>(-1.51)</td>
</tr>
</tbody>
</table>

(Need to change data for 2005)

The export quantity of pepper was found to be the highest during 1987-88 and thereafter it started to decline. The study reveals that soon after liberalisation there has been a decline in the export quantity of pepper due to high competition in the world market.

The export prices of pepper fell very low after 2001 due to the impact of globalization and liberalization. The government has to check the problem of declining export quantity and export prices in order to evade from the dangers from the global competition.

Summary
The study concludes that the export and export price performance of pepper in India declined drastically, particularly since 2000.

The Government of India has approved a WTO compatible subsidy scheme intended to boast export of domestic pepper and value added pepper products processed from domestic pepper. The subsidy will be at the rate of Rs.5/- per kg (or the actual cost incurred which ever is kgs) for international freight and Rs.2/- per kg (or actual internal transport expenses which ever is less) for internal transport.

The subsidy will be applicable to export of pepper in all forms including value added pepper products from November 2005 for the export of a maximum of 20,000 exporters on "First come first served basis" and the scheme will end on 31st March 2006.

CHAPTER VIII

SUMMARY OF FINDINGS, SUGGESTIONS AND CONCLUSIONS

Black pepper is the main spice of Kodagu district of peninsular India. Pepper is known to have been grown in the evergreen forest and neighborhoods of the Western Ghats since the Vedic time. Pepper is considered as the king of spices International trade in this dates back to 4000 BC and the struggle to monopolize its trade led to the discovery of sea routes.