CHAPTER VI
SUMMARY AND CONCLUSIONS

Soundness of any economy depends on its agricultural base. A well-developed agriculture sector is a pre-requisite for the development of secondary and tertiary sectors and hence the economy. Similarly, the nature and magnitude of macroeconomic aggregates also depends on the agricultural sector. Indian agriculture, by contributing a quarter to its Gross Domestic Product, by supporting nearly three-fourth of its population and by providing employment to more than half of its workforce; has a significant status in the economy.

An efficient market system in agricultural sector is required to keep the pace of agricultural growth. And an efficient market system depends on market mechanism and the efficiency of market mechanism in turn depends on regional price integration. Uniformity in prices can be attained through the integration of an economy. Therefore, market integration is the process by which price interdependence occurs. Integrated markets are those where prices are determined interdependently; which is assumed to mean that price changes in one will be fully transmitted on to others.

Market integration is a useful parameter to measure marketing efficiency for temporal and spatial analysis. An integrated market is required for an effective implementation of economic reforms, liberalization policies,
agricultural or famine policies. With market integration, all economic agents are able to attain an economically viable gain. Hence, the principle of attainment of maximum utility with the most efficient utilization of resources can be obtained through market integration.

Now, if the economy is ruled by controlled pricing, the existing price will never reflect the true market situation. Free play of market forces is possible only in a liberalized economy. Only the forces of demand and supply can make price transmission effective. Liberalisation of economy from controls will enable farmers and traders to get remunerative gain. In such an atmosphere, the process of liberalization got prominence throughout the world. On this line, Government of India too has initiated several policies as part of economic reforms and liberalization. The aim of all these policy initiatives is to attain efficiency in the market.

Against this background, attempts were made to test the validity of market integration hypothesis of various agricultural crops at national and international level. Some efforts were also made to know the effect of liberalization on market integration. The majority of these studies has concentrated on food crops. Even though some of the Indian states are dominant in cultivation of non-food crops; market integration studies of these non-food crops are rare in literature.

The state of Kerala has devoted three-fourth of its agricultural area to non-food crops. Among non-food crops, the state is having a monopoly over
pepper which is considered to be a major item of spice. But no effort is made to explore market efficiency of this dominant crop either at regional or national level. The entire state cultivates this crop. All the small and big farmers sell their products to traders of their region. These traders in turn transport the products to the wholesalers. Then the wholesalers of the state trade the products to the pepper assembling markets namely, Tellicherry, Kozhikode, Kochi and Alleppey, whichever is accessible. All the assembling centres then transport it to the terminal market namely Kochi, which is considered to be the exporting centre.

The reform process in India has started in July 1991. The initial focus was on industrial sector. Trade liberalization in agriculture later became part of economic reforms. Removal of import controls on certain agricultural products, relaxation of quantitative restriction on imports, delicensing some imports and slashing of basic import duty are some of the important policy initiatives. This necessitated an impetus for international competition for exports. Hence, these policy initiatives exposed Indian agriculture to global markets. Since pepper is exposed to international markets, economic reform and liberalization will definitely affect the pepper economy of Kerala. In such a trading scenario following issues emerges.

(i) How far pepper markets of Kerala are integrated? If they are integrated, how far price transmission mechanism works out among the markets?
(ii) What will be the impact of economic reforms on market integration and transmission mechanism of prices across the pepper markets of Kerala?

Against this background, we attempted to investigate the following objectives:

(i) examination of earlier literature pertaining to market integration studies of agricultural commodities and to identify the gap in the studies.

(ii) critical evaluation of market integration hypothesis and its earlier methodology employed to verify market integration hypothesis which will enable us to derive suitable methodology to verify the market integration hypothesis.

(iii) examination of trend and pattern of area, production, productivity and price of pepper with special reference to Kerala economy and also to identify the impact of liberalization on these indicators of pepper.

(iv) investigating the validity of market integration hypothesis among pepper assembling markets of Kerala and if it is, then to identify the transmission mechanism of prices of pepper during pre and post-reform periods.

Summary

The present study consists of six chapters. By introducing the concept of market integration, the first chapter briefly explains the objectives of the study. Under methodology of the study ratio, percentages and compound growth rates were considered to examine the trend of area, production, productivity and prices of pepper. To identify the impact of liberalization,
dummy variables were introduced to the trend equation. In order to examine the existence of market integration hypothesis, Dickey-Fuller and Phillips-Perron tests were employed. Further, Johansen’s multiple cointegration technique and error correction models were employed to identify cointegration across the selected pepper markets of Kerala and transmission mechanism of prices among markets respectively.

The major pepper assembling markets of Kerala namely, Tellicherry, Kozhikode, Kochi and Alleppey were chosen for examining the validity of market integration hypothesis. Thus, the monthly wholesale price of pepper of all the above assembling centres for the period April 1974 to March 2003 were collected to verify the market integration hypothesis. The entire period has divided into April 1974 to June 1991 and July 1991 to March 2003 to know the effect of liberalization. The study is exclusively relied on secondary data. The main data sources are Statistics for planning, Economic Review, Agricultural Abstract of Kerala, Statistical Abstract, Spices Statistics, Cocoa, Arecanut and Spices Statistics, Arecanut and Spices data base, Area and production of spices in India and the world, Pepper statistical year book, International Pepper News bulletin and the unpublished data of Directorate of Arecanut and spices development for the period 1960-61 to 2002-2003. The first chapter concludes by detailing the limitations and scheme of the study.

The earlier literature pertaining to market integration studies of agricultural commodities was dealt in the second chapter. For the sake of
brevity, the earlier literature have reviewed under two sections namely; international level studies and national level studies. A series of studies have undertaken at international level. Studies at national level are less in comparison with international studies. All these studies have attempted to verify the market integration hypothesis of various crops of agricultural sector and products of allied activities. Most of the studies were mainly attempted to verify the market integration hypothesis of food crops. However, some attempts were made to identify the validity of market integration hypothesis of non-food crops. At international level, some studies were conducted to know the effect of liberalization on market integration.

Most of the studies have used monthly wholesale price to examine the market integration hypothesis. Few studies have relied either on daily or weekly prices. A major number of studies were able to reveal the existence of strong market integration in their analysis.

The third chapter analysed the theoretical and methodological issues related to marketing efficiency and market integration hypotheses. The concepts of market integration, marketing efficiency and its various components were dealt in detail. Price spread and market integration are the two criteria to measure marketing efficiency. The techniques employed to measure price spread and market integration were detailed in this chapter. Some of the important techniques employed to test the market integration hypothesis were price series correlation, variance component approach,
ordinary least square method, autoregressive model, Koyck's distributed lag model, Ravallion model, cointegration technique and parity bound model. The present chapter concludes with a critical evaluation of all these statistical and econometric tools.

Common trends and seasonal components may make an upward bias in the results of correlation coefficient. Variance component approach fail to measure the degree of market integration once the assumption of constant variance of price over the season and transaction cost relaxes. Attention is not paid to the properties of error term and stationarity of data series in ordinary least square framework. Regression techniques have generally ignored or misrepresented the time series properties of price series and hence, there are serious flaws in the estimation procedure. The Engle-Granger cointegration technique is a bivariate model that ignore the linkage that may operate through a third-market.

With the presentation of a brief history of pepper, the fourth chapter analysed countrywise and statewise area, production and productivity of pepper. Countrywise export of pepper was also analysed. Similarly a districtwise analysis of area, production and yield of pepper pertaining to the economy of Kerala were also examined. Besides, price trend of major pepper assembling markets of Kerala were also investigated. Simple ratio, percentages and compound growth rate were used to examine the trend and pattern of pepper. By introducing dummy variables, multiple linear regression
models were estimated to identify the impact of liberalization on various indicators of pepper.

The validity of market integration hypothesis of pepper assembling markets of Kerala were empirically tested in the fifth chapter. Four major pepper assembling markets of Kerala, viz; Tellicherry, Kozhikode, Kochi and Alleppey were selected for the analysis. Monthly data of market prices of pepper product for April 1974 to March 2003 were collected to verify the market integration hypothesis. Price series were divided into two to examine the impact of economic reform on the validity of market integration hypothesis and transmission mechanism of prices between the selected markets. They are: (i) April 1974 to June 1991, and (ii) July 1991 to March 2003.

Dickey-Fuller and Phillips-Perron tests were conducted to know the stationarity of the variables and examination of market integration hypothesis. Johansen’s multiple cointegration technique was employed to verify the existence of cointegration between the markets. After obtaining multiple cointegration between the selected markets, transmission mechanism of excess prices across the markets were tested with the help of error correction model.

The last chapter summarises arguments of the thesis and explores policy implications and future agenda of research.
Findings

The main findings of our study are:

(1) Most of the studies at national and international level have given much emphasis on food crops. Market integration studies related to non-food crops or cash crops were almost neglected.

(2) At national level, there is only a single study of coconut market pertaining to Kerala economy. But studies on pepper, which is a dominant cash crop of Kerala are lacking.

(3) Some international studies have shown that economic liberalization has a positive effect on marketing efficiency. At regional level, no serious attempt is made to know the effect of economic liberalization on marketing efficiency.

(4) On methodological front, studies employing modern techniques such as multiple co-integration test and error correction models to identify the existence of market integration across multiple markets are rare in the literature.

(5) Critical evaluation of all the statistical and econometric techniques reveals that Johansen’s multiple cointegration technique is superior than other techniques to test the validity of market integration hypothesis in a multivariate framework.

(6) It is observed that nearly fifty per cent of the area of cultivation of pepper in the world belongs to India and its contribution to the world
production of pepper is about 25 per cent. This lower share in pepper production can be attributed to lower productivity. The reason for lower productivity can be because of the mixed cropping pattern, use of low yielding vines, existence of senile and unproductive vines, loss due to disease and natural calamities.

(7) Other than India, Indonesia, Brazil, Malaysia, Vietnam and China are the other pepper producers. Sri Lanka, Thailand, Madagascar and Mexico are the minor contributors. Productivity of Malaysia and Brazil are high because of their commercial cropping pattern.

(8) Among the Indian states, Kerala has a near monopoly over pepper with 95 to 98 percentage of the area and 85 to 98 percentage of production. Karnataka, Tamil Nadu, Pondicherry and Andaman and Nicobar islands are the other regions from where pepper is produced. The highest productivity has recorded by Pondicherry due to its small acreage.

(9) All the regions of Kerala state are blessed with pepper production; even though Idukki, Wynad, Kozhikode and Kannur are the dominant pepper producing districts. The geographical position of the districts of Idukki and Wynad coupled with its suitable soil resulted in higher level of production. Similarly, the districts of Kozhikode and Kannur are renowned for their international quality of pepper.
Prices of all the assembling markets of Kerala have moved synchronously. This may be because of the improved transportation system and information technology prevalent in the state.

Further, it is revealed that post-reform compound growth rate of pepper yield and export from India are greater than the pre-reform growth rate. But the pre-reform compound growth rate of area and production of pepper in India and area, production and yield of pepper in Kerala are greater than the post-reform growth rate. Farmers’ non-response to economic reforms on pepper production may be due to the following factors. Pepper is considered only as a secondary crop. The acreage of pepper also depends on the acreage of the main crop which is used as the stead. Similarly acreage shift of a perennial crop like pepper also depends on the steady nature of market price.

Multiple linear regression result shows that economic reform is not able to make any significant impact on area and production of pepper in India and pepper production in Kerala. However, pepper cultivation in Kerala has positively affected by economic reforms. With economic reform, there is greater dissemination of market information which lead to competitiveness among economic agents.

The economic reform is able to influence the monthly wholesale price of Alleppey, Kozhikode, Kochi and Tellicherry assembling markets of...
Kerala. This positive influence is because of the fact that with reform there is greater transparency in dissemination of market information.

14) Dickey-Fuller and Phillips-Perron test results shows that all the selected markets of Kerala were well-integrated during pooled, pre-reform and post-reform periods. The well-integrated nature of the selected markets may be because of the following reasons. Alleppey market is the nearest assembling centre to the southern districts of Kerala. Kozhikode market is a highly producing district and is surrounded by equally productive regions. Kochi market is acting both as an assembling centre and as a terminal market. Tellicherry market has the superior quality of pepper in the world.

15) Johansen’s multiple cointegration results exhibits a long run relation between the four pepper assembling markets during the period of our study. It implies that all the four pepper markets used to share market information in a transparent way.

16) The error correction model results revealed that there is strong transmission mechanism of prices from one market to the other during pooled period. Again, transmission mechanism of prices across the markets is stronger during post-reform period than the pre-reform period. This may be due to the influence of recent economic reforms and liberalization in dissemination of market information.
It has also been observed that Alleppey is the dominant market followed by Kozhikode, Kochi and Tellicherry markets. Alleppey market is dominant because it is the nearest pepper assembling centre to the southern districts of Kerala. Dominance of Kozhikode market is due to the fact that it is a highly pepper producing district surrounded by similarly productive areas. Since Kochi market is primarily concerned of exports, it is not dominant as other markets. Tellicherry market is not able to exert much influence like other markets due to its peculiar quality of pepper.

Policy Implications

The main policy implications of the study are:

(1) We are able to observe that economic reform is not able to exert the desired impact on several indicators of pepper. This may be because of the fact that the policy initiatives of economic reform has not implemented in toto. Therefore, policy initiatives should be implemented in toto.

(2) It is explored that Indian pepper productivity is one of the lowest in the world. Farmers should be promoted to cultivate pepper as a major crop and only dead steads are to be used as climbers.
Future Agenda of Research

The main future agenda of research in the area are:

(1) Market integration study of pepper by incorporating more wholesale markets of different pepper producing Indian states can be undertaken and can also examine the transmission mechanism of prices. Besides, state specific validity of the hypothesis can be explored.

(2) Daily or weekly prices of various market information are better than monthly market price behaviour. Hence, the entire experiments can be worked out on the basis of daily or weekly price behaviour of pepper market.

(3) The present experiment can be extended to other cash crops of Kerala and to the rest of the states in India.