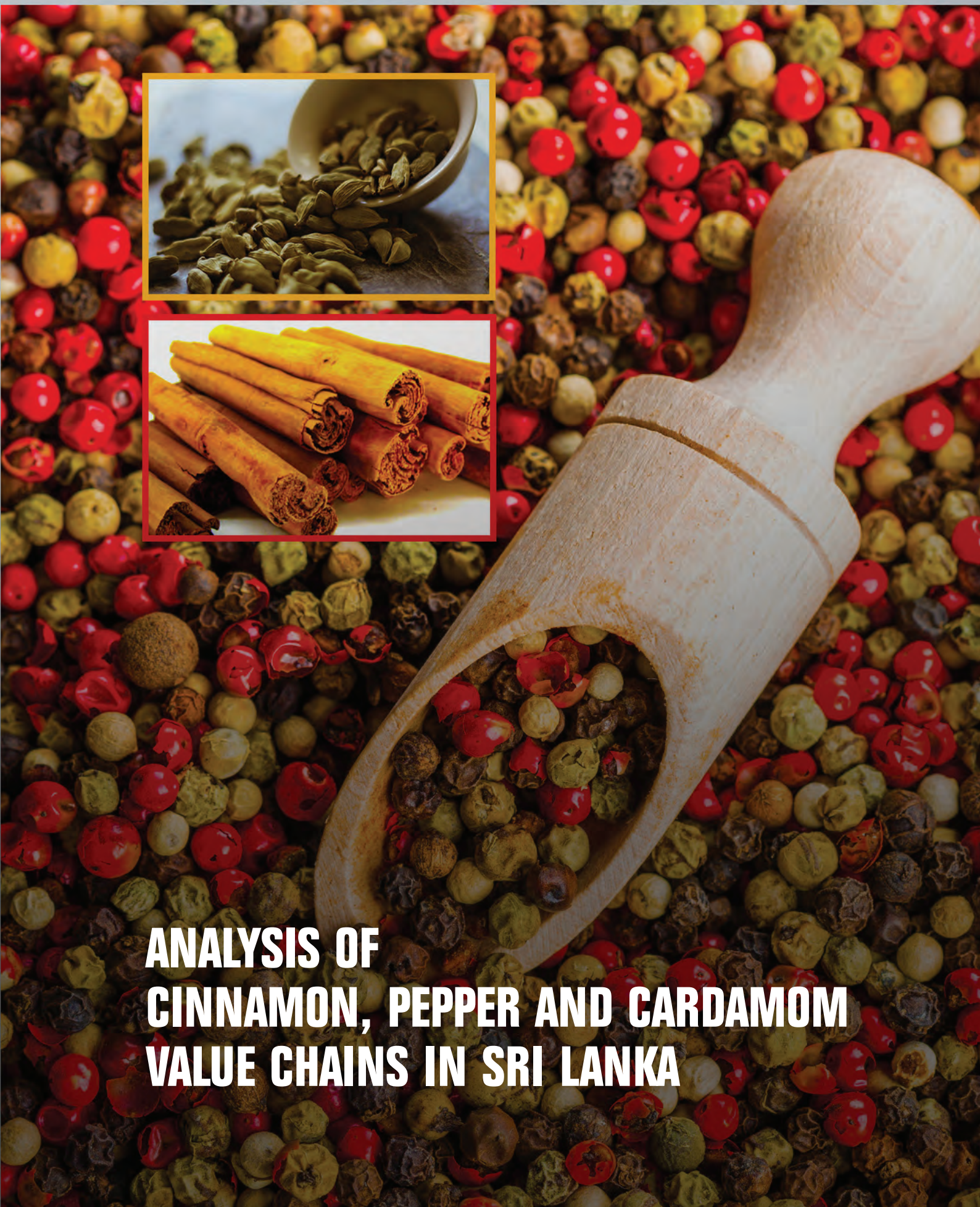

ANALYSIS OF CINNAMON, PEPPER AND CARDAMOM VALUE CHAINS IN SRI LANKA

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MARCH 2017

Prepared by
INSTITUTE OF POLICY STUDIES OF SRI LANKA

In collaboration with
The Department of National Planning
Ministry of National Policies and Economic Affairs

Supported by
Japan International Cooperation Agency

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MARCH 2017

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JOINT MESSAGE

Sri Lanka has achieved a remarkable growth during the last decades and is moving now towards the upper middle income status with the achievement of per capita income of US$ 4,065 in 2017. Presently, the Sri Lanka's economy is being transitioned from a rural, agricultural economy towards a more urbanized economy driven by the service sector. Even though the share of the agriculture sector to GDP was accounted on 7 percent in 2017, the agriculture sector continues to be the backbone of Sri Lankan economy owing to the fact that its engagement in the provision of livelihoods particularly to the rural community. The sector provides employments for about 26 percent of the workforce in the country, forms the resource base for a number of agro-based industries and agro-services, and stimulates the economic growth through horizontal and vertical integration with other sectors in the economy.

The main policy direction of the agriculture sector is to drive the sector towards commercialization with due consideration for ecological sustainability, to ensure the food and nutrition security of people by and to increase the competitiveness of agriculture and agro-based products in the international market.

Sri Lanka endows with a diversity of production of agriculture crops and also rich in a range of spices including cinnamon, pepper, cardamom, cloves, nutmeg and mace. The export of spices and allied products constitutes nearly56% of the entire agricultural products which exclude tea, rubber and coconuts. Sri Lanka exports approximately 85% of true cinnamon to the international market and is the largest cinnamon exporters in the world. The export of pepper and cardamom is also take a significant proportion in the export volume of agro products. However, the potential of these crops has not yet fully been harnessed to meet the needs and to increase their share in the international market. Thus, there is a need to make a close look at the value chains of theses crops to assume their characteristics where the constraints exist, and how they could possibly be resolved, etc.

In this background, the value chain analysis was conducted by the Institute of Policy Studies of Sri Lanka in collaboration with the National Planning Department of Ministry of National Policies and Economic Affairs supported by the Japan International Cooperation Agency (JICA).This study aimed to better understand overall trends, structure, and function of Sri Lanka's spice sector especially the value chains of cinnamon, pepper and the cardamom. It also identified leverage points for policy and technical interventions by breaking down the value chain into its constituent parts.

We hope this report is met with interest primarily of policy makers and planners who seeks initiatives for further development of the sector. It is also our pleasure that this study provides useful information for producers, extension workers, private sectors, civil societies, and media, who all have stakes in the development of the spice sector in Sri Lanka.

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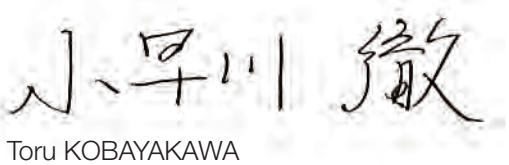

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The study has been possible, thanks to the support extended by many individuals, institutions and organizations to which we remain grateful. First, we would like to thank all the Advisory Committee Members for the project, who represented the relevant government institutions; Ministry of Primary Industries, Department of Export Agriculture, Export Development Board and Ministry of Agriculture, private sector entities; The Spice Council, National Chamber of Exporters of Sri Lanka and International Commodity Exports Pvt. Ltd, and JICA for giving overall guidance throughout the study.

We also would like to express our gratitude to the assistance extended by the Secretary to the Ministry of Primary Industries and the Director General and the other officials of the Department of Export Agriculture in Peradeniya in arranging and facilitating field visits. Other than the government officials and private associations, the study immensely benefitted from the first hand experiences of the spice producers' groups, farmers, collectors, traders and exporters who generously contributed their time.

Shinga Kimura, JICA Agricultural Policy Advisor for National Planning Department of Sri Lanka, steered the design, implementation and finalization of the study. We are thankful for his guidance. Nilakshi Liyanage, Iroshani Perera, and Madunika Jayawardena, who worked as project officers are acknowledged for the research assistance provided during the study.

ABBRIVIATIONS

ASTA	-	American Spice Trade Association's
BOI	-	Board of Investment of Sri Lanka
CBSL	-	Central Bank of Sri Lanka
CISIR	-	Ceylon Institute of Scientific and Industrial Research
DEA	-	Department of Export Agriculture
DEA	-	Department of Export Agriculture
EDB	-	Export Development Board
ESA	-	European Spice Association
EU	-	European Union
FDGs	-	Focus Group Discussions
GAPS	-	Good Agricultural Practices
GMPS	-	Good Manufacturing Practices
HACCP	-	Hazard Analysis and Critical Control Points
IPC	-	International Pepper Community
IPS	-	Institute of Policy Studies
ITI	-	Industrial Technology Institute
JICA	-	Japan International Cooperation Agency
MPI	-	Ministry of Primary Industry
NCR&TC	-	National Cinnamon Research and Training Center
NIPO	-	National Intellectual Property Office of Sri Lanka
SAPPTA	-	Spices and Allied Products Producers' and Traders' Association
SLSI	-	Sri Lanka Standards Institution
TSC	-	The Spice Council
USAID	-	United States Agency for International Development
USA	-	United States of America
VCA	-	Value Chain Analysis

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CONTENTS

EXECUTIVE SUMMARY

Present government has identified the spice sector as one of the key sectors for achieving better export performance in future due to the high demand in the export market. To achieve the level of exports that the government anticipates by 2020, the sector needs to overcome key challenges that inhibit its performance. The study maps 3 spice value chains in Sri Lanka – cinnamon, pepper and cardamom – to identify opportunities as well as constraints including quality and safety issues affecting the sector towards providing recommendations for policy interventions at different points in the chain. It adopts a value chain analysis as a framework of analysis and uses both qualitative and quantitative data to provide a situational analysis. It involved 31 Key Informant Interviews (KIIs), 6 Focus Group Discussions (FGDs), which were supplemented with a purposive survey of farmers and observations to triangulate the findings. The study reveals the following with regard to the three chains in the spice sector.

Cinnamon

The cinnamon value chain is fairly complicated with many agents involved at various stages of the process. Cinnamon cultivation is mostly done by smallholders wherein large scale producers and regional plantation companies are also involved in cultivation. Cinnamon peelers are the most important actors in the value chain; they are involved at the production level and they play a major role in making cinnamon bales. Village level and regional level wholesale collectors are some of the intermediaries who are involved in the collection stage of the chain; collectors are a crucial link between the producers and exporters. Processing of cinnamon is mainly done by exporters according to their foreign buyer requirements. Lack of skilled labour, high cost of labour and planting materials and unstable prices in the market are some of the main issues faced by the producers. High cost of transportation, poor hygienic practices in storages, and high competition amongst collectors are some of the issues at collector level. At exporter level finding quality products, high cost of maintaining quality standards and market concentration are the main drawbacks. To find solutions to these issues, there is a need to implement several strategies, requiring public private partnership at each levels of the value chain.

Pepper

The pepper chain is very fragmented and consists of many stakeholders performing various functions; cultivation is undertaken by smallholders while there are a number of intermediaries in the chain; they include collectors/traders/wholesales, who buy the pepper, clean, grade and in turn sell either to processors or exporters, who then sell in either the local or international market. A number of challenges confront the stakeholders at different points in the pepper chain. At the production level, cultivation/ harvest has been affected due to low productivity, climatic changes, cost and availability of inputs including labour, pests/diseases, price fluctuations, theft and inadequate support/assistance for cultivation. In the intermediary stage in the chain, there is inadequacy of supply, lack of facilities for processing of pepper and related labour issues. At the point of exports, the export companies face shortages of supply, quality issues, inadequate facilities to undertake testing, amongst other issues. In the upstream portion of the chain, concern for quality and safety of the product is low compared to exporters, depending on the end-markets. Addressing these constraints require multi-pronged approach involving both the private and public sectors including the value chain actors themselves.

Cardamom

The marketing structure of cardamom in Sri Lanka is characterized by its traditional nature at the domestic level and comparatively high degree of sophistication at exporter level. The traditional supply chain of cardamom in Sri Lanka is characterized by small holder cultivations, decentralized purchasing, low quality product purchases and sales and the presence of a number of intermediaries who extract a share of the benefits that should accrue to the producers. This has resulted in low value added in the chain, poor incentives for upgrading especially related to the quality and technology improvements and sluggish growth of the industry. There is not much concern on producing quality cardamom at the producer level. This can be primarily attributed to poor crop management and post harvest practices, high labour cost, lack of quality awareness and difficulty in getting a premier price due to poor dealer network. Despite the potential for expansion created by the various opportunities and strengths in the sector, current production is mostly used for the domestic consumption due to the structural and socio economic issues. Unavailability of suitable lands for cultivation and Thrips problem are two most severe issues that the sector is facing at present. The sector requires an integrated approach involving both private and public sectors to link the small holders with the processors and exporters in a shortest possible way to ensure not only quantity requirements, but also quality and price signals are moved both ways in the value chain. Research on productivity improvement, quality ensuring, cost minimizing and value adding promotion should be an integral part of such an approach.

Given that much of the spices from Sri Lanka including cinnamon, pepper and cardamom are currently destined to developing countries, attention on quality and safety considerations has been low. However, to diversify markets away from the traditional markets and ensure access to markets in developed countries and meet their expectations, there has to be a lot more emphasis given to improving quality of products exported and processes along the value chains. While the industry has undertaken initiatives towards this end especially in the case of cinnamon sector, much remains to be done to up lift the competitiveness of the industry including the poor standard of products flowing in the chains.

CHAPTER 01: INTRODUCTION

1.1 Background

Sri Lanka has always been renowned for producing exceptionally good spices. The spice sector constitutes an important sub-sector of the Sri Lankan economy, contributing 9 per cent to agricultural GDP and to agricultural exports (Central Bank of Sri Lanka, 2015). Over 111,000ha of land - equivalent to 6 per cent of land under perennial crops is under spice cultivation (Department of Export Agriculture, 2010). Spice cultivation has a small holder orientation where 70 per cent of production comes from smallholder farm units of less than 1ha which are cultivated by more than 200,000 small-scale growers (Samaratunga, 2006). Cinnamon, pepper, and clove are the main crops of spices, produced and exported from Sri Lanka. Spice production is geographically concentrated in Mid Country region (Kandy, Matale, Kegalle and Rathnapura Districts) and certain parts of the Southern Province (Galle, Matara and Hambanthota Districts).

Spices have become the main cash earning enterprise of many farmers in the major spice growing areas over the last couple of decades (Samaratunga, 2006). Production of spices has grown significantly over the last decade. Pepper production has more than doubled from 2006 (14,440 Mt) to 2015 (31,013 Mt). Cloves production grew by nearly 50 percent over the same period from 3,575 mt in 2006 to 5,253 mt in 2015. However, cinnamon and cardamom production have increased only marginally by 11% and 14% respectively. Cinnamon production increased from 15,900 Mt in 2006 to 17,707 Mt in 2015, while cardamom production has grown up from 80 Mt to 91 Mt during the same period.

Spices play a vital role as a source of foreign exchange earnings for the country, as export crops. For the past ten years, the average annual turnover from spices exports increased from Rs. 11,724 million in 2006 to Rs. 61,558 million in 2015 which is equivalent to 1.5 per cent of total export and 9 per cent of agricultural exports. This value exceeds 50 per cent when the 3 major export crops in tea, rubber and coconut are excluded (Central Bank of Sri Lanka, 2015). Spice export basket is more concentrated on cinnamon and pepper which contributes for over 75 percent of the total revenue from total spice exports. Based on the 2015 statistics, pepper, cinnamon, cloves and nutmeg constitute about 43%, 35%, 14% and 6% respectively of the total turnover from spices (Central Bank of Sri Lanka, 2015).

Present government has identified the spice sector as one of the key sectors for achieving better export performance in future due to the high demand in the export market. However, recent export performance in the spices sector has been sluggish. From 2010 to 2015, export amount of cloves and nutmeg dropped by 35 percent and 2.4 percent respectively. Cinnamon and pepper exports shrank by 2.3 percent and 21.5 percent respectively from 2013 to 2015. In order to achieve the level of exports that the government anticipates by 2020 (Table 1), the sector needs to overcome key challenges that inhibit its performance.

Table 1: Anticipated targets against recent performance in export value

Spice	Export value (USD. Mn)						
	2010	2011	2012	2013	2014	2015	Target@ 2020
Cinnamon	86	81	102	131	161	166	300
Pepper	26	22	47	33	85	154	400
Cloves	33	13	40	37	22	59	100
Nutmeg	9	9	19	29	27	37	60

Source: Central Bank of Sri Lanka and Vision 2020 Department of Export Agriculture

Since sub-sector specific constraints are not well identified, a comprehensive analysis of value chains of major spice products with the highest export potential is very important for the future policy interventions. Hence, the main purpose of the proposed study is to undertake a value chain analysis (VCA) focusing on cinnamon, pepper and cardamom. These three products are selected due to high production potential and export capacity among the spices.

The findings and recommendations of the analysis will contribute to national policy formulation and development planning and provide the necessary guidance for other stakeholders, including JICA and other nongovernmental organizations and private sector, etc. in articulating strategies and effective programs for the spices sector in Sri Lanka.

1.2 Objectives

The research study;

- Maps the value chain actors, functions and enabling environment;
- Identifies distribution of benefits and constraints faced by the Sri Lankan spice sector, including quality and hygiene related standards by applying VCA;
- Provides recommendations for policy interventions at different points in the chains to upgrade the spice sector and expand production/export opportunities based on VCA.

CHAPTER 02: METHODOLOGY

2.1 Conceptual Framework

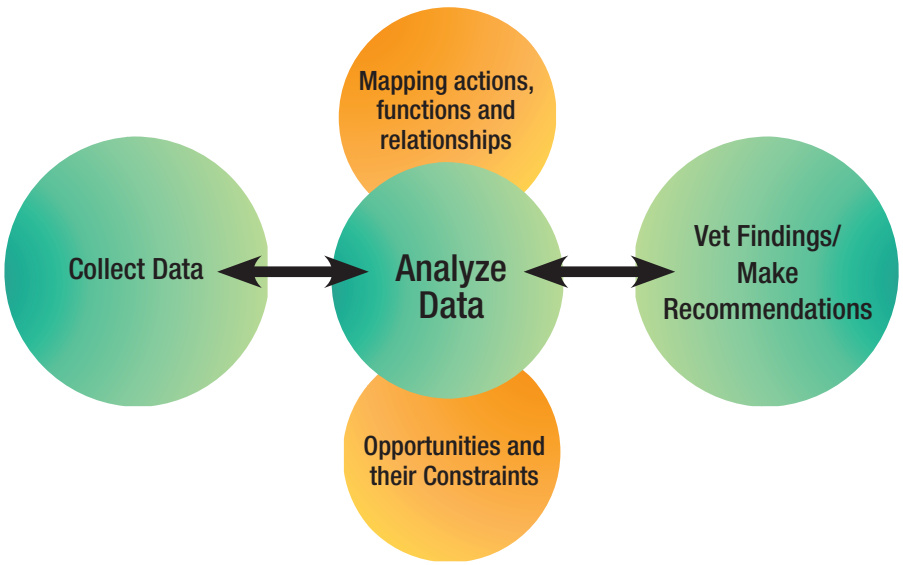
Originally defined by Porter in 1985, VCA has emerged as a powerful analytical tool in development policy making and it has been widely adopted by researchers, industry and development practitioners to understand the different production systems (Kaplinsky and Morris 2001). Simply put, a value chain (VC) describes the full range of activities that are required to bring a product from the producer to the final consumer by going through the different phases of value addition and processing. It provides a more holistic picture of the socio-economic environment that VC stakeholders operate in, describes the structure of the market, traces the distribution of benefits along the chain, diagnoses the opportunities, constraints and competitive advantage of a firm/industry, and allows for the formulation of more integrated solutions.

Standard VCA method developed by USAID was used in the proposed spice VCA (Figure 1). This framework consists of 4 steps: 1) data collection; 2) value chain mapping; 3) analysis of opportunities & constraints and 4) vetting findings & proposing recommendations. Both secondary and primary data was collected in the first step. These collected data were analysed in the mapping exercise in second step and to identify the constraints and opportunities in the third step. Finally, the findings were vetted through the Project Advisory Committee[1], which was set up for the purpose of the study, and disseminated through a national level workshop with all concerned stakeholders.

2.2 Study Area Selection

Cultivated extent and quantity produced were the main criteria in selecting the major producing districts for the primary data collection. In Sri Lanka, pepper is mainly cultivated in low and mid country wet and intermediate agro-climatic zones (DEA, n.d.). Total extent of pepper in Sri Lanka is about 12,000ha and Matale, and Kandy alone accounting for 23 and 20 percent of the extent, respectively (Ministry of Minor Export Crop Production, 2014). Other districts with sizable extent of cultivation include Kurunegala, Kegalle, Badulla and Ratnapura. The area under cardamom cultivation is about 5400 hectares, and major growing areas of cardamom can be found in central hill country of Sri Lanka; Kandy alone accounts for more than 50 percent of it (Ministry of Minor Export Crop Production, 2014). The reminder

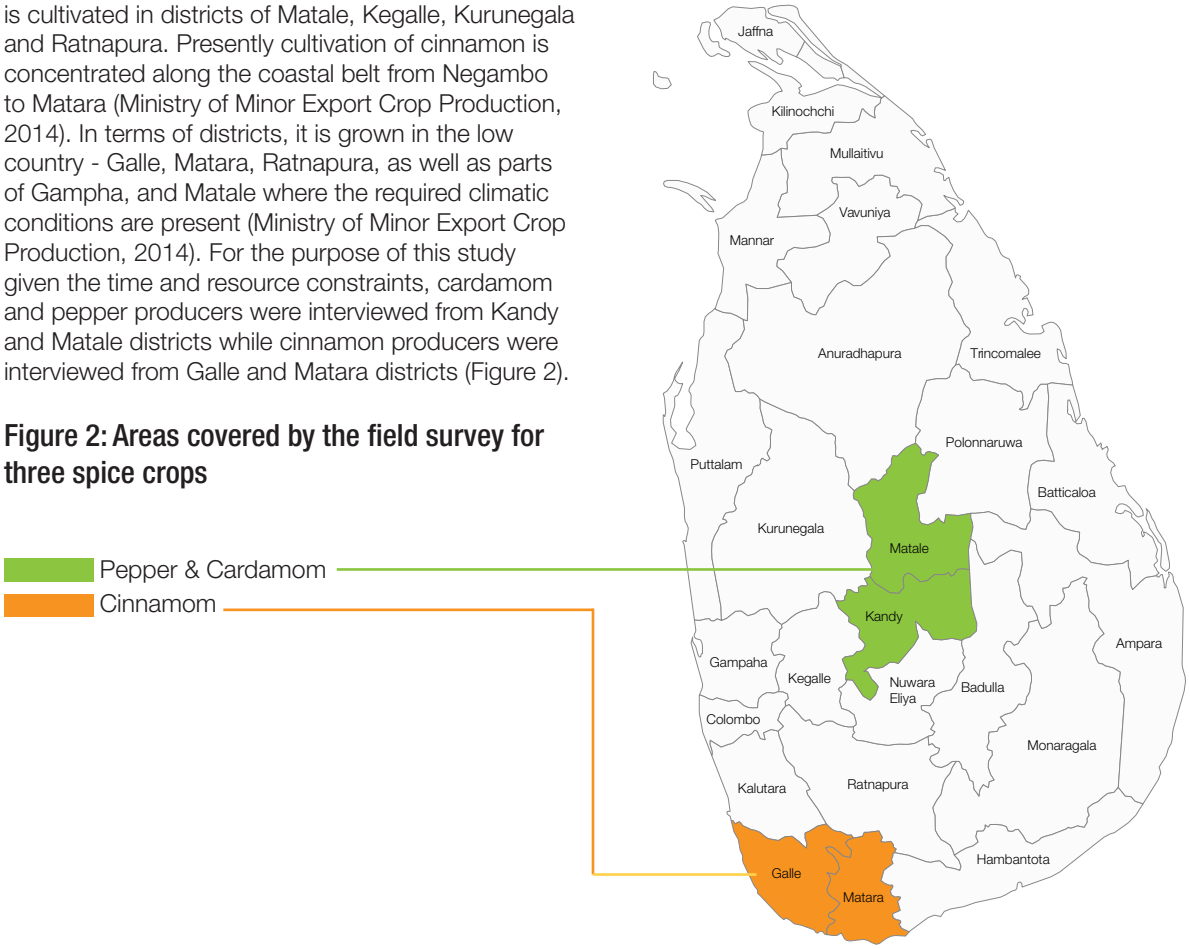
Figure 1: Process for value chain analysis



1. Project Advisory Committee consisted members from both the public and private sector which are associated with the spice sector. Stakeholders from the public sector included official from the Ministry of Primary Industries (MPI), Department of Export Agriculture (DEA), Export Development Board (EDB), Department of National Planning, while the private sector was represented by representatives from the Spice Council and National Chamber of Exporters of Sri Lanka (NCE).

is cultivated in districts of Matale, Kegalle, Kurunegala and Ratnapura. Presently cultivation of cinnamon is concentrated along the coastal belt from Negambo to Matara (Ministry of Minor Export Crop Production, 2014). In terms of districts, it is grown in the low country - Galle, Matara, Ratnapura, as well as parts of Gampha, and Matale where the required climatic conditions are present (Ministry of Minor Export Crop Production, 2014). For the purpose of this study given the time and resource constraints, cardamom and pepper producers were interviewed from Kandy and Matale districts while cinnamon producers were interviewed from Galle and Matara districts (Figure 2).

Figure 2: Areas covered by the field survey for three spice crops



2.3 Data Collection & Sampling

The study utilized a mix of quantitative and qualitative methods for data collection. A participatory/ consultative approach was adopted throughout the process. Secondary data collection included a compilation of documents with relevance to the focus of the study through a desk review as well as visits to the library of the Department of Export Agriculture (DEA) in Kandy and Sri Lanka Institute of Standards (SLSI) in Colombo to obtain documentation relating to standards. Sources of information included: journals, articles, reports, documents nationally published data sources, etc. Desk review was undertaken prior to the field work/primary data collection.

Primary data was collected through a mix of data collection methods: 1) questionnaire survey, 2) focus group discussions (FGDs), 3) key informant interviews (KIIs) which were complemented by direct observation in the field. These methods allowed for more in-depth exploration of value chains and yielded information that facilitated deeper understanding of the constraints and opportunities in the respective value chains.

Selection of the sample of producers and collectors was done in consultation with DEA and its extension officers in order to ensure optimum representation of the stakeholders (eg: small, medium and large players). There were different levels of interactions with different stakeholders during this stage (Table 2). 9 FGDs (approx.12 participants each) were organized in all 3 districts for all 3 spices covering a sample of 108 participants. All 3 FGDs for cinnamon producers were done in Galle and Matara district while the FGDs for pepper and cardamom were arranged in both Kandy (2 FGDs for cardamom and 1 FGD for pepper) and Matale (2 FGDs for pepper and 1 FGD for cardamom) districts. Towards conducting the FDGs, a guide was prepared (See Annex 1-4). Due to low turn-out of participants for both the cardamom FDGs, the participants who attended the meeting were interviewed separately as key informants for the study. FDG participants were enlisted for the short structured questionnaire survey to collect quantitative information (See Annex 5).

In addition to the above, about 30 KIIs were conducted in all 3 districts, as well as in Colombo and suburbs covering all the stakeholders associated with value chains of cinnamon, pepper and cardamom. A semi-structured questionnaire was prepared towards this end to gather information. Key stakeholders in the spice value chains interviewed included: large scale vertically integrated companies, plantation companies, processors/exporters, agents/ brokers, wholesalers (regional and Colombo), village collectors, government officials (from ITI, SLSI, DEA, MPI, etc), private associations representing the industry (Spice Council, SAPPTA). They were identified purposefully after initial mapping for interviews to capture a broad variation in responses. The informant pool was expanded using snowballing technique whereby informants were asked to refer other potential interviewees.

All the discussions/interviews were digitally audio-recorded after obtaining consent to be able to go back over and obtain an accurate rendition of the information collected. In addition, field observation was used to record information on-site to validate information collected using FGDs and KIIs.

Table 2: Primary data collection methods and tools

Methods	Spice	Sample distribution					Tools	Stakeholders
		Kandy[1]	Matale[2]	Galle[3]	Matara[4]	Total		
1. FGDs	Cinnamon			2	1	3	FGD guide	Small and medium scale producers
	Pepper	1	2			3		
	Cardamom					0		
	Total	1	2	2	1	6		
2. KIIs	Cinnamon					7	Semi structured questionnaire (face to face interviews)	Large producers, processors, exporters, agents/ brokers, regional wholesalers, village traders/collectors, Colombo wholesalers, government officials (ITI, SLSI, EDB, Department of Export Agriculture etc.), private associations (Spice Council, SAPPTA)
	Pepper					7		
	Cardamom					11		
	Supportive Services					6		
	Total					31		
3. Survey	Cinnamon			32	10	42	Structured questionnaire	Producers/collectors
	Pepper	12	20			32		
	Cardamom	3				3		
	Total	15	20	32	10	77		
4. Observation	All						Notes	Producers, collectors, wholesalers, processors, exporters

Notes:
Locations of 1. Kandy- Karagasthanna, 2. Matale –Ukuwela, Thanna, 3. Galle – Gonapeenuwala , Karandeniya, 4. Matara – Makandura

2.4 Data Analysis & Mapping

Content analysis was used for analyzing the qualitative data collected and this included labeling/ coding all of the information so that similarities and differences can be recognized for the purpose of summarisation. The aim was to make sense of the data collected and to highlight the important messages, features or findings. Quantitative analysis of survey data collected was done in excel software package.

Qualitative and quantitative information was then used for mapping of actors, their functions and relationships and identifying constraints & opportunities in the value chains. Final products and markets, key functions/ activities, different market channels, actors, enabling environment and linkages/relationships were mapped schematically and explained for better understanding on market structure, dynamics, and enabling environment including quality standards and safety regulations, etc.

Value chain mapping is the process of developing a visual depiction of the basic structure of the value chain. A value chain map illustrates the way the product flows from raw material to end markets and presents how the industry functions. Final products and markets, key functions/activities, different market channels, actors, enabling environment and linkages/ relationships are mapped schematically.

There are no rigid rules to value chain mapping, but the following guidelines were be used in mapping process. First, the producers were listed at the top of the map and the functions were listed down the right side of the map. Then, end markets were listed across the bottom of the map and the participants/ actors were filled in blocks according to their functions and markets. If actors are involved in more than one function or market, the block was extended to reach the relevant functions/markets. Next, the linkages were drawn between blocks with arrows in the direction of the product flow. Finally, additional information related to the value chain such as supporting markets and business enabling environment were included.

CHAPTER 03: STANDARDS GOVERNING SPICE SECTOR

A standard is a document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose. Standards can be classified in to product and process standards. Products standards as opposed to process standards specify the characteristics of the final product. Process standards specify characteristics of the production process- that is the way in which a product is made. (Caswell, 2003: OECD, 2006). This section will provide an overview of the relevant product and process standards, both local and international, public and private, affecting cinnamon, pepper and cardamom trade in Sri Lanka.

3.1 Product Standards for Cinnamon

Cinnamon is sold generally as quills. In addition to this, cinnamon is also exported as quislings, featherings and chips. The quills should of light brown colour and well formed and well dried (Table 3). The occurrence of reddish brown patches on the quills which may become dark - brown with time is known as 'foxing'. These are defects and the value of quills is depreciated depending on the amount of foxing.

Table 3: Commercial Specifications of Cinnamon

Character	Specification
Colour	Pale brown to slightly reddish colour Ground cinnamon – yellowish to reddish brown in colour
Odour	Characteristic fresh aroma
Flavour	Delicate and sweet flavor characteristic to Ceylon cinnamon. It shall be free from foreign flavor. Including mustiness.
Moisture	Not more than 15% for quills and 12% for other grades
Volatile Oil	Minimum 1% for quills and 0.7% for other grades on dry basis.
Shelf Life	Minimum of 1 year
Packing	Packaged in clean, sound, dry packages, made of of jute, cloth, paper or polyethylene bags.

Source: SLSI

Almost all the parameters of SLSI (Sri Lanka Standard Specification for Ceylon Cinnamon – SLS 81: 2010) focus on the physical appearance of the products. There are two main grades - 'coarse' and 'fine'. The fine grade is named as 'Alba' which usually comes from Ratnapura. The 'coarse' grades include "Mexican" and "Hamburg". These grades are categorized according to the diameter of quills, number of whole quills per Kg etc. These grades are described in Table 4. Furthermore, these specifications also prescribe the requirements for quilling, featherings[2] and chips[3] which are different forms of the processed dried bark of cinnamon. Quills are graded on the basis of the diameter of the quill and the level of foxing.

2. Cinnamon featherings are the pieces of inner bark, obtained by peeling and/ or scraping the bark of small twigs and stalks of cinnamon shoots, which may include a quantity of chips as specified.
3. Cinnamon chips are the dried bark of unpeel able cinnamon stems, branches and trimmings inclusive of the outer bark, which has been obtained by chipping or scraping.

Table 4: Classification for Quills (ISO 6535:1997) (SLS 81:2000)

Commercial designation of grades and qualities	Diameter of quills Max mm	Number of whole quills (1050mm) per kg min	Extent of foxing1 % max 2	Minimum length of quills in a bale mm	Pieces of tube and broken pieces of the same quality per bale max % (m/m)
Alba	6	45	Nil	200	1
Continental					
C 0000special	6	35	10		
C 00000	10	31	10		
C 0000	13	24	10	200	1
C 000	16	22	15		
C 0	17	20	20		
	19	18	25		
Mexican					
M 00000special	16	22	50		
M 00000	16	22	60	200	2
M 0000	16	18	60		
Hamburg					
H 1	23	11	25		
H 2	25	9	40	150	3
H 3	38	7	60		

Source: SLSI

3.2 Product Standards for Pepper

The Sri Lankan Standards Institution SLS105 standard (Part 1:2008 and Part 2:2008) relates to the requirements for whole black pepper and white pepper (Piper nigrum), respectively.. Whole black pepper is classified into three grades: Grade 1, Grade 2 (FAQ), and Grade 3. The standard has requirements relating to; hygiene, appearance, odor and flavor, freedom from mould, insects, physical requirements, chemical requirements, chemical requirements, microbiological limits and contaminants including pesticide residues.

According to hygiene requirements, the pepper has to be harvested, processed, packed, stored and transported under hygienic conditions while the appearance should be black in colour with a wrinkled pericarp. In terms or odour and flavor, the pepper has to be pungent (odour and flabour) and be free from moulds and insects and contamination visible to the naked eye. Physical, chemical and microbiological limits are given in the Table 5. Whole white pepper is classified into two grades - Grade 1 and Grade 2 - according to similar requirements as black pepper but with different limits.

Table 5: Physical, Chemical, Microbiological Limits/Requirements for Black Pepper

Characteristics	Grade 1	Grade 2	Grade 3
	Physical		
Extraneous matter % by mass, (Max)	1	2	2
Light berries, broken pepper, % by mass (Max)	2	10	15
Pinheads % by mass (Max)	0.5	1	2
Bulk density, g/l, (Max)	550	500	450
	Chemical		
Moisture % by mass, (Max)	12	14	14
Ash, %, on dry basis (Max)	7	7	7
Non-volatile ether extract, % by mass, on dry basis (Min)	10	10	10
Volatile oils, ml/100g, on dry basis (Min)	3	3	3
Piperine content, % by mass, on dry basis (Min)	6	6	6
	Microbiological limits		
Escherichia coli (MPN/g)	Negative	Negative	Negative
Salmonella, per 25 g	Absent	Absent	Absent

Source: SLSI

The EU and a few countries including the USA and Japan have their own specifications for both black pepper and white pepper and they differ in their specifications (IPC, 2015). The International Pepper Community (IPC), with the participation of the member countries, has prepared a set of specifications for export of both black pepper and white pepper. These specifications cover the physical characteristics of the pepper, insect and microbial infestations, extraneous matter and mammalian and / or other excreta (IPC, 2015). Based on these parameters, IPC has specified two grades each for whole black pepper and whole white pepper. There a few other specifications introduced by the importing countries to ensure that their consumers are protected from other health hazards in pepper (IPC, 2015). These include restrictions against aflatoxin, heavy metals and pesticides residues.

3.3 Product Standards for Cardamom

Under the SLS (166: 1980) standard, cardamom is graded into five main categories - LG, LLG 1, LLG 2, LB and LNS (Table 6). Cardamoms are graded on the basis of color, splits per cent by count and mass in grams per litter. The cardamom (Elettaria cardamomum) should be a nearly ripe fruits with capsules which have been dried. The capsules color range from light green to brown, cream and white.

Table 6: Cardamom Grades According to SLS 166: 1980

Grade	Color	Splits per cent by count, max	Mass in grams per liter, min
LG	Green	2	370
LLG 1	Light green	5	340
LLG 2	Light green	6	320
LB	Pale buff	8	300
LNS	Off color	Not specified	280

Source: SLSI

There are some basic requirements that need to be met such as flavor of the fresh pods must be free from foreign taste (i.e.: rancidity and mustiness). Color of the capsules must be fairly uniform in color as well as free from extraneous matter, molds and insects. The volatile oil content in the seeds must be a minimum of 4 percent by mass.

3.4 International Process Standards Applicable to Cinnamon, Pepper and Cardamom

European Spice Association specifications of quality for herbs and spices represents the interests of its members in all matters pertaining to the processing, packing, quality assurance and food safety and/or marketing of herbs, spices and spice products (Table 7). The European Spice Association (ESA) is the umbrella organization of the European spice industry. Members of ESA are the national federations of the spice industry in the member countries of the European Union, Switzerland and Turkey (ESA, 2015).

Table 7: European Spice Association Specifications

Product (whole form)	ASH % W/W Max	AIA % W/W Max	H20 % W/W Max	V/O % V/W Min
Cinnamon	7	2	14	0.4
Black Pepper	7	1.5	12	2
White Pepper	3.5	0.3	12	1.5
Cardamom	9	2.5	12	4

Notes:
ASH % W/W- Ash percentage weight by weight; AIA % W/W - Acid Insoluble Ash percentage weight by weight; H2O % W/W - Moisture percentage weight by weight; V/O % V/O- Volatile Oil percentage weight by weight
Source: Spice Council

American Spice Trade Association's (ASTA) cleanliness specifications (Table 8) include five recommendations to minimize the risk of introduction of filth throughout the supply chain, to prevent environmental contamination, cross-contamination, and post-processing contamination during processing and storage, and uses validated microbial reduction techniques, performs post-treatment testing to verify a safe product and tests to verify a clean and wholesome manufacturing environment (ASTA, 2015). ASTA's Cleanliness Specifications were developed to ensure that the spices meet federal regulatory requirements for safety and cleanliness. They were designed to meet or exceed the U.S. Food and Drug Administration's Defect Action Levels.

Table 8: American Spice Trade Association's (ASTA) Cleanliness Specifications

Spice	Whole insects dead by count	Excreta Mammalian By mg./lb	Excreta other By mg./lb	Mold % by Wgt.	Insect defiled/ infested % by Wgt.	Extraneous foreign matter % by Wgt.
Cinnamon	2	1	2.0	1.0	1.0	0.50
Black Pepper	2	1	5.0	1.0	1.0	1.00
White Pepper	2	1	1.0	1.0	1.0	0.50
Cardamom	4	3	1.0	1.0	1.0	0.50

Source: Spice Council

In addition, spice exporters should comply with pesticide residue limits in EU and USA.

Good Agricultural Practices (GAPs) are production and farm level approaches to ensure the safety of fresh produce for human consumption. GAPs help growers to understand the practices and risks associated with their farm, and help identify practical ways to reduce the risk of contaminating produce being grown, harvested and packed on the farm. GAP production and post-harvest guidelines are designed to reduce the risk of food-borne disease contamination on fresh produce. These voluntary procedures can be tailored to any production system.

Good Manufacturing Practices (GMPs) specifies a set of manufacturing guidelines to ensure the quality of the product; which includes a range of preventative controls such as training, audits, documentation and validation/evaluation.

HACCP (Hazard Analysis and Critical Control Points) is a systematic preventive approach to food safety. There are physical, chemical, and biological hazards in production processes. HACCP certification is built around several principles to prevent process hazards. HACCP standard is a complete food safety and quality management system and the food standards agencies recommend it as the most effective way for maintain product quality and consumer protection (SLSI, 2017).

ISO 22000:2005 specifies the requirement's an organizations food safety management system has to meet. To obtain ISO 22000:2005 a company has to demonstrate its ability to control food safety hazards.

Organic regulations are formulated based on guidelines or basic standards provided by the International Federation of Organic Agriculture Movements **(IFOAM)** and Codex Alimentarius. Overall, organic operations must demonstrate that they are protecting natural resources, conserving biodiversity, and using only approved substances (IFOAM, 2015).

Fair Trade is a trading partnership, based on dialogue, transparency and respect, which seeks greater equity in international trade. It contributes to sustainable development by offering better trading conditions to, and securing the rights of, marginalized producers and workers. Fair Trade organizations have a clear commitment to Fair Trade as the principal core of their mission. They are engaged actively in supporting producers, awareness raising and in campaigning for changes in the rules and practice of conventional international trade (Fair Trade International, 2011).

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CHAPTER 04: SUPPORTING INSTITUTIONS & ENABLING ENVIRONMENT

Spices constitute an important sub-sector of the Sri Lankan economy. Therefore, a number of public and private institutions support the spice sector in Sri Lanka. Within the public sector there is the the Industrial Technology Institute (ITI), the National Cinnamon Research and Training Station, the Department of Export Agriculture (DEA), Ministry of Primary industry (MPI) and the Sri Lanka Standards Institution (SLSI) which is a semi-government organization. Among well-established private sector associations, the Spice Council and the Spices and Allied Products Producers' and Traders' Association (SAPPTA) contribute significantly to the betterment of the spice industry.

This section will examine the most relevant public, semi-government and private organizations related to the industry and their main objectives, activities/functions, and relationships with stakeholders, and challenges facing them.

4.1 The Spice Council (TSC)

The Spice Council (TSC) is a joint initiative of the public and private sector stakeholders in the spice Industry. It is the result of a recommendation of the Task Force for Spices and Allied Products Sector, under the Ministry of Enterprise Development. Establishment of TSC was supported by the Spice Cluster of United States Agency for International Development (USAID), which was funded under the Competitiveness Initiative (TCI). The Spice Council comprises of all key industry private and public sector stakeholders. TSC was founded in December 2003 as a non-profit organization registered under the Registrar of Companies Act No. 17 1982, Section 15 (1). (Spice Council, 2012)

Its mission is to facilitate and implement strategies to achieve the industry vision of propelling "Sri Lanka to be within the top five branded and value added Spices and Allied Products marketers in the world". The Spice Council acts as the apex body for the spice industry and provides a unifying front to meet the aspirations of its stakeholders to further the industry's development.

Specifically, the Spice Council works towards to ensure the Sri Lankan spices and allied products compete effectively and profitably at both domestic and international markets. It serves as a common forum by bringing together producers, exporters, processors, dealers and other stakeholders in the industry, and promotes high standards of business conduct. The Council also promotes scientific research related to spices and allied products industry as well as conducts training and development programs aimed at the industry. Moreover, it works with the Government to ensure that industry interests are represented and considered in policy making.

Spice Council consists of producers, dealers, brokers, processors and exporters, represented by eight personnel from private sector and four from government sector. It has worked with SLSI committee to develop standards for the country. They have developed GMPs for cinnamon and pepper industries while the GMP for cardamom is currently under development.

4.2 Industrial Technology Institute (ITI)

Industrial Technology Institute (ITI) is the pioneer scientific research & development organization in Sri Lanka. It succeeded the Ceylon Institute of Scientific and Industrial Research (CISIR), and now comes under the purview of the Ministry of Science, Technology and Research.

ITI aims to be a regional center of excellence in scientific industrial research for national development. It has conducted innovative research and development and provides internationally competitive technical services to accelerate industrial development for the benefit of Sri Lanka.

The main objective of the ITI is to support industry by undertaking testing, investigation and research; improving product quality, technical processes and methods used in industry; discovering new processes and methods to be used in industry; providing technical services and consultancies; and engaging in activities connected with technology transfers, the adaptation of technologies and the development of new technologies. It also conducts research with a view to accelerating industrial technology development. The ITI conducts client-sponsored research and development for government agencies, commercial businesses, and other organizations.

4.3 National Cinnamon Research and Training Station (NCR&TC)

National Cinnamon Research and Training Center (NCR&TC) comes under the Department of Export Agriculture and the Ministry of Minor Export Crops Promotion. It aims to develop and deliver research, academic programs and training courses, to benefit all stake holders of the cinnamon industry.

More specifically, it aims to strengthen all aspects of cinnamon industry such as production technologies, transferring technology and providing residential training for all the stake holders related to the industry from grassroots level to executive levels. NCR&TC provides training programmes ranging from raising a quality seedling, field planting, and crop management to harvesting, processing & grading.

National Cinnamon Research and Training Center (NCR&TC) located in Thihagoda, Matara was established to fulfill the research and training needs for cinnamon. In fact, it is the only research and training center on cinnamon in Sri Lanka and statutory responsibilities for research, development and training on all aspects of cinnamon industry rest with it. NCR&TC conducts more than 25 research programs during the year. NCR&TC expects to widen and improve its research and training capacity in quality and quantity with collaboration of other relevant local and international institutions.

4.4 Sri Lanka Standards Institution (SLSI)

SLSI, a semi government organization under the Ministry of Science, Technology and Research, is the premier national organization that promotes standardization and quality in the country. It is also a member of the International Organization for Standardization. The SLSI was formerly known as the Bureau of Ceylon Standards, which was set up under the Bureau of Ceylon Standards Act No.38 of 1964. This Act was repealed and replaced by the Sri Lanka Standards Institution Act No. 6 of 1984 paving the way for the establishment of the SLSI with the primary responsibility of promoting standardization and quality management practices in Sri Lanka (SLSI, 2012). Stakeholders of SLSI include the Government, local and foreign organizations registered with SLSI, scientific institutions, and consumers.

Functions of SLSI include: formulation/revision/ amendments of national standards, product certification (including SLS specification for cinnamon- SLS 81, SLS specification for pepper- SLS 105, SLS specification for cardamom- SLS 166), system certification (ISO 9001, ISO 22000, HACCP, GMP, ISO 14001, OHSAS 18001 and SA 8000), laboratory testing services, industrial metrology and instrument calibration services, inspection of imports, quality assurance of exports, training on standardization and quality management, providing information service and acting as the national enquiry point on WTO/ TBT.

4.5 Spices and Allied Products Producers' and Traders' Association (SAPPTA)

Originally SAPPTA was formed in 1984 as the Spices and Allied Traders Association, with the disbanding of the Cardamom Traders Association and Sri Lanka Association of Producers and Exporters of Spice and Other Products. In 1997, this Association changed its name to SAPPTA with the objective of enlarging the scope of business coming under its purview. It is the official body representing the spice trade in Sri Lanka. SAPPTA covers the entire spectrum of spices, including cinnamon, pepper, cloves, cardamoms, nutmeg, mace and vanilla, and other agricultural crops and derivatives such as cashew, arecanut, cocoa, coffee, essential oils, oleoresins, herbal products and organic products. The Association's activities are managed by an Executive Committee of 20 members made up of annually elected representatives from the exporter, producer, processor, dealer and service sectors. The Colombo Brokers' Association is invited to nominate a representative to serve on the Committee. The Association promotes regular dialogue with the state agencies and all other policy making bodies. The Association has excellent rapport with the DEA, EDB, the Department of Customs, the Department of Commerce, the Ministry of Agriculture, the Ministry of Trade and the Ministry of Finance, as well as foreign agencies (SAPPTA, 2012).

As a premier institution in the spice industry, SAPPTA identifies problems of each commodity, difficulties in exporting and benefits of government regulations. SAPPTA encourages exporters to take part in marketing/ international trade fairs, organize trade fairs, and seminars to educate producers to upgrade quality. SAPPTA monitors its members and intervene in legal issues. SAPPTA publishes weekly prices for all spices, which are published in local newspapers and set the auction prices. It also lobbies the government on behalf of the industry; for example, in 2014, the government imposed a CESS tax for all spices e. SAPPTA pressed the government to remove the CESS and the tax was subsequently removed on 20th December 2015 after one and half years.

SAPPTA has played a vital role in assisting the plantation sector to successfully diversify its crops into large scale spice cultivation. SAPPTA has already initiated dialogue with the government and the relevant institutions to bring them to a common platform together with the plantation sector with a view to encourage the expansion of spice cultivation in Sri Lanka.

4.6 Department of Export Agriculture (DEA)

DEA is a government institution which was established under purview of Ministry of Minor Export Crops Promotion. In 1975, the Department of Minor Export Crops formed under the Plantation Industries was transferred to the Ministry of Agriculture Department and was renamed in 1992 as the Department of Export Agriculture and strengthened under a Parliamentary Act No 46 of 1992 (DEA, 2010). DEA mainly deals with spices such as cinnamon, pepper, cardamom, clove and also turmeric, ginger, coffee, cocoa, goraka, betel, vanilla, areca nut, citronella and lemon grasses.

The primary objective of the DEA is to increase foreign earnings through enhancement of quality and quantity of export agricultural crop production. DEA mainly undertakes activities for the benefits for small holders. Broadly speaking, DEA has three major objectives: increase export earnings from minor export crops, increase farmer income and increase productivity of existing cultivations.

DEA functions are carried out through two main divisions; development and research. Its development division is present in fourteen districts of the country (Kandy, Matale, Nuwaraeliya, Galle, Matara, Hambantota, Colombo, Kalutara, Gampaha, Kurunagala, Kegalle, Ratnapura, Moneragala and Badulle). At the district level awareness and training programs are implemented by extension officers. Research division was started at Wariyapolawatta, in Matale district and there are six sub research stations in Matale, Kurunagala, Gampaha, Kundasale, Nillambe and Kandy district.

To improve productivity and to achieve its organizational goals DEA carries out the following activities: economic and market research, administer assistance schemes such as new planting assistance scheme, productivity improvement program and post-harvest assistance scheme, training and awareness programs for farmers (such as in service training), farmer training and cinnamon peeler training programs. In addition, DEA is involved in crop protection activities, assists in organizing and arranging marketing activities and disseminates information in various aspects etc.

4.7 Ministry of Primary Industry (MPI)

MPI is a government institution which was established in 2015 to promote economic development and recognize the government's progress goals of achieving USD 25 billion exports and generating one million employments by the year 2020 (MPI, 2016). The vision of the MPI is to provide the "enabling environment for right share of Ceylon exports in the competitive global market"(MPI, 2016). MPI covers three sectors: agriculture, spices and fisheries. The focus of MPI is to sustainably increase productivity while protecting natural environment. There are three main approaches adopted by the MPI including value chain development, product diversification and branding. Under value chain approaches, the MPI mainly aims to assist farmers and entrepreneurs by generating opportunities along the value chains to transform commodities into higher-end value products, offer value-added products at lower costs and linking small-scale farmers to global value chains. Through product diversification, it aims to introduce improved varieties of crop which can enhance plant productivity, quality, health, nutritional value and pests, diseases resistance (MPI, 2016). In branding, MPI focuses ton creating the supply chains of primary industry commodities to ensure their viability and profitability.


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CHAPTER 05: CINNAMON VALUE CHAIN ANALYSIS

5.1 Overview of the Cinnamon Sector

Sri Lanka has been famous for its quality spices since time immemorial. As the botanical name stands "*Cinnamomumzeylanicum*" the cinnamon plant is an endemic plant to Sri Lanka and we still continue to dominate over 90 percent of the world market for true cinnamon (Spice Council of Sri Lanka, 2011). Cinnamon is the most important spice commodity among the spice sector. At present cinnamon is widely used in bakery products, pharmaceutical preparations & cosmetics worldwide. Sri Lanka is the world largest producer & exporter of cinnamon to the world.

Figure 3 shows that the land extent of cinnamon is increasing overtime except in year 2007-08 due to severe drought. Cultivation of cinnamon is mainly concentrated in four districts, namely; Galle, Matara, Kaluthara and Rathnapura. They represent 90 percent of the total cultivation areas. Amongst the districts, 70 percent of areas belong to Galle and Matara districts (Dissanayake and Dodangoda, 1993). Cinnamon is a hardy plant which can grow well in almost all types of soils under a wide variety of tropical conditions.

In Sri Lanka it is cultivated under varying conditions ranging from semi-dry to wet zone conditions and soils varying from silver sand to loamy and lateritic to gravelly soils (Spice Council of Sri Lanka, 2011). Cinnamon trees usually grow up to 5m - 6m high. There are eight cinnamon species in Sri Lanka. Amongst them only Cinnamomum zealanicum is grown commercially. Moreover, the figure shows that the cinnamon production has increased from 2006 to 2012 and thereafter it was stagnant. According to DEA, the productivity of a well-managed and matured cinnamon plantation is estimated to be 1,000kg/ha per year. However, the actual figure in 1997 was 475 Kg/ha and it was 510 Kg/ha in 2009.

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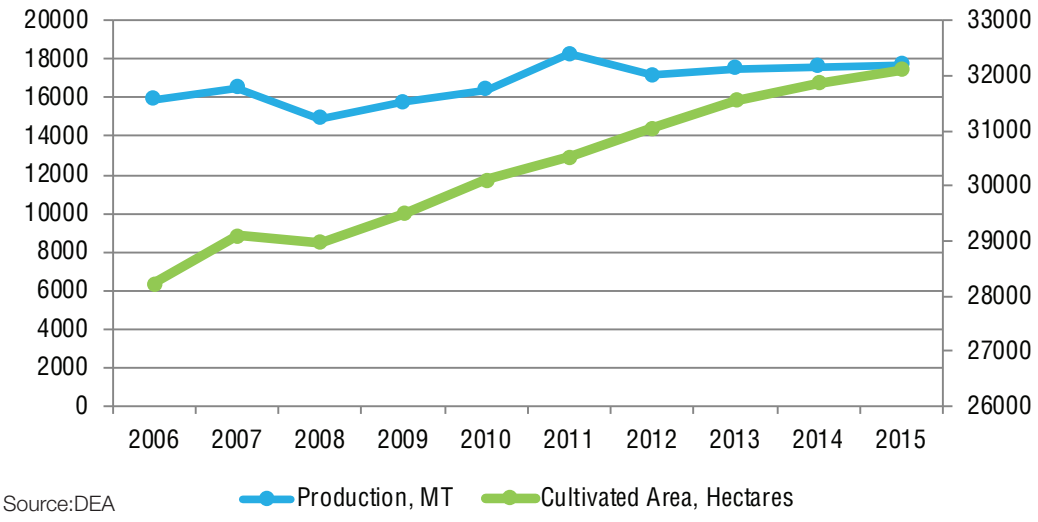
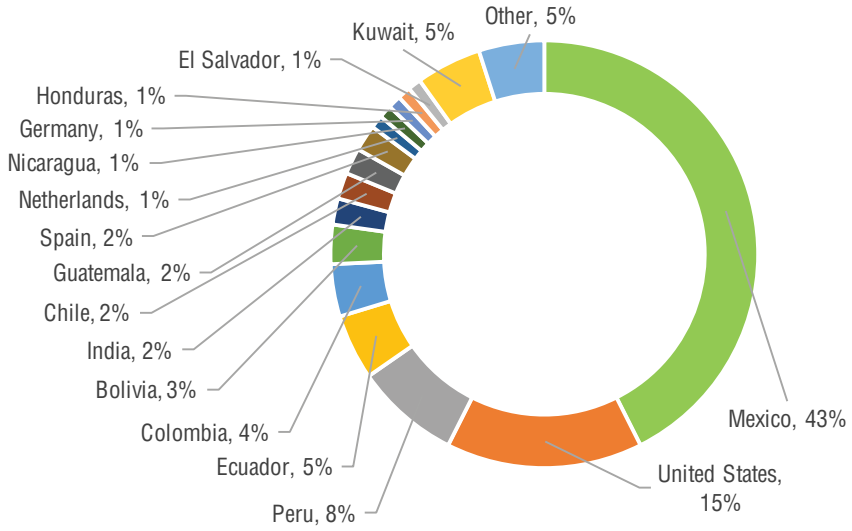
Figure 3: Extent and Production of Cinnamon Cultivation in Sri Lanka 2006-2015



Source:DEA

Mexico, USA and Peru are the main markets for Ceylon Cinnamon (Figure 4). Colombia, Ecuador, Peru, Spain, Guatemala, Chile and Bolivia are the other main countries which consume a considerable amount of Ceylon Cinnamon. Sri Lanka has an immense potential to penetrate into niche market segments in the international market too.

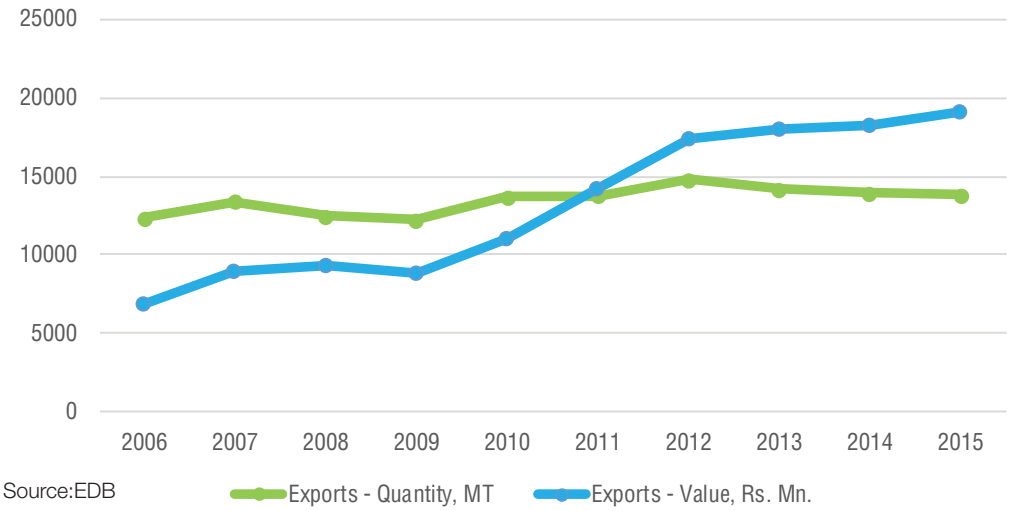
Figure 4: Key Export Markets of Sri Lankan Cinnamon, 2015



Source:EDB

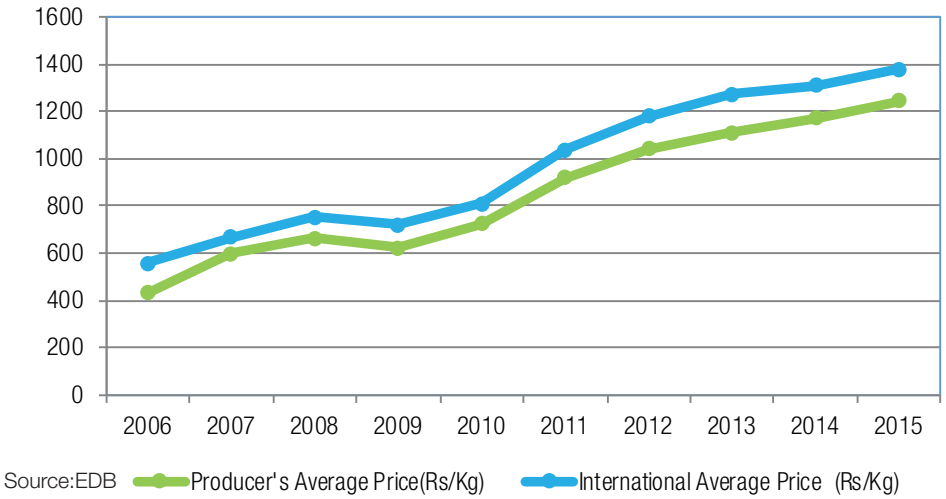
As shown in Figure 5 except for the year 2009, there was an increasing trend for cinnamon exports. The highest quantity of cinnamon exports recorded in the year 2012. This could be due to the highest production recorded in 2011. However, in overall quantity of exports do not show any significant variation. During this time period the lowest export quantity was recorded in the year 2009 due to bad weather condition.

Figure 5: Export Quantity and Value of Cinnamon in Sri Lanka 2006-2015



Source:EDB

Figure 6: Producer and International Average Prices for Cinnamon 2006-2015

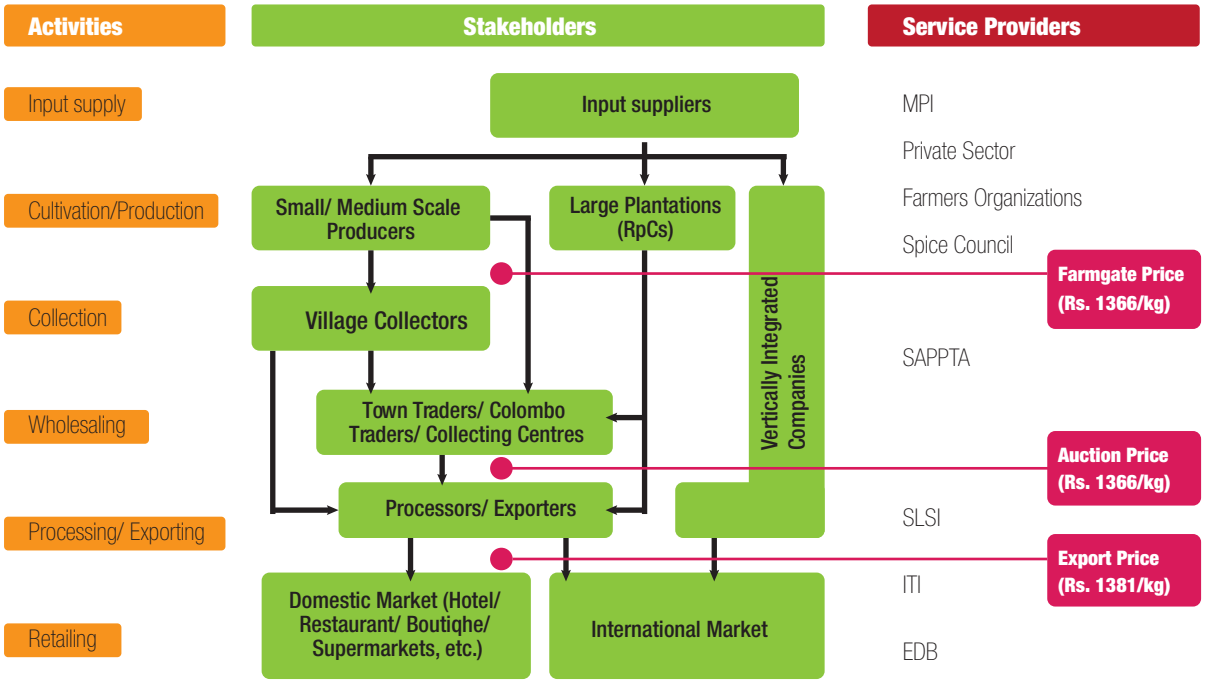


The export values for cinnamon were highest during the period of 2012-2015.Values from 2006 to 2009 are relatively low but after that the values show a steady increment. When considering the export prices of Cinnamon the prices have gone up rapidly. The export prices in 2006 doubled from 2012 onwards.

This could be due to new markets for cinnamon. The highest international market price was recorded for cinnamon in the year 2015 (Rs. 1381/kg) (Central Bank of Sri Lanka, 2015). Figure 6 shows the changing pattern of average producer prices and average international prices. It illustrates that the international prices determine farm gate prices to a greater extent.

5.2 Cinnamon Value Chain Map

Figure 7: Schematic Illustration of Cinnamon Value Chain Map



5.3 Value Chain Activities and Players

5.3.1 Cinnamon Production

According to the General Report of the Census of Agriculture 2002, the cultivation of cinnamon was dominated by the smallholder sector. Most of the smallholdings (70 percent) were less than 2 ac. 15 percent of land was 2-5 ac, 7 percent ranged 5-10 ac and the balance was 10-50 ac. More than 90 percent of cinnamon was cultivated as a mono crop (Spice Council of Sri Lanka, 2012). Some of the cinnamon trees are more than 100 years old. Most of the growers are involved mainly in producing cinnamon, which is highly labour intensive.

Producers purchase planting material from District Office of the Department of Export Agriculture and from private nurseries. Producers, whose lands are less than 5 acres, pay Rs.6.50 for a planting pot when they buy from the department. Whereas when they buy from private plant nurseries they have to pay Rs. 25.00-30.00 for a pot. In each area, there are department certified plant nurseries from which the department buys planting materials. The department buys planting pots at the rate of Rs. 13.00. According to the planting nursery owners, they have to spend Rs.2,500 for each cube of soil[4] they buy compared to the earlier price of Rs.500. This increase was due to the introduction of permit system for soil delivery in last year. Normally, they can make 1000-1,500 bags from one soil cube.

Cinnamon producers use both organic and chemical fertilizers to increase productivity. Most of the producers interviewed prefer to use organic fertilizers. However; the problem lies with the high cost of production of organic fertilizer. Normally, organic producers use residuals of rice plants, cattle manure and poultry manure. Approximately, it takes 3-5 months to decompose organic fertilizers. The cost of an organic fertilizer packet (50 Kg) is Rs.700. Producers are using chemical fertilizer too to improve productivity. As chemical fertilizers they use MOP (Muriate of Potash), Urea, Dolomite. For one acre, usually they use 8 bags of 50kg of fertilizers. After 2015 with the elimination of fertilizer subsidy, producers have to buy 50 Kg fertilizer bag for Rs.2850 - Rs.2900. Cinnamon industry mainly uses fertilizer but very rarely uses weedicides and pesticides. Before 2015, the government paid 50 % subsidy for cinnamon fertilizer under the productivity improvement programme. Most of the producers used and benefited from this fertilizer subsidy programme and they requested the government to introduce the facility again. Currently, they buy chemical fertilizers from the village or town shops. Few fertilizer companies are operate at village level. They distribute their fertilizer through agents.

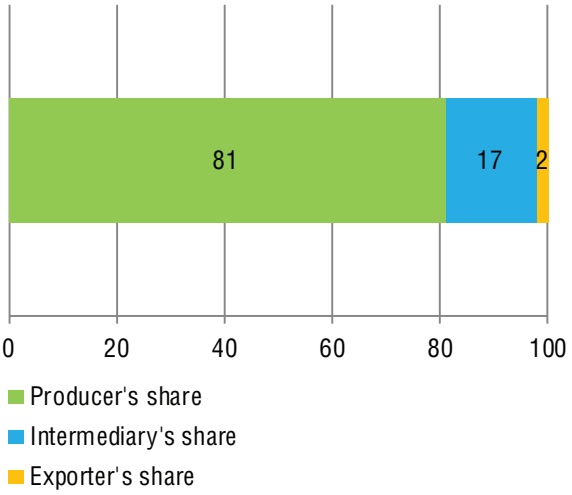
Cost of labour is another major cost component in cinnamon production. On average, the labour cost is 67% of production cost whilst the balance 19% is the average cost of material inputs.

Cost of labour is another major cost component in cinnamon production. On average, the labour cost is 67% of production cost whilst the balance 19% is the average cost of material inputs (Spice Council of Sri Lanka, 2012). Cinnamon is a labour intensive crop; both men and women are involved in land preparation, weeding etc. Weeding is an essential requisite in cinnamon cultivation and clean weeding is recommended for young plantation whereas slash weeding is recommended 2-3 times a year for mature crops. In general, producers pay Rs.1,200.00 per day for a female worker and Rs. 1,500.00 for a male labourer.

According to data provided by the DEA, cost of production of cinnamon was LKR/Kg 669.17 in 2015 and high prices are received by producers at the farm gate (LKR/kg 1246.1) After deducting the cost of production, the farmers keep about 81% of FOB price of cinnamon, while the intermediaries retain 17 % and exporters 2 % (Figure 8).

4. One cubic meter of soil weighs between 1.2 and 1.7 metric tonnes, or between 1,200 and 1,700 kilograms.

Figure 8: Distribution of Benefits in the Cinnamon Value Chain



Agricultural extension officers at the Department of Export Agriculture provide and disseminate agricultural and technological knowledge to producers and laborers. An agricultural extension officer directly works with farmers and companies related to agriculture. DEAs programme on "Productivity Improvement on Spices" provides knowledge on GAP[5] at farmer level through extension officers. Usually, extension officers organize awareness programmes at villages with the help of farmer organizations. Further, during these awareness programmes members of the association share their experiences.

Harvesting of cinnamon takes place three years after planting and two harvests can be reaped in a year. Harvesting is ready when the bark of the stem tuns brown and the stick diameter reaches about 3-5cm. Firstly, branches and leaves are removed from harvested sticks. Peeling of harvested stems should be done on the same day, but due to the shortage of peelers it does not happen in practice. Cinnamon peelers play a major role in the cinnamon industry. Peeling requires skilled labour and the knowhow of cinnamon peeling is handed down from generation to generation. The cinnamon peelers demand 1/3 (33 percent-in Galle) or ½ (50 percent – in Matara) of the sales. There is no formal agreement amongst producers and peelers. However, they verbally agree on the amount and the percentage. Normally, peelers link producers with collectors and they are present when sales take place. Peelers work in groups and move from one plot to another at the village. In most occasions peeling is done at producer's premises.

Some producers (who own more than 5 acs) have received the government incentive scheme to put up primary processing units (in-house). Through this grant the government expects to promote GMP when processing cinnamon.

Both men and women are engaged in peeling of cinnamon. A peeler can earn Rs.3400.00 – 4000.00 rupees per day. However, these peelers work from morning to night, often more than 12 hours a day. They peel the bark, part by part, with a special knife (Kokeththa or Sawuthuwa) and peeled bark is allowed to dry under sun for few hours. Afterwards the barks are pieced together and rolled to make a pipe like structure (called quill). The standard length of a quill is 42 inches. The hollow of the tube is filled with small pieces of stem and the tubes are left for in-door drying for about 4-7 days before selling. Even though peelers are earning high wages they lack social recognition. Lack of recognition and social stigma have caused people to move away from this profession.

Proper care and attention are important during peeling to ensure the quality of the product. Un- skilled labor especially when it comes to peeling lack of knowledge and lack of motivation are affecting the quality of production. For example, they are reluctant to peel C grade (Fine) of cinnamon as it is time consuming and opt for H grade (Coarse).

There are awareness programmes conducted by DEA and Spice Council of Sri Lanka at the Cinnamon Research Training Center at Kamburupitiya and Cinnamon Training Centre at Kosgoda, respectively. Department of Export Agriculture provides a set of peeling utensils for a peeler who has successfully completed two weeks training at the center. Most of the FGD participants and KIIs emphasized the importance of attracting younger generation to cinnamon peeling as the whole industry dependent on peelers.

In some areas there are farmer associations. For an example; 'Siriparakum Cinnamon Association' at Gonnapinuwala, Galle District Growers Association. These associations help producers to get fertilizer when the fertilizer subsidy in existence. Moreover, these associations organize workshops and disseminate knowledge amongst their members on new varieties; new programmes conduct by the department, pest and diseases which are affecting cinnamon cultivation.

5. According to the FGDs , extension officers attempting to practice some activities of the GAP. Such as ; practice methods to minimize soil erosion, use of organic agriculture etc.

5.3.2 Collection

Once the cinnamon is peeled it is ready to sell. Mostly, producers sell their products as cinnamon bales to collectors in surrounding area. Few producers sell their products to more than one buyer. Transporting of cinnamon from producers to the collecting centers is done by collector's themselves. Neither the collectors nor the producers have any contractual agreement in selling cinnamon. Hence, they can sell cinnamon to any collector. Producers will give their bales of cinnamon any collector who offers them the highest price. Collectors determine price according to the grades and the quality of cinnamon.

The quality of the bale is the main requirement of buyers and they consider security as well as guarantee of supply when collectors buy. Few producers also sell cinnamon leaves for cinnamon oil producers (cinnamon leaf oil). At the point of sales, producers are price takers and collectors are price makers. Instability of prices for cinnamon product is one of the main challenges that the producers are facing. Thus, some of the FGD participants suggested government involvement in pricing of cinnamon bales.

Collectors act as the intermediates connecting the producers (smallholders/medium scale) and exporters/ processors. Collection of cinnamon is the main activity that collectors perform. Once the producer is ready to sell the cinnamon bales they inform the collectors. Producers know who are the collectors and they contact them mainly via telephones. The collectors come to the producers where they had finished harvesting and peeling of cinnamon and buy mainly cinnamon quills and transport them to the town level collecting centers or directly to the processor / exporter. When buying cinnamon collectors main requirements are moisture content and appearance of cinnamon bales. Collectors measure moisture content through checking samples using their hands or moisture meters. Even though collectors have moisture meters none of them are using them according to FDGs and KIIs.

In general, one cinnamon bale consists with different grades of quills (for an example; H, C and M grades are in one bale)[6]. Thus, deciding a price of a bale is entirely a collector's decision. When pricing they reduce the weight for moisture and threads tying the bales. While the collector decides the price, it is producer's choice to sell the good or not. If the producer is not satisfied with the price quoted by the collector he can refuse and look for another buyer. More than 50 percent of the participants stated that their main requirement is good quality. Apart from quality, collectors are concern on price, trust amongst producer and collector, security etc.

Collectors sell their products directly to the exporter's. Some collectors bring the cinnamon to a town level center where their cinnamon bales are stored under favorable conditions until sale. Most of the time collectors prefer to sell their collected cinnamon to the buyer who gives a good price and makes a quick payment. Most of the time collectors receive cash in hand from the exporters.

Exporters are mainly concerned about the cleanliness of cinnamon bales. It should be free from microbial attacks. Well peeled cinnamon prized. Collectors do not add any value to the product. Sometimes they tie up cinnamon bales again. Collectors learn about changing consumers preferences through the exporters. Some exporters conduct awareness programmes on cinnamon standards and constantly inform collectors about their buyers' requirements.

Exporters provide processors with credit, information on markers and prices. There is competition between collectors to supply exporters. Such competition leads them to to transport and store under good conditions. Hence, collectors try their best to ensure good quality and the cleanliness of collected cinnamon.

Collectors buy cinnamon from the producers who properly cultivate and peel the cinnamon. They consider cleanliness and healthy cinnamon bales which are free from microbial attack. Most of the producers are reliable and honest. However, some producers try to cheat collectors by providing wet cinnamon (not dried properly) to increase the weight, as it is not easy for them to clear an entire lot at once. Collector's main issues are the high cost in transporting of cinnamon and assuring the quality of their products.

Collectors act as the intermediates connecting the producers (smallholders/ medium scale) and exporters/processors.

Collectors provide assistance to suppliers by providing credits as well as technical assistance whenever possible. They do not hesitate to give credit on cash. They maintain a good relationship with the suppliers. But they do not provide any inputs like fertilizers, seeds. They communicate information to their producers regarding their requirements such as quality and delivery dates. But they do not tell anything regarding the size because the size.

6. These grades are classified based on diameter of quills and numbers of whole quills per Kg. Description of grades are provided in the section of Standards. For an example ;H – Hamburge, C-Continetal, M-Mexican etc.

Current prices that the collectors are offering for producers are as follows;

- Alba, less than 6 mm (0.24 in) in diameter – 2500 Rs / 1kg
- Continental, less than 16 mm (0.63 in) in diameter – 2000 Rs/1 kg
- Mexican, less than 19 mm (0.75 in) in diameter-1600 Rs/1kg
- Hamburg, less than 32 mm (1.3 in) in diameter-100 Rs/ 1 kg

There are no international/national standards and regulations governing collection. Collectors pay attention to cleanliness of the cinnamon. It should be well peeled and collectors are well experienced enough to determine the quality of the cinnamon according to the grades. DEA organizes special workshops and also in the monthly meeting where collectors obtain information regarding standards.

Collectors suggested that the government to strengthen the training delivery mechanism and to develop national framework for training operators involved in the cinnamon industry to produce quality cinnamon. Further, they also emphasized the need for government involvement in setting fair and constant prices for cinnamon.

5.3.3 Processing/Exporting

According to the DEA, nearly 90 percent of the total cinnamon produce was exported in the year 2014. There are 254 registered private sector companies in Sri Lanka which exports cinnamon to commodity or bulk markets. Further, there are another 34 private sector companies, which exports value added products such as cinnamon oils and cinnamon flavoured tea bags. These companies range from small and medium to large. There are nearly three companies that manufacture cinnamon based value added products, mainly essential oils, for the export market. Cinnamon is exported in primary and value added forms, However, a majority of cinnamon is exported in primary form as quills (98 percent). In addition, it is exported as quislings, featherings and chips in primary form and also as powder, cut cinnamon, cinnamon oil in value added form (2 percent) according to Sri Lanka Customs (2012).

Some exporters and processors directly deal with producers (growers) when purchasing cinnamon, whereas most of the exporters source their supply volumes through collectors. There are a very few vertically integrated firms that are all stages of the value chain. These firms mostly engage in organic cinnamon business.

Processors/exporters supply to both domestic and international markets. Their supply to the domestic market which is mainly in primary form is less than 10 percent of the total production. Local cinnamon consumers are catered through village level markets, supermarkets, hotels, boutiques etc. More than 90 percent of the cinnamon produce is exported to international markets, especially to Mexico, USA, and Peru. Based on the requirement of buyers goods are supplied by the exporters.

Nearly, 50 percent of Sri Lankan cinnamon is exported to Mexico mainly in primary form. Usually, Mexican buyers do not request for any international product or process standards, whereas, European buyers are more concerned about both product and process standards. Thus, SLS 81 :2010, ISO 6535:1997, GAP,GMP, Fair trade, microbiological safety requirements, are important standards when catering to EU buyers. Processors/ exporters carefully cut and pack cinnamon according to buyer requirements and send them through a stringent quality control process to ensure high quality.

Exporters divide the cinnamon into different grades of products (Alba, C5 Special, C5, C4, C3, M5,M4, H1, H2, H3 [7]). These grades are sold either in quills or cut form. Although most of the exporters have individual or personal contacts with their buyers, no inputs, technological or any other assistance is given them. Business depends on the trust/ faith the buyers have in them. Thus, exporters strive to provide quality products as per their buyer requirements. Some of the exporters have more than ten years of relationships with certain buyers.

Usually, exporters do not share or communicate market information with other exporters. There is a competition amongst them in finding buyers and markets. Foreign buyers are also change their local suppliers if they are not satisfied with quality, price, volume and delivery. Moreover, exporters do not provide any information to peelers or producer as they presume that producers have the necessary expertise.

There are many constraints facing exporters. As explained by exporters, finding quality products is the main constraint that they are facing. This is mainly due to weak linkages that they have with producers. Thus, middlemen or the collectors have control over the value chain as they provide bales which are a mix of several grades to exporters. Further, major export markets are limited to Mexico, USA, Colombia, Peru and Germany. As explained by exporters, they have

7. Grades are described in the section of standards

not yet fully explored the European markets due to limited promotional activities. Furthermore, exporters have to pay huge amount of money to obtain and maintain standard certificates as they have to renew certificates every three years. Exporters standard credit procedure is to deal with Cash against Documents (CaD), though Latin and South American buyers prefer to do payments on Delivery Acceptance (D/A) which some exporters hesitate to proceed with.[8]

5.4 Opportunities and Constraints in Cinnamon Value Chain

VC Actor	Opportunities	Constraints
Producer	• Sri Lanka has the monopoly powers in the world market for pure cinnamon (90 percent of world market share) • Sri Lanka has created a brand name for cinnamon as "Ceylon Cinnamon" • Cinnamon has been used for medicinal purposes and has been known as a healing herb since it is mentioned in Chinese botanical books that date back to 2700 B.C • Cinnamon can be grown in various types of soils. Thus, there is an opportunity to explore other growing areas • First harvest of cinnamon can be taken after three years of planting and two harvests can be taken per year and can use cinnamon trees for hundreds of years • Can use both organic and carbonic fertilizer to maintain high productivity • Support from government and private institutions (DEA.MPI, Spice Council, SAPPTA) • Potential for expansion of cultivation into dry zones • Availability of 50% grant provided by the MPI for in-house processing units • Provision of free planting material by DEA for home-gardens; 50 percent subsidy for others. • Promote organic villages and obtain group certification • Women can also participate in both cultivation and peeling • No restrictions in selecting collectors	• Insufficient skilled labor (peelers) • High labor cost • Lack of recognition and social cast stigma • Lower attraction to youth • Tendency towards in making coarse grades except other fine grades • Limitations of converting lands in to cinnamon cultivation by RPCs • Unstable price in the market • High cost of fertilizer • High prices of planting materials • Lack of proper production infrastructure and technology • Climate change • Susceptibility to pest and disease • Limited number of cultivars

8. CaD means a payment arrangement in which an exporter instructs a bank to hand over shipping and title documents to the importer when the importer fully pays the accompanying bill of exchange or draft. Also called documents against payment. D/A means Documents against Acceptance (DA). A buyer is required to "accept" a seller's time draft, thus acknowledging obligation to pay at the specific future date. The time of payment occurs at maturity of an accepted time draft, 30, 60 or 90 days after date of acceptance or date of bill of lading, available at: http://www.creditmanagementworld.com.

Collectors	• Solitary in Determining prices • Can store cinnamon for one year in a warehouse • Engage in backward integration • Opportunities to establish centralized processing centres • Availability of 50% grant provided by the MPI for entrepreneurs for value addition	• Poor hygienic, sanitary in storage and transport facilities • Low concern to assure the quality of the cinnamon, Lack of awareness of international standards • High competition amongst collectors • High transportation cost of cinnamon
Exporter	• High world market demand for pure cinnamon • World market is already established for Ceylon cinnamon and brand name is already created • Creation of brand names • Ability to buy products directly from farmers and processing to own standards to ensure traceability • Adoption of product and process standards to access new markets • Opportunities to explore organic cinnamon • Research published at international level confirming the importance of Sri Lankan cinnamon main chemical Euginol and hundreds of other minor chemical ingredients which have high medicinal values • High possibilities to explore new markets such as Japan, European markets and also for value addition • Availability of 50% grant provided by the MPI for entrepreneurs for value addition	• Major market limited to Mexico (63 %) , USA (11 %) , Colombia (5.7%) , Peru (11%) and Germany (1 %) • Insufficient promotional activities in the international market • Lack of research undertaken to measure end market requirements • Traditional methods which are highly labour intensive • High cost in obtaining and maintaining standards certificates

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CHAPTER 06: PEPPER VALUE CHAIN ANALYSIS

6.1 Overview of the Pepper Sector

Black pepper (Piper nigrum L.), known as the "King of Spices", is the most important and most widely used spice in the world and belongs to the family Piperaceae (DEA, 2010). The plant is a perennial, evergreen, climbing vine and Western Ghats of India, is thought to be origin of black pepper (Silva, Weerasena, Seneviratne, 2015). The dried fruit or the peppercorn is used as condiment and the same is used to produce white, red and green pepper (Silva, Weerasena, Seneviratne, 2015). Historically, peppercorns were much prized traded good, often referred to as "black gold" and used as commodity money (Ministry of Minor Export Crop Promotion, 2014). While commercial varieties were introduced from India and Malaysia, Sri Lanka is also home to a number of wild black pepper varieties with superior quality.

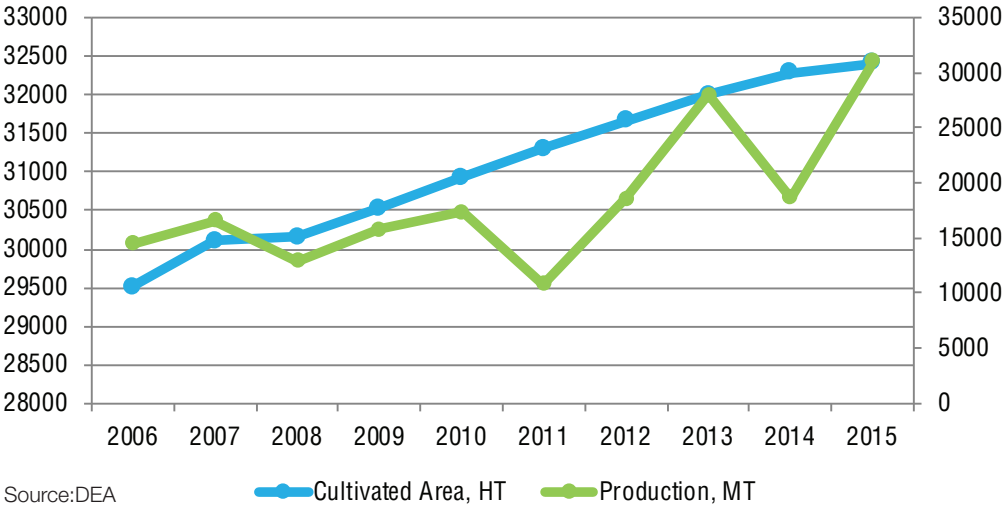
Pepper is usually propagated vegetatively using stem cuttings or ground runners. As pepper is grown in different climatic zones the selected line should be tolerant to the climatic conditions of the area. For both mono and inter cropping with coconut, 2.4mx2.4m spacing is recommended (1700 plants/ha) by the DEA (2010). After the land preparation, pits are made and filled with the mixture of top soil, cow dung or compost. In Sri Lanka, pepper vines are trained on live supports such as Glyricidia sepium, Erythrina indica (Dadap) or Gravilia robusta. Commonly used support tree is Glyricidia sepium. Glyricidia sticks of 3-5cm in diameter and 2.2m in length are recommended by DEA to be planted to a 20cm depth at the corner of the planting pit. Supports should be planted at least 06 months before the planting of pepper to provide adequate shade. Field planting of pepper is done with the onset of monsoon rains. About 4-6 months old potted healthy and vigorously growing plants with 5-8 leaves are planted in the pits at 15-20cm away from the support.

Pepper plants must be tied to the support to facilitate the roots to attach themselves to the support. After 3-5 years pepper vine grows to the top of the standard and provide a good canopy. At the height of 3.5-4.0m height pruning is recommend to maintain the height of the pepper plant and to make a good shape for the canopy. The height and number of branches of the Glyricidia support should also be regulated by pruning so as to keep a final height of about 3.5-4.0m height. It is recommended to prune Glyricida trees at least 3 to 4 times a year as it reduces the labor cost, unwanted shade and provides adequate mulching material. Experimental evidences have shown that application of Glyricidia lopping, at the rate of 10kg/tree/year, can cut down inorganic fertilizer requirement by 50% without any yield loss (DEA, 2010).

Pepper is harvested after 7-8 months of maturity. Pepper corns are threshed manually or by using a mechanical thresher. Pepper berries can be dried directly under sun or artificial dryers can be used. Sun drying takes 4-6 days. To get uniform black color, blanching of raw pepper is done by immersing berries in boiling water for about 03 minutes as this reduces drying time by 2-3 days as well as kills any microorganisms. To produce white pepper, fully ripened berries are immersed in water for about 5-6 days until the seed coat get rots. Then the seed coat is removed by rubbing on a wire mesh or using mechanical decorticator and pepper seeds are thoroughly washed and dried to produce white pepper.

Pepper is mainly cultivated in the wet and intermediate agro ecological zones in the mid and low country regions. Present land area under black pepper in Sri Lanka is around 32,411 ha and these cultivations are mostly found in the districts of Matale, Kandy, Kagalle, Kurunagala and Nuwaraeliya. Pepper is cultivated in 14 districts out of a total 26 in Sri Lanka and according to IPC (2002), there are over 200,000 pepper farmers in Sri Lanka, of whom about 50,000 are dependent on pepper and other spices for their main family income. Figure 9 displays a stable increment in the cultivated extent from 2006 to 2015 as well as an upward trend in production. The highest production of 31,013 MT and the highest export quantity of 17,027 MT could be observed in 2015.

Figure 9: Extent and production of Pepper Cultivation in Sri Lanka 2006-2015



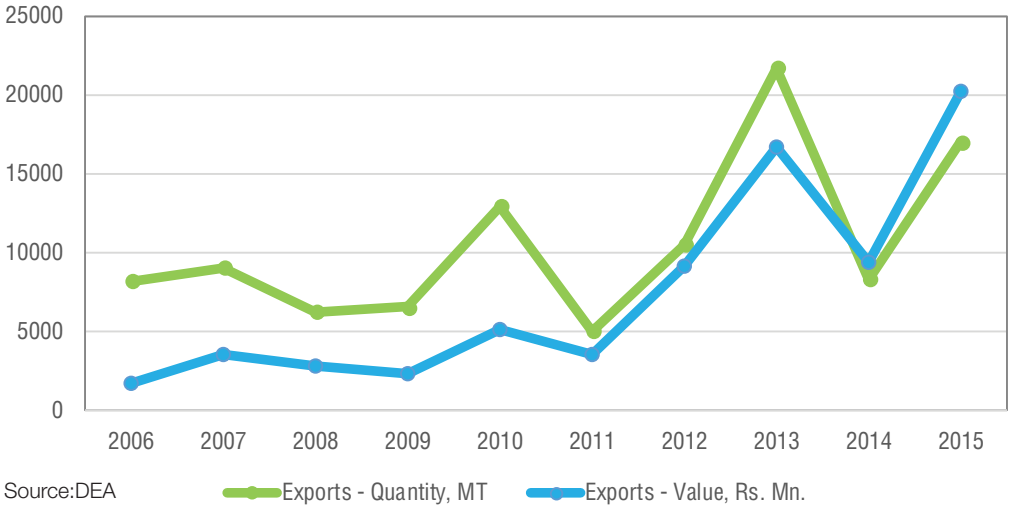
Source:DEA

Pepper production is confined to a few developing countries in Asia and the Pacific, Brazil and Madagascar (IPC, 2005). Currently, Sri Lanka ranks at 5th place in terms of area under black pepper cultivation with an extent of 32,411 hectares in (after India, Indonesia, Vietnam and Brazil), while it ranked at 7th place in production with a world share of production of 5.7 percent; the main pepper producers in the world include Vietnam (34.9%), Indonesia (20.2%), India (12.4%), Brazil (9.9%), China (7.2%), Malaysia (6%) (Ministry of Minor Export Crop Promotion, 2014). It is noteworthy that over the last few years, Vietnam has overtaken the traditional pepper producing countries such as India and Indonesia and added considerable to world pepper production. The area under pepper in Sri Lanka has increased steadily, mainly because of the better prices that were received by farmers as well as various forms of Government assistance provided to encourage farmers to cultivate perennial crops. Assistance to the pepper industry over the years included subsidies to expand pepper cultivation, fertilization promotional and soil conservation programmes, programmes focused on integrated nutrient management and Productivity Improvement Programme. The latter is the most comprehensive programme implemented by the DEA since 2004 (Seneviratne, 2011). PIP includes a package of agronomic practices including soil and moisture conservation, gap filling, shade manipulation, training and pruning of pepper vines and shade trees, weed control, adoption of integrated nutrient management measures and integrated pest management measures (Seneviratne, 2011)

Although Sri Lanka over the years shows an increase in productivity of pepper as a result of emphasis on productivity improvement of existing pepper lands, the national average yield is 590 kg/ ha (Gunaratne, 2011), which is far below to the levels of the other pepper producing countries like Vietnam, Malaysia and Brazil (IPC, 2016). The main reasons for the low yield of pepper in Sri Lanka are: poor crop stand, poor shade regulation, and negligence of fertilizer application (KII).

While pepper export quantity and export value have fluctuated widely, an upward growth can be observed from Figure 10, with the highest volume recorded in 2013 in line with production levels of pepper in the country. Sri Lanka was the 5th largest exporter of black pepper, after Vietnam, Brazil, Indonesia, and India in that year (IPC, 2016). Export earnings from pepper are important to all the pepper producing countries in Asia and the Pacific as a source of income for farmers and intermediaries as well as a source of foreign exchange for the country.

Figure 10: Export Quantity and Value of Pepper in Sri Lanka 2006-2015

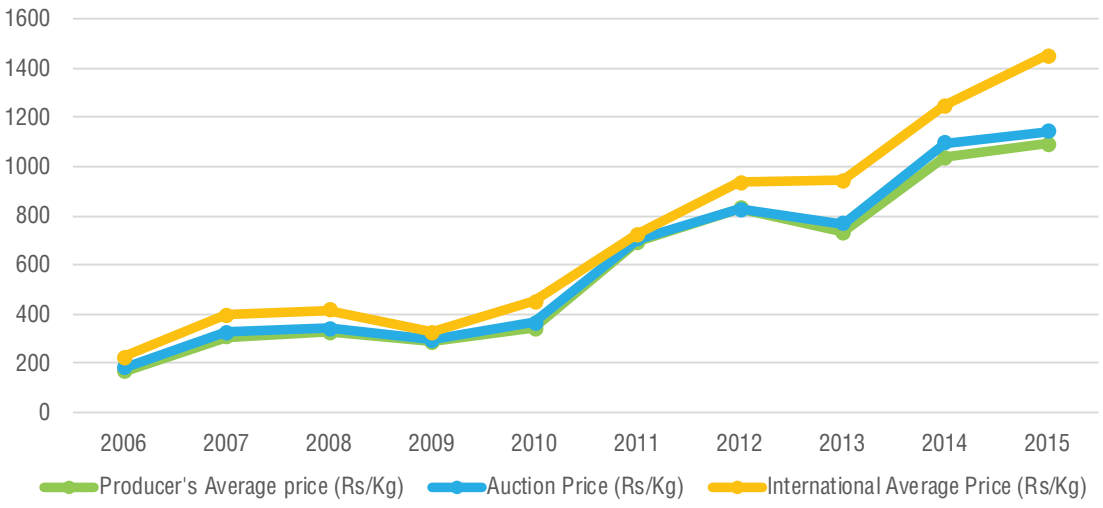


Source:DEA

In 2012, pepper brought in LKR 12,0215mn worth of foreign exchange, overtaking cinnamon. The export price (F.O.B) shows a firm growth over the last 10 years and this is mirrored at the auction and farm gate prices, as shown in Figure 11. Given that much of the pepper production is exported, it appears that international prices determine farmgate prices to a large extent. India (60%) and Germany (6%) are the main markets for Sri Lankan pepper (Figure 12).

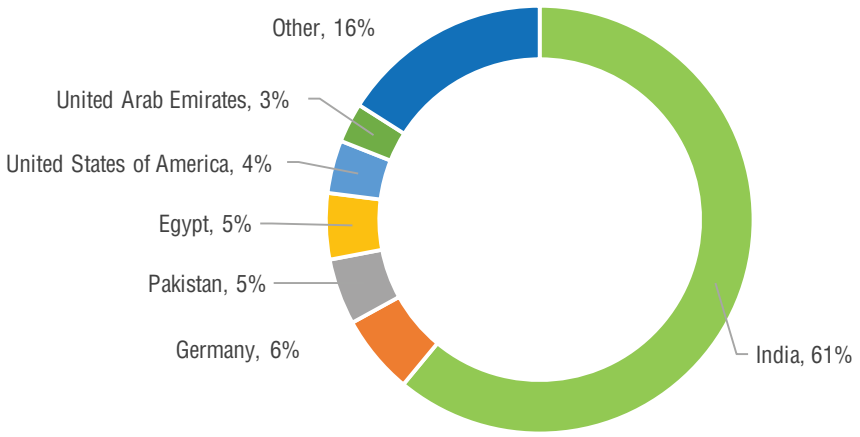
Currently Sri Lanka has duty free access for pepper exports to India and Sri Lankan pepper has benefited from the Indo-Lanka Free Trade Agreement (ILFTA). Under the Agreement, India has enabled import of 2500 Mt of pepper per annum duty free from Sri Lanka (High Commission of India, 2013).

Figure 11: Producer, Auction and International Average Prices for Pepper 2006-2015



Source:DEA

Figure 12: Key Export Markets of Sri Lankan Pepper, 2015

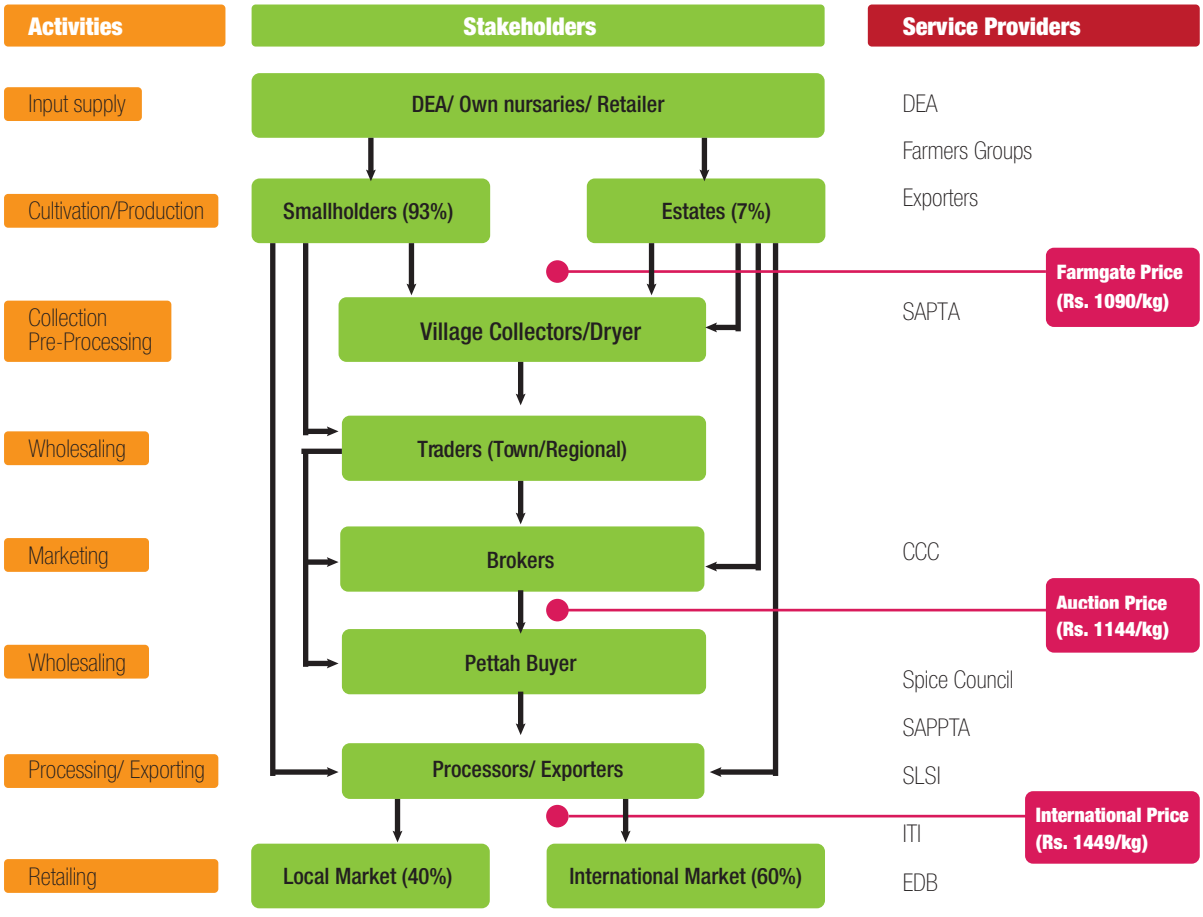


Source:TradeMap Database

6.2 Pepper Value Chain Map

There are numerous actors and functions involved in the Sri Lankan pepper value chain. A summary of the key actors, functions and their relationships and standards governing the chain is presented below together with constraints affecting at three levels of the value chain. A graphic depiction of the vertical inter-firm linkages is also shown in Figure 13.

Figure 13: Schematic Illustration of Pepper Value Chain

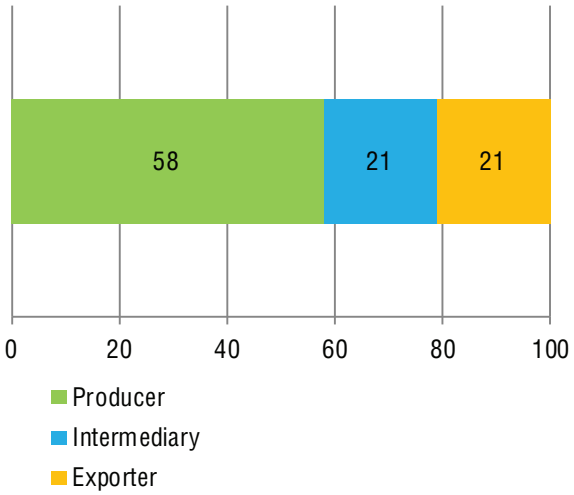


6.2.1 Production

Pepper, which is the second most important commodity among spices, is grown in abundance all over the island in fertile and diverse soil types and varying temperature conditions. In Sri Lanka pepper is grown in the wet and intermediate zones mostly as a mixed crop using live supports. The information collected from the field confirms that farmers cultivate pepper alongside other crops such as cloves, nutmeg, cinnamon arecanut, and coffee etc. Many of the farmers interviewed in Kandy and Matale districts have been growing pepper for several years, ranging from 8 to 50 years; much of the knowledge has been passed down through generations. Some pepper vines are reportedly very old. Most of them grow pepper in their own small plots of land (home gardens); according to the survey conducted amongst the farmers, on average, the size of the land is about 3 acres (the extent of land ranged 0.25 to 15 acres) although there a number of regional plantation companies and large privately owned estates, which cultivate pepper. According to the Census of Agriculture (2002), out of the total extent of land (27,661 hectares) about 93.3% was held by smallholdings – that is, holdings less than 8.1 hectares (20 acres).

Harvesting and value adding activities such as drying and cleaning are also done by farmers other than cultivating pepper in their own land; some (sun/machine) dry their harvest and sell while others dispose it in a fresh form. Some farmers also are engaged in collecting pepper from other farmers in the vicinity. While a number of farmers are engaged in other livelihood activities, their main source of income is derived from cultivation of pepper. 75 percent of the farmers surveyed for the study depended on pepper as their main source of income. Almost half the farmers derived an income of LKR10,000-20,0000 a month from pepper whilst another one-fourth reported an income of between LKR20,000-30,000 and LKR 0-10,000. The cultivation of pepper is lucrative given the low cost of production, estimated to be LKR/kg.297.54 in 2015 according to data provided by the Department of Export Agriculture and high prices they receive at the farm gate (LKR/kg 1090.3). After deducting the cost of production, the farmers keep about 58% of FOB price of black better, while the intermediaries and exporters retain about 21%, each (Figure 14).

Figure 14: Distribution of Benefits in the Pepper Value Chain



Source: Estimated using DEA data

In order to undertake the above activities, they harvest and/or hire workers and they are paid either a daily (fixed) wage (LKR 1,000-1,500) or by the kilogram of pepper harvested (LKR15/kgs). Almost all of the pepper farmers (97%) surveyed depended on laborers who worked under their supervision. There was a general consensus amongst farmers that high labour cost and lack of labour are negatively affecting the pepper industry and its production. Labour is the most expensive input in pepper cultivation (IPC, 2005). Other than during the first year of planting, most labour is required for harvesting. Thus there is need to identify labour efficient operations in pepper production including mechanization (IPC, 2005).

Knowledge/information on how to grow the crop and to control pest and diseases has been handed over time while farmers also have benefited from the extension services of Department of Export Agriculture (DEA) which provides technical advices including Good Agricultural Practices (GAP) through its farming training programmes/in-service training to improve pepper cultivation . Inputs such as Gliricidia loppings, dolomite, pepper mixture and planting material are used as inputs by farmers. Almost all of the farmers surveyed used such inputs (90%); however hardly

There was a general consensus amongst farmers that high labour cost and lack of labour are negatively affecting the pepper industry and its production.

anyone surveyed used any pesticides unlike other pepper producing countries. They obtain these inputs from nearby shops, the DEA and others including exporters. The DEA provides a number of assistance to farmers under various programmes: new planting/ replanting (planting material, technical advice, financial rewards), Productivity Improvement Programme (planting material, technical advice, fertilizers), post-harvest facilities/equipment (DEA, 2010). However, the plants given by the DEA are reportedly not suitable for the regional climatic conditions such as in Kandy, and plants produced in their own nurseries have proved to be more successful (FGD-Kandy). Nevertheless, it was noted that vines multiplied by the traditional planting methods can be highly susceptible to pests and diseases.

The main types of products farmers sold include fresh green berries, dried black pepper and white pepper, which is involves more processing. Fresh green and light berries[9] have a higher demand in the export market for oil and oleoresins, namely in India compared to black heavy berries, which are used as condiments, preservatives and food tasters. Generally, there are two harvesting seasons per year for light berries; 60% of the pepper is harvested during the period November to January and the second harvest taking place from May to July (IPC, 2005). Matured heavy berries can be harvested once a year and they are purchased for powdering, etc.

The most serious challenge facing the pepper industry is harvesting of light berries. Light berries sells for around Rs. 315/kg and heavy berries sells for about Rs. 300/kg but the price differential could be much higher in some months (Seneviratne, 2006). Some farmers harvest light berries given that they can harvest it twice a year and therefore believe they could command a higher income. However, accordingly to key informant interviews one kilogram of light berries can produce 3-4kg of heavy berries when they mature; thus, the return to harvesting heavy berries is much higher. The cultivation of light berries causes a huge loss of revenue to the farmers and the country. It is estimated that premature harvesting results in a loss of approximately 40-50 percent of pepper yield (Seneviratne, 2006). Moreover, due to the demand for light berries, there is a high incidence of theft and fear of theft, which also lead to harvesting of light berries by farmers. Given that theft was a prevalent problem in some districts, some farmers are compelled to pick pepper before they mature. To combat this problem, some farmers have employed watchers. Interestingly, some of the farmers interviewed know the thieves who are from the same village. Some of the farmers stated that legislation should be brought into control harvest/ sale of fresh green and light berries to minimize this problem as well as ensure a better supply of quality black pepper in the market. Other reasons for LB harvesting include: financial constraints (need for an immediate income), anticipation of better subsequent crop, following neighbors behaviour, location of cultivation being far away from the residence, easy disposal, overestimation of crop by leasees, and anticipation of drought/diseases (Seneviratne, 2006)

While some farmers lease their land/harvest to collectors/intermediaries, most sold their product to village collectors or to the shops in the town, which trade in spices. Majority of the farmers surveyed supplied their pepper to shops, collectors, and exporters. Most smallholders are price takers with little or no bargaining power over price although at the moment, they are receiving a good price for their prices. Organically cultivated/fair trade certified pepper is directly bought by exporting companies at a higher/ premium price by-passing village collectors/town shops and the goods are transported by company itself to their warehouses. While matured heavy berries are dried and sold, and can be stocked if properly stored, light green berries cannot be kept in storage for a long period. Therefore, they are sold as quickly as possible once harvested.

The most serious challenge facing the pepper industry is harvesting of light berries The cultivation of light berries causes a huge loss of revenue to the farmers and the country.

Farmers prefer to sell to buyers – whether collector, trader or exporter - who pay the highest price, and on time taking into account their convenience and transport costs. Buyers' main requirements are quality and reliability of the product in case of organic pepper. Quality characteristics include appearance, maturity, bulk density, low moisture and low extraneous matter (dust, stones, leaves) present in the product. According to the farmers, quality is the main requirement of their buyers (accounting for more than 40 percent of

9.When pepper is harvested at the pre-mature stage (6 months), it is called light berry. When it is harvested at the mature stage, it is called heavy berry. Pepper berries take around 6.75 months to mature and 7.5 months to ripe and turn red (Seneviratne, 2006)

the responses), followed by price, trust, etc. Safety of the product did not figure high in terms of buyers requirements when they purchased pepper from the farmer. In this context, programmes should be initiated to ensure quality and safety of pepper as required by buyers and consumers at the end market by using low cost processes such as on-farm hygiene in production as opposed to steam treatment down the value chain by exporters to reduce microbial count. Farmers complained that drying could not be done during rainy seasons and this affected the quality of the pepper; therefore they sometimes supply fresh green pepper at a lower price. Farmers requested restoration of assistance to buy dryers as well as other support including fertilizer subsidy, pruning knives, ladders, etc. to promote pepper cultivation.

Whilst a handful of farmers grade pepper according to appearance, dryness etc, most of them did not grade their products. Farmers who were interviewed recognized the significance of certifications such as organic and fair trade but not many farmers are certified – those who were supplying certified pepper belong to a farmer organization through which certification was obtained. Of the farmers' surveyed, half of them claimed it was difficult to get such certification and as such requested assistance for their adoption. Information regarding standards are mainly provided by the DEA, certification agencies, neigbours, as well as exporters. While such information of standards are useful, the majority of the farmers (90%) surveyed stated that they would require assistance towards increasing quality and safety standards.

Collectors/shops buy any supply of pepper produced regardless of the quality but pay a lesser price for lower quality pepper. Given the instability of the prices, FDGs with farmers mentioned that the government should intervene in the market, setting a fair, and constant price. For example, in Malaysia the Pepper Marketing Board (PMB) plays an important role in determining prices at farm level – its purchase price is often seen as a benchmark for other buyers and farmers, who have the option to sell to PMB and obtain better prices. The farmers who are interested in a providing a quality product to buyers especially exporters who have exacting requirements like organic pepper, properly dry the product and remove leaves, sand, etc. to meet their buyer's requirements. If they cannot meet the requirements of the exporters, the pepper is not purchased by these quality conscious, organic exporters from the farmers. Equal number of farmers surveyed stated that they have difficulties in meeting the requirements of their buyers.

Collectors/shops buy any supply of pepper produced regardless of the quality but pay a lesser price for lower quality pepper.

Buyers' preferences are verbally communicated to the farmers by purchase orders. There is a high demand for fresh green and light berries overtime but some farmers prefer to pluck only matured heavy berries given the high prices they command – a price differential of LKR15– although most prefer to pick immature light berries as they believe they could harvest more than once a year and generate more revenue. However, if they let the berries mature, they would be able to command a higher revenue given that 1kg of light berries could produce 3-4kgs of heavy berries.

Contracts/agreements among buyers and farmers could be observed only in organic farming with the exporters but not otherwise in conventional pepper value chain. These agreements provide assurances that agro-chemicals (pesticides) have not been applied in the cultivation of pepper. Exporters which source organic pepper also monitor the farms to check whether inorganic inputs are used.

Three-fourths of the farmers stated that they received assistance from their buyers. Assistance in way of information, inputs and technical assistance are provided to farmers and credit/advances when required by the collectors/traders; the amount is deducted from their next supply. In the case of farmers which supplied organic and fair trade certified exporters, they received advise, packing materials, field equipment, welfare facilities; they also regularly visit and monitor quality of the pepper and farms to ensure the pepper is organically grown by checking the soil conditions.

Some producers belong to farmer groups/associations through which they benefit from information sharing/ credit facilities. However, producers do not appear cooperate with each other to set prices or meet large contracts collectively. Some farmers interviewed belong to farmer groups which were set up towards complying with organic/fair trade certification requirements.

6.2.2 Intermediaries

Important intermediaries in the pepper value chain include village collectors and traders. Local collectors are sometimes farmers themselves or rural entrepreneurs who purchase pepper directly from farmers. Collectors do not need licenses/permits to operate so competition is fierce with few barriers to entry. Other than being involved in the spice whole sale trade operating from stores based in town bordering

spice growing areas, traders also purchase pepper from collectors/farmers/estates/leasees, after which they clean, dry, store, pack and transport pepper to their buyers mostly in Colombo. According to KIIs with traders in Matale and Kandy, farmers tend to bring higher quality supplies than village collectors. It was stated that village collectors deal with large quantities of pepper from various farmers and therefore, it is hard for them to maintain quality. In fact, collectors do not show a concern for quality of pepper (Jayalath and Gunaratne, 2013).

Important intermediaries in the pepper value chain include village collectors and traders.

Wholesalers buy whatever suppliers bring but reduce price according to the quality of the peppers they purchase. In addition to buying and selling pepper in bulk, they also trade in other spices (cinnamon, nutmeg, mace, cloves, etc), products such as arecanut, and coffee. Products are sold to spice exporters, low spice manufacturers and marketers, Pettah buyers, and hotels/restaurants/households. Usually the traders/collectors do not take part in auctions; hardly any pepper is now traded through the Colombo auction. The traders/collectors prefer directly dealing with exporters, as they pay a higher price according to the price in the world market (organic pepper fetches higher prices), buy large volumes at a time and pay on time – they are more reliable customers. They do not have any agreements/ contracts with their buyers (with the exception of organic pepper in case of collectors) but buyers provide information about prices and technical knowledge about drying to the collectors/wholesalers.

Buyer's, namely exporters, main requirements are quality of the pepper and reliability. Quality parameters consist of bulk density, moisture content, oil content, and absence of extraneous matter and they are graded accordingly (Grade 1, Grade 2, Grade 3) and prices are determined accordingly. For example, if the bulk density is higher than 500 g/L they are considered as a high quality sample (Grade 1) and paid the highest. Buyers check these parameters when they receive the pepper, which are then sorted by the shops according to their buyer's need.

Supplies are rejected if stocks do not meet the buyer's requirements. If suppliers are rejected, the grade is then prepared again by the collector/shops according to buyer's need and supplied. It was pointed out that the demand for light berries has increased overtime due to exports to India, where it is used for oleoresin extraction. India began purchasing light berries from Sri Lanka in 1978 and the trade has considerably increased since then (Seneviratne, 2006). Buyers' preferences are discussed and price is confirmed through telephone conversations. While the buyers quote the price, the prices are negotiated. No contracts are maintained with the exporters. Nevertheless, the traders receive information from their buyers regarding prices and knowledge on drying pepper.

There is hardly any cooperation between the wholesale traders/collector; if at all they would discuss about prices in the market and set them. The collectors/ traders do not receive any support from the government or other organizations, nor do they have any association among them. However, processors are eligible under the DEA's assistance for development of post-harvest facilities, which encourages setting up of large scale processing (DEA, 2010).

6.2.3 Exporting

Currently about 60 percent of pepper production of the country is exported while the remainder is consumed domestically (Ministry of Minor Export Crop Promotion, 2014). Pepper is bought by exporters as bulk to meet their quality requirements. Pepper is then dried, cleaned and graded to meet the requirements of the buyers if the quality of supply is poor. Exporters collect pepper from different sources to prepare shipment according to buyers' requirements. It was stated that Sri Lankan pepper has high intrinsic quality; Sri Lankan pepper has higher piperine, content which gives it a superior quality and pungency. Piperine content found in Sri Lankan black pepper is 2-6 times higher than in other countries providing Sri Lanka a competitive advantage in the world market (Ministry of Minor Export Crop Promotion, 2014). Bought pepper is stored in warehouses and cleaned manually or using machines (such as spiral cleaners) to remove stones, stalks, leaves or pinheads and thereafter value addition is done. The pepper is then packed in gunny bags or boxes according to buyers' requirements. Very few exporters engage in backward integration including cultivation of pepper and drying in large scale.

Sri Lanka exports pepper as: black pepper, white pepper, black pepper oil, pepper ground pepper crushed, light berries, organic pepper (Ministry of Minor Export Crop Promotion, 2014). However, majority of the exports are black pepper – neither crushed/ grounded (53% of total export earnings of pepper products in 2012), followed by light berries (41%) (DEA, 2014). Exports of white pepper crushed pepper, grounded pepper and organic pepper are negligible (about 2 percent of total export earnings of pepper).

Most of the exporters interviewed are exporting black pepper and there are a sufficient number of light berry pepper exporters operating including a company which procures light berries for its mother company in India. The export of black pepper oil has brought a sizable proportion of foreign exchange earning to Sri Lanka over the years compared to the export of the primary product; for example, value of pepper oil exports rose from LKR11.9mn in 2008 to LKR 278.9mn by 2012 and now accounts for 3 percent of export earnings from pepper. Thus there is an immense potential for value addition in the pepper industry in the form of extraction of pepper oil, oleoresin, white pepper, and other forms such as green and ripened black pepper preserved in brine, dehydrated green black pepper and preserved red black pepper. For example, according to an exporter, white pepper has 40% mark up in price, while green and ripened black pepper preserved in brine is highly demanded in European countries with a 20-25% mark up in price; dehydrated green black pepper and preserved red black peppers have 40% mark up in price. Organic pepper has 10-15% mark up in price but the market share for organic products is small – about 5-10%.

Sri Lankan pepper has higher piperine, content which gives it a superior quality and pungency; Piperine content found in Sri Lankan black pepper is 2-6 times higher than in other countries providing Sri Lanka a competitive advantage in the world market.

Essential oil isolated from black pepper is extensively used as a flavor component in many food products including alcoholic and non-alcoholic beverages, cosmetics (perfumes, soap, detergents, creams, lotions). However, there are inadequate oil extraction units at commercial scale operating in the country (Ministry of Minor Export Crop Promotion, 2014) given the high capital cost of starting an extraction plant in the country (Seneviratne, 2006). Moreover, India has a virtual monopoly on spice oils and oleoresins in the global market (Krishnakumar, 2013). It produces oleoresins from almost all spices and offers a variety of products. At present India has no major competitor in spice oils and oleoresins. In fact, most spice imports from Sri Lanka are used for extraction of essential oils and oleoresins in India.

Currently, India alone accounts for 60.7% of pepper exports from Sri Lanka to the world followed by, Germany (5.9%), Pakistan (5.5%), Egypt (4.7%), USA (4.3%), UAE (3.1%), UK (2.6%), Vietnam (1.7%), Saudi Arabia (1.6%) and Spain (1.35), which are the main export destinations of Sri Lanka black pepper products. Together the top ten countries account for 91 percent of total pepper exports from Sri Lanka (ITC, 2018); thus, there is a high level of market concentration. Given that majority of black export from Sri Lanka focus on the low end of the market (India), Sri Lanka should explore high end markets in the USA and EU, which are yet to be fully exploited (Ministry of Minor Export Crop Promotion, 2014). Sri Lanka ranks at 5th largest exporter of black pepper in 2015, accounting for 4 percent of total world trade in pepper (ITC, 2018), highlighting the potential for further market penetration. Nevertheless, Sri Lanka faces competition from the traditional pepper exporters including Vietnam, Indonesia, India, Brazil and Malaysia. In this regard, international promotional activities and branding of Sri Lankan black pepper, highlighting its intrinsic quality, could help ward off the competition and enter new markets. Towards this end, the Export Development Board (EDB) has proposed to implement a brand promotion campaign on Ceylon Pepper (and Cinnamon) in identified international markets to create buyer/consumer awareness on intrinsic quality characteristics of Sri Lankan spices.

Given that majority of black export from Sri Lanka focus on the low end of the market (India), Sri Lanka should explore high end markets in the USA and EU, which are yet to be fully exploited.

At the same time, increasing standards by the developed countries can act as a trade barrier to enter those markets (Ministry of Minor Export Crop Promotion, 2014). International buyers' requirements include quantity and quality of the material and exporters grade products according to meet this requirement. There are several quality parameters including bulk density (for example, light berry 380-420 g/L, heavy berry above 500 g/L), pungency/ piperine content (8-11.5%); moisture content (maximum 12-14%); and dust and extraneous matter (maximum 1%), which they look into. Prices are determined largely by bulk density and moisture content. However, these requirements are subjective to the end buyers/markets. Buyers in India are not so qualiy conscious unlike those who imports into the EU, USA and the Middle East (Jayalath and Gunaratne, 2013).

Currently, there is no compulsory system to control quality by the government for export. Exporters depend on the requirements prescribed by the importers, and usually request quality-certifying bodies to certify the pepper. Before export, pepper bought from the growers and/or traders is dried, cleaned and graded to ensure quality meets standards requested by importers. Exporters closely work with their international buyers with whom they have a mutual understanding and built a long term relationship. Information regarding prices in other countries, and technical assistance regarding quality maintenance are sometimes provided by buyers.

Steps are taken to ensure that clients' specifications are met, every shipment is fumigated and test (for aflatoxins, heavy metals and pesticide residues) and phytosanitary certificates are obtained. While pepper supplies are dried to reduce the moisture content and remove extraneous matter, etc. to get the preferred quality standards of the buyers, pepper is highly sensitive to moisture, and shipment can be affected by formation of mold/aflatoxins. Moreover, Sri Lanka does not have up to date technology to undertake some tests: "*We are sending our samples to Germany to get the certification. SGS and ITI have equipment with the ability to detect only above 50 ppm and when they are tested aflatoxin is not detected. But when the same sample is tested in Germany, it shows 15-35 ppm of aflatoxin level. European importers need 10 ppm so we have to get the samples tested in Germany. This is a costly and time consuming procedure.*"(KII-Association).

Currently, there are Sri Lanka Standards for Black Pepper (SLS 105 Part 1: 2008) and White Pepper (SLS 105 Part 2: 2008). However, neither of these product standards is required for export at the moment. None of the exporters have obtained SLS 105 product certifications for black pepper and white pepper so far. Systems certifications are also increasing being obtained by the pepper industry at the exporter level and these include: ISO22000 Food Safety Standards, Hazard Analysis and Critical Control Points (HACCP), and Good Manufacturing Practices (GMP). Few exporters have also obtained organic and fair trade certifications. Information regarding standards is provided by various private agencies and associations including SLSI, SAPPTA and the Spice Council.

According to exporter interviews, ISO22000 is going to be important to enter the developed markets but it is not a requirement at the moment given that much of the exports go to India where Sri Lankan pepper has a market. Nevertheless, there are many advantages of complying with standards including reducing costs, increasing productivity, minimizing waste, ensuring safety, assuring quality, increasing the marketability of the product/company, and providing access to new markets. At the same time, some disadvantages were noted: the quality of a large consignment is measured using a small sample; large amount of money, time and paperwork required for compliance; standards force people to change their methods, etc.

Currently, there are SLSI Standards for Black Pepper (SLS 105 Part 1: 2008) and White Pepper (SLS 105 Part 2: 2008); however, neither of them these product standards are required/applied for export at the moment.

Whilst most of the international buyers have regular buying patterns, yet supply of pepper is insufficient to meet their demand. Therefore, relationships among sellers and buyers are affected. As stated by one exporter: *'Sri Lankan black pepper is well known for its high quality. We do not need any international marketing or branding campaigns for Lankan pepper since we cannot meet the growing demand and we are looking for more supplies'*. Given the competition amongst exporters, they hardly cooperate with each other or even share information among themselves. Nevertheless, there are private sector organisations like the Spice Council and Spices and Allied Product Producers and Traders Association (SAPPTA), which work closely for the industry with the DEA and the Export development Board (EDB) to improve the international marketing of pepper. However, they lack promotional budgets for participation in trade fairs and market research and do not have adequate staff (Jayalath and Gunaratne, 2013).

Exporters obtain pepper from several sources. Some buy green pepper from farmers/estates, dryers in Dambulla and Polonnaruwa, those who lease land and harvest pepper. They also buy both black pepper and green pepper from village collectors. Exporters source much of their supplies from collectors whom they prefer to deal than farmers/estates as collectors have the ability to supply large quantities of pepper regularly. Therefore, exporters contact with farmers is minimal (Jayalath and Gunaratne, 2013) in the conventional pepper value chain; the exception being organic pepper. Collectors/suppliers have general idea about market price as they keep in touch with the market on day to day basis. Information is verbally communicated through phone calls and purchase orders are made. There are no agreements signed between exporters and their suppliers but in the case of exporters who have obtained certifications such as ISO22000 or organic, there is a supplier agreement signed by the supplier to comply with the standard requirements.

Exporters source much of their supplies from collectors whom they prefer to deal with area collectors than farmers/estates as collectors have the ability to supply large quantities of pepper regularly.

As discussed, certain parameters should be maintained by their suppliers including piperine level, bulk density, minimal extraneous matter (e.g. stones, stalks). Supplies which do not meet the requirements of the exporters can be rejected; usually 3-5 supplies per year are rejected. A difficulty that suppliers face in meeting exporters' requirement is that pepper production in Sri Lanka is highly seasonal. Two peaks and a trough can be observed in black pepper cultivation. In black pepper, peak periods fall in March-April and October-November while the lowest value is seen in July. The low price in July coincides with major harvest season of black pepper as harvest of major pepper growing areas in Sri Lanka comes to the market in June-August period (Ministry of Minor Export Crop Promotion, 2014). Therefore, the supply is inconsistent and insufficient throughout the year.

Moreover, the quality of black pepper supplies appears to be low due to weaknesses in the coordination, awareness and infrastructure in terms of proper drying/storage, etc. Also, the production of high quality black pepper has been affected due to the demand for light berries, which is exported to India for extraction of oleoresins (Ministry of Minor Export Crop Promotion, 2014). Moreover, India has emerged as a major trading partner of Sri Lanka for pepper due to the Indo-Sri Lanka Free Trade Agreement (ISFTA). Although considered a low-value market, India is the main buyer of Sri Lankan pepper, cloves, nutmeg, and mace in terms of both volume and value. India purchases Sri Lanka's entire light berries production of pepper—known for high oil content and pungency—at premium prices for extraction of essential oil and oleoresin.

6.3 Opportunities & Constraints in Pepper Value Chain

VC Actor	Opportunities	Constraints
Producer	• Sri Lankan pepper has high levels of piperine, and oil content; highlight the intrinsic properties to increase exports • Support from government and private institutions Diverse varieties of pepper grown with resistance to pests and diseases • High farm gate prices due to growing international demand • Low application of agro-chemicals in pepper cultivation, providing opportunities to enter niche organic market and command higher prices • Potential for expansion of cultivation into dry zones • Availability of 50% grant provided by the MPI for entrepreneurs for value addition • Provision of free planting material by DEA for home-gardens; 50 percent subsidy for others. • Promote organic villages and obtain group certification	• Most pepper is grown in scattered small plots of land, under mixed and non-intensive cultivation with little inputs, and on live supports, which lead to low yields (the number of plants per area and per plant) • Climatic changes affecting amount and size of the crop • High labour cost and lack of labour • High cost of fertilizer • Pests and diseases - Lack of planting materials • Animal attacks • Formation of moulds and aflatoxin, reducing the quality and safety of pepper • Price fluctuation • Theft • Inadequate extension services • Poor attitude among farmers to diversify land and good agricultural practices of pepper cultivation • Poor infrastructure (roads)
Intermediary	• Buy green pepper and process to buyer's requirement/ standards • Engage in value addition • Increase in prices due to growing demand for black pepper • Engage in backward integration • Establish centralized processing centres • Availability of 50% grant provided by the MPI for entrepreneurs for value addition	• Inadequate supply of pepper due to: cultivation of black pepper limited to some districts; seasonal variations in supply; poor response from the plantation sector to pepper cultivation; low productivity • Inadequate supply of quality black pepper due to high demand for light berries with attractive prices at farm gate and • Willingness of farmers to sell light berries to earn "quick money" • Improper processing/ storage and facilities • High labour cost for drying

VC Actor	Opportunities	Constraints
Exporter	• Buy green pepper directly from farmers and process to own standards/requirements • Adoption of product and process standards to access markets with stringent requirements • Marketing of organic black pepper; hardly any agro-chemicals are used in pepper cultivation in the country compared to competitors • Capitalise on high quality of Sri Lankan black pepper as a marketing/branding tool • Research published at international level confirming Sri Lankan black pepper having the highest Piperine content • Availability of technology for pepper oil and oleoresin extraction and demand for spice oils and oleoresins in the world • Change of food habits, increase in come in new markets and switch to natural food like spices including pepper from artificial flavours • Immense potential for value addition in the pepper industry (pepper oil, oleoresin, white pepper, etc.) • Increasing pepper prices due to growing international demand • Availability of 50% grant provided by the MPI for entrepreneurs for value addition • Explore niche/high end markets in the USA and EU, which are yet to be fully exploited	• Inadequate amount of supply of black pepper to meet the international demand • High market concentration (India 60%, Germany 6%, Pakistan 5%, USA 4%, Egypt 4%) & high competition from traditional pepper producers/exporters • Quota on pepper exports under ILFTA • Exporters have little or no direct involvement in cultivation • Inadequate supply of quality black pepper products due to low standards of black pepper supplies • Quality standards of developed countries can act as a trade barrier • Low cost production of Indian essential oils undercuts Sri Lankan oil extracts • Inadequate testing capabilities of local laboratories to meet emerging stringent requirements • Lack of market research at the international level

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CHAPTER 07: CARDAMOM VALUE CHAIN ANALYSIS

7.1 Overview of the Cardamom Sector

Cardamom (Elettaria cardamomum), known as the "Queen of Spices", is one of the oldest known spices in the world which has a strong, unique taste with intensely fragrance and aroma. It is a perennial herbaceous plant with a pseudo stem and thick irregular shaped rhizomes (DEA, n.d.). It is the third most expensive spice only exceeded by saffron and vanilla and grows extensively as a native in the southern Indian forests of the Western Ghats (Reyes et al. 2006). Other than that, cardamom is found in Sri Lanka, Papua New Guinea, Tanzania, Vietnam and Guatemala as well (USAID, 2011).

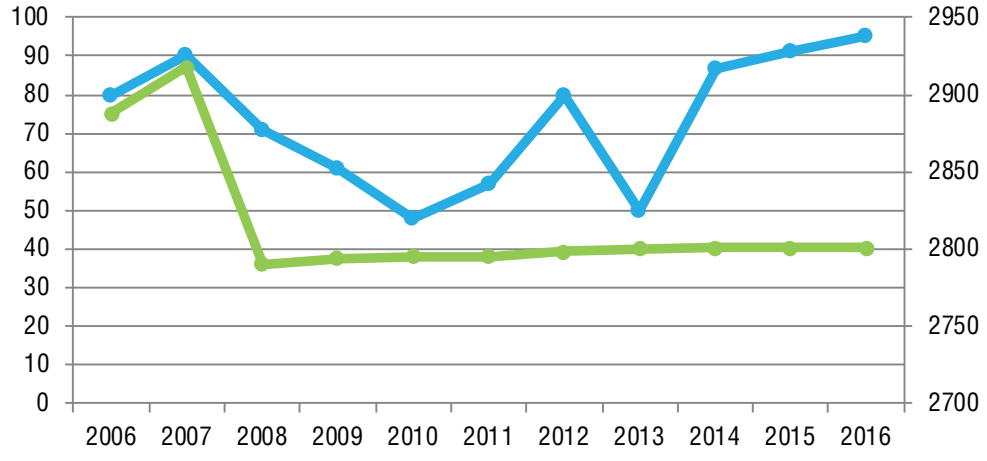
Dried fruit of cardamom is traded as a spice and it is used as a flavouring agent in many culinary preparations and in applications in medicine. Thus, in Sri Lanka, it is regarded as a good cash crop grown in high elevations around 600m-1800m under high forest canopy with a well distributed rainfall over 1500-2500mm/year (DEA, n.d.). In Sri Lanka, majority of commercial cardamom growers are located in up country wet and intermediate zone districts that include Kandy, Matale, Nuwara Eliya, Kegalla, Rathnapura and Galle (The Spice Council, n.d.).

Cardamom is considered as a good cash crop grown in high elevations around 600m-1800m under high forest canopy with a well distributed rainfall over 1500-2500mm/year.

Current low annual yield of dried cardamom in Sri Lanka which is around 60Kg/ha could be increased up to 250Kg/ha with good management practices (DEA, n.d.). Cardamom is graded into 5 categories according to the SLS 166:7980 standards and it is traded commercially as a primary product (whole cardamom), as a secondary processed product (ground cardamom) and as a value added product (oil and oleoresin extractions).

Both the area under cardamom cultivation and production have decreased drastically since 2001 soon after declaring Knuckles range as a conservation forest in 2000. This was further exacerbated by government gazette notification of 2007 that acquired private lands located within the conservation area under the Knuckles Conservation Forest and the declaration of the central highlands as UNESCO Natural World Heritage Site in 2010 (Jayasinghe and Rambodagedara, 2016).

Figure 15: Extent and Production of Cardamom Cultivation in Sri Lanka 2006-2015



Source: DEA (2016)

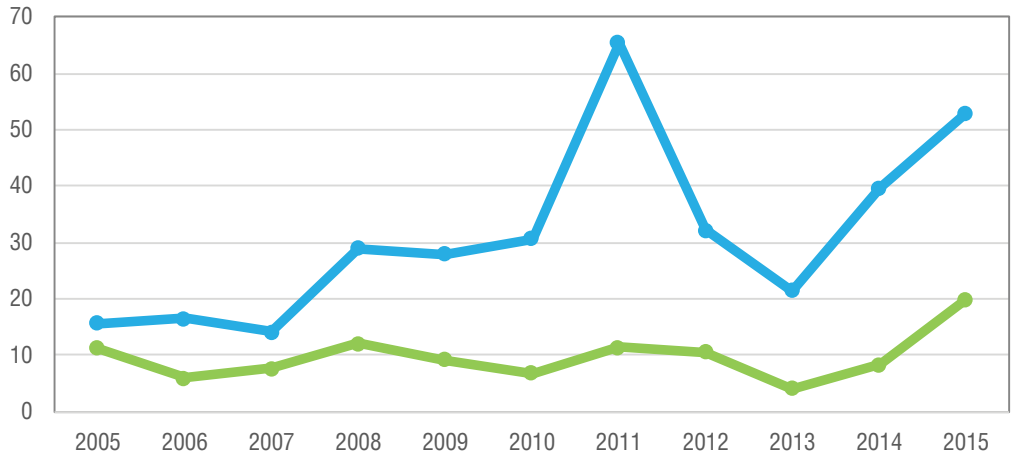
During the last decade, cultivated extent has declined by 3 percent from 2,888 ha in 2006 to 2,801 ha in 2016 (Figure 15). Even though, the annual cardamom production has increased by about 19% from 80Mt in 2006 to 95Mt in 2016, it has shown an irregular pattern of fluctuation throughout the period.

Major exportable products of cardamom include raw cardamom and cardamom oil. Figure 16 shows the recent trends in cardamom exports. The volume of bulk raw cardamom exports in recent years has shown a significant volatility over the years. The export volume was in a declining trend over the last decade or so. The export amount reduced from 11.3 MT in 2005 to 4.1 MT in 2013 and then it took a reverse turn increasing up to 8.3 MT in 2014 and 20 MT in 2015. Despite the sluggish export performance in volume terms, the value of cardamom exports has increased by more than threefold from Rs. 15.6 million in 2005 to Rs. 53 million in 2015 with the maximum value of Rs. 65.4 million in 2011 (DEA, 2016). This could be explained by the fact that the cardamom prices have been gradually increasing on average over the years.

The production and export performances of cardamom have shown a significant volatility over the years until recently.

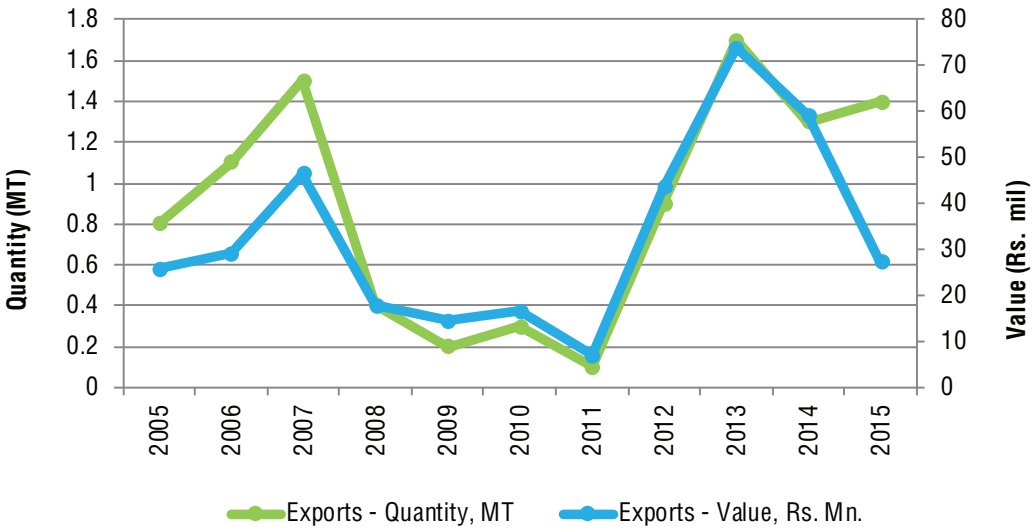
Cardamom oil is the major processed/value added export product which is extracted from cardamom pod. Export performance of both the volume and value of cardamom oils have been sluggish during the first half of the last decade with a decline of export quantity from 0.8 MT in 2005 to 0.1 MT in 2011 and export value from Rs. 25.8 million in 2005 to Rs. 7 million in 2011 (Figure 17). Since, then it picked up

Figure 16: Export Quantity and Value of Cardamom in Sri Lanka 2006-2016



Source: DEA (2016)

Figure 17: Export Quantity and Value of Cardamom Oil in Sri Lanka 2000-2015

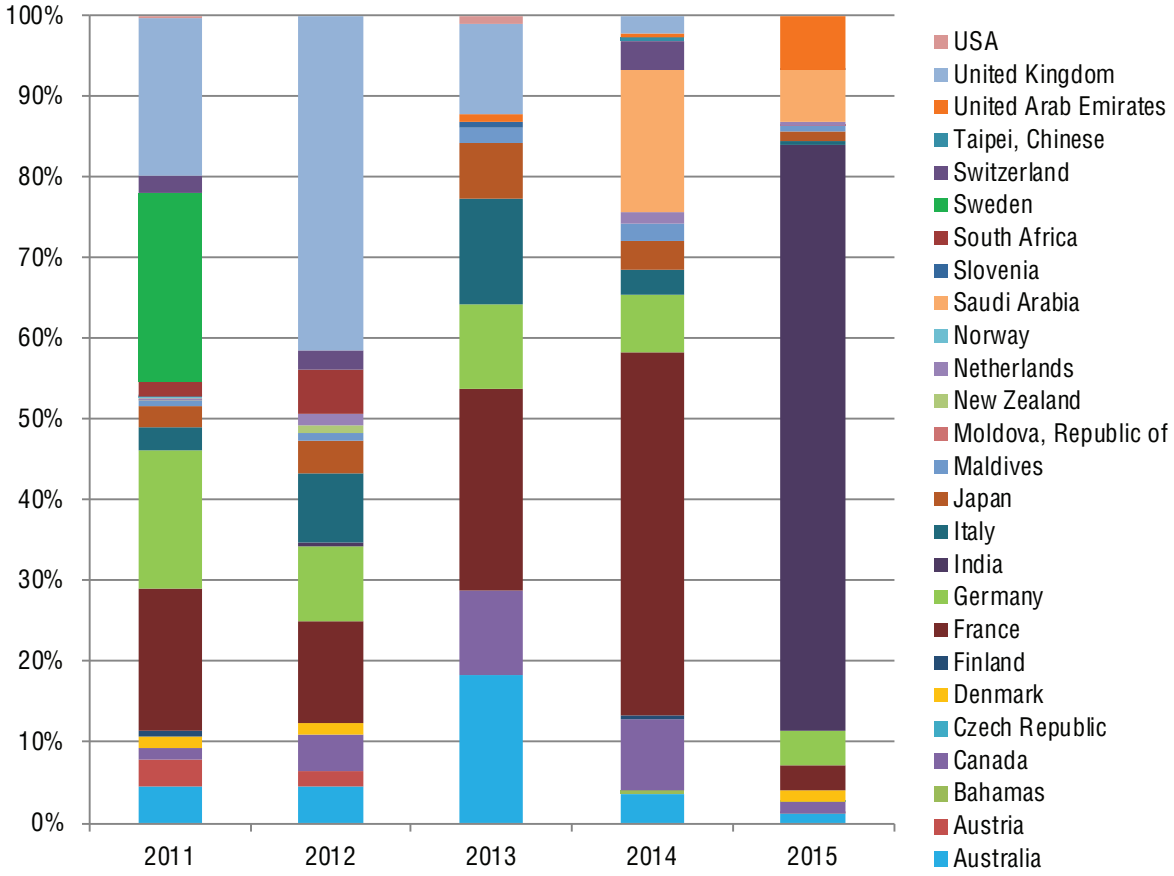


the momentum and the highest export performance of cardamom oils was recorded in 2013. However the growth of the value added sector has been hampered by various structural, socio-economic and policy issues in the sector which would be discussed in detail later.

Increasing export market concentration towards low end markets such as India and Middle East is an issue of concern.

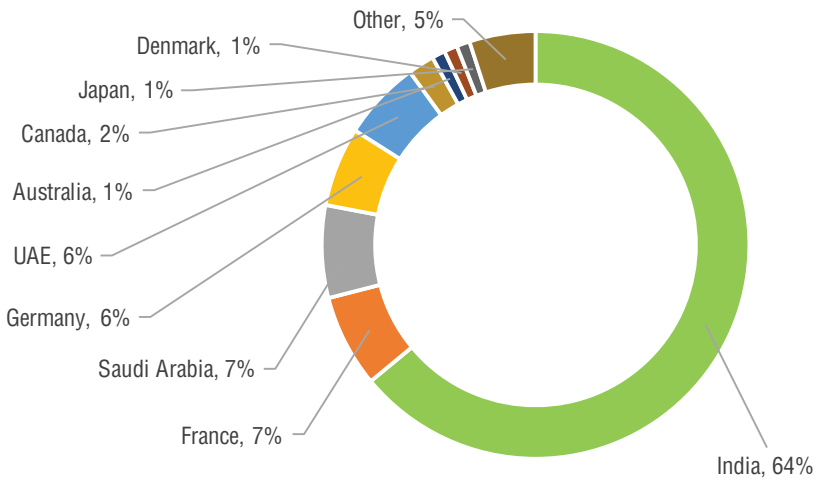
Figure 18 shows the export market trends over the years. Figure shows some dynamism in export markets with a significant export market diversification from 2011 to 2014. However, the market has been transformed towards a more concentrated one in 2015. The share of Sri Lankan cardamom exports in low end markets such as India and Middle East has increased substantially in recent years at the cost of high end markets such as France, German and UK. This is further substantiated in Figure 19 which presents the export destinations of Sri Lankan cardamom in 2015. As the figure shows, India has become the major market for Sri Lankan cardamom with a share of 64% followed by France (7%), Saudi Arabia (7%), Germany (6%) and UAE (6%). Canada (2%), Australia (1%), Denmark (1%) and Japan (1%) also have some export contribution for Sri Lankan cardamom. All the other countries import only 5% of total cardamom exports from Sri Lanka.

Figure 18: Export market concentration of Sri Lankan cardamom (2011-2015)



Source: http://www.trademap.org

Figure 19: Major Destinations of Cardamom from Sri Lanka (2015)



Source: http://www.trademap.org

Figure 20 illustrates the recent trends in cardamom imports. It shows that the quantity and value of cardamom imports have increased drastically since 2011. Cardamom import quantity increased from 6 MT in 2011 to 60 MT in 2015 while the import value increased by a similar proportion from Rs. 7 million to Rs. 67 million during the same period of time.

The quantity and value of cardamom imports have been increased drastically during the last decade or so.

Figure 20: Import Quantity and Value of Cardamom in Sri Lanka 2006-2016

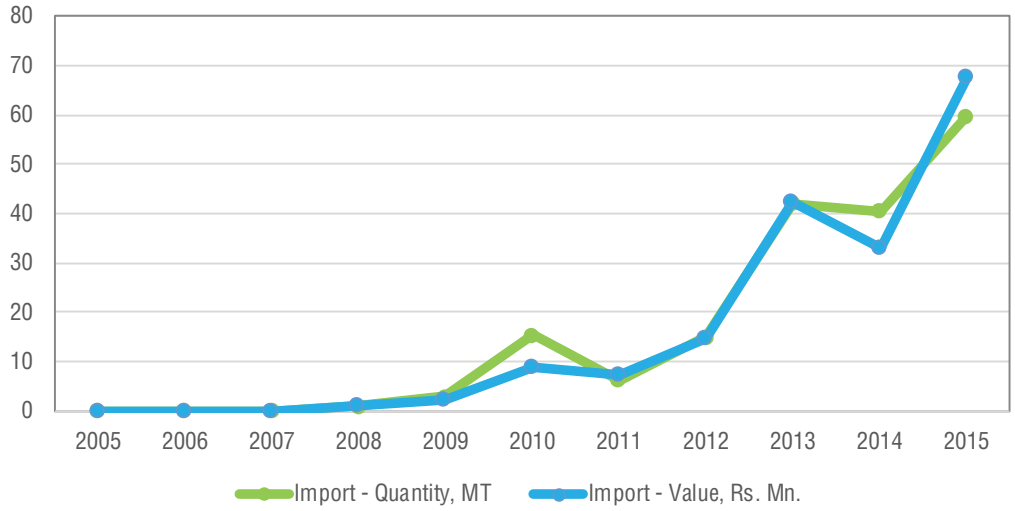
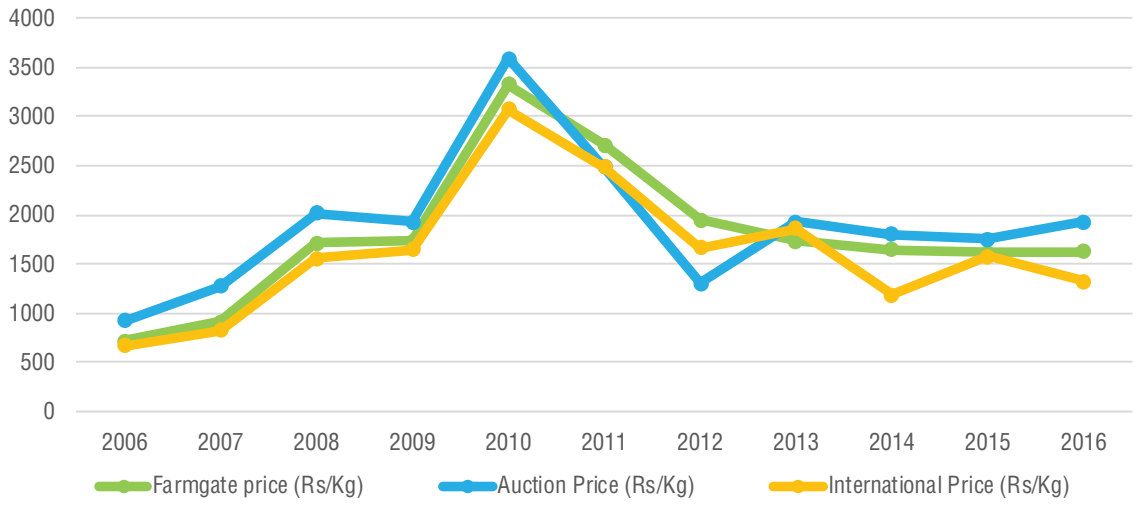


Figure 21 presents the annual average cardamom prices from 2006 to 2016. As the figure shows, Sri Lankan market prices (Auction price and Farm-gate price) closely follow the world market prices of cardamom. Average world market cardamom prices were higher in 2010-2011 periods. The highest international market price for cardamom in the last decade was recorded in 2010 (Rs. 3,075/kg). Similarly, auction and farm-gate prices were also the highest in 2010. The prices dipped thereafter mainly due to drastic climatic conditions experienced by major cardamom producing countries. Auction price is about 10% higher than the farm-gate price, while the international price is 15% and 9% lower than the auction price and farm-gate price respectively. The current international price is around Rs.1325/ Kg. Lower international prices and inadequate supply have resulted in cheap and low quality imports from India and smuggled products affecting the long term sustainability of the sector.

Figure 21: Average Producer, Auction and International Prices for Cardamom (2006-2016)



Cardamom has a high demand and continuously attracted the third highest price among all the spices. But, its price has been highly volatile both in domestic and international markets.

7.2 Cardamom Value Chain Map

Schematic presentation of cardamom value chain map in Figure 22 provides an overview of cardamom value chain as it moves from production to the final consumer, passing through different stages and processes. The linkages between different value chain actors are shown vertically from top to bottom. Different activities of these actors and the supporting institutes/service providers catering to the different stages are listed on either sides of the map. The activities, in this case, include importation, local production, collection/pre-processing, wholesaling, marketing, processing, exporting and retailing. A summary of the key functions, actors performing these functions and their transactional relationships are presented below.

Figure 22: Schematic Presentation of Cardamom Value Chain

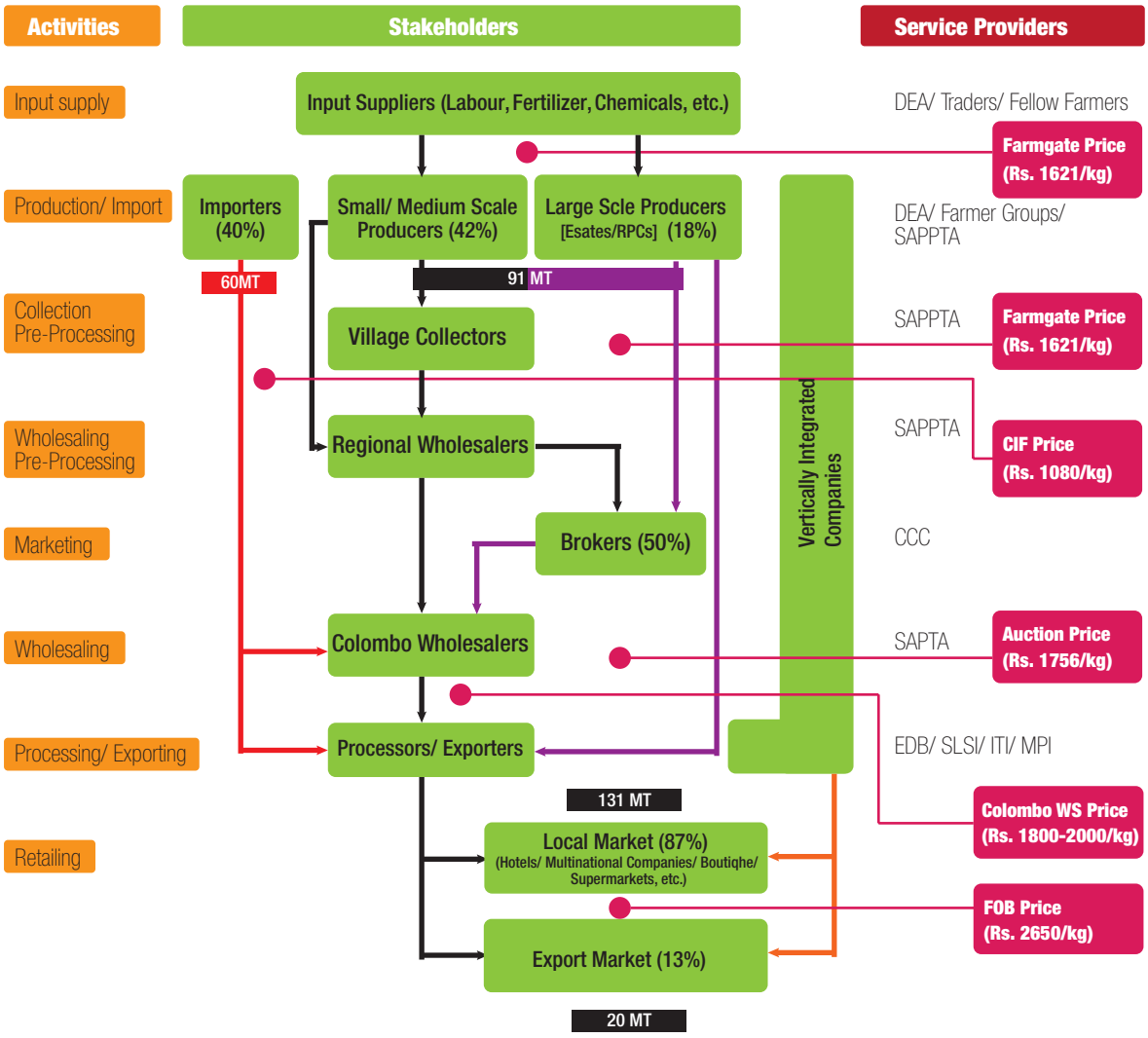
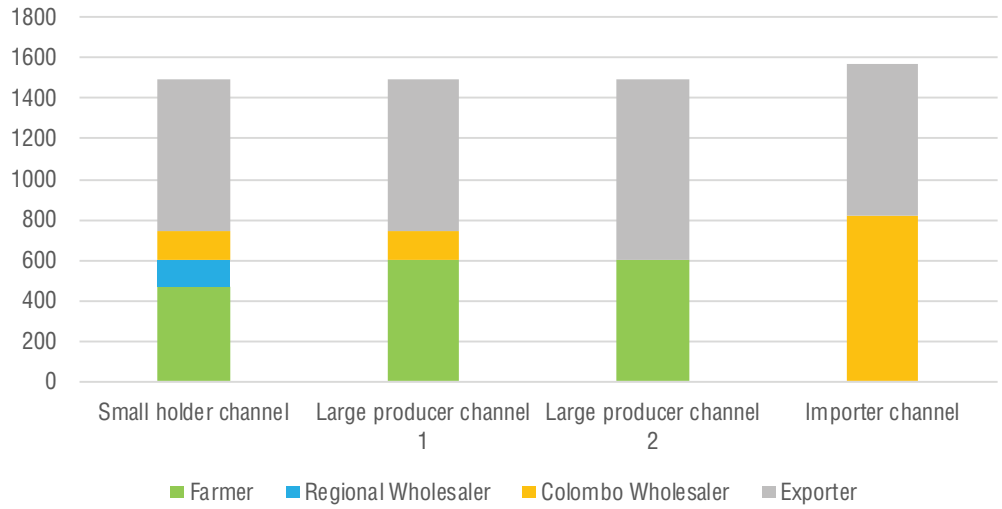


Figure 23 shows the benefit distribution of different actors along the different channels in the cardamom value chain map. Is it clear from the analysis that a significant share of benefits (>30%) could be received by the producer even in the traditional small holder supply channel. Also about 10% margin is kept by each intermediary in value chain. Producers share could be increased if the number of intermediaries could be reduced by introducing centralized collection and processing facility. Importers earn a significant benefit share in import led supply channels. However, this could be detrimental to the local production as well as the quality of the exports in case of re-exports. This figure may be misleading in the case of exporters as the cost of processing is not included in the benefit calculation due to lack of data.

With proper centralized collecting and processing facilities, cardamom could be a viable solution to rural poverty and unemployment due to its high benefit share for farmers.

Figure 23: Benefit Distribution in Different Channels in Cardamom Value Chain



7.3 Cardamom Value Chain Actors

7.3.1 Cardamom producers

Cardamom producers can be broadly categorized into two main sub sectors as small/medium holders and estates/RPC based on the extent and production volume. Cardamom is generally cultivated under shade trees at elevations above 600m (DEA, n.d.). At present, the area under cultivation is approximately 2,801 hectares of which more than 80% is in the Knuckles range (Kandy and Matale Districts). Rest of the production is scattered in Kurunegala, Kagalle, Nuwaraeliya, Rathnapura and Galle districts. The sector has a small holder orientation with scattered small holder cardamom producers (70%) and only few estates and RPCs having cardamom plantations (30%).

Majority of small holders are traditional growers with years of experience on cultivation methods. Cardamom can be propagated through both the suckers[10] and seedlings. However, the use of suckers from their own cultivations is prominent among the growers. Use of other agricultural equipment and agrochemicals such as chemicals fertilizers and pesticides are very rear in cardamom cultivation. Organic manure is used as the main input in cardamom cultivation by small holders. However, there is a need by farmers to apply fertilizer in the future to increase the productivity. Jayasinghe and Rambodagedara (2016) highlighted that the fertilizer application will be required in future due to the continuous cultivation and soil depletion in growing areas.

Major portion of the cost of cultivation is for labor wages due to the use of manual labour with simple tools (hoe, knife, etc.) for most of the operations such as land clearing, weeding, soil conservation and harvesting. Terracing and mulching are the most prominent soil and moisture conservation practices among the cardamom farmers. Unavailability of labour especially during harvesting time is one of the main problems faced by cardamom growers. Labour is hired on daily wage basis as well as per weight pay basis. However, growers prefer to provide daily wage basis payment as weight basis does not assure the quality of the harvest due to immature plucking. DEA is the main supporting institution at the producer level of the value chain. They have different subsidy schemes on different inputs such as planting materials, equipment for the farmers. Even though, SAPPTA does not have a direct mandate for the producers, they are more focused on liaison with policy makers on behalf of the producers.

Major portion of the cost of cultivation is for labor wages due to the use of manual labour for most of the operations including land clearing, weeding, soil conservation and harvesting.

10. A shoot springing from the base of a tree or other plant, especially one arising from the root below ground level at some distance from the main stem or trunk which can be used for vegetative propogation.

Farmers who have barns inside the forests cure the harvested cardamom pods using firewood and sell directly to regional wholesalers. Very minimal grading and practices to ensure quality management occur at the farmer level while remoteness, poor road infrastructure, drying facilities and lack of storage act as barriers not only for ensuring product quality but also for finding competitive buyers. This has resulted in cultivators selling their uncured cardamom pods to barn owners who act as local collectors. Cultivators have very low bargaining power in this kind of associations.

Many small holder spice producers are not fully aware of the quality requirements of the final consumer as the quality signals are not sufficiently trickled down from the exporters through the value chain.

Many small holder spice producers are not fully aware of the quality requirements of the final consumer as the quality signals are not sufficiently trickled down from the exporters through the value chain. Due to this lack of backward communication, the farm-gate quality of spices does not match with end market quality standards most of the time. The quality of Sri Lankan cardamom is assessed on the basis of product specifications set by Sri Lanka Standard Institute (SLSI). SLSI product standards are mainly focused on the physical appearance of the product that includes colour, splits percentage by count and litre weight which was discussed in a separate chapter. Producers receive certain advices on Good Agricultural Practices (GAP) by the DEA extension officers. However, if the producers choose to adopt those practices depend on their own discretion and the producers are hardly certified with GAPs standards.

Cardamom production in estates/RPCs is more systematic and they are usually engaged in organically certified cardamom production. After curing and grading, they sell their products through the brokers to the buyers at the Auction. With the amount of production going through the auction have reduced over the years, selling directly to the processors/ exporters is increasingly occurring. Sometimes, organic estates are having written agreements with processors/ exporters. Those companies often provide technical assistance, advices, and field training programs to ensure the better quality and supply their own transport. Some of organic estates sell their products through fair trade to obtain a price premium. There are some exporting companies who have vertically integrated their activities along the value chain. These companies have their own plantations to fulfill their processing and exporting requirements. Sometimes, they have contractual agreements with a set of farmers who act as their preferred suppliers. These kind of arrangements not only ensure the quality of the production at the farm gate level, but also provide the farmers with a competitive price.

Cardamom cultivation is affected by the pest and diseases such as shoot and capsule borer attack and clump rot disease. However, thrips attack has been the most serious pest and disease problem that affected the cardamom cultivation in recent years. Apparently, currently available controlling methods have not been much effective in controlling thrips attack. Being a forest based cultivation, wild animal damages for cardamom cultivation are not very rare. Cultivators usually use traditional methods like hooting, firecrackers, and sometimes even gun firing and setting traps to prevent such attacks.

Even though, there is a huge demand for cardamom, current supply is not enough to meet even the local demand, let alone export demand. The major reason for declining the cardamom production over the years has been the government introduced ban on cultivating cardamom in environmentally sensitive areas such as Knuckles range which used to be the most productive areas. As highlighted in Jayasinghe and Rambodagedara (2016), various crop management practices such as forest undercover clearing, removal of canopy trees, using forest trees as firewood for curing create a major threat for long term sustainability of the knuckles conservation forest which declared as a world natural heritage by UNESCO recently. Due to the lack of high yielding verities and poor crop management, yield levels in Sri Lanka has been relatively lower than the other producing countries. Annual yield of dried cardamom in Sri Lanka is around 60Kg/ha which could be increased up to 250Kg/ha with good management alone (Spice Council, n.d.).

7.3.2 Intermediaries

The traditional supply chain of cardamom in Sri Lanka is characterized by the presence of a large number of intermediaries with no essential function (Figure 15), decentralized purchasing and low quality product purchases and sales. Intermediaries in cardamom value chain usually consist of village collectors, regional traders, brokers and Colombo traders. The role of some of the intermediaries such as village collectors and the brokers has diminished drastically over the years. However, this cannot be considered a positive transformation since this has happened as a response to the decline in production volume transferred through the value chain rather than value chain modernization.

Village collector who is usually a cultivator himself, plays an important role in remote areas with poor transport infrastructure, lack of storage and drying facilities. Sometimes they provide the cultivators with technical and financial assistance. They buy whatever the product that comes to them regardless of the quality of the product and maintain a dominant role in transactions. Due to the low price differentiation for the quality, cultivators are not interested in upgrading the quality of the production. Major costs incurred by village collectors include costs of cleaning, drying, grading, packing in gunny bags and transferring to regional traders.

Insufficient supply and poor product quality have been two of the major issues at the intermediary levels of the cardamom value chains.

Regional trader is the most important intermediary in cardamom value chain who gets the cardamom products both from the regional collector and the cultivators. There could be 5-6 traders regionally who often handle many different spices such as cardamom, pepper, nutmeg, cloves, cinnamon etc. They are primarily specialized in buying and wholesaling. In addition, they are performing some primary processing/ value addition activities such as drying and grading products. Sometimes, these traders provide the quality and price information and financial assistance to the regular buyers. Regional traders are more concerned about the quality of the product they buy. Prices are decided based on several quality parameters such as litre-weight of the product (grams/litre), moisture level/dryness, color and appearance. They usually maintain a similar price among the fellow traders in the region. Low production volume, low quality and the smuggled products have been the major threats at the intermediary level of the value chain.

Regional traders sell their cardamom products to the Colombo wholesalers either directly or through the brokers at the auction. Besides regional traders, large scale estates and RPCs also sell their products through the brokers. Approximately 50% of the cardamom goes through the brokers while the remaining 50% goes through the other channels. Out of the total eight registered brokers at the Colombo auction, only Forbes and Walkers Commodity Brokers handles cardamom. The products to be sold at the auction are stored and catalogued according to the quality by the brokers before the transaction takes place. Buyers in the auction are mainly Colombo wholesalers and the transaction happening through the forward contract with pre negotiated prices. Other than that, processors/exporters also reach the auction to buy cardamom. Though auction is preferred by the sellers due to higher prices, faster payments and transparency, the volume of products going through the auction has been going down due to low supply and minimum transaction requirement. About 5-10 main buyers are currently involved in the cardamom auction.

Colombo wholesaler is the final intermediary in the value chain who buys cardamom products from the regional wholesalers and the auction. Similar to the regional wholesalers, Colombo wholesalers too handle several categories of spices together. Major share of cardamom demand is fulfilled by a large number of regional suppliers who bring the products to the door step of Colombo wholesalers. The share of the demand handled through the auction system is limited due to the low supply while it involves additional transportation cost that has to be borne by the wholesalers. They are not involved in any kind of processing/value additions other than buying and selling. There are few Commission Agents who link the auction with the Colombo wholesalers and facilitate the auction buying and handling. Due to the inadequate local supply, raw cardamom is imported in bulk at low prices by the importers based in Colombo. They sell their products mainly to processors and exporters.

Due to the lack of focus on the quality of the product at the producers' stage, there is a considerable amount of cleaning, preprocessing and grading carried out at the intermediary level throughout the value chain. SLSI (SLS 166:790) helps to maintain standard product specifications for cardamom according to five grades (Grade 1 - Lanka green (LG); Grade 2 - Lanka Light Green 1 (LLG 1); Grade 3- Lanka Light Green 2 (LLG2); Grade 4 - Lanka Bleached (LB) and Grade 5 - Lanka Non Specified (LNS)) (DEA, n.d.). This is the only quality criteria adapted at the intermediary levels including the auction brokers. Collective actions and backward/ forward integration to ensure quality and traceability as a response to the different process standards adopted at the end market are rarely available.

7.3.3 Processor/ Exporter

Processor/exporter is the final link in the cardamom value chain. Other than the Colombo wholesalers, processors and exporters use various supply sources to meet their demand requirements. These include brokers, large scale estates/RPCs and importers. There are few vertically integrated companies who are engaged in various activities in the value chain that include cultivation, processing and exporting. Sometimes, especially in the case of organic production, these processors/exporters have contractual arrangements with a set of preferred suppliers.

Those processors/exporters serve both the domestic market as well as the export market after value addition through different levels of processing, packaging and labeling. Local cardamom production primarily serves the local consumers through local markets, supermarkets, multinational companies, hotels, cafes, boutiques, etc., while only a small fraction goes to the export market. Few companies are currently engaged in exporting bulk raw cardamom; semi processed crushed/ground cardamom and processed/value added products such as oils, oleoresins, etc.

Sri Lankan cardamom is mainly exported to the countries like India, Middle East and some European markets. This is the most sophisticated stage of the value chain where the process standards such as SLS standards, ISO standards, Fairtrade, GMP, ASTA (American Standard Test certificate) and US (European standards) are also applied depending on the buyer requirements. Before exporting the products needs to be tested and obtain certification from SLSI or private laboratories. The Industrial technology institute in Sri Lanka plays an important role for the factories to obtain this certification. Generally, cardamom exporters do not have adequate information about different standards, and health and sanitary regulations applicable in the export markets because usually transactions happen after testing the samples by the buyers themselves.

Strong, unique taste with intense fragrance and aroma of Sri Lankan cardamom attract a good export demand and better price in the international market. While the world demand for cardamom value additions has been consistently increasing, low production volume in the country and low quality of the products have been critical issues of concern in dealing with cardamom value addition and exports. Also mixing Sri Lankan cardamom with imported Gouthamala varieties in oil extraction is an emerging issue that affects the quality of local value addition. This could affect the demand for local exports as the foreign buyers are increasingly aware of the product quality aspects. High labor wages, low availability of skilled labors for value addition and high capital for sophisticated equipment have been the major threats for the exporters in expanding the export volume and value additions.

7.4 Opportunities and Constraints in the Cardamom Value Chain

VC Actor	Opportunities	Constraints
Producer	• Vegetative propagation ability through suckers • Availability of conducive climatic and soil conditions • Availability of dedicated government and private support structure catering to the sector (DEA,MPI, Spice Council, SAPPTA) • Different grant and subsidy schemes to promote cultivation and value addition • Availability of 50% grant provided by the MPI for entrepreneurs for value addition • Provision of free planting material by DEA for home-gardens; 50 percent subsidy for others. • Availability of research facilities (DEA, ITI and Agriculture Faculties) • High demand from both the local and export markets • High price in both local and international markets (Third highest price among all spices) • Adaptability to organic cultivations under forests and intercropping with perennial crops • Availability of price premium and increasing demand for organically certified products	• Legislative restrictions (eg: Knuckles Range and Sinharaja forest)/ No specific provisions for cardamom cultivation in current policies and acts • Low productivity • Small holder orientation with low investments on crop management/poor crop management • Lack of high yielding verities suitable for different elevations and shade levels • Insufficient extension services • Low quality of the products • Immature harvesting and low quality drying • Poor storage and handling • Unskilled labour • Insufficient extension services • High Cost of Production • High labour cost • Lack of research on low cost technologies • Pest and disease attacks • Thrips, shoot/capsule borer, • Wild animals • Marketing issues • Lack of bargaining power & fair stable price • No proper dealer network • Weak linkage among value chain actors • Poor infrastructure (road transport, electricity) and support services in cardamom growing areas

Intermediary	• High demand from local and international markets • Ability to engage in value addition in terms of pre-processing and drying • High price in both local and international markets (Third highest price among all spices) • Different grant and subsidy schemes to promote cultivation and value addition • Availability of 50% grant provided by the MPI for entrepreneurs for value addition	• Low and inconsistent quality of products - Poor practices by producers - Low quality traditional drying - Poor storage and handling • Low supply volume: - Limited number of scattered farmers • Cultivation restriction in high elevations • Smuggled low cost Indian products in the market • Week linkages with the exporters
VC Actor	**Opportunities**	**Constraints**
Processor/ Exporter	• High price in both local and international markets (Third highest price among all spices) • Backward integration vertically to buy directly from preferred suppliers to ensure traceability and product quality • Availability of dedicated government and private support structure catering to the sector (EDB, Spice Council) • Different grant and subsidy schemes to promote value addition • Availability of 50% grant provided by the MPI for entrepreneurs for value addition • Increased used of cardamom as an ingredient for cooking in different countries (in Asian cooking, to spice Scandinavians “Danish pastry”, in Swedish meatballs, in German cookies, betel nut chewing in South and South East Asia) • Increased use for medicinal purposes (as a breath freshener, aid in digestion, to prevent teeth cavities, as an aphrodisiac in Middle East, for windiness, to stomach problems, for combating digestive ailments, as a cardiac stimulant, etc.)	• Low and inconsistent quality of products • Low supply volume : scattered, limited number of farmers and restriction in Knuckles range • Smuggled low quality products in the market • Lack of research on value addition and modern technology and poor dissemination of output • Poor linkage between export companies and state research institutions • High capital cost for value additions i.e.: Sophisticated machines, laboratory equipment and skill labors • Higher import of bulk raw cardamom • Increasingly stringent quality standards by the high end markets • Poor access to land • Less direct involvement to cultivation by most of the producers • lack of promotional activities in high end markets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CHAPTER 08: CONCLUSION & RECOMMENDATIONS

8.1 Conclusion

Despite the important role in the economy of Sri Lanka, the spice sector is facing several challenges and threats related to the traditional marketing system. This study makes an attempt to understand the various issues that the value chain actors face especially focusing on quality aspect and to suggest a set of policy level recommendations to convert those issues/ threats in to the opportunities. This section summarizes all the finding from the three value chain analyses and generalizes them in to the spice industry.

The traditional supply chain of spices in Sri Lanka is characterized by decentralized purchasing, low quality product purchases and sales, the presence of a number of intermediaries without essential functions, such as travelling collectors, village traders, wholesale buyers, commission agents and auction brokers and weak linkages among the different value chain actors. This has resulted in low value added in the chain, lack of quality concern, poor incentives for the farms to make investments and sluggish growth of the sector. This set up has been dominating spice marketing for a long time without any changes until now except for certain isolated attempts of entrepreneurial firms who have integrated backwards towards the cultivation while linking small holders farms in to dynamic modern supply chains.

The marketing structure of spices in Sri Lanka is characterized by its traditional nature at the domestic level and rather high degree of sophistication at exporter level. Despite the greater scope of further expansion, current production is mostly used for the domestic consumption due to various issues. The major issues concerning the production aspect include high cost of production, poor yield levels and insufficient supply, poor quality of the products, scattered small holder subsistence cultivation, unavailability of suitable lands and pest and disease problems. Moreover, rapid changes are occurring in the domestic and export procurement systems in terms of increased quality concern due to the development of high quality retail markets (supermarkets), bulk procurement by domestic manufacturing firms, and increased quality awareness in the global trading system.

Spice value chains in Sri Lanka have been blessed to be surrounded by a network of vibrant supporting institutions coming from both the state and private sectors who are engaged in promoting cultivations, ensuring high quality supply and increasing export earnings. Department of export agriculture is the main government organization involved in production sector. They provide technical assistance, field trainings, advisory campaigns, subsidy programs to uplift the production level. Export Development Board, SAPPTA, SLSI, ITI and Spice council also play an important role in different stages of the value chain by conducting research and development programs, finance, market development, technical assistance etc. focusing on product quantity and quality, farm income, employments among others. Other than that, there are number of opportunities in the sector such as inherent quality of Sri Lankan spices, increasing both local market and international demand, increasing prices for quality products, etc.

However, the spice sector has not been able to capture the full advantage of these opportunities. Therefore, this study recommends (Sections 8.2.1 to 8.2.3) making investments on research focusing on high yielding verities, pest and disease resistant varieties, low cost production technologies and environmental friendly cultivation practices; strengthening the existing research and extension system to ensure the quality throughout the value chain; introducing centralized collection and processing; improving value addition targeting international demand and promoting export towards nontraditional and high end consumers.

8.2 Recommendations to Address Constrains in 3 Spices Value Chains

8.2.1 Cinnamon Value Chain in Sri Lanka

PRODUCER LEVEL			
Constraints	Recommendations	Responsible Institute	Timeline
Insufficient skilled labor (peelers)	Attract new labour and provide proper training to existing labour force. Peeling skill comes from generation to generation. Thus, it is important to provide this training via an active peeler who is currently involved in peeling. He could act as a trainer at a training center or at an association and could train selected peelers. Thereafter, these trained peelers can play the role of trainers amongst others. Thus, the government or association could value this trainer's service by providing them honorarium to motivate them engage in training service. It has to be a continuous training. This issue was already identified and the importance of providing training was already highlighted in the MPIs Action plan. Thus, it is utmost important to implement identified actions immediately. And also conduct promotional campaigns at village levels.	MPI Spice Council via Cinnamon Training Academy	●
High labor cost	Increase number of peelers to reduce competition amongst each other's	DEA MPI	●
Lack of recognition and social cast stigma	It is utmost important to make them make them self-esteem by way of providing a certificate after a proper training Provide them with an identity card that they can use at the bank, hospital, police station etc. Conduct awareness programmes to communicate them the value of their service It is important to link them with an insurance and /or pension scheme	DEA MPI	● ●
Lower attraction of youth	Attract youth to peeling job by way of providing decent working environment. It has to be similar to white collar job. It is important to provide them a uniform or provide an incentive to purchase a decent dress. Provide them with an identity card that they can use at the bank, hospital, police station etc. Make them proud of the work they do. Offer a certificate after a proper training It is essential to conduct these training programmes at village level where the village youth have easy access. This was recognized by the MPI and the Spice Council under UNIDO project and made arrangements to provide NVQ certificates to peelers. The pilot project was planned to initiate by the Spice council with the TUT University Japan. Thus it is important to reactivate the proposed project.	MPI DEA Cinnamon Training Research Institute Vocational Training Authority Financial Institutions	●

Constraints	Recommendations	Responsible Institute	Timeline
Tendency towards in making coarse grades except other fine grades	Training programme to make them aware on international demand. It will be useful to introduce few techniques, methods or equipments to make peeling, rolling and quilling job easily. It is important to conduct proper identification programmes and promotional campaigns.	MPI DEA Cinnamon Training Research Institute ITI Associations (Exporters, village level)	● ● ●
Limitations of converting lands in to cinnamon cultivation especially in RPCs	Introduce a lean structure and the approvals should be obtain to RPCs faster	Ministry of Plantation Industries MPI	● ● ●
Unstable price in the market	Maintain stable farm-gate price for cinnamon by way of government intervention as in paddy. Introduce a guaranteed price scheme	MPI DEA	● ●
High cost of fertilizer	Promote organic fertilizer and encourage producers using organic fertilizer and also promote adoption of Good Agriculture Practices (GAP) for cinnamon	MPI DEA Ministry of Agriculture	● ● ●
Less quality of fertilizer and its time consuming results	Develop programs for optimum utilization of fertilizers Enforce regulatory mechanism for quality control in carbonic fertilizer	MPI DEA Ministry of Agriculture	● ●
High prices in planting materials	Promote producers to maintain their own nurseries using quality seeds	MPI DEA Ministry of Agriculture	● ●
Lack of proper production infrastructure and technology	Extend government subsidy on “in-house processing sheds” to less than 5 acres plantations. Disseminate newly developed technologies to grass root level producers. At the same time it is important to establish central processing units at selected places where producers could sell their products.	MPI DEA	● ● ●
Climate change	Develop drought tolerant varieties of cinnamon suitable to different agro - ecological regions Develop suitable methods for cinnamon cultivation to adapt to the changes in climate	MPI DEA ITI Climate Secretariat	● ● ●
Susceptibility to pest and disease like deer, pig, peacock etc. Limited number of cultivars	Develop pest and disease resistant varieties of cinnamon Develop improved cultivars	MPI DEA ITI Climate Secretariat	● ● ●

INTERMEDIARY LEVEL			
Constraints	Recommendations	Responsible Institute	Timeline
Poor hygienic, sanitary in storage and transport facilities	Promote sound storage and transport system for cinnamon Warehouse should be a covered premise, well protected from rain, sun and excessive heat	MPI DEA	● ● ●
Less concern to assure the quality of the cinnamon, lack of awareness of international standards and specification and	Strengthen and introduce new technologies for quality assurance and improvement of cinnamon	MPI DEA ITI	● ● ●
High competition amongst collectors	Make them aware on collecting quality products	Spice Council Exporter Associations	● ●
High transportation cost of cinnamon	Introduce a support scheme to cinnamon collectors	MPI Exporter Associations	● ●

EXPORTER LEVEL			
Constraints	Recommendations	Responsible Institute	Timeline
Major market limited to Mexico USA, Colombia, Peru and Germany	Strengthen promotion Champaign on Ceylon cinnamon brand products at international market Strengthen brand promotion programs	MPI EDB	● ● ●
Insufficient promotional activities in the international market	Develop promotional campaign for cinnamon industry through electronic and print media Trade Mark registrations Establish a mechanism to obtain Geographical Indications	MPI EDB NIPO	● ● ●
Lack of research undertaken to measure end market requirements	Conduct market research to identify new markets and expand existing markets for cinnamon	MPI EDB	● ● ●
Traditional methods which are highly labour incentive are using for processing	Develop appropriate methods and technology programs for processing.	MPI DEA ITI Spice Council	● ● ●
High cost in obtaining and maintaining standards certificates	Provide intensive scheme for stakeholders who wish to achieve quality standards	MPI SLSI	● ●

8.2.2 Pepper Value Chain in Sri Lanka

PRODUCER LEVEL			
Constraints	Recommendations	Responsible Institute	Timeline
Low productivity: most pepper is grown in scattered small plots of land, under mixed and non-intensive cultivation with little inputs, and on live supports, which leads to competition between crops for nutrients and low yields (the number of plants per area and per plant)	- Implementation of modern agricultural practices – Productivity Improvement Programme (PIP)	MPI/DEA	●
	- Replanting/new planting programmes to ensure that pepper productivity does not decline in the long term	MPI/DEA	●
	- Encourage mixed cropping with other crops in home gardens; for example, Black Gold League in India where pepper is intercropped with areca nuts and coffee	MPI/DEA	●
	- Encourage commercialization of pepper cultivation by adopting a mono cropping system where non-living supports (for example, concrete beams) are used in plantations, such as in Vietnam	MPI/DEA/ SAPPTA	●
Climatic changes affecting amount and size of the crop; changes in rain fall pattern influences flowering of pepper	-Use of drip/rainwater/micro irrigation systems	MPI/DEA	●
	-Conduct proper research to develop drought tolerant varieties	MPI/DEA	● ● ●
High labour cost and lack of labour costs Rs. 1500/ day for pruning Glyricidia trees & Rs. 1200day for harvesting	-Promote good agricultural practices to reduce labour requirement: Glyricidia support should be regulated by pruning to keep height at about 3.5-4.0m; Prune Glyricida trees at least 3 to 4 times a year	MPI/DEA	●
	- Maintain a height of 12ft for pepper plant (for example, China) for ease of plucking	MPI/DEA	●
High cost of fertilizer; plantation companies are not eligible for fertilizer subsidy/planting materials	- Provide fertilizer subsidy to smallholders	MPI/DEA	●
	- Encourage application of Glyricidia lopping to reduce fertilizer application; recommended mixture - 2380 kg / ha (without Glyricidia lopping); 1190 kg / ha (with Glyricidia lopping)	MPI/DEA	●
Pests and diseases including little leaf disease & glyricidia sap sucker	- Encourage farmers to follow GAPs	MPI/DEA	●
	- Conduct proper research to identify control methods and to develop resistant varieties	MPI/DEA	●
	- Adoption of more effective pest and disease control measures/practices and discourage/safe use of chemicals	MPI/DEA	●
Lack of planting materials	- Maintain own nurseries by using shoots from existing vines	MPI/DEA	●
	- Development of new varieties	MPI/DEA	● ● ●

Constraints	Recommendations	Responsible Institute	Timeline
Animal attacks (porcupines, wild boars, monkeys)	-Provide a proper boundary		
Post-harvest damage: growth of molds and aflatoxin, reducing the quality and safety of pepper	–Encourage farmers to use hot water treatment to reduce plate count and mould	MPI/DEA	●
	- Educate on proper processing and storage of pepper to reduce post-harvest loss Assistance for development of post-harvest facilities and equipment	MPI/DEA	●
Price fluctuation	- Set a minimum a higher farm gate price for HB compared to LB by the government	MPI/DEA	●
Theft due to demand for light berries at farm gate	- Farmers should get together to address this issue	Farmer organizations	●
	- Famers should come forward and report the theft - Increase the fine as a deterrent	Farmers	●
	-Impose a CESS on export of light berries/provide an incentive to cultivate heavy berries vis-à-vis light berries	EDB	●
Inadequate extension services: lack of human resources	Improve efficiency and reach of extension services by increasing resources; for example, providing mobile phones, motor cycles for extension officers to facilitate their work in remote areas in the hill country	MPI/DEA	● ●
Poor attitude among farmers to diversify land and good agricultural practices/good manufacturing practices of pepper cultivation/ harvesting	- Encourage farmers to diversify from other crops to pepper	MPI/DEA	● ●
	- Educate farmers by organizing field trips to show the economic return from cultivating heavy berries	MPI/DEA	●
	-Construct model farms in each village towards educating farmers about proper agronomical practices include drying	MPI/DEA	●
	-Distribution of processing equipment to farmers/ farmer organizations at a subsidized price	MPI/DEA	● ●
Poor infrastructure (roads)			●

INTERMEDIARY LEVEL			
Constraints	Recommendations	Responsible Institute	Timeline
Inadequate supply due to: cultivation of black pepper limited to some districts; seasonal variations in supply; poor response from the plantation sector to pepper cultivation	-Encourage cultivation of black pepper by plantation companies and expand cultivation into dry zones	MPI/DEA/ SAPPTA	● ● ●
	-Increase productivity of existing crop (Productivity Programme)	MPI/DEA/	●
Inadequate supply of quality black pepper due to high demand for light berries with attractive prices at farm gate and willingness of farmers to sell light berries to earn "quick money"	-Promote harvesting of matured heavy berries through awareness campaigns highlighting the economic loss to the farmers and the economy by harvesting of light berries	MPI/DEA	●
	-Improve processing/storage facilities to reduce post-harvest damage - Educate pepper farmers to manage their finances better so that they do not resort to picking LB; short term loans to farmers who can use their harvest as a surety	MPI/DEA	●
Improper processing/storage and facilities	-Assistance to build/reconstruct process and storage facilities/buy equipment	MPI/DEA	●
	-Establish central collecting/processing/ storage centres to improve the quality of pepper	MPI/DEA	●
	- Promote GMP	MPI/DEA/ Spice Council	●
High labour cost for drying	-Promote the use of mechanical drying by extending technical and financial assistance to purchase	MPI/DEA	●

EXPORTER LEVEL			
Constraints	Recommendations	Responsible Institute	Timeline
Inadequate amount of supply of black pepper to meet the international demand	- Increase the productivity of existing crop	MPI/DEA	●
	- Encourage cultivation of black pepper by plantation sector and expansion of cultivation into dry zones including the North and the East	MPI/DEA/ SAPPTA	●
	- Promote value addition rather than bulk exports: Development of new products and uses of pepper. Research and development efforts need to be stepped up to enhance the use of pepper and pepper derivatives in both food and non-food sectors. New food products should seek to take advantage of the trend towards "hot" and ethnic foods. In the non-food sector, the intrinsic properties of pepper (medicinal, insecticidal, anti-bacterial, etc) should be investigated comprehensively, with a view to develop new products for market.	EDB/ITI	● ● ●
High market concentration (India 60%, Germany 6%, Pakistan 5%, USA 4%, Egypt 4%) & high competition from traditional pepper producers/ exporters	- Branding of Sri Lankan black pepper at the country and individual level (ie Malwatte Plantation – Uva pepper)	EDB/ Spice Council	● ●
	- Conduct promotional activities to diversify and enter new markets. There has been significant growth in some new markets, including China, some central European countries and in the Middle East. These and other new markets should be the focus of a concerted campaign to improve consumption	EDB	● ●
	- Exporters to be encouraged to look beyond India into other markets; equal attention need to be paid to both light berries and heavy berries markets	EDB	● ●
Quota on pepper exports under ISLFTA	- Removal of pepper quota	EDB/ Department of Commerce	●
Exporters have little or no direct involvement in cultivation	- Encourage backward integration of exporters	SAPPTA	● ●
Inadequate supply of quality black pepper products due to low standards of black pepper supplies	- Buy directly from farmers and process according to export/buyer requirements	SAPPTA/ Spice Council	● ●
	- Implement quality and safety standards at production and processing stages of pepper value chain		
	- Set up a steam sterilization treatment plants for use by exporters.	MPI	● ●

Constraints	Recommendations	Responsible Institute	Timeline
Quality standards of developed countries can act as a trade barrier	- Implement mandatory standards for pepper exports to prevent adulteration, etc. and thereby ensure quality of Sri Lankan pepper whilst encouraging good agricultural and manufacturing practices upstream in the value chain	MPI	● ●
	-To ensure access to markets in developed countries and their meet expectations, there has to be continued emphasis on improving quality of products exported and processes.	EDB/SLSI/ Spice Council/ SAPPTA	● ● ●
	- In addition to the traditional quality considerations relating to grading/physical cleanliness, attention has to be paid to microbiological and chemical safety of pepper and pepper products. Awareness of pepper growers, traders and processors of the quality requirements of importing countries need to be improved and encourage stakeholders to put in place quality systems such as GAP/GMP/HAACP/ ISO22000.	EDB/SLSI/ Spice Council/ SAPPTA	● ●
Low cost production of Indian essential oils undercuts Sri Lankan oil extracts	- Encourage setting up of oil extraction units at commercial scale close to the cultivation area by encouraging export-oriented foreign direct investment into the sector given that local utilization of LB is low and majority of LB is exported to India	DEA/BOI	● ●
	- Allow import of pepper imports for re-export purposes in value added forms	DEA/BOI	●
Inadequate testing capabilities of local laboratories to meet emerging stringent requirements	- Invest in advanced testing equipment, which can detect lower limits of pesticides, aflatoxins, ochratoxins, etc. to be able to export to more developed markets	ITI/SLSI	● ●
Lack of market research at the international level	- Conduct market research to identify new markets and expand existing markets	EDB	●

8.2.3 Cardamom Value Chain in Sri Lanka

PRODUCER LEVEL			
Constraints	Recommendations	Responsible Institute	Timeline
Legislative restrictions (eg: Knuckles Range and Sinharaja forest)	Expand cardamom cultivations to non- traditional areas and intercropping with perennial cropping systems and forest plantations	MPI/DEA	●
	Introduction of improved curing techniques that uses alternative fuel sources	MPI/DEA	●
	Investment on R&D on, • environmental friendly cultivation practices • producing new varieties suited for different elevations and shade levels	MPI/DEA	● ● ●
	Investments on R&D focusing on high yielding varieties suited for different elevations and shade levels	MPI/DEA	● ● ●
	Explore the possibilities of providing provisions in national policies for cardamom cultivation (Demarcation of areas)	MPI	● ● ●
Low productivity	Investments on R&D focusing on • high yielding varieties suited for different elevations and shade levels • crop management techniques suited for different elevations and shade levels	MPI/DEA	● ● ●
	Improving the capacity of public extension services especially on GAP and modern techniques	MPI/DEA	● ●
	Providing incentives for the producers to adapt GAP and modern irrigation practices (Eg: Drip)	MPI/DEA	●
	Promoting bee keeping practices in cardamom growing areas to increase the pollination	MPI/DEA	●
Low and inconsistent quality of products	Improving the capacity of public extension services especially on GAP and modern techniques	MPI/DEA	● ●
	Introduce mandatory quality and safety standards and implement throughout the cardamom value chain	MPI/DEA/ITI/ SLSI/ SAPPTA/ Spice Council	● ●
	Integrating small holders with dynamic value chains by promoting out grower schemes	MPI/DEA/Spice Council/ SAPPTA	●
	Introduction of improved curing techniques instead of sun drying and other unhygienic tradition drying practices	MPI/DEA/ITI	●
High Cost of Production due to high labour cost	Investments on R&D on • high yielding varieties • low cost production techniques	MPI/DEA	● ● ●
	Introduce mechanization by providing pit makers, weed cutters, graders/sieves, etc at a subsidized cost	MPI/DEA/ITI	●

Constraints	Recommendations	Responsible Institute	Timeline
Climate change (drought)	Introducing low cost and convenient rainwater harvesting for irrigation purpose (eg: excavated storage tanks lined with UV resistant polythene tarpaulin used in India).	MPI/DEA/ITI	● ● ●
	Developing perennial water resources in cardamom plantations by constructing water storage devices like farm ponds and wells	MPI/DEA	● ●
	Provision of small irrigation pumps sets, sprinkler sets and gravity irrigation equipment at subsidized costs	MPI/DEA/ITI	●
	Introducing soil water conservation methods	MPI/DEA	●
Pest and disease attacks : Thrips, shoot and capsule borer, wild animals	Improving the capacity of public extension services to ensure adoption of recommended controlling methods and GAPs by farmers	MPI/DEA	● ●
	Investment on R&D on developing pest and diseases resistant varieties	MPI/DEA	● ● ●
Lack of bargaining power & fair price	Introduction of cardamom specific farmers' groups in major production pockets	MPI/DEA/ SAPPTA	●
	Provision of appropriate storage, drying facilities and market information	MPI/DEA/ Spice Council/ SAPPTA	● ●
	Establishing centralized collecting points	MPI/DEA	●
	Integrating small holders with dynamic value chains by promoting out grower schemes	MPI/DEA/Spice Council/ SAPPTA	●
Labour shortage	Establish job recognition and job security	MPI/DEA	● ● ●
	Introduce mechanization by providing pit makers, weed cutters, graders/sieves, etc at a subsidized cost	MPI/DEA	●
Low infrastructure facilities	Establishing infrastructures (Road, electricity) in cardamom growing areas	Local Government	● ●

INTERMEDIARY LEVEL			
Constraints	Recommendations	Responsible Institute	Timeline
Low supply volume	Increase the productivity of farmers	MPI/DEA	●
	Expand cardamom cultivations to non- traditional areas and intercropping with perennial cropping systems and forest plantations	MPI/DEA	●
	Establishing centralized collecting and processing centres	MPI/DEA/ SAPPTA	●
Low quality of products	Improving the capacity of public extension services especially on GMP and modern techniques	MPI/DEA/ SLSI/ ITI	● ●
	Introduce mandatory quality and safety standards and implement throughout the cardamom value chain	MPI/DEA/ITI/SLSI/ SAPPTA/ Spice Council	● ●
	Improving the linkage of the intermediaries with the producers and processors/exporters	MPI/DEA/ SAPPTA/ Spice Council	●
	Introduction of improved curing techniques instead of sun drying and other unhygienic tradition drying practices	MPI/DEA/ SAPPTA	●
	Promote knowledge and skill on the postharvest technology of cardamom including storage and transport	MPI/DEA/ SAPPTA	● ●
	Establish centralized collecting and processing centres	MPI/DEA/ SAPPTA	●
Smuggled low cost Indian products in the market	Introduce new legislations to prevent smuggling	MPI/DEA	●
Poor access to credit and government subsidy schemes for technological development	Introduce micro-credit schemes with the state and private banks and other financial institutions	MPI/DEA	●
Week linkage with the large buyers and exporters	Increased access of local traders to large buyers and Explore market opportunities for cardamom at international level	MPI/DEA/ EDB	●
	Increasing awareness on value additions for international market	MPI/DEA/ITI/ Spice Council	●
Low infrastructure facilities	Establishing infrastructures (Road, electricity) in cardamom growing areas	Local Government	● ●

PROCESSOR/EXPORTER LEVEL			
Constraints	Recommendations	Responsible Institute	Timeline
Low supply volume	Increase the productivity of farmers	MPI/DEA	●
	Expand cardamom cultivations to non- traditional areas and intercropping with perennial cropping systems and forest plantations	MPI/DEA	●
	Establishing centralized collecting and processing centres	MPI/DEA/ SAPPTA/ Spice Council	●
	Integrating small holders with dynamic value chains by promoting out grower schemes	MPI/DEA/ Spice Council	●
Low quality of products	Introduce mandatory quality and safety standards and implement throughout the cardamom value chain	MPI/DEA/ITI/SLSI/ SAPPTA/ Spice Council	● ●
	Improving the direct linkage with the producers and processors/exporters (more backward integration)	MPI/DEA/ Spice Council	●
	Establish centralized collecting and processing centres	MPI/DEA/ SAPPTA/ Spice Council	●
	Introduce new legislations to prevent smuggling of low quality Indian goods	MPI	●
High market concentration towards low end markets such as India and Middle East	Exploring the market potential in high end markets such as USA, UK, European Union (increased market research) and Australia and conduct promotional activities for Sri Lankan cardamom in such markets	EDB	● ●
	Promote value added exports such as oil and oleoresins rather than bulk exports	EDB/ITI	● ● ●
Lack of value addition, product development and modern technology	Investments on demand driven research on value added product and technology development and link the research institutes with the industry in order to disseminate research outcomes	MPI/DEA/ ITI	● ● ●
	Encourage own research by private companies	Spice Council	● ● ●
	Increasing awareness on value additions among the processors and exporters for international markets	EDB/ Spice Council	●
High capital cost for value additions (Sophisticated machines, laboratory equipment and skill labor)	Promote low cost technologies for value added cardamom products	ITI	● ● ●
	Access of entrepreneurs to concessionary credits	BOI	●


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ANNEX 1: QUESTIONNAIRE GUIDE - EXPORTERS

Section1: Business & the Products

1. Number of employees?
2. How long have you been in the business?
3. What are your main functions and activities?
4. What do you sell and types of products do you sell? (bulk/raw, value added, etc)
5. Are you involved in any other business activities (vertical and horizontal integration)?
6. What are your main costs factors/inputs (e.g. shipment, customs, labour, raw materials etc.)?
7. What is the potential for value addition in your industry?
8. What prevents you in adding value to products?
9. What are the most serious challenges for your enterprise/industry?

Section 2: Clients/Buyers

10. What are your main markets (local/international)? How important are local/international sales (percentages)?
11. Who are your main clients (buyers)?
12. How many principal clients do you have?
13. What are your client's main requirements?
14. How do you learn about your clients preferences? (probes: order quantities, standards, quality requirements, delivery dates)
15. Have you noticed any changes in preferences over time? (i.e., trends)
16. How would you characterize your relationships with your principal clients? (probes: independent, close, collaborative, difficult, lots of information passes between you, client is in charge, they direct you, level of trust)
17. How has your relationship changed with them over time?
18. Does your firm receive any assistance/help or collaboration from your clients? (probes: Advances, credit, information, inputs, technical assistance, recommendations)
19. What are the steps you usually take to ensure that you meet your clients' specifications, including delivery date and quality? (Is it difficult to comply with your clients' requirements? What do you have to do?)
20. Do you share information with other exporters? If so, what kind of information and why? (probes: to meet large contracts, set prices, legal issues, etc.)

Section 3: Suppliers/Producers

21. What are all the ways you source the product?
22. Who are your main suppliers?
23. Do you buy your product from individual producers, associations (groups) of producers or intermediaries?
24. How many producers do you work with?
25. If you have different types of suppliers, how would you characterize the differences between each type of supplier? (What are the characteristics of each type of supplier?
26. How do you communicate information to your suppliers regarding your requirements in terms of quality of produce, size, chemical use, delivery dates, etc.?
27. How do you demand that your suppliers meet the requirements?
28. What difficulties do your suppliers have in meeting your demands? Do you help them? How?
29. What changes would you like your suppliers to make? (potential investments)
30. Have you communicated your wishes to them? How do they respond? What can you do to facilitate or demand these changes?

31. How do you work with producers to ensure that they satisfy your requirements for quality? What do you do to encourage them? What pressures do you apply?
32. Do you think available suppliers are capable enough for satisfying current demand? (demand supply mismatch)
33. Do you see any potential of productivity improvements of existing stock of crops?

Section 4: Standards

34. Do you grade products according to quality? If yes, what are these grades? And what are the selection criteria?
35. What are the existing international/national standards and regulations affecting your business? (e.g. ISO norms, GAP, GMP, quality standards and laws, etc.)
36. Are they mandatory/voluntary? For which markets?
37. Where do you obtain information with regard to standards?
38. What specific problems did you experience in complying with them?
39. Have any spice exports been rejected/returned due to non-compliance with standards? How frequently does it happen?
40. Who tests/audits/certifies the standards? How frequently?
41. What are the advantages/disadvantages in complying with standards?

Section 5: Environmental Sustainability & Social Aspects

42. Have you noticed any changes in the natural resources as a result of production of different spices? (Probes: damages to bio-diversity, soil quality depletion, soil erosion, landslides, etc.)
43. Do you see any social concern (ethno religious, caste, etc.) that affects the performance of the value chain?

Section 6: Competition

44. Who are your main competitors on the world market?
45. What strategies that you employ to make your product different from that of competitors?
46. What is the local competitive advantage of products from Sri Lanka?

Section 7: Business Environment & Supporting Services

47. Are there any government policies that are helpful to your business? Are there any policies that you would like to see changed? What changes would be helpful?
48. With regard to the legal and regulatory framework, have you experienced any difficulties to grow your business? If yes, what were these difficulties?
49. What kind of services does the (local) government provide to exporters? Are these services up-to date and useful?
50. Are you member of any business association? If yes, are you satisfied with the services that you receive?

Section 8: To Finish Up

51. Do you have additional observations or comments that we have not discussed?
52. Thank you for your time. Are there other players in this value chain that you think we should talk to? Could you give me referrals?

ANNEX 2:
QUESTIONNAIRE GUIDE - COLLECTORS/ INTERMEDIARIES

Section 1: Background

1. How long have you been in the industry?
2. What is the main activity that you perform? (probes: cultivation, harvest, collect, storage, transport)
3. Are you involved in any activities other than collecting/trading?
4. Is collection/trading the main source of income?
5. Do you own land? If yes, how much of land do you own and what crops do you cultivate? Main crop and other crops? Mono/mixed cultivation?

Section 2: Relationship with Clients/Buyers

6. What are the main products that you sell?
7. Where and whom do you sell your product probes: exporters, intermediary, broker, shop/store, association, etc.)
8. To which type of buyer do you currently sell the most of your product and why (probe: larger volume of sales, higher prices, fewer risks, repeat sales, faster payment, more trust, more assistance, etc)? Benefits and challenges?
9. What are your buyer's main requirements? (Probes: quality, price, reliability, standards, etc.)?
10. How do you learn about your buyer's preferences? (probes: order quantities, standards, quality requirements, delivery dates)
11. Have you noticed any changes in preferences overtime? (i.e. trends)
12. Do you have a contract/agreement with your clients/buyers? What do these contracts/agreements specify?
13. Do you receive any assistance/help or collaboration from your clients/buyers? (probes: Advances, credit, information, inputs, technical assistance,)
14. What are the steps you usually take to ensure that you meet your client's specifications including delivery date and quality? Is it difficult to meet your client's requirements? What do you have to do?
15. Do your clients/buyers monitor your activities? If yes, how do they monitor?
16. Do you cooperate with other producers? If so, what kind what do you cooperate and why? (Probes: to meet large contracts, set prices, legal issues, etc.)

Section 3: Relationship with Suppliers

17. From which type of suppliers do you currently buy the most of your product?
18. What benefits and problems do you have with regard to different suppliers you work with (probe: quality, price, punctuality, Standards, volume, cost of collecting products, etc.)?
19. What kind of help do you provide to your suppliers (probe: inputs, seeds, credit, technical assistance, etc)?
20. Do you communicate information to your suppliers regarding your requirements (probes: quality of produce, size, chemical use, delivery dates, etc)?
21. What difficulties do your suppliers have in meeting your requirements?
22. What changes would you like your suppliers to make? (potential investments)
23. Do you see any potential productivity improvements of existing stocks of crops?

Section 4: Standards

24. Do you grade products according to quality? If yes, what are these grades? And what are the selection criteria?
25. What are the existing international/national standards and regulations affecting your business? (Probes: ISO norms, GAP, GMP, organic, fair trade, etc)?
26. Where do you obtain information with regard to standards?
27. What specific problems did you experience in complying with them?
28. Are any of the farmers you source from certified under various programmes (probes: ISO norms, GAP, GMP, organic, fair trade, etc)?

Section 5: Environmental Sustainability & Social Aspects

29. Have you noticed any changes in the natural resources as a result of production of different spices? (probes: damages to bio-diversity, soil quality depletion, soil erosion, landslides, etc.)

Section 6: Business Environment & Supporting Services

30. Are there any government policies/laws/regulations that are helpful to your business? Are there any of those that you would like to see changed? What changes would be helpful?
31. What kind of support/service do you receive? Who provides them (probe: government extension, NGOs, buyers, neigbours, etc)? Are these services useful?
32. Are you member of any business association? What are the activities do you do together? What are the benefits of being in the association? What are the common problems that you face? Are you satisfied with the services that you receive?

Section 7: To Finish Up

33. What are the most serious challenges facing you/industry?
34. Do you have additional observations or comments that we have not discussed?
35. Thank you for your time. Are there other players in this value chain that you think we should talk to? Could you give me referrals?

ANNEX 3:
FGD GUIDE - PRODUCERS

Section 1: Background

1. What are the crops that you cultivate? Main crop and other crops? Mono/mixed cultivation? How old are the vines /trees planted in your land?
2. Are you involved in any activities other than producing?
3. Is production the main source of income? If not what are the others sources?
4. What are the main activities that you perform? (probes: cultivation, harvest, collect, storage, transport)
5. Do you hire workers to work on the land? What are the problems/challenges that you face in hiring labour?
6. How did you learn about the way to grow the product (probes: when to plant it, how to plant it, how to control pests and diseases, when to harvest, etc?
7. What are the inputs that you use in cultivation?
8. What are the problems and challenges that you face in acquiring inputs?

Section 2: Relationship with Clients/Buyers

9. What are the main products that you sell?
10. Where and whom do you sell your product probes: exporters, intermediary, broker, shop/store, associations, etc.)
11. To which type of buyer do you currently sell the most of your product and why (benefits and problems with the buyers)?
12. What are your buyer's main requirements? (probes: quality, price, reliability, standards, etc.)?
13. How do you learn about your buyer's preferences? (probes: order quantities, standards, quality requirements, delivery dates)
14. Have you noticed any changes in preferences overtime? (i.e. trends)
15. Do you have a contract/agreement with your clients/buyers? What do these contracts/agreements specify?
16. Do you receive any assistance/help or collaboration from your clients/buyers? (probes: Advances, credit, information, inputs, technical assistance,)
17. What are the steps you usually take to ensure that you meet your client's specifications including delivery date and quality? Is it difficult to meet your client's requirements? What do you have to do?
18. Do your clients/buyers monitor your activities? If yes, how do they monitor?
19. Do you cooperate with other producers? If so, what kind what do you cooperate and why? (Probes: to meet large contracts, set prices, legal issues, etc.)

Section 3: Standards

20. Do you grade products according to quality? If yes, what are these grades? And what are the selection criteria?
21. Do you know about the existing international/national standards and regulations affecting your business? (probes: ISO norms, GAP, GMP, organic, fair trade, etc)?
22. Where do you obtain information with regard to standards?
23. What specific problems did you experience in complying with them?
24. Have you faced rejection of any of your supplies?
25. Are any of you certified under various programmes (probes: ISO norms, GAP, GMP, organic, fair trade, etc)?

Section 4: Environmental Sustainability & Social Aspects

26. Have you noticed any changes in the natural resources as a result of production of different spices? (probes: damages to bio-diversity, soil quality depletion, soil erosion, landslides, etc.)

Section 5: Business Environment & Supporting Services

27. Are there any government policies/laws/regulations that are helpful to your business? Are there any of those that you would like to see changed? What changes would be helpful?
28. What kind of support/service do you receive for your cultivation? Who provides them (probe: government extension, NGOs, buyers, neigbours, etc)? Are these services useful?
29. Are you member of any business association? What are the activities do you do together? What are the benefits of being in the association? What are the common problems that you face? Are you satisfied with the services that you receive?

Section 6: To Finish Up

30. What are the most serious challenges facing you/industry?
31. Do you have additional observations or comments that we have not discussed?
32. Thank you for your time. Are there other players in this value chain that you think we should talk to? Could you give me referrals?

ANNEX 4:
QUESTIONNAIRE GUIDE - PRIVATE ASSOCIATIONS/ GOVERNMENT INSTITUTIONS

1. Section 1: Background

1. How long has the association/institution been in existence?
2. What are the major objectives of the association/institution?
3. What are the main activities of the association/institution? What are the main benefits for its members/ stakeholders?
4. What is the potential for value addition in the industry ? What prevents from adding value to the products?
5. What are the most serious challenges for the industry?

Section 2: Relationship with members/beneficiaries

6. Who are your beneficiaries?
7. How do you communicate information with your members/beneficiaries?
8. How would you characterize your relationship with your members/beneficiaries?
9. Do you monitor your member/beneficiaries activities?
10. Do you provide any assistance to your members/beneficiaries?

Section 3: Standards

11. Does the industry grade products according to quality? If yes, what are these grades? And what are the selection criteria?
12. What are the existing international/national standards and regulations affecting your business? (Probes: ISO norms, GAP, GMP, organic, fair trade, etc)?
13. How do you inform about the standards
14. What are the advantages and disadvantages with standards?

Section 4: Environmental Sustainability & Social Aspects

15. Have you noticed any changes in the natural resources as a result of production of different spices? (Probes: damages to bio-diversity, soil quality depletion, soil erosion, landslides, etc.)

Section 5: Business Environment & Supporting Services

16. Are there any government policies/laws/regulations that are helpful to your business? Are there any of those that you would like to see changed? What changes would be helpful?

Section 6: To Finish Up

17. Do you have additional observations or comments that we have not discussed?
18. Thank you for your time. Are there other players in this value chain that you think we should talk to? Could you give me referrals?

ANNEX 5:
SURVEY OF PRODUCERS

Name:

Address:

Telephone Number:

1. How long have you been in the industry?

2. Do you own land? (Yes/ No)

3. If yes, how much of land do you own?

4. What crops do you cultivate?

5. How much pepper/cinnamon/cardamom do you produce (kg/year)?

6. How much do you spend for cultivation?

7. Do you hire people?

8. How much do you pay for a worker (daily or per quantity)?

9. Are you involved in any activities other than cultivation?

10. Is cultivation the main source of income? (Yes/ No)

11. How much do you earn monthly?
1) Less than Rs. 10,000
2) Rs. 10.001 – Rs. 20,000
3) Rs. 20,001 – Rs. 30,000
4) Rs. 30,001 – Rs. 40,000
5) Rs. 40,001 – Rs. 50,000
6) More than Rs. 50,000

12. To whom do you sell your products?
1) Exporters
2) Collectors
3) Shop/ boutique
4) Company
5) Others (please specify)

13. What are your buyer's main requirements?
1) Quality
2) Security
3) Price
4) Reliability of supply
5) Others (please specify)

14. Is it difficult to meet your buyers' requirements? (Yes/ No)

15. Do you receive any assistance/help or collaboration from your buyers? (Yes/ No)

16. What sort of assistance do your buyers provide?
1) Advance
2) Credit
3) Information
4) Input
5) Technology
6) Others (please specify)

17. What are the inputs used?

18. Inputs are supplied by,
1) Government
2) Exporters
3) Collectors
4) Shop/ boutique
5) Company
6) Others (please specify)

19. Is it difficult to comply with standards? (Yes/ No)

20. Do you gain any assistance to comply with standards? (Yes/ No)

21. Who provides the assistance regarding standards?
1) Government
2) Non Government Organizations
3) Buyers
4) Neighbors
5) Others (please specify)

22. Is the assistance helpful? (Yes/ No)

23. Do you expect more assistance to improve quality/ security of the product? (Yes/ No)


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