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.
This chapter concludes under various heads,

(i) Summary of findings
(ii) Suggestions for the improvement of pepper cultivation
(iii) Conclusions

8.1 SUMMARY OF FINDINGS

The summary of findings highlight the global and Indian scenario of pepper. It includes results of production and marketing of pepper in Kerala. Finally, it presents the results to export prices of pepper in India.

8.1.1 Global Scenario of Pepper

- The global production of pepper fluctuates between 3.5-4.0 lakh tons, with a production of 3.08 lakh tons recorded in 2004.
- Vietnam (957000 tons), Indonesia (94371 tons), India (51000 tons), Brazil (64540 tons), Malaysia (21000 tons), Sri Lanka (17800 tons), Thailand and China are the major producers of pepper in the world.
- Vietnam's sudden increase in the production has resulted in the global production, jumping to 3.5-4.0 lakh tons from 1.9-2.9 lakh tons in the late nineties. Vietnam is the world's largest producer and exporter of pepper now.
The global exports of pepper are around 2.5-3.0 lakh tons, with 2.88 lakh tons being exported in 2004.

The major exporters of pepper are Vietnam (78494 tons), Indonesia (32364 tons), Brazil (43003 tons), Malaysia (19788 tons), and India (14150 tons).

New York, Singapore and Rotterdam are the major international trading centres for pepper. The primary international grades and their markets are Lampung at Panjang (Indonesia), Sarawak at Kuching (Malaysia), Vietnam at HCM city (Vietnam). However, Malabar grade of pepper from India traded at Kochi, Kerela is considered to be the premium grade of pepper and rules above the international grades.

8.1. 2 Indian Scenario of Pepper

The analysis of India's share in the world production of pepper revealed that it ranged between 6.5 per cent and 25.5 per cent. On an average, the volume of pepper production in India to that of the world stood at 21 per cent during the period under review.

India harvests most of its pepper at the beginning of the year. During 2003, production of pepper in India was reported to be 62000 tons against 70000 tons in 2002.

Kerala accounts for 90 per cent of India's pepper production. The other producers are Karnataka and Tamil Nadu.
• During 2004, Indian exports of pepper amounted to 14,150 tons, registering a 15 per cent fall compared to exports of 16,635 tons in 2003. The export in 2004 was the lowest quantity of pepper exported from India during the last four decades. This quantity was only 64 per cent of the average export over the last five years. In term of export share, India contributed only 5 per cent to total producing country exports in 2004, a fall from the 14 per cent of average share during last five years.

• Developments in the spice industry in India have significantly affected exports. During 2004, export of whole pepper from India was only 26 per cent of the total production, against 31 per cent during 2003. The main market for Malabar black was United States, which traditionally imported around 50 per cent of India's export, followed by Canada, Netherlands and Italy. However, during 2004, only 30 per cent of India's export was shipped to the United States.

• Kochi, Sulthan Bathery in Kerala are the major primary markets. Nagpur, Indore and Delhi have recently developed as the major up country markets for pepper.

• The supply of pepper has shown a dramatic increase over the last ten years. While prices have fallen over the last three years, the market has absorbed the supply of pepper.

• Indian pepper is at a premium against all the international grades. However, the production and exports of pepper from other locations has a profound influence on Indian pepper prices too.

• Weather and the annual production of a year.

• Year ending stocks and stocks-to-consumption.
Indian pepper arrives in the market in the beginning of the year. However, distress selling is not witnessed in pepper and the producers hold back the stock in anticipation of better prices.

- Government policies with regard to imports and exports.
- Traders allege large-scale imports of pepper from Sri Lanka and re-export from India as a major price depressing factor and government has been asked to take measures to stop this practice.

8.1.3 Production of Pepper in Kerala

The chapter attempts to analyse the production of pepper in Kerala. The findings of the analysis are presented below.

Kerala is the principal pepper growing state in India. Its share in the total production of pepper in India ranged between 95.4 per cent and 97.60 per cent during the period under review. On an average, 90.5 per cent of pepper production in India is from Kerala. Pepper production in Kerala has recorded a minimum of 17,350 metric tones and a maximum of 77,226 metric tones during the period under study.

The analysis of area under pepper cultivation in Kerala revealed that there was a gradual increase from 1,57,000 hectares in 1988-89 to a peak a level of 1,97,600 hectares in 1995-96 and which finally reached 2,17,917 hectares in
2004-05. The trend value had also shown a similar trend which signified the possibility of further growth in the years to come.

A comparison of total production with area indicated that the productivity of pepper in Kerala ranged between 164 kg/ha and 376/kg/ha. The analysis of compound growth rate revealed that production had been increased by 3.63 per cent per annum, area by 2.41 per cent and the productivity by 1.16 per cent during the period under study. The increase in pepper production in Kerala was the result.

Of the fourteen districts of Kerala where pepper cultivation takes place, Idukki district led both in terms of quantity of production and the area under cultivation, with 37.06 per cent and 31.66 per cent respectively in 2004-05. Wynad ranked second and Kannur held the third position. On an average these three districts alone contributed 60.94 per cent in total area and 71.88 per cent in total production of pepper in Kerala.

According to the decomposition of the production model, the most dominant factor contributing to the growth in the production of pepper is the interaction effect between contribution of area and field of pepper. The interaction effect shows a reduction from 100.75 during the pre-liberalisation period to 96.02 during the post-liberalisation period.
According to the supply response, it is observed that the short run price elasticity shows that one percent increase in the lagged price will increase the area under crop by 0.04 per cent per annum all else equal. Whereas the long run price elasticity reveals that if the price increased by one per cent in the lagged year, then the area under pepper would be increased by 0.31 per cent in the current year.

The long run price elasticity is relatively higher than the short run price elasticity.

8.1.4 Nature and Conditions of Pepper Planter and the Cropping Pattern

Chapter five attempts to analyse the socio-economic conditions of the pepper planter, nature of cropping pattern of pepper planters and nature of labourers engaged in pepper cultivation. The results of the analysis are presented below.

(i) Socio-Economic Conditions of the Pepper Planters
• Out of the 300 pepper planters, Fifty five percent of the planters lies within the age group of 40 to 60 years indicating high experience in the field of pepper cultivation.
• Ninety two per cent of the respondents are male planters.
• Sixty three percent of the planters belong to backward community.
• Sixty five percent of the planters have studied upto school level only
• Sixty five percent of the planters have three to five members in their family indicating a medium family size.
• Out of the 300 planters, 183 planters consider pepper cultivation as the main occupation and 117 planters consider it as a subsidiary occupation.
• Sixty three percent of the pepper planters earn a family income of less than Rs.1,00,000 annually.
• Out of the 300 planters 210 planters are small farmers, 66 planters are medium level farmers and 24 planters are large farmers.
• Seventy percent of the planters are small farmers with a land size of less than 2 hectares having a land value of less than 15 lakhs.

(ii) Nature of Cropping Pattern of Pepper Planters

• Out of the 210 small farmers, 103 planters prefer pepper plantation as mono-cropping and 107 planters prefer pepper plantation as intercropping.
• According to intercropping, 93 planters have intercropped pepper with cardamom, 87 planters have intercropped pepper with coffee and 77 planters have intercropped pepper with coconut.
• 60 percent of the planter has cultivated pepper using traditional variety and 40 percent of the planter has cultivated pepper using hybrid variety.
• The most commonly used traditionally varieties are Karimunda and mudan and that of hybrid variety is Panniyur -1.
• The traditional varieties are preferred the most under pepper cultivation due to favourable climatic conditions and availability of seedlings.
• Sixty six percent of the pepper planters have availed of subsidy in the form of cash.

(iii) Nature of Labourers Engaged in Pepper Cultivation

• Family labour occupies very dominant position in the cultivation of pepper as most of the farmers grow pepper plants as homestead garden. When compared to hired labour, family labourers are comparatively low.
• Regarding family labourer, both male and female labourers are actively involved in pepper cultivation.
• Majority of one to two members from each families are engaged in the pepper cultivation.
• Out of the hired labourers, majority of the pepper planters have hired male labourers.
• Majority of one to two hired labourers are engaged in the pepper cultivation of the sample planters.
• The hired male labourers are paid ready cash of Rs.100 per man day, whereas the hired female labourers are paid Rs.80 per man day. Male labourers are paid more owing to their hard work in nature.

In Kerala the growers prefer indigenous varieties of pepper to hybrid varieties. Analysis made using Garrett's ranking technique revealed that consistent yield was attributed as the major reason for the preference of the native variety, followed by ability to withstand the prevailing climatic condition, resistance to pests and diseases and availability of pepper vines.

The average production of pepper per acre in India is not so satisfactory as compared to the world average. Analysis made using Garrett's ranking technique revealed that frequent attack of pests and diseases, lack of drive and initiation for intensive cultivation and un-favourable climatic conditions were the three major causes of low productivity. Non-availability of hybrid varieties on time and lack of proper guidance from the government agencies on scientific farming were the other two reasons for low productivity of pepper.

8.1.5 Cost and Returns of Pepper Cultivation

The chapter five attempts to analyse the cost of cultivation of pepper and breakeven output of pepper in Kerala. The results of the findings are presented below.
(i) Cost of Cultivation of Pepper

The cost of production of pepper on an average was Rs.58.57 per kilogram, of which the variable cost constituted 42.65 per cent and the fixed cost 57.34 per cent. Cost of labour was the major component with 59.34 per cent to total variable cost, followed by manure and fertilizer with 30.45 per cent. In the total fixed cost, rental value of land formed part of 37.01 per cent of the total and the annual share of bet establishment cost was 11.95 per cent. Therefore any step taken to improve the efficiency of labour and manure and fertilizer would result in the reduction of cost of production.

The age-wise analysis of annual productivity of pepper in the study area disclosed that average output was 489.03 kilograms per acre during 4-6 years, 780.36 kilograms during 7-12 years 493.32 kilograms during 13-16 years and 415.27 kilograms during 17-20 years. Hence it is concluded that the pepper output starts increasing from the fourth year onwards, reaches stabilized yield between 7 and 12 years of age, starts decreasing from thirteenth year onwards and reaches the minimum yield during the last phase.

The analysis of the age-wise cost of production of pepper revealed that total variable cost per acre increased with the increase in age of the plant, reached the maximum during 7-12 years and decreased with increase in age and reached the minimum during 17-20 years of age. However, the fixed cost remained constant during all the four phases of the pepper plant. Therefore the
cost of production was the maximum during the peak yielding stage and the minimum during the depression stage. The cost of production for pepper at 7-12 years of age worked out to Rs.38,127.14 whereas the cost of production for 17-20 years amounted to 29,418.09. The comparative analysis of the unit cost of production showed that the unit cost for 17-20 years worked out to Rs.70.84 whereas it was only Rs.48.86 for 7-12 years. This was due to the high productivity of pepper during the peak yielding stage of the plant.

The analysis profitability among different age groups of pepper revealed that the highest contribution, Rs.46,721.46 was realized during the peak yielding stage whereas it was the minimum of Rs.25,278.42 during the depression stage. Net profit to gross return has been 41.19 per cent which was the highest during the peak yielding stage 15.17 per cent, the lowest, during the depression stage.

The stage-wise analysis of pepper plants revealed that the average productivity of pepper per acre was the highest during the yield increasing stage with 680.82 kilograms and it was the lowest during the yield decreasing stage with 468.68 kilograms. The stage-wise analysis of cost of production showed that the total variable cost was the maximum of Rs.18,174.60 per acre during the yield increasing stage and it was the minimum of Rs.10,399.64 per acre during the yield decreasing stage. The total cost of production also showed a similar relationship. The analysis further revealed that the cost of production per kilogram was Rs.56.09 which was the lowest in the yield increasing stage and was Rs.64.90 which was the highest in the yield decreasing stage during the period under study.
The stage-wise analysis of profitability revealed that the net profit ratio of 32.41 per cent during yield increasing stage was the result of high productivity and 21.75 per cent during the yield decreasing stage was the result of low productivity.

The cost and returns analysis reassured that cultivation of pepper was profitable. To ascertain the scope for further increase of net return per acre resource use efficiency was analysed. Cobb-Douglas type production function was fitted to evaluated resource productivity and returns to scale in pepper cultivation.

The relationship between yield of pepper and independent variables during the yield increasing stage indicated that for every one per cent increase in the level of labour used value manures and fertilizer, age of the plant, and expenditure on plant production, would increase, ceteris paribus, the pepper production by 0.652 per cent, 0.182 per cent, 0.398 percent and 0.521 per cent respectively from the mean level. During the yield decreasing stage the production function indicated that the variables such as fertilizer expenditure of plant protection would cause an increase in yield by 0.298 per cent and 0.483 per cent for every one per cent increase in the respective costs. However, every one per cent increase in the age of the plant would decrease the yield by 1.17 per cent from its mean level.
The analysis also revealed that the sum of the production elasticities for the yield increasing stage was 1.753 which indicated increasing returns to scale. But it was 0.133 in the case of yield decreasing stage which denoted decreasing returns to scale.

The analysis of resource use efficiency in the case of yield increasing stage revealed that the ratios of marginal value product to the factor cost were 4.05, 1.795 and 52.16 respectively for human labour, manure and fertilizer and plant protection. It is implied that there was a wide scope for increasing the use of human labour, manure and fertilizer and plant protection to increase the yield of pepper. The ratio of marginal value product to the factor cost in the yield decreasing stage indicated that every rupee additionally spent on manure and fertilizer and plant protection would yield Rs.3.90 and Rs.39.59 worth of output respectively.

(ii) Break-Even Analysis of Pepper Cultivation

On an average the profit-volume ratio of pepper cultivation was 69.89 per cent and the percent of margin of safety was 42.09 percent.

The break-even output of pepper was 345 16 kgs and the break-even sales was Rs.28,639.10. The percentage of BEP output to total output was found to be 57.91 percent.
According to the age-wise distribution of the plant, it is observed that the profit volume ratio was higher among the peak yielding stage and depression stage. The break even output and sales of pepper was highest during the initial stage. The percentage of margin of safety was highest during the peak yielding stage as compared to other stages.

According to the stage-wise distribution of pepper, the profit volume ratio was the highest of 73.24 per cent during the yield decreasing stage. The break-even output and sales of pepper was the highest of 355.58 kgs and Rs.29508.88 during the field increasing stage respectively. The percentage of margin of safety was the highest of 47.78 percent during the yield increasing stage and the percentage of BEP output to total output was the highest of 70.27 percent during the yield decreasing stage.

8.1.6 Marketing of Pepper

Chapter Six attempts to analyse the marketing of pepper in Kerala. The results of the analysis are presented below.

In the study area, the marketable surplus had been 99.39 per cent of total production and the growers retained only less than one per cent for meeting their own domestic requirements and for offering as compliments.
The analysis of storing habits among sample growers showed that 63.29 per cent of marketable surplus was stored anticipating remunerative prices later. On an average 35.62 percent of growers stored pepper for a period upto 30 days, 41.40 per cent for a period of 31 to 60 days, 7.91 percent for a period of 61 to 90 days and 15.07 per cent of the growers stored pepper for more than 90 days.

The percentage of loss on storage of total quantity of the pepper stored was 0.61 per cent. Out of the total marketable surplus the loss was 0.27 per cent. The reasons attributable to such loss were poor storage facilities and prolonged retention of the commodity.

Both villages traders and primary wholesalers put together, transacted 66.95 per cent of the marketed surplus, whereas co-operative form of intermediaries did 33.05 per cent. Conventional practice, advance money offer, regular payment and easy accessibility were the major reasons for more sales through the non co-operative sector market Intermediaries. The study reveals that more of the growers have sold pepper through village traders.

The analysis of cost incurred by the producers in marketing of pepper revealed that the average marketing cost incurred was 286 per quintal. It also showed that the cost was the minimum (Rs.229 per quintal) in channel III while compared with the marketing cost of other channels. The marketing
channels III and IV were found to be cheaper, for there was no commission involved and lesser expenses were incurred on transportation.

The cost incurred by village traders in marketing their produce while receiving commissions, rejection and preparation for market, put together constituted 87.54 per cent and transportation, loading and unloading and packaging accounted for 12.46 percent of the total marketing cost at Ra.345 per quintal.

The marketing cost incurred by the primary wholesalers was Rs.229 quintal which was higher than that of the village traders due to the incidence of high transportation cost and payment of commission in the terminal market.

The marketing cost of the service co-operatives was Rs.335 per quintal. The service co-operatives sold their produce only to the primary co-operative marketing society established in the assembling market and this closeness had a bearing on the marketing cost.

The total marketing cost incurred by the primary co-operative marketing societies was Rs.235 per quintal in the study area. Cost for preparation to market rejections and transportation charges formed a major share of it. Similarly the total marketing cost incurred by the secondary wholesaler was Rs.975 per quintal of pepper. The total marketing cost incurred by the retailer was Rs.91 per quintal which was the lowest among the marketing costs of other intermediaries.
Price spread analysis in the domestic market revealed that the producer's share in the price paid by the consumer was about 81-82 per cent in all the four channels. It implies that there was not much difference in the net price received by the producer whatever may be the type of channel he chose to market his produce. However, taking the net share received into account, channel IV was the best from the producer's point of view as it had the lowest price spread at Rs.1887 per quintal because of less marketing cost and higher producer's price. Marketing efficiency analysis using Shepherd's Method also confirmed that channel IV was the most efficient channel of all. However, the producers preferred non-co-operative type of marketing intermediaries who formed either channel I or channel II for the obvious reasons such as proximity, advance money offered and the like. Between channels I and II, channel II was more profitable to the producer.

The analysis of factors influencing the sample growers who chose village traders to sell their produce, with the help of Garrett's ranking technique revealed that convenient sale, no price benefit in other markets, pre-sale advance offer and regular payment were the primary reasons which influenced their decision. Low transportation cost, low marketable surplus and long term practice were the other reasons.

The analysis of the most crucial problems faced by the sample growers in the marketing of pepper with the help of Garrett's ranking technique showed that
frequent price fluctuation of pepper price ranked first, followed by absence of grading and processing facility and inadequate storage facility. Inadequate market finance ranked fourth as the important problem followed by indebtedness to village ladies and lack of adequate transportation. The lack of market information was found to be the least important problem.

8.1.7 Domestic Prices of Pepper

Chapter six attempts to analyse the trend of domestic prices of pepper in Kerala before and after liberalisation. The results of domestic price of pepper in Kerala are presented below.

The price of pepper always depends on the international demand and supply position. As the crop situation in different pepper producing countries varies, demand and supply of pepper in world market widely fluctuate resulting in fluctuation in price levels in both world market and domestic market.

- The annual average prices of pepper increased from Rs.6.70 per kg in 1970-71 to Rs.54.29 per kg in 1986-87 and gradually declined to Rs.38.40 in 1988-89. The average price of pepper rose to a maximum of Rs.54.29 per kg in 1986-87 and maintained Rs.52.82 per kg in 1987-88.
- The annual average price of pepper increased from Rs.62.81 per kg in 1994-95 to a maximum of Rs.215.02 per kg in 1999-2000. From 2000 onwards,
the price of pepper started to decline and reached a minimum of Rs.88.32 per kg in 2002-2003.

- There has been a fluctuation in the annual average price of pepper during the study period. The growth rate of domestic price of pepper showed a significant constant growth rate of 10.06 per cent per annum from 1970 to 2003 in Kerala.

8.1.8 Export of Pepper

Chapter seven attempts to analyse the trend in the export of pepper and the factors that determine export of pepper in India. The results of the analysis are presented below.

Among the spices exported from India, pepper enjoys the leading position both in terms of quantity and value realization. Volume-wise analysis of India's pepper export revealed that high fluctuation had been witnessed during the study period. The results of trend and growth analysis of export of pepper revealed that the trend was declining. The export of pepper had been declining at the rate of 1.43 percent per annum in India.

The export of pepper fluctuated since 1970's ranging between a minimum of 15,719 metric tones in 1978-79 to a maximum of 48,743 metric tones of 1993-94.
The export of pepper attained the peak level of 48743 metric tones in 1993-94 and 47893 metric tones in 1996-97 since 1990's.

The export unit value of pepper found to be the highest ranging between Rs.138.23 per kg to Rs.206.73 per kg during the period form 1997-98 to 1999-2000.

The export of pepper started to decline after 2000 and reached a minimum of 21609 metric tones accounting for unit value of Rs.85.93 per kg.

According to the relative contribution of different factors in the growth of pepper export value in India, the interaction effect of export price and quantity was the dominating factor accounting for 93 per cent during the sub period of liberation.

The interaction effect of both export price and export quantity on the value has been very high and it has shown a sharp decline during both the periods before and after liberalization.

The study reveals that the export of pepper after liberalization due to high competition in the world market.
(ii) Factors that Determine Export of Pepper in India

- The results indicate that 85 per cent of the variations in the export of pepper are explained by the variables included in the function.
- F value (23.48 per cent) indicates that the mean difference between the variations of the sample are significant.
- The variables such as export price, world import, India's percentage share in the world production, ratio of domestic consumption to availability and exchange rate influenced the export of pepper in India.
- Thus, the export prices, world import 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 has highly affected the export of pepper in India.
- The export of pepper was highly influenced by Export Price, world import and India's percentage share in the world production and was highly affected by Ratio of domestic consumption to availability before liberalization.
- The domestic factors contributing to the growth in export value of pepper during the pre and post liberalization period the interaction effects in Export price and export quantity efforts.

8.1.9 Export Price of Pepper in India
Chapter Seven also attempts to analyse the export price of pepper in India. The results of the analysis are presented below.

- Export prices of pepper have been fluctuating since 1970's ranging between a minimum of Rs.7.17 per kg in 1972-73 to a maximum of Rs.206.77 per kg in 1999-2000.
- The export prices of pepper declined from Rs.49 per kg in 1970-71 to Rs.7.17 per kg in 1972-73, increased to Rs.20.06 per kg in 1977-78 and further declined to Rs.13.01 per kg in 1982-83.
- The export price of pepper increased from Rs.13.01 per kg in 1982-83 to Rs.58.66 per kg in 1987-88 and further declined to Rs.33.14 per kg in 1992-93.
- The export prices of pepper increased from Rs.33.14 in 1992-93 to Rs.206.73 per kg in 1999-2000 and thereafter it declined to Rs.2.78 in 2002-03.
- There have been fluctuations in the export price of pepper from 1970 to 2003.
- The export price of pepper in India has been stagnating with a significant growth rate of 9.23 per cent per annum from 1970 to 2003.

The co-integration test between the domestic price and international price of pepper reveals that the international price of pepper in 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. Due to open trade status for pepper, prices have moved synchronously indicating integration of world pepper market. The integration process implies that the domestic supply variables are responsive to international market conditions.

### 8.1.10 Impact of Production and Export of Pepper on Liberalisation

- There has been a structural Break in the area, production, productivity and domestic prices under Pepper Cultivation in Kerala and in the export and export prices of pepper in India between the Pre-Liberalization and Post-Liberalization Period.
- The growth rate of area under Pepper has been accelerating from a significant growth rate of 2.01 percent per annum during the Pre-Liberalization Period to 3.16 percent per annum during the Post-Liberalization Period Kerala. The growth rate of Production of Pepper has been accelerating from a significant growth rate of 3.37 percent per annum during the Pre-Liberalization Period to 4.14 percent per annum during the Post-Liberalization Period in Kerala. But the growth rate of Productivity of Pepper has been decelerating from a significant growth rate of 1.38 percent per annum during the Pre-Liberalization Period to 0.98 percent per annum during the Post-Liberalization Period in Kerala.
- Thus the Production of Pepper increased drastically after Liberalization. Since the area under Pepper Cultivation increased drastically, the
Production of Pepper also increased to a greater extent. Hence, there has been a positive impact on the improvement of Production of Pepper after Liberalization. The productivity of Pepper in India and Kerala decreased from the Pre-Liberalization to Post-Liberalization Period explaining the adverse effect of liberalization on the growth rate of Productivity Production of Pepper.

- The growth rate of Domestic Prices of Pepper has been accelerating from a significant growth rate of 9.61 percent per annum during the Pre-Liberalization Period to 10.84 percent per annum during the Post-Liberalization Period. The growth rate of Export Prices of Pepper has been accelerating with a significant growth rate of 8.83 percent per annum during the Pre- Liberalization Period and 9.67 percent per annum during the Post- Liberalization Period in India. Thus the domestic and export prices of Pepper increased drastically after Liberalization.

- But the growth rate of export of Pepper has been decelerating from a significant growth rate of 3.08 percent per annum during the Pre-Liberalization Period to -1.51 percent per annum during the Post-Liberalization Period in India.

The export of Pepper decreased to a greater extent because of poor competence power of export in the international market and India has encouraged more Import of Pepper from Vietnam and Sri Lanka for the purpose of re-export of Pepper. Hence, there has been an adverse impact on the Export of Pepper in India after Liberalisation.
8.2 SUGGESTIONS

Well-rooted pepper cuttings and improved hybrid varieties must be easily available to the pepper growers through recognized nurseries, at subsidized rates.

The improved and hybrid varieties must be pest resistant and drought-tolerant. They must be suitable for cultivation in high altitudes and adaptable to different agro climatic conditions.

The latest bio-technologies like Genetic engineering and Tissue culture may be followed to develop drought and pest resistant pepper varieties to achieve the maximum level of productivity.

The growers must be educated on the scientific methods of intensive cultivation in increase productivity by periodical "Growers Meet" organized by Government organizations and Extension agencies, using all the popular media of communication.

Of late, due to Global warming and factors like EL-nino and La-nina phenomenon the monsoon patterns seem to be erratic, which tells upon the
productivity of pepper. Therefore to ensure consistently good yield, various irrigation methods like pump irrigation with sprinkler accessories, irrigation by check dam, rivulets and by water harvesting methods may be taken up.

Co-operative farming may be taken up by enclosing large areas for cultivation. In such a case, integrated pest management, effective labour management and co-ordinated functioning in all aspects of cultivation are possible.

Replantation may be taken up on time on a large scale to replace the old and diseased vines to ensure uniform stage of the plants and consistently high yield.

Demonstration plots may be formed for pepper crop and mini input kits consisting of fertilizers, plant protection chemicals and the like may be distributed at subsidized rates.

New plantations in non-traditional areas such as North Eastern India, Konkan region in Maharashtra, Goa, Karnataka and Tamil Nadu may be started. Tea, Coffee, Areca nut and Coconut planters may be encouraged to raise pepper as inter-crop.
Pepper growers are to be motivated to form a grower's association in micro-level and to meet periodically to discuss the issues relating to pepper cultivation.

Crop-Insurance for pepper crop may be introduced to make good the loss incurred by the growers when plantation becomes a victim to natural calamities. This will go a long way in saving the industry.

Region-wise identification of suitable spice varieties and choosing the ideal variety together with the practices, should be done.

Liberal financial assistance may be made available to the growers as crop loans and development loans through commercial banks and co-operative societies.

Assured floor price to pepper will encourage the prospective growers to continue pepper cultivation and undertake the same on large scale.

Information on Marketing should be passed on to growers and traders through the mass media and other means of communication.
Warehouses must be established in the production centres so that the growers can stock their produce to sell it at attractive price at the appropriate time.

More number of co-operative societies may be organized so that the growers can market their produce through these societies and realize reasonable returns.

Grading and processing facilities may be provided at the production centres so that the pepper growers would get the right price for their produce.

Open auction system as in the case of other spices like cardamom may be introduced in pepper trade also, which will open up an organized marketing system for pepper.

Growers must be educated about quality control form the field level onwards. Quality will command good demand in the international market and fetch attractive prices.

Value-added pepper products may further be popularized in domestic markets through organized marketing network.
The public is to be informed through the mass media about the importance of indigenous medicines where the usage of pepper is substantial.

New industries may be started as joint ventures in collaboration with NRIs and other foreign investors to manufacture value added pepper product which would facilitate easy marketing in foreign countries too.

Indian pepper may be made attractive among foreign consumers by personal selling and also by arranging stalls in international trade fairs.

8.3 CONCLUSION

Pepper, being a significant foreign exchange earner and a source of income and employment to millions of people from time immemorial, deserves a planned and continuous attention. It is a goose that lays golden eggs. Any step taken in the right direction by the people concerned such as producers, traders, exporters, Government and the like would go a long way in reaffirming the share of Indian pepper in both domestic and foreign markets. The present study has brought into focus various issues relating to production and marketing. The policy implications suggested, if properly implemented may result in increased revenue for the nation and for the people concerned.