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FRUIT AND VEGETABLE EXPORT GROWTH INSTABILITY AND DIVERSIFICATION

**Subashini Perera
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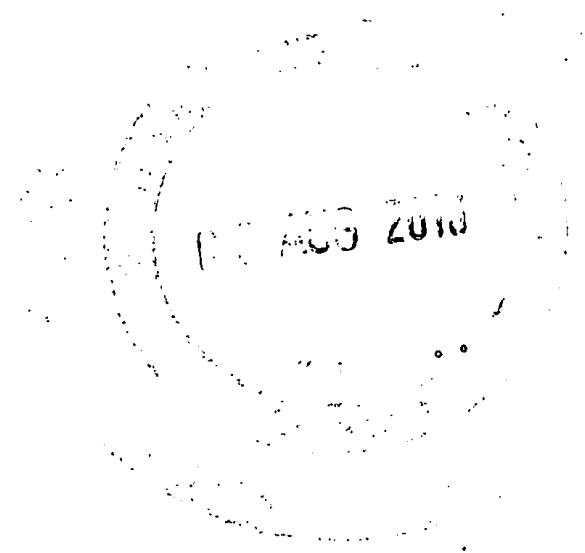


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Fruit and Vegetable Export Growth, Instability and Diversification

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FOREWORD

The government has taken action to promote fruit and vegetable exports in Sri Lanka in many ways. In recent past, fruit and vegetable export earnings have remarkably increased with *the Mahinda Chinthana* government agricultural development policy as well as expansion of world demand for horticultural products towards healthy dietary patterns. The Department of Agriculture, The Department of Commerce and the Export Development Board play a major role to enhance the fruit and vegetable export subsector in the country.

Sri Lanka can cultivate a plenty of tropical fruit and vegetables with its unique aroma, taste and color. Therefore, Sri Lankan tropical horticultural products have a greater potential to be promoted in international markets. Despite of the impressive growth of fresh fruit and vegetable export earnings, only few items dominate the export basket and export destinations are fragmented to limited markets. Therefore, export earnings are susceptible for high volatility and the development of this sector is unpredictable.

Diversification policies have been identified as the way out of stabilizing and expansion of Sri Lanka's tropical horticultural products. The development of this sub sector not only delivers benefits to exporters but also increases the income level of rural farmers. Thus, awareness is required for policymakers to generate efficient export promotional policy decisions in order to expand the fruit and vegetable export sector in Sri Lanka.

This study provides a comprehensive analysis of fruit and vegetable export growth, instability and diversification in Sri Lanka. The report consists of useful information on fruit and vegetable export performance during the period of 1990-2012. Further, it highlights issues related to growth and diversification of fruit and vegetable export products and markets in the country. Therefore, I am confident that the information provided in this report will be utilized by policymakers, researchers and academia in the related field.

E.M. Abhayaratne
Director

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EXECUTIVE SUMMARY

Fruit and Vegetable (F&V) export earnings have been increasing overtime in real value terms compared to other non-traditional exports in Sri Lanka. However, this trend shows high instability. The sector is depending on a limited number of products and a very few trading partners make this sector vulnerable to wide fluctuations. Hence, the policy of export product and market diversification is a growing concern among policymakers as a key solution for the instability in the export sector. Therefore, this study examined the patterns of export diversification, growth and instability to address the issues of unstable situation prevailing in the F&V export subsector in Sri Lanka.

Sri Lanka Customs' export data of fresh vegetable HS (70110-70999) and fresh fruit HS (8030010 – 8109090) for the period of 1990-2012 was used for the analysis. Using compound growth rate and co-efficient of variation (CV), the growth rate and instability of export were estimated. Intensive and extensive margin analysis was used to estimate diversification of export in products and markets respectively. Normalized Herfindahl Index was also used to assess the export concentration and the degree of diversification on markets and products.

The results reveal that real value of fresh fruit exports has risen by 13 percent with high instability. Comparatively, fresh vegetable exports have been growing by 6 percent with low instability. This growth performance has been driven more by increasing real value of existing export (from 1990-2012) products. However, new products and new markets have contributed less than 3 percent to the existing growth. This discloses that export growth is due to the deepening of the export value of existing trading partners and product lines.

Despite this growth, this sector has concentrated around 98 percent on the top 3 product lines in both F&V. Yet, export markets have rather diversified compared with product lines. Explicitly, 92% of fruit and 93 % of vegetable exports were directed to ten destinations. It reveals that export markets are diversified considerably compared to product lines in both F&V. Herfindahl Index also proved that product lines are highly concentrated especially during the period of 2008-2012 compared to early 2000. Thus, export diversification at product lines is more crucial. Hence strategies towards enhancing value addition industry to make Sri Lanka a competitive platform for F&V exports in the Asian region is decisive. Lack of quality and inconsistency in the supply are hindering the product and market diversification. Further, cultivation of high value F&V in Sri Lanka is still in the ground level despite having a great potential in international markets.

According to the key informant interviews, this study identified seasonality, small scale F&V farming, and poor exporter - farmer linkages as major barriers to promote Sri Lanka's F&V exports. Thus the study recommended diversifying the F&V export sector specially focusing on off season specialty, development of value added industry, enhancing the cultivation of high value F&V at commercial level, linking farmers to the exporters through forward sales contracts.

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CHAPTER ONE

Introduction

1.1 Introduction

During the past two decades international trade in fruit and vegetables (F&V) has increased rapidly than other agricultural commodities. So far, trade in F&V has well globalized and a large volume of F&V is being traded around the world. The global F&V market is expected to exceed \$735 billion by 2015, reflecting a 25% growth over five years. By 2015, the market is predicted to reach over 690 million tons in volume, up by 5% compared with 2010 (Marketline.com, 2012). This makes the fresh produce being accessible year round globally. Changing consumer preferences as the income rises and middle class being concerned about healthy diet have led to increase in the world demand for fresh F&V.

According to the Food and Agriculture Organization (FAO), global F&V has been growing at around 3 percent per annum over the last decade. Horticulture crop production generates high returns per unit of land, offering promising income prospects, specially for small holders and this sub sector can contribute to poverty reduction by providing paid employment opportunities due to labour intensive activities. Apart from the monetary value, F&V leads to a healthy diet. Further, FAO highlighted that F&V can create opportunities for increase income level of farmers in developing countries with the rising of global demand (FAO, 2013).

Sri Lanka is an ideal location for tropical horticulture. The country can grow many types of tropical F&V throughout the year. Favorable natural conditions including its tropical sites, two monsoons a year, geographic and good soil conditions would lead year round cultivation of these crops in different parts of the island.

At present, in Sri Lanka, around 602,000 metric tons of vegetables and 855,000 metric tons of fruit are produced annually (Department of Census and Statistics, 2012). Out of the total production merely 80, 595 metric tons of fruit and 21,092 metric tons of vegetables are exported (Department of Customs, 2012). Agricultural exports as a whole generated 24% of Sri Lanka's export earnings (USD 2.3 billion) in 2012 (CBSL, 2013). Exports of F&V represented USD 32 million (<2 %) of total agricultural exports. However, the most significant aspect of this sector is the increasing trend of growth in exports. There is a rise in real export value of F&V from Rs. 8 million to Rs. 38 million (inflation adjusted) during 1990-2012. Yet, agricultural sector exports as a whole grew by 40 percent in the same period. This implies that F&V export sector has expanded compared to traditional and other non-traditional agricultural exports.

The government has given priority to export promotional strategies targeting F&V exports. This has led to an increase in the export of F&V in the recent past. With the objective of promoting export of horticultural products, the Export Development Board (EDB) has implemented several export promotional projects in the past decade. According to the EDB strategic plan 2011 – 2015, under the Agro Export Zone Project, cultivation of pineapple for export in the Ampara district with the participation of 200 farmers was implemented. The project aimed at distributing Rs. 1.2 million worth of pineapple suckers to cultivate in 200 acres. Pineapple cultivation in the Matara district and chili cultivation in the Mannar district were planned targeting export. Further, EDB has taken action to cultivate F&V for export in the Hambantota district. As far as this, action has been taken to cultivate mango, papaya, banana, drumstick and sesame in selected areas. EDB also assists a few selected export oriented F&V companies which are closely working with small farmer clusters to expand their business under the Integrated Agriculture Model Project Programme. Uva Paranagama Export Production Villages, Market Development Programmes and Establishment of a Quality Management System for the Agricultural Products were also targeting the promotion of F&V export.

However, this sector is mostly operates as small-scale home - garden cultivations and this growth pattern shows an inconsistent trend over the years. There is an enormous fluctuation in total F&V export earnings throughout the last two decades, mainly in individual commodities and markets. In addition, our F&V export sector depends on a limited number of products and a very few trading partners are making this sector vulnerable to wide fluctuations.

1.2 Research Problem

In real value terms, export earnings of F&V subsector in Sri Lanka have increased compared to other non-traditional exports during the last three decades. However, F&V export value with volume is susceptible for fluctuation over time. That is divergent trends could be observed behind these growth. At the same time, the sector mainly depends on a few exportable products and a limited number of destinations.

Higher degrees of export concentration (markets and products) are strongly correlated with greater volatility in export earnings and the economic growth. However, the magnitude of trade losses depends on the country's mix of exports and main trading partners.

Usually, by changing the shares of commodities/trading partners in the existing export mix, or by including new commodities/ new trading partners in the export portfolio, a country can attain export diversification. The more advanced economies export a wide range of goods to a large number of trading partners, creating a stable export sector.

Export dependency on primary products of a country can be reduced through diversification of the export portfolio (Ferdous & Farazi, 2011). Many countries that are commodity dependent or exhibit a narrow export basket often suffer from export instability arising from inelastic and unstable global demand. A more diverse structure of exports reduces vulnerability to demand shocks and price swings in overseas markets and creates greater opportunities in regional as well as global markets (Brenton, n.d). Therefore, export diversification could be seen as a way to alleviate these particular constraints. To be successful in export diversification, countries' exports need to be globally competitive to take advantage of leveraging world markets (Heiko, 2007). In general, the empirical evidence of developing countries shows the tight relationship between export earnings volatility and export diversification. The key challenges of the developing countries are expanding and diversifying their export baskets and trading partners with the aim of expanding export revenues, stabilizing export earnings and upgrading the value added. Hence at present the policy of export diversification is a growing concern among policy makers as a key solution for the instability in the export sector.

Therefore, addressing the issues with regard to the unstable condition of F&V export subsector in Sri Lanka, despite the growing world demand is vital. Although many empirical research related to overall non plantation export sector has been carried out, key issues related to instability and diversification of F&V export subsector in Sri Lanka are not documented. Thus, initially it is important to identify the patterns of F&V export growth, instability and export concentrations of products and markets in order to identify the key issues of F&V export diversification in Sri Lanka.

1.3 Research Objectives

1.3.1 Major Objective

The main purpose of this study is to examine the patterns of F&V export growth, instability and diversification and identify the key issues in order to provide remedies to stabilize the sector.

1.3.2 Specific Objectives

1. Briefly review the F&V export sector
2. Estimate the growth rate and instability in terms of F&V export products and markets
3. Estimate export diversification and examine the patterns of export diversification
4. Decomposition of export growth to examine whether this growth has been driven by product diversification or market diversification
5. Identify the key issues relating to export growth instability and diversification

1.3.3 Limitations of the Study

A comprehensive review of export diversification of fresh vegetables could not be accomplished due to unclassified Harmonized System (HS) for all fresh vegetables. Total value of more than 80 percent of fresh vegetable exports was specified under other vegetable export categories.

1.3.4 Structure of the Report

The first chapter of this report provides a ⁴brief introduction of the world trend of F&V exports and Sri Lanka's situation including the research problem, present objectives and limitations of the report. Export diversification theory and measures are explained in the second chapter. Theoretical and empirical research relating to export growth, instability and diversification are also provided in this section. Third chapter consist of the methodology adopted in this report and the conceptual framework. Sri Lanka's F&V export performance and the global situation are examined in the fourth chapter and the estimation of results and a discussion of the Sri Lanka's F&V export growth, instability and diversification include in fifth chapter. Issues relating to F&V export growth, diversification and instability are discussed in the sixth chapter and finally, conclusion and recommendations are presented in the seventh chapter.

CHAPTER TWO

Export Diversification Theory and Measures

2.1 Introduction

This chapter will emphasize the definition of the term export diversification and its economic significance to the development of the export sector to provide a basic understanding of (i) the concept of export diversification, (ii) the theory on diversification and export sector development and (iii) empirical evidence on export diversification, export growth, and instability.

2.2 What is Export Diversification?

There are numerous definitions for export diversification. According to Ali *et al* (1991), diversification is defined as the change in the composition of a country's existing export product mix. Diversification is export destination or as the spread of production over many sectors (Berthelemy and Chauvin, 2000).

Paul (n,d) explained that diversification can be achieved through improving the quality of the existing exports, breaking into new geographic markets, increasing services exports, or expanding the output of goods and services that are inputs in export production. Further, he articulates that export products are diversified into:

1. Non-traditional relative to traditional export products
2. Manufactured as opposed to agriculture and minerals
3. Intra-industry versus inter-industry trade
4. High-productivity goods as opposed to low productivity goods
5. Quality upgrading (It is not what a country produces but how it is produced is that matters)

Therefore, the policy of export diversification is the key to find a solution for sinking export markets. With this means investors are often advised to diversify their portfolio in order to manage their risk (Meilak, 2008).

2.3 Different Dimensions of Export Diversification

Export diversification can occur in diverse forms and dimensions and thus its analysis can be undertaken at different levels. There are two recognized forms of export diversification i.e. horizontal and vertical (Salomon, 2010).

2.3.1 Horizontal Diversification

Horizontal diversification takes place within the same sector whether it is primary, secondary or tertiary. This involves alteration of country's export mix by adding new products on the existing export basket within the same sector. The horizontal diversification can reduce the unfavorable economic conditions such as international price volatility and political risks.

2.3.2 Vertical Diversification

Vertical diversification takes place with the transformation of primary into manufactured export. In the aspect of vertical diversification, processing of domestic manufactured goods requires a shift from the primary to the secondary or tertiary sector. It entails arrangement of further uses of existing products by means of increased value added activities such as processing, marketing or other services. This can expand market opportunities for raw material and help enhance growth and stability since processed goods generally have greater price stability than raw commodities (Salomon, 2010).

Requirements for successful horizontal and vertical diversification can vary considerably in terms of skills and capital investments, technology, managerial competences and marketing skills. Sustainable long term export growth requires both horizontal (e.g. adding new products on existing ones), and vertical (e.g. move from commodity to higher value added manufactures) diversification. This can be achieved either by adjusting the shares of commodities in the existing export mix or by adding new products to the export mix (Salomon, 2010).

2.4 Diversification Vs Specialization

Diversification or specialization of a country in export production has been a topic that has incited much debate in the theoretical literature and international trade policy arena. Both the productivity theory of Adam Smith and arguments of trade as an engine of growth emphasize the importance of product specialization and trade. However, diversification of the export sector became prominent subsequently.

Love (1986) argued that diversification can lower earnings' volatility if the country diversifies into products with price movements that are not strongly correlated with current exports. However, there can be a trade-off between greater stability if the new products are of lower value, though this will lower the value of export earnings. Consequently, diversification offers potential yet no guarantee for greater stability and higher earnings. The choice of specialization or diversification depends on the country's economic structure. Thus, he had stressed the question of appropriate trade and

industrial policies that remain open and become a matter of carefully weighing the long-term costs, benefits and risks of alternative strategies.

Export diversification, thus, helps in stabilizing export earnings in the long run (Michaely, 1962; Acharyya, 2006). Interestingly, Rodrik (2006) and Acharyya (2007) explain that the nature and composition of export baskets may matter. Neither specialization nor diversification aids growth as long as exports comprise predominantly low value added commodities. Ferdous & Farazi (2011) considered that international trade and specialization are closely interrelated as trade requires specialization, and specialization requires trade as a means of the resulting surplus. The theme of sectoral diversification is important, as a high degree of overall specialization – implying concentration of resources in a few sectors may be dangerous considering the risk associated with asymmetric shocks. The consequences may be particularly serious if such shocks hit the core sectors of the economy in which its activity is predominantly intense. If the number of goods exported by a country is at larger scale, movements in the prices of individual goods will offset each other and the country's export price level will tend to be relatively stable.

2.5 Importance of Export Diversification

Developing countries are more vulnerable to external shocks since they are seriously dependent on primary commodity exports. These countries have been struggling to expand and diversify their export baskets and trading partners. Expanding export revenues, stabilizing export earnings and upgrading value added are the key challenges. When export is fragmented in a few primary commodities and /or market destinations, there can be serious economic and political risks. Heavy dependence on a small number of primary commodity products exposes a country to the negative effects of unfavorable characteristics of world demand and negative supply side features of these primary products. On the demand side, the low income elasticity of world demand of primary commodities can lead to declining export revenues which can be exacerbated by historically downward trends in primary commodities relative to manufactures.

The instant volatility and instability in foreign exchange earning roots in adverse macroeconomic impact on economic growth, employment, investment planning, import and export capacity, foreign exchange cash flow, inflation and capital and investment flows. In the long run, this can be associated with political risks. Basically, primary commodity dependence is correlated with several dimensions of poor governance and the risk of conflict. This is strongly related to economic growth and the level of income.

Thus, export diversification intends to extenuate these economic and political risks. Further diversification will reduce dependence upon one or a limited number of geographical destinations for its exports. In addition diversification will expand opportunities for export and improvement of backward and forward linkages to

domestic inputs and services. Hence a diversified portfolio could help minimize volatility in export earnings and boost overall growth by replacing commodities with positive price trends, products and by adding value through additional processing or marketing (Salomon, 2010).

It has been argued that, by providing a broader base of exports, diversification can lower instability in export earnings, increase export revenues, promote value added, and increase growth through several channels. These include: improved technological capabilities via broad scientific and technical training as well as learning by doing; facilitation of forward and backward linkages within output of some activities that then become inputs of other activities; increased sophistication of markets, scale economies and externalities. When exports are more diversified, productivity will increase and technological and market knowledge tends to be enhanced (Gutierrez & Ferrantino 2000).

Hence developing countries have to increase the variety of their export basket and diverse market destinations. In this aspect policymakers consider export development and diversification as the new engine of growth. It is especially important because the major objective of any trade policy is not only the promotion of exports but also the diversification of the commodity basket and sectoral composition of exports (Malini & Kumara, 2011).

2.6 Measures of Export Diversification

2.6.1 Concentration Ratios

According to the UNDP (2011), export concentration replicates the degree to which a country's exports are concentrated on a small number of products or a small number of trading partners. A country that exports one product to only one trading partner has a perfectly concentrated export portfolio. Conversely, a country in which exports comprise a larger number of products and trades with a larger number of trading partners have a lower export concentration ratio i.e. the country has more diversified exports.

There are several indicators to measure the export concentration. The well established concentration indices which are derived for export categories are i) the Concentration Ratio, (ii) the Herfindahl-Hirschman Index, (iii) the Hall-Tideman Index, (iv) the Rosenbluth Index, (v) the Comprehensive Concentration Index, (vi) the Hannah and Key Index, (vii) the Entropy measure, and (viii) the Diversification Index. These indicators together provide a perspective on the degree to which countries are taking advantage of potential trading relationships. Products are defined at the HS six-digit level. Markets are defined as partner countries. The Herfindahl-Hirschman Product Concentration Index measures dispersion of trade value across an exporter's products, while the

Herfindahl-Hirschman Market Concentration Index does the same across an exporter's partners. A higher value indicates greater concentration of value across products or markets.

2.6.2 Intensive and Extensive Margin

The definitions of intensive margins and extensive margins vary in the literature. Recent empirical research emphasizes that variation in trade flows across countries, products and years are governed by two types of margins which are the intensive margin and the extensive margin.

According to Ferdous and Farazi (2011) the intensive margin captures changes in the trade that takes place within surviving trade relationships e.g. trading more or less of the same product to the same country. On the other hand, the extensive margin tracks change in the number of products or trading partners. In the static framework the extensive margin is defined as the number of relationships in a year, while the intensive margin is the average value per relationship (Tibor & Thomas, 2010). Brenton (n,d) regarded the intensive/extensive margin of trade flows as another view of the diversification process. He derived the total change in export due to diversification as depicted in diagram 1.

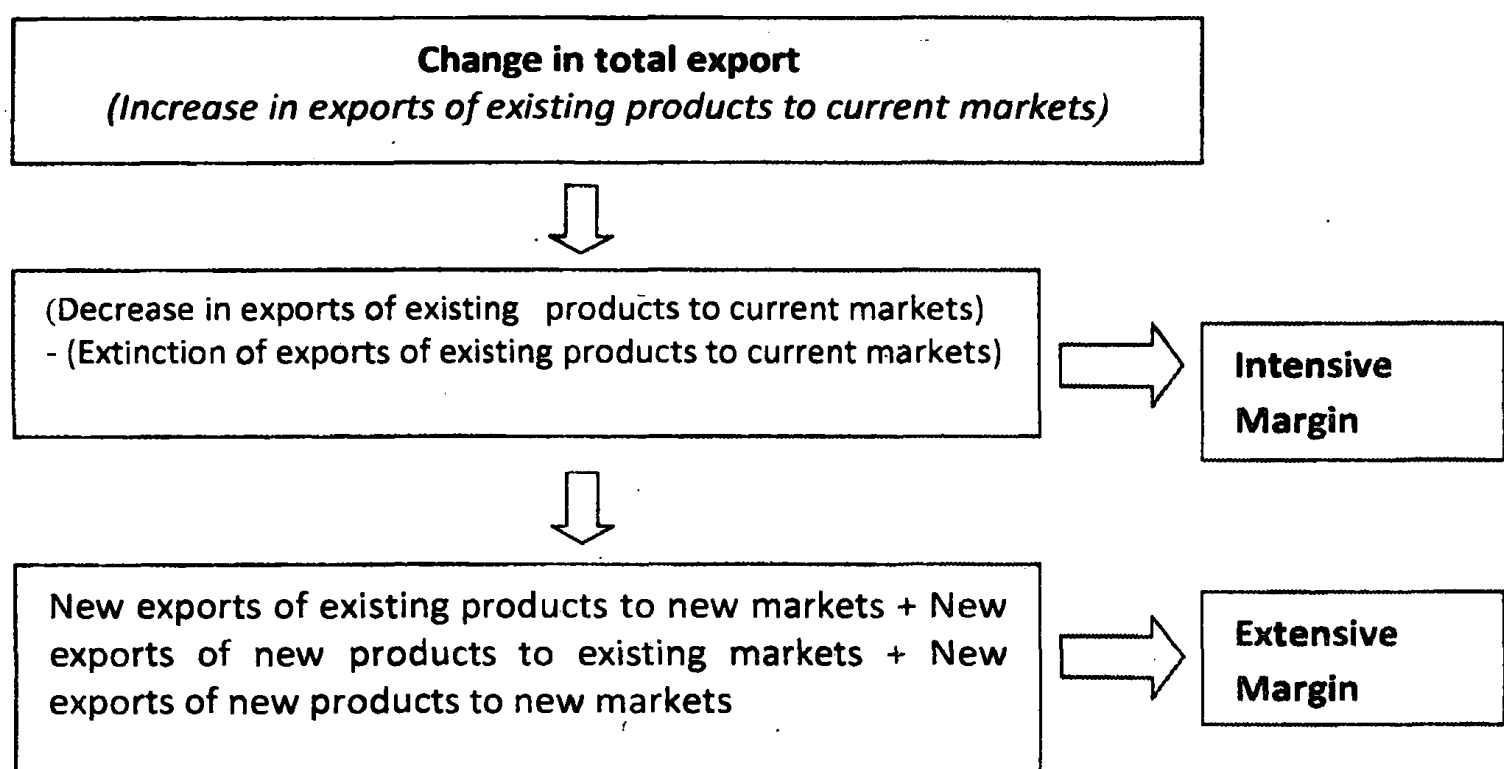


Diagram 1: Total Change in Export as a result of Export Diversification

2.7 Empirical Studies Testing the Relationship between Export Diversification, Growth and Instability

The Sri Lankan context: - the empirical studies linking export diversification and growth are still limited. There does not seem to be a sound analysis in academic literature to address the question of why countries diversify their F&V exports and how it benefits

countries' economic growth. Thus we attempt to review some important studies that are relevant to diversification of overall agricultural sector in Sri Lanka.

Weerahewa *et al* (2012) have analyzed the patterns of agricultural export diversification in Sri Lanka using intensive and extensive margin analysis. They provided evidence that 80% of export is occupied by top ten product lines and around 60 % of exporters are occupied by the top ten export destinations. They highlighted that the country has been relying more on intensification rather than diversification.

Samaratunge *et al*, (2009) established strategic recommendations for developing the horticulture sector to sell more to the export markets since Sri Lanka enjoys the location advantage. They also stressed that, for successfully growing and exporting more tropical fruit requires extensive private and public investment in expanding production and improving the supply chain links in rural areas.

Esham & Usami (2006) have evaluated the type of backward linkages used by the F&V industry to procure raw materials and discussed the associated constraints and the industry's perception of small farmers as suppliers. They highlighted that the issue of lack of proper organization models to organize small farmers was a major constraint resulting in high cost of establishing and managing linkages with small farmers. However, the industry had a positive perception of small farmers' ability to be contract-farming partners to supply industry requirements.

The global context: - The existing literature and arguments for export diversification which provide an empirical analysis of the relationship of export diversification and growth in global international trade academia will be broadly reviewed in the following.

The significant evidence on diversification found that economic growth across countries increases with diversification of export up to a critical level of export concentration which is then reversed with increasing specialization leading to a higher growth creating a U-shaped relationship between concentration and income (Adityaa and Acharyyaa, 2013).

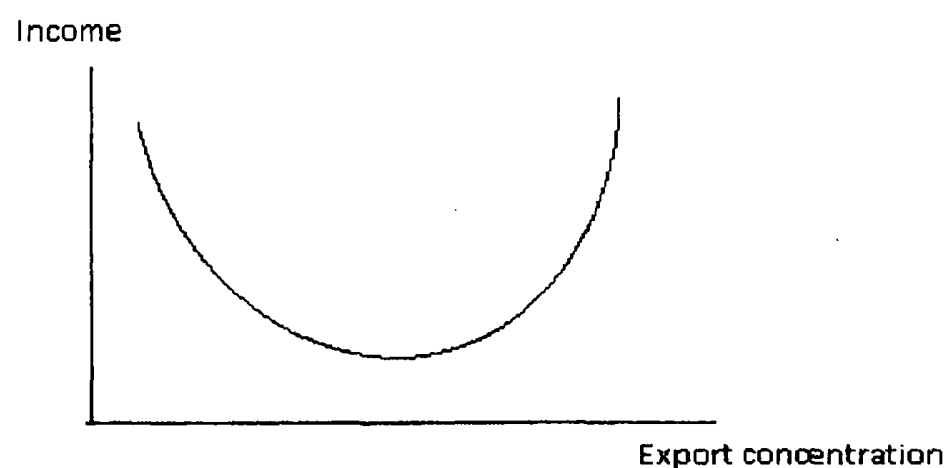


Diagram 2: Relationship between Export Concentration and Economic Growth

According to the above explanation, income falls with concentration up to a critical level and then with specialization income increases. He further reveals that export diversification and composition are important determinants of economic growth.

Ferdous, and Farazi (2011) convey that the greater economic integration in East Asian economies leads to export diversification because exchange rates and tariff rates have a significant negative impact on specialization.

In global setting, export diversification was empirically analyzed using a range of indices. Meilak (2008) has pragmatically analyzed the phenomenon of export concentration and tested whether its incidence can be linked to country size and the stage of economic development. He measured concentration of export goods, services and destinations through eight different export concentration measures. (i) the Concentration Ratio, (ii) the Herfindahl-Hirschman Index, (iii) the Hall-Tideman Index, (iv) the Rosenbluth Index, (v) the Comprehensive Concentration Index, (vi) the Hannah and Key Index, (vii) the Entropy measure, and (viii) the Diversification Index. He revealed that the highest export concentration is exhibited in smaller countries. The results also point towards higher export concentration in less developed countries, indicating that both size and the stage of economic development are relevant factors in determining export concentration. Shepherd (2008) reinforced the idea that the trade growth of developing countries can take place through the creation of trading relationships with new partners.

There is strong empirical evidence on a positive effect of export diversification on per capita income growth in global scenario. This effect is potentially nonlinear with developing countries benefiting from diversifying their exports in contrast to the most advanced countries that perform better with export specialization (Heiko, 2007). It was validated that export concentration has been detrimental to the economic growth performance of developing countries in the past decades.

In a seminal paper, based on domestic production and labor data, Imbs & Wacziarg (2003) investigated the relationship between domestic sectoral concentration and per capita income patterns across countries. They also found a U-shaped pattern whereby countries in their early stages of development diversify production and specialize at higher income levels.

There is significant evidence on the role of extensive margins for export growth. Evenett and Venables (2002) showed that an export expansion along the extensive margin plays a considerable role in export growth in developing countries. They showed that about one third of the export growth of developing countries between 1970 and 1997 were due to exports of old goods to new markets.

There are several interesting findings regarding the significant positive relationship between instability of export earnings and concentration of exports (Massell, 1964). His findings are based on the argument that the newly developing countries, in particular,

many of which are heavily dependent upon earnings from the sale of primary commodities experience instability in their export.

Recent research findings emphasized that the export growth has been driven more by the intensive (existing export flows) than the extensive margin (new export flows), and low income countries have low survival rates of new flows. Further within the extensive margin, the export of existing products to new markets has accounted for a greater share of export growth than the export of new products (Brenton, n.d).

CHAPTER THREE

Methodology

3.1 Introduction

This chapter will present the conceptual framework of the analysis and the tools used for measuring the export growth, instability and diversification.

3.2 Conceptual Framework

The theory explains that a properly diversified export basket tends to stabilize the price level and will result in sustainable export growth. This can be illustrated in diagram 3.

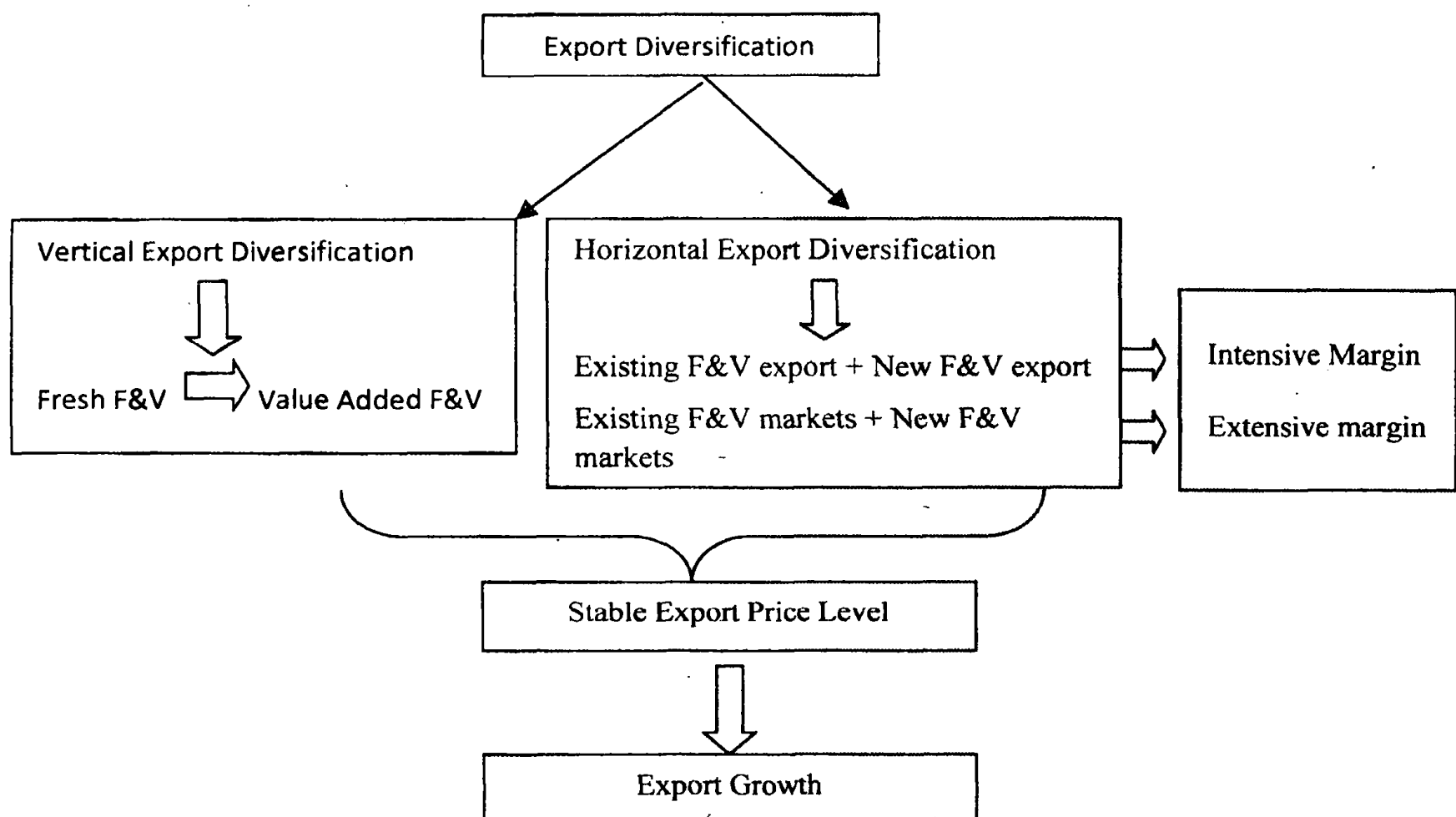


Diagram 3: Conceptual Framework for F&V Export Diversification

As illustrated in diagram 3, F&V export diversification can take place with vertical diversification or horizontal diversification. That is either introducing new F&V items to the export market or promoting value added products than fresh products. However,

for the sustainable long term export growth both vertical and horizontal diversification is required. Price volatility of individual goods will offset if the country exports a large number of goods and the total export price level will also tend to be relatively stable. Further, export prices tend to be relatively stable if the country exports a large number of value added products than fresh products. However, in this analysis horizontal diversification of products/markets was considered.

3.3 Export Diversification Measures

F&V export diversification was assessed by measuring concentration of export goods, and destinations through Normalized Herfindahl Index. Intensive and extensive margin analysis were done to identify the magnitude of export product/ market diversification and decomposed the export growth to examine the extent to which export growth is accounted for by introduction of new export products/ markets, by the 'death' of previously exported products/ markets, or by volume changes on existing products/ markets.

According to the World Bank definition the Herfindahl-Hirschman Product Concentration Index measures dispersion of trade value across an exporter's products, while the Herfindahl-Hirschman Market Concentration Index does the same across an exporter's partners.

3.3.1 Herfindahl-Hirschman Product Concentration Index

This indicator measures the dispersion of trade value across an exporter's different product lines. A country with a preponderance of trade value concentrated in a very few products will have an index value close to 1. Thus, it is an indicator of the exporter's vulnerability to trade shocks measured over time. On the other hand, a fall in the index may signal diversification in the exporter's trade profile. The user has the option of selecting product clusters, which will return the index calculated only for that specified subset of products. If a country exports only a single product, then the indicator returns no value.

3.3.2 Herfindahl-Hirschman Market Concentration Index

This indicator is a measure of the dispersion of trade value across an exporter's partners. A country with a preponderance of trade value concentrated in a very few markets will have an index value close to 1. Thus, it is an indicator of the exporter's dependency on its trading partners and the danger it could face by its partners increases trade barriers. Measured over time, a fall in the index may be an indication of diversification in the exporter's trading partnerships. If a country exports only to a single market, then the indicator returns no value.

3.3.2.1 Normalized Herfindahl Index

Include normal index

$$h^i = \sum_k (S_k^i)^2 \dots\dots\dots (ix)$$

$$nh^i = \frac{h^i K}{1 - \frac{1}{K}} \dots\dots\dots (x)$$

h^i is 'Herfindahl Hirschman Index' of country i and nh^i is normalized Herfindahl Hirschman Index. S_k^i is the export share of sector k or export destination k for exporter i . K is the number of products or markets for exporter i . Then, it is converted into export diversification index by taking the value from 1. Where h declines as a number of products or markets increases and the share of each product or market falls.

3.3.3 Decomposition of Export Growth

Decomposition of growth has been undertaken to examine Sri Lanka's fresh F&V export growth patterns. Observed changes of F&V exports during 1990 -2012 were decomposed into changes in product lines supplied and changes in export destinations. F&V export growth decomposed considering the real changes in mean export of 1990-1995 and 2008 -2012.

To simplify the exposition the following notation were used (Evenett & Anthony, 2002)

$\sum_k X_{ijk}^{90-95}$ = The mean value of "l" (Sri Lanka) total exports of good j (fruit/vegetable) to nation k in 1990-1995

$\sum_k X_{ijk}^{08-12}$ = The mean value of "i" (Sri Lanka) total exports of good j (fruit/vegetable) to nation k in 2008 – 2012

$\Delta X_{ijk} = \sum_k \Delta X_{ijk}^{08-12} - \sum_k \Delta X_{ijk}^{90-95}$ = The change in " i " (Sri Lanka) total export of good j (fruit and vegetable) to nation k in 1990 -2012

The decomposition of ΔX_{ijk} has been undertaken for the set of goods j (fruit / vegetable) that Sri Lanka exports, and the set of client countries k that may have changed over time.

3.3.4 Decomposition at Product Lines (intensive margin analysis)

Product lines were decomposed to observe the changes in set of products (fruit/vegetable) exported by Sri Lanka regardless of its destinations (Intensive Margins). The purpose of this decomposition was to establish the extent to which export growth is

accounted for by the introduction of new export products, by the 'death' of previously exported products, or by volume changes on existing products.

Threshold level of trade \bar{X} was introduced in order to reduce the economically unimportant levels of exports that distort the analysis.

\bar{X} = Percentage share of total fresh fruit/ vegetables = 0.01

According to that two indicators were defined:

$$X_{ij}^{90-95} = \begin{cases} 1 & \text{if } X_{ij}^{90-95} \geq \bar{X} \\ 0 & \text{otherwise} \end{cases}$$

$$X_{ij}^{08-12} = \begin{cases} 1 & \text{if } X_{ij}^{08-12} \geq \bar{X} \\ 0 & \text{otherwise} \end{cases}$$

Subjected to this cutoff level, the following three sets associated with changing total fruit and vegetable exports were introduced:

D = contains all the export goods that died (the set of product lines j that Sri Lanka exported in 1990 -1995 but no longer exported during 2008 -2012)

N = contains all the newly exported goods (the set of product lines j that Sri Lanka did not export in 1990 -95 but did export in 2008-2012)

C = contains all the goods that were exported at the beginning of the period and continued to be so at the end (the set of product lines j that Sri Lanka exported in 1990-95 and continued to export in 2008 -2012)

The total change in exports associated with the sets D, N, and C are calculated as follows:

$$D(X_i) = \sum_{(i,j) \in D} \Delta X_{ij} = \text{Total change in export with respect to D}$$

$$N(X_i) = \sum_{(i,j) \in N} \Delta X_{ij} = \text{Total change in export with respect to N}$$

$$C(X_i) = \sum_{(i,j) \in C} \Delta X_{ij} = \text{Total change with respect to C}$$

The change in export value with respect to each set as a percentage of total export of each category can be denoted as follows:

$$d(X_i) = 100 \frac{D(X_i)}{\Delta X_i} = [\text{percentage change in total exports due to death product lines}]$$

$$n(X_i) = 100 \frac{N(X_i)}{\Delta X_i} = [\text{percentage change in total export due to new product lines}]$$

$$c(X_i) = 100 \frac{C(X_i)}{\Delta X_i} = [\text{percentage change in total export due to change in value of existing product lines}]$$

3.3.5 Decomposition at Trading Partners (extensive margin analysis)

Secondly, decomposition was performed to examine the extent to which the observed changes in export flows were accounted for by changes in trading partners for each considered export category regardless of product lines.

Using same cut off levels and decomposition procedures, the total change in export which associated with three defined sets were estimated as follows:

$D(X_i)$ represents the change in exports that is associated with trade partners to whom Sri Lanka used to export the products in 1990-95 but subsequently ceased in 2008-12.

$N(X_i)$ is the change in total exports associated with Sri Lanka exports to new trading partners.

$C(X_i)$ represents the change in the total export value due to trading partners, which have been supplied by Sri Lanka both at the beginning and the end of the period concerned.

Likewise, the change in export value with respect to each set as a percentage of total export of each category was denoted as follows:

$$d(X_i) = 100 \frac{D(X_i)}{\Delta X_i} = [\text{percentage change in total exports due to death client countries}]$$

$$n(X_i) = 100 \frac{N(X_i)}{\Delta X_i} = [\text{percentage change in total export due to new client countries}]$$

$$c(X_i) = 100 \frac{C(X_i)}{\Delta X_i} = [\text{percentage change in total export due to change in value of existing trading partners}]$$

3.4 Estimation of Growth Rates and Instability

Growth rates and instability were computed for the period of 1990 -2012 with respect to following trade categories.

1. Total F&V export
2. Fresh fruit export
3. Fresh vegetable export
4. Fruit export by major commodity
5. Vegetable export by major commodity
6. Fruit export destinations by major client countries
7. Vegetable export destinations by major client countries

3.4.1 Growth Rate

Export growth rates for the selected export categories are computed by using log linear functions on the time series trade data on real export values.

The equation fitted to analyze the growth rate is semi log exponential form (Gujarati & Sangeetha, 2009).

$$Y_t = Y_0 (1+r)^t \dots\dots\dots (i)$$

Where; Y_t is real export values of above export categories in t^{th} time period and r is the compound (i.e. over time) rate of growth of Y , Y_0 is intercept and $t =$ time in years.

Considering the natural logarithm of equation (i) this can be rewritten as:

$$\ln Y_t = \ln Y_0 + t \ln(1+r) \dots\dots\dots (ii)$$

$$\text{If } \beta_1 = \ln Y_0 \dots\dots\dots (iii)$$

$$\beta_2 = \ln (1+r) \dots\dots\dots (iv)$$

Substitute (iii) and (iv) into (ii);

$$\ln Y_t = \beta_1 + \beta_2 t \dots\dots\dots (v)$$

After adding the disturbance term to equation (v);

$$\ln Y_t = \beta_1 + \beta_2 t + u_t \dots\dots\dots (vi)$$

$$\text{Compound Growth Rate (CGR) (\%)} = \{\text{Antilog} (\log \beta_2) - 1\} * 100$$

3.4.2 Instability

Coefficient of variation (CV) was used to measure the magnitude of instability of export earnings for the selected export trade groups. In general the coefficient of variation measures the amount of variation of the response variable. The index is as follows;

$$CV = \frac{\sqrt{\frac{1}{N-1} \sum (X_t - \bar{X})^2}}{\bar{X}} \dots\dots\dots (vii)$$

Where; X_t = real commodity value of export of the selected export categories in the year t

\bar{X} = mean value of real commodity export of the selected export categories in the year t

From equation (vii);

$$CV = (\text{Standard deviation}/\text{Mean}) * 100 \dots\dots\dots (Viii)$$

3.5 Data and Data Sources

Mainly secondary data was employed for the analysis. However, stakeholder key informant interviews were conducted to validate the results driven by the quantitative analysis and to obtain their suggestions for export diversification of F&V sector.

3.5.1 Secondary Data

Secondary data were obtained from the Sri Lanka Customs for the period of 1990 to 2012. Disaggregated data at Harmonized System (HS)¹ at fresh vegetables HS (70110-70999) and fresh fruit HS (8030010 – 8109090) were used. This categorization consists of around 20 fresh vegetable items excluding HS 071310 – 071390 (Dried leguminous vegetable, shelled, whether or not skinned or split) and HS 071410 - 071490 (Manioc, arrowroot, salep, Jerusalem artichokes, sweet potatoes and similar) and around 21 fresh fruit items except HS 8011109- 8029090 (coconuts, cashew, arecanuts and other nuts).

Agricultural export price index and other agricultural export price index were used to calculate the real export value with the base year of 2010 for the period of 1990-2012.

¹ The Harmonized System is an international nomenclature for the classification of products. It allows participating countries to classify traded goods on a common basis for customs purposes. At the international level, the Harmonized System (HS) for classifying goods is a six-digit code system. <http://unstats.un.org/unsd/tradekb/Knowledgebase/Harmonized-Commodity-Description-and-Coding-Systems>

Threshold level (\bar{X}) of trade was introduced in order to reduce the economically unimportant levels of exports that distort the analysis.

\bar{X} = Percentage share of total fresh fruit/ vegetables = 0.01

3.5.2 Primary Data

Key stakeholders were identified to discuss derived results and obtain their views to develop recommendations. Guided questionnaire was used to conduct interviews. Identified stakeholders included:

1. Five leading fresh fruit and vegetable exporters
2. President - Fresh Fruit and Vegetable Producers, Processors and Exporters Association
3. Director - Fruit Research and Development Institute, Department of Agriculture
4. Director Fruit and Vegetable Export – Export Development Board
5. Director Export Planning – Export Development Board

3.6 Scope of the Study

The study attempts to identify the export growth, instability and diversification patterns of the F&V export sector. Thus, the study proposes remedies for the issues of F&V export diversification and growth and provides recommendations for the F&V export diversification and growth.

CHAPTER FOUR

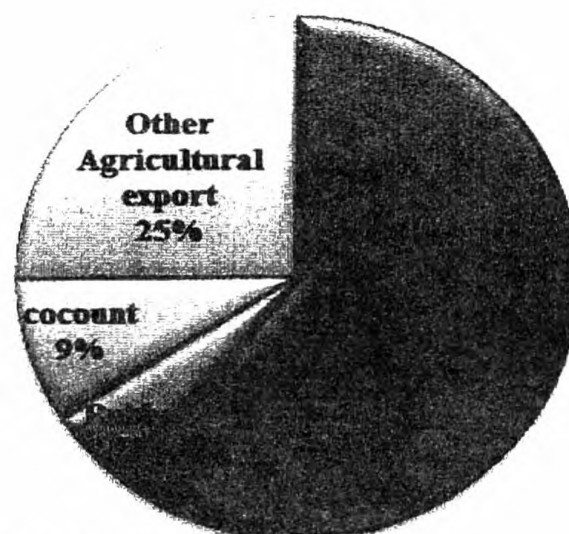
Fruit and Vegetable Export Performance in Sri Lanka and the Global Situation

4.1 Introduction

This chapter presents an overview of agricultural exports with special reference to Sri Lanka's position in global markets to identify the competitiveness and to find out the potential export items and destinations.

4.2 Composition of Agricultural Exports

The plantation crops (tea, rubber and coconut) form the largest category of agricultural exports. This sector contributed to around 18 per cent of the value of total exports (CBSL, 2013). Tea is the most significant export item in the agricultural export sector. Approximately 61 per cent of agricultural export earnings are from tea (Figure 4.1). Other agricultural export commodities constitute to one fourth of export earnings out of the total agricultural exports.

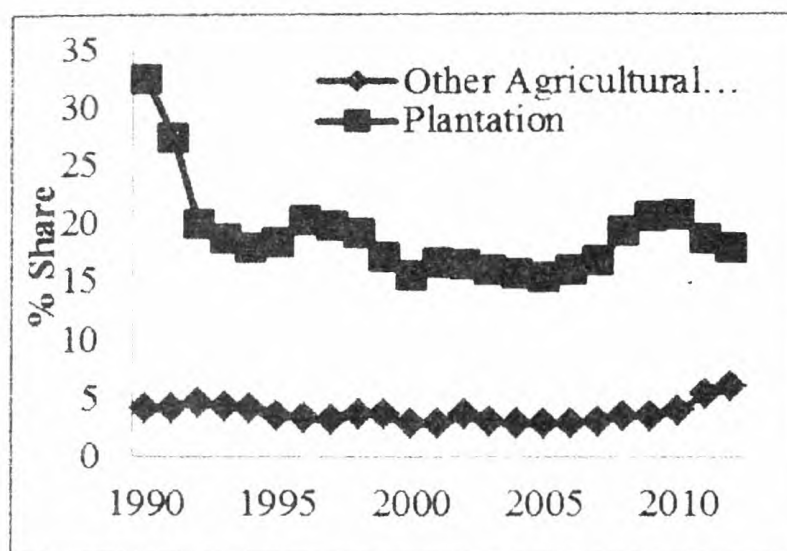


Source: Central Bank of Sri Lanka

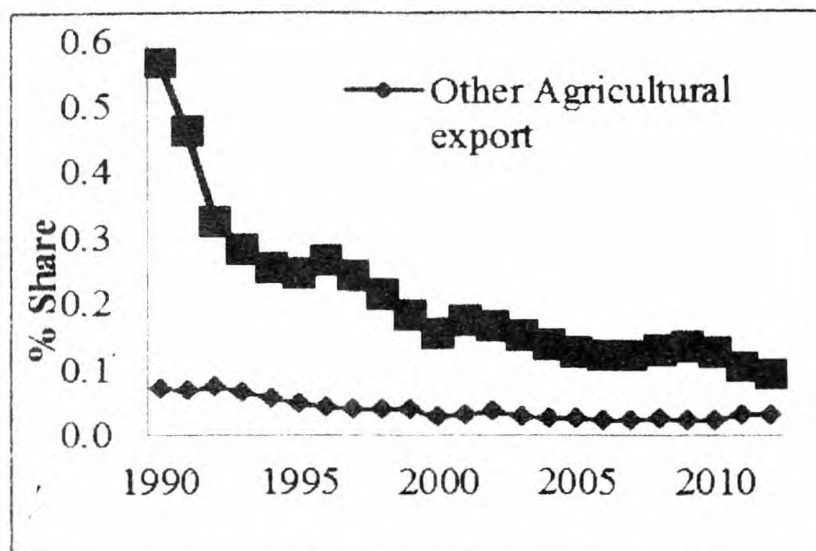
Figure 4.1: Composition of Agricultural Exports in 2012

4.3 Structural Changes in Agricultural Exports

With the introduction of open market policies in 1977, the involvement of agricultural exports including traditional (including plantation crops) and nontraditional (excluding plantation crops) exports to the total export earnings has decreased in real value term. However, as illustrated in Figure 4.2 and 4.3, in recent years this trend is intensifying both in the share of GDP and export earnings.



Source: Author's calculation based on the data from Central Bank of Sri Lanka



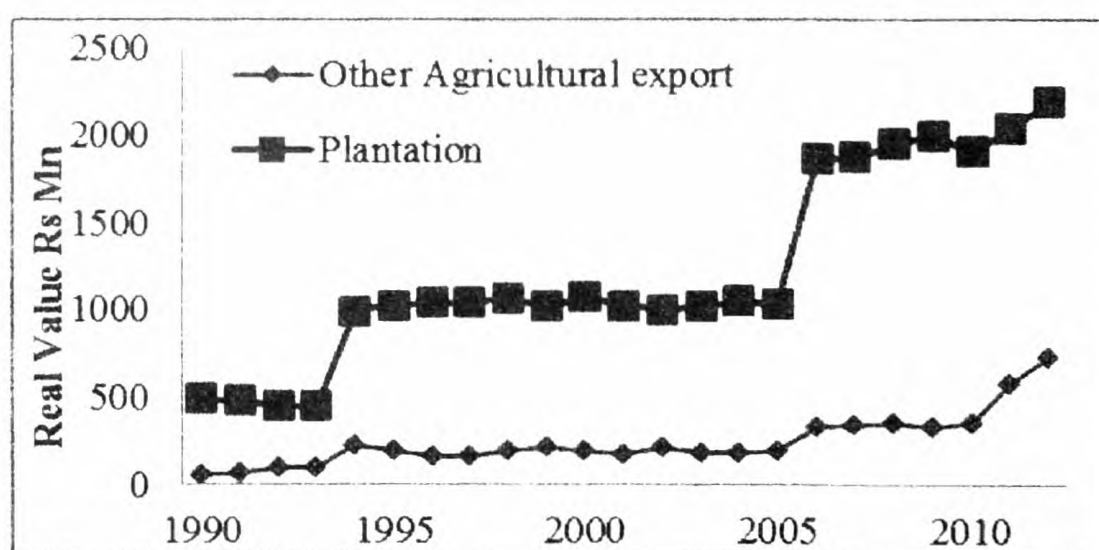
Source: Author's calculation based on the data from Central Bank of Sri Lanka

Figure 4.2: Share of Plantation and Other Agricultural Export in Total Export: 1990-2012

Figure 4.3: Gross Domestic Product (GDP) Share of Plantation and Other Agricultural Export: 1990-2012

Sri Lanka increasingly relies on traditional export of tea, rubber and coconut by narrowing export earnings into limited commodities. According to the literature, the country can diversify its export basket if there is an alternative form of traditional into nontraditional export. Figure 4.3 shows that the gap between traditional and nontraditional export contribution to the GDP is diminishing overtime, playing a significant role in other agricultural exports. Other agricultural export basket is a mix of spices (pepper, cinnamon, cardamom, cloves and nutmegs), vegetables, fruit, unmanufactured tobacco and other minor exports (cocoa, betel leaves, areca nuts, essential oils and cashew nuts). In 2012 other export crops accounted for 0.03% of GDP including F&V (CBSL, 2013).

Besides this trend, both traditional and nontraditional export earnings in real value terms have sharply increased over the years (Figure 4.4).



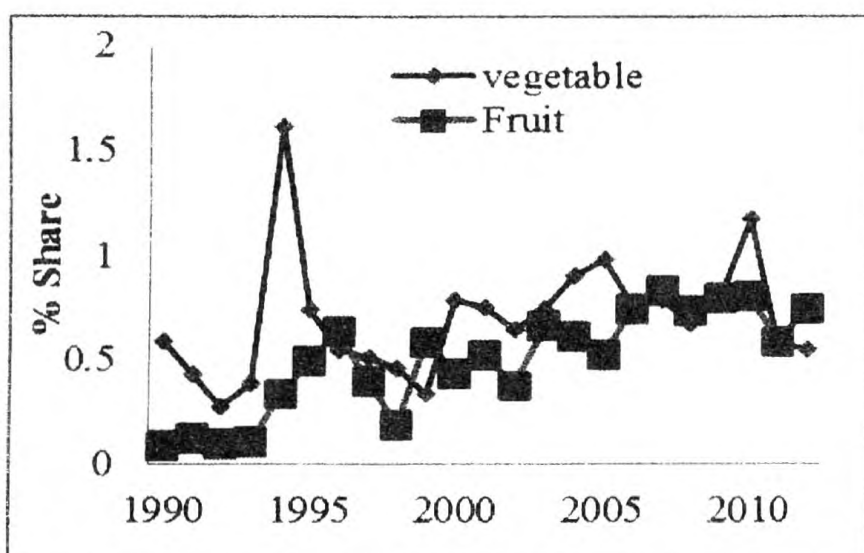
Source: Author's calculation based on the data from Central Bank of Sri Lanka

Figure 4.4: Plantation and Other Agricultural Commodity Export Values (real):1990-2012

Increasing F&V export earnings, performance of the fisheries sector, good demand for spices in the world market, favorable global economic stipulations along with government export promotional programmes resulted in a surge in exports.

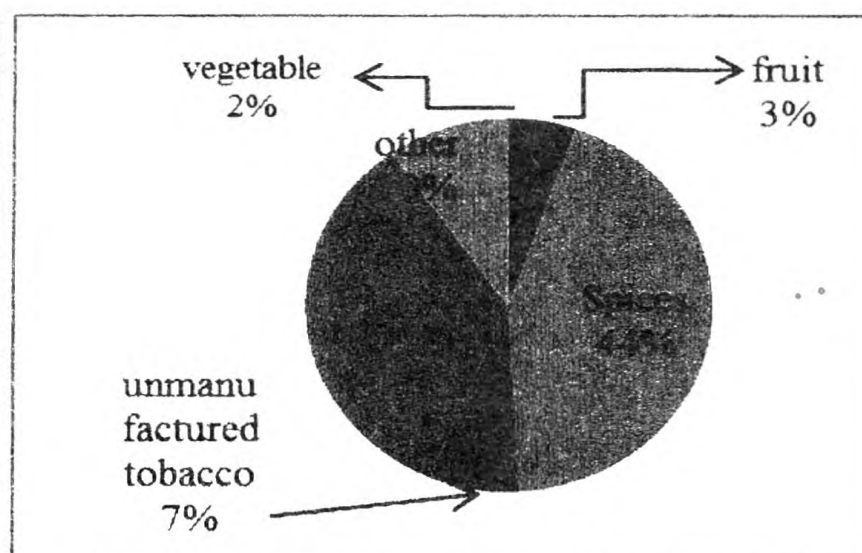
4.4 Changing Patterns of F&V Export Share in Agricultural Export Basket

In Sri Lanka, other agricultural real exports earnings grew only by 44 per cent from 1990-2012. However, its export of fruit grew by Rs. 1.06 million in 1990 to Rs. 22 million in 2012 and vegetables grew from Rs. 7 million in 1990 to Rs. 16 million in 2012 in real value (CBSL, 2013).



Source: Author's calculation based on the data from Sri Lanka Customs

Figure 4.5: Changing Share of F&V Export in Total Agricultural Export Basket: 1990-2012



Source: Author's calculation based on the data from Sri Lanka Customs

Figure 4.6: Share of F&V Export in Agricultural Export Basket (excluding plantation) in 2012

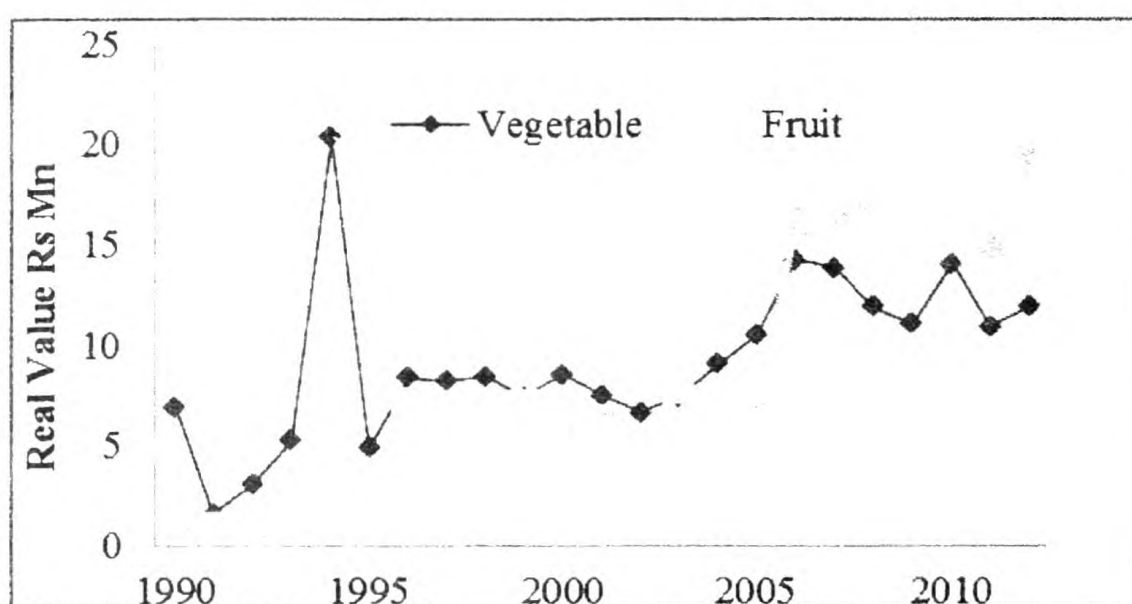
The nontraditional agricultural sector largely comprises of spice exports which contribute to around 44 per cent followed by seafood exports that contribute to around 34 per cent. However, as illustrated in Figure 4.6, Sri Lanka's F & V exports occupy around 5 percent in the nontraditional export basket. According to literature, poor performance of less developed countries is primarily due to their export composition, which is inelastic to demand (Nurkse, 1953). F&V exports in Sri Lanka are also inelastic to the growing demand in the world. However, the process of trade expansion is generally assessed by the structural shift in the commodity composition of export basket (Tiwari, 1986). Thus, along with an upward trend in export of F&V, it is necessary to change the composition of exports.

The F&V industry in Sri Lanka has the potential to make a significant contribution towards commercialization of non-plantation agriculture (Esham & Usami, 2006). The increase in processed F&V, specially the export of fruit in cans and bottles also encouraged the rise in export earnings. Expanding of the F & V processing industry creates higher paid jobs in the sector and helps farmers sell the less valuable segment of

their crop at bulk rates (Samaratunge *et.al*, 2009). Thus for diversification of traditional to nontraditional export, this sector can be utilized to a great extent with this upward performance.

4.5 F&V Export Trend in Previous Two Decades

Over the last two decades F& V export earnings inclusive of processed products have contributed to the growth of nontraditional exports (Figure 4.7). In 1993 -1994 vegetable export earnings increased to the highest record level. This is mainly due to the growth in the export of gherkin in the processed form e.g. gherkin brine or vinegar. Basically these processed items were directed to European markets (Belgium, France, Germany and Italy) during this period. Gherkin was cultivated for export by a relatively large number of small farmers on production management contracts. In the mid 1990s a number of agribusiness companies were involved in gherkin cultivation with the participation of about 15,000 small farmers (Dunham, 1995). However, in the latter part of 1995, the gherkin processing industry slowed and there was a downturn in production and exports. This is mainly due to competition from India. Further, the lack of proper organization models to sustain agribusiness linkages greatly influenced the decline of this industry (Esham & Usami, 2006).



Source: Author's calculation based on the data from Sri Lanka Customs

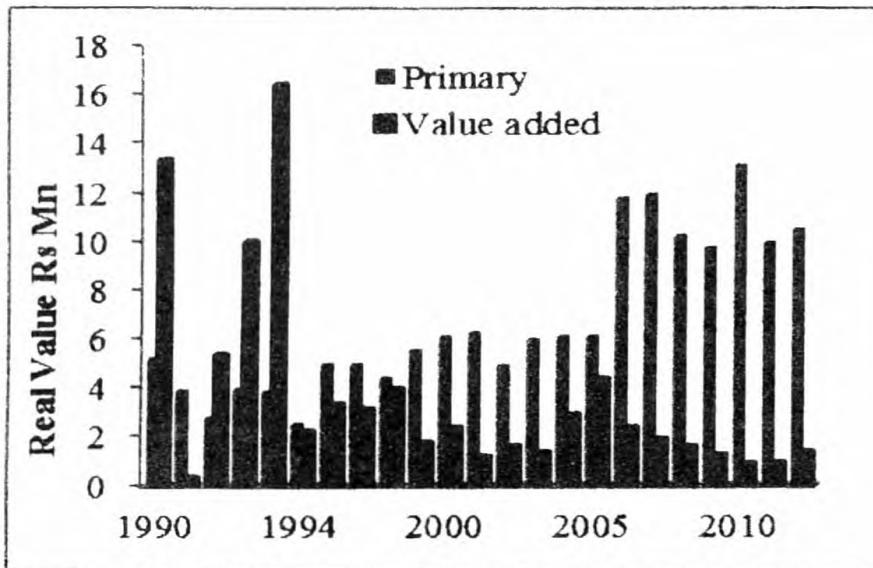
Figure 4.7: Fruit and Vegetable Export Value (inflation adjusted) (both primary and value added): 1990-2012

4.6 Value Addition of Fruit and Vegetable for Export

Initially the F&V sector was limited to the local market as it was grown mostly at home garden level. There was a lack of value addition and F&V were consumed in the fresh form. As shown in figure 8 and 9, around 11% of the total vegetable exports and 20% of the total fruit exports are in its processed form. Tomato, chili and gherkin are the major vegetable varieties that are processed mainly to produce chutney, pickles, sauce and gherkin in brine and vinegar while pineapple, mango, melon and passionfruit are the

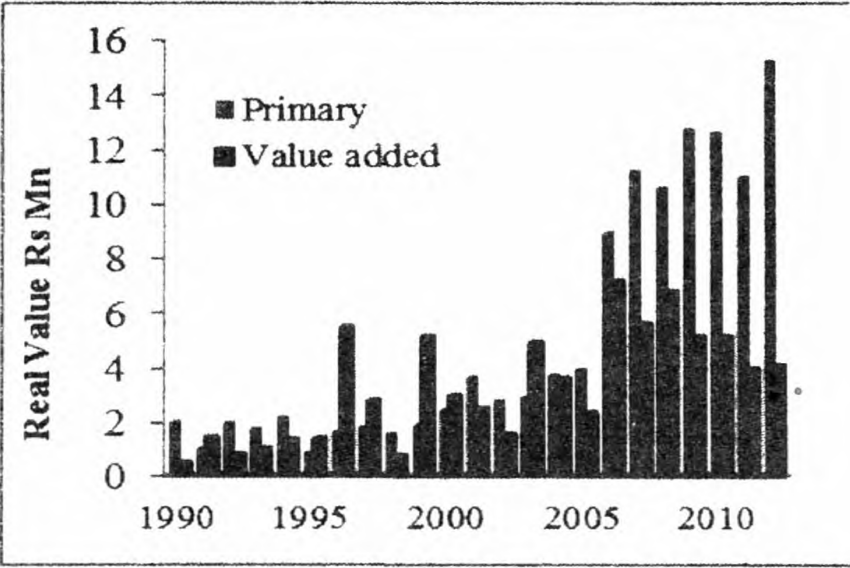
major fruit used in the fruit processing industry to produce ready to serve beverages, squash and jam.

The total real export value of fresh F & V has increased from Rs. 7 million in 1990 to Rs. 25 million in 2012. In contrast, the corresponding value for value added export has decreased by Rs 13 million in 1990 to Rs. 5 million in 2012 (Figure 4.8). This is mainly due to the poor performance of the value added industry in vegetables. The main reason was the collapse of the gherkin sales contracts. Nevertheless, fruit export of value addition has increased slightly over time (Figure 4.9).



Source: Author's calculation based on the data from Sri Lanka Customs

Figure 4.8: Primary and Value Added Vegetable Export: 1990-2012



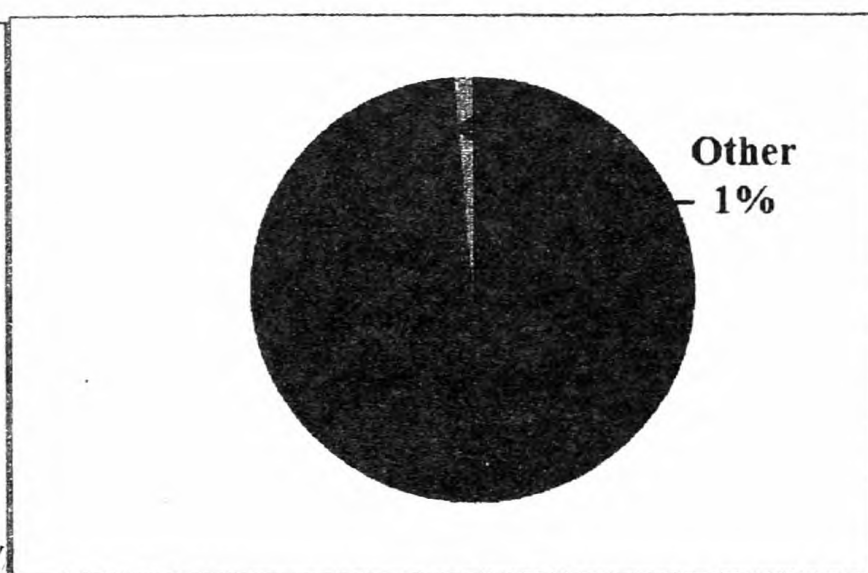
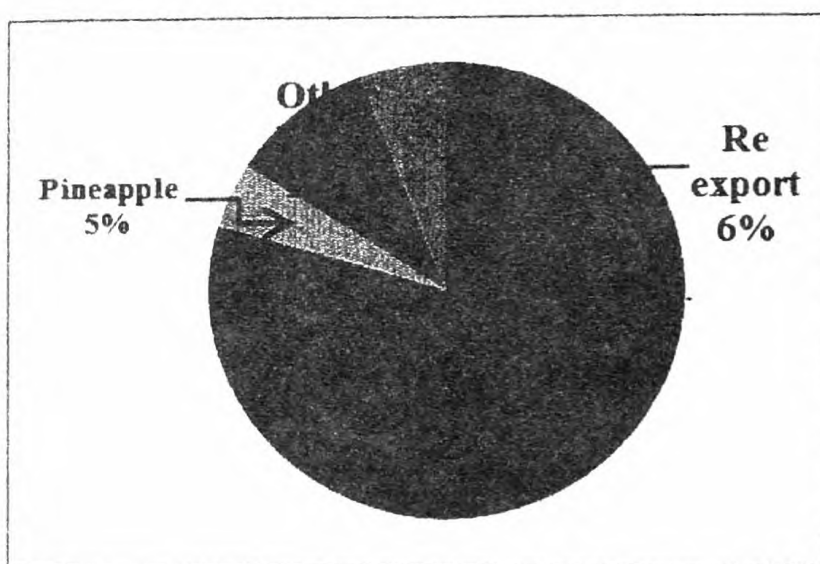
Source: Author's calculation based on the data from Sri Lanka Customs

Figure 4.9: Primary and Value Added Fruit Export: 1990-2012

4.7 Structure of Trade in Export of Fresh F&V

The main vegetable that are exported include globe artichokes, green beans, leeks, capsicum, cabbage, carrot, tomato, bell pepper and gherkin, while the fruit include banana, pineapple, papaya, passionfruit and lime.

Figure 4.10 shows that in the fruit sector, banana is the main export mainly due to Cavendish cultivation which is now at commercial level. Other local varieties of banana such as Ambul, Kolikuttu, Sugar Plantain, Rathambala and Ambun export is very limited though these are popular among local consumers. However, varieties such as Rathambala have a very good demand particularly in the Maldivian hotel industry yet Sri Lanka cannot cater to the demand due to issues such as quality, post harvest losses and high perishable nature. Papaya and pineapple are the other main exports of fruit (Figure 4.10). The most promising situation is the re-export of fruit which maintains a considerable share in the fruit export basket. Apple, grapes, figs, dates, plums and sloes are the main re - export fruit specially directed towards Maldives and UAE markets.



Source: Author's calculation based on the data from Sri Lanka

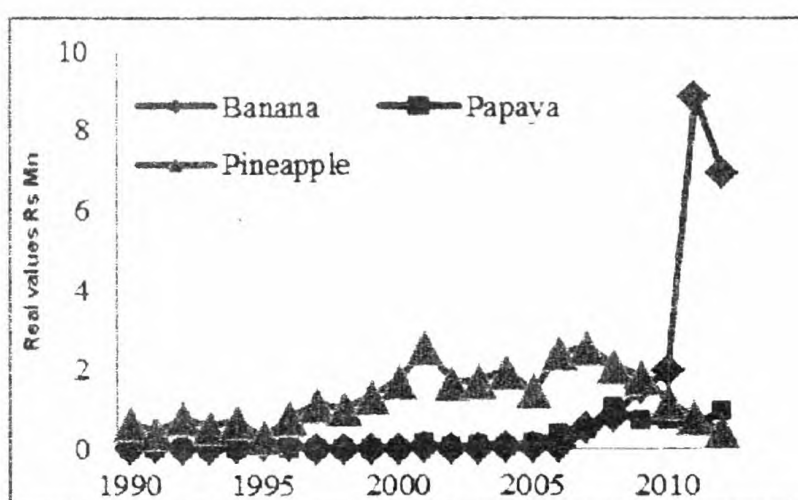
Figure 4.10: Export Structure of Fresh Fruit in 2012

Figure 4.11: Export Structure of Fresh Vegetables in 2012

Approximately 80 per cent of the total vegetable exports in Sri Lanka are specified by way of HS code which falls under the other category (Figure 4.11). Difficulties of disaggregation to review individual vegetable items are a core dilemma in the vegetable export sector. Globe artichoke is the next highest export earning crop in the vegetable export mix, according to the Sri Lanka Customs data base. However, under this HS code other types of fresh vegetable also exported. Therefore, it is difficult to have a clear image about the individual vegetables are export figures. All other types of vegetable are given a separate HS code which represents around 1 per cent.

4.8 Changing Patterns of Major Fresh Fruit and Vegetable Exports

Papaya and banana exports grew significantly during the last few years while pineapple export declined over time (Figure 4.12).



Source: Author's calculation based on the data from Sri Lanka

Figure 4.12: Change in Banana, Papaya & Pineapple Export: 1990-2012

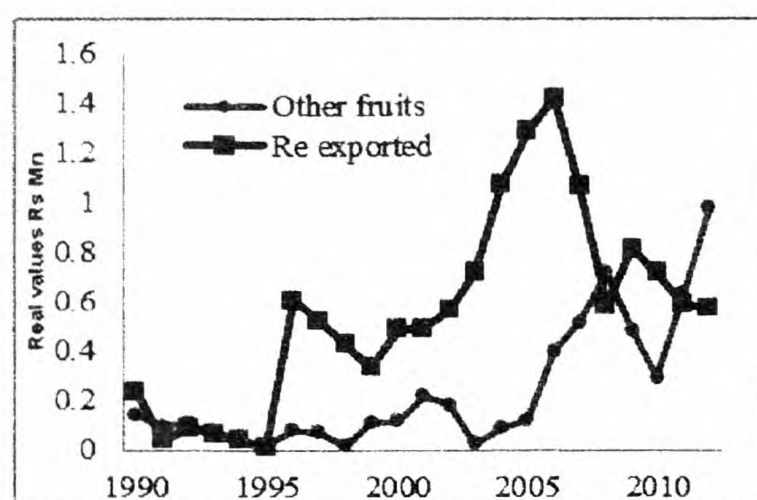
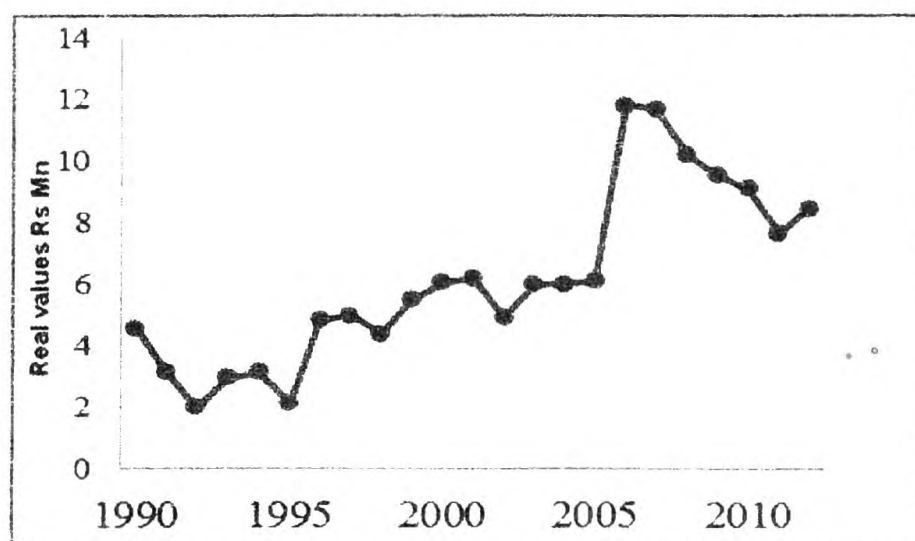
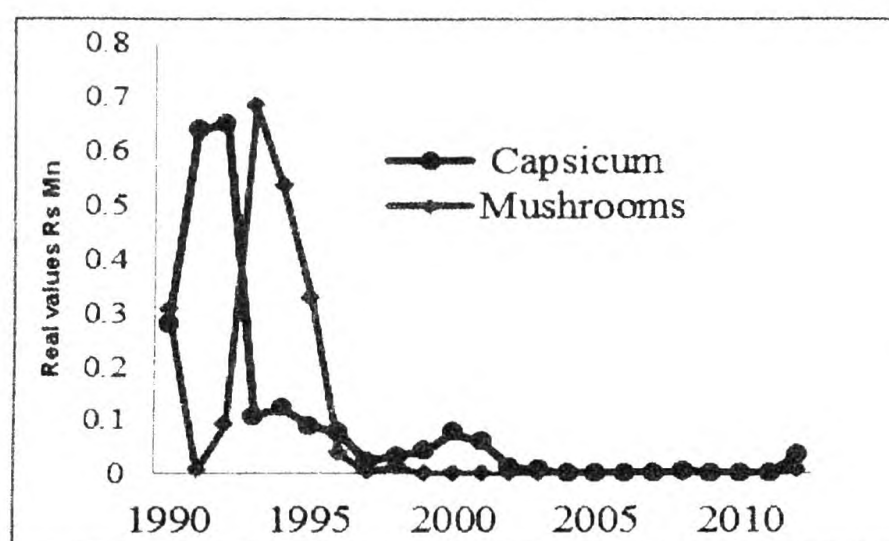


Figure 4.13: Change in Export of Other Fruit Re-export Fruit: 1990-2012

Cavendish and red papaya are the two prominent varieties in Sri Lanka and have led to a rise in export earnings during the last few years. On the other hand the pineapple export market share has declined over the years irrespective of the growing demand for Sri Lankan pineapple in the world market. High cost of production and inefficient supply linkages are the drawbacks. In addition to that, real value of other exportable fruit items has increased recently despite high fluctuations (Figure 4.13). This group of items includes strawberries, avocados, guava, lime, mangoes, mangosteens and lemons. Re-export fruit showed a sharp rise during the period of 2007-2008. However re-export of fresh fruit is highly susceptible to the demand of Maldivian and Middle East markets.



Source: Author's calculation based on the data from Sri Lanka Customs

Figure 4.14: Change in Capsicum and Mushrooms Export: 1990-2012

Figure 4.15: Change in Vegetable Specified under Other Category: 1990-2012

In early 1990s capsicum and mushroom exports showed an unexpected increase in export earnings in real term (Figure 4.14). Inclusive demand for these items and the well managed mushroom production programmes led to this remarkable increment. However, inadequate quality improvements and lack of ability to meet the changing demand towards button mushroom and capsicum led to a decline in exports. As Figure 4.15 depicted, vegetable exports in the other category show an upward trend over the years, yet Sri Lanka has been sluggish in utilizing the growing opportunities in global markets.

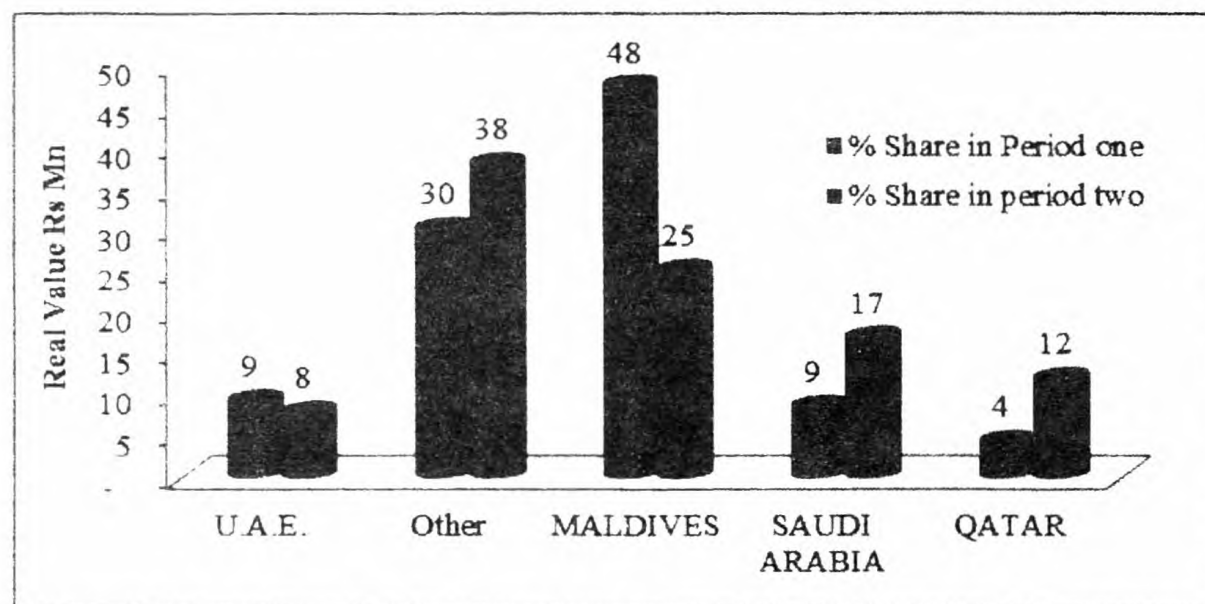
4.9 Direction of Export

Sri Lanka's F&V exports as a whole are directed mainly towards the Middle East and Maldives. Approximately 54 per cent and 22 per cent of the total fresh F&V were exported to Middle East and Maldives respectively in 2012 (Sri Lanka Customs, 2013). Geographical proximity, regular shipping connections and higher demand of these countries led to the opened up Sri Lankan F&V exports to these markets. Freshness plus the lower cost of maritime transport are strong reasons for "best practice" horticulture enterprises to be located in Sri Lanka than in more distant countries (Samaratunge *et. al*

2009). Hence Sri Lanka is set to capture a larger share of these markets. On the contrary, Sri Lanka's potential to capture the growing Asian and European markets for F&V is negligible.

4.9.1 Fresh Fruit Export Direction

Fresh fruit export market share has comparably shifted within the period of 1990 – 2000 and 2002 -2012. According to the Figure 4.16, particularly the Maldivian market shares have reduced to 25 per cent during this period. On the other hand, market share of Saudi Arabia and Qatar had expanded by around 8 per cent. In addition, fresh fruit export has been distributed to other markets as well. The detailed analysis is presented in Table 4.1.



Source: Author's calculation based on the data from Sri Lanka Customs

Figure 4.16: Top Fresh Fruit Export Destinations: Average Value (inflation adjusted) in Period One (1990-2000) and Period Two (2002-2012)

In terms of generating foreign exchange, banana is the top exported item in the fruit export basket, adding 41 per cent to the total fresh fruit export earnings. Saudi Arabia is the top market for Sri Lankan banana importing around 49 percent. However, 75 percent of banana exports during the last ten years were sent to Saudi Arabia, U.A.E. and Qatar (Table 4.1).

Table 4.1: Top Five Fresh Fruit and Their Export Share and Destinations

Top five fruit exported	Top Five Export Destinations				
	Country 1	Country 2	Country 3	Country 4	Country 5
1. Banana (41%)	Saudi Arabia (49%)	U.A.E (15%)	Qatar (11%)	na	na
2. Pineapple (28%)	Germany (24%)	U.A.E (22%)	Maldives (16%)	USA (7%)	France (6%)
3. Figs (14%)	U.A.E (29%)	Maldives (18%)	Kuwait (11%)	Qatar (10%)	Saudi Arabia (8%)
4. Papaya (9%)	U.A.E (45%)	Japan (15%)	USA (14%)	Austria (12%)	Germany (4%)
5. Lemon (2%)	U.A.E (74%)	Saudi Arabia (17%)	Maldives (4%)	na	na

Note: Figures in parenthesis indicate percentage share of export in real value term

Figures are pertaining to last ten year average (2002-2012)

na: No country reported percentage share of its export > 1

Source: Author's calculation based on the data from Sri Lanka Customs

Pineapple exports contributed nearly 28 per cent to the total fruit export earnings, second to banana. However, unlike other major fruit exports, the markets for pineapple are shared between Middle East as well as European markets. The highest percentage of exports was to Germany (24%). The USA and France are also leading markets for Sri Lankan pineapple (Table 4.1). The third top fresh fruit is figs. This fruit is re-exported basically on the demand of Middle East and Maldivian markets.

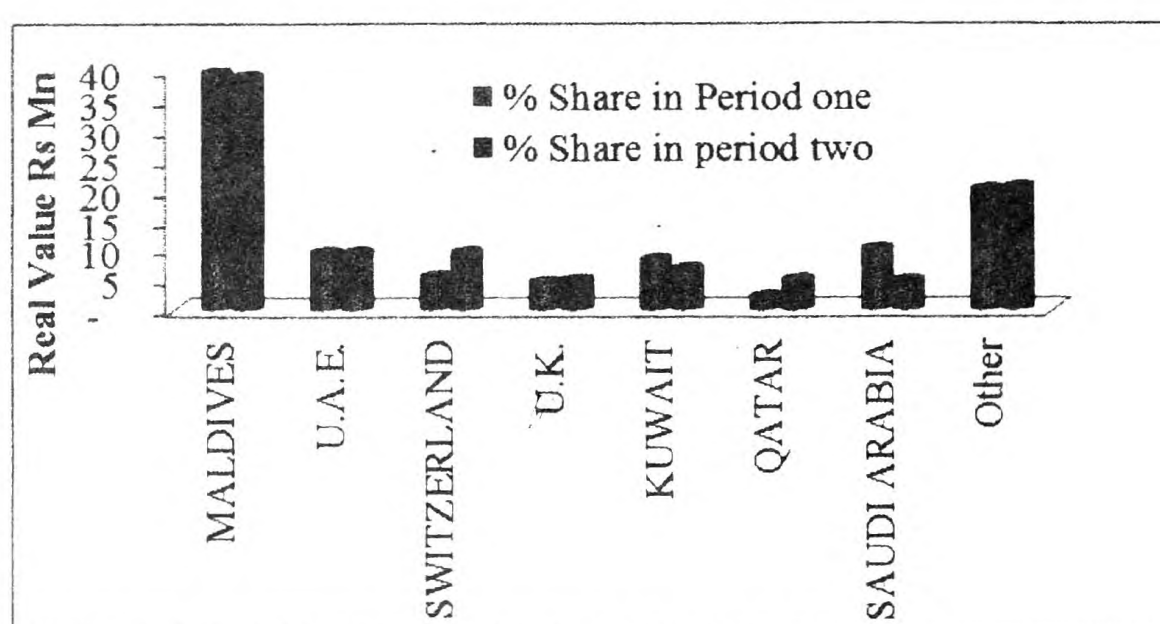
Papaya export is centered in Middle East, Japan and the USA, diversifying the export destinations even though the contribution to total fresh export is little. Lemon which is also a major fruit is being exported to the Middle East.

4.9.2 Fresh Vegetable Export Direction

Figure 4.17 illustrates that diversification of fresh vegetable export destinations has relatively improved compared to fruit export destinations. Though Maldives imported around 40 per cent of Sri Lankan vegetables and the remaining 60 per cent is sent to Middle East and European countries such as Switzerland and the United Kingdom.

It was founded that around 87 per cent of fresh vegetable are specified into the other category under single HS code. However, 42 per cent of this category is exported to Maldives, UAE and Switzerland and the export share of Kuwait and Qatar of these vegetables is around 10 %, 9 % and 12 % respectively for the last decade (Table 4.2). The Second highest value vegetable export is globe artichokes taking 10 per cent of the total fresh vegetable export value and significantly this high value items are exported to

Switzerland (15 %), United Kingdom(14%), Norway (9%) other than Maldives and U.A.E. Export direction of leek and allies has captured the EU markets (Table 4.2).



Source: Author's calculation based on the data from Sri Lanka Customs

Figure 4.17: Top Fresh Vegetable Export Destinations: Average Value (inflation adjusted) in Period One (1990-2000) and Period Two (2002-2012)

Due to the disaggregation issue, it is rather difficult to identify potential vegetable export commodity and their markets. Introducing separate HS codes is essential. However, authorities argue that owing to a vast number of vegetable items with significantly fewer quantities makes it difficult to introduce separate coding for individual vegetable.

Table 4.2: Top Five Fresh Vegetables and Their Export Share and Destinations

Top five vegetable exports	Top Five Export Destinations				
	Country 1	Country 2	Country 3	Country 4	Country 5
Commodity					
1. Non - specified (87%)	Maldives (42%)	U.A.E (10%)	Switzerland (9%)	Kuwait (7%)	Qatar (5%)
2. Globe artichokes (10%)	Switzerland (15%)	U.K. (14%)	Maldives (10%)	U.A.E (10%)	Norway (9%)
3. Leeks and other (1%)	Switzerland (35%)	France (21%)	Germany (13%)	U.K. (10%)	Italy (7%)
4. na	na	na	na	na	na
5. na	na	na	na	na	na

Note: Figures in parenthesis indicate percentage share of export

Figures are pertaining to last ten year average

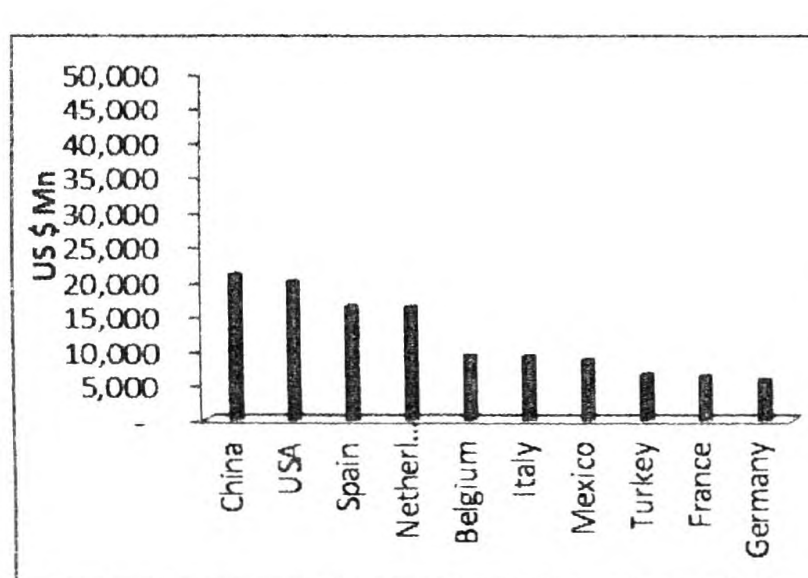
Na: No country reported percentage share of its export > 1

Source: Author's calculation based on the data from Sri Lanka Customs

4.10 Competitiveness of Sri Lankan Fresh Fruit and Vegetables in Global Markets

China is the world's leading F & V exporter. The USA and other European countries play a major role being competitors to China (Figure 4.18). However, China is the only representative of the Asian region among the top ten leading F&V exporters. Yet the share of Asian F&V export value is second only to Europe, contributing around 27 per cent of the world F&V export value (Figure 4.19).

According to Abeysinghe (2013), Asia has a potential to expand the export of goods and services. The global trade share of Asia is increasing at a rapid pace and by 2025 Asia is expected to be the world's largest producer of goods and services; it will also be the world's largest consumer. It is already the most populous region in the world. In the future, it will also be home to a majority of the world's middle class (Abeysinghe, 2013). The growth in F&V exports as a proportion of the total agricultural exports has been noticed to be much faster for developing countries as against the developed countries. However, this will depend on prices and import demand of these high value crops in various regions of the world (Shah, 2008). China, India, Thailand, Malaysia and Philippines are the top traders of F & V to the world. As shown in Figure 4.19, South Asia contributed to around 3 per cent of F&V exports. Asian leading fresh fruit and vegetable exporters are China, Philippines, Thailand, India, and Korea (Huang, n.d.). Sri Lanka has to compete mainly with India and Pakistan; as the main competitors in the South Asian region. So far Sri Lanka exports F&V to Asian countries as well as to Middle East and a very little to European countries. Capturing the developed market where there is a demand for fresh F and V is difficult with the competition from emerging countries like China and India. Therefore, diversifying our F&V with underutilized indigenous F&V varieties is crucial.



Source: Author's calculation based on the data from FAOSTAT, FOA (<http://faostat.fao.org/site/342/default.aspx>)

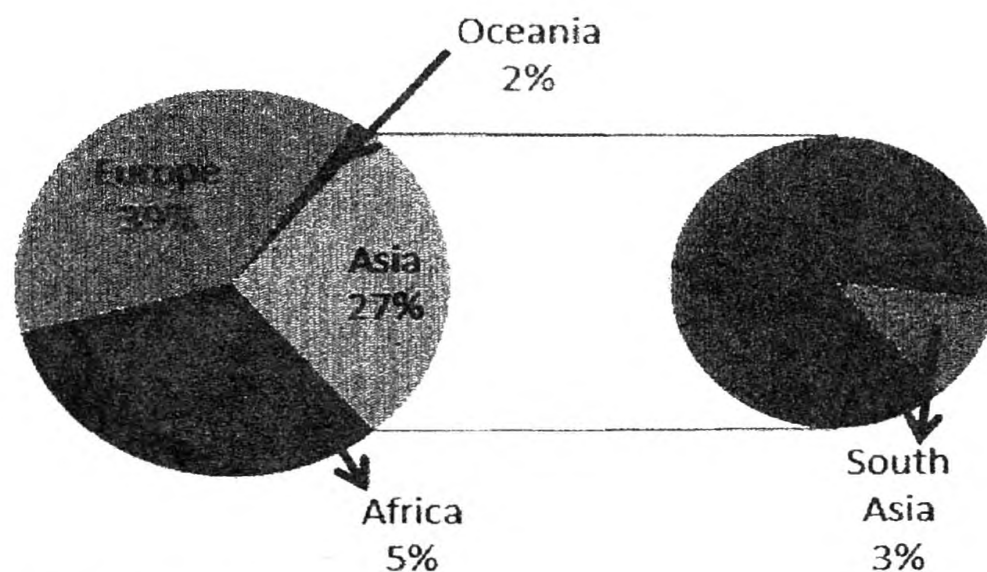


Figure 4.18: Top Ten Leading F&V Exporting Countries in 2011

Figure 4.19: Regional Distribution of F&V Export in Value Term: 2011

Sri Lanka has a promising but virtually untapped potential as an exporter of high value horticultural products to nearby markets and Sri Lanka benefits from its proximity and regular shipping connections to these markets (Samaratunge *et.al*, 2009). However, Sri Lanka's position in the world F&V export is still insignificant. For pineapple and papaya Sri Lanka's rank among global exporters was 39 and 27 respectively (Table 4.3).

Table 4.3: World Market Share of Top Five Leading F&V Exporters and Sri Lanka's Position in Global Trade

Commodity	Country 1	Country 2	Country 3	Country 4	Country 5	Sri Lanka's Rank in global trade
Banana	Ecuador (27%)	Belgium (15%)	Colombia (9%)	Costa Rica (9%)	Philippines (6%)	na
Pineapple	Costa Rica (43%)	Belgium (12%)	Netherlands (10%)	USA (6%)	Philippines (4%)	Rank (39) Share (0.11)
Papaya	Mexico (25%)	Brazil (21%)	USA (12%)	Netherlands (11%)	Belize (7%)	Rank (27) Share (0.35 %)
Lemon & Lime	Spain (16%)	Turkey (13%)	Mexico (10%)	Netherlands (7%)	Argentina (6%)	Rank (54) Share (0.04 %)
Artichokes	Spain (32%)	France (17%)	Egypt (13%)	Italy (10%)	Netherlands (2%)	na
Leeks, other alliaceous vegetable	Belgium (13%)	Netherlands (12%)	China (11%)	Spain (4%)	France (4%)	Rank (73) Share (0.001)
Vegetable un specified	Mexico (9%)	Italy (8%)	Netherlands (8%)	USA (5%)	China (5%)	Rank (43) Share (0.22)

Note: Figures in parenthesis indicated percentage share of world export in 2011(in Value term US\$)

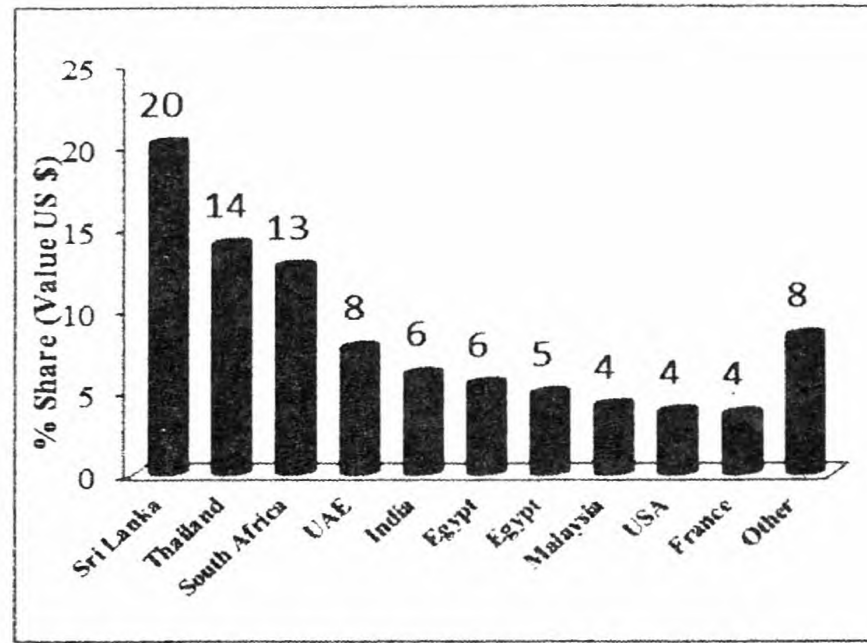
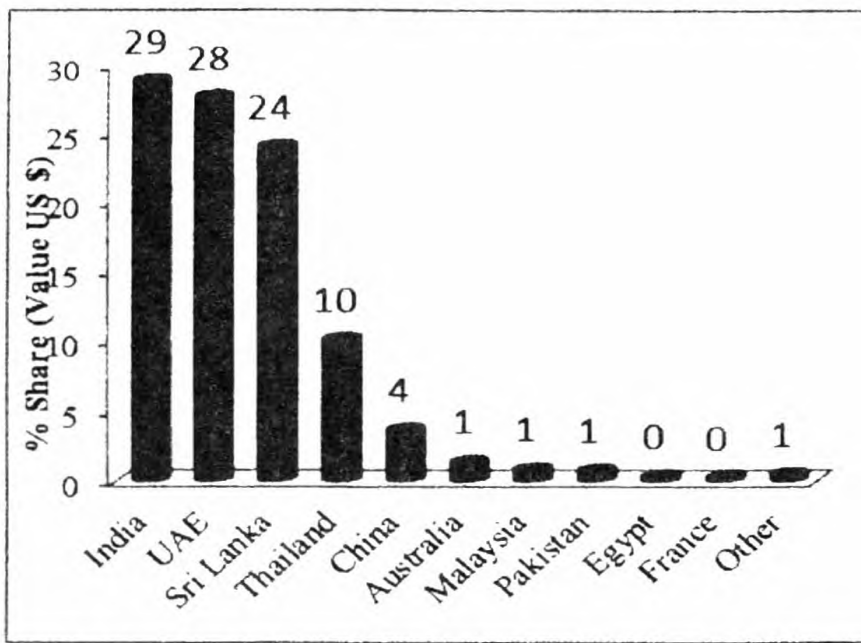
Source: Author's calculation based on the data from FAOSTAT, FA

(<http://faostat.fao.org/site/342/default.aspx>)

4.11 Sri Lanka's Share of F & V in Selected Markets

4.11.1 Maldives

The demand for F & V in Maldives is increasing to cater to the demand of tourism industry. The tourism industry has been very well developed in Maldives and the industry is expanding over the years. Further, Maldives imported most of food items including F&V to meet the demand of its local consumers as well. The Maldives' major F&V importers are Sri Lanka, India, Thailand, UAE and China (Figure 4.20 & 4.21). As figures depict Sri Lanka was the top fruit importer in 2011 sharing nearly 20 per cent of the total fruit imported by Maldives.



Note: Percentage share of total export are indicated top of the each bar for particular year
 Source: Author's calculation based on the data from UN comtrade, United Nation
<http://comtrade.un.org/db/>

Figure 4.20: Top Ten World Fresh Vegetables Suppliers to Maldives in 2011

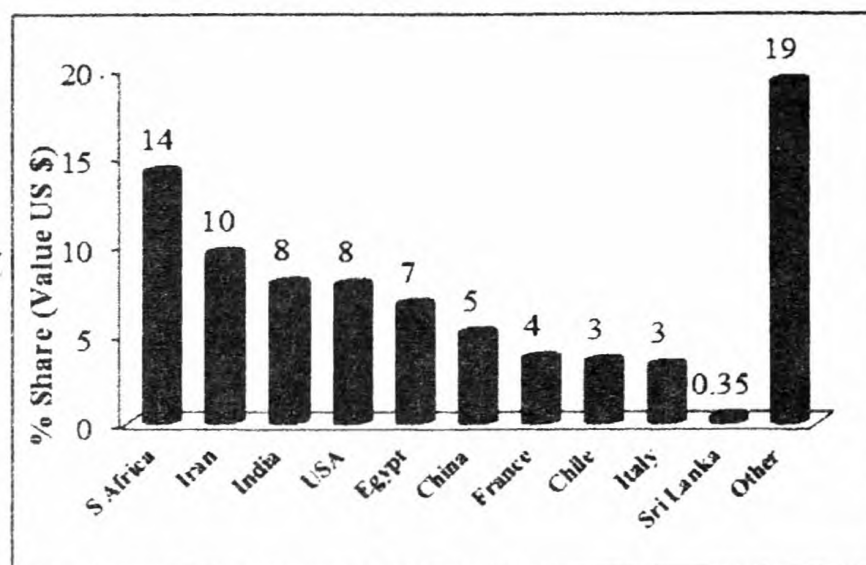
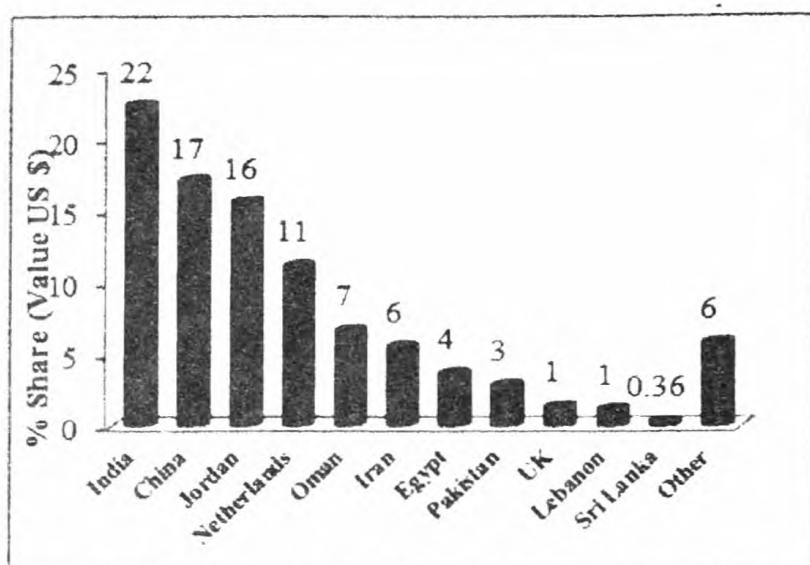
Figure 4.21: Top Ten World Fresh Fruit Suppliers to Maldives in 2011

Thailand, South Africa, UAE and India are the major competitors of Sri Lanka in Maldivian fruit market. However, in case of vegetables India is the top importer of this country (Figure 4.20). Further, around 28 per cent of total vegetables are imported from the UAE. An important point is that the UAE is importing quality F&V from other countries especially from Europe and re exporting to Maldives. Sri Lanka is losing the market share of F & V due to quality standards and high price volatility as well as high competition of India, UAE, Thailand and China. The major fresh vegetable items Sri Lanka is exporting to Maldives are potato, onion and shallot, globe artichoke (groups of vegetable coming under this HS code), mushrooms, carrot, cabbage and the major re-exported fruit items are apple, figs, plums and dates. Other than that banana, lemon, pineapple, mango, papaya are major fruit demanded by the Maldivian market. Sri Lanka is regularly supplying these products. However, the quantity supplied is changing over the years.

Overall, Sri Lanka is losing its market share in Maldives to India. According to the Exporters Association of Sri Lanka, this is mainly due to cost advantage of Indian products that are transported via sea compared to Sri Lankan products transported by air. Therefore there is a need of shifting transport of goods from air to sea, between Colombo and Male; to regain the Maldivian market is highlighted. The view of the Association was that a small vessel of 100 tones with air condition facility was sufficient to carry the cargo from Sri Lanka to Male. The cost could be further reduced by operating the vessel from one of the fisheries harbors in Sri Lanka.

4.11.2 The United Arab Emirates

The UAE is one of Sri Lanka's top five F&V client countries (Figure 4.16 & 4.17). However, the Sri Lankan share of the UAE market is very little (Figure 4.22 & 4.23).



Note: Percentage share of total export are indicated on the top of the each bar for particular year

Source: Author's calculation based on the data from UN comtrade, United Nation -

<http://comtrade.un.org/db/>

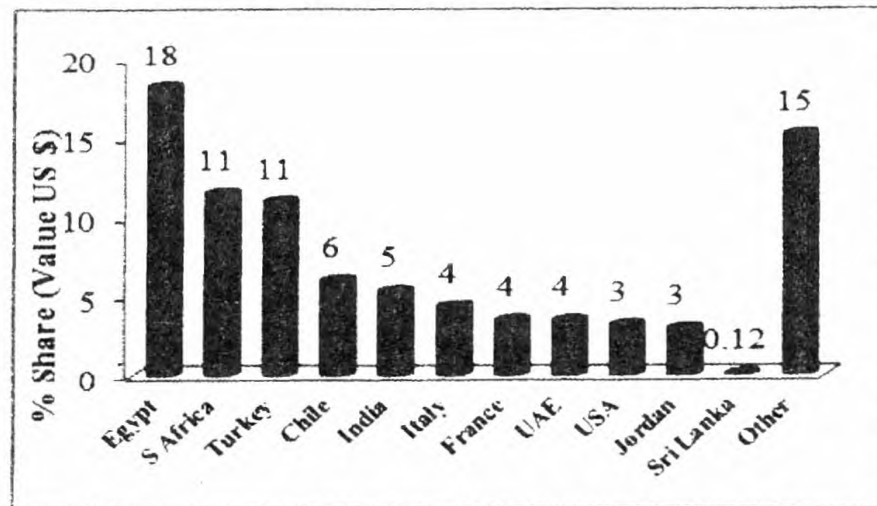
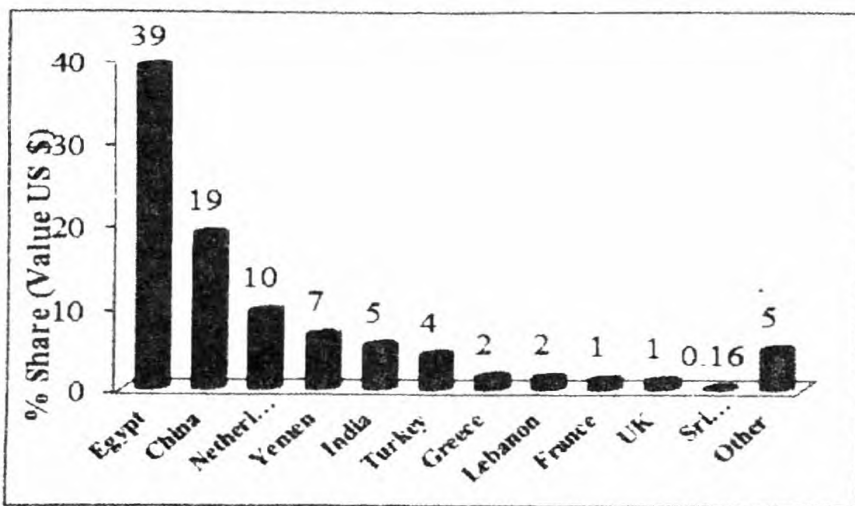
Figure 4.22: Top Ten World Fresh Vegetables Suppliers to UAE in 2011

Figure 4.23: Top Ten World Fresh Fruit Suppliers to UAE in 2011

Sri Lanka contributed only around 0.35 per cent to the total UAE F&V import demand. India and China are the top two vegetable exporters and South Africa, Iran and India are the top three vegetable exporters to the UAE. High quality and consistency in supply are the major barriers to capture the UAE market. However, Sri Lanka is regularly supplying major fruit such as pineapple, banana, papaya and figs. Sri Lanka's export of globe artichokes (groups of vegetables coming under this HS code) to UAE has increased in recent times. Nevertheless, Sri Lanka has lost the markets for mushrooms, capsicum and leeks and other allies over time.

4.11.3 Saudi Arabia

Saudi Arabia is a Sri Lanka's major F&V export destination. Yet Saudi Arabia mainly exports from European markets and China to meet their total import demand of F & V (Figure 4.24 & 4.25).



Note: Percentage share of total export are indicated on the top of the each bar for particular year
 Source: Author's calculation based on the data from UN comtrade, United Nation - <http://comtrade.un.org/db/>

Figure 4.24: Top Ten World Fresh Vegetable Suppliers to Saudi Arabia in 2011

Figure 4.25: Top Ten World Fresh Fruit Suppliers to Saudi Arabia in 2011

Sri Lanka's position in Saudi Arabian F&V export market is also negligible. India, USA, China are the potential countries which compete with Sri Lanka. Globe artichokes (groups of vegetable coming under this HS code), pineapple, figs, banana and papaya are mainly exported to this market and papaya and banana exports have increased recently. On the other hand, Sri Lanka has been losing the export of leeks, capsicum and mushroom to Saudi Arabia. According to the exporters view, quality and inconsistency in supply create the market mislay.

CHPATER FIVE

Growth, Instability and Degree of Diversification of F&V Export in Sri Lanka

5.1 Introduction

The empirical findings of the research will be demonstrated in this chapter under three subsections: estimated results of growth and instability of F&V exports, degree of changing concentration of Sri Lanka F&V export basket over the years and decomposing of the F&V export growth rates towards intensive and extensive margins followed by a discussion on the product and market diversification.

5.2 F&V Export Growth and Instability

Sri Lanka F&V exports show a positive growth although there are wide fluctuations in export earnings as discussed in the previous chapter. Instability among the individual commodities has affected export earnings of the country.

5.2.1 Growth Rates and Instability of Fresh Fruit Exports

The compound growth rate analysis shows that the total fresh fruit export earnings have increased by 13 per cent annually. Papaya export records the highest growth rates over the years compared to other major fresh fruit items which Sri Lanka exports (Table 5.1). The world market share of Sri Lankan papaya is noticeably high compared to pineapple and banana, which demonstrates that there is a great potential for the export of this commodity. However, instability index value is very high.

Thus if Sri Lanka is capable of balancing the market price fluctuations of banana and stabilizing the market share of papaya, these export items would be much prominent in the export market. Despite the global demand, Sri Lanka's pineapple export earnings grew only by 8 per cent annually indicating inadequate performance (Table 5.1). According to the stakeholders' view, high cost of production and supply chain inefficiency has an effect on this mislay of market share of pineapple. Banana export is also growing significantly. The growth of banana export earnings would be more augmented in future due to commercial level cultivation of Cavendish.

Table 5.1: Growth Rates and Instability of Fresh Fruit Export Flows for the Period of 1990-2012

	Growth Rate	Instability (CV)
Total fresh fruit export	13 (0.012)*	88
Top fresh fruit export Items		
Banana	41(0.051)*	252
Papaya	49(0.034)*	146
Pineapple	8(0.021)*	53
Re-Export	18((0.031)*	71
Top fresh fruit markets		
Qatar	30(0.017)*	146
Saudi Arabia	20(0.029)*	217
Maldives	17(0.023)*	82
U.A.E.	15(0.025)*	122

Note: Figures in parentheses indicated the standard error for their respective coefficients

* Denote coefficients are significant at 1% level

Source: This is based on the author's estimations

According to the growth rate estimation for export destinations as illustrated in Table 5.1, Sri Lanka's fruit export to Qatar has increased over time by 30 per cent. This is the highest growth of export earnings. Fruit export to Saudi Arabia is also growing significantly. Regardless of this performance export direction toward the Middle East markets have not stabilized. Maldives recorded a low instability yet the growth of export earnings stagnated compared to Middle East markets. Sri Lanka is losing market share of Maldives due to high competition from India and UAE.

5.2.2 Growth Rates and Instability of Fresh Vegetable Exports

Fresh vegetable export earnings are rising by 6 per cent per annum. However this rise is much lower compared to fruit export growth. At any rate of growth as a group, instability of total fresh F&V export earnings are less even though individual commodities show higher fluctuations over time. As Table 5.2 illustrated, capsicum and mushroom exports are declining at a higher rate. Capsicum export has declined by 24 per cent annually and mushroom by 16 per cent and recorded higher variations of export earnings during the study period. This poor performance was recorded mainly due to poor quality and insufficient availability of high value fresh items like bell pepper and button mushroom. Those vegetables have a large export potential.

Table 5.2: Growth Rates and Instability of Fresh Vegetable Export Flows for the Period of 1990-2012

	Growth Rate	Instability (CV)
Total fresh vegetable export	6(0.007)*	46
Top fresh vegetable export Items		
Non specified	12(0.013)*	53
Capsicum	-24(0.043)*	186
Globe Artichokes	43(0.069)*	260
Mushroom	-16(0.069)*	213
Other vegetable	-6(0.022)*	80
Top fresh vegetable markets		
Kuwait	6(0.019)*	43
Maldives	7(0.01)*	46
U.A.E.	6(0.01)*	57
Qatar	13(0.018)*	84

Source: This is based on the author's estimations

Note: Figures in parentheses indicate the standard error for their respective coefficients

* Denote coefficients are significant at 1% level

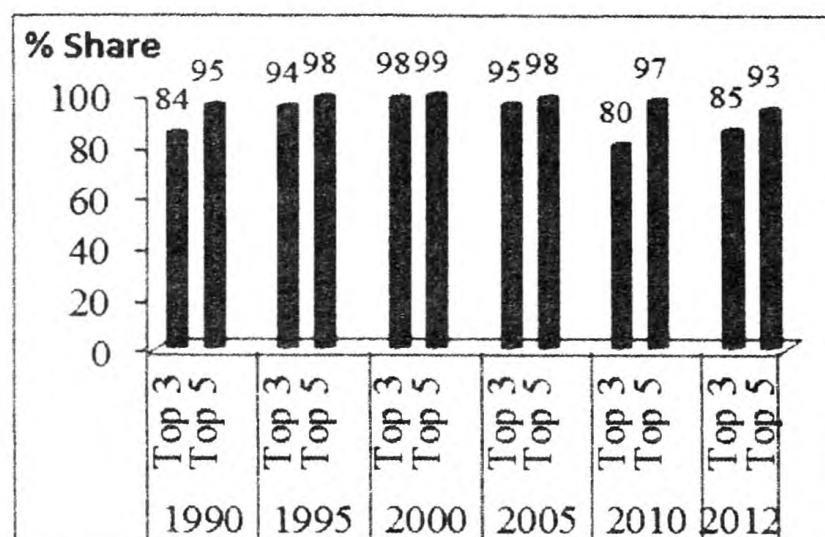
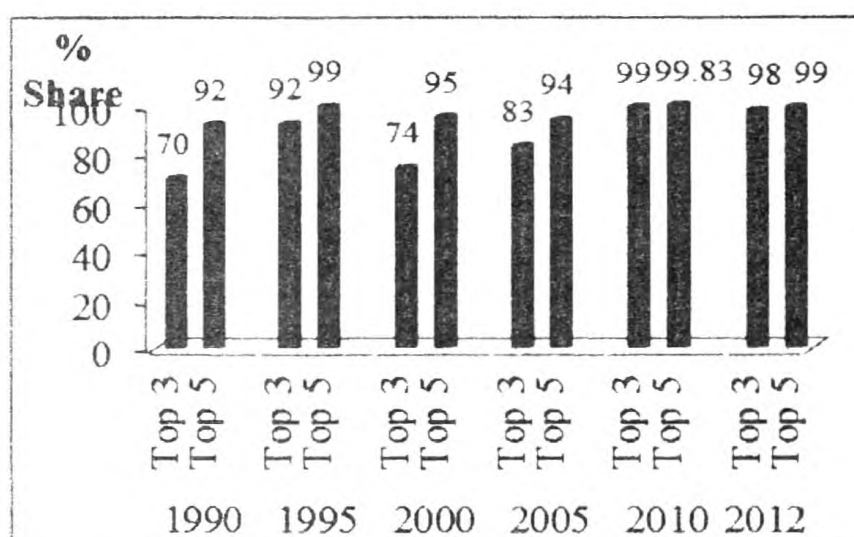
Fresh vegetable export to Qatar is increasing by 13 per cent and this rate of growth is rapid compared to other fresh vegetable export destinations specially Kuwait and UAE which grew only by 6 per cent (Table 5.2). Maldives is our top vegetable importer though growth performance is very poor. Export earnings from this market is growing only by 7 per cent annually despite Sri Lanka's great potential to capture these markets due to geographical proximity and low sea freight chargers.

5.3 Tendency in Export Concentration

Export concentration demonstrates that the levels of country's exports are fragmented to a limited number of products or trading partners. A country that exports one product to only one trading partner has a perfectly concentrated export portfolio. Conversely, a country in which exports comprise a larger number of products and trades with a larger number of trading partners has a lower export concentration ratio i.e., more diversified exports (UNDP, 2011). The impact of external economic shocks can be minimized if a country can diversify their export portfolio to prevent the losses of export revenue. Despite the growing participation of developing countries in world trade, their exports are increasingly more concentrated in a narrow range of products, compared to the more advanced economies. Nevertheless according to the empirical evidence, the tendency towards increased export concentration remains confined mostly to developing countries. Despite the growing participation of developing countries in world trade, their exports are increasingly more concentrated in a narrow range of products, compared to more advanced economies (UNDP, 2011).

5.3.1 Concentration at Product Line

The analysis of export concentration shows that along with the rapid growth of F&V exports in the last two decades its concentration on major products has increased. Our fresh F&V export basket is concentrated on three to five product lines. There are over 20 separate HS codes for fresh vegetables and 21 HS codes for fresh fruit. On the contrary, only three to five product lines contribute to the total F&V export earnings covering 80 -85 per cent from top three products lines. Almost 99 per cent of export earnings are drawn by top five products (Figure 5.1 & 5.7). According to the concentration analysis, the long term trend of this fragmentation is showing similar patterns, even though in early 1990s the degree of concentration was fairly low.



Source: Author's calculation based on the Sri Lanka Customs data base

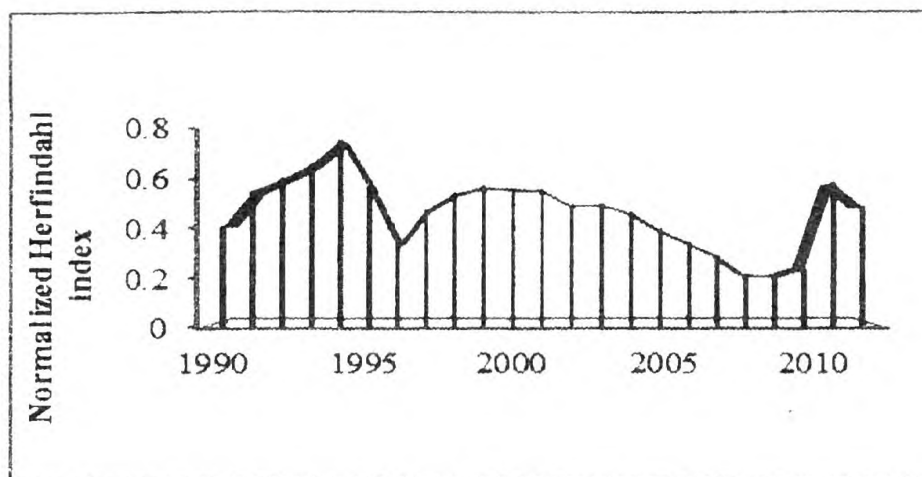
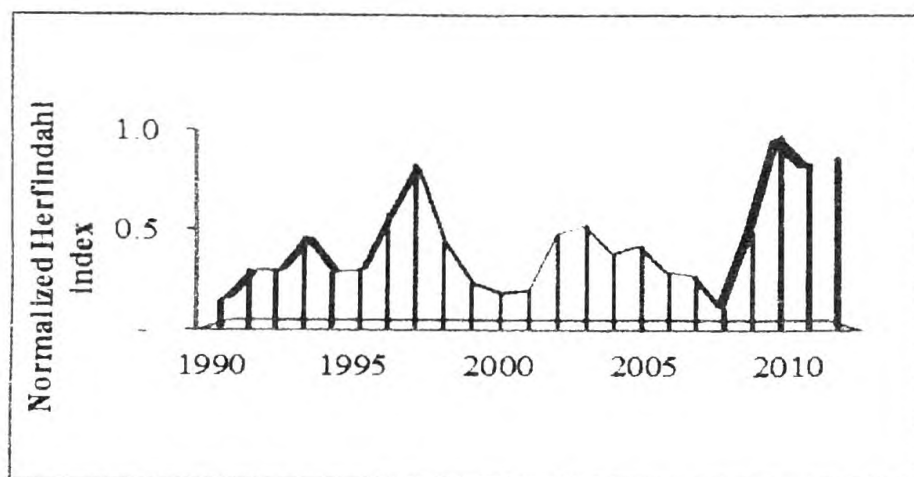
Note: Cumulative percentages are indicated in the top of the each bar and HS code 07099090 excluded in this analysis due to non classification and it represents around 80% of total value of fresh vegetable export in recent years.

Figure 5.1: Fresh Vegetable Export Concentration at 20 Product Lines which Covered HS code 5 Digits to 7 Digits Level (070190-07099010)

Figure 5.2: Fresh Fruit Export Concentration at 21 Product Lines which covered HS code 5 Digits to 7 Digits

5.3.1.1 Herfindahl Concentration Index for Product Lines

In this study, diversification was constructed based on the most commonly used Herfindahl Index, also known as Herfindahl-Hirschman Index for measuring export specialization/concentration.



Source: Author's calculations based on the data from Sri Lanka Custom data base

Figure 5.3: Normalized Herfindahl Index for Fresh Vegetable Export in 1990-2012

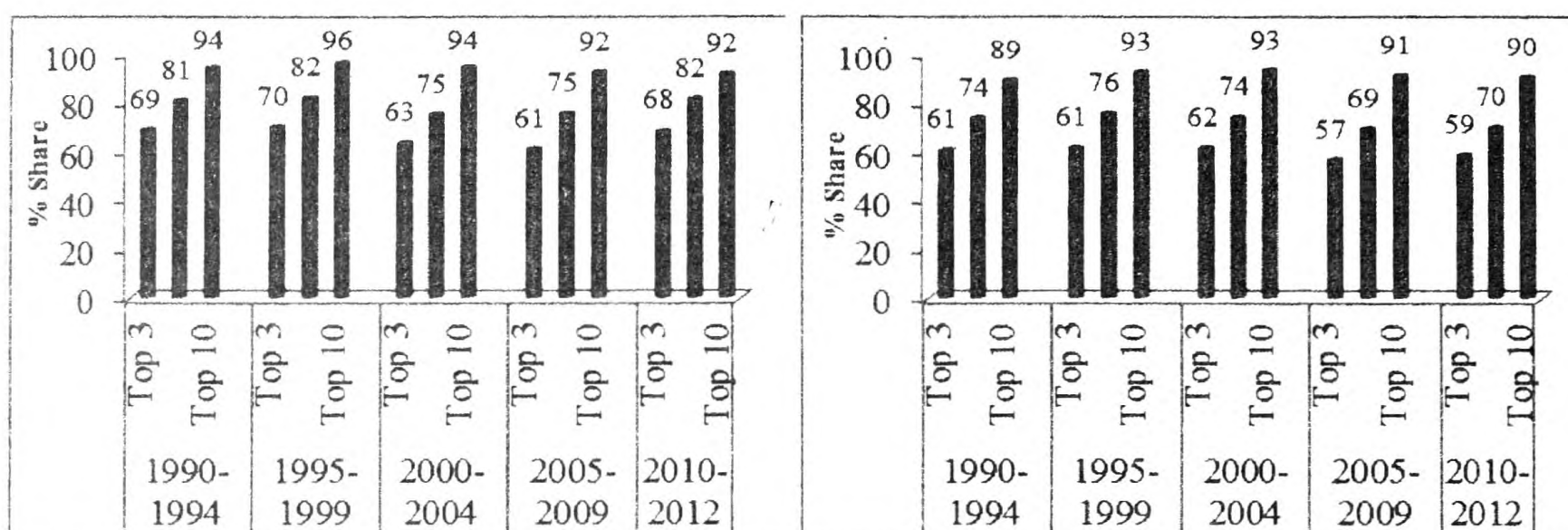
Figure 5.4: Normalized Herfindahl Index for Fresh Fruit Export 1990-2012

As the concentration index explains if value of the index is close to one, there is a high concentration or specialization of exportable products. If a country's export products are diversified, the index value is close to zero. In this view, according to the figure 28 & 29 in recent years both F&V were highly concentrated and this is more severe in vegetable export mix. However, during 2000 – 2007 the index value is nearly 0.5 indicating quite diversified products mix in both F&V export (Figure 5.3 & 5.4).

These dependencies on a few products make it vulnerable to wide fluctuations. Even specialization generates trade advantage, according to empirical evidence by Sasem (2010), if a country's exports are perfectly concentrated, then its export earnings will fluctuate with international price fluctuations. Such fluctuations, especially in the case of commodities, can be very large varying by 30–50 percent on a monthly basis. Countries with a more diversified portfolio will find that price fluctuations in the prices of two or more products having a smoothening effect on total earnings. Empirical evidence of examining the relationship between export concentration and export revenue volatility showed that increased export concentration is strongly correlated with higher export earnings volatility: regions with a higher export concentration ratio have a higher relative deviation in export earnings. This again was proved by Ferdous & Farazi (2011) explaining that export dependency on primary products of a country can be reduced through diversification of the export portfolio. However, export diversification can take place in different forms and dimensions and thus its analysis can be undertaken at different levels. Therefore, EDB suggests through their strategic plan that considering the adverse effects of high dependency on a few products, it is essential to broaden the export base of Sri Lanka through horizontal diversification. That is widening the range of export and vertical diversification of export at a different stage of value addition to capture more value from products that are exported from Sri Lanka.

5.3.2 Concentration at Export Destinations

Concentration at export destinations also estimated to analyze the degree of concentration in the direction of a few trading partners and to observe the changing patterns.



Note: Cumulative percentages are indicated in the top of the each bar
 Source: Author's calculation based on the Sri Lanka Customs data base

Figure 5.5: Fresh Fruit Export Market Concentration at 48 Export Destinations during the Period of 1990-2012

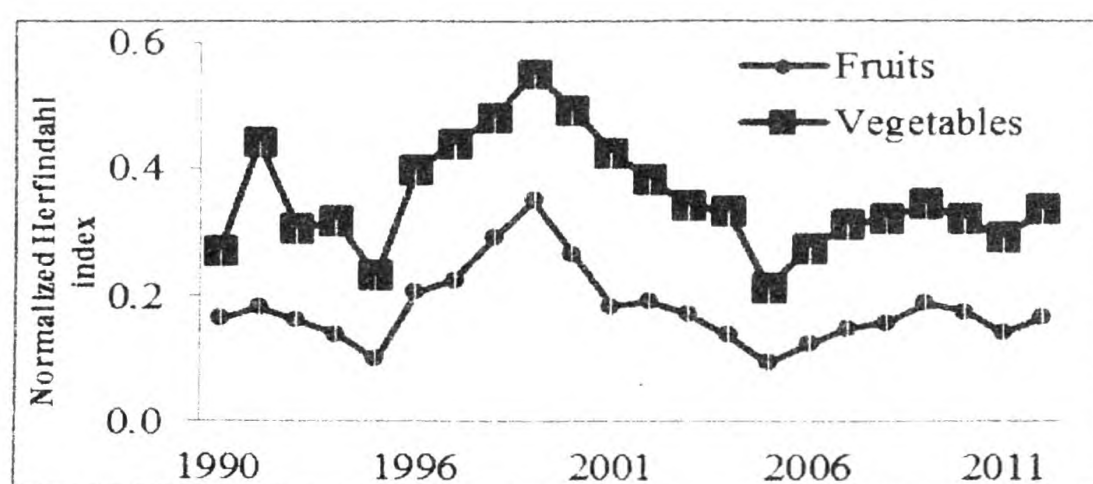
Figure 5.6: Fresh Vegetable Export Markets Concentration at 42 Export Destinations during the Period of 1990-2012

As illustrated in Figure 5.5 & 5.6 over 90 per cent of total F&V export earnings are drawn from 10 export destinations. The most striking observation is that specialization/concentration of export markets take similar patterns both in F&V. However, the degree of concentration varies.

Top three export destinations of fruit are occupied by around 70 per cent of total export. On the other hand, vegetable export destinations are concentrated on around 60 per cent at the top three destinations. Three countries among Maldives, UAE, Switzerland, Kuwait and Saudi Arabia were at the top three major fresh vegetable export destinations during the last decade time to time. UAE, Maldives, Germany, Saudi Arabia and Switzerland were among the top three client countries time to time for fruit export during the last decade. The F&V export markets comparably diversified during the period of 2005-2009 (Figure 5.5 & 5.6).

5.3.2.1 Herfindahl Concentration Index for Destinations

According to the Herfindahl concentration index of export destinations as depicted in Figure 5.7, when compared to vegetable export markets, fruit export destinations are more diversified though the pattern of diversification was comparable during the study period.



Source: Author's calculation based on the data from Sri Lanka Custom data base

Figure 5.7: Normalized Herfindahl Index for Fresh Fruit and Vegetable Export Markets during the Period of 1990-2012

The overall results revealed that F&V export products are more concentrated than export markets. Over 99 per cent of F&V export earnings were fetched through 3 to 5 products. However, when considered the export destinations of F&V, 10 countries contributed to 90 per cent of the earnings. This implies that Sri Lanka has to pay more attention on diversifying the F&V export products.

5.4 Decomposition of Export Growth

Decomposition of F&V export growth was carried out to examine the trading patterns over the years. For this, analysis of intensive and extensive margin was performed. Observed changes of F&V export earnings during the period of 1990-1995 and 2008-2012 decomposed into product lines supplied in respect of died products, new products and deepening of export in existing products (intensive margins). Changes in export destinations split into died markets, new markets and deepening the relationship of existing markets (extensive margins) to see the individual contribution.

The findings of the intensive and extensive margin analysis are quite remarkable. The results revealed that the contribution to the total growth performance occurred more by deepening (Increasing) the real value of existing export product and the export value drawn by the subsistence client countries.

The export of existing products to existing markets has accounted for a greater share of export growth than the export of new products to new markets. More than 99 per cent share of total export earnings growth is driven by deepening the existing fruit export value and the increased export value with respect to each export destination (Table 5.3). However, in case of vegetable export, 14 per cent share is earned by introducing new product lines to the vegetable export basket.

Table 5.3: Decomposition of F& V Export Growth into Intensive and Extensive Margins

Intensive Margin						
	Died product line		New product line		Survived product line	
	Value	%contribution to the total change	Value	%contribution to the total change	Value	%contribution to the total change
Fresh fruit	34	0.33	154	1.5	10,054	99
Fresh vegetable	159	3	748	14.45	1,871	36.12
Extensive Margin						
	Died markets		New markets		Survived markets	
	Value	% Change	Value	% Change	Value	% Change
Fresh fruit	4.2	0.04	126	1.16	10,764	99
Fresh Vegetable	8.6	0.11	135	1.7	7,867	99

Note: Figures indicate the real value of export in 000' Rupee for the period 1 (1990-1995) and period 2 (2008-2012)

Source: Author's calculation based on the data from Sri Lanka Custom data base

Introducing new products as well as entry into new markets is vital for export growth. Brenton (n. d) says that a successful export diversification requires not only entry into new export markets but also survival and growth. The developing countries would experience significantly higher export growth if they were able to improve their performance with respect to two key components of the survival and deepening of their exports (Tibor & Thomas, 2010). However, some of them argue that usually, by changing the shares of commodities in the existing export mix, or by including new commodities in the export portfolio, a country can attain export diversification (Ferdous & Farazi, 2011). However, the results disclose that in Sri Lanka, F&V sector growth has taken place ensuring the survival of existing products and markets implying that the importance of introducing new products lines and destinations to the existing export mix. Matthee and Naude (2007) argue that it is not only important how much is exported, but also what is exported. They concluded that regions with less specialization and more diversified exports generally experienced higher economic growth rates and contributed more to the overall exports.

Pham & Martin (2007) argue that export growth does not consist solely of expansion in the quantities of the same goods. As an alternative, if export growth comes through expansion in the number of range of products exported, the outcome of export growth may be much promising. Other research proves that poor countries tend to have highly homogeneous (specialized) export structures and thus the diversification is generally more important for poorer countries. Since Sri Lanka's F& V exports show a favorable growth in real value terms for a long time it is necessary to diversify more into increased products lines and destinations to circumvent the rigorous fluctuations of total export earnings.

CHAPTER SIX

Promoting Export Diversification

6.1 Introduction

This chapter will discuss issues relating to F&V export diversification, growth and instability and also highlight emerging opportunities to strengthen the sector. The information in this sector is based on the key informant interviews conducted with key stakeholders in the sector.

6.2 Issues of Export Diversification, Growth and Instability of Sri Lanka's F&V Export Sector

6.2.1 Issues at the Border

Addressing constraints at the borders implies reducing tariff and non-tariff barriers, improving customs facilitation and other formalities. Further, macroeconomic policies which impact on inflation, real exchange rate, and export bias policies can address the issues of border. In case of F&V export in Sri Lanka, according to the exporters view, border issues are minimum.

6.2.2 Issues Behind the Borders (supply side)

The constraints in supply side such as infrastructure, trade related policy constraints including an adequate business regulatory framework and investment policy regime, competitiveness constraints such as quality standards, packaging, and delivery in time and need of support incentives such as fiscal incentives and credit incentives are discussed under this.

Quality of the products: Quality product is the engine of export growth and diversification. Among these concerns constraints which directly influence competitiveness is the poor quality of Sri Lanka's F&V exports. According to the key stakeholder informant interviews exporters are frustrated by their inability to access greater quantities of export-quality F&V to cater to the growing demand especially from the Maldivian and Middle East markets. Also, Sri Lankan exporters are facing difficulties in meeting safety standards imposed by the Europe union and WTO (Sanitary and Phyto Sanitary Measures and Technical Barriers to Trade). The firms cannot be competitive in the global market if technology and management are inappropriate. All F&V should conform to international food safety standards to be eligible to export to Europe, US, Australia and ASEAN markets. The UN food standards body, Codex Alimentarius has agreed on new standards to protect the health of consumers worldwide. These include standards on fruit, vegetable, fish and fisheries products and animal feed. Thus it is

essential to diversify F&V exports by improving quality at the production and packaging stage.

Supply inconsistency: Supply inconsistency is the major barrier of the F&V export sector. There are around 20 vegetables and 21 fruit export product lines. However, due to inconsistent supply situation, these products are promoted less; even there is a good demand. The problem of seasonality should be overcome in order to supply to the export market regularly. The technology, unfavorable climate, poor pest and diseases control, lack of improved varieties and labour shortage are the major constraints behind supply inconsistency.

Lack of commercial level farming: In Sri Lanka, approximately 150,000 hectares of land is used for fruit cultivation with 95 % being cultivated in home - gardens. The small farmers are not rich with the improved varieties, technology and proper maintenance.

Supply chain inefficiency: Most of farmers are reluctant to supply export markets continually because of high intermediary cost and their very less profit margin. Some exporters are used to collect F&V from Colombo markets. Only few large scale exporters who own commercial level farms target export. Further, a few exporters directly purchase from farmers. Exporters and farmers are not always willing to make forward sales contracts since both parties experience breach of contracts.

6.2.3 Beyond Border Issues

Addressing constraints beyond the borders implies addressing market access barriers with regard to export growth. Effective negotiation skills can be useful in this context to enhance the benefits of bilateral, regional, and multilateral negotiations. Middle East countries such as United Arab Emirates, Saudi Arabia, Kuwait and Maldives and European markets are potential regions to direct Sri Lankan F&V. However, trade negotiations with these countries are still far behind of the policy agenda (<http://www.spssrilanka.lk>). Export diversification is not only about product diversification, but also about expanding the number of markets that a country exports to. Countries can consider diversifying their export markets to reduce dependence on a few sources of demand or they can boost intra-regional trade by improving transport links and simplifying customs and inspection procedures. Several sub-regions have very little trade between constituent countries, a gap that represents a major opportunity for realizing trade gains and strengthening regional resilience.

If a country is negotiating for export quota system, exporters can pressurize domestic producers to supply the demanded quantity. Hence farmers also have assurance of the markets for their products.

6.3 Opportunities for Export Diversification, Growth and Stability

6.3.1 Good Demand for Sri Lanka's Fresh F&V in Global Market

Sri Lankan F and V have unique characteristics of pleasant smell, taste and colour which have led to higher demand of the products for example; Sri Lankan pineapple and papaya are popular for its taste. Further, the brand name of "Ceylon" logo is more competitive. This has already led to fetching of premium prices for Sri Lankan Tea and Cinnamon.

6.3.2 Improved Infrastructure

Infrastructure helps to increase productivity and enable local firms to compete in global markets. The inadequate functioning of infrastructure may harm enterprises by hampering production activities, delaying the movement of goods and passengers, and leading to a delay in the delivery of goods. It adds to business uncertainty and risk and imposes additional costs. However, recent development of infrastructure facilities in Sri Lanka may lead to expand the export. Efficient infrastructure is a precondition for good export performance.

- Improved communications technology
- Infrastructure investments: Constructions of highways, expansion of Colombo seaport, and construction of Hambantota seaport and Maththala airport.

The development of infrastructure ensures that goods arrive on time, in good condition and in the least delivery time which are crucial factors in any successful export diversification policy. Faster and more frequent delivery time means that F&V exported from Sri Lanka will arrive fresher than the produce shipped from more distant countries. Freshness plus the lower cost of maritime transport are strong reasons for "best practice" horticulture enterprises to be located in Sri Lanka rather than in more distant countries (Samaratunge *et.al*, 2009).

6.3.3 The Favorable Institutional and Regulatory Framework that Supports Export Diversification

Export Development Board: EDB is the facilitator for promotion and development of export oriented products. Their main role is to introduce smooth policies and recommendations plus simplification of the existing export policy. They have already implemented several programmes to diversify the F&V export sector.

Fruit and vegetable Producers', Processors' and Exporters' Association: This association consists of producers, processors and exporters in the F&V industry. Their long term

objective is to develop the industry and place it on a firm foundation capable of withstanding external challenges and adapt to technological advances. Their immediate objectives are to maximize productivity, increase employment opportunities and introduce new technology to retain the price competitiveness in international markets. This association has already prepared proposals with respect to increasing production, development of protected agriculture and regaining of the Male market. With the purpose of increasing production the association has launched two Agri - Zone Projects in F&V growing areas. The aim of this project is to develop high value horticultural practices to compete in global markets. The important aspects of the project will be developing systems for sustainable crop practices, including adopting appropriate post harvest practices through in-house expertise to be offered through model farms which will be operated by the association with the assistance of EDB, DOA and the ITI. The Association is planning to set up an efficient supply chain management system which will take the installation of cold storage, packaging unit to support exports.

Department of Agriculture (DOA): DOA takes responsibility to conduct training and extension which aims at developing the F&V sector. Consultation of farmers, providing planting materials, introducing new varieties and other activities related to the increase of productivity are the main role of the F&V Research Institute. They are conducting F&V development projects at national level. The aim of the institute is to make all types of F&V available in sufficient amount throughout the year.

Establishment of Sri Lanka Fruit Association: With the purpose of resolving the urgent issues of the sector DOA has recognized the importance of building strong linkages among stakeholders. Thus Fruit Research and Development Institute of DOA has taken steps to form the Sri Lanka Fruit Association to make a common platform to all stakeholders.

CHAPTER SEVEN

Summary, Conclusion and Recommendations

7.1 Summary

There are diverse varieties of F&V grown in Sri Lanka. However, the contribution to export is indeed unsatisfactory. Even though the real export value of this sector has increased with time, the stability of the export earnings fluctuates over time.

The top five fresh fruit export commodities are banana (41%), pineapple (28%), figs (14% -re exported), papaya (9%) and lemon (2%) and the non classified category of vegetable contribute to 87 per cent of the total vegetable export earnings. The second highest value vegetable is globe artichoke (groups of vegetables coming under this HS code) which contributes to 10 per cent of the total vegetable export earnings.

Sri Lanka's main F&V export market is Maldives and Middle East. The major competitors of Sri Lanka's F&V export market are China, Philippines, Thailand, India, and Korea. Competing with the emerging countries such as China and India is difficult as they have developed a good marketing system which has led to a good demand for their fresh F&V. Therefore, diversifying our F&V to include underutilized local crops is crucial. Theoretically the geographical proximity of Sri Lanka to Maldives could make the country a top exporter even though Sri Lanka cannot meet the demanded quantity. Further, UAE and Saudi Arabia are also Sri Lanka's major F&V export destinations. However, Sri Lanka's share in these markets is very little. Due to inadequate supply and quality constraints, export of mushrooms, capsicum and leeks and other allies to UAE and Saudi Arabia has already mislaid.

According to the growth and instability analysis the total fresh fruit export earnings are increasing by 13 per cent and fresh vegetable export earnings are rising by 6 per cent per annum. Papaya export records the highest growth rates (annual growth rate - 49 %) over the years compared to other major fresh fruit items. Sri Lanka's pineapple export earnings grew only by 8 per cent annually indicating inadequate performance. Capsicum and mushroom exports are declining at the rate of 24 per cent and 16 per cent respectively. Growth rate estimation for export destinations illustrated that Sri Lanka's fruit exports to Qatar have increased over time by 30 per cent. Fruit exports to Saudi Arabia have also grown significantly. Fresh vegetable exports to Qatar are increasing by 13 per cent and this rate of growth is rapid compared to other fresh vegetable export destinations specially Kuwait and UAE which grew only by 6 per cent. However, the growth of export earnings in Maldivian markets is very poor regardless of the greater potential to capture this market due to geographical proximity and low sea freight chargers owing to high competition posed by India.

The analysis of export concentration shows that during the last two decades export of F&V concentrated on top three product lines and this situation has aggravated in recent years. There are over 20 separate HS codes for fresh vegetables and 21 HS codes for fresh fruit. On the contrary, only three to five product lines contribute to total F&V export earnings covering 80 -85 per cent from top three product lines. These dependencies of a few products make it more vulnerable to wide fluctuations. The analysis with respect to the concentration of export destinations shows that over 90 per cent of total F&V export earnings were drawn from 10 export destinations. Top three export destinations of fruit occupy around 70 per cent of the total exports. On the other way, vegetable export destinations are concentrated on around 60 per cent at top three destinations. Maldives, UAE, Switzerland, Kuwait and Saudi Arabia were among the top three major fresh vegetable export destinations during the last decade. The UAE, Maldives, Germany, Saudi Arabia and Switzerland were among the top three client countries for fruit export during the last decade. The results revealed that F&V export products are more concentrated than export markets. This implies that Sri Lanka has to focus more on diversifying the F&V export products.

Findings of the intensive and extensive margin analysis of the decomposition process are significant. The results revealed that the contribution to the total growth performance occurred more by increasing the real value in terms of existing export products or markets during 1990 - 2012. However, in case of vegetable exports, 14 per cent of the share is earned by introducing new products lines to the vegetable export basket. However, new products and new markets have contributed less than 3 percent to the existing growth. The results disclose that in Sri Lanka, the F&V sector growth has taken place assuring the survival of the existing products and markets implying the importance of introducing new products lines and destinations to the existing export mix.

According to the key informant interviews and literature review, the study has identified the major issues relating to F&V export diversification. Inability of supply greater quantities of export-quality F&V continuously to cater to the growing demand of the world as the major issues affecting this sector. The problem of seasonality, technology, unfavorable climate, poor pest and disease control, lack of improved varieties and labour shortage are the major constraints behind the issues of supply inconsistency. With regard to the supply chain inefficiency, the study identified the issues that should be resolved urgently such as making strong linkages between exporters and producers collaborative with other government stakeholders. Further, lack of bilateral and regional negotiations specially focusing on F&V markets restrict diversification of export destinations.

7.2 Conclusion

Sri Lanka has a favorable demand in international fresh F&V export market and export earnings have been increasing over time. However due to high concentrations of F&V export products and depending on a limited number of markets, export revenue is susceptible for fluctuation over the years. Sri Lanka's F&V exports are mainly limited to top three to five products and around five to ten export destinations. Therefore introducing new products as well as entry into new markets is vital for F&V export growth because the results reveal that in Sri Lanka F&V sector growth has taken place with increasing real value of existing F&V products and markets and contribution of new products and new markets is very less. Further, Sri Lanka is losing markets owing to unavailability of adequate and regularly supply due to quality constraints, poor technology, high seasonality, poor farmer skills and lack of proper linkages among stakeholders. Therefore, off season cultivation, technology dissemination by establishing small farmer clusters and encouraging young generation by providing white color jobs at commercial level F&V farms are timely. What is important is not the export quantity but vast variety of items in order to diversify the country's F&V export basket. Therefore, priority should be given to value addition, targeting export. Again, large scale of production with commercial level farming is important.

7.3 Recommendations for Diversifying the F&V Exports

The study recommends diversifying F&V export products and markets under following aspects.

Off season specialty: Diversifying the cultivation of crops mix, particularly in the Yala season aiming at producing high value cash crops for export is necessary to maintain the export supply consistency. Extended crop season' can be introduced through proper irrigation facilities. DOA has so far identified the off season's fruit producing zones to make products available at least for 9 months. This mechanism should be introduced for the vegetable sector as well. This would lead to improve the supply consistency.

Develop value added industry: The study highlights strategies for enhancing productivity of value addition industry to make Sri Lanka a competitive platform for F&V export. This could be done through skills development and technology dissemination especially among young agro industry entrepreneurs. Incentives for investment are more attractive for large companies in the agriculture processing industry. However, F&V processing sector is abundant with small and medium enterprises. Therefore, similar incentives should focus small and medium level agro entrepreneurs to encourage them to expand the production. The Board of Investment (BOI) and the Department of Inland Revenue can be recommended as facilitators for these investment incentives.

Enhance the cultivation of high value F&V at commercial level: At present, major companies have set up partnerships with foreign investors for the cultivation and export of F&V, utilizing large scale farms. Therefore, they should promote the cultivation and export of high value F&V. Fruit that can be commercially grown include pineapple, papaya, avocado, banana and strawberry. Vegetable with market potential include salad lettuce, capsicum, broccoli, cauliflower and cucumber and button mushroom. DOA needs to develop the home - garden high value F&V cultivation in a systematic manner. They can develop a system to cluster small farmer groups and disseminate technology and provide proper extension and improved seed and planting materials.

Reducing freight charges: Introducing new product lines to the existing export destinations is highlighted. Currently, there are more than 40 product lines for F&V exports. These product lines need to be promoted in the existing export markets. Thus, the study recommends introducing easy flying hours, permitting cargo freighters to fly with collaboration of airlines of Sri Lanka (SriLankan and Mihin Lanka). This would help increase the volume of F&V exports to most potential destinations such as Maldives, the UAE, Kuwait, Qatar and Saudi Arabia.

Linking farmers to the export markets: Introducing forward sales contracts for growers is needed to ensure the export markets for farmers and exporters. For that, exporters and farmers should be motivated towards forward sales contracts. EDB can organize workshops and awareness programmes to familiarize them on forward sales contracts as a promoter and the Central Bank of Sri Lanka is recommended as a facilitator.

Fruit and Vegetable Producers, Processors and Exporters Association's responsibility: It is essential that exporters have good linkages with farmers and traders. As an association the producer's role is lagging behind. Thus, active participation of small holder producers in this organization is necessary. This association can support growers to enhance productivity. Further, the association should have a long term programme to reduce post harvest losses by investing in cold rooms, developing a technique of the out grower system and assuring a good profit margin for growers. They have already prepared proposals and above points can be added to that. Further, they should document predictions of the quality characteristics and quantity they need in future at least for a year. EDB can play a major role to encourage them to apply these recommendations.

Further Research: A comprehensive study on analysis of F&V value chain is essential in order to identify the issues prevailing in grass root level to export markets. Further Studies on processed F&V export products and market situation in Sri Lanka are also necessary.

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