Democratic Socialist Republic of Sri Lanka
Data Collection Survey
on
Agricultural Distribution Network and Marketing

Final Report

March 2013

Japan International Cooperation Agency
System Science Consultants Inc.

Executive Summary

1. Background of the survey

The economy of Sri Lanka is rapidly growing in recent years. The annual GDP real growth rate in 2010s is higher than 8%, and the per capita GDP reached to USD 2,836 in 2011.

The GDP growth rates by sector (2003-2011) showed that the growth rate of agricultural sector remains at 4.4%, which is significantly lower than the industry (9.3%) and service sector (8.5%). Therefore, the share of GDP by agricultural sector has shrunk from 13.7% (2003) to 11.2% (2011).

However, the agricultural sector is still the important industry, which employs 33% (2011) of labour force in the country and is also an essential industry in the rural area. Since the gap of income between the urban area and rural area is expanding recently, it is necessary to increase the income in the rural area through the improvement of the productivity of agricultural sector. After the achievement of the self-efficiency of rice, the government is promoting the activities to expand the production of the other crops.

While the efforts are being made to expand production are made, the improvement of "marketing of agricultural products" has become important because of diverse problems such as high post-harvest loss, complicated marketing system and miss matching of demand and supply. However, specific approaches to solve the problems of marketing are yet to be implemented.

This survey was conducted in this context to find the bottlenecks in the marketing and distribution network of agricultural products in Sri Lanka and to identify priority areas for future supports through the data analysis on present status.

2. Outline of the survey

Purpose of the survey	Data analysis on present status and finding the bottlenecks in the marketing and distribution of agricultural products to identify priority areas for future supports
Target area	Entire country
Period of survey	July 2012 – March 2013 (Period of survey in Sri Lanka: July 2012- February 2013)
Method of survey	・Desk review of existing data, documents and reports ・Discussions and interview with officials of relevant ministries/ organizations ・Sub-contracted survey - Marketing flow and value-chain survey（n=693） - DEC infrastructure survey（n=12） - Survey of inflow and outflow of vehicles and handling volume (Dambulla DEC and Thambuththegama DEC) - Traders survey (n=439) - Tracing survey (n=20)

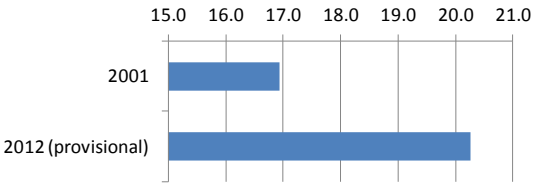
3. Result of the survey

(1) Current situation of marketing of agricultural products

1) Changes of trend in food consumption

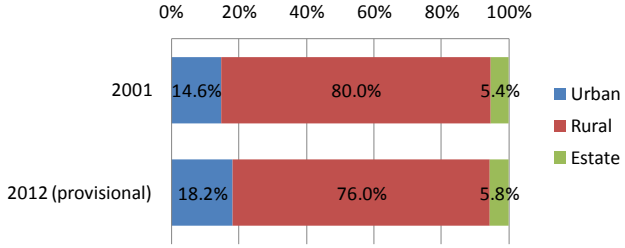
The population of Sri Lanka has increased from 16.9 million in 2001 to 20.3 million in 2012 (Figure 1). During the same period, urban population has expanded from 14.6% to 18.2% (Figure 2).

With the progress of urbanization and increase of income, food preferences by consumers have been changing. The demand for foods with rich nourishment and high calorie content has increased recently. This tendency is specifically clear and distinct in the capital city of Colombo, where the expenditures on prepared food, milk & milk food, meat, fruits, fish and vegetables are significantly higher than the national average (Figure 3). In accordance with the change of demand, imports of agricultural products have also increased. It is presumed that the competition between domestic products and imported products would become more severe in the future.



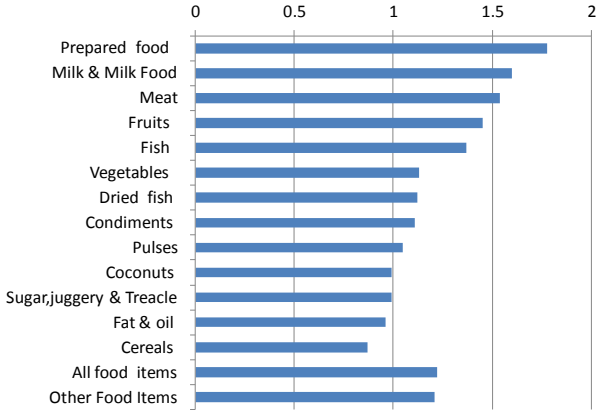
Source: Census of population and housing, Department of census and statistics

Figure 1 Census of population (million) in 2001 and 2012



Source: Census of population and housing, Department of census and statistics

Figure 2 Composition of population by sector in 2001 and 2012



Source: "Household income and expenditure survey 2009/10", Department of census and statistics

Figure 3 Average monthly household expenditure in Colombo (National average=1)

2) Changes of supply side players

In accordance with the change of the demand side, the response of supply side is also changing. The supermarket chains, which have increased the numbers of retail stores in the urban area in recent years, are able to curtail the cost through the direct purchasing of agricultural products from farmers. Other business model is the agri-business companies, which manages a series of stages from production, processing to retailing/ exporting. Those new business models have mechanisms to control the quality of agricultural products at collection centres and are able to curtail time loss from collection to retailing of agricultural products. They use plastic containers or cardboard boxes to transport agricultural products to reduce damage of products to the minimum possible extent (Photo 1: Efforts made by the supermarket chains and agri-business companies to maintain quality of agricultural products).

On the contrary, the conventional marketing flow through Dedicated Economic Centres (DEC) or other wholesale markets do not have mechanisms to control the quality of agricultural products. Sometimes unmarketable and/or low-quality products are transacted which are mixed with marketable products. However, all players in this channel are not making attempts to improve the quality of products they handle. Some producers and collectors hide rotten or immature products intentionally in the centre part of sacs in which the commodities are packed. Even commission agents are least concerned about the maintenance of the quality. Commodities are sold in the sacks, which are over-packed and piled up in the back of the tracks for transportation. These sacks of commodities are handled without much care. At DECs or other wholesale markets, some traders or their helpers throw, step on and take rest on the sacks which are full of commodities (Photo2 : Awareness of maintenance of quality at DECs and other wholesale markets). Although the government of Sri Lanka recommends the use of plastic containers for the transportation of commodities, traders are reluctant to replace plastic bags or nets into plastic crates because they are of the view that, it would lead to the increasing of transportation costs.

In addition, the higher margins accruing to the numerous intermediaries in marketing chain result in lower producer's price and higher retail price. The tracer survey which was conducted as a part of the main Survey, and which targeted 10 items of agricultural products, revealed that the shares of producer's price to the retail price were in the range of 31-73%. The example of the value chain of brinjals shown in Figure 4 indicates that the share of producer's price to the retail price was 39%, while the cumulative margins of the intermediaries at the 4 successive stages of the marketing chain were 41% in total and the margins of the retailer alone was 20%. The accumulated time loss caused by the handling of the commodities by numerous intermediaries results in the deterioration of the freshness of the products and lowering of the price.

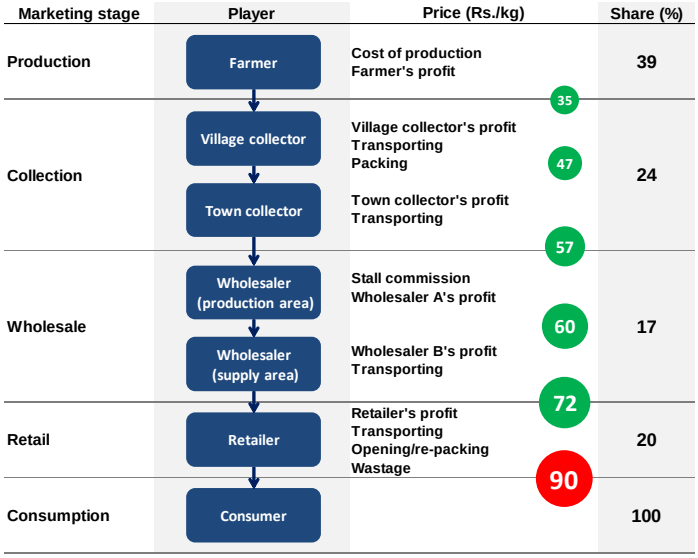
Photo1 : Efforts made by the supermarket chains and agri-business companies to maintain quality of agricultural products

	
Farmers who bring their products to the collection center are obliged to use plastic crate for transportation. (Cargills Collection Center, in Thambuththegama)	Plastic crates used for transportation at the collection center. (Cargills Collection Center, in Thambuththegama)
	
Papayas neatly stacked into the cardboard bags. (CIC Agri-business Ltd., Dambulla farm)	Cardboard boxes used for the transportation of bananas (CIC Agri-business Ltd., Dambulla farm).

Photo2 : Awareness of maintenance of quality at DEC and other wholesale markets

	
Vegetables maximally jammed into plastic or net bags. Plastic or net bags are commonly used as packing materials. (DEC Nuwaraeliya)	Sacks of vegetables marketed by farmers or collectors are usually not opened until the stage of retailing. Sometimes unmarketable products such as rotten or immature vegetables are secretly hidden inside of sacks. Lengthy supply chain hides responsibility of the loss. (Pettah-Manning market)

	
Sacks of cabbages loaded on to the back of a truck. (Dambulla DEC)	One of the traders taking a rest on the commodities. (Dambulla DEC)



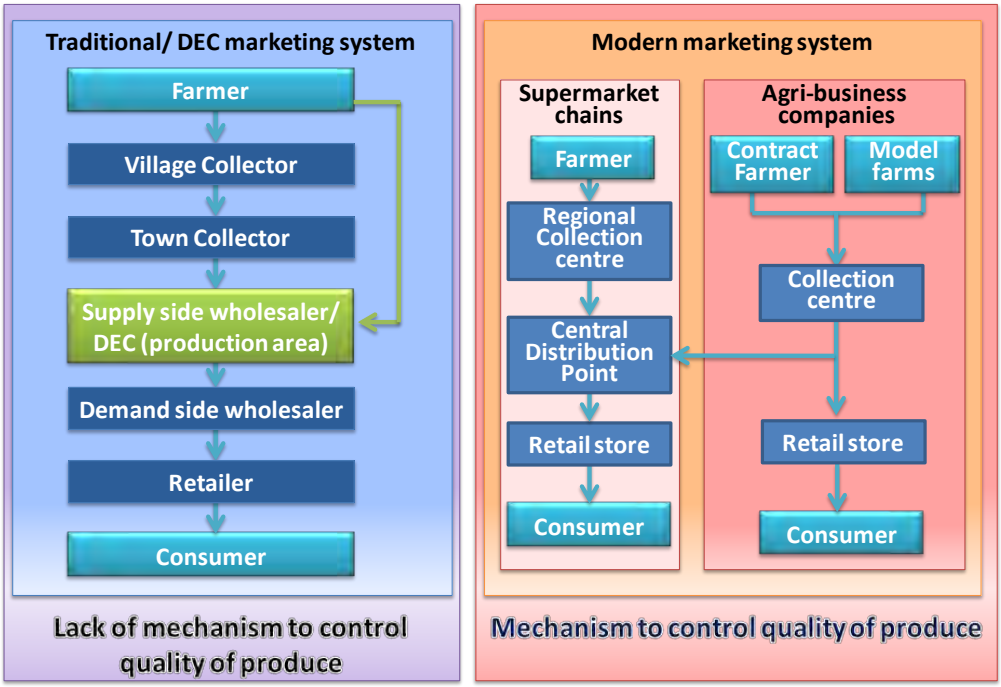
Source: Prepared by the Survey team

Figure 4 Example of a value chain in the marketing through DECs and other wholesale markets (brinjals)

3) Differences between the modern and the conventional marketing system

As shown in the previous section, there are numerous problems in the conventional marketing system of the agricultural products marketed through the DECs or other wholesale markets. However, it is the most common marketing channel for the transaction of agricultural products in Sri Lanka. In this survey, conventional marketing channel is called as "conventional marketing system". It is compared with the "modern marketing system", which is a streamlined supply chain run by the supermarket chains and agri-business companies. Each supply chain is shown in Figure 5[1]. First, it can be seen that the supply chain of "conventional marketing system" is long and there are 5 intermediaries between the farmers and consumers. In the contrary, the "modern marketing system" contains only 3 facilities (collection centre, distribution centre and retail store) between the farmers and the consumers.

[1] The supply chain of "conventional marketing system" is a modeling pattern based on the Marketing flow survey. The supply chain of "modern marketing system" is drawn based on the interviews held with Cargilles (the largest super-market chain) and the CIC (the largest agri-business company).



Source: Prepared by the Survey team

Figure 5 Supply chains of "modern marketing system" and "conventional marketing system"

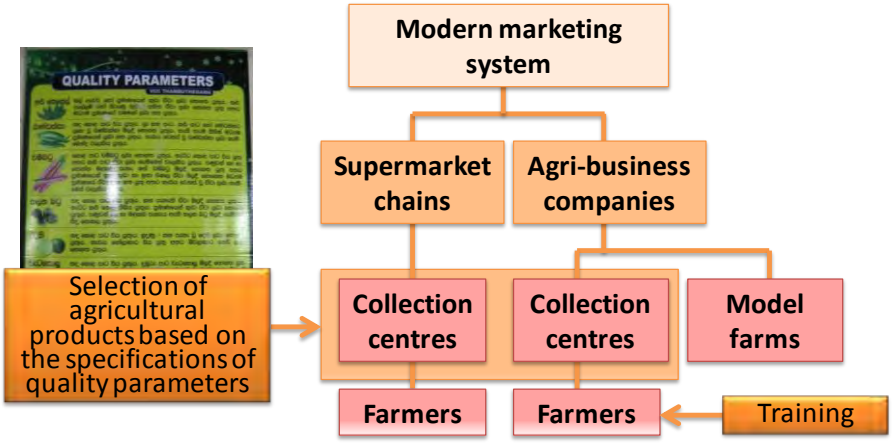
4) Mechanism of quality control by the modern marketing system

The crucial factors of the difference between the "modern marketing system" and the "conventional marketing system" are "with/without a quality control system" and "with/without a mechanism to feedback consumers' needs". In the "modern marketing system", the collection centres, where farmers bring their products, are functioning as a base of quality control and feedback of consumers' needs (Figure 6). The collection centres announce their needs of items and quantities of them on the day to the farmers who have business relationships with the supermarket. At the collection centres, agricultural products brought by farmers are selected based on the quality parameters specified by the headquarters. Farmers should bring back the products which do not meet the standard. Through this selection process, farmers bring about the better understanding of "quality requirement by the consumers". At each collection center, agiricultural officers are assigned and they provide training for the quality improvement of products in response to the request by farmers. Farmers are obliged to use plastic crates to bring their products into the collection centres. The selection criteria specified by the supermarket chains are relatively strict but farmers are able to obtain the higher price from them than collectors because supermarket chains pay the same amount as the wholesale price of the day in cash.

Also, in the "modern marketing system", plastic crates or cardboard boxes are used for the transportation of commodities to maintain the quality of agricultural products from the collection centres to the distribution centres.

As shown above, "modern marketing system" controls the quality of commodities at collection centres and they have a mechanism to feedback consumers' needs to producers. On the contrary, "conventional marketing system" does not have a system to control the quality of products or to

feedback consumers' needs to producers because there is no mechanism to convey the information through the entire chain. This is the crucial factor that makes the difference of the quality of the commodities between the conventional system and the modern system.



Source: Prepared by the Survey team

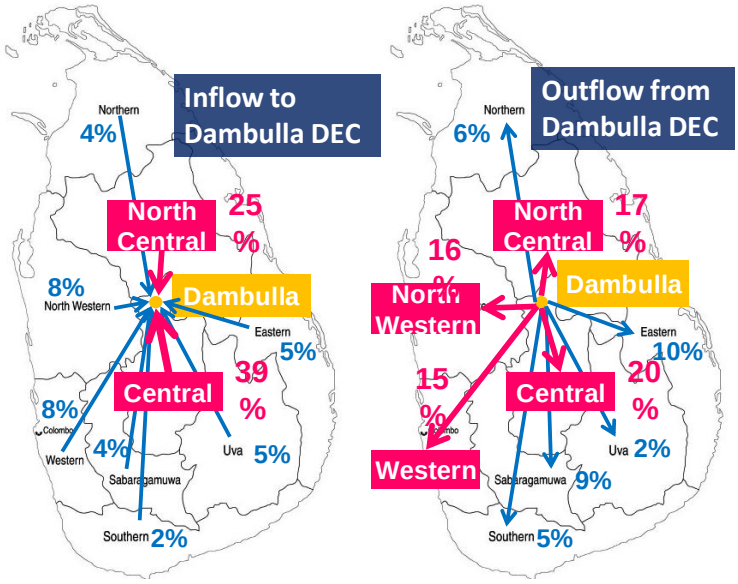
Figure 6 Mechanism of quality control in the modern agricultural marketing system

(2) Bottlenecks in agricultural marketing

As shown by the results of the marketing flow survey and the value-chain survey, it was found out that there are numerous players in the supply chain and each player add their margins to the price. As a result, the profits of the producers are kept low.

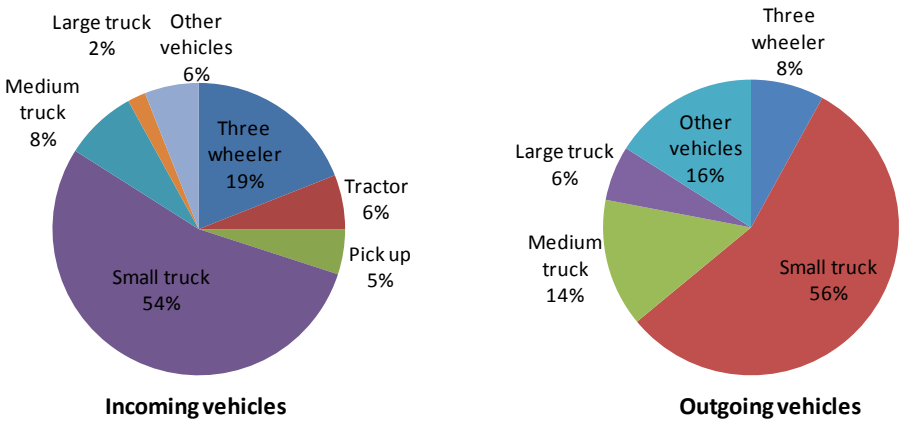
Other findings of DECs based on the trader's survey at DECs were that the DEC is the important hub for the marketing of agricultural products because it was estimated that around 38% of the domestic agricultural products was transacted through the DECs in the nation. It was also found that Dambulla DEC operates as a transhipment market because a sizeable quantity of domestic agricultural products flow into the Dambulla DEC from all over the country and they are distributed nationwide again from Dambulla (Figure 7). Also, it was found that the majority of vehicles used for the transportation of agricultural products to/from Dambulla DEC were small sized. In the case of incoming vehicles, 84% of them were of small size because there were many small scale producers. However, in the case of outgoing vehicles, still 64% of them were small sized ones. It is assumed therefore that the efficiency of transportation is significantly low (Figure 8).

Furthermore, based on the analysis of the wholesale prices of agricultural products, it was found that there were large price fluctuations (Figure 9) and sometimes producer's prices remained lower than the production costs.



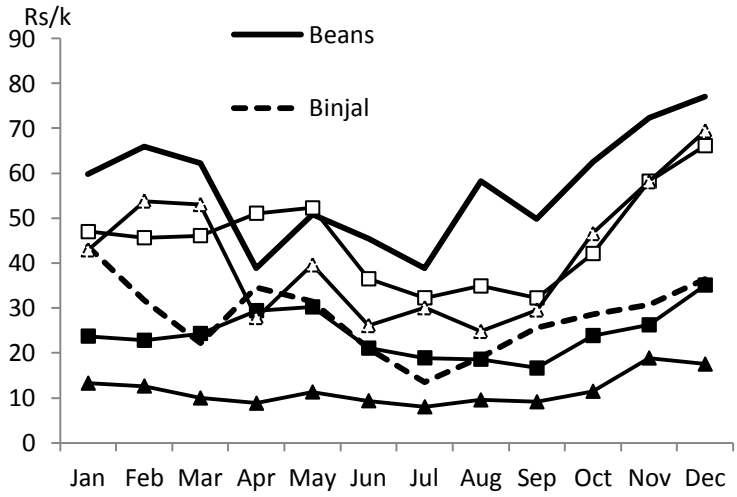
Source: Marketing flow and value-chain survey 2012

Figure 7 Origin and destination of commodities at Dambulla DEC



Source: Marketing flow and value-chain survey 2012

Figure 8 Type of incoming and outgoing vehicles at Damulla DEC



Source: Prepared by the Survey team based on the data from MoCIT

Figure 9 Monthly wholesale price fluctuation of selected crops at Keppetipola DEC (average between Jan. 2007-Dec. 2011)

1) Bottlenecks in marketing of agricultural products and resulting issues

As summarized in the previous section, while supermarkets and agribusiness companies with a "modernized marketing system" are boosting their efforts toward quality control and increasing their presence in marketing based on the changes in the demand side for agricultural products, under the "conventional marketing system" through DECs and wholesale markets, awareness of quality control and consumer needs are low and there is a failure to respond adequately to the market changes.

This survey, therefore, focused on the "conventional marketing system" which accounts for much of the agricultural marketing in Sri Lanka, and identified the bottlenecks when considering revitalization of the system. Figure 10 summarizes the bottlenecks in the conventional marketing system and the issues arising from them, and shows the relationship with the present situation that has resulted.

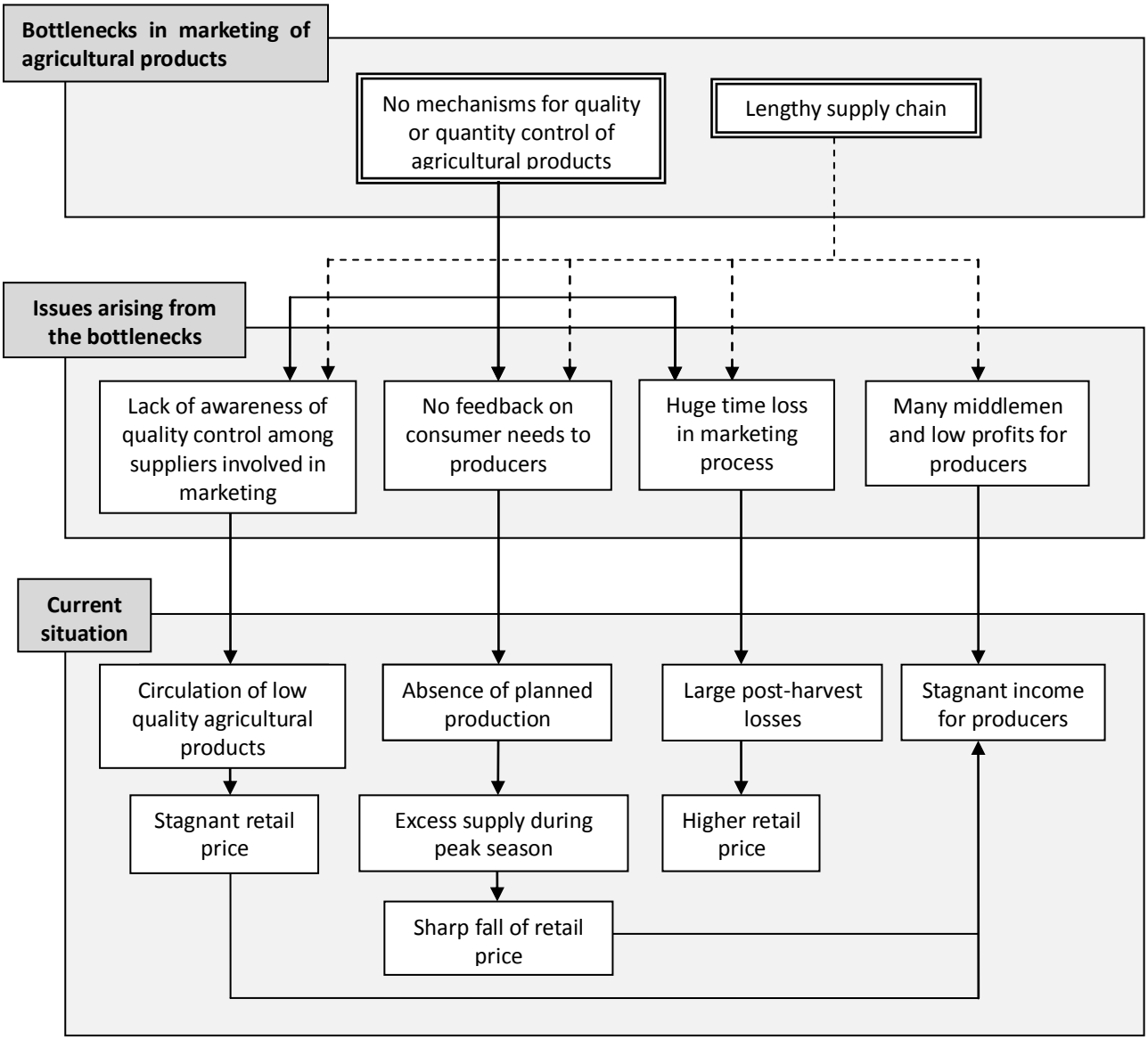


Figure 10 Bottlenecks in conventional marketing system and resulting issues

2) Bottlenecks in conventional marketing system

As shown in Figure 5, under the conventional marketing system, sometimes as many as five players

stand between the producer and the consumer, forming a long supply chain. The results are problems of huge time loss in the marketing process, involvement of many middlemen in the marketing chain and little profit for the producers. In addition, a system has been created in which each player's role in the supply chain ends by "passing the agricultural products on to the next player," so no responsibility is borne for the quality of the products further along the supply chain. With regard to the quantity and varieties of agricultural products, the farmers produce without any grasp of the needs of the consumers, so sometimes profits fall below production costs when prices collapse as a result of excess supply.

Based on the situation described above, in this survey the bottlenecks in the conventional marketing system and the resulting issues and present status are summarized as shown in Table 2.

Table 1 Bottlenecks and issues

Bottlenecks in conventional marketing system	Issues arising from bottlenecks	Present status
・No mechanisms for quality or quantity control of agricultural products	・Lack of awareness of quality control among suppliers involved in marketing	Under the conventional marketing system, many players intervene as shown in Fig. V-2, but none of the players bears any responsibility for the quality of the agricultural products and there is an absence of any player who serves as a base for quality control. For this reason, low quality agricultural products are in wide circulation under the conventional marketing system and prices are accordingly low. This results in stagnant incomes for the producers.
	・No feedback on consumer needs to producers	As there are no mechanisms for grasping the quantities or varieties required on the demand side or for feedback to the producers, the producers cannot engage in planned production. For this reason, excess supply occurs during peak periods, causing prices to collapse and resulting in stagnation of producers' incomes.
・Long supply chain	・Huge time loss in the marketing process	Time loss arises in the marketing process due to the long supply chain and intervention by many players, causing post-harvest losses. This leads to higher retail prices as a result.
	・Many middlemen and low profits for producers	Middlemen margins are generated at each stage by the intervention of many players, depressing the profits of the producers while retail prices increase.

4. Measures to solve the issues

To solve these issues, "strengthening of the DECs to function as marketing hubs" is proposed in this survey. Concrete measures include assignment of marketing advisors, review of transportation routes and means from production areas to consumption areas, and development of marketing channels linking the DECs in the production areas and consumption areas and the producers. Figure 11 shows the measures to solve the problems, and the issues, current approach by relevant agencies and details

of countermeasures are shown in Table 3.

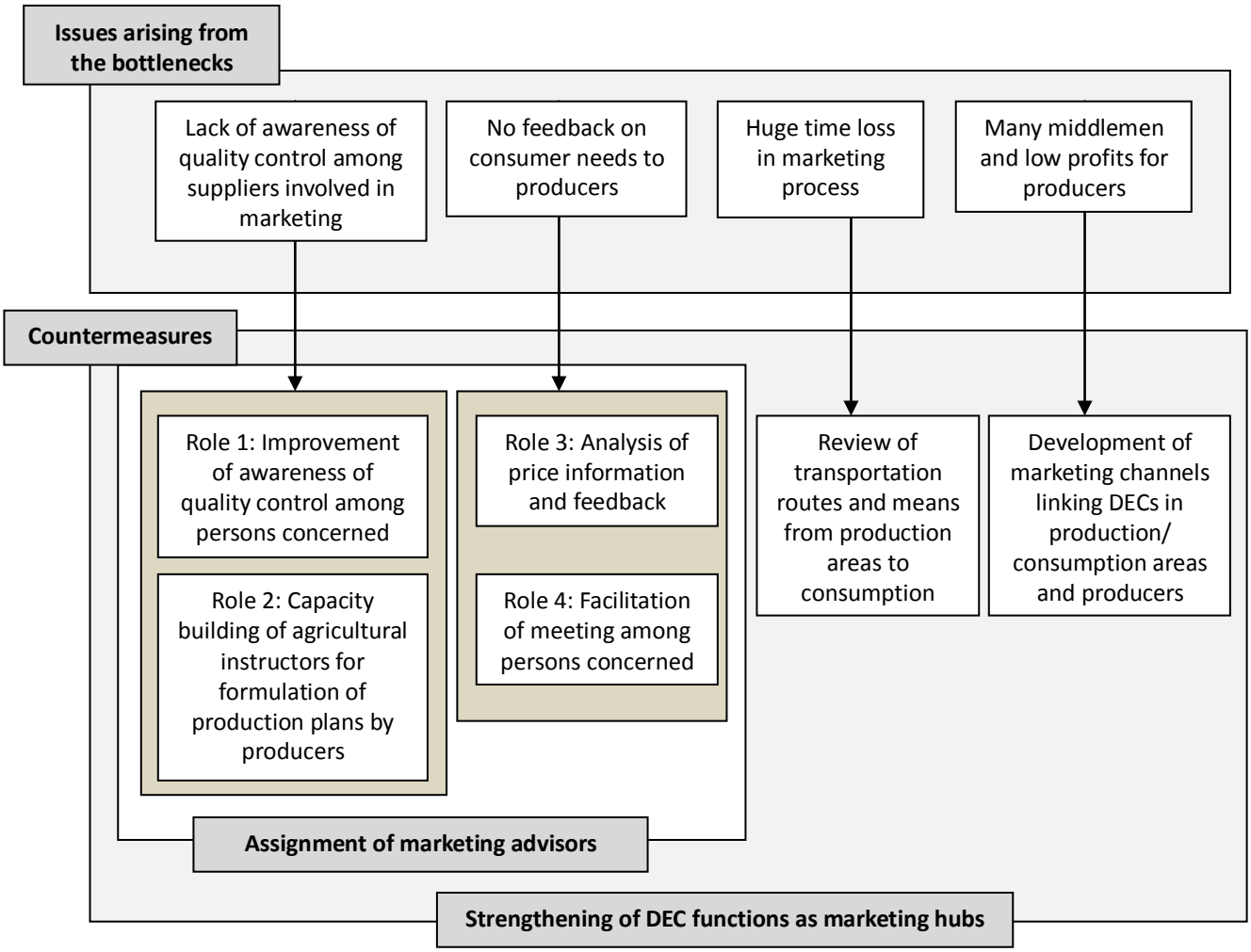


Figure 11 Countermeasures to solve the issues

Table 2 Issues, current approach by relevant agencies and countermeasures

Issues arising from bottlenecks	Current approach by relevant agencies	Agency concerned	Countermeasures	Details
Lack of awareness of quality control among players involved in marketing	Marketing activities by DECs entail individual traders conducting their own sales activities and there is no marketing policy for the entire DEC. In addition, DEC managers participate in regular meetings with management trust board members including trade union representatives, but no discussions are held or guidance is given relating to marketing policy.	MoCIT DECs	Assignment of marketing advisors (Role 1. Improvement of awareness of quality control among persons concerned)	A marketing advisor is assigned to each DEC and seminars are held for producers, traders and DEC managers.
	DoA agricultural instructors are the extension workers closest to the producers and a personal relationship with the producers has already been built through the regular meetings. As the instructors provide instruction in agricultural	DoA/ MOA DECs	Assignment of marketing advisors (Role 2. Capacity building of agricultural instructors for	Marketing advisors are assigned at division level, the marketing skills of the agricultural instructors who are the extension workers closest to the

	skills, they lack knowledge related to production plans or marketing, and instruction for producers in these fields is inadequate.		formulation of production plans by producers)	farmers are reinforced, and instruction is provided to farmers in drawing up production plans based on market trends.
No feedback of consumer needs to producers	DECs gather price information for each crop daily and this information is provided through mobile phone services, but no analysis is carried out of seasonal price fluctuations or long-term price trends for each crop. In addition, similar price information is collected and provided by HARTI, but it is not analyzed either.	MoCIT HARTI DECs	Assignment of marketing advisors (Role 3. Analysis of price information and feedback)	The wholesale price information collected by each DEC is analyzed by time series, information on seasonal fluctuations of each crop is organized, and feedback is provided to producers and traders.
	MoCIT calls DEC managers to irregular meetings, but discussions mainly focus on facility management duties, and marketing is not discussed. In addition, traders in the production and consumption areas trade by individual routes, and no introduction of DECs is attempted.	MoCIT DECs	Assignment of marketing advisors (Role 4. Facilitation of meetings among persons concerned)	The opportunity is provided for regular meetings between the persons concerned in the DECs in the consumption areas and DECs in the production areas, and feedback on consumer needs is provided.
Huge time loss in marketing process	MoCIT plans to increase the current 13 DECs to 16 DECS in 2013, including one DEC to be established for the first time in the north and one in the east. For efficient use of DECs, the entire marketing system including the new DECs needs to be reviewed, but MoCIT has not yet started this task.	MoCIT	Review of transportation routes and means from production areas to consumption areas	Distribution of functions from Dambulla DEC to other DECs is promoted and transportation routes are made more efficient.
				Transportation centered on small vehicles is reviewed and large vehicles are used efficiently.
Many middlemen and low profit for producers	No support for development of marketing channels by producers is provided by the DECs.	MoCIT DECs	Development of marketing channels linking DECs in production areas and consumption areas and producers	Producers are organized into groups to ensure shipping lots of a certain size and direct trading is promoted with DEC traders in the production and consumption areas instead of going through middlemen.

5. Coordination with relevant ministries

DECs are organizations under the jurisdiction of MoCIT, whose MoCIT initiatives are indispensable to address the "strengthening of DEC functions as marketing hubs." In addition, it is necessary to utilize the resources related to agricultural production and information systems in departments under

the jurisdiction of the MoA, and coordination with the agencies concerned is required.

In the explanations and discussions of the draft final report of this survey held on during February 21 - 22, 2013, with MoFP, NPD, MoA, MoED and MoCIT. In response to the "Assignment of marketing advisors" proposed by the Servey team, MoED and MoA explained about the plan for the development of information system of agricultural production and marketing. They pointed out that the plan included the development of computer network system connecting all Agrarian Service Centers (ASC) and assignment of computer operators to all ASC[2]. A synergistic effect is anticipated by linking the above-mentioned measures by the Survey team and with the plan of information system.

[2] This proposed plan by MoA is under deliberation at MoED as of February 2013.

Table of Contents

Executive Summary
Table of Contents
List of Tables
List of Figures
Abbreviations and Local Terms

I. INTRODUCTION 1
1.1 Background of the Survey 1
1.2 Objective and outputs of the Survey 2
1.3 Methodology of the Survey 3

II. NATIONAL SOCIO-ECONOMY 4
2.1 Socio- economic conditions of Sri Lanka 4
2.1.1 Population growth 4
2.1.2 Economic growth 4
2.1.3 Population by province 5
2.1.4 Income and expenditure 5
2.1.5 Land use 8
2.2 Agriculture in Sri Lanka 9
2.2.1 Agricultural policy 9
2.2.2 Agricultural production 11
2.2.3 Post harvest losses of vegebales and fruits 21
2.2.4 Export and import of agro-products 22

III. POLICIES AND PRESENT CONDITIONS RELATED TO AGRICULTURAL MARKETING 26
3.1 National agricultural marketing policies 26
3.2 Relevant ministries and their intervention in agricultural marketing 27
3.3 Players and roles and functions 28
3.4 Agricultural marketing by crops, livestock and fisheries 29
3.4.1 Paddy 29
3.4.2 OFC/Vegetables/Fruits 31
3.4.3 Livestock products 33
3.4.4 Fishery products 33
3.5 Price fluctuations and pricing of agricultural produces (OFC, vegetables and fruits) 35
3.6 Producers and traders organizations/institutions 39
3.6.1 Farmers organizations 39
3.6.2 Cooperatives societies 39
3.6.3 Farmers companies and producer groups 40
3.6.4 Farmer managed societies for livestock development 41
3.7 Agricultural market information system 42
3.7.1 Price information system by MoCIT/DEC, HARTI 42
3.7.2 Information use by players 43
3.8 Institutions for agricultural marketing 44
3.8.1 Rules and regulations 44
3.8.2 Institutions for agricultural marketing 44
3.9 Marketing flow of supermarket chains and agri-business companies 46
3.9.1 Marketing flow of supermarket chains 46
3.9.2 Marketing system of the agri-business companies 49
3.10 Importance of DEC 50
3.10.1 Background of DECs 50
3.10.2 Management structure of DEC 53
3.10.3 Physical facilities of DECs 54
3.10.4 Outline of several DECs located in production areas 55
3.10.5 Outline of DEC 57
3.10.6 Future plan of DEC by MoCIT 58

IV. VALUE CHAIN ANALYSIS OF AGRICULTURAL COMMODITIES 60
4.1 Outline of the subcontracted value chain survey 60
4.1.1 Background 60
4.1.2 Methodology 60
4.1.3 Survey areas and scope of work 61
4.1.4 Sample size 64
4.2 Results of value chain survey 65
4.2.1 Paddy/rice 65
4.2.2 Value Chain of Other Field Crops 68
4.2.3 Value Chain of highland vegetables 71
4.2.4 Value Chain of lowland vegetables 75
4.2.5 Value Chain of fruits 79
4.2.6 Value Chain of fish 83
4.2.7 Value Chain of livestock 85
4.3 Origin and Destination (O/D) through DEC 90
4.3.1 O/D of products: Traded volume and commercial zone by each DEC 90
4.3.2 Major traded commodities at six DECs 93
4.3.3 Marketing flow ofagricultural products and vehicles 95
4.4 Tracing survey (OFC and vegetable/ fruits) 108
4.4.1 Results from the tracing survey 108
4.5 Tracing surveys of fish and livestock 119
4.5.1 Tracing of fish 119
4.5.2 Tracing of milk 121
4.5.3 Tracing of Poultry (Broiler) 122

V. SUMMARY OF ISSUES AND MEASURES FOR IMPROVEMENT OF AGRICULTURAL MARKETING SYSTEM 123
5.1 Summary of present status of agricultural marketing system 123
5.2 Difference between the “conventional marketing system” and the “modern marketing system” 123
5.3 Bottlenecks in marketing of agricultural products and resulting issues 125
5.3.1 Bottlenecks in conventional marketing system 127
5.3.2 Measures to solve the issues 128
5.3.3 Coordination with relevant agencies 130

Reference 131

APPENDICES:
1: Survey team members
2: List of interviewees
3: Organization chart of the government
4: Sector shares of Gross Domestic Product (GDP) 2002-2011
5: Chicken population by provinces 2003-2011
6: Egg production by province 1998-2007
7: Poultry breeder farms
8: Fishery harbours information and available facilities
9: Refrigeration facilities by harbours
10: Active ice plants and cold rooms – 2010
11: Cropping calendar
12: Breakdown of production cost per acre (only 2nd survey)
13: Minutes of wrap-up meeting
14: Minutes of meetings with relevant ministries

List of Tables

Table I-1 Share of GDP by industrial origin (1950-2010) ... 1
Table I-2 Share of labour force by industry (1990-2010) ... 1
Table I-3 Average monthly income per household ... 1
Table II-1 Population and annual population growth rate ... 4
Table II-2 GDP and annual GDP growth rate ... 4
Table II-3 Population by province ... 5
Table II-4 Mean household income (monthly average) by province 2009/10 ... 6
Table II-5 Average monthly household expenditure on major food items by province 2009/10 ... 7
Table II-6 Average monthly per capita consumption on major food items by province 2009/10 ... 7
Table II-7 Average monthly household expenditure on major food items by income group 2009/10 ... 8
Table II-8 Land use pattern 2002 ... 8
Table II-9 Production of crops 2001-2009 ... 12
Table II-10 Paddy production and rice availability in Sri Lanka ... 13
Table II-11 Production and average yield of selected other food crops in Sri Lanka ... 13
Table II-12 Production and average yield of vegetables ... 14
Table II-13 Production and average yield of fruits ... 15
Table II-14 Production of milk ... 16
Table II-15 Production and imports of milk & milk products 1998 – 2010 ... 16
Table II-16 Production of day old chicks, egg and chicken (1998-2010) ... 17
Table II-17 Number of animals slaughtered and the poultry population ... 18
Table II-18 Marine and inland fisheries and aquaculture production (1980-2011) ... 19
Table II-19 Marine fish production by maritime provinces (1983, 2005-2011) ... 20
Table II-20 Inland and aquaculture production by major sectors ... 20
Table II-21 Inland fish production by provinces (2009-2011) ... 21
Table II-22 Post harvest losses occurring in some economically important crops in Sri Lanka ... 21
Table II-23 Yield of selected crops of selected Asian countries (2010) ... 23
Table II-24 Export of vegetables and fruits ... 24
Table II-25 Import of OFC, vegetables and fruits (2001-2011) ... 25
Table II-26 Breakdown of import of selected agro-products (2001, 2005 and 2010) ... 25
Table III-1 Department/institutes and functions of relevant ministries in agricultural marketing ... 27
Table III-2 Activities of organizations under the relevant ministries ... 27
Table III-3 Monthly special commodity levies on OFCs in 2012 ... 32
Table III-4 Fish sales of CFC (2010) ... 34
Table III-5 Number and capacity of active cold rooms and ice plants in 2010 ... 34
Table III-6 Monthly wholesale price fluctuation of selected agricultural products at four different DECs (average between Jan. 2007 and Dec. 2011) ... 36
Table III-7 Daily wholesale fluctuation of selected agricultural products at Keppetipola DEC ... 37
Table III-8 Existing agriculture information system ... 42
Table III-9 Source of price information for the producers ... 43
Table III-10 QUALITY PARAMETERS Cargills Collection Centre – Thambuththegama ... 47
Table III-11 Outlines of major agri-business companies ... 49
Table III-12 Summary of present DECs ... 52
Table III-13 Plan of DEC by Ministry of Cooperatives and Internal Trade ... 59
Table IV-1 Value chain survey areas and scope of work ... 62
Table IV-2 Sample size of first stage survey ... 64
Table IV-3 Sample size of second stage survey ... 64
Table IV-4 Inflow and Outflow by Province of Dambulla DEC ... 91
Table IV-5 Inflow and Outflow by Province of Thambuttegama DEC ... 91
Table IV-6 Daily flow (Origin) of commodity to DECs in production areas ... 93
Table IV-7 Inflow and outflow of commodities by province of six DECs in the production areas ... 94
Table IV-8 Origin of supply by districts to the Dambulla DEC ... 95
Table IV-9 Supply quantity by type of suppliers to the DEC Dambulla ... 96
Table IV-10 Type of incoming vehicles ... 96
Table IV-11 Destination by dsistricts from Dambulla DEC ... 97
Table IV-12 Type of outgoing vehicles from Dambulla DEC ... 98
Table IV-13 Type of buyer by quantity from Dambulla DEC ... 100

Table IV-14 Outgoing quantity from Dambulla DEC to other DECs 100
Table IV-15 Origin of supply by districts to the Thambuttegama DEC 101
Table IV-16 Type of Suppliers by quantity to the Thambuttegama DEC 102
Table IV-17 Type of incoming vehicles to Thambuttegama DEC 103
Table IV-18 Destination by districts from Thambuttegama DEC 105
Table IV-19 Type of buyers by quantity from Thambuttegama DEC 105
Table IV-20 Type of outgoing vehicles from Thambuttegama DEC 107
Table IV-21 Summary of results from the tracing survey (week 1-2 December 2012) 109
Table IV-22 Summary of wastage survey 117
Table IV-23 Percentage of wastage occurred during marketing of the selected perishable vegetables ..117

List of Figures

Figure III-1 Monthly wholesale price fluctuation of selected agricultural products at KeppetipolaDEC (average between Jan. 2007 and Dec. 2011) 35
Figure III-2 Daily wholesale price fluctuation of selected agricultural products at 37
Figure III-3 Players of the vegetable and fruit supply chain 45
Figure III-4 Marketing flow of Cargills 47
Figure III-5 Location of collection centres and Retail stores (Cargills) 48
Figure III-6 Location of Collection Centres & retail stores (Keells, Laugfs) 48
Figure III-7 Location of Supermarket Retail Chain Store in Colombo District 48
Figure III-8 Marketing flow of agri-business companies 49
Figure III-9 Present and proposed location of DECs 51
Figure III-10 Basic organization structure of Management Trust Board for DEC 53
Figure III-11 Operational structure of Dambulla DEC 53
Figure IV-1 Marketing flow of paddy / rice 67
Figure IV-2 Marketing flow of OFC 70
Figure IV-3 Marketing flow of highland vegetable 74
Figure IV-4 Marketing flow of lowland vegetable 78
Figure IV-5 Marketing flow of fruits 82
Figure IV-6 Marketing flow of fish 84
Figure IV-7 Marketing flow of egg 86
Figure IV-8 Marketing flow of chicken 87
Figure IV-9 Marketing flow of milk 89
Figure IV-10 Inflow and Outflow of Commodities by Provinces to & From Dambulla DEC 91
Figure IV-11 Inflow and Outflow of Commodities by Provinces to & from Thambuttegama DEC 91
Figure IV-12 Origin of Commodities by Province to Dambulla DEC 92
Figure IV-13 Destination of Commodities by Province from Dambulla DEC 92
Figure IV-14 Origin of Commodities by Province to Thambuththegama DEC 92
Figure IV-15 Destination of Commodities by Province from Thambuththegama DEC 92
Figure IV-16 Origin of supply by districts to Dambulla DEC 95
Figure IV-17 Type of suppliers according to quantity supplied (%) to Dambulla DEC 96
Figure IV-18 Time of vehicle entry to Dambulla DEC 97
Figure IV-19 Destination of commodities (%) by districts from Dambulla DEC 98
Figure IV-20 Type of outgoing vehicles (%) from Dambulla DEC 99
Figure IV-21 Time of vehicle departure from Dambulla DEC 99
Figure IV-22 Type of buyers (%) from Dambulla DEC 100
Figure IV-23 Outgoing quantity (%) from Dambulla DEC to other DECs 101
Figure IV-24 Origin of supply by districts to Thambuttegama DEC 101
Figure IV-25 Type of suppliers by quantity (%) by districts to Thambuttegama DEC 102
Figure IV-26 Type of incoming vehicles (%) to Thambuttegama DEC 103
Figure IV-27 Time of vehicle entry to Thambuttegama DEC 104
Figure IV-28 Destination of commodities (%) by districts from Thambuttegama DEC 105
Figure IV-29 Type of buyers by quantity (%) from Thambuttegama DEC 106
Figure IV-30 Time of vehicle departure from Thambuttegama DEC 106
Figure IV-31 Type of outgoing vehicles from Thambuttegama DEC 107
Figure V-1 Supply chains of “modern marketing system” and “conventional marketing system” 124
Figure V-2 Mechanism of quality control in the modern agricultural marketing system 125
Figure V-3 Bottlenecks in conventional marketing system and resulting issues 126
Figure V-4 Countermeasures to solve the problems 128

Abbreviations and Local Terms

ADA	Agricultural Development Authority
ADB	Asian Development Bank
ASC	Agrarian Service Center
CFC	Ceylon Fisheries Corporation
CFHC	Ceylon Fishery Harbours Corporation
COP	Cost of Production
CWE	Cooperative Wholesale Establishment
DCS	Department of Census and Statistics
DEC	Dedicated Economic Center(s)
DFC	Department of Food Commissioner
DOA	Department of Agriculture
DOAD	Department of Agrarian Development
DS Division	Divisional Secretary Divisions
EDB	Export Development Board
EEZ	Exclusive Economic Zone
EPV	Export Production Village
FMS	Farmer Managed Society
FO	Farmers Organization
FTA	Free Trade Agreement
GDP	Gross Domestic Product
GN Division	Grama Niladhari Division
GoSL	Government of Sri Lanka
GPS	Global Positioning System
HARTI	Hector Kobbekaduwa Agrarian Research and Training Institute
IFAD	International Fund for Agricultural Development
JICA	Japan International Cooperation Agency
LMF	Lanka Milk Foods
MoA	Ministry of Agriculture
MoCIT	Ministry of Cooperative and Internal Trade
MoED	Ministry of Economic Development
MoFARD	Ministry of Fisheries and Aquatic Resources Development
MoLRCD	Ministry of Livestock and Rural Community Development
MPCS	Multi Purpose Cooperative Society
MSE	Medium sized Enterprises
NAQDA	National Aquaculture Development Authority
NARA	National Aquatic Resources Research and Development Agency
NCD	National Development Council
NLL	Nestle Lanka Ltd.
NMB	National Milk Board
NPD	Department of National Planning
OFC	Other Field Crop(s): Major crops except other than rice (potato, onion, beans, maize, and chilli)
PMB	Paddy Marketing Board
PPP	Public and Private Sector Partnership
Rs	Rupee
SCDLIP	Second Community Development and Livelihood Improvement Project
SSC	System Science Consultants Inc.
TOR	Terms of Reference
UPFA	United People's Freedom Alliance
US	Unites States
USAID	United States Agency for International Development
VAT	Value Added Tax
VO	Village Organization

I. INTRODUCTION

1.1 Background of the Survey

The agriculture's position in the GDP of Sri Lanka has followed a declining trend from around 46% in 1950 to about 12 % in 2010. However, the agriculture sector contributes 32.7% (2010) of total employment. Since 82% of the poor population in Sri Lanka lives in the rural areas, the growth in agriculture sector is indispensable to income earning among the poor. Therefore, the government of Sri Lanka (GoSL) has an important strategy in the development and promotion of the agriculture sector.

Table I-1 Share of GDP by industrial origin (1950-2010)

Unit: %

Year	Agriculture, Livestock, Forestry and Fishing	Industry	Service	Total
1950	46	19	35	100
1970	28	24	48	100
1990	26	26	48	100
2010	12	29	59	100

Source: Annual Report-Central Bank of Sri Lanka

Table I-2 Share of labour force by industry (1990-2010)

Year	Labour force (Persons)	Share (%)			
		Agriculture, Livestock, Forestry and Fishing	Industry	Service	Total
1990	5,047,000	47	18	35	100
2000	6,310,247	36.0	23.6	40.3	100
2010	7,707,000	32.7	24.2	43.1	100

Source: Economic and Social Statistics of Sri Lanka-Central Bank of Sri Lanka.
Date does not include Northern and Eastern Province.

Table I-3 Average monthly income per household

Unit: Rs in the constant price at 2002

	2002	2006/07	2009/10
Sri Lanka	3,141	4,253	4,275
Urban	5,203	6,353	5,281
Rural	2,885	3,944	4,187
Estate	1,763	3,020	2,715

Source: Department of Census and Statistics, Household Income and Expenditure Survey in each year

Sri Lanka has an arable land area of about 2.9 million ha, of which 1.9 million ha are used for cultivation of rice (40%), plantation crops (coconuts, tea and rubber) 39% and the remainder 21% for other agricultural crops.Sri Lanka, in fact, maintains self-sufficiency ratio of more than 90% in rice; however its self-sufficiency in other agriculture produce and dairy products is generally low. As a result, the Mahinda Chintana Plan declares that food security and promotion of diversification in agriculture as priority areas.

On the other hand, the efforts on marketing of agricultural products are relatively slow and lagging. For instance, there is no sufficient access to market information; and there is a mismatch and imbalance of information between markets and production areas. Other problems include large wastage or spoilage of surplus vegetable harvests; decrease in quality due to unsuitable post-harvest handling and practices; (post-harvest loss of 30-35 % has been reported); sluggish prices during the harvesting time; and low awareness on the quality in relation to market. In addition, there exist a complex marketing system with many intermediate traders and middlemen; and there is government price control of food items. There are diverse factors causing difficulties to secure and maintain markets for agriculture produce and production activities and direction of sale. The GoSL recognizes these issues and have devised adequate strategies in the Mahinda Chintana Plan to link the producers and consumers.

Under this situation this survey collected basic information pertaining to the regulations, systems and current situation of marketing of agricultural, fishery and livestock products (vegetables, fruits, OFC, rice, fisheries and livestock.) in order to prioritize assistance approach and support measures in the said sector in Sri Lanka.

1.2 Objective and outputs of the Survey

The objective of the survey is to collect and analyse data and information on the present status and issues, and bottlenecks in order to examine and support the future priorities in the marketing and distribution of agricultural products that include fisheries and livestock.

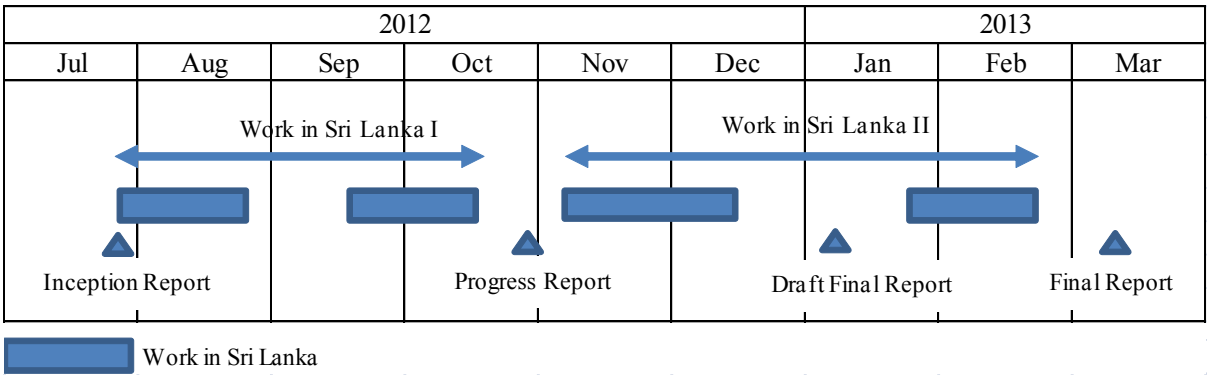
The expected outputs are:

Output-1: Value chain according to the country's agricultural, fishery and livestock products are analysed; bottlenecks in production, processing, and mutual relationships, such as distribution and sales will be examined and organized.

Output-2: Market activities, and roles and functions in the distribution by the government and the private (including producers) sector, are examined, and made clear for effective approach assistance.

1.3 Methodology of the Survey

Work in Sri Lanka was begun in the late July 2012 and completed in February 2013. Main activities are shown below.



First work in Sri Lanka

(1) Collection and analysis of existing reference data & information
(2) Confirmation of survey methods & items in the survey
(3) Meetings and Discussions with relevant personnel of central government
(4) Field study (Dambulla, Thambuththegama, Kurunduwatta, Keppetipola, Ambewela, Jaffna)
(5) Selection and signing of a contract with a local consultant which implemented "Marketing flow and Value-Chain Survey on Agricultural, Fishery and Livestock Products"

Second work in Sri Lanka

(1) Field study in the South, Upcountry and Northern Area (Embilipitya, Hambantota, Monaragala, Badulla, Nuwara Eliya, Dambulla, Anuradhapura, Vavuniya, Mannar)
(2) Supervision of the implementation of sub-contracted survey
(3) Identification of issues and consideration of countermeasures for improvement of current situation
(4) Discussion with relevant ministries over the issues and countermeasures

II. NATIONAL SOCIO-ECONOMY

2.1 Socio- economic conditions of Sri Lanka

2.1.1 Population growth

Based on the results of "Census of population and housing 2012", the population of Sri Lanka is 20.2 million (Table II-1). The annual growth rate of population during 2001 to 2012 was 0.7%, and is on a long-term declining trend.

Table II-1 Population and annual population growth rate

Year of Census	1963	1971	1981	2001	2012
Population (1,000)	10,582	12,690	14,847	18,797	20,263
Annual growth rate (%)	-	2.5	1.7	1.3	0.7

Source: Department of Census and Statistics, "Census of population and housing"

2.1.2 Economic growth

The economy of Sri Lanka is steadily expanding. Its real GDP growth rate in 2011 was 8.3%. Per capita GDP in 2011 reached to USD 2,836.

Table II-2 GDP and annual GDP growth rate

	2006	2007	2008	2009	2010	2011
GDP at Constant Prices (2002) Trillion Rs	2,091	2,233	2,366	2,449	2,646	2,864
Real GDP growth rate (%)	7.7	6.8	6.0	3.5	8.0	8.3
GDP Per Capita (Rs)	147,776	178,845	218,167	236,445	271,346	313,511
GDP Per Capita (USD)	1,421	1,617	2,014	2,057	2,400	2,836

Source: "Annual report 2011", Central Bank of Sri Lanka

2.1.3 Population by province

Sri Lanka consists of nine provinces. According to the results of the census in 2012, 29% of the total population concentrats in the Western province, which comprises the national capital, Colombo.

Table II-3 Population by province

Unit: 1,000

No	Province	Capital	Area sq.km.	Population by census					
				1981	%	2001	%	2012	%
1	Western	Colombo	3,684	3,868	26	5,366	29	5,837	29
	Districts in Western province								
		Colombo	699	1,699	11	2,251	12	2,310	11
		Gampaha	1,387	1,391	9	2,064	11	2,295	11
		Kalutara	1,598	830	6	1,066	6	1,217	6
2	Central	Kandy	5,674	1,969	13	2,418	13	2,557	13
3	Southern	Galle	5,444	1,869	13	2,277	12	2,466	12
4	Northern	Jaffna	8,884	1,098	7	1,041	6	1,060	5
5	Eastern	Trincomalee	9,791	963	6	1,419	8	1,547	8
6	North-Western	Kurunegala	7,888	1,684	11	2,167	12	2,372	12
7	North Central	Anuradhapura	10,472	829	6	1,101	6	1,259	6
8	Uva	Badulla	8,500	891	6	1,175	6	1,259	6
9	Sabaragamuwa	Ratnapura	4,968	1,458	10	1,801	10	1,919	9
Total			65,610	14,847	100	18,797	100	20,263	100

Source: “Census of population and housing”, Department of Census and Statistics

2.1.4 Income and expenditure

(1) Household income

According to the Household Income and Expenditure Survey (HIES) 2009/10, the mean household income in Sri Lanka was Rs 36,451. As shown in Table II-4, there were large income disparities among provinces. The highest income is reported from the Western province, which recorded an income equivalent to 129% of national average. Especially in Colombo district, which is a part of the Western province, the mean household income was 140% of national average. On the contrary, the Northern and Eastern provinces have the lowest and second lowest mean household incomes, which are equivalent to 65% and 66% respectively.

Table II-4 Mean household income (monthly average) by province 2009/10

	Province	Mean household income (monthly average)	Index
1	Western	47,118	129
	Colombo district	51,070	140
	Gampaha district	48,870	134
	Kalutara district	35,780	98
2	Central	31,895	88
3	Southern	32,514	89
4	Northern	23,712	65
5	Eastern	23,922	66
6	North-western	35,586	98
7	North central	35,577	98
8	Uva	28,717	79
9	Sabaragamuwa	36,173	99
National average		36,451	100

Remarks: Index is a ratio to national average
Source: Department of Census and Statistics, HIES 2009/2010

(2) Household expenditure

According to HIES 2009/10 the monthly average household expenditure is Rs 31,331. Out of this, 42% (Rs 13, 267) is spent on food and drinks.

Provincial characteristics of expenditure on food items are shown in Table II-5. Provincial percent shows the proportion of provincial average expenditure to the national expenditure on the items in each category. In the Western province, especially in the Colombo district more non-conventional characteristics, namely less consumption of cereals, fat and oil, and more consumption of prepared food, vegetable, meat, fish, milk and milk food, fruits can be seen.

The changes that have taken place in the monthly average per capita consumption of selected food items from 1980/81 to 2009/10 are shown in Table II-6. Some items, namely rice, wheat four, bread and milk shows a declining trend of consumption. Items such as pulses, meat, fish, eggs and sugar exhibit a significantly increased demand.

Table II-6 shows the average monthly household expenditure on major food items by income group. The proportion of the amount of expenditure by each income group is shown in comparison to Group 1, the lowest income group (less than Rs 11,341 per month). The table shows that with the increasing of income, the household expenditure on almost all the food items expands. Especially, expenditure on chicken, beef, fish, samba rice, banana, milk powder, and eggs shows higher expenditures by the high income groups.

Table II-5 Average monthly household expenditure on major food items by province 2009/10

Unit: %

Items	Sri Lanka		Province									
	Rs	%	Western	Colombo	Central	Southern	Northern	Eastern	North-western	North central	Uva	Sabaragamuwa
All food items	13,267	100	113	122	95	95	114	109	92	91	83	90
Cereals	2,669	100	89	87	113	92	130	107	94	105	109	107
Prepared food	1,409	100	156	178	72	95	70	94	80	67	60	68
Pulses	547	100	106	105	115	105	95	56	83	95	99	114
Vegetables	1,006	100	103	113	99	92	99	107	98	102	104	97
Meat	517	100	122	154	95	39	184	198	102	89	56	55
Fish	1,163	100	127	137	53	105	156	168	97	94	48	53
Dried fish	492	100	118	112	94	97	13	60	121	97	69	113
Coconuts	738	100	101	99	88	108	137	96	99	98	77	113
Condiments	1,209	100	107	111	95	105	109	123	95	90	74	90
Milk & milk food	1,038	100	139	160	100	100	85	72	70	74	82	79
Fat & oil	324	100	90	96	124	75	165	125	80	105	131	89
Sugar,juggery & treacle	466	100	99	99	96	100	145	132	98	91	83	89
Fruits	386	100	126	145	91	99	116	92	88	82	76	78
Other food items	1,303	100	109	121	107	94	109	104	90	83	85	98

Source: Department of Census and Statistics, HIES 2009/2010

Table II-6 Average monthly per capita consumption on major food items by province 2009/10

Food item	Unit	1980/81	1990/91	2009/10	Rate of increase 80/81-09/10 (%)
Pulses	kg	0.3	0.5	0.7	145.0
Meat	kg	0.2	0.2	0.4	114.4
Eggs	no.	1.4	2.2	2.5	75.0
Sugar	kg	0.8	1.2	1.2	58.0
Fish	kg	0.7	0.5	1.0	33.0
Dried fish	kg	0.3	0.3	0.3	13.8
Coconuts	no.	7.6	8.0	7.4	-2.3
Rice	kg	9.5	9.0	9.1	-4.8
Wheat flour	kg	0.7	0.5	0.7	-8.1
Milk	liters	0.6	0.3	0.5	-13.8
Bread	kg	1.6	2.0	1.3	-19.9

Source: Department of Census and Statistics, HIES 2009/2010

Table II-7 Average monthly household expenditure on major food items by income group 2009/10

Food items	Income group (Rs)									
	1	2	3	4	5	6	7	8	9	10
	<11341	11341-14750	14750-17916	17916-21196	21196-24509	24509-28381	28381-33313	33313-40921	40921-55521	55321<
Rice - (Kekulu)	1.0	1.5	1.6	1.8	1.8	1.8	1.7	1.9	1.9	1.8
Rice - (Samba)	1.0	2.1	3.5	4.1	5.4	5.8	7.4	8.1	10.4	12.7
Rice - (Nadu)	1.0	1.4	1.6	1.7	1.8	1.9	1.6	1.4	1.4	1.0
Wheat flour	1.0	1.5	1.8	2.0	2.4	2.5	2.4	2.1	1.7	1.6
Bread (Normal)	1.0	1.6	1.9	2.2	2.5	2.7	3.0	3.3	3.5	4.1
Dhal	1.0	1.5	1.8	2.1	2.3	2.3	2.6	2.6	2.9	3.2
Chicken	1.0	2.4	3.8	5.8	7.8	11.1	13.5	16.4	22.2	31.2
Beef	1.0	3.2	4.1	5.7	8.3	8.4	10.5	13.0	10.7	12.7
Fish - Balaya	1.0	3.0	3.6	4.7	6.2	6.6	7.3	7.2	10.6	10.4
Fish - Kelavalla	1.0	3.6	4.9	7.4	9.1	14.0	18.3	21.8	32.9	47.5
Fish - Sprats (dry)	1.0	1.5	1.7	1.8	1.8	2.0	2.0	2.0	2.1	2.0
Fish - Balaya (dry)	1.0	2.0	2.1	2.6	2.6	2.6	2.5	2.7	2.5	2.5
Eggs (hen)	1.0	2.3	2.8	3.5	4.3	4.5	5.4	5.9	6.0	7.7
Coconut	1.0	1.4	1.6	1.8	1.9	1.9	2.0	2.1	2.2	2.3
Chilly	1.0	1.4	1.5	1.7	1.9	1.8	1.9	1.9	1.9	1.9
Big Onions	1.0	1.7	1.9	2.1	2.4	2.5	2.8	2.9	3.4	3.7
Cow milk	1.0	2.2	2.4	3.8	4.4	4.8	4.6	4.8	7.4	6.0
Milk Powder	1.0	2.1	3.0	3.6	4.2	4.8	5.3	6.1	6.9	8.4
Sugar	1.0	1.5	1.7	2.0	2.2	2.3	2.3	2.4	2.5	2.6
Banana	1.0	2.1	2.9	3.6	4.3	5.5	6.3	8.0	9.9	12.7
Tea dust / Leaves	1.0	1.4	1.5	1.7	1.9	1.9	2.0	2.1	2.2	2.5

Remarks: Each income group is equivalent to 10% of the total sample size.
Source: Department of Census and Statistics, HIES 2009/2010

2.1.5 Land use

Out of 62,705 Sq.km of total land area of Sri Lanka, 30% (18,595 Sq.km) is used as agricultural land. Among them, the biggest share (49%) is used for cultivation of plantation crops (tea, rubber, coconut) and other permanent crops (spices). The second largest share is occupied by irrigated paddy land (27%). Seasonal crops (fruits and vegetables) shares 8% of the total of agricultural land.

Table II-8 Land use pattern 2002

Type	Area (sq. km)	%
Plantation Crops (tea, rubber, coconut) and other permanent crops (spices)	9,150	49
Irrigated Paddy land	4,971	27
Seasonal Crops (fruits and vegetables)	1,475	8
Forest Land	1,304	7
Lands under roads, buildings, ect.	783	4
Lands not classified elsewhere	615	3
Lands not suitable for cultivation	299	2
Total agriculture land area	18,595	100

Source: Department of Census and Statistics, 2002

2.2 Agriculture in Sri Lanka

2.2.1 Agricultural policy

(1) Agricultural development policies

1) Effects of trade liberalization

Before 1977 when the liberalized economy came into being, the Other field crops (OFC) were important for national food security because the economy was closed. As a result the cultivated extent and the production have shown significant increases. Sri Lanka stepped on an extensive economic liberalization process in 1977. This covered a series of economic reforms including devaluation of exchange rate, adoption of floating exchange rate system, liberalization of trade policy accompanied by custom reform, deregulation of price control system, adoption of measures for the promotion of foreign private investment and raising bank interest rates. As a result, since 1978 the subsidiary food crops sector of Sri Lanka has experienced a noticeable transition compared to the period of 1970-77. A significant second wave of liberalization reforms took place in 1990. In 1994, when the WTO Agreement was signed the economic environment was already fairly liberal because the private sector was identified as the main "engine of growth".

2) 2001-2004 period

The United National Party came in to power in December 2001 Parliamentary elections and it had a reinforced determination to accelerate the reform process. In June 2002, it presented to the IMF and World Bank Sri Lanka first Poverty Reduction Strategy Paper (PRSP) as “Regaining Sri Lanka”. This policy document presented the governments renewed commitment to greater economic growth and poverty reduction, more exports and further liberalization and privatization (Regaining Sri Lanka (2003).

The result of these policy reforms was that Sri Lanka became one of the most open economies in the region (WTO, Sri Lanka Trade Policy Review 2004). The official measure of openness, the ratio of exports and imports to gross domestic product (GDP), was 67% in 2002. Tariffs were the major trade policy instrument in the agricultural sector and while individual tariffs have been raised and lowered frequently, the simple average applied tariff was 21.0% on agricultural products.

The aims of the agricultural policy framework of Sri Lanka in 2004 were to improve agricultural productivity, raise farm incomes, and ensure food security through supplying food at affordable prices. A secondary goal was to facilitate the transformation of conventional agriculture into commercially and economically viable enterprises. At the same time, the Government recognised the importance of small-scale agriculture as a means of reducing rural poverty and contributing to rural development. To achieve these aims the government made proposals for maximising the contribution of the agricultural sector towards poverty reduction (Government of Sri Lanka, 2002). These proposals involved: (a) improving land markets and strengthening land tenure arrangements; (b) making improved technology available to small farmers through intensive adaptive research on technologies that have proved successful elsewhere; (c) shifting responsibility for commercial seed production, veterinary services, etc. to the private sector; (d) rationalising government extension services at local

level, encouraging private management where possible; (e) introducing partial cost recovery and other local financing mechanisms to enhance the responsiveness of research and extension services to the needs of small farmers; and (f) upgrading the agricultural marketing system.

3) 2004-2007 period

In 2004, a left of center government came back to power after Parliamentary elections. But the former process was not changed as expected by the people. The Ministry of Agriculture, Lands and Livestock (MALL) prepared the National Policy Framework in 2004. There was a change of government after the 2004 General Elections. The alliance government (based on a Memorandum of Understanding between the Sri Lanka Freedom Party and the Marxist Janatha Vimukthi Peramuna) launched a five point nation building programme called 'Rata Perata' (Country Forward: Creating Our Future: Building Our Nation), which included a new economic order, durable peace with dignity, investing in people, clean governance and ensuring law and order. The new United People's Freedom Alliance (UPFA) adopted a different strategy from that of the UNF regime, realizing that new social policies were essential for growth and economic stability. The policy of the new regime emphasized an equitable distribution of income by providing enhanced relief for the poor and vulnerable while encouraging more economic activities in the rural areas, through support of small and medium enterprises. Further, the government continued with welfare measures even at a time of high fiscal constraints despite the resistance of the multilateral financial institutions. Some polices such as restoring the fertilizer subsidy, broadening the poverty alleviation programme, and continuation of electricity, transport and petroleum subsidies were carried out to address the issues of poverty and unbalanced growth at the time (United People's Freedom Alliance 2004; Kelegama 2006).

In the policy statement 'Creating Our Future – Building Our Nation' (2004) rejected the previous policies. It implied that "due to the misaligned trade and tariff regime, the domestic resource based products such as milk powder, sugar, and wheat flour are unable to compete with imports", "liberalization and deregulation have displaced domestic based production and other economic activities, particularly agriculture", and "adequate safeguards should be put in place to protect the domestic economy from unfair import competition from nations that subsidize their own producers".

With the implementation of this policy the government moved towards state intervention in the economic activities for the benefit of the poor, both consumers and producers. The strategies they used were incentives, subsidies, tariffs and other protective measures to build up the domestic economy to increase exports via small and medium sized enterprises (SME), particularly in agriculture. At the same time, it was projected to promote exports by pursuing greater access to foreign markets through bilateral trade agreements.

In the 2005 budget which was announced on 18th November 2004, the government continued its line against trade liberalization. In the areas of sensitive food items the government moved towards greater protection of domestic agriculture and industry, with a range of new subsidies, tax exemptions and tariff increases. The agricultural inputs such as seeds and planting materials, animal feed and shrimp feed etc. were exempted from VAT, and import duty on milk powder was to be reintroduced.

4) 2006-2012 period

The most recent development plan is the Mahinda Chinthana: Vision for a New Sri Lanka. It provides a development framework for the country with a ten-year horizon, 2006-2016. This policy tries to integrate the positive attributes of the market oriented economic policies while safeguarding the domestic needs by providing necessary support to domestic enterprises and encouraging foreign investment. The planning refers to creating an economy, which is largely private sector driven, more dynamic and regionally integrated. It is important to note that the current development strategy emphasizes the importance of regional development and provide fertilizer subsidy for paddy and small holding agriculture (Ministry of Finance and Planning 2006).

(2) National agricultural policy 2007

The National Agricultural Policy document of 2007 covered food, floriculture and exports agricultural crop sectors with the aim of solving many problems and facilitated their rapid growth. The objectives stipulated in the policies have been designed to meet the basic needs of the farming community in terms of food and nutrition security, enhanced employment opportunities and incomes. To achieve these objectives they have to adopt technically feasible, socially acceptable, economically viable and environmentally friendly production technologies, marketing and related strategies.

Goals and objectives stipulated in the policy are to a) increase domestic agricultural production to ensure food and nutrition security of the nation, b) enhance agricultural productivity and ensure sustainable growth, c) maximize benefits and minimize adverse effects of globalization on domestic and export agriculture, d) adopt productive farming systems and improved agro technologies with a view to reduce the unit cost of production and increase profits, e) adopt technologies in farming which are environmentally friendly and harmless to health, f) promote agro based industries and increase employment opportunities, and g) enhance the income and the living standard of farming community (Herath, A).

2.2.2 Agricultural production

(1) Crops

Paddy is the crop which has the largest production among all the crops. In 2009, the production of paddy was 3.65 million mt, far exceeding the production of tea (0.29 million mt), which has the second largest production. Other crops which have large size of production are manioc, maize, big onions, potatoes, green chillies and red onions (Table II-9).

Tea, which is known as Ceylon tea, is one of the major export items of Sri Lanka. In 2011, it brought USD 1,490 million to the country, which accounted for 14% of the total export value. Coconut, spices and rubber are also major items of exports, equivalent to 2.5%, 2.2%, 2.0% of the value of total exports respectively.

Table II-9 Production of crops 2001-2009

Unit: 1,000 mt

	Crop	2001	2002	2003	2004	2005	2006	2007	2008	2009
1	Paddy	2,695	2,859	3,071	2,628	3,246	3,342	3,131	3,875	3,652
2	Tea	295	310	303	308	317	311	305	319	290
3	Manioc	234	225	229	221	223	226	220	241	278
4	Rubber	86	91	92	95	104	109	118	129	136
5	Maize	29	26	30	35	42	48	56	112	130
6	Big Onions	32	32	32	38	56	74	92	57	82
7	Potatoes	58	89	72	81	79	78	77	75	62
8	Sweet Potatoes	49	47	44	40	41	42	49	52	47
9	Chilies (green)	49	46	46	40	53	53	49	51	46
10	Red Onions	37	35	36	39	54	61	57	49	46
11	Pepper	17	18	18	19	18	19	19	23	25
12	Cinnamon	13	13	13	13	13	13	13	13	15
13	Cowpea	10	10	13	9	11	10	11	12	13
14	Ground Nuts	6	6	7	8	9	10	10	10	13
15	Ginger (raw)	5	5	5	6	7	7	8	10	11
16	Green Grams	10	10	11	8	9	8	9	9	9
17	Gingelly	4	4	5	4	6	6	6	6	9
18	Tumeric (raw)	4	4	4	4	4	4	4	7	8
19	Kurakkan	4	4	5	5	6	6	5	7	6
20	Coffee	10	10	9	9	7	6	6	5	5

Source: Department of Census and Statistics, HIES 2009/2010

1) Rice

The production of rice, the staple diet of the people, has been hovering around the self-sufficiency level after the concerted efforts made during the past sixty years or so. Still the occasional surpluses recorded in this sector are not sufficient to accumulate a sufficient buffer stock to meet the frequent food deficits year after year, especially due to changing climatic conditions. The quality of local milled rice is still far below the international standards and the cost of production is also comparatively high, so that becoming a competitive supplier to the world market is still a question.

Table II-10 presents data on production and demand supply and self-sufficiency ratios of paddy/ rice in Sri Lanka. In summary, the staple food crop rice (paddy) has shown an increase in the extent cultivated, average yield and hence the total production per year.

Table II-10 Paddy production and rice availability in Sri Lanka

Unit: 1,000 mt

	2005	2006	2007	2008	2009	2010*
Paddy production	3,246	3,341	3,331	3,875	3,652	4,044
Paddy availability for human consumption	2,954	3,046	2,857	3,536	3,331	3,698
Rice production equivalent from domestic sources	2,009	2,071	1,943	2,405	2,265	2,514
Estimated carried over stock of rice from previous year	50	59	67	50	150	167
Total rice availability for human consumption from domestic sources (a)	2,959	2,130	2,010	2,455	2,415	2,682
Total rice requirement (b)	2,045	2,068	2,081	2,102	2,250	2,345
Rate of self-sufficiency (b)/(a) (%)	145	103	97	117	107	114

Remarks: *Provisional
Source: Department of Census and Statistics

2) Other field crops (OFC)

In the case of some Other field crops (OFC), millet and maize, production was increased. Especially the production of maize expanded significantly because of the improvement of the yield. On the other hand, the production of green gram, cowpea, manioc, and potatoes shows a declining trend (Table II-11). To meet the demand, wheat grain and flour and some other cereals and pulses have been imported into the country in large amounts.

Table II-11 Production and average yield of selected other food crops in Sri Lanka

Crop	2007		2008		2009		2010
	Prod (mt)	Yield (kg/ha)	Prod (mt)	Yield (kg/ha)	Prod (mt)	Yield (kg/ha)	Prod (mt)
Millet	5,457	1,009	6,506	1,070	6,433	1,090	6,209
Maize	56,438	1,651	112,287	2,176	129,769	2,552	127,761
Green gram	8,513	971	8,878	949	9,258	1,080	7,594
Cowpea	10,855	1,021	11,952	984	13,485	1,179	8,143
Manioc	219,933	9,749	240,731	10,058	277,847	11,643	178,633
Potatoes	77,386	14,503	74,814	15,365	61,705	14,908	26,114

Source: Dept. of Census & Statistics

(3) Fresh vegetables

A large number of vegetable varieties are consumed in Sri Lanka in the form of curries together with rice, the staple food. The bulk of the quantities consumed are grown in Sri Lanka, although a small quantity is imported. Sri Lanka also exports a small quantity of fresh vegetables to the countries in the Middle East.

There are two types of vegetables grown in Sri Lanka namely highland (temperate zone) vegetables and lowland (mostly dry-zone) vegetables. As a whole the extents cultivated to these two types of vegetables are more or less stable with minor variations from year to year due to the changes in the

weather and the relative prices of the vegetables concerned. There has been an increase in production and yields in more recent years, particularly from 2003 onwards (Table II-12). No disaggregated data is available for the year 2011, but according to the Central Bank Annual Report 2011, the vegetable production in the country increased by 11.8 % during 2011 to 956,722 mt. compared to 855,994 mt. in 2010. This was due to farmers being encouraged by increased vegetable prices caused by crop damage in the first half of 2011.

However, it can be said that Sri Lanka is achieving a near self-sufficiency in vegetables. Gluts in certain seasons are also unavoidable. Thus, the Sri Lankan government in recent years has been trying to promote the cultivation of high value vegetables with a view to increase the volume of vegetables exported.

Table II-12 Production and average yield of vegetables

Crop	2007		2008		2009		2010	
	Prod (mt)	Yield (kg/ha)	Prod (mt)	Yield (kg/ha)	Prod (mt)	Yield (kg/ha)	Prod (mt)	Yield (kg/ha)
Beans	41,328	5,355	42,562	5,279	40,513	5,122	25,623	5,806
Cabbage	63,836	14,554	76,928	17,099	62,774	15,635	34,697	17,812
Carrot	38,106	11,732	40,015	13,228	35,830	12,377	16,910	11,662
Leeks	29,105	15,254	27,123	16,145	26,793	15,948	11,005	14,480
Knoh-khol	14,954	10,214	15,942	10,551	12,289	8,564	5,869	8,799
Radish	31,732	10,717	37,830	10,665	33,889	10,140	20,278	10,752
Tomatoes	65,157	9,760	84,698	10,951	73,917	10,357	43,791	10,580
Red pumpkin	86,906	10,940	87,222	11,273	107,319	11,669	69,158	12,871
Beet-root	27,348	9,542	25,878	10,919	26,664	9,905	14,066	10,267
Ash plantain	77,345	8,589	78,399	8,338	77,633	9,188	47,988	9,411
Cucumber	28,294	9,690	9,690	9,548	31,757	10,271	32,486	10,331
Ladies fingers	42,935	6,531	6,531	6,858	56,549	7,821	24,797	7,762
Bitter gourd	30,015	7,371	7,371	8,369	39,692	9,518	6,303	9,150
Ash pumpkin	10,043	9,779	9,779	8,619	9,582	9,828	10,545	9,160
Brinjal	92,902	9,146	9,146	9,104	106,700	9,858	18,138	9,648
Snake gourd	25,041	9,244	9,244	9,478	33,421	10,550	7,252	10,515
Capsicum	14,089	4,411	14,911	4,287		4,383		4,278

Source: Dept. of Census & Statistics

4) Fruits

A large number of varieties of fruits are grown in Sri Lanka, mostly in home gardens. Large-scale fruit orchards are almost non-existent in Sri Lanka. Although pineapple, banana and papaw are grown in medium sized farms as well, production is limited to certain production areas like Kurunegala, Gampaha and Embilipitiya.

Table II-13 shows the total production per year and yield per hectare of four selected varieties of fruits namely plantain (banana), papaw, pineapple and mangoes. Pineapple and mango production has remained more or less stable from 2001 to 2011 while exhibiting slight variation in some years due to climatic factors. Another notable feature of fruit production in Sri Lanka is that the average yields of these four varieties of fruits have remained more or less at the same level, implying that the progress

of the varietal improvement of these crops has been very slow and/or distribution of improved varieties among the farmers have been ineffective.

Table II-13 Production and average yield of fruits

Year	Plantain		Papaw		Pineapple		Mangoes	
	Production	Yield	Production	Yield	Production	Yield	Production	Yield
	(000' bunches)	(000'bunchs / ha)	(000 nos)	(000'nos /ha)	(000'nos)	(000'nos / ha)	(000'nos)	(000'nos /ha)
2001	30,575	1	22,632	7	42,594	9	458,987	18
2002	31,719	1	26,310	7	42,432	9	487,228	18
2003	32,997	1	29,641	6	40,716	8	500,577	17
2004	33,750	1	31,036	6	48,065	9	459,552	17
2005	34,083	1	30,390	6	48,721	9	464,125	17
2006	31,528	1	32,520	6	47,640	10	426,777	17
2007	32,419	1	33,555	6	44,421	9	424,701	17
2008	33,121	1	38,361	6	43,480	9	394,598	15
2009	31,982	1	37,320	6	41,289	9	411,763	16
2010	35,776	683*	49,600	6	44,188	9	432,903	16
2011	37,661	706*	52,343	6	44,429	7	419,503	15

Remarks:*Number of Bunches
Source: Department of Census and Statistics; Data Bank of HARTI

5) Livestock products

The livestock sector is an important sector as a supplementary income source for the rural poor. About 90% of livestock farmers in rural areas together with estate sector workers are involved in livestock raising on a small scale (i,e, one to two heads of cows). Hence, the government has identified livestock sector as one of the key areas to be developed to promote small enterprises and sideline business in rural areas to diversify rural community's sources of income and to promote off-farm activities to provide food security for the rural families.

- **Milk**

The two types of milk produced in Sri Lanka consist of the milk of the neat cattle and milk of the buffaloes. Table II-14 shows the production of milk from the year 2000 to 2011. Production of both types increased, during the period between 2000 and 2011. Only a small percents of the requirements of the milk in the country are produced locally while the balance is imported mainly in powder form. Therefore the present government is trying to increase the local milk production by setting up milk producing villages (*Kiri gammana*) and is trying to popularize the consumption of fresh milk among the consumers in order to increase the demand for fresh milk. To increase the milk production in the country the government in recent years has intensified its extension efforts in the livestock sector, expanded veterinary services, provided improved breeds of cows to the farmers and offered price incentives. The government's Divi Neguma program[3] also supports the livestock production in a moderate scale.

[3] Divi Neguma program (Divi Neguma means 'uplifting livelihoods') aims to support household units to be self sufficient, financially secure, and rely on the market for their daily food requirements. It is implemented by the Ministry of Economic Development.

Table II-14 Production of milk

Unit: 1,000 litres

Year	Milk		
	Cattle	Buffaloes	Total
2000	151,246	30,210	181,456
2001	152,765	30,263	183,028
2002	152,841	30,354	183,195
2003	156,546	30,258	186,804
2004	159,696	30,600	190,296
2005	161,816	30,925	192,741
2006	164,934	31,649	196,583
2007	169,728	32,281	202,009
2008	172,442	35,651	208,093
2009	184,065	49,251	233,316
2010	191,920	55,634	247,554
2011*	203,454	54,850	258,304

Remark: *Provisional
Source: Dept. of Census & Statistics; Data Bank of HARTI

The import of milk powder and other milk products continue to remain stable (Table II-15). Imports of milk, mainly milk powder, continue to be significant in the dairy sector. Sri Lanka has spent Rs 19 billion in 2009 to import 65,237 mt. of milk and milk products; of which milk powder alone is 62,365 mt (96%) valued at Rs 18 billion.

Table II-15 Production and imports of milk & milk products 1998 – 2010

Unit: mt

Year	Fresh milk			Powdered milk			Condensed milk			Milk food			Total
	Cow	Buffalo	Total	Local	Import	Total	Local	Import	Total	Local	Import	Total	
1998	124.5	25.1	149.6	8.6	53.6	62.2	4.2	0.3	4.4	1.5	0.3	1.8	218.0
1999	126.4	25.5	151.9	9.5	48.3	5783.0	4.2	0.2	4.4	1.5	0.1	1.7	215.8
2000	127.7	25.5	153.3	11.3	56.8	68.1	4.6	0.1	4.7	1.2	0.2	1.4	227.4
2001	129.0	25.6	154.6	15.7	52.1	67.9	4.4	0.1	4.5	1.7	0.1	1.8	228.8
2002	129.1	25.6	154.7	13.7	61.8	75.5	4.4	0.1	4.5	1.7	0.3	2.0	236.8
2003	132.2	25.6	157.8	6.1	63.7	69.8	4.7	0.1	4.8	2.2	0.4	2.5	234.9
2004	134.9	25.8	160.7	6.5	54.0	60.5	5.1	0.2	5.2	2.5	0.4	2.9	229.3
2005	136.7	26.1	162.8	6.5	52.8	59.3	5.3	0.0	5.3	2.8	0.2	3.0	230.4
2006	139.3	26.7	166.1	7.0	68.1	75.1	4.8	0.0	4.8	2.8	0.2	3.0	248.9
2007	143.4	27.3	170.6	7.2	61.6	68.8	5.0	0.4	5.4	2.9	0.1	2.9	247.8
2008	145.6	30.1	175.8	7.5	62.5	70.0	4.3	0.0	4.3	2.9	0.1	2.9	253.1
2009	155.5	41.6	197.1	8.7	62.4	71.0	4.1	0.0	4.1	5.6	0.1	5.7	277.9
2010	162.1	47.0	209.1	9.3	72.4	81.7	5.0	0.0	5.0	8.0	0.1	8.0	303.9

Source: Compiled from data source of Dept of Census & Statistics

- **Chicken and eggs**

The poultry industry is one of the most developed industries in the livestock sector. The poultry sector has shown a phenomenal growth from a sideline business and emerged as a dynamic industry in a short span of time. As a result, chicken meat and eggs have now become relatively a cheap animal protein source in Sri Lankan diet. With the active participation of the state and the private sector to production of poultry feed of high quality, the industry has improved its productivity. The growth was more prominent in the broiler sector whereas there had been no remarkable growth in the layer sector

according to Livestock Master Plan (2011) of the MoLRCD (Table II-16).

Table II-16 Production of day old chicks, egg and chicken (1998-2010)

Unit: million

	Day-old chicks		Egg production	Chicken production
Year	Layer	Broiler		
2001	5.96	63.7	-	10.655
2002	5.72	64.7	891	11.564
2003	7.22	67.1	885	9.772
2004	6.51	69.7	875	11.042
2005	6.72	73.7	868	11.636
2006	6.31	73.4	901	13.117
2007	6.64	79.9	915	13.779
2008	5.88	80.9	866	14.331
2009	4.67	77.6	951	14.018
2010	53.5	84.2	949	14.199

Remarks: Chicken comprises hens, chicks and cock birds.
Source: Day Old Chicks from Dept. of Animal Production and Health, and Chicken Production from Dept. of Census and Statistics

Chicken population by province (2003-2011) is shown in Appendix 5 and egg production by province is shown in Appendix 6. There are two intensive poultry producing regions; the most developed is the coastal belt that includes Western and North Western provinces, where Sri Lanka's breeders and commercial poultry farms, feed manufacturing plants, and processing plants are mainly concentrated. The Central Province is the second intensive poultry producing area. There are 33 poultry breeder farms (refer Appendix 7), and most of the breeder farms and commercial farms are located in this region. According the Agricultural and Environmental Statistics Division (DCS), as of 2011 in total there are 188,862 poultry farms; of which 134,707 (71%) are back-yard porltry; 39,982 (21%) are egg-producing farms and 14,173 (8%) are broiler farms.

Poultry farming is clearly differentiated to two farming systems; the organized commercial farming and unorganized back yard system. Average farm size in a commercial layer farm is over 2,000 or more birds. Commercial broiler production comes mainly from farms having more than 3,000 birds. The back yard farms are scattered over the island and average flock size per holding is around 10-25 birds.

Poultry requirement is supplied mainly (around 80%) by the organized sector of chicken meat processing, and the rest is provided by the informal sector (live bird markets according to the Livestock Master Plan of MoLRCD, 2011). Chicken meat based products comprised nearly 86% of the total meat based value-added products (6,688 mt) manufactured in the country in 2009. The organized chicken meat sector has progressed over the years to meet the consumer demands, and branded chicken products have been introduced with quality certification. On the other hand, the informal sector (live birds markets or wet chicken as they are called) is mainly in the Western province and the North Western province.

- **Meat**

Table II-17 provides information on the number of animals slaughtered and the estimated production

of beef, mutton and pork during the period from 2000 to 2010.

Table II-17 Number of animals slaughtered and the poultry population

Year	Neat cattle	Sheep and goat	Pig	Poultry
2000	206,115	87,502	25,565	10,622,370
2001	201,443	79,116	26,865	10,654,870
2002	205,025	80,889	25,628	11,564,167
2003	213,503	70,600	29,752	9,773,500
2004	206,979	71,605	29,240	11,041,960
2005	215,181	74,601	30,249	11,635,770
2006	187,689	68,171	30,540	13,116,920
2007	186,084	64,283	31,861	13,778,610
2008	163,716	58,288	21,481	14,331,170
2009	168,002	62,635	22,265	13,615,290
2010	187,689	68,171	30,540	13,116,920

Remarks: The number of animals slaughtered at licensed slaughterhouses only
Source: Department of Census and Statistics

In the fourth column of Table II-17 the total population of chick-birds is given but no information is available on the number of birds killed and estimated production (volume in mt) of chicken meat. Beef, mutton, pork and chicken are the main type of meats consumed in Sri Lanka both in the carcass form and processed form. According to the data given in this table, the number of neat cattle slaughtered and the number of sheep and goats slaughtered has decreased during the last decade. On the contrary, the number of pigs slaughtered has increased. Total number of poultry population also shows an increasing trend. Sri Lanka is not self–sufficient in meat products and therefore, it has become necessary to import meat from other countries to satisfy the demand. Reasons of the declining numbers of the livestock slaughtered are explained as below:

- Shortcomings in the data collection procedures. The DCS gives the number of animals killed in the licensed slaughter houses only. The slaughter of animals in unlicensed slaughter houses are on the increase and these do not get recorded.
- Municipal slaughter houses now accept animals killed in outstations (presumably in unlicensed slaughter houses). Because of the restrictions imposed on transport of animals, ban on killing of buffaloes, and female animals etc transportation of live animals to the licensed slaughter houses are on the decline. Instead transportation of slaughtered animals is on the increase. Therefore, the total number of animals actually slaughtered is greater than the official figures.
- Disruption of transportation of animals from the North and East due to the strict laws imposed on transportation of live animals and due to the disruption of train services.
- Buddhist promotional campaigns that discouraged the consumption of red meat, and the practice of freeing the animals earmarked for slaughtering as a “meritorious deed."

6) Fisheries

- **Coastal and offshore fisheries**

The Sri Lankan fisheries sector can be divided broadly into two sub-sectors, marine, and inland &

aquaculture. The marine subsector can be further subdivided into two major components – coastal and offshore or deep-sea fishing. Of the two marine fishing categories, the major share of the production (about 60%) comes from the coastal fishing along the entire coastline. Fishers land a variety of species reflecting the variations of the fishing grounds. While coastal fisheries dominate the nation's fish production, production from offshore and deep-sea fishing is seen increasing rapidly since the 1990s as a result of the introduction of multiday boats for deep-sea fishing, which was primarily in the South and South Western regions of the country. This in turn has increased production from 2,148 mt in 1985 to 162,920 mt in 2011, contributing around 37% of total fish production. Production from coastal fisheries accounted for 50%, and inland fisheries and aquaculture 13%. The national fish production figures for the period 1980-2011 are shown below (Table II-18).

Table II-18 Marine and inland fisheries and aquaculture production (1980-2011)

Unit: mt

Year	Marine (capture)		Total marine	Inland fisheries and aquaculture	Total fish production
	Coastal	Off shore (Deep Sea)			
1980	165,264	2,148	167,412	20,266	187,678
1985	140,270	2,400	142,670	32,740	175,410
1990	134,120	11,670	145,790	38,190	183,980
1995	157,500	60,000	217,500	18,250	235,750
2000	175,280	88,400	263,680	36,700	300,380
2001	167,530	87,360	254,890	29,870	284,760
2002	176,250	98,510	274,760	28,130	302,890
2003	163,850	90,830	254,680	30,280	284,960
2004	154,470	98,720	253,190	33,180	286,370
2005	63,690	66,710	130,400	32,830	163,230
2006	121,360	94,620	215,980	35,290	251,270
2007	150,110	102,560	252,670	38,380	291,050
2008	165,320	109,310	274,630	44,490	319,120
2009	180,410	112,760	293,170	46,560	339,730
2010	202,420	129,840	332,260	52,410	384,670
2011	222,350	162,920	385,270	59,560	444,830

Source: Statistics Unit – MoFARD

Marine fish production by maritime regions is shown below (Table II-19). With the exception of the North-western and the Northern regions having shares of 16% and 10%, respectively, the eastern region dominates with 28%, followed by southern (24%) and western (22%) regions.

Table II-19 Marine fish production by maritime provinces (1983, 2005-2011)

Unit: mt

Year	Maritime Provinces					Total
	Western	Southern	Eastern	Northern	North-Western	
1983	28,980	24,900	28,620	75,740	26,500	184,740
2005	27,140	37,720	27,070	24,520	13,950	130,400
2006	60,190	69,600	26,690	25,880	33,620	215,980
2007	76,170	87,270	32,670	15,250	41,310	252,670
2008	78,430	85,460	54,880	14,840	41,020	274,630
2009	71,420	90,100	68,480	21,210	41,960	293,170
2010	73,600	80,970	92,240	33,600	51,850	332,260
2011	95,870	93,740	88,220	46,370	61,070	385,270
% Share (2011)	22	24	28	10	16	100

Source: Compiled from Statistics provided by MoFARD

- **Inland fisheries and aquaculture**

Inland fisheries and aquaculture production provides about 13% of the total fish production. Numerous freshwater bodies (reservoirs and tanks) spread over the island support the inland fish production that is mainly from capture and culture-based activities. Inland and aquaculture production by sectors is shown below (TableII-20). Inland capture and culture-based fisheries provide the bulk of the production, around 75% (44,115 mt); shrimp culture farms about 7% (4,150 mt) and the rest are from aquaculture activities in brackish waters, seasonal tanks, etc.

Table II-20 Inland and aquaculture production by major sectors

Unit: mt

Sector	2009	2010	2011
Capture / Intensive culture Fisheries	**35,900**	**40,820**	**44,115**
Major Tank	16,310	18,420	18,530
Medium Tank	9,450	10,540	10,892
Minor Tank	10,140	11,860	14,693
Fresh water prawns	**-**	**240**	**312**
Other Inland Fisheries	**3,140**	**3,280**	**5,607**
Aquaculture (Freshwater)	**3,962**	**4,550**	**5,362**
Seasonal Tanks	3,930	4,490	5,160
Tanks and Ponds	32	60	202
Aquaculture (Brackish water)	**8.3**	**40**	**18**
Shrimp Farms	**3,550**	**3,480**	**4,150**
Total	**46,560**	**52,410**	**59,564**

Source: Compiled from statistical data of MoFARD

Among the fish catches in the freshwater bodies, namely Indian carps, Chinese carps, common carp, etc., Tilapia species constitute the bulk of the inland fish catch. Province-wise, the bulk of the catches are from Eastern, North-western and North Central regions ranging from 10,000 mt to 22,000 mt in 2011 (Table II-21).

Table II-21 Inland fish production by provinces (2009-2011)

Unit: mt

Provinces	2009	2010	2011
Western	370	410	430
Central	1,020	1,130	1,360
Southern	2,800	3,180	3,600
Northern	670	810	2,150
Eastern	8,830	9,320	10,670
North western	8,880	10,010	11,140
North Central	18,050	20,840	22,740
Uva	3,600	4,210	4,480
Sabaragamuwa	2,340	2,500	2,990
Total	46,560	52,410	59,560

Source: NAQDA

2.2.3 Post harvest losses of vegebales and fruits

It is well known that the present system of post-harvest activities from the producer to the consumer of fruits and vegetables, etc. causes very high post harvest losses due to poor handling, packing, poor storage, transport, etc. Many in the agriculture sector have statistically cited the level of losses at around 20 to 50%. Table II-22 shows the post harvest losses occurring in some economically important crops in Sri Lanka. This data was published in 2001, which is the only data available according to the Institute of Post Harvest Technology under the MOA, see the part of "Wastage survey" in page 120). However, farms such as IFCO and CIC Agri business have indicated that their losses are in the range of 5 to 7% due to proper handling practices from pre-harvest to post harvest, and due to the use of plastic crates, etc.

Table II-22 Post harvest losses occurring in some economically important crops in Sri Lanka

Unit: % on the weight basis

Crop	Harvesting	Collecting	Drying	Threshing/ Cleaning	Storage	Transport	Selling	Milling	Total
Paddy	2.98	-	1.65	4.34	3.86	1.02	-	1.67	15.31
Maize	7.32	-	2.78	0.91	2.35	-	-	-	13.36
Pulses	1.87	-	2.7	2.32	2.22	-	-	-	9.11
Oil Seeds	6.77	-	3.5	3.66	3.42	-	-	-	17.35
Dried Chilly	9.03	-	2.67	-	10.36	-	-	-	22.06
Vegetables	8.89	2.22	-	-	-	12.6	12.13	-	35.81
Fruits	8.76	1.76	-	-	-	5.11	11.67	-	27.32
Chilly (Green)	9.03	2.56	-	-	-	5.47	3.45	-	20.51

Remarks: Rates of losses correnspond to the percentage on the weight basis of the total production
Source: Annual Report – 2001 Institute of Post-Harvest Technology

2.2.4 Export and import of agro-products

(1) Potential for rice export from Sri Lanka

One of the significant post independent achievements of the country is the attainment of self-sufficiency in rice. The production of rice, the staple diet of the people, has been hovering around the self sufficiency level after the concerted efforts made during the past sixty years or so. However, the bulk export of rice would not be realistic due to the following reasons. First, the current production quantity and quality of the rice surplus are not likely to reach the standards required for export. Further the varieties of rice produced locally are not those that are demanded abroad. As well, the production costs of paddy and the prices fetched locally are higher than those of the large rice exporting countries. As for milling techniques, they have not yet rised to the level of international marketplace all in terms of quality, quantity, and cost.

Although the rice production occasionally cover the domestic demand, the rice surpluses are not sufficient enough to build its stockpiles. When the self-sufficiency is fully attained, the rice surplus could be exported but the quality of local rice is still below the international standards and the cost of production is also comparatively high. Therefore it will be difficult for Sri Lanka to become a competitive supplier to the world market.

As for expansion of cultivation, Sri Lanka does not have additional area for rice and it is not easy to produce more than what is domestically demanded. Rice yield levels have not been increasing significantly over the last two decades and the country's average yield hovers around 4.5 mt/ha. The highest level achieved in high potential areas is 6 mt/ha, whyich is not sufficient for exports.

Sri Lanka is already exporting Samba or red rice to the market of Sri Lankan Diaspora or the limited market demanding for the particular rice varieties. However, the size of these markets is small, of which demand is not large enough for the country to to ambitiously embark on exports.

(2) Export potentials for vegetables and fruits

The sector of high value horticultural crops comprise of vegetables, fruits, cut flowers, cut foliage and ornamental plants. This is an important sector with high growth potential. In fact, at present the high value horticulture sector accounts for a major portion of the export earnings in the agriculture sector. Although the scale of the vegetable and fruit industry is small, Western Europe, Australia, Maldives, Japan and the Middle East are some of the countries with high potential export markets for high value horticultural produce.

However, International Foodstuff Group of Companies and the President National Chamber of Exporters asserts, the major constraints to increase the exports of vegetables and fruits from Sri Lanka are the very low yield levels of these crops and resultant high costs of production. Table II-23 shows the average yields of some crops in selected Asian Countries, and it is clear that Sri Lankan yields of these crops are the lowest amongst the countries selected. In comparison to India and China, the

yields per hectare in Sri Lanka are low for almost all the crops. This badly affects the competitiveness of Sri Lankan vegetables and fruits in the international market. Hence, the cultivation of horticultural crops in most of the districts in the country is not export oriented at present.

Table II-23 Yield of selected crops of selected Asian countries (2010)

Unit: kg/ha

Crop	Yield					
	Sri Lanka	India	China	Thailand	Philippines	Indonesia
Avocados	-	-	7,027	-	4,067	10,937
Bananas	-	35,880	26,373	11,870	20,243	56,826
Beans, green	5,537	2,806	25,954	2,005	3,509	6,525
Cabbages and other brassicas	17,076	24,231	35,508	13,436	15,065	20,510
Carrots and turnips	12,247	15,255	35,138	-	14,095	14,874
Chillies and peppers, green	9,746	8,507	22,345	13,917	4,079	5,609
Eggplants (aubergines)	15,896	17,249	35,776	15,728	9,720	9,247
Leeks, other alliaceous veg	-	-	27,035	-	6,805	9,400
Lemons and limes	467	8,894	14,766	9,717	2,313	-
Mangoes, mangusteen, guavas	3,185	6,499	9,351	8,200	4,359	9,776
Okra	-	10,626	-	-	8,324	-
Oranges	1,239	9,451	12,019	17,335	2,661	35,543
Papayas	10,692	39,585	25,015	17,111	19,102	73,258
Pineapples	10,928	15,090	26,498	20,626	37,050	115,843
Potatoes	13,523	19,930	14,731	14,173	15,337	15,945
Pumpkins, squash and gourds	12,200	9,271	18,354	10,918	16,095	34,588
Tomatoes	10,376	19,598	50,951	13,844	11,565	14,580

Source : FAO STAT

Sri Lanka produces more than 800,000 mt of vegetables and fruits annually and exports both fresh and processed varieties to many destinations in the world. Ninety % of the fresh products are targeted to the Middle East and the Maldives Island and almost about 98% of the processed products to the European market. As can be seen from Table II-24 Sri Lanka's vegetable and fruit export volume shows large fluctuations. Fresh vegetables and fruits show fluctuations in export values also yet showing overall positive trends. In 2011 the country earned Rs 3,761 million by exporting 33,453 mt of fresh, semi-processed and processed vegetables and fruits to more than 25 destinations around the world. It is estimated that the export volume is only about 1 – 2% of the total annual domestic production.

Table II-24 Export of vegetables and fruits

Year	Vegetable		Fruits	
	Quantity (mt)	Value (Rs millions)	Quantity (mt)	Value (Rs millions)
2000	10,675	617	5,709	339
2001	9,248	576	7,399	399
2002	10,240	661	5,674	379
2003	9,437	679	7,706	605
2004	12,190	964	10,780	651
2005	14,071	1,153	6,566	609
2006	11,075	1,005	12,979	982
2007	12,761	1,246	11,238	1,229
2008	12,279	1,384	14,362	1,498
2009	15,670	1,394	13,032	1,381
2010	20,994	2,645	17,072	1,807
2011	13,446	1,871	20,007	1,890

Source: Central Bank Annual Reports and Sri Lanka Customs and Returs

As for export potential in terms of quality, Sri Lanka is being adjusting well to the ISO 9000 series and to the health and safety regulations stipulated by the European Union. In Sri Lanka, more than 80 vegetables and fruits are cultivated, out of which around 25 varieties of fruits and 40 varieties of vegetables are exported. Whereas availability of most fruits is seasonal, vegetables are generally available throughout the year.

The country has established two overseas markets, which account for approximately 72% of the fresh vegetable and fruits exports. These are Maldives Island and the Middle East. Between these markets Maldives accounts for 35% of exports mainly consisting of highland vegetables (carrot, cabbage, leeks, tomatoes, beans etc). The Middle East market comprising six countries is the major importer of pineapples, along withlowland vegetables such as green mango, green papaya, snake gourd, bitter gourd, green chillies, manioc, kiri-ala.

Around 25% of total exports of fresh fruits and vegetables are for Sri Lankan Diaspora in Europe and other countries. These exports cater mainly to the Sri Lankan immigrants. United Kingdom is an important market for lowland vegetables; Germany for fruits and Switzerland for both fresh vegetables and fruits.

Major markets for Sri Lanka's processed vegetables and fruits are Europe and the Continental countries. Gherkins in brine and vinegar contribute around 50% of the export earnings from the processed vegetable and fruit sector.

(2) Import of OFC, vegetables and fruits

Sri Lanka has a range of agro-climatic zones where diverse commercial crops can be grown. However, a number of varieties of agro-food products are imported to meet demand when local products are not available.

Wheat and lentils were the most important single items of agro-food imports into Sri Lanka. The total

imports of food and beverages accounted for 9.9% of total imports. Dried red chillies and big onion along with potatoes are widely consumed items and are imported mainly from India or Pakistan in large quantities. The cost of production in Sri Lanka is often higher for such products than the sources of origin. Smaller quantities of fresh vegetables are also imported. Around 35,000 mt of fresh fruit is imported to Sri Lanka each year, mainly comprising orange, grapes, mandarin and apple. Average annual volumes of imports for these products are oranges (4,300 mt), grapes (3,400 mt), mandarin (7,400 mt) and apples (20,138 mt). The imports are significant, with fluctuations of quantities and values (Table II-25). In 2011 the imported volume was 396,219 mt (value of about Rs 24 billion). A breakdown of the selected items is shown in Table II-26.

Table II-25 Import of OFC, vegetables and fruits (2001-2011)

Year	Quantity (mt)	Value (Rs Mn)
2001	419,499	7,261,437,813
2002	392,073	7,407,116,342
2003	370,274	7,646,335,819
2004	553,356	13,459,786,121
2005	397,145	8,910,584,162
2006	313,143	8,760,506,904
2007	460,914	18,821,377,828
2008	487,848	20,493,831,288
2009	388,333	17,872,111,373
2010	484,561	25,254,672,613
2011	396,219	23,903,120,174

Source: Compiled from Sri Lanka Customs Returns

Table II-26 Breakdown of import of selected agro-products (2001, 2005 and 2010)

	2001		2010		2011	
	Q'ty (mt)	Value (Rs)	Q'ty (kg)	Value (Rs)	Q'ty (mt)	Value (Rs Mn)
Rice	51,891	966,515,737	125,776	6,741,364,881	27,844	2,032,047,935
Maize	157,334	1,794,638,353	9,571	283,620,245	7,011	249,918,390
Potatoes	62,559	875,931,127	129,879	4,167,940,539	130,511	3,943,023,887
Tomatoes	1	850,716	0	7,245	6	862,150
Red Onions	2,726	64,782,027	11,908	641,286,361	6,807	464,355,055
Big Onions	110,168	1,749,368,093	158,086	6,649,347,792	170,731	6,556,190,776
Green Gram	8,716	271,433,924	11,563	1,762,905,801	10,447	1,523,454,623
Chilies	25,818	1,520,000,959	37,707	4,995,447,235	42,735	9,111,548,090
Beans	60	2,129,523	12	2,221,202	16	2,578,194
Others	225	15,787,354	60	10,531,312	112	19,141,074
Total	419,499	7,261,437,813	484,561	25254672613	396,219	23,903,120,174

Source: Compiled from Customs Returns, Sri Lanka Customs

III. POLICIES AND PRESENT CONDITIONS RELATED TO AGRICULTURAL MARKETING

3.1 National agricultural marketing policies

Currently the private sector takes major role in agricultural marketing operation except for indispensable government intervention. As for some crops, their tariff rates and price ceiling are often changed by the government, which blocks new access of the private sector.

The two main objectives of government intervention in agricultural marketing are to stabilize food prices and to ensure that farmers receive remunerative prices for their produce. Since the early 1970s, successive governments in Sri Lanka have intervened in agricultural marketing by offering guaranteed prices to farmers for paddy and other field crops including green gram, cowpea, soya bean, red onion and big onion. The guaranteed price scheme has been in operation for over three decades and played a certain role in improving farmers' income. However, the market has lost its competitive logic and farmers have lost their motivation to improve productivity and quality of produces.

Food price policies have not alleviated the impact of falling incomes on food security. Import/sales taxes are imposed on most of the basic food items in Sri Lanka including milk powder (including infant milk), wheat flour, lentils, potato, various grains and grain legumes including chick peas, green gram, and cowpea etc. and sugar, canned fish and dry fish. In addition high profits are reaped by players in the supply chain particularly by the importing firms which are more often than not oligopsonists. The Government imposes these import/sales taxes with the objective of providing price incentives to the domestic producers who are themselves the poor farmers, but the resulting increase in production is marginal due to low average yields of these crops and it is resulting high costs of production. The attempts at promoting cultivation of these crops in the paddy fields during the Yala (lean) season were made from 1970's but have met with limited success. Therefore neither the production is increasing, which could thus help in bringing down the prices to the consumers, nor the level of consumption and thereby nutritional levels of the poor are increasing.

"Sri Lanka National Agricultural Policy" document (2007) of the Ministry of Agriculture and Agrarian services summarizes the following points related to agricultural marketing.

a) Minimize problems associated with marketing of agricultural products through interventions by cooperatives and other state institutions as and when necessary for price stabilization.
b) Promote private sector investment to improve infrastructure facilities necessary for marketing agricultural products.
c) Explore and promote foreign markets for crops with high export potential.
d) Encourage product branding, certification and use of geographical indicators for products to enter competitive markets.
e) Facilitate marketing information dissemination and marketing operations through the establishment of district level agro enterprise centres.
f) Appropriately align the agricultural sector according to the current multi and bilateral trade agreements.

g) Encourage farmers to produce high quality primary products.

h) Promote participation of community organizations in the marketing process.

i) Identify the opportunities for agro-enterprises that may cater to the needs of the small farmers and promote public and private investments in such ventures.

j) Promote the participation of producers in agricultural processing and marketing; and

k) Strengthen the supply chain management to ensure an efficient agricultural marketing system.

3.2 Relevant ministries and their intervention in agricultural marketing

Department/institutes of ministries relevant to agricultural marketing and their functions are summarized in Table III-1, and activities of relevant organizations under the ministries are summarized in Table III-2.

Table III-1 Department/institutes and functions of relevant ministries in agricultural marketing

Ministry	Department/ institute	Function
MoA	Department of Agriculture	■ Agricultural instructorof Department of Agricultureat division level, has the closest links to the farmers organizations
	HARTI	■ Presentation of daily/weekly wholesale prices of rice, OFC, vegetables and fruits
MoCIT	DEC (under Additional Secretary, Marketing Development)	■ Operation of trading space of agricultural products at 13 DEC in the whole country
	Lak Sathosa Ltd	■ Retail of essential food items at reasonable prices through 152 outlets ■ Purchase of OFC mostly through farmers at 5 collection centres
	PMB	■ Purchase of paddy from farmers to stabilize the price of paddy and rice
	CWE	■ Assistance for the implementation of tariff policy to stabilize market price (including direct import)
MoLRCD	Milco Ltd.	■ Collection of raw milk through FMS and produce dairy products for consumers with “Highland” brand.
MoFARD	CFC	■ Purchase and distribution of local fish ■ Import of fish ■ Retail of fish through 84 CFC outlets and 152 Lak Sathosa Outlets
MoED	Rural development division	■ In charge of rural development, poverty alleviation and empowerment of the poor ■ Implementation ministry of “Second Community Development and Livelihood Improvement Project” financed by World Bank for the upgrading the living condition of rural community

Table III-2 Activities of organizations under the relevant ministries

Ministry having initiative	Name of organization	Function and existing conditions of organizations
MoA	Farmers organization	■ Formulation and implementation of local agricultural program, management of irrigation system, distribution of agricultural inputs ■ Mainly focused on the production but somefarmers' organizations engage in marketing activities
	Farmers companies	■ Acceleration of commercialization in non-plantation agriculture ■ Stagnation of activities because of the difficulties in management of private company by farmers
MoCIT	Multi-purpose Cooperative Societies	■ Provision of loan and production inputs to the members
	Cooperative Wholesale Establishment/ Lanka Sathosa Limited	■ Wholesale of agricultural products for Lak Sathosa Limited ■ Purchase of agricultural commodities from farmers as and when necessary
MoED, with financial assistance by WB	Producer Groups	■ Newly created farmers group focused on the promotion of cultivation of a specific crop ■ Received training of marketing by WB
MoLRCD	Farmer Managed Societies for Livestock Development	■ Procurement of raw milk and dairy products by Milco

3.3 Players and roles and functions

The following types of private sector players play major roles in agricultural marketing.

1) **Collector:** The buyer who visits the farms and collects the produces. Some time the collector using hired labour does the harvesting and preparation of produce for sale (cleaning, washing, sorting, grading and packing).
2) **Supply side wholesaler**: Wholesalers in the production areas and collect the commodities from farmers and transport to a market and selling to wholesalers or retailers.
3) **Demand side wholesaler**: Wholesaler in the consumption area who visit the farms in production areas, collect the produce either directly from farmers or collectors, and transport the produce to the markets and sell to the retailers.
4) **Contract suppliers**: A trader who purchases commodities directly from farmers or collectors or from a market and supply to exporters, and institutions such as hotels, restaurants, hospitals, armed forces etc.
5) **Roadside retailers**: The retailers who sell commodities at a roadside stall, which is usually a temporarily shed, to passers- by.
6) **Commission agent:** A trader who does not take the ownership of the commodities through outright purchase, but sells on behalf of the producers and charges a commission from the producer for his services. Almost all traders in the Colombo Pettah-Manning market are commission agents.
7) **Super market collecting center:** Collecting centers of the leading super markets. They are opened in production areas to collect the produce either from farmers or collectors.
8) **Pola retailers:** Retailers who sell commodities to the consumers at Rural Pola (Rural Fairs).

3.4 Agricultural marketing by crops, livestock and fisheries

3.4.1 Paddy

(1) Purchasing system and marketing

Marketable surplus[4] of paddy (un-milled rice) is the quantity of paddy left after deducting the quantities set aside for home consumption, payments in kind and seeds. There are five types of first hand marketing outlets for paddy. They are private collectors, mobile traders, private millers, the Paddy Marketing Board (PMB) and the Multi-purpose Cooperative Societies (MPCSs, see Chapter 4, Figure IV-1). The Private Collectors include village boutique keepers and purchasers in the nearby town. Mobile traders are the traders who come in lorries or trucks to the producing areas from distant places to purchase paddy. The mobile traders purchase paddy directly from farmers as well as from the collectors in the villages and nearby towns. At times private millers also visit producing areas in their trucks to purchase paddy directly from the producers or collectors. Mobile traders and private millers go to the threshing floor of the producers to purchase paddy. Hence the farmers do not have to incur costs for transporting paddy. These three groups purchase more than 90 % of the marketable surplus of paddy of the farmers in a given season. They usually purchase paddy immediately after harvest when the prices are low. Some of the collectors, mobile traders and millers provide credit facilities for the farmers for financing their cultivation operations. They also provide inputs in kind (such as chemicals) and hire their land preparing (tractors) and threshing machines on credit basis and later get back the monies due to them in the form of paddy. The farmers sell their paddy to these buyers for several reasons. They include repayment of loans, mutual trust, and long patronage. These buyers often purchase paddy with higher moisture contents (at a discounted price), and the institutional buyers (PMB and MPCS) purchase only a limited quantity. When the harvest is bountiful the paddy prices in the open market go down severely and these buyers purchase paddy much below the floor price set by the government. However in the lean seasons paddy prices in the open market rise above the floor price and there is severe competition among the millers to purchase paddy.

The two types of institutional first hand marketing outlets are the purchasing centres (paddy stores) of the PMB and MPCSs. They purchase paddy at these purchasing points and the farmers are required to transport their paddy to these purchasing points. Paddy is purchased at the prices fixed by the government. At present the purchasing prices are Rs 35 per kg of Samba (round grain) variety and Rs 32 per kg of Nadu (long grain) variety. These two institutions are purchasing paddy subjected to the pre-specified quality criteria in respect of moisture content, extraneous matter and sand etc. These institutions purchase only a limited quantity of the marketable surplus of paddy available with the farmers (roughly about 10%).

[4] The marketable surplus for an agricultural entrepreneur is the surplus of produce that exists after the point at which he can make back any money he paid to laborers or used to buy tools, fertilizer and land. If he takes some of the crop for his own family's consumption and to use as seed for the next year, he must account for this as well before calculating the marketable surplus. In this way, marketable surplus is what a farmer makes for his personal labor. Another term that closely relates to marketable surplus is marketed surplus. In some cases, these terms may be interchangeable. The principal difference is time perspective: marketable surplus is produce that a farmer currently has on hand to take to market to earn a profit, while marketed surplus is what she has already taken to market to earn a profit.

Marketable Surplus= Total Production – Quantities kept for home consumption- quantities set apart as seeds-Payments in kind to laborers-gifts to friends and relatives-waste (Spoilage)
Marketed Surplus + Quantity already sold

The paddy purchased by the collectors and mobile traders are sold to the private millers. In addition these millers also purchase paddy directly from producers. When the need arises the PMB also obtain the services of these millers to get milled part of the paddy collected by the PMB. The PMB mills process the balance. The MPCSs usually have their own rice mills to process the paddy collected by them.

Some of the private mill owners have their own sales outlets and they also distribute the rice through their own fleets of vehicles either to wholesalers or retailers. Consumers purchase rice from retailers. The rice milled by the PMB by its own mills or through the private mills are supplied to institutions (armed forces, hospitals, etc.) and sold through the MPCS, and private retailers. The rice milled by the MPCS mills is sold through the MPCS branch network.

(2) Overall issues in marketing

At present the main objective of the PMB is to stabilize prices both in paddy (producers) and rice (consumers) markets. PMB offers guaranteed prices for producers. The Samba (round grain) variety is purchased at Rs. 35.00 and the Nadu (long grain) variety at Rs. 32.00 a kg (After the 2012 Government Budget). Since the cost of production (COP) of paddy is estimated at Rs. 23.00 a kg (MoA), farmers are getting a reasonable profit margin by producing paddy. On the other hand, Samba rice price to the consumers is fixed at Rs. 70.00 and Nadu rice at Rs. 60.00 a kg. Paddy collected by the PMB is milled at the private sector as well as the Lak Sathosa two rice mills in addition to the milling done through its own mills.

Although it is alleged that certain mill owners corner the market due to their oligopsonic and oligopolistic powers as well as large scale operations there is no truth of such allegations made against the rice market (personal communication with the Chairman, PMB). It is not monopolistic or oligopolistic as often thought. This is because there are a large number of rice mills in major producing areas and therefore collusion among the millers is not possible. For example, Polonnaruwa district alone has 246 large rice mills which can produce high quality rice. Another 700 mills produce fair average quality rice. Anuradhapura district also has 280 rice mills, which produce good quality rice. In the country there are 721 large rice mills, which can process 5,000- 7,000 mt. per day. Some MPCS also purchase paddy from the producers at guaranteed prices and also own some rice mills.

The biggest problem faced by the paddy producers during harvest time is the very low prices prevailing in the market during those periods. During the harvesting time prices fall much below the minimum floor price. The PMB and MPCSs are unable to purchase all the paddy offered for sale during such periods, due to insufficiency of working capital and lack of other resources such as storage facilities and packaging material. The PMB now owns only 180 stores and they are also very old and badly needing repairs. Many stores were damaged by terrorist activity during 1988/ 1989 and during the conflict in the North and East. The government has sought foreign assistance to repair these stores and the mills but so far the response has been very poor. The situation is very serious in the Northern and Eastern parts of the country. Special programs have been launched by the PMB in these

areas but such measures are inadequate to solve the problems[5].

3.4.2 OFC/Vegetables/Fruits

(1) Collection and marketing system

In the marketing process of OFC, vegetables and fruits, both the conventional and modern marketing channels are observed. In the conventional channels, farmers sell commodities to collectors in his/her village or nearby towns, pola traders, and/or DEC traders. DECs are selling local produces and, as for OFC, imported produces are also sold. The local produces are brought to the DECs directly by farmers or the collectors. Some traders of DECs are direct importers of OFC and some purchase them from importers in Colombo. The main private wholesale market for OFC is located in Colombo, and the trading in this wholesale market is predominantly on commission basis. The traders and collectors in the producing areas transport their consignments to a commission agent of the wholesale market. The latter sells these consignments to a buyer with charge of a few percents of commission for his services and pays the balance to the producer (for commission, see the column in page 39). From the wholesale markets commodities are sold to pola retailers, canteens, retailers in the public markets run by the local authorities, hotels, restaurants and/or hospitals.

As a modern marketing channel, farmers also have the option to sell to the supermarket collecting centres. In the collection centres, the produces are sufficiently washed, selected and graded, of which quality is higher than those sold through the conventional channels. The purchased commodities are sent to the central purchasing units of the super markets by refrigerated trucks and from there to the retail shops of the super markets to be sold to the consumers. In Sri Lanka supermarkets are growing at a faster rate and are firmly established now. The supermarkets radically change food supply chains and producer-retailer relations through new procurement practices. There are no middlemen and unnecessary price deductions. The vertical relationship between farmers and supermarkets has been helpful to improve the quality of the products, reduce transaction cost and information asymmetries.

Furthermore, the MPCSs also purchase a limited quantity of produces through the Cooperative Wholesale Establishment (CWE), and sell through their branch net work and through Laksathosa outlets.

Particularly saying for OFC, as a new marketing system, forward trade agreements was introduced by the private animal feed companies like Prima and this is used by the maize farmers in Anuradhapura, Mahaweli H area and Monaragala and Badulla districts. Though the farmers engaged in the forward contract agreements they do not sell all produces to the agreed company when the market price was higher than the agreed price. As usual they visited the market traders and sold the produce at a better price.

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[5] "Special Programs of PMB launched in the North and East (Personal Communication with Mr. K.B.Jayasinghe, Chairman, PMB)

1. Establishment of two Zonal Offices of the PMB in Kilinochchi and Trincomalee and recruitment of staff including Tamil speaking officers.
2. Establishment of temporary paddy stores and started purchasing paddy.
3. Repair of the paddy stores and rice mills damaged by the war and terrorist activities
4. Foreign assistance is sought for the establishment of new paddy stores and rice mills and for the provision of transport facilities such as lorries, trucks etc to the North and East"

(2) Overall issues in marketing

There is a high risk for investment on agribusiness due to ad hoc changes of "Special commodity levies[6]"as shown in Table III-3. In order to protect domestic products from the competition with imported products, the government increases the amount of levies in the peak season. As a result of the unjustifiable tariff rate the prices has increased sharply. Threfore leading agribusiness companies in Sri Lanka such as CIC and IFCO do not engage in production of the protected products.

Table III-3 Monthly special commodity levies on OFCs in 2012

Unit: Rs/kg

Items	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Potato	30	30	30	30	30	30	10	30	50	50	50	15
Big Onion	10	10	10	10	35	35	25	50	50	50	50	15
Red Onion	25	25	25	25	25	25	25	25	25	25	25	15
Green Gram	50	50	50	50	100	100	100	100	100	100	100	100
Black Gram	100	100	100	100	100	100	100	100	100	100	110	110
Cowpea	100	100	100	100	100	100	100	100	100	100	100	100
Millet	75	75	75	75	100	100	100	100	100	100	100	100

Source: Sri Lanka Costoms

As for the supermarket channel, many farmers point out the problems such as the limitation of quantity demanded by the supermarkets, and the low quantity even at the time of high production, and the farmers' burden for cost for transporting to the collectin centres.

Technological improvement is limited and this is seen as a major bottleneck impeding the growth of the OFC, vegetable and fruit sectors and restricting most producers into selling their produce only into the national market. Value addition is low and is mainly generated through transport. As for fruits, poor and inappropriate land/ tree management practices result in the production of unprofitable, low quality fruits and wastage of land. The international rejection rate for Sri Lankan fruits is extremely high due to poor quality. Inadequate packaging, transportation and overall post-harvest treatment of fruits and vegetables lead to huge post-harvest losses.

The highly seasonal nature of certain fruits prevents most farmers from expanding production and exploiting economies of scale thus generating higher per unit long-term costs of production and a lower level of output. According to leading exporters and experts, unreliable supplies of fruits discourage exporters from developing a long-term strategy around these products. The major issues in the fruit marketing are harvesting of immature fruits and excessive application of chemicals for ripening them, thus lowering the quality of fruits offered for sale. These practices are widely prevalent among collectors, renters as well as producers. Thus there is a need for conducting awareness programs on pre-harvesting, harvesting and post-harvest methods to these groups of market participants.

[6] All commodities imported to Sri Lanka are subject to the import duties specified by items. Apart from the import duties, "Special commodity levies" are applied to the import of rice, sugar, OFCs, shoes, liquor and tobacco.

3.4.3 Livestock products

(1) Raw milk collection and marketing system

Milk is currently sold through a combination of private and public organizations. Raw milk producers sell to processors, consumers, hotels, cafeterias and canteens, and also cooperatives. These cooperatives collect raw milk and sell to either hotels or main dairy processors with networks of collection points and milk chilling centres. There are a few large-scale processors who have organized farmers, who are not members of cooperatives to sell their milk to them.

Raw milk collecting centres are located in each province, and the number of the centres has increased from 2,535 in 2008 to 2,813 in 2011 (Dept. of Census and Statistics). There are two major players of collection and distribution, Milco, the state-owned raw milk processing company, and Nestle Lanka Ltd (NLL), a private company. The former accounts for 44%, and the latter for 26%, in the total nationwide raw milk collection of 125 million litres in 2009. As for the production of milk and milk products by Milco, the share of liquid milk production was 25 % and the rest for milk powder, butter, fermented products, ice cream, etc. Refering NLL, until 1981, farmers had sold raw milk to the National Milk Board (NMB), but NLL became one of the major players in the country after buying 80% of NMB shares under the policy of liberalization and privatization introduced in 1981.

(2) Poultry and egg marketing

Concerning the marketing of poultry products, around 60 % of broiler chicks produced are marketed through out-grower system, which is presently operated in 18 districts. There is no well-organized out-grower system for egg marketing. In the major egg-producing areas in the Northwest province, small and medium scale feed mixers sell their feed, collect eggs from farms and supply to the wholesale markets. These feed mixers are engaged in the input supply. Eggs produced by layer farms have to be sold within the shelf life period (normally two weeks) of the eggs.

3.4.4 Fishery products

(1) Fish collection and marketing system

The fishery sector serves both the domestic and export markets with the domestic component attracting 75 % of the marine fish production. In 2010, total marine fish production was 332,260 mt, and the export market and dried fish production accounted for 9 % and 15 %, respectively. The domestic fish market comprise a number of end markets including wholesale fish markets, retailers, fish vendors, CFC and supermarket outlets.

Fish collection and marketing system is dominated by the private sector. Ceylon Fisheries Corporation (CFC), the state fish marketing organization under the MoFARD, in reality controls less than 2 % of the total market. Fish sales network of CFC are listed below (Table III-4).

Table III-4 Fish sales of CFC (2010)

Sales Outlets	Quantity (mt)
Lak Sathosa & Supermarkets	260
Hospitals & other govt. sectors	340
CFC outlets / Regional sales	2,640
DEC, Bulk Sales, Mobile Vans	210
Total Sales	**3,450**
Annual consumable fish quantity	350,760
Share of CFC in marketing (%)	**1.2**

Source: MoFARD

St. John's fish market in Colombo was the largest wholesale market and domestic fish trading centre (hub) in Sri Lanka, where most wholesale & retail activities had taken place; it had received supplies from all over the island. The St. John's fish market was closed, and the role is now taken over by the newly constructed fish market complex in Peliyagoda from March of 2011. Some 300 to 400 fish lorries (trucks) unload fish supplies daily. Regional wholesale fish markets also operate in the rest of the country.

(2) Fisheries-related infrastructure facilities (including marketing infrastructure)

Sri Lanka's fisheries related infrastructure currently include 16 functioning major fisheries harbours (among the 23 harbours in Sri Lanka), 40 anchorages, 785 minor fish landing centres, 29 boat manufacturing yards and six fishing gear factories. For details on facilities in the harbours, refer Appendix 8.

A summary of the ice plants and cold rooms is shown below (Table III-5); 80 ice plants with ice production capacity of 2,152 tons/day, and 31 cold rooms with a storage capacity of 1,492 mt are active in 2010. Refer Appendix 9 for the details of refrigeration facilities located at major fishing harbours, and Appendix 10 for active cold rooms and ice plants by districts.

Table III-5 Number and capacity of active cold rooms and ice plants in 2010

	CFC (Gov.)		Private		Total	
	No.	Capacity	No.	Capacity	No.	Capacity
Active cold rooms*	20	1,395	11	97	31	1,492
Active Ice Plants*	10	140	70	2,012	80	2,152

Remarks: Asterisks refer to storage capacity (mt) for cold rooms and production capacity (tons/day)
Source: MoFARD

(3) Overall issues relevant to fish marketing

There are several issues that are constraining the development of the fisheries sector in general. The issues relevant to fisheries marketing, among others from non-availability of reliable resource data, weak fisheries resources management, etc., are summarized below.

- Considerable post-harvest value losses and poor marketing and transport: quality of fish landings is generally poor and fish spoilage is high. This is due to lack of proper fish landings and quality maintenance facilities on board the vessels and lack of knowledge of fish handling and post-harvest practices. Only small portions of landings meet the international quality

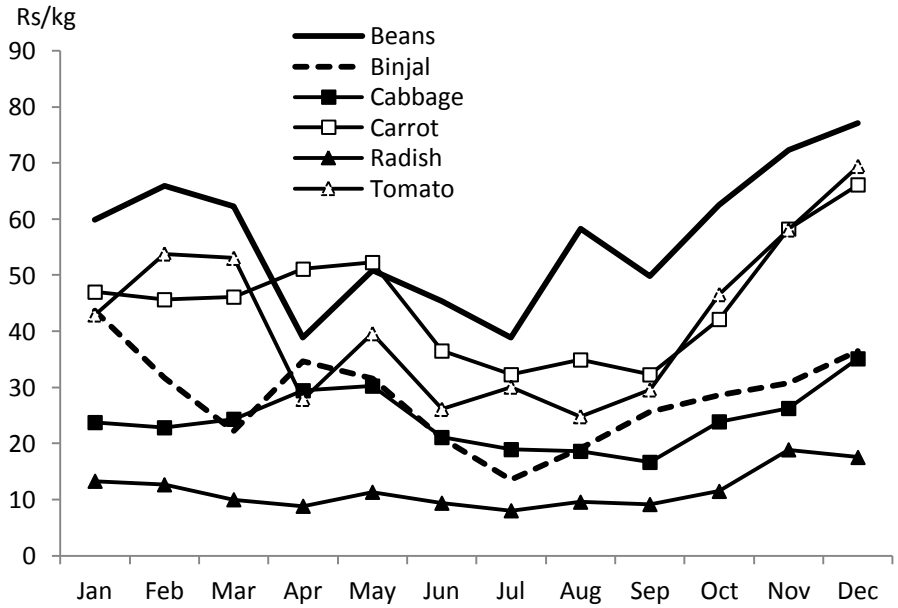
standard. Post-harvest losses are estimated to be 30 % as cited in 10-year (2007-2016) development policy framework of the fisheries and aquatic resources.

- Inadequate application of fisheries technologies, particularly in offshore fishing, that not only prevents optimum harvesting of fisheries resources but also adds to post-harvest losses and constraints value addition.
- Poor fisheries infrastructure particularly the under-equipped and badly maintained fisheries harbours add to the post-harvest losses through inadequate ice production and storage. Slow rehabilitation of the damaged infrastructure and facilities (for production and marketing) in the conflict affected fisheries in the north and east is also contributing to losses and value addition.

3.5 Price fluctuations and pricing of agricultural produces (OFC, vegetables and fruits)

(1) Wholesale price fluctuations at DECs

In this section, wholesale price fluctuations at DECs will be explained, which are also related to the results from Tracing survey in Chapter IV. For example, monthly price fluctuations in 2011 at the Keppetipola DEC are shown in Figure III-1. In general, prices fluctuate on a monthly basis according to the changing shipment volume of crops from season to season. It can be said that, prices stay lower during the harvesting periods around February to April for Maha, and August to October for Yala, and gets higher during lean periods especially before the Maha harvest period starts (refer to Appendix 11 for cropping calendar). Ratio of price reduction ranges from the lean harvesting season with the maximum monthly prices to the peak harvest season with the minimum monthly prices, from 50 to 69%, depending on the crops.



Source: MoCIT

Figure III-1 Monthly wholesale price fluctuation of selected agricultural products at Keppetipola DEC (average between Jan. 2007 and Dec. 2011)

Table III-6 summarizes fluctuations of monthly wholesale prices at DECs in the different areas. Rate

of increase from the minimum monthly price to the maximum monthly price is used to indicate price fluctuations.

Table III-6 Monthly wholesale price fluctuation of selected agricultural products at four different DECs (average between Jan. 2007 and Dec. 2011)

Unit: Rs/kg

Crops	Keppetipola DEC				Dambulla DEC				Meegoda DEC				Nuwara Eliya DEC			
	(1)	(2)	(3)	**(4) %**	(1)	(2)	(3)	**(4) %**	(1)	(2)	(3)	**(4) %**	(1)	(2)	(3)	**(4) %**
Bean	57	39	77	**98**	73	60	85	**41**	88	64	100	**56**	-	-	-	**-**
Brinajal	28	13	44	**224**	35	18	68	**278**	38	25	63	**152**	-	-	-	**-**
Cabbage	24	17	35	**111**	35	27	42	**55**	40	30	49	**63**	38	28	45	**61**
Carrot	45	32	66	**105**	71	46	89	**91**	75	50	93	**86**	69	46	86	**87**
Potato	-	-	-	**-**	73	60	89	**48**	-	-	-	**-**	72	59	88	**49**
Radish	12	8	19	**135**	16	10	21	**106**	26	21	33	**57**	23	18	28	**56**
Tomato	42	25	69	**180**	44	26	63	**144**	52	31	77	**148**	-	-	-	**-**

Remarks:
(1) = Average of monthly prices
(2) = Minimum monthly price
(3) = Maximum monthly price
(4) = Increase rate (%) from the minimum prices and maximum prices: [(3)-(2)]*100 / (2)
Source: MoCIT

Seasonal price changes are observed in most of the sampled crops, of which production is based on the cropping calendar. This observation is relevant except in the case of potato. In this case price changes occur according to the adjustments in the shipment schedule. The maximum monthly prices were around 2-4 times of the minimum monthly prices in these five years, except for potato. Characteristics of pricing are different from DEC to DEC and from area to area. The findings are summarized below:

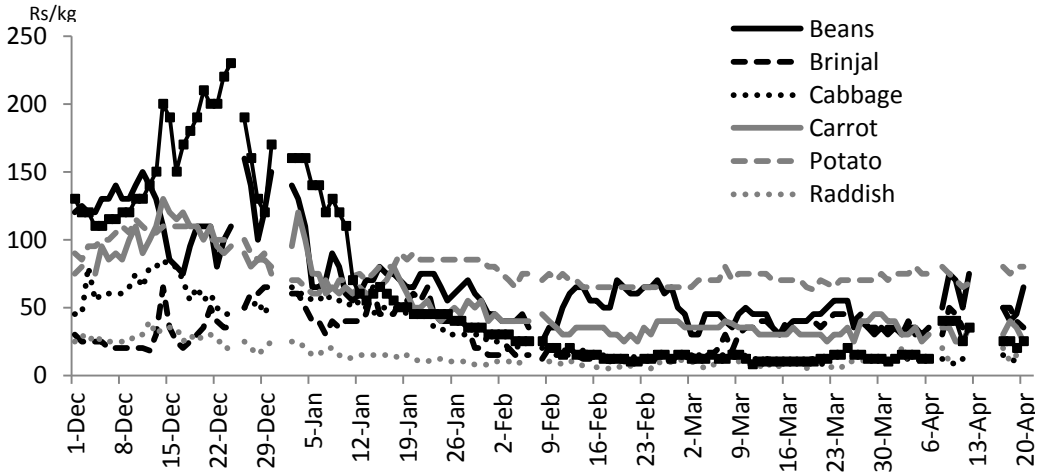
1) Keppetipola DEC: Average prices in Keppetipola DEC are always the lowest among all DECs. Also the differences between minimum and maximum prices are most of the time higher than the other DECs'. Rates of price increases however, are mostly higher than those in the other DECs', indicating that the seasonal price fluctuations are rather unstable. This is probably because of the location of this DEC is in the highland production area, which is far away from the distribution and consumption centres.

2) Dambulla DEC: Rather higher averages are observed maybe due to its functions as a major trans-shipment market from production areas to consumption areas. Rates of increase in prices vary from crop to crop, probably because the DEC collects produces from various areas all over the country without a specific cropping calendar.

3) Meegoda DEC: The highest averages and comparably smaller fluctuations are observed. This is probably because of the location of the market in the major consumption area. Prices in Meegoda and Nuwaraeliya DECs move together because Meegoda receives the bulk of the vegetables traded there from Nuwara Eliya.

4) Nuwara Eliya DEC: Rather high averages are observed, which are close to those of Meegoda DEC. This might be because of the location advantage of Nuwara Eliya which is producing only specific highland vegetables, with added value. Rather higher production costs might be another reason. Comparably small fluctuations might be because of the year-round cultivation of vegetables in the area.

Price fluctuations of the crops become larger in the case of daily comparison. For example, Figure III-2 shows daily wholesale price fluctuations from a lean to peak season at Keppetipola DEC. Here, differences between two extreme prices are most of the time more than 100% except for potato (Table III-7). This implies that during the peak harvesting season, farmer's share would be dropped by about 50%.



Source: Keppetipola DEC

Figure III-2 Daily wholesale price fluctuation of selected agricultural products at Keppetipola DEC (2011.12.01-2012.04.30)

Table III-7 Daily wholesale fluctuation of selected agricultural products at Keppetipola DEC (2010.12.01-2012.04.30)

Unit: Rs/kg

	Year	Average	Min.	Max.	**Increase rate (%)**
Beans	2010-2011	125	35	230	**557**
	2011-2012	69	25	160	**540**
Brinjal	2010-2011	81	10	65	**550**
	2011-2012	32	35	155	**343**
Cabbage	2010-2011	52	8	85	**963**
	2011-2012	32	18	95	**428**
Carrot	2010-2011	94	25	130	**420**
	2011-2012	54	55	160	**191**
Potato	2010-2011	78	60	115	**92**
	2011-2012	79	50	100	**100**
Radish	2010-2011	27	5	40	**700**
	2011-2012	15	5	55	**1,000**
Tomato	2010-2011	90	8	230	**2,775**
	2011-2012	60	30	180	**500**

Source: Keppetipola DEC

(2) Retail price formation

In some production areas, collection system is commonly prevailed, and in this case farmers conventionally bear costs of gunny bags for transporting, and collectors bear costs of harvesting. In other production areas, farmers individually transport produces to a DEC and pass them to DEC traders, or engage in retail or wholesale by themselves. In this case, they also bear costs for packing/handling. As for the stall commission, it is paid to commission agents (stall owner) by those who use a stall to sell produces (for the detail of stall commission, see the bordered explanation below). Those who come and purchase produces at a DEC are sometimes wholesalers from consumption areas and sometimes retailers. Depending on the volume of handling, those who bear costs of transporting often pay loading/unloading fees to local sack-carriers called "natami" (generally around Rs 10-20 per sack. In our calculation, it is included in transportation cost). Lastly, retailers generally bear costs for loss caused by wastage, which largely contributes to the determination of the final retail price.

Stall commission

There is no general rule about stall commission, which differs from one DEC to another. Only in Pettah-Manning market a 10% commission is charged per market price. In the DECs there is no uniformity of commissions charged; various levels of commissions are charged in different DECs. They charge a specific amount of Rupees per kilo (in absolute terms, but not in percentage terms).

Example: Stall commission at Dambulla DEC

Price (Rs/kg)	**Commission Rs/kg**
Less than Rs 10.0	Rs 0.5
Rs 10.0- Rs.19.0	Rs 1.0
Rs 20.0- Rs. 59.0	Rs 2.00
Rs 60.0- Rs 99.0	Rs 3.0
Above Rs 100	Rs 5.00

Source: JICA Survey team Traders survey (2012)

3.6 Producers and traders organizations/institutions

3.6.1 Farmers organizations

Agrarian Development Act No 46 of 1979 approves the creation of the farmers' organization (FO) under the authority of Agrarian Development Council. According to the Agrarian Services (Amendment) Act of 1991, the FO is responsible for:

a) Formulating and implementing the agricultural program for the area;
b) Carrying out village-level construction work and repairs to irrigation work;
c) Production and distribution of seed, fertilizer and agrochemicals;
d) Cooperating and coordinating agricultural activities of government organizations and the farmers;
e) Any other activity approved by the commissioner as being beneficial to the farming community

Most FO has a small subcommittee for the discussion of specific issues. There are four types of meetings: 1) committee meetings, 2) general meetings, 3) Pre-cultivation meetings (Kanna meetings) and 4) ad hoc meetings. FOs is able to undertake the operation and maintenance of irrigation system and negotiate for the prices and marketing with the private sector. Members of FOs have an access to credit also. However, in many cases, the male farmer dominates the membership of FO and there is some extent of gender inequality. In Sri Lanka, there are various types of Farmers Organizations.

3.6.2 Cooperatives societies

The legal background of cooperative was enacted in 1911 with the enforcement of "Cooperative Credit Societies Ordinance. However, at that time the cooperatives were organized mainly by the government and handed down to the people.

During the World War II the cooperatives were fully activated as organizations to distribute essential food items equally to the people who were under the influence of the black market. Through this experience, the government realized the importance of the role of cooperatives as an organization to revitalize the rural sector. In 1947, the government formulated a scheme to establish cooperative agricultural production and sales societies in order to help farmers obtain credit, timely procurement of agricultural inputs, and market their products.

In 1970's, the number of cooperative societies exceeded 5,000. The government provided financial support to them to improve rural product, storage and marketing facilities in order to increase the production of essential food items under the import substitution policy. In 1980's, there was the 13th amendment of the constitution. After 1989, most of the activities of the cooperative sector were given to the provincial councils. As of 2010, there were 14,679 cooperative societies nationwide (data as of 2010, Department of Census and Statistics). The main activities of cooperative societies are the provision of loan and production inputs to the members.

3.6.3 Farmers companies and producer groups

(1) Farmers companies

Farmers companies in Sri Lanka were established with the view to accelerating commercialization in non-plantation agriculture. However, due to various constraints they have failed to achieve expected objectives and most of the farmers companies, which were set up in the 1980s and 1990s, are now defunct. Farmers companies are investor-owned companies established under the companies act as people's companies. They are registered as people's companies[7] to safeguard against possible private ownership by imposing restrictions on membership and share trading. Only farmers and other stakeholders involved in agriculture and living within a particular geographical region can become shareholders and shares cannot be traded except among farmers eligible for membership. In addition, the maximum number of shares one can own is limited to 10% of shares issued at a given time according to the relevant provision of the act. The history of farmers companies goes back to the early 1980s when the government of Sri Lanka introduced the concept of people's companies. The EDB took the initiative to establish Export Production Villages (EPVs) with the aim of integrating the village level producers with the exporters. Under this program about 36 EPVs were established of which about 20 were involved in the production of agricultural commodities. Another notable initiative was the United State Agency for International Development (USAID) sponsored Shared Control of Natural Resource project under which two farmers companies; Huruluwewa Farmers Company and Nilwala Farmers Company were established as pilot projects (Wijayaratna, 1997). In addition, the National Development Council (NDC) also conducted pilot programs on the concept of farmers companies in two major irrigation schemes, namely Ridi Bendi Ela and Uda Walawe. Based on these experiences, several other government agencies like the Department of Agriculture, Ministry of Irrigation and Mahaweli Authority promoted farmers companies based on the people's company concept in the late 1990s. The most common approach adopted by the Department of Agriculture in establishing farmers companies was to form interest groups and once viable business ventures were identified to develop them into farmers companies. In 17 districts, 85 interest groups were formed, 32 of which were transformed into farmers companies (Batuwitage, 2001). The Ministry of Irrigation and the Mahaweli Authority developed farmers companies based on the existing farmer organizations and block farmer federations in the irrigation schemes with the aim of handing over part of the operation and maintenance of the irrigation scheme and thereby accelerating commercialization of agriculture. As of December 2003 there were in total 59 farmers companies and 33 EPVs registered with the Registrar of Companies. However, most of these farmers companies and EPVs are defunct at present.

The performance of farmers companies over the past two decades has been below expectations. Several constraints that account for this situation are: (1) politicization of farmers companies; (2) lack

[7] According to Inland Revenue Act (No. 28 of 1979) - Sect 33, "people's company" means a company which is resident in Sri Lanka and in respect of which the Assessor is satisfied that -
(i) it is not a private company within the meaning of the Companies Ordinance ;
(ii) the number of shareholders of the company exceeds one hundred and the nominal value of each share does not exceed ten rupees ;
(iii) any person may invest in one or more shares of the company at any allotment of Shares by the company or in the open market;
(iv) no person either individually or together with his wife or minor children holds, either directly or through nominees, more than five per centum of the issued share capital;
(v) there are three or more directors each owning one or more shares ;
(vi) none of the directors of the company holds office as director of any other people's company; and
(vii) no other company holds any share either directly or through nominees ;

of managerial and entrepreneurial skills due to poor recruitment of management staff; (3) lack of sound plans and poor management by incompetent board of directors without professional advice; (4) lack of proper mechanisms to monitor and evaluate; and (5) mistrust between farmers company management and farmers (Senanayake, 2002).

(2) Producer groups

The World Bank funded Second Community Development and Livelihood Improvement Project (SCDLIP) is trying to promote Producer Groups (PGs) for marketing of agricultural commodities to fill the vacuum created by the failure of many farmers companies.

Presently the Ministry of Economic Development implements this project. There are five major components of Phase II of the SCDLIP including 1) Intra Village Development, 2) Inter-Village Development, 3) People, Public and Private Partnerships (PPP), 4) Project Management and Monitoring, and 5) Convergence and Policy Support. Formation of PGs is an activity, which comes under People, Public and Private Partnership component. Among these components, component 3) PPP, is expected to develop partnerships between rural communities and private sector and public sector agencies to increase access to new technology and marketing opportunities; and enhance skills for employment generation and off- farm activities especially among unemployed youth.

These Producer groups are being organized only recently in seven districts of the country (Teams Pvt. Ltd: 2013). Among these seven districts Monaragala, Polonnaruwa, Badulla, Ratnapura and Hambantota have been pioneering districts in which PPP arrangements were started under the Project from the first batch of the Phase I onwards. However these programs at present are fraught with a number of difficulties. As a substantial number of years have passed since the introduction of Gemidiriya Project in the Badulla district, the progress made so far in the promotion of the PPPs is more satisfactory than those in many other districts. Many programs are progressing with lesser amount of problems including potatoes (Cargills) Maize (Prima) fresh milk (Milco), Tea leaves (TSHDA) and seed paddy (Dept. of Agrarian Services). The District Federation is coordinating these arrangements satisfactorily. In Ratnapura PPP arrangements exist for a number of commodities including cut flowers (Anthuriums) fresh milk, coir based products, ladies' garments, Kitul Treacle, Bed sheets, and mats. Although there are about 297 VOs in the Ratnapura district, the number of Producer Groups is very small (only 15). The total number of producers engaged in PPP is also very small, altogether 231. Another important feature in the PPP arrangements in Ratnapura is that, except in the case of Milco other buyers who are linked with the producers are themselves micro and small businesses that do not have a sufficient reputation as reliable companies.

3.6.4 Farmer managed societies for livestock development

Milco is a public company, under the Ministry of Livestock and Rural Community Development. It is involved in dairy development, milk collection, processing and marketing. Milco has organized farmers into village level self-managed societies that are called "Farmer Managed Societies" (FMS). These societies are established under the Co-operative Act, and the Department of Co-operative

Development is responsible for the registration of FMS. It provides assistance mainly for their institutional aspect (e.g. annual auditing and inspection), and FMSs daily activities as a society are usually monitored and given advice and instruction by the related department and officers, i.e. Department of Animal Production and Health.

Milco's goal with these FMSs is to develop the Dairy Industry through increased productivity and uplift of socio economic standards of the dairy farmers and get high quality raw milk to meet the requirements of the company. These FMSs usually have a milk collection centre in the community and collect milk at the centre every day from the members, and managed by the farmers to empower themselves to face their challenges such as getting the correct price for their milk, obtaining input services, social welfare etc., collectively. In addition, Milco's vision is for the farmers to get their correct price for milk without interference of any middlemen, and also assure the best of their products to the customers. According to Milco website, up to now it established 2,300 such FMSs in this network, and around 65,000 Farmers (Members) are benefited by this. In turn this network provides 150,000 litres of high quality raw milk daily, which is more than 40% of the national milk collection.

The services provided by Milco to the farmers through the FMSs are listed below.

- Free transport of milk from FMS
- Payment of operational commission to meet the expenses of the FMS
- Daily testing of individual farmer's milk for correct payment
- Maintenance of correct price for the milk supplied by the farmers
- Supply of inputs at subsidized or reduced rates
- Training of farmers for modern dairy farming
- Supply of cattle feed at subsidized prices
- Dairy extension service

Milco also provides benefits under farmers social security fund.

3.7 Agricultural market information system

3.7.1 Price information system by MoCIT/DEC, HARTI

There are six different existing agriculture information systems in Sri Lanka as shown in Table III-8.

Table III-8 Existing agriculture information system

Organi-zation	Name of the information system	Covered information	Frequency of data collection	Publicized/ disclosed
HARTI	Agricultural Marketing Information System (AGMARIS)	■ Wholesale prices of rice and subsidiary food crops	Daily	Publicized, available on website
DCS	Agricultural production database	■ Agriculture and livestock production	Biannually/ annually	Ditto
	Producer and retail prices database	■ Retail and producer's price of food items	Weekly/biweekly/ monthly /quarterly	Ditto

Central Bank of Sri Lanka	Selected weekly economic indicators	■ Average wholesale & retail prices of rice, vegetables, eggs and fish	Weekly	Ditto
MoCIT	Average daily price	■ Average wholesale price of selected crops by selected DECs (Data collection is done by HARTI assistant)	Daily	Ditto
		■ Average wholesale price of selected crops by all DEC	Daily	Not publicized

Source: prepared by the Survey team

Issues of existing agricultural information systems can be summarized as follows.

- Duplication of work among four organizations, which collects price information.
- HARTI and DEC price information is on daily basis but the price information systems of DCS and Central Bank of Sri Lanka are not on time.
- Price information publicized in the website of MoCIT is the data collected by HARTI assistants at only selected DECs. There is no publication of information collected at all the DECs.
- Information coverage is inadequate. Information on marketing cost such as transport, loading and unloading, wastage and trader's profit is totally lacking. international price is not collected or disseminated.
- Lack of analysis of price information. There is a need to compare domestic price with international price.
- Lack of utilization of agricultural information (including quantity data) for decision making by farmers, traders and policymakers.

3.7.2 Information use by players

Based on the interviews with the Deputy Directors of agricultural department in production areas, the usage of price information system by farmers can be summarized as below:

- Farmers: Most farmers get price information through traders. Young farmers know the HARTI price information but they do not utilize it for decision making. Most farmers point out that it is no use to check the retail or wholesale price because anyhow they have to sell their products at the best price offered by the limited options of traders.
- There is a necessity of time series analysis of selling price at DEC. It is one of the most serious problems for farmers because there are big fluctuations of selling price of the products in a year. Farmers should be informed and advised on the strategic timing of planting and harvesting based on the accumulated price data of DEC.

Based on the Sub-contracted survey, it was found out that most of the farmers obtain price information through traders or other farmers.

Table III-9 Source of price information for the producers

Commodity	Number of respondents	Traders	Other farmers	Other	Total
Paddy	16	100%	-	-	100%
Other Field Crops	27	55%	18%	27%	100%
Highland Vegetables	27	22%	56%	22%	100%
Lowland Vegetables	27	63%	0%	37%	100%
Fruits	30	52%	29%	19%	100%

Source: Subcontracted survey 2012

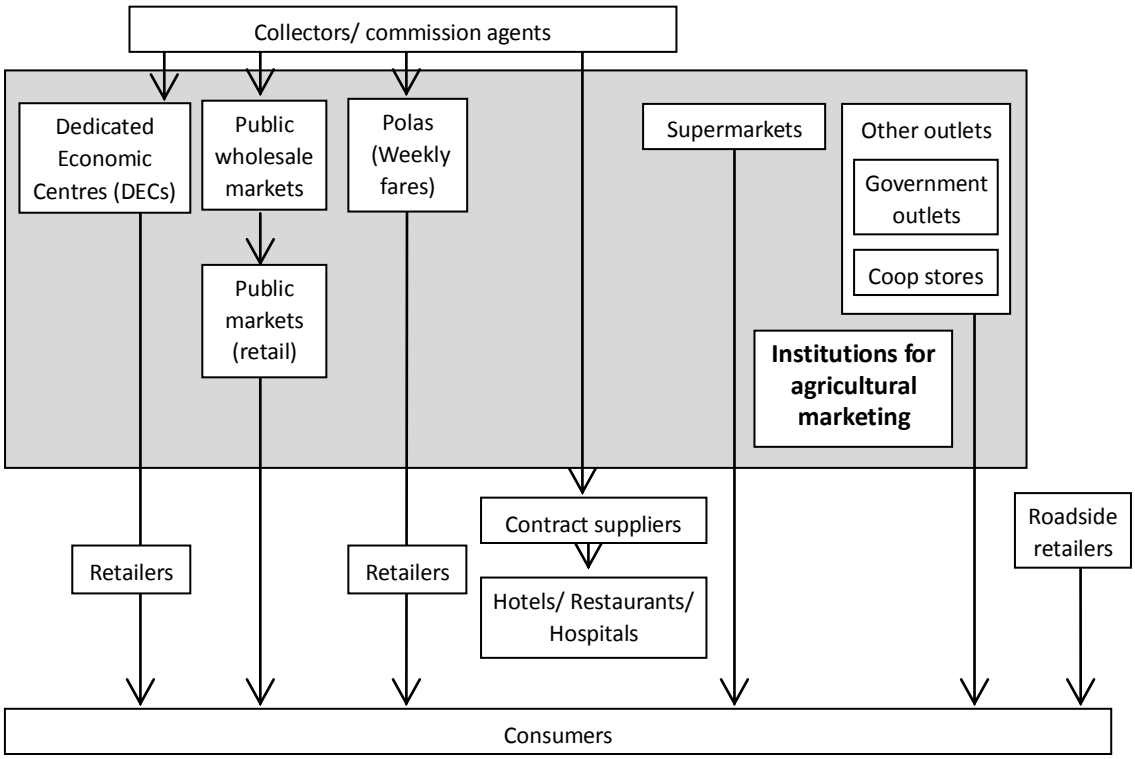
3.8 Institutions for agricultural marketing

3.8.1 Rules and regulations

There is no government organization, which is responsible for the marketing policy of agricultural products. However, there is an organization, which is responsible for the collection of market statistics, namely the Division of Marketing and Food Policy and Agri-Business, established in 1979 in Hector Kobbekaduwa Agrarian Research and Training Institute (HARTI). However, there are many stakeholders related to the marketing of agricultural products and some of them are function under the different government organizations. The current situation makes the marketing of agricultural products quite complicated. Also, in the sector of agricultural marketing in Sri Lanka, the role of private sector is quite large and there are a few rules and regulations to guide or direct their activities.

3.8.2 Institutions for agricultural marketing

Figure III-3 shows the players of the f vegetable and fruit supply chain. Institutions for agricultural marketing namely Dedicated Economic Centers (DECs), public wholesale markets, public markets (retail), Polas (weekly fairs), supermarkets and other outlets (government outlets and coop stores) are shown in the screened box in Figure III-3.



Remarks: DECs, public markets and Polas have either or both of the function of wholesale and retail and there are mutual trading between them. To simplify the figure, wholesale/retail function of them and mutual trading among them are not shown.
Source: Prepared by the Survey team

Figure III-3 Players of the vegetable and fruit supply chain

(1) Dedicated Economic Center (DEC)

DECs, which are a trading centre of agricultural products, are established and supervised by the Ministry of Cooperatives and Internal Trade (MoCIT). DECs mainly function as wholesale markets, but in some DECs, particulary in consumption areas, retail function assumes a greater role. After the opening of the first DEC, at Dambulla, in 1999, other DECs had been constructed consequently. As of October 2012, there were 13 DECs in total and MoCIT is aiming to establish additional three DECs by the end of 2013. However, the legal background for DEC has not been specified so far.

(2) Public wholesale markets

Public markets are managed by the municipal council of its location. Public markets function mainly as retail markets and the local government authorities manage them.

(3) Pola

There are 598[8] Polas (fair, usually open on a specific day of the week) in Sri Lanka and some of them transact quite large quantities of agricultural products. In some cases, local government provides basic infrastructure such as roofs and water facilities. Traders pay usage fee (120 rupees per day per lot:

[8] District Statistical Handbook 2012

around 25 square meters), in the case of Dambulla Pola) to the manager of the Pola.

(4) Supermarket

Cargills, the biggest supermarket chain, has 206 outlets in 23 districts. Keels super, the second largest, has 45 outlets. 24-hours open supermarket chains, Laughs, have 25 outlets. Other retail chain is Arpico, owning 25 outlets.

(5) Other outlets

The government owns retail outlets to provide better quality food with economical prices to consumers. MoCIT has 152 retail shops called Lak Sathosa, which sells fresh and packaged foods and daily necessities. MoF&ARD owns 84 fish retailing shops managed by the CFC.

3.9 Marketing flow of supermarket chains and agri-business companies

3.9.1 Marketing flow of supermarket chains

There are four major supermarket chains in Sri Lanka, such as Cargills, Keells, Laughs and Alpico.

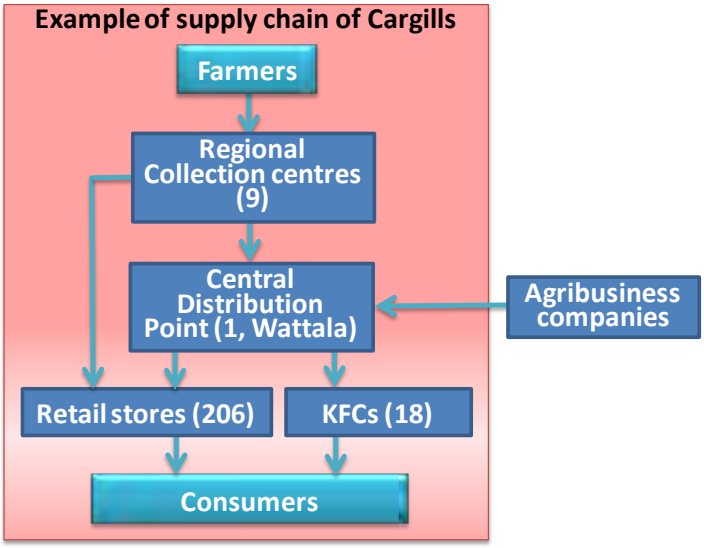
Figure III-6 shown the marketing chain of Cargills as an example of supply chain of supermarket. Cargills has 9 regional collection centres to purchase fruits and vegetables directly from the farmers. At the regional collection centres, "quality parameters" of products are shown in Sinhala (Table III-10). For the ordinary farmers, their requirement is rather strict and they accept remitted amount only. Therefore, numerous farmers prefer to deal with DECs or other wholesale markets. Commodities brought by farmers are graded accoring to quality parameters and those which fail to meet the standards will be rejected. Through this process, farmers increase their understanding towards "standards required by consumers". Agricultural instructors are allocated at each collecting center and training for quality improvement is implemented according to farmers' request.

The regional collection centres announce their requirement of items and quantity of the day to the farmers who has business relationship with them. However, they do not make contract with farmers. The settlement is done in cash on the daily basis. Farmers are able to obtain the higher price from them than collectors because supermarket chains pay the same amount as the wholesale price of the day. In any case, farmers have to cover the cost for transportation from their farms to the collection centres.

The products collected by the regional collection centres are delivered to the central distribution point in Wattala, suburban area of Colombo for the packing and distribution to the retail stores and KFCs. Although some items are delivered directly from the regional collection centres to the retail stores in the vicinity, they account for merely 6% of total volume of agricultural products they deal with. The rest of 94% is delivered through the central distribution point. The wastage is curtailed at 5%.

Figure III-5 shows the location of collection centres and retail stores of Cargills, Figure III-6 shows

those of Keells and Laughs. Figure III-7 shows the location of retail stores of Cargills, Keells, Laughs and Alpico in Colombo district.



Source: Interview to the manager of Central Distibution Point, Cargills Ltd.

Figure III-4 Marketing flow of Cargills

Table III-10 QUALITY PARAMETERS Cargills Collection Centre – Thambuththegama

1. Ash Plantain	Should obtain only the ones which are medium in size & should not obtain the ones which are either smaller in size or with scratches or black marks.
2. Okra	Should be Dark Green in colour. Should not obtain the ones which are Light Yellow or Black in colour. Should obtain the ones which are, slim & medium in size. Should avoid from obtaining the ones, which are out of the shape.
3. Brinjals	Should not obtain the ones in Green colour. Should not obtain the ones which are infected by fungus & should be medium in size.
4. Thalana Batu	Should be Dark Green in colour. Should not obtain the ones which are Yellow in colour, small in shape & infected by fungus.
5. Lime	Should be Dark Green in colour. Should not obtain the ones which are Yellow in colour. The shape should be round & not oval.
6. Luffa	Should be Dark Green in colour. Should not obtain the ones which are Brown in colour & shouldn't be large & out of shape. (size should be convenient to be packed in a crate)
7. Snake Gourd	There should be a regular shape along with the fresh quality & should not obtain the ones which are bend.
8. Green Chili	Tropical Chilies would be most favorable. Should be Dark Green in colour. It should be at least 3" in length & should not obtain the discoloured ones & out of shape ones.
9. Capsicum	Should not be discoloured. It should be at least 3" in length & should be in fresh quality without being out of shape.

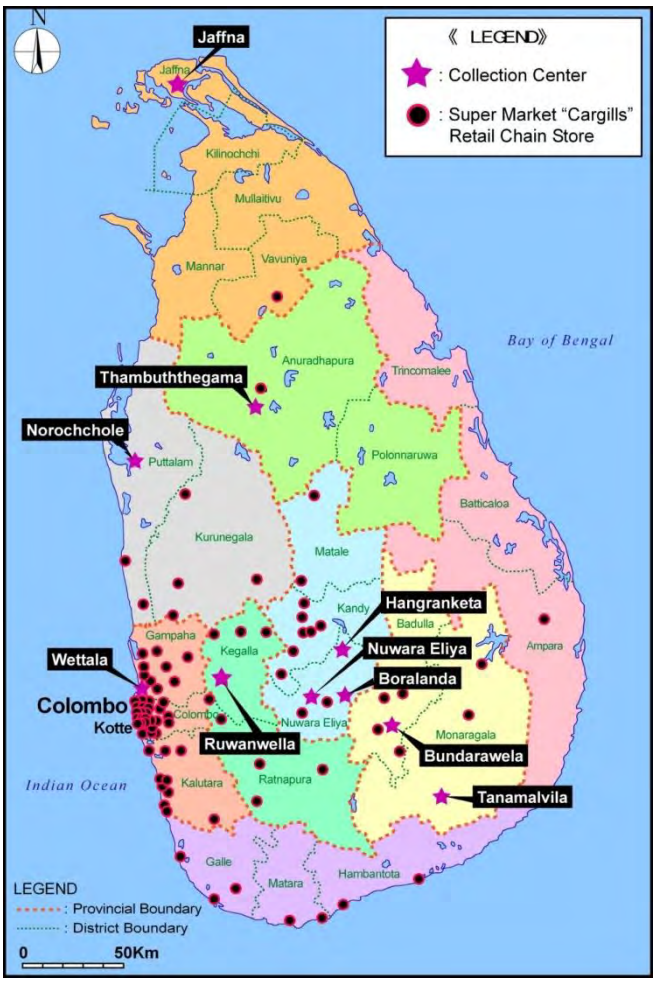


Figure III-5 Location of collection centres and Retail stores (Cargills)

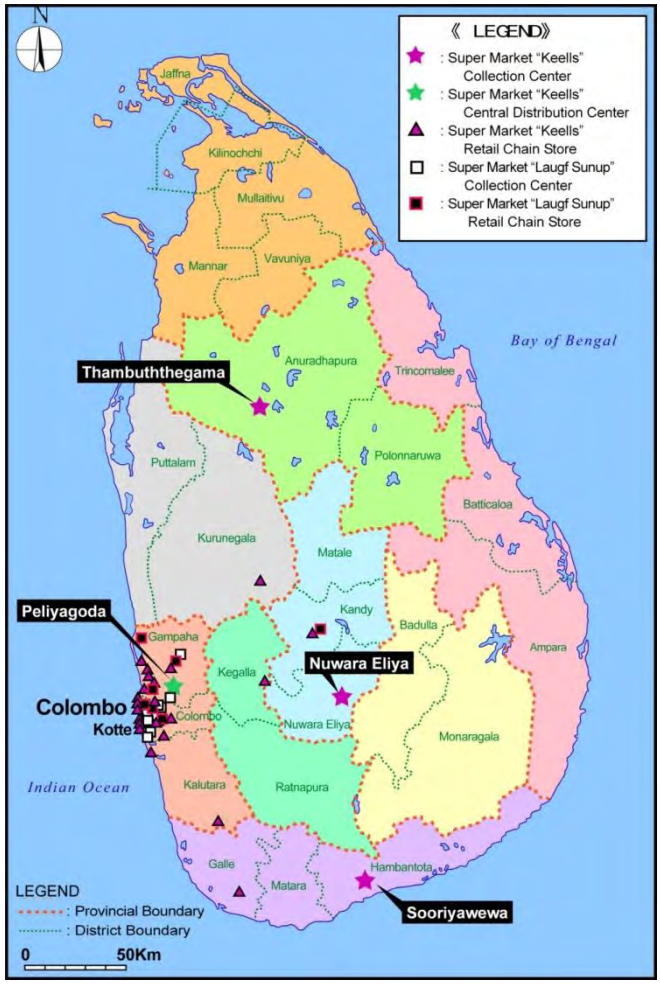


Figure III-6 Location of Collection Centres & retail stores (Keells, Laugfs)

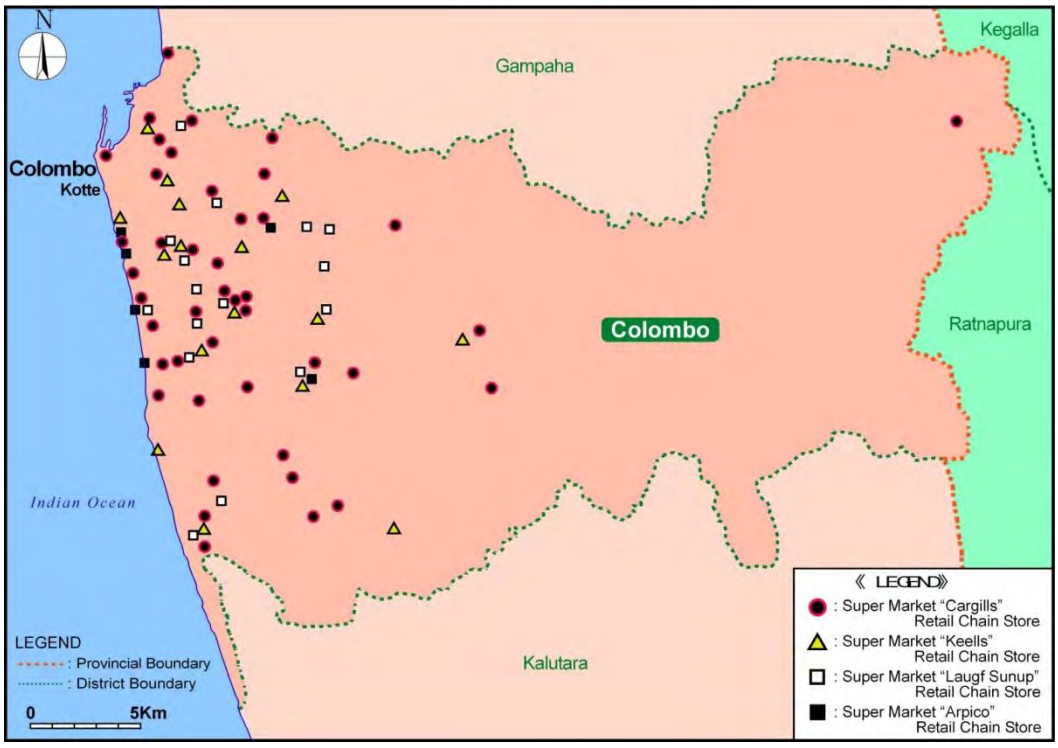


Figure III-7 Location of Supermarket Retail Chain Store in Colombo District

3.9.2 Marketing system of the agri-business companies

There are two major agri-business companies namely CIC and IFCO. The outlines of the companies are shown in Table III-11. CIC sells their products through own retail shops and wholesales the products under CIC bland and original equipment manufacturer as well as export. IFCO focuses on export in addition to the domestic sales.

Table III-11 Outlines of major agri-business companies

Names	CIC Agri Businesses (Private) Limited/ CIC	International Foodstuff Company (Pvt) Ltd/ IFCO
Foundation	1993	1979
Business fields	Production and wholesaling/retailing of fertilizers, seeds and nurseries Training of contract farmers Production/ wholesaling and retailing/ export of fruits, vegetables, meat, eggs and dairy products Operation of the retail shops and fresh juice shops	Selling of nurseries Training of contract farmers Production/ wholesaling and retailing/ export of fruits, vegetables, meat, eggs and dairy products
Number of farms	2 (in total 10,000 acres)	7 (total area is unknown)

Source: Website of CIC and IFCO

Figure III-8 shows the marketing flow of agri-business companies. Agri-business companies collect the agricultural products cultivated at model farms and contract farms to the collection centres, and distribute the products to the own retail shops, supermarket chains and buyers out of countries.

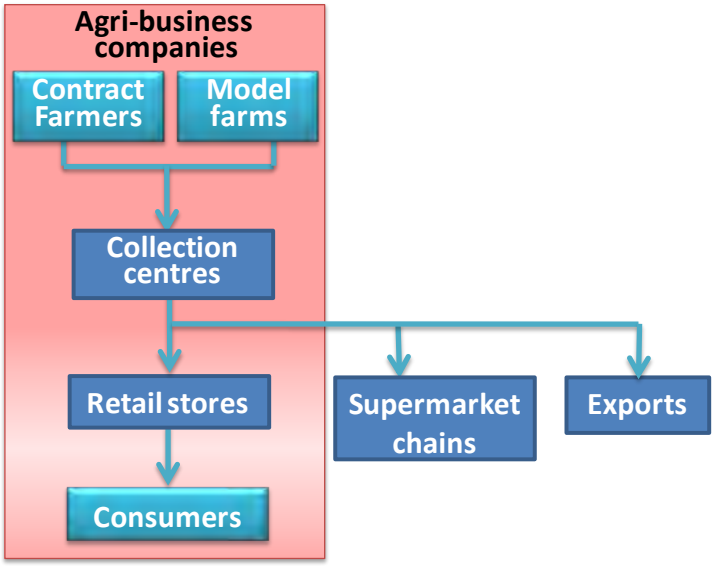


Figure III-8 Marketing flow of agri-business companies

3.10 Importance of DEC

Based on the estimation made by the Survey team, 38% of total agricultural products are traded through DECs. Establishment of DECs changed the style of marketing of agricultural products drastically in the area. The government has a plan to establish additional DECs in the near future and therefore it can be assumed that the role of DEC will be expanding further. In this section, the history and current situation of DECs is summarized.

3.10.1 Background of DECs

The Government of Sri Lanka (GOSL) initiated the establishment of Dedicated Economic Centres (DECs) in late nineties as a solution to the problems faced by farmers to obtain a reasonable price for their produce and to allow the consumers to buy those produce at a reasonable and affordable price. It was identified that the main reasons for the huge disparity in price received by farmers and the price paid by consumers were due to considerable wastage of products in handling, storage and transportation, substantive margins kept by intermediaries in the supply chain, price manipulations by cartels of some wholesalers and due to entire wholesale operation was confined to Colombo. Therefore the GOSL upon evaluating the system existed, implemented a scheme to provide required infrastructure and improve the process involved to decentralize the wholesale operations. This project consisted of establishment of Dedicated Economic Centres with related facilities at places where such wholesale activities have been established for years and streamlining of the marketing process by ensuring availability of market information. Under this project, the very first DEC was established at Dambulla in 1999, followed by the second DEC which was established at Keppetipola in 2001. Subsequently three more DECs at Welisara, Meegoda and Embilipitiya have been added in 2003. During the 6 year period from 2005 to 2010, six DECs have been established at Thambuttegama, Nuwara-Eliya, Veyangoda, Narahenpita, Ratmalana and Piliyandala at a rate of one DEC per year. In addition to above eleven DECs, two special DECs have been established for minor export crops (including spices) at Kurunduwatta in 2008.

Out of twelve DECs six DECs; Dambulla, Embilipitiya, Thambuttegama, Nuwara-Eliya, Keppetipola and Kurunduwatta which are located in production areas, are functioning as collecting centres while remaining six DECs; Welisara, Meegoda, Veyangoda, Narahenpita, Ratmalana and Piliyandala are functioning as distribution centres which are situated within the Western province where approximately 25% of the Sri Lanka's population live.

Figure and Table of DECs location and characters are shown as follows (Figure III-9 and Table III-12).

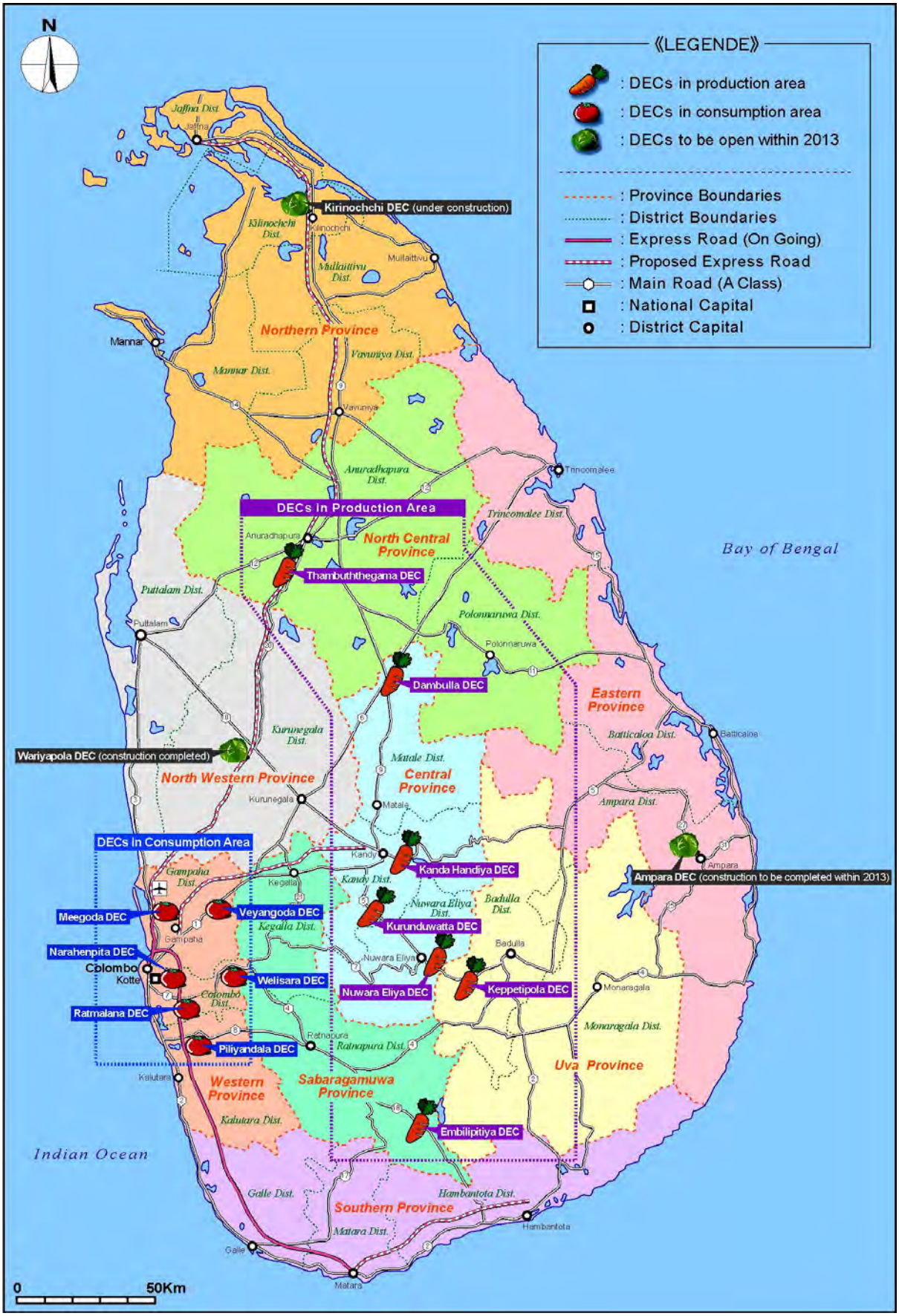


Figure III-9 Present and proposed location of DECs

Table III-12 Summary of present DECs

	Dedicated Economic Centers	Est.	Location (District)	Area (ha)	No of stalls	No. of Traders	Handling capacity (MT/week)	Major commodity	Typr of Function	Facilities
1	Dambulla DEC*	1999	Matale	4.0	146	145	H: 250-350 L: 80-150	Vegetables & fruits	Wholesale	*Big roof General facilities *2)
2	Keppetipola*	2001	Badulla	1.1	56	56	Avg. 40-42	Highland vegetables	Wholesale	*Open hall General facilities
3	Meegoda*	2003	Colombo		104	75	Av. 53-55	Vegetables & fruits	Retail	General facilities
4	Welisara	2003	Gampaha		122	105		Vegetables & fruits	Retail	*Cold storage General facilities
5	Thambuththegam*	2005	Anuradhapura	1.1	56	50	Avg 40-60	Lowland vegetables	Wholesale	General facilities
6	Nuwara Eliya*	2006	Nuwara Eliya	0.9	136	129	Avg 20-22	Highland vegetables	Wholesale	General facilities
7	Veyangoda	2007	Gampaha		64	52	Avg 22-25	Vegetables & fruits	Retail	General facilities
8	Kurunduwatta*	2008	Kandy		15	15		Spices	Wholesale	General facilities
9	Narahenpita*	2008	Colombo	4.9	208	143	Avg 30-35	Vegetable & fruits, consumer items	Retail	General facilities
10	Rathmalana	2009	Colombo		128	110	Avg 10-15	Vegetable & fruits, consumer items	Retail	General facilities
11	Piliyandala	2010	Colombo		56	46	Avg 6-10	Vegetable & fruits, consumer items	Retail	General facilities
12	Embilipitiya	2003	Ratnapura	1.0	45	42		Banana	Wholesale	*Large open hall General facilities

Source: Website of Ministry of Cooperatives and Internal Trade & JICA Survey
*1) Big roof over the stalls was constructed at August 2012.
*2) General Facilities: Stalls, Storage, Parking, Bank, Police, Canteen (Food Shop), Meeting room, Toilet, Generator

3.10.2 Management structure of DEC

DEC is managed by the Management Trust Board, mainly consisting of the government representatives in the district where the DEC is located. Basic organization structure of Management Trust Board is shown in Figure III-10.

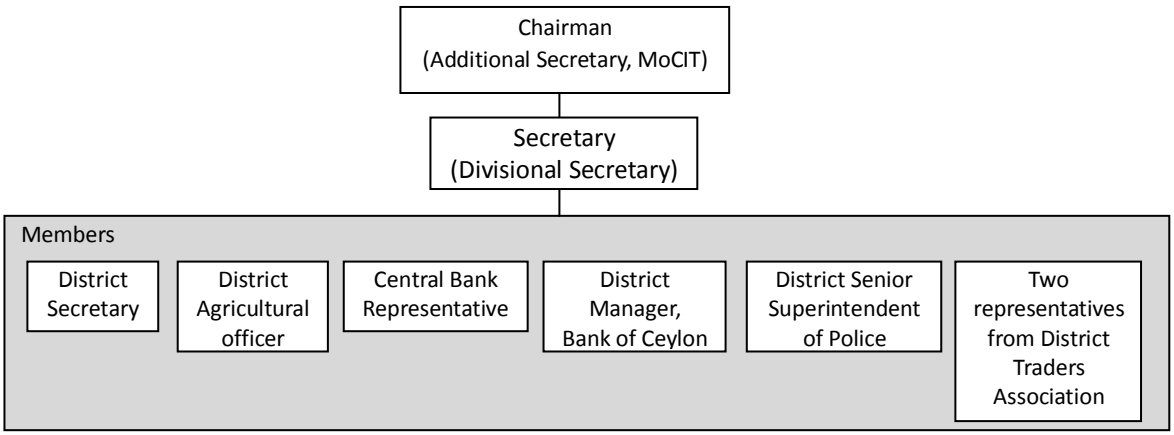
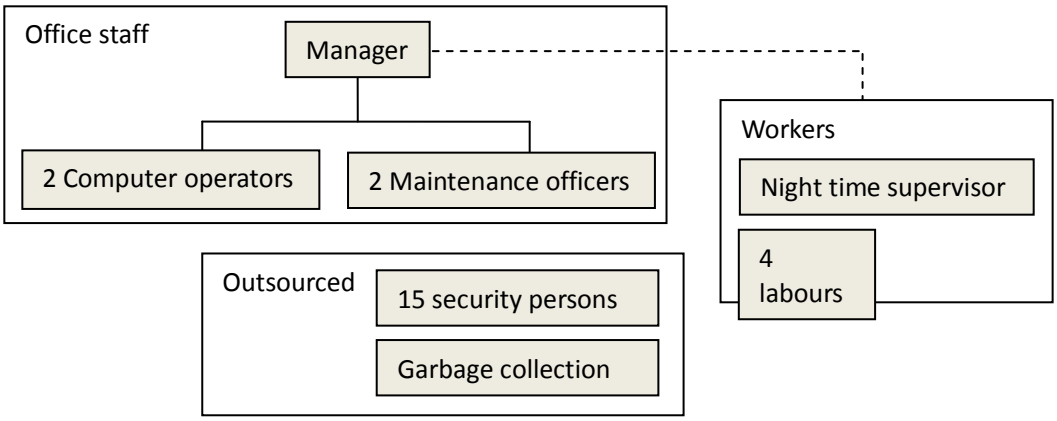


Figure III-10 Basic organization structure of Management Trust Board for DEC

The office staffs under the manager appointed by the Management Trust Board are in charge of the daily operation of DEC. Operational structures and numbers of staff are different by the size or characteristics of the particular DEC. As an example, the operational structure of Dambulla DEC is shown in Figure III-11. In Dambulla, there is no staff dispatched by MoCIT but there are some DECs, which have staff sent by the MoCIT. The main roles of the office staff are management of the facility of DEC, collection of rent from the tenants of the stalls, collection of daily price information and sending them to MoCIT. Trade of agricultural products are completely the business of the private traders, who pay rent of stalls to the DEC. In the case of Dambulla DEC, there are 144 stalls established inside of the facility and which are conducting trading.



Source: Based on the interview to the manager, Dambulla DEC

Figure III-11 Operational structure of Dambulla DEC

3.10.3 Physical facilities of DECs

Facilities provided in DECs are depending on the activities involved, type of products, extent of the catchment for products and volume of products involved. Usually DECs are provided with buildings (for storage, marketing and services), access roads, washing areas, parking areas for transport vehicles and passenger vehicle, utilities such as electricity (permanent and standby), water supply, waste disposal and sewerage disposal and services such as security, cleaning, fire fighting and banking.

(1) Main Components of DECs

Most of the building components in existing DECs were specially constructed for the DEC purpose (eg. Dambulla, Meegoda and Nuwara-Eliya) but for some DECs refurbished buildings have been provided (eg. Welisara; warehouse buildings belonged to Food Department have been refurbished). Almost all the buildings were with concrete structures, concrete block walls, zinc-aluminium roofs with steel frame and concrete floors. In some DECs (Meegoda) cold rooms have been provided for storage of perishable products. Spaces has been provided in buildings for collection, storage, marketing/sales (Wholesale and retail), administration, canteen facilities, banking and toilets.

Especially, the big roof construction which constructed over the existing stalls at August, 2012 was remarkable rehabilitation for DEC of Dambulla. This rehabilitated area under the big roof has been using not only for the truck access also for the handling and temporary stock space of vegetable and fruits.

(2) Access Roads

Access roads have been provided from main trunk roads to DECs where DECs are located away from such trunk roads. Most of the access roads are existing roads which have been improved / upgraded to cater for increased traffic conditions due to the establishment of DECs and are consisted of asphalt paved, two lane single carriageway configurations with wide shoulders. In addition to access roads, roads from production areas to DECs and main trunk roads between DECs have been improved / upgraded under separate projects coming under the Ministry of Highways and Ministry of Provincial Councils.

(3) Parking Areas

Parking areas have been provided in every DEC and the number of lots for each type of vehicle is depended on the basic functions of the DEC, type and volume of products exchanged and % of mode of marketing (either retail or wholesale) involved. DECs which are functioning only as collection centres in production areas (Such as Dambulla), almost all the parking lots were for transport vehicles while in DECs which are also functioning as retail marketing centres, considerable number of parking lots have been allocated for passenger vehicles.

(4) Utilities

Permanent electricity connections from National Grid (with dedicated transformers for considerably larger ones) have been provided for all DECs, in addition to providing standby generators for most of

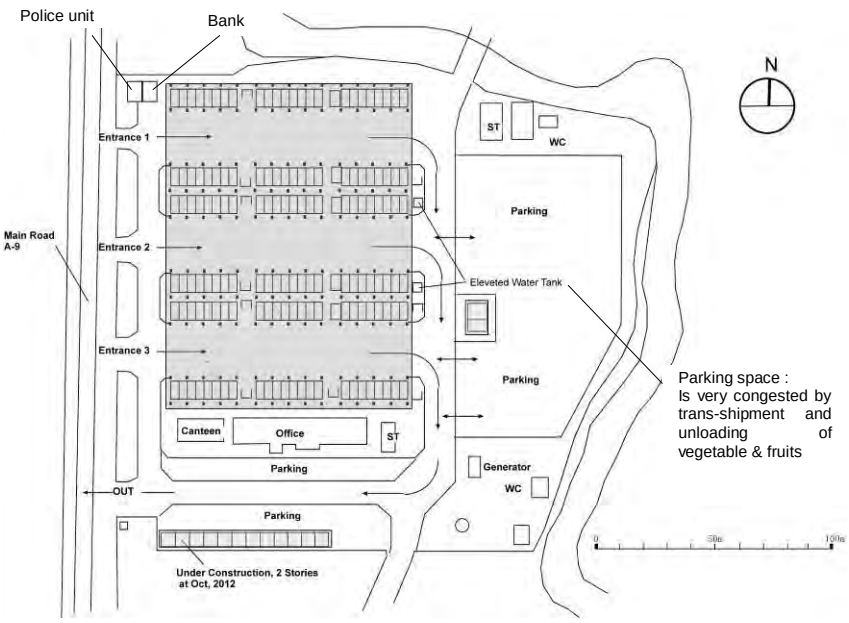
the DECs. Also all the DECs were provided with water supply from public mains by Water Supply & Drainage Board while some of the DECs have been provided with shallow wells and all DECs have been provided with storage tanks. For sewerage disposal, septic tanks of suitable sizes have been provided depending on the number of users involved. Most of the DECs, solid waste disposal has been arranged through the respective local authority.

(5) Other Services

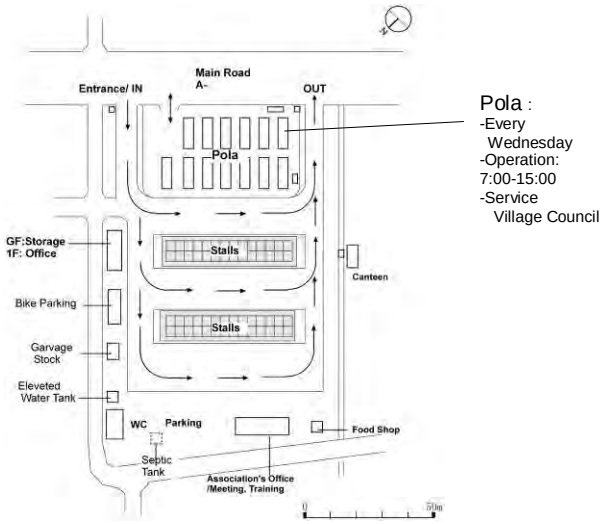
Every DEC has been provided with canteens, toilet facilities, security services, cleaning services, fire fighting arrangements, storm water drainage systems, external lighting, boundary fences with gates, police units and banking facilities.

3.10.4 Outline of several DECs located in production areas

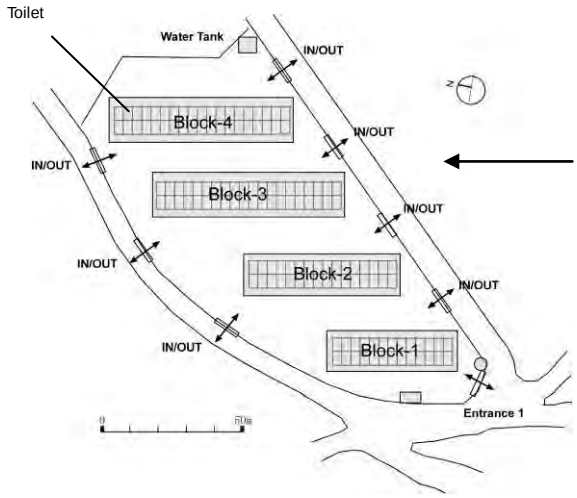
1) Dambulla DEC (Matale District)

Layout Plan	Facilities Note
	● Establishment : 1999 (First DEC) ● Access road : National Road A-9 ● Site Area : Approx. 4ha ● Building Structure :RC+Block Masonry ● Big Roof Structure : Steel Frame ● Number of Stalls : 146 Nos Size: 3.5m x 7.0m ● Stories -Office: 2 stories -Stalls: 1 story with Mezzanine floor (Note) Big Roof was constructed at August 2012. Above mentioned number of stalls are not including small food shops (5 nos).

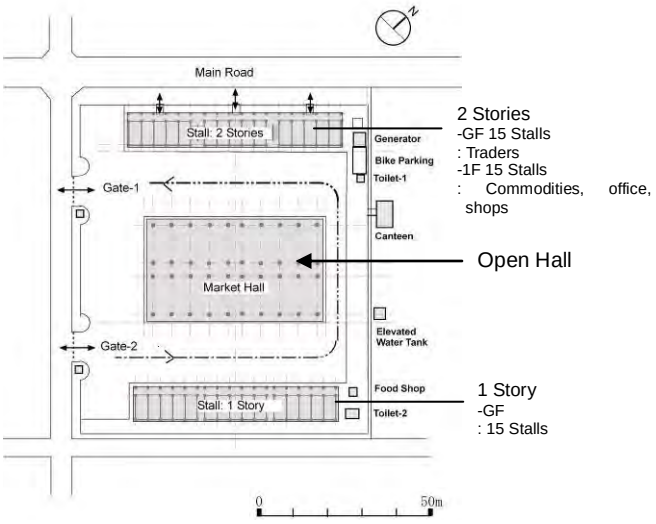
2) Thambuttegama DEC (Anuradhapura District)

Layout Plan	Facilities Note
	● Establishment : 2005 ● Access road : National Road ● Site Area : Approx. 1.1ha ● Building Structure :RC+Block Masonry ● Roof Structure : Steel Frame ● Number of Stalls : 56 Nos Size: 3.5m x 6.0m ● Stories -Office: 2 stories -Stalls: 1 story (Note) Pola is locating beside the DEC.

3) Nuwara Eliya DEC (Nuwara Eliya District)

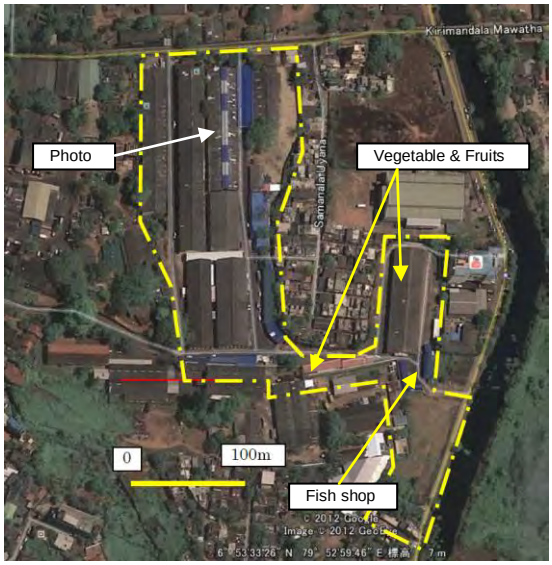
Layout Plan	Facilities Note
	● Establishment : 2006 ● Access road : National Road ● Site Area : Approx. 0.9ha ● Building Structure :RC+Block Masonry ● Roof Structure : Steel Frame ● Number of Stalls : 136 Nos Size: 3.3m x 5.0m ● Stories -Stall Blocks: 2 stories (Note) 8 entrance are operating.

4) Embilipitiya DEC (Ratnapura District)

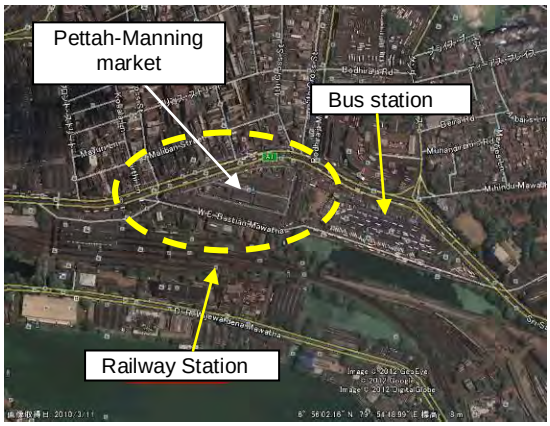
Layout Plan	Facilities Note
	● Establishment : 2003 ● Access road : National Road B-486 ● Site Area : Approx. 1.0ha ● Building Structure :RC+Block Masonry ● Roof Structure : Steel Frame ● Number of Stalls : 45 Nos Size: 3.6m x 6.6m ● Stories -Office: 2 stories -Stalls: 1 story (Note) Open hall is operating on Saturday and Tuesday only (5:00-12:00).

3.10.5 Outline of DEC & Other markets located at consumer area

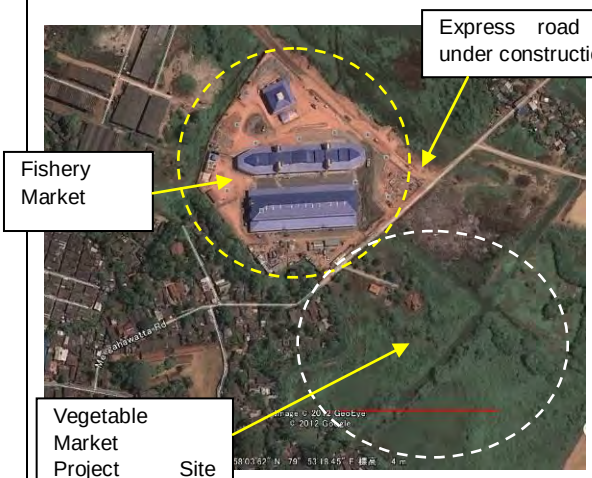
1) Narahenpita DEC (Colombo District)

Location Satelite Photo (Google)	Photo of Inside	Facilities Note
	 Stalls: - Most items are consumer items. -Some vegetable & fruits, paddy retail shops - Fish shops - Food shops	● Establishment : 2008 ● Access road :Kirimandala Mawatha Road ● Site Area : Approx. 4.9ha ● Building Structure :RC+Block Masonry ● Roof Structure : Steel Frame ● Number of Stalls : 208 Nos ● Stories -Stall Block: 2 stories & 1 story

2) Pettah-Manning market (Colombo District)

Location Satelite Photo (Google)	Photo of Inside	Facilities Note
	 Stalls: - Most items are vegetable & fruits - Very old facilities - Lack of sanitary situation	● Establishment : 1983 ● Access road : ● Site Area : Approx. 2.5ha ● Building Structure : Wood ● Roof Structure : Wooden Frame ● Number of Stalls : 300 Nos ● Stories 1 story (Note) UDA has a plan to shift this market function beside the new fish market.

3) Fishery Market (Colombo /Peliyagoda)

Location Satelite Photo (Google)	Photo of Inside	Facilities Note
	 Stalls: - GF: Fishery activities use -1F: Bank, net cafe, trader's office, canteen, others	● Establishment : 2011 ● Access road : ● Site Area : Approx. 3.8ha ● Building Structure :RC+Block Masonry ● Roof Structure : Steel Frame ● Number of Stalls : 154 Nos ● Stories 2 stories (Note) Ice plant is at same site. Express road beside the site is under construction.

3.10.6 Future plan of DEC by MoCIT

Although MoCIT does not have a development plan for the DECs, they have a rough paper of future plan of DEC construction. According to their plan, three additional DECs will be constructed by the target year of 2013. However, as of the end of 2012, numbers of DECs in operation are 13 and their plan is behind of the schedule.

Table III-13 Plan of DEC by Ministry of Cooperatives and Internal Trade

(as of February 2013)

Priority areas	Objectives	Main performance indicators	Based year 2010	2011		2012		2013 Targets	Remarks
				Target	Progress	Target	Progress		
Protecting the consumer throughout the marketing process	Empowering the competitive & fair business	Number of functioning DECs	12 Dambulla Welisara Veyangoda Piliyadala Ratmalana Embilipitiya Meegoda Nuwara Eliya Thambuththegama Keppetipola Narahenpita Kurunduwatta	13	12	15	13 Kanda Handiya	15 Wariyapola Kilinochchi Ampara	The construction of Wariyapola DEC is completed & it is advertised on papers on 01.07.2012 calling for tender. The construction of Kiliochichi DEC is on going. Construction work of Ampara DEC will be started and completed within 2013.

IV. VALUE CHAIN ANALYSIS OF AGRICULTURAL COMMODITIES

4.1 Outline of the subcontracted value chain survey

4.1.1 Background

A marketing flow and value chain survey covering the agricultural marketing sector, including fisheries and livestock was carried out to grasp the current situation of these sectors in view of the lack and/or absence of relevant data and information. The survey was assigned to a local Sri Lankan company and carried out according to the Terms of Reference (TOR) prepared by the Survey team. The specific objectives of the survey are as follows:

- Analyze cost of production and margin,
- Analyze market arrivals and wastage
- Analyze marketing costs and margins
- Analyze problems/constraints hindering efficient input supply, production and distribution

The survey was conducted in two stages as explained below with respective objectives; approach and TOR of the two stages are delineated below.

Stage	Contents	Schedule
First Stage	■ Marketing Flow and Value-Chain Analysis Survey ■ Marketing Infrastructure Survey	August/ September 2012
Second Stage	■ Survey of DECs (inflow/outflow of vehicles and Agricultural products) ■ Tracing Survey of selected products	November/ December 2012

4.1.2 Methodology

This study was based on the value chain approach, which focuses on all the activities, players and relationships between and among players from input supply to consumption. Both quantitative and qualitative data were collected. Quantitative data were collected through four surveys: 1) market inflow, 2) market outflow, 3) trader and 4) tracing.

Qualitative data was collected from interactions with farmers, traders, exporters, transporters and government officials. Research team was led the discussions in the field and observed the market operations such as packing, handling, transporting and buying.

In the tracing survey, crops were selected on the basis of availability in the market (in season) and major marketing channels were selected. For the trader surveys two DECs were selected, namely Dambulla, the Sri Lanka's largest DEC, and Thambuttegama, an average-scale DEC in a production area, for enumeration survey of inflow/outflow of commodities and vehicles in view of the location.

Five DECs were selected in the production areas and 1 DEC was selected in the consumption area based on the findings of the general survey conducted in November 2012. Accordingly, commodities and market channels were selected. For the trader survey a complete enumeration of traders in the particular DECs was done.

4.1.3 Survey areas and scope of work

The survey areas, scope of work, methodology and time of the surveys are summarized in the following tables.

Table IV-1 Value chain survey areas and scope of work

Stage	Scope of work	Survey Items & Targets	Survey methodology	Survey areas	Survey Period (Timeline)
First stage	Marketing Flow and Value-Chain Survey	- Refer the report of the Sub-contracted survey - Major products of each category by major production areas were selected - Market players, transaction volumes, buying & selling prices, etc. - Producers, traders/suppliers, processors/exporters, supermarkets, farmers' organizations, etc. - Marketing Information	- Structured questionnaires - Training of enumerators - Focus group discussions	- Whole of Sri Lanka - All DECs and wholesale markets	Late August / September 2012
	Marketing Infrastructure Survey	- Marketing & distribution facilities (products collection, sorting, processing and packaging, etc. - DECs and wholesale markets - Road networks between supply and consumption areas - Utilities relevant to marketing & distribution (water, power, garbage disposal, wastewater treatment, etc.	- Structured questionnaires - Interviews of relevant authorities and persons.		Late August / September 2012
Second stage	Inflow and outflow of vehicles and handling volume of DEC	- Inflow and Outflow of agricultural commodities (daily handling volume) of Dambulla DEC and Thambuttegama DEC	- Use of trained enumerators and structured formats - Target participants: collectors, wholesalers, retailers, commission agents, Pola traders - Counting of vehicles movement (entering & exiting) and estimating inflow & outflow of commodities by major category - Counting commenced from the first vehicle arrival till midnight in case of Dambulla and till 12:00 noon for Thambuttegama DEC	- Dambulla DEC (in Matale district) and Thambuttegama DEC (in Anuradhapura district)	November 31 to December 10, 2012
	Traders (Stall owners) Survey	- Marketing & distribution facilities (products collection, sorting, processing and packaging, etc. - DECs and wholesale markets - Road networks between supply and consumption areas - Utilities relevant to marketing & distribution (water, power, garbage disposal, wastewater treatment, etc.	- Structured of format - Direct interview of stall owners (traders or commission agents). - Traded volume by major type of commodities for each DEC in supply area. - Collect traded volume information for a particular day.	- Dambulla DEC - Thambuttegama DEC - Nuwara Eliya DEC - Keppetipola DEC - Embilipitiya DEC - Meegoda DEC	December 10 – 17

	Tracing Survey	- Selected products in season for each category. - Red onions, big onions, cabbage, carrots, leeks, tomatoes/beans, brinjal, okra, pineapple, papaya, banana - Poultry, eggs and milk - Selected fish species in season	- Tracing survey with tags on the selected item, and to follow through DECs, wholesale market to Pola market and/or retail markets. - Producer (farmer/out-grower/fishermen – Collector—Commission agents—Buyer (wholesaler or retailer) -- Consumer	- Norochcholai (Puttalam) - Dambulla (Matale) - Kandapola (Nuwara Eliya) - Bandarawela (Badulla) - Nochchiyagama (Anuradhapura) - Kurunegala - Gampaha - Embilipitiya - Tangalle (H'tota) - Pesalai (Mannar) - Peliyagoda (Colombo)	December 10 – 17

4.1.4 Sample size

First stage survey was carried out in both production areas and consumption areas. The total sample size in production areas was 454, in consumption area it was 239.

Table IV-2 Sample size of first stage survey

Area	Commodity	Producers	Collectors	Wholesalers	Transporters	Total
Production	Paddy	16	20	10	10	76
	Other Field Crops	27	15	11	10	63
	Highland vegetables	27	12	13	8	60
	Lowland vegetables	27	12	13	8	60
	Fruits	30	16	14	8	68
	Fish	30	15	15	8	68
	Livestock	26	12	13	8	59
	Total	183	102	89	60	454
Consumption	Paddy	8	12	-	-	20
	Other Field Crops	11	20	-	1	32
	Highland Vegetables	11	22	-	4	37
	Lowland Vegetables	11	22	-	4	37
	Fruits	10	22	4	3	37
	Fish	11	22	2	2	39
	Livestock	11	22	4	-	37
	Total	74	142	10	15	239

Second stage survey was carried out at 5 DECs in production area and 1 DEC in consumption area. All stores of selected 6 DECs were targeted for the data collection on items and volume of transaction. At Dambulla DEC and Thambuththegama DEC, inflow and outflow of vehicles and handling volume survey were also carried put. In addition to the above, tracing survey of price of 20 selected commodities was implemented.

Table IV-3 Sample size of second stage survey

Inflow and outflow of vehicles and handling volume of DEC[1)]	Day		Dambulla DEC	Thambuttegama DEC	Nuwara Eliya DEC	Keppetipola DEC	Embilipitiya DEC	Meegoda DEC
	1	Inflow	878	387	-	-	-	-
		Outflow	547	190	-	-	-	-
	2	Inflow	795	472	-	-	-	-
		Outflow	489	182	-	-	-	-
Traders Survey[2)]			145	56	85	46	40	67
Repeat of Traders Survey			-	-	Repeated-	Repeated	Repeated	Repeated
Tracing survey			Vegetables 7 OFC 2 Fruits 2 Dairy 3 Poultry 1 Egg 1 Fish 4					

Remarks:

1) Inflow and outflow surveys were conducted twice to capture the variability

2) Due to traders' fear of opening income tax and their market shares, the data was collected anonymously to obtain accurate figures.

4.2 Results of value chain survey

The data used in this section is collected through the first stage survey conducted in August to September, 2012.

4.2.1 Paddy/rice

(1) Value Chain Players

Value chain includes intermediaries from input supply to consumption. Major players in the value chain of rice are described in this section with their roles based on the findings of the general survey, key personnel interviews and focus group discussions. With regard to rice, rice millers play a major role in the value chain due to the unique characteristic of rice that it needs to be de-husked before consumption. The financial strength of the millers places them in a very advantageous position to purchase and hold un-husked rice. Often rice millers are blamed for market manipulation to lower the purchase price of paddy and increase the price of rice.

(2) Major findings

1) Farmers (Sample size =16)

- 31% of the farmers own less than 5 acres.
- Tenant farmers are 31% of the total sample while 50% are owner cultivators.
- 62% of them are members of farmers organizations, however, only 56% of them answered that their organizations were effective.
- The average amount of marketable surplus of paddy is 91%.
- Almost all the farmers sold their paddy to collectors except in the Southern province where 75% farmers sold to millers. Farmers only from Eastern and North Central provinces sold to the Paddy Marketing Board (PMB) as reported by 33 and 67% respectively. Since PMB purchased only a limited quantity, bulk of their marketed surplus was also sold to collectors. Major problems reported in selling paddy to PMB were long queuing time (46%), inability to meet the quality (36%) and cumbersome paper work process (18%).

2) Collectors (Sample size =20)

- Major reasons given for choosing this business are good income (24%), spare time activity (24%) and being a family business (20%).
- On average, a collector has 65 regular farmers. 41% of the collectors provided credit to the farmers.
- 25% of collectors are involved in paddy farming.
- 41% of the collectors borrowed money from banks.
- 54% of the quantity purchased by collectors was sold to millers in the town followed by 27% to the millers in the village and 19% to the millers outside the district.
- 61% get price information from other collectors and millers while 38% collectors reported

that they get prices and production information from farmers. With regard to Trade Associations, 47% of the collectors, who were reported from all the provinces concerned, are aware of such Associations and 31% of them are members of these associations. The performance of Trade Associations is not satisfactory as reported by 84% of the collectors.

- Major marketing problems reported by collectors are limited investment capacity (52%), lack of regular supply (31%), poor roads (15%), poor quality (15%) and irregular imports (15%).

2) Paddy millers (Sample size =20)

- 71% of the rice mills belonged to the category of sole proprietor and 19% were partnership mills.
- Average milling capacity is 11 mt/day
- 88 % of the millers paid famers at the time of purchasing paddy.
- All the millers in the sample borrowed money both from state banks (76%) and private banks (24%). Average amount borrowed per miller amounted to Rs. 12.8 million.
- 58 % of the quantity of rice was sold at mills and the rest by delivery.
- Major problems cited by millers are low quality of paddy (65%), high electricity cost (20%) and unstable price (15%).

3) Supply side wholesalers (Sample size =10)

- None of the wholesalers are involved in farming.
- No one in the sample stored rice and only 20 % of wholesalers transported rice. In other words, 80% of the wholesalers purchased rice at shops and it was delivered by either millers or big wholesalers.
- 60% of the wholesalers purchased rice at their own business place.
- Payment was made on the spot as reported by 80% of wholesalers.
- Regarding borrowing money, 70% answered “no”.
- 30% of them were members of traders associations. These trade organizations are not effective as reported by 90 % of the wholesalers.
- Major marketing problems reported were poor quality (37%), irregular imports (37%) and inadequacy of market facilities (12%).

4) Demand side wholesalers (Sample size =8)

- 75 % of the wholesalers purchased rice from millers and the rest (25%) from wholesalers at Marandagahamula.
- Problems faced by them are lack of storage facilities (37%), inadequacy of market facilities’ (27%) and government regulation such as price control and taxes (27%).

5) Demand side retailers (Sample size =12)

- Retailers purchase rice from millers (62%) and wholesalers (38%).

- Problems faced by them are government regulation such as price control and taxes (75%) inadequacy of market facilities (50%) and lack of storage facilities (25%).

(3) Marketing flow

Figure IV-1 depicts the marketing flow of paddy into rice millers and rice from millers to consumers. Percent values give the transaction volume of each player in the value chain. Farmers mainly sell to the village collectors and selling to PMB is not significant. Similarly millers mainly sell rice to wholesalers.

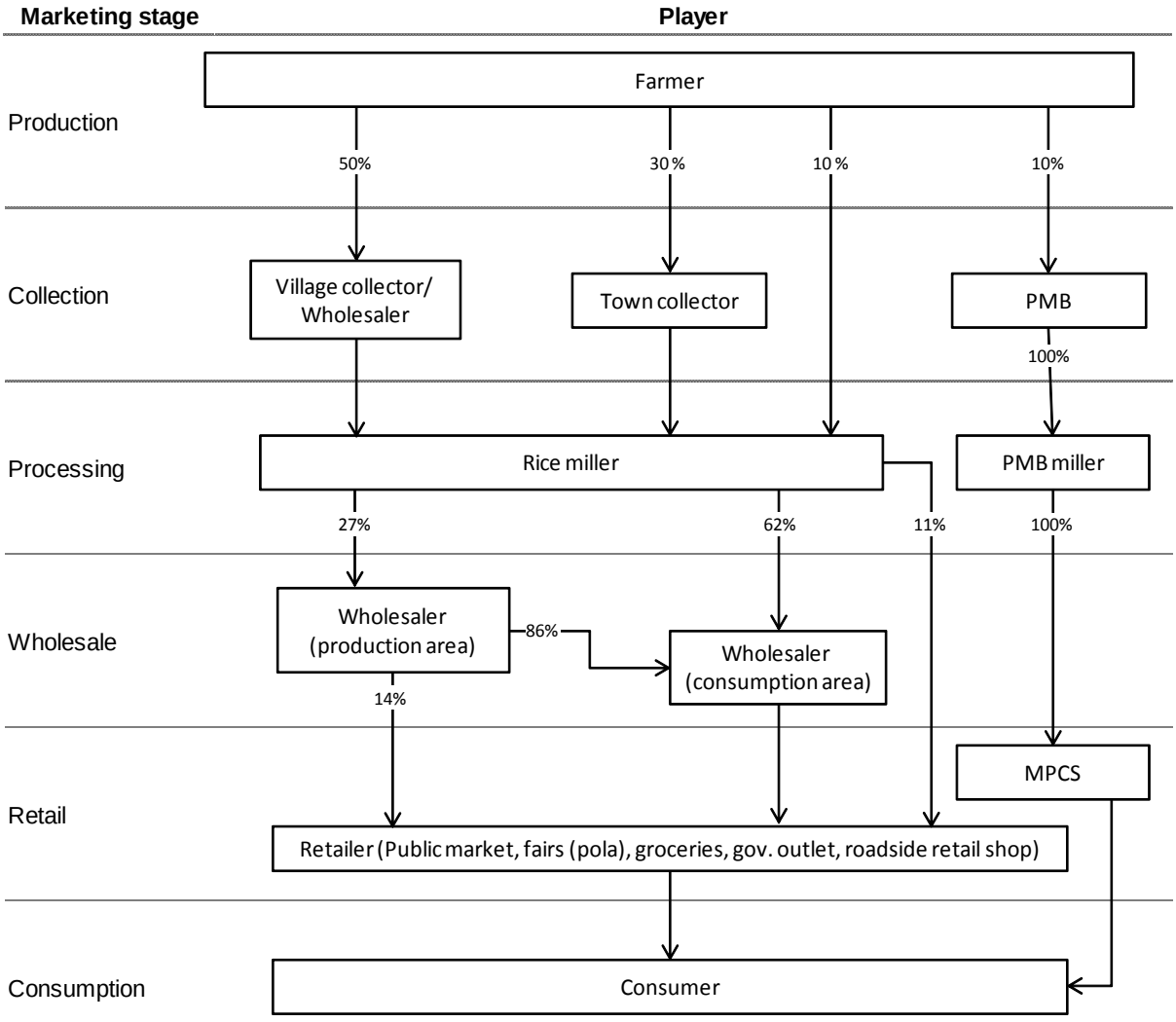


Figure IV-1 Marketing flow of paddy / rice

Remarks: MPCS (Multi-purpose Cooperative Societies) is excluded as its sample number was small.

4.2.2 Value Chain of Other Field Crops

(1) Value chain players

Value chain includes intermediaries from input suppliers to consumers. Major players in the value chain of Other Field Crops (OFC) are described in this section with their roles based on the findings of the general survey, key personnel interviews and focus group discussions.

(2) Major findings

1) Farmers (Sample size=27)

- 93% of the famers in the entire sample reported incomes derived from OFC faming as their major source.
- 82% of the farmers had more than two acres and only 18% reported owning less than one acre. Similarly, 23% of the farmers had more than five acres. Compared to paddy, vegetables and fruits, OFC farm size is relatively big.
- Regarding land ownership, the survey found three categories of farmers: tenant (29%), lease/rent (15%) and own land (56%).
- Farmers consider many factors in selecting OFC crops: high price (56%), easy to cultivate (56%), crop popularity (48%), soil suitability (48%) and assured market (37%). (multiple answers)
- 8%of the farmers were involved in sorting, 19% in grading and 23% in packing on average and results vary by crops.
- 78% of farmers are members of the farmer organizations. Only 16% of the farmers reported that these organizations are effective.
- For most of the OFC, marketable surplus is over 95%.
- 30% % of the farmers sold to the Dedicated Economic Centres (DEC), 28% to the collectors and 16 % to town wholesalers.
- Factors affecting selection of buyers by farmers were ascertained and it was found that high price (41%), credibility (33%), on time payment (30%) and proximity (22%) are major determinants.
- Major reported marketing problems are low price (74%) and high transport cost (63%).

2) Collectors (Sample size=15)

- 75% of the collectors purchased at their centres including DEC.
- On average, each collector has about 25 regular farmers.
- Regarding provision of credit to farmers, the average collector provides credit to 29 farmers and amount given to a farmer averaged Rs 5,071.
- Only 18% of the collectors borrowed money from private banks.

- Collectors received price information from traders (77%) and famers (13%).
- 59% of the collectors are the members of trade associations and all members reported effectiveness of trade associations.
- Major marketing problems reported by collectors are lack of storage facilities (74%), poor roads (52%) and competition from imports (18%).

3) Supply side wholesalers (Sample size=11)

- The three major reasons given by the wholesalers to enter into the business are good income (46%), absence of other employment opportunities (38%), family business (23%) and social recognition (23%)
- Most wholesalers carry out only buying and selling activities. A few (8%) of the wholesalers were involved in holding stocks, primary processing such as cleaning and sorting.
- 57% of the wholesalers purchased OFC from farmers, 26% from village collectors and 15% from town collectors.
- Payment was largely made on the spot as reported by 85% of the wholesalers.
- They also provide credit to famers. On average, a total of 13 farmers per trader were observed. The credit amount given to a farmer was Rs 4,975 on average.
- Majority (25%) sell to public market retailers, to fair retailers 25%, and to town wholesalers 17 %.
- 46% are members of traders associations. In case of effectiveness, 46% of the wholesalers mentioned that they are effective.
- Major marketing problems reported were competition from imports (69%), high interest rates (57%), and lack of storage facilities (48%).
- 50% of wholesalers purchased OFC from contract suppliers, 22% from importers, 17% from collectors and 11 % from farmers.
- Majority (85%) of wholesalers used their own transport.
- Payments are largely made on the spot as reported by 86% of the wholesalers.
- Problems faced by the wholesalers in demand areas are competition from imports (96%), lack of storage facilities (63%), high transport cost (58%) and inadequacy of market facilities (41%).

4) Consumption area retailers (Sample size=20)

- Retailers mainly purchase OFC from Pettah-Manning market (34%) contract suppliers (24%) and wholesalers (18%). 6% purchase directly from farmers, 15% from DECs.
- Wastage was around 5 %.

(3) Marketing flow

Marketing of OFC from producer to consumer is shown in Figure IV-2.

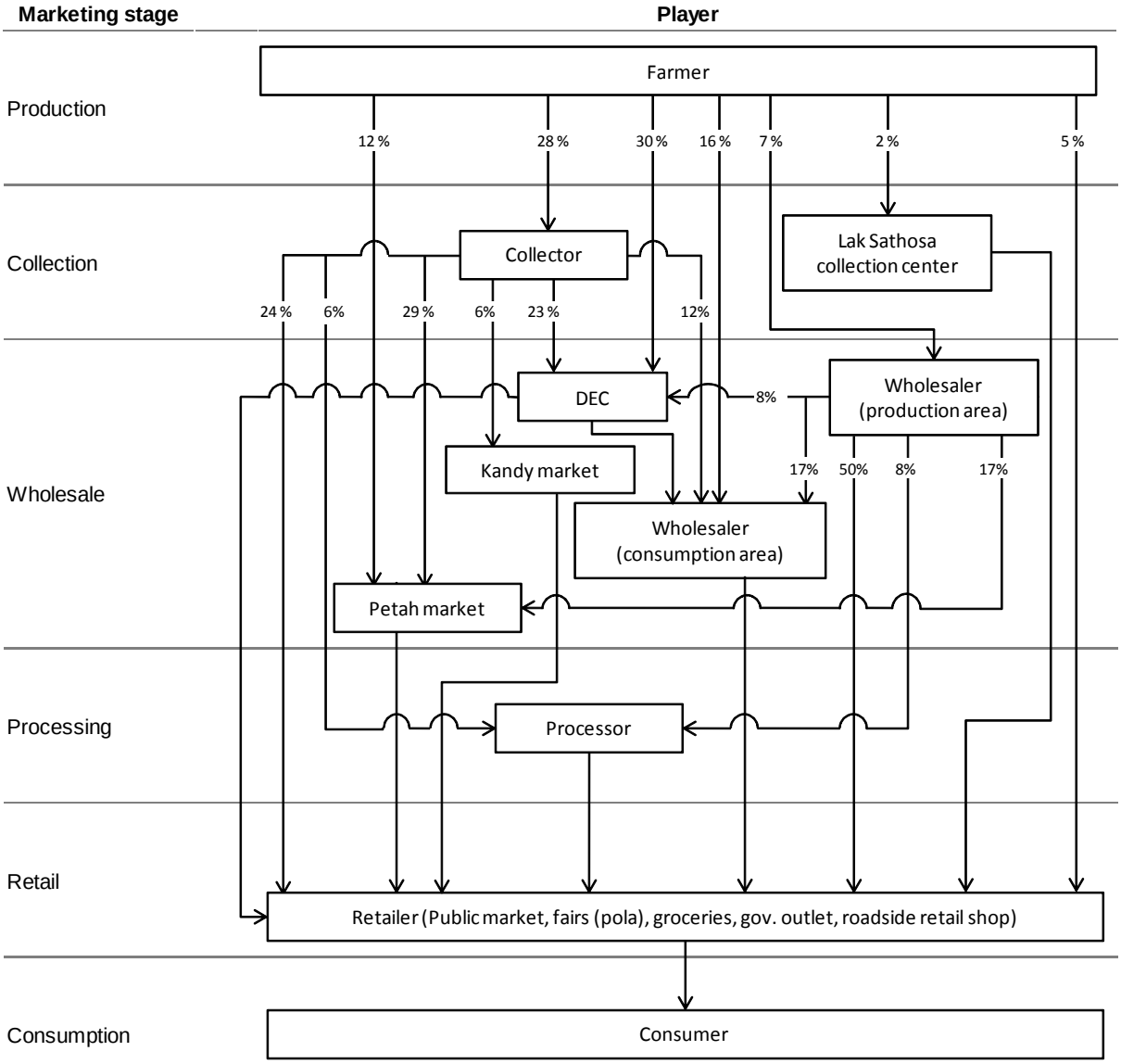


Figure IV-2 Marketing flow of OFC

4.2.3 Value Chain of highland vegetables

(1) Value chain players

Value chain includes intermediaries from input suppliers to consumers. Major players in the highland vegetable value chain are described in this section with their roles based on the findings of the general survey, key personnel interviews and focus group discussions.

(2) Major findings

1) Farmers (Sample size=27)

- 93% of the farmers reported incomes derived from highland vegetable faming as the major source of income.
- With regard to the farm size, 37% of the farmers had half an acre or less and only 18% reported having more than two acres. This confirms predominance of the small-scale vegetable farming in the country.
- 85% of the highland vegetable farmers were owner operators.
- High price (74%) and ease of cultivation (44%) are two major reasons affecting crop selection. Key person interviews and focus group discussions reveal that farmers consider prices in the previous season and if they were high many farmers grow the same vegetables in the following season. That results in increased production and lower prices. This is clearly evident from tomato price crisis seen in October 2012. Tomato prices were high in May and June in the year and hence many farmers cultivated more tomatoes in August and harvested in October 2012. Prices came down even below Rs 5.0/kg and many farmers did not even harvest the crop.
- 63% of them are members of farmer organizations. 56% of the farmers reported that these organizations are effective.
- The marketable surplus of most vegetables is over 90%.
- 45% of the farmers sold to collectors and 4% to the Dedicated Economic Centres (DEC). Only 15% of the farmers sold to collectors at farm gate. However, in Nuwaraeliya 60% of the farmers sold to collectors at farm gate.
- High transport cost (44%), lack of reliable buyers (17%), incorrect weighing (17%) and low prices (11%) are the major marketing problems.
- 56% of the farmers in the sample reported that they learnt the prices from other farmers and 22% reported that they came to know of the prices from traders.

2) Collectors (Sample size=12)

- 44% of the collectors had entered into business after 2006 and only 22% reported commencement of business before 1990. Analysis clearly indicates that the role played by collectors has become increasingly important in the recent past. Key personnel interviews and

focus group discussions confirmed that marketing system of vegetables has undergone structural changes. Instead of the Colombo based conventional commission system, the collector system had evolved and is further developing.

- Many Consumption area wholesalers now directly visit supply areas to purchase vegetables from collectors thus bypassing the Colombo market due to road improvements in the country side, high traffic in Colombo and ownership of trucks by wholesalers. Due to small scale farming and lack of effective farmer organizations, wholesalers who visit production areas are unable to buy vegetables directly from farmers. As a result, collectors entered into the system. Another reason is the establishment of DEC. Farmers who reside close to DEC directly sell through them and others sell to collectors who in turn sell at DEC.
- Most collectors (78%) do business individually. 33% of the collectors are farmers as well. This is evident in Nuwaraeliya district with 67 % collectors being involved in farming.
- 57 % of them purchased at farm gate. 78% used their own trucks to transport vegetables.
- With regard to payment 78% reported delayed payments.
- On average, a collector has 21 regular farmers. Regarding provision of credit to farmers, the average amount given to a farmer was about Rs 5,300.
- 33 % of the collectors borrowed money from banks.
- 41% of collectors sold vegetables to traders at DECs. District data show that collectors in Nuwaraeliya District behave differently. None of the collectors sold to DECs though a DEC is located in Nuwaraeliya town. Some 60% of collectors sold to town wholesalers and the rest (40%) to Pettah-Manning Commission agents.
- Majority of the collectors in the whole sample use their own transport.
- Collectors got price information from traders (67%) and famers (22%).
- With regard to trade associations, 22% of them are members in them. The performance of trade associations is not satisfactory as reported by 67 % of the collectors.
- Major marketing problems reported by collectors are excessive wastage (33%), lack of facilities at markets (22%) and excessive government regulations (11%).

3) Supply side wholesalers (Sample size=13)

- Most wholesalers carry out only buying and selling activities. None of the wholesalers were involved in holding stocks, primary processing such as cleaning and sorting. Only 8% reported transport function.
- 67% of the wholesalers purchased vegetables from farmers, 22% from DECs and 11% at Kandy market.
- Payment was largely made on the spot as reported by 75% of wholesalers. They also provide credits to famers.
- On average, a total of 20 famers per trader were observed. The average credit amount given to

a farmer was around Rs 6,600.

- 67 % of the wholesalers had borrowed money.
- Majority (25%) sell to town wholesalers. That means production area wholesalers have links with consumption area wholesalers. Next important groups are Pettah-Manning commission agents (17%), and public market retailers (17%).
- Some 68% of the wholesalers reported that they get market information from traders and 25% from farmers. Key personnel interviews and focus group discussions reveal that wholesalers get information from farmers on crop outlook, price behaviour and harvesting time in order to decide the quantity to be purchased.
- 66% of the wholesalers were members of traders associations. In case of effectiveness, 58% wholesalers mentioned that they are effective.
- Major marketing problems (more than one answer accepted) reported were high interest rates (42%), poor quality (17%), lack of good roads (10%) and lack of storage facilities (8%).

4) Demand side wholesalers (Sample size=11)

- 50% of the wholesalers purchased vegetables from DEC traders and 30% from wholesale markets.
- Majority (90%) of wholesalers used their own transport.
- Payments are largely made on the spot as reported by 70% of the wholesalers.
- Major buyers are retailers (95%) and consumers (5%).
- Problems faced by highland wholesalers in demand areas are lack of storage facilities (64%), poor quality of produce (32%) and inadequacy of market facilities (21%).

5) Retailers (Sample size=22)

- Retailers mainly purchase highland vegetables from wholesalers (55%). 20% purchase directly from farmers, 10% from DECs.
- Unlike wholesalers, some retailers were (50%) dependent on transporters for delivery.
- Analysis of trade volumes depicts that a trader sells 200kg of popular varieties such as beans, carrot and leeks per week.
- Average wastage reported by retailers was 9%.
- Problems reported by retailers are inadequacy of market facilities, lack of good roads and excessive wastage.

(3) Marketing flow

Movement of Highland vegetables from producer to consumer is shown in figure IV-3. Relative importance of each channel is represented in %.

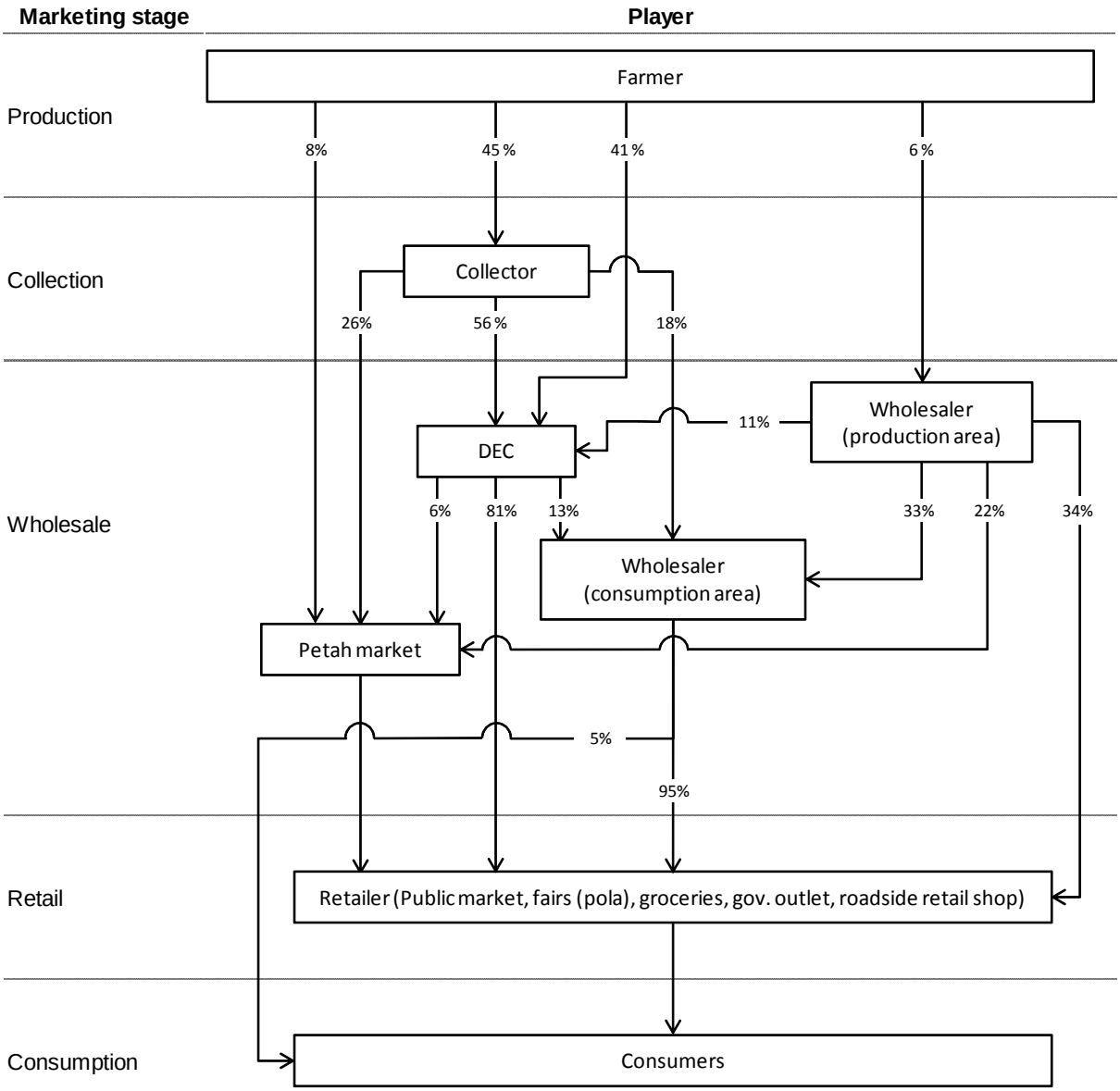


Figure IV-3 Marketing flow of highland vegetable

4.2.4 Value Chain of lowland vegetables

(1) Value chain players

Value chain includes intermediaries from input suppliers to consumers. Major players in the lowland vegetables value chain are described in this section with their roles based on the findings of the general survey, key personnel interviews and focus group discussions.

(2) Major findings

1) Farmers (Sample size=27)

- 76% of the famers in the entire sample reported incomes derived from low country vegetable farming as a major income source.
- With regard to the farm size, results show that 26% of the farmers had less than one acre and only 15% reported having more than 2.5 acres. This confirms pre dominance of the small-scale vegetable farming in the country.
- Regarding land ownership, the survey found that majority (81%) of low country vegetable farmers ware land owners.
- High price (70%) and convenience to cultivate (48%) are two major reasons affecting crop selection.
- Key person interviews and focus group discussions reveal that famers consider prices prevailed in the previous season for selection of crops. If prices were high in the previous session many farmers grow such vegetables in the following season resulting in increased production and low prices.
- 74% of farmers are members of the farmer organizations. Nevertheless, only 55% of the farmers reported that these organizations are effective.
- On average, marketable surplus is 90%.
- The wastage at farm level is 9%.
- 94% of the farmers sold to collectors and 4% to town wholesalers and Pettah-Manning market. 94% of the farmers sold at farm gate and only 22 % farmers sold to collectors at collecting centre. (Multiple answers). Credibility (59%), high prices (41%) and timely payment (36%) are major factors considered by famers in the selection of buyers.
- Major marketing problems were reported by 70 % farmers and theycomplained about low price.
- Some 63% of the farmers in the sample reported that they came to know the prices from traders and 26% through mobile phones.

2) Collectors (Sample size=12)

- Key personnel interviews and focus group discussions confirmed that marketing system for lowland vegetables too has undergone structural changes. Many demand side wholesalers

now directly visit supply areas to purchase vegetables from collectors thus bypassing the Colombo market due to road improvement in the countryside, high traffic in Colombo and possession of trucks. Due to small-scale farming and lack of effective famer organizations wholesalers who visited production areas sometimes find it difficult to buy vegetables from farmers. As a result, collectors had entered into the system. Another reason is the establishment of DECs. Famers who reside close to DECs directly sell through them and others sell to collectors who in turn sell to DECs.

- 92% do business individually. It is also found that 38 % of the collectors are famers as well.
- Collectors purchase vegetables from farmers at farm gate and the collecting centre. However, purchasing at collecting centre is more popular as reported by 60% of collectors in the survey. Discussions with farmers reveal that collectors were reluctant to visit and purchase vegetables at farm gate because farms are scattered and small.
- On average, a collector has a few regular farmers (less than five). Regarding the provision of credit to farmers, the average collector provides credit to 16 farmers and amount given to a farmer averaged Rs 8,167.
- The survey found that only 15% of the collectors borrowed money from banks. Lower borrowing indicates that many collectors are involved in small-scale businesses and payments are made after sales.
- Collectors have different buyers such as town wholesalers; supermarket collecting centres, public market retailers and fair retailers but market share of the wholesalers is quite high (40%). No collector in the sample sold vegetables to the traders at DECs.
- Many collectors (67%) received price information only from traders. With regard to trade associations, 15 % collectors are members. The performance of trade associations is not satisfactory as reported by 77% of the collectors.

3) Supply side wholesalers (Sample size=13)

- 31% of the wholesalers were involved in farming. Also, some 15% of the wholesalers performed storage function and retailing.
- 69% of wholesalers purchased vegetables from farmers, and 31% from village collector. None of the wholesalers in the supply side purchased low country vegetables from either DECs or wholesale markets.
- On average, a trader provides credit to four farmers only but amount is quite high (Rs 35,833).
- Regarding borrowing money, 61% of the wholesalers mentioned that they borrowed. Except one who borrowed money from a money lender, all others were dependent on either private or public banks.
- 20% sell to Pettah-Manning commission agents and DECs.
- All the wholesalers in the sample reported that they get information from traders and stated that there were no other avenues available. Key personnel interviews confirmed that traders

are unaware of the mobile-based wholesale price dissemination system.

- 46% of them were members of traders associations. In case of effectiveness, only 54% wholesalers mentioned that the associations are effective.
- Major marketing problems reported were high interest rates (23%), poor market facilities (23%), poor quality (15%) and lack of storage facilities (15%).

4) Demand side wholesalers (Sample size=11)

- 50% of the wholesalers purchased vegetables from wholesale markets, 30% from DEC traders and 20% from contract suppliers.
- They have regular suppliers between 5 and 10.
- Majority (80%) of the wholesalers used their own transport.
- Payments are largely made on the spot as reported by 70% of the wholesalers. Those who undertake commission trading in which payments are made after sale have reported delayed payments by Colombo commission agents.
- Regarding borrowing money, no one reported borrowing.
- Major buyers are retailers (83%) and consumers (17%).
- Problems faced by low country wholesalers in demand areas are lack of storage facilities (33%), poor quality of produce (33%) and inadequacy of market facilities (24%).

5) Retailers (Sample size=22)

- 60% of retailers mainly purchase low country vegetables from wholesalers. 40% purchase directly from farmers, 10% from DECs.
- Visit and purchase is a common approach and delivery to retail places.
- Unlike wholesalers, majority of the retailers (63%) were dependent on hired transport for delivery.
- Average wastage reported by retailers was around 10%.
- Problems reported by retailers are inadequacy of market facilities, lack of good roads and excessive wastage.

6) Marketing flow

Movement of selected low country vegetable from producer to consumer is shown in the Figure IV-4. The relative importance of each channel is represented in percentage.

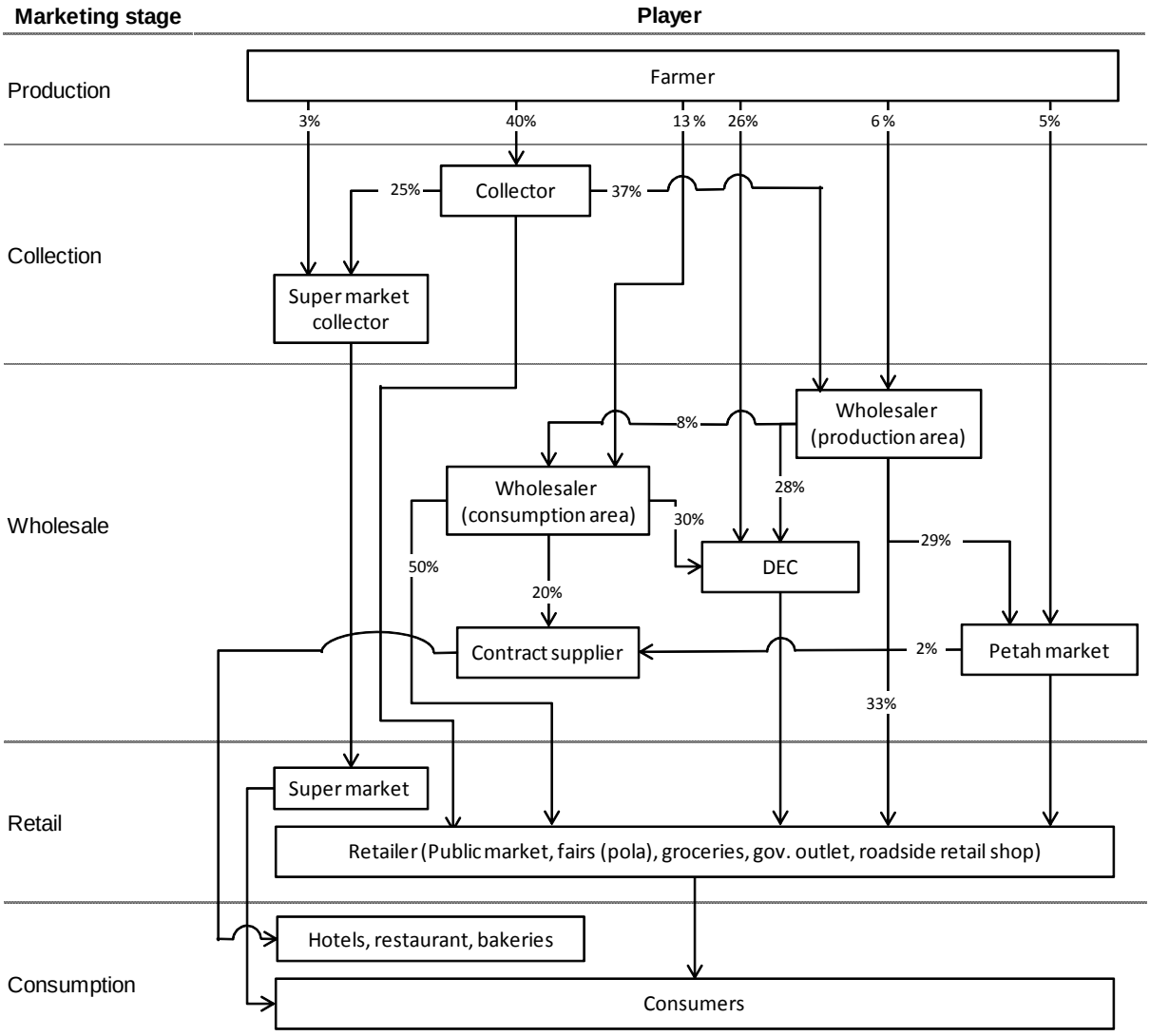


Figure IV-4 Marketing flow of lowland vegetable

4.2.5 Value Chain of fruits

(1) Value chain players

Value chain includes intermediaries from input suppliers to consumers. Major players in the value chain of fruits are described in this section with their roles based on the findings of the general survey, key personnel interviews and focus group discussions. Players identified include farmers, collectors, wholesalers (production as well as consumption areas), processors, DEC traders, market traders and consumers.

(2) Major findings

1) Farmers (Sample size=30)

- 68% of the farmers in the entire sample reported incomes derived from fruit farming as a major source.
- With regard to the farm size, overall results indicate small farm sizes of less than one acre for 42% of the farmers.
- 74% of fruit farmers were owner operators. Unlike in many other crops, 20% of the farmers had used lease/rent land for fruit cultivation.
- High price was the one and only principal reason for selection of fruits as reported by 64% of sample famers.
- The figure is over 80% for farmers growing pineapple, papaya and banana. Key person interviews and focus group discussions reveal that fruit farming is highly profitable compared to paddy, vegetables and other filed crops. Due to the nature of commercial farming, primary processing, such as sorting, grading and packing is carried out by farmers depending on the type of fruits. For instance, 60% of the passion fruit farmers graded fruits before selling while 76% % of the papaya farmers in Monaragala district packed their fruits for sale.
- 42% of the farmers were members of farmes organizations. Only 29% farmers reported that these organizations are effective.
- On average, marketable surplus is 94% ranging from 88% for passion fruit to 98% for banana.
- Wastage at farm level is around 5%.
- Survey findings reveal that 35% of fruit farmers sold to collectors at farm gate, 29% to village wholesalers and 13% to Pettah-Manning market (Pettah-Manning market). Crop-wise analysis shows different channels. Passion fruit is widely sold to village collectors as reported by 60% of the growers while avocado is largely sold to collectors at farm gate (Collectors harvesting by themselves).
- 94% farmers reported that buyers decide prices.
- Buyers mainly provide the transport as reported by 74% of the farmers. Small trucks are widely used by 78% collectors.
- With regard to packing materials, poly sack is used by 39%, plastic crate by 27%, and wooden

crate by 15 . Some 18 % of the farmers did not use any packing materials. In most instances, pineapple and banana are marketed without packing.

- Closeness to market outlets (92%), credibility (72%), high prices (64%) and timely payment (46%) are major factors considered by farmers in selecting the buyers.
- The major problem for all is low prices as reported by 93% of the entire sample.
- 52% of the farmers in the sample reported that they came to know about the prices from traders and 29% from other farmers.

2) Collectors (Sample size=16)

- 64% of the collectors had entered into business after 1996. As in the case of high and low land vegetables, the role of collectors is becoming important recently.
- Collectors purchase fruits from farmers at farm gate and at the collecting centre depending on the type of crops. All the passion fruit collectors in the sample purchased at collecting centre while mango and avocado collectors purchased them at farm gate.
- The regular suppliers were reported only for banana, pineapple and papaya with 30% on average.
- Regarding provision of credit to farmers, the average collector provides credit to eight farmers and amount given to a farmer averaged Rs 48,000.
- Only 15% of the collectors borrowed money from banks.
- Collectors have different buyers such as Pettah-Manning Commission Traders, town wholesalers, supermarket collecting centres, public market retailers and fair retailers but market share of Pettah-Manning market is quite high (41%) followed by Public market retailer (29%). Majority of buyers (73%) had their own transport.
- Many collectors (79%) received price information only from traders.
- With regard to trade associations, 14% of the collectors are members of trade associations. The performance of trade associations is not satisfactory as reported by 93% of the collectors.
- Major marketing problems reported by collectors are poor quality (62%), lack of storage facilities (41%), and inadequate credit facilities (35%).

3) Supply side wholesalers (Sample size=14)

- Some 66% of the wholesalers had entered into business after 1996 and 33% started business after 2006. This indicates fruit market in the country is growing.
- 87% have their own transport facilities.
- On average, a trader provides credit to 150 farmers.
- Regarding question on borrowing money, 40% of the wholesalers answered that they borrowed.

- Highest market share was reported for Kandy Market Commission Agent and suppliers to processors.
- Majority (75%) of the wholesalers in the sample received information from other traders and 17% from the farmers.
- Only 40% of the wholesalers reported existence of trade associations and 26% of them were members of trade associations. In case of effectiveness, only 20% of wholesalers mentioned that they are effective.
- Major marketing problems reported were lack of reliable suppliers (40%), excessive wastage (39%), poor market facilities (28%), and lack of storage facilities (21%).

4) Demand side wholesalers (Sample size=10)

- 40% of the wholesalers purchased from DEC at Dambulla, 30% from collectors, 22% at Pettah-Manning market and 8% from contract suppliers.
- It was also observed that a wholesaler has around 7 regular suppliers.
- Majority (90%) of the wholesalers have their own transport facilities.
- Payments are largely made on the spot as reported by 88% of the wholesalers.
- Those who borrowed money were very few (4%).
- Major buyers are retailers (91%) and consumers (8%).
- Problems faced by fruit wholesalers in consumption areas are lack of storage facilities (48%), poor quality of products (41%) and inadequacy of market facilities (37%).

5) Retailers (Sample size=22)

- As found from the survey, retailers mainly purchase fruits from wholesalers (72%). 17% purchase directly from farmers and 6% from DECs.
- Delivery is a common approach as reported by 79% of interviewed retailers.
- Unlike wholesalers, majority of the retailers (84%) who had to transport after purchase were dependent on hired transport for delivery.
- Average wastage reported by retailers was around 9%.
- Problems reported by retailers are inadequacy of market facilities, lack of good roads and excessive wastage.

(3) Marketing flow

Movement of fruits from producer to consumer is shown in figure IV-5. Relative importance of each marketing flow is represented by %.

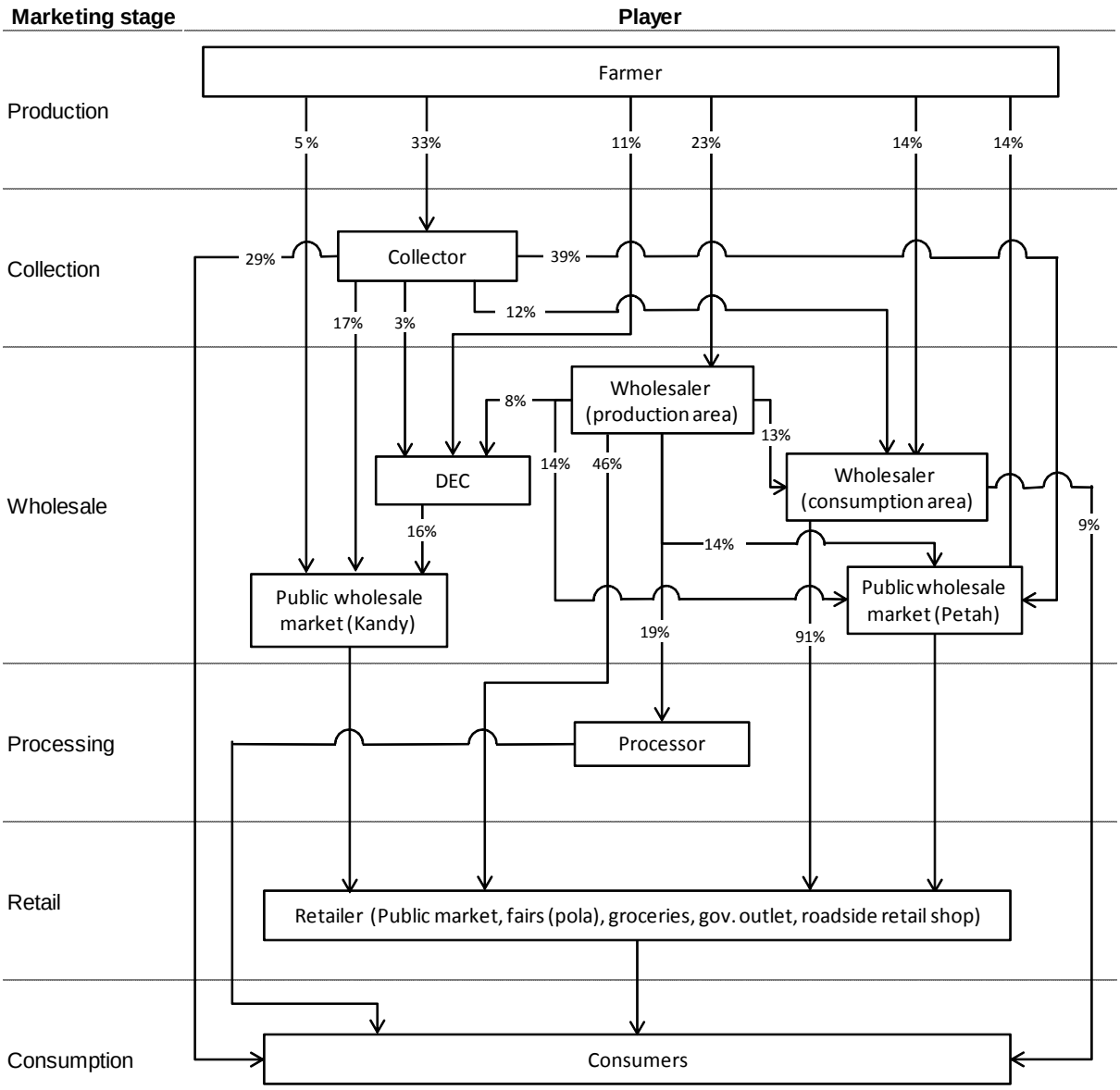


Figure IV-5 Marketing flow of fruits

4.2.6 Value Chain of fish

(1) Value chain players

Fisheries value chain is dominated by the private sector at all levels. Fish landed at fish landing centres are generally marketed through diverse channels to different, mainly domestic end markets that include urban and rural retail fish outlets, small mobile vendors, supermarket chains and the state-owned Ceylon Fisheries Cooperation (CFC) outlets, urban wholesale markets, such as Peliyagoda fish market in Colombo.

(2) Major findings

1) Producers (Sample size=30)

- A critical element of the chain is the numerous small-scale fishers who operate in small motorized, conventional craft and relatively large, multi-day boats.
- Majority (40%) of the fishermen sold to wholesalers. Some 8% of fishermen indicated selling to Ceylon Fisheries Corporation and this was reported only from Jaffna district.

2) Supply side wholesaler (Sample size=15)

- 30% had experience more than 20 years. Those who had experience less than 5 years were only 17%.
- Supply-side wholesalers are generally involved in transporting and to some extent in retailing and fish drying.
- Volume of sale by a wholesaler was examined, and it was found that a total of 20,630 kg fish per month was handled during the peak season. The figure for off–season declined to 4,313kg per month.
- Arrival of fish to Colombo was from Puttalam, Trincomalee and Hambantota districts in this survey. Fish catch from Hambantota moved to various locations.

3) Demand side wholesaler (Sample size=11)

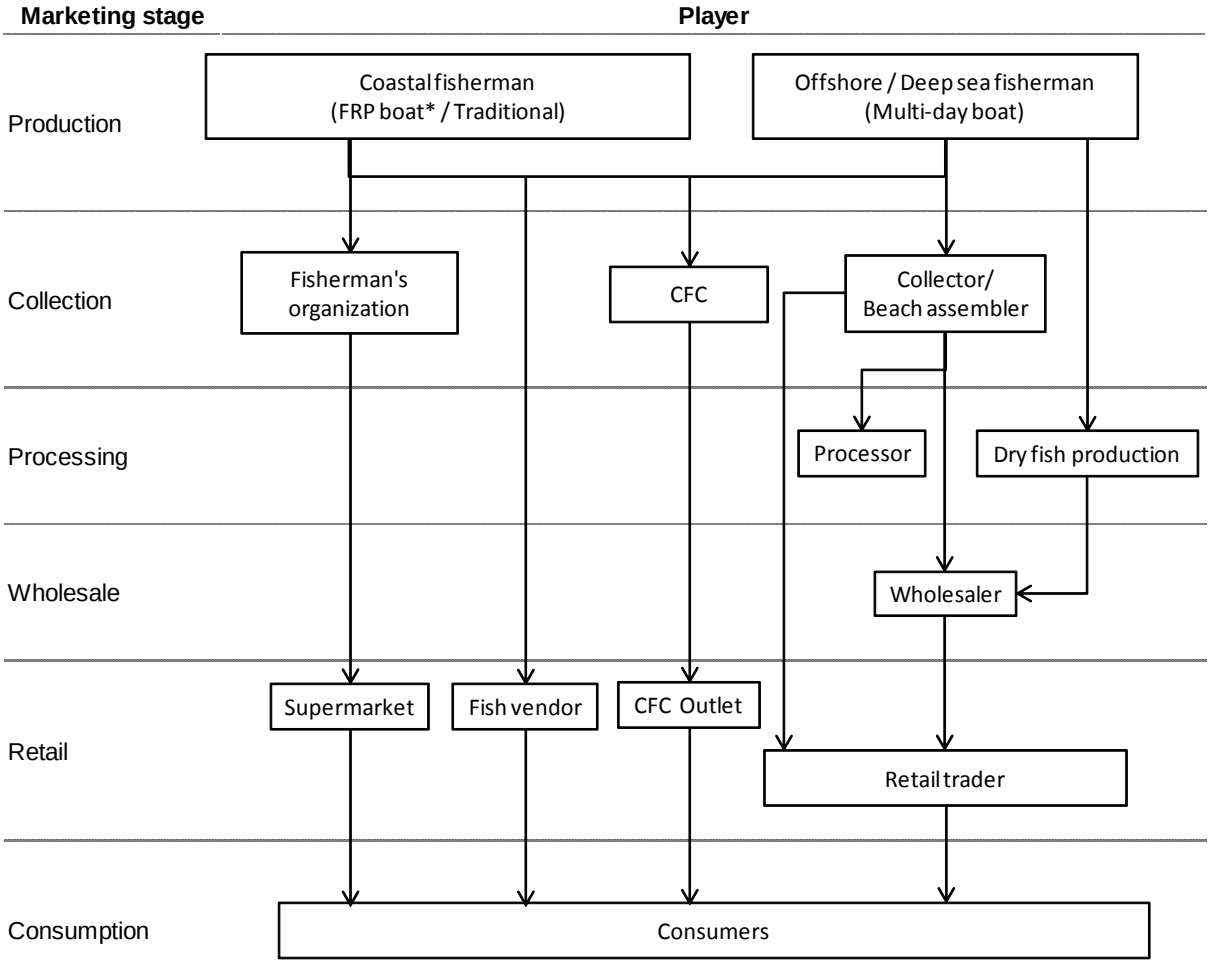
- Major established wholesale market is located at Peliyagoda. Supply is mainly from the wholesalers. Trading takes place on commission basis (5%).
- Major buyers are retailers and intuitional buyers such as hotels, restaurants and contact suppliers.

4) Consumption side retailers (Sample size=22)

- According to the survey 60% of the retailers purchased fish from wholesale market at Peliyagoda. In addition, DEC traders purchased fish from landing sites at Dehiwela and Moratuwa. Some 20% retailers close to beach purchased from landing sites.

(3) Marketing flow

Marketing flow of fish from fishermen to consumer is shown in figure IV-6.



* FRP boat = Fiber Reinforced Plastic boat

Figure IV-6 Marketing flow of fish

Remark: Prepared based on FAO "Value Chain Analysis in the Fisheries Sector in Africa", p.75"Sri Lankan marine fisheries value chain map"

4.2.7 Value Chain of livestock

(1) Eggs

1) Value chain players

Value chain includes intermediaries from input supply to consumption. Based on the findings of the general survey, key personnel interviews and focus group discussions value chain chart is prepared.

2) Major findings

Producers (Sample size=15)

- Lands and buildings are two major fixed costs in poultry farming. Some 47 poultry farmers reported small lands with less than one acre.
- Some 50% of the farmers reported buildings size with over 7,500 square feet. Less than 2,500 square feet buildings were reported by only 13%. This indicates the growth of bigger poultry farms. Key personnel interviews and focus group discussions reveals that small-scale poultry farmers have difficulties in competing with big poultry farms mostly operated by organized companies such as Prima, Bairaha, Nelna and Gold Coin.
- All lands and buildings in the survey indicated belonging to owners themselves. No one reported rented or leased properties. Due to own properties fixed cost can be reduced and assured sustainability in the business.
- Feed is the major variable cost in poultry farming. Unlike in the past, large companies such as Prima are involved in concentrate feed production. The survey found that 67% of the farmers purchased feeds from Prima.
- A total cost of 100-bird poultry farms would be Rs 38,550. Feed is the largest cost item. Cost of production per egg was worked out at Rs 6.46. On average, the number of eggs per 100 layers was amounted to be 75 per day ranging from 70 eggs in Colombo to 78 eggs in other two districts of Kurunegala and Puttalam.
- Farmers sell eggs to collectors, wholesalers, supermarket-collecting centres, restaurants and consumers. Some poultry farms have own selling centres in which both wholesaling and retailing undertake. There were 25% of the farms that had collecting centres in the sample.
- All the sample farmers used wooden box for packing. A box contains 280 eggs.
- Usually, buyers transport eggs from producer. However, registered farmers who supplied to supermarket collecting centres and restaurants transported to the buyer's point. No one used hired vehicles.

3) Maketing flow

Marketing flow of eggs is given in Figure IV-7.

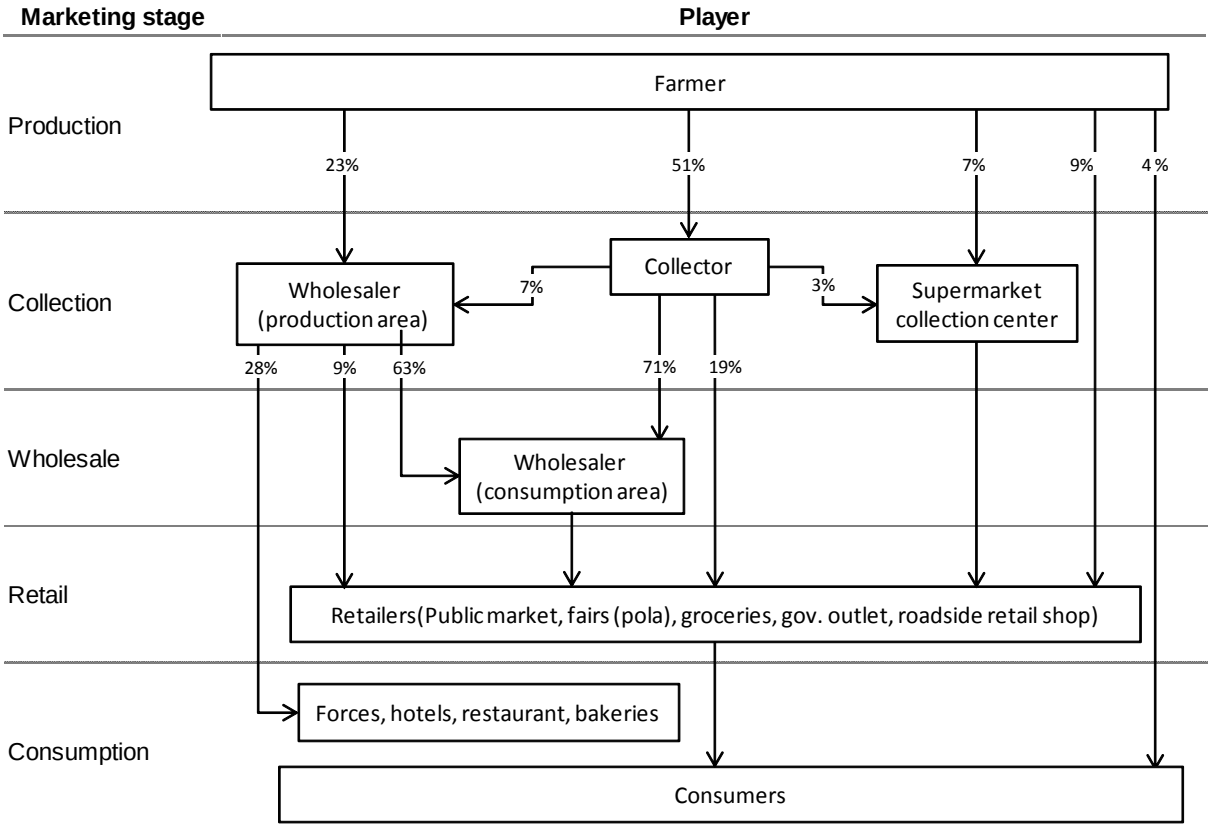


Figure IV-7 Marketing flow of egg

4.2.3 Broiler

(1) Value chain players

Value chain of broiler chicken is rather simple. There are producers, supply side wholesalers, demand side wholesalers, supermarkets collection centres, retailers and consumers.

(2) Major findings

Producers (Sample size=15)

- In order to supply continuously the broiler famer maintains many batches simultaneously. Only 40% of the broiler farmers had less than 10 batches. On average, the number of birds per farm was 5,805 for all batches. Some 40% of the broiler farmers were out- growers. The feed mixer provided chicks, feed, and medicine and labour comes from the farmer. The purchase is made at agreed price. Payments are made after reduction of cost incurred by the company.
- Cost of producing one kg of meat was Rs 190. Out of that, profit was Rs 80.

(3) Marketing flow

Marketing flow of chicken is given in Figure IV-8.

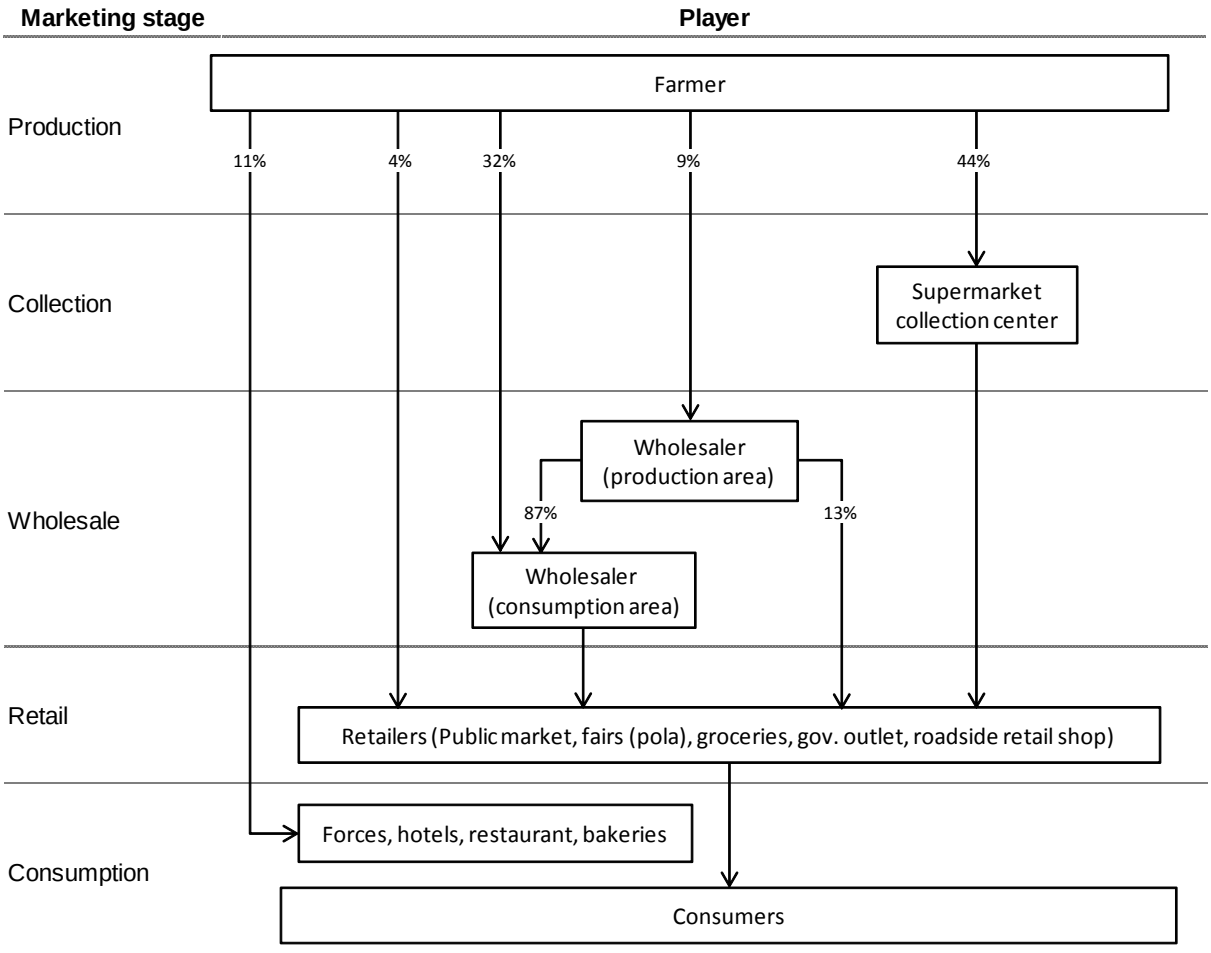


Figure IV-8 Marketing flow of chicken

4.2.7.3 Milk

(1) Value chain players

Producers, private and government milk companies, local sales for processing, retailers are major players of milk value chain.

(2) Major findings

- A total of 23 respondents of cattle farmers (individual) dairy farm owners (small scale) milk collectors milk collecting agents as well as companies (milk processing and wholesaling /distributing) were interviewed and for collecting data.
- Average milk production per animal was highest (8.5 for litre/day) and minimum at 2.8 litre/day).
- There were high yielders with 22 litres of milk per cow per day in Nuwara Eliya district. There were medium level producers as 12 litres per animal. According to this, it has been observed that per animal milk production range between minimum to maximum was very wide indicating the animals are not producing at their optimum capacity. Therefore, it is obvious that there is a massive potential of increasing average milk production of animals.
- It was observed that there is no unique system of purchasing milk at farm gate. Some companies pay for quantity (volume) and some companies pay for quality. Moreover, milk is not tested for quality (for Fat % and SNF %) in front of the farmer.
- According to the survey the average guaranteed price in Ampara is Rs 52.00 and Hatton is Rs 50.00. Wastage recorded were 6% of Ampara and 9% in Hatton. According to the survey findings, 60% of the fresh milk production in this area goes to the collection centres.
- Most of these centres are owned by the companies who process value added milk products and 35% goes to the local – domestic market and 5% goes to consumers directly.

(4) Marketing flow

Marketing flow of milk is given in Figure IV-9.

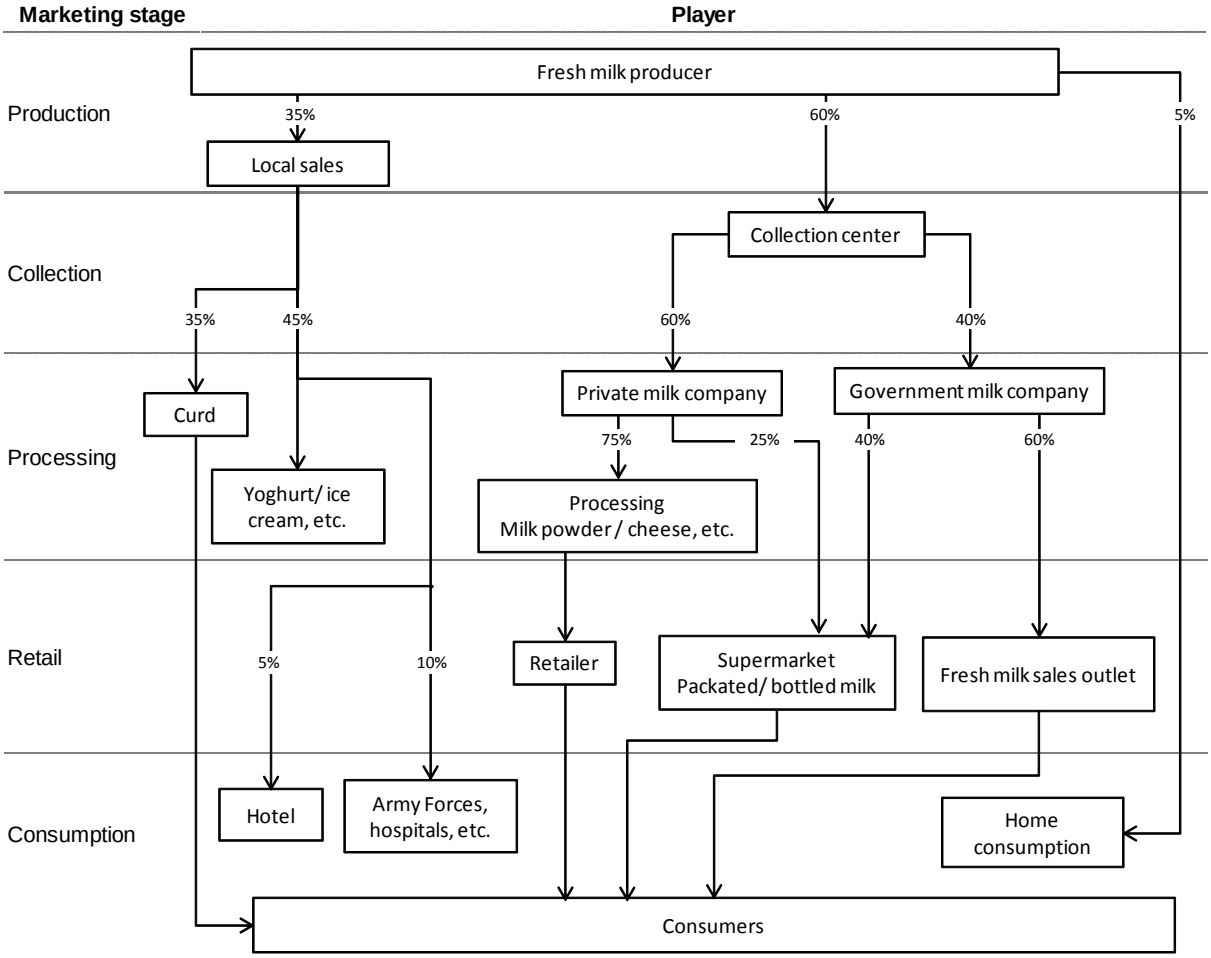


Figure IV-9 Marketing flow of milk

4.3 Origin and Destination (O/D) through DEC

The data used in this section is collected through the first stage survey conducted during November to December, 2012.

The survey focused on the marketing flow of agricultural products, and it has grasped the current marketing flow from supplying areas to consumption areas through the six DECs in the production areas. It is necessary to know what % of the agricultural products is passing through the DECs. An estimate is attempted here to know the share as described below.

The daily average inflow volume of two DECs (Dambulla and Thambuttegama) is around 1,513 mt (based on the inflow/outflow survey), and the daily traded volume is 1,093 mt for the same DECs as quoted by stall owners in the traders' survey. Inflow survey conducted for nearly 24 hours and all inflow vehicles were counted whereas in the traders survey, handling volume of all stall owners (traders) were interviewed. For the other four DECs, the daily handled volume in total is about 598 mt from traders' survey. Therefore, the total daily handling volumes of the six DECs in the production area amount to 1,690 mt. The DECs operate for about 350-day year, and the total annual handling is estimated to be 591,500 mt.

The other 5 DECs in the consumption areas, namely Narahenpita, Ratmalana, Piliyandala, Welisara and Veyangoda are also handling agricultural products. It is estimated that about 105 mt (based on the first survey in September) are handled daily in average in the 5 DECs that amounts to about 183,750 mt a year.

The total annual handling volume of 11 DECs is 775,600 mt. Considering the total supply of 2,058,807 mt in 2011 (including import) of OFC and vegetables, the handling (marketed) volume is about 38 %. This 38 % can be regarded as the minimum quantity passing through the DECs. The handling volumes of respective DECs are under estimates because the traders are not giving the correct total volumes handled. The actual % could be greater.

4.3.1 O/D of products: Traded volume and commercial zone by each DEC

The daily inflow (origin) and outflow (destination) volume grasped through inflow and outflow survey conducted for Dambulla DEC (TableIV-4 & Figure IV-10) and Thambuttegama DEC (Table IV-5 & Figure IV-11) provides an indicative of the commercial zones covered. The O/D for the two DECs is summarized below, and the O/D maps are shown in Figures IV-12 and IV-13 for Dambulla and Figures IV-14 and IV-15 for Thambuttegama.

The inflow and outflow of surveys of the above two DECs are supported by the traders survey of six DECs in the supply (production) areas as shown in section 4.3.2. DEC supply mainly comes from within the province and surrounding provinces. Due to a variety of commodities available more traders are coming to Dambulla DEC. This has an advantage to Dambulla DEC.

Table IV-4 Inflow and Outflow by Province of Dambulla DEC

Provinces	Inflow (mt)	%	Outflow (mt)	%
Central	526	39	245	20
North Western	111	8	195	16
North Central	343	25	205	17
Uva	73	5	26	2
Northern	51	4	68	6
Eastern	65	5	118	10
Sabaragamuwa	55	4	113	9
Southern	31	2	55	5
Western	107	8	175	15
Total	1,363	100	1,201	100

Source: JICA Sri Lanka Marketing Survey, Dec 2012
Remarks: Average of 2 days survey (Dec 1 and Dec 5)

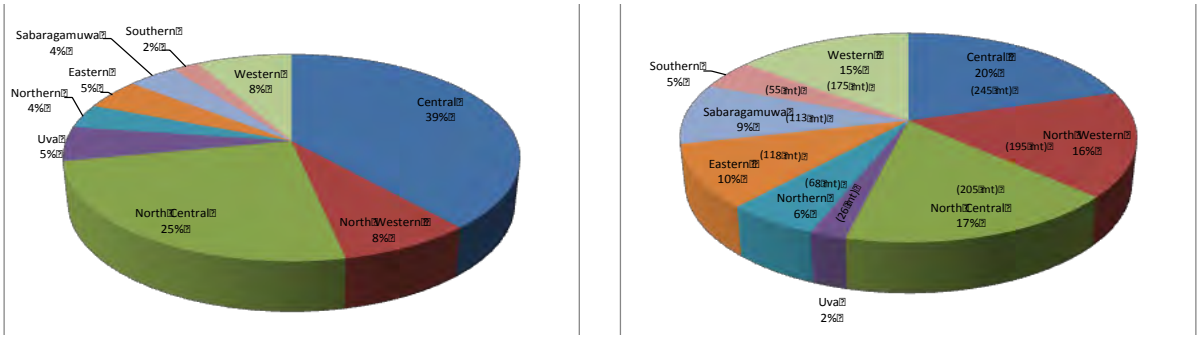


Figure IV-10 Inflow (left) and Outflow (right) of Commodities by Provinces to & From Dambulla DEC

Table IV-5 Inflow and Outflow by Province of Thambuttegama DEC

Provinces	Inflow (mt)	%	Outflow (mt)	%
Central	5.9	4	13.7	10
North Western	9.0	6	36.1	25
North Central	132.6	89	75.2	53
Uva	1.8	1	-	-
Sabaragamuwa	0.1	0	0.2	0
Southern	-	-	0.5	0
Western	0.3	0	16.1	11
Total	149.65	100	141.82	100

Remarks: Average of 2 days survey (Dec 5 and Dec 17)
Source: JICA Sri Lanka Marketing Survey, Dec 2012

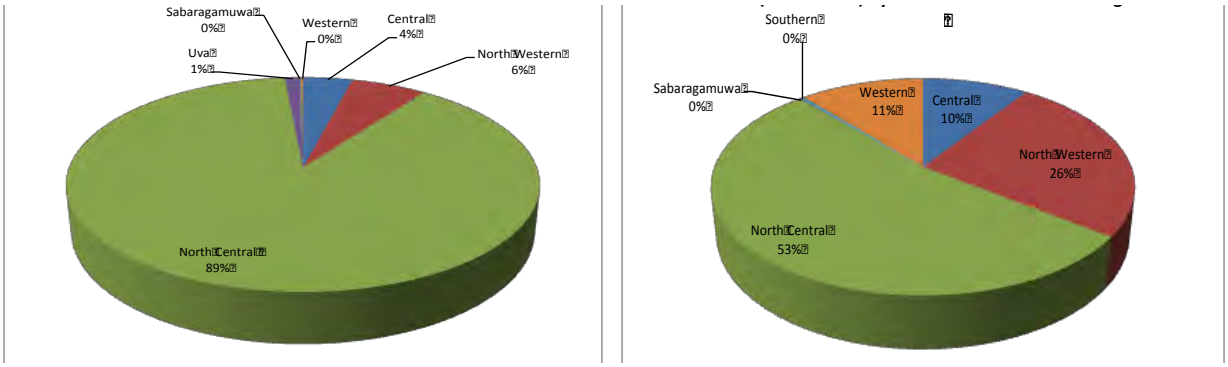


Figure IV-11 Inflow (left) and Outflow (right) of Commodities by Provinces to & from Thambuttegama DEC

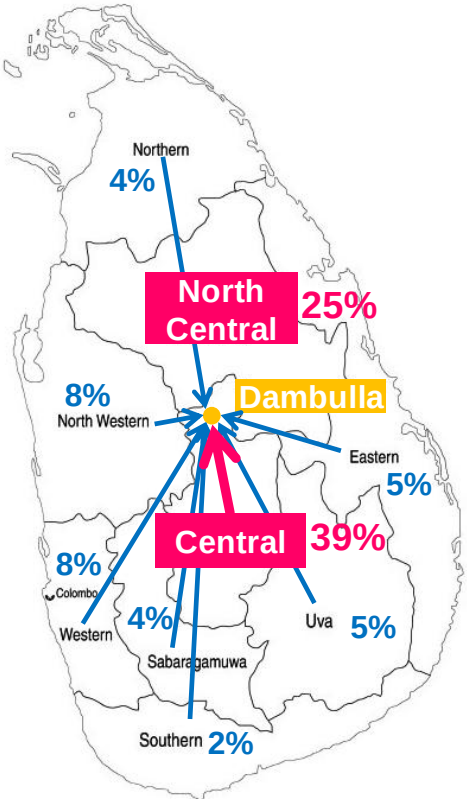


Figure IV-12 Origin of Commodities by Province to Dambulla DEC

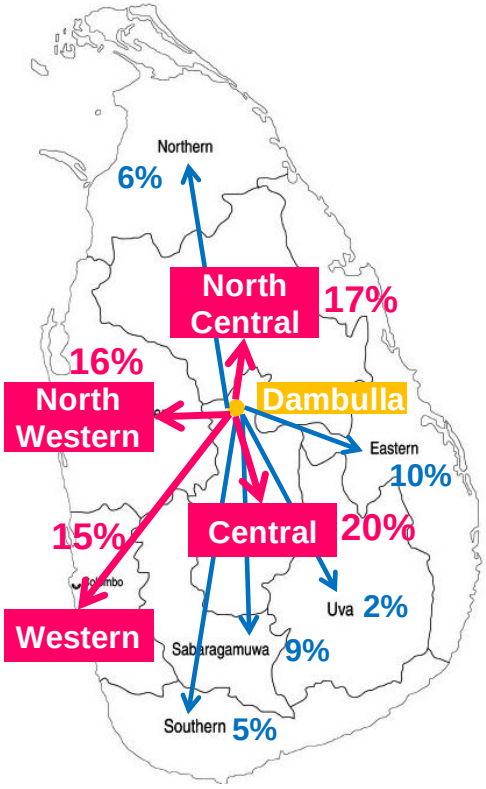


Figure IV-13 Destination of Commodities by Province from Dambulla DEC

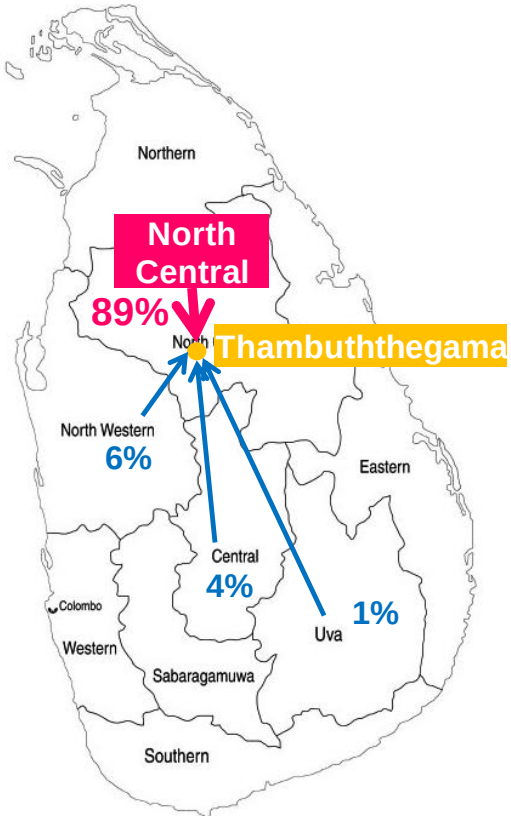


Figure IV-14 Origin of Commodities by Province to Thambuththegama DEC

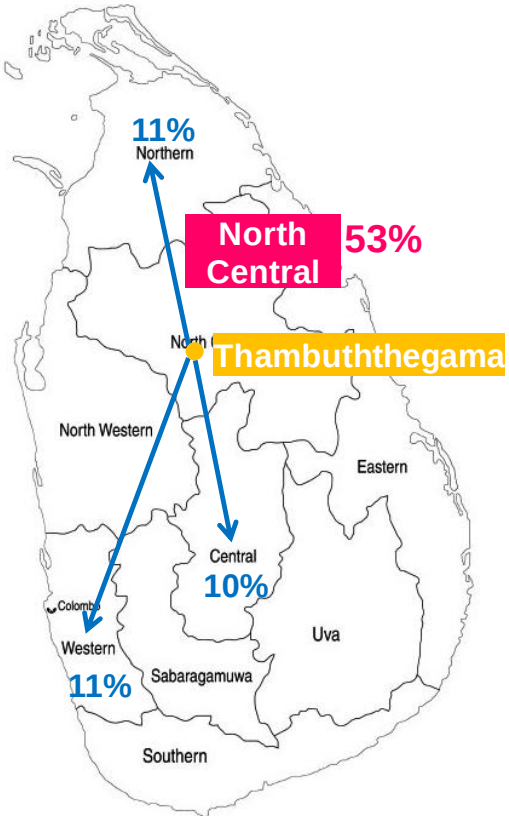


Figure IV-15 Destination of Commodities by Province from Thambuththegama DEC

4.3.2 Major traded commodities at six DECs

The major traded commodities according to traders survey in the six DECs located in the production areas (supplying areas) are summarized below (Table IV-6). The inflow and outflow of commodities by provinces of the six DECs are summarized in Table IV-7. [9]

Table IV-6 Daily flow (Origin) of commodity to DECs in production areas

Unit: kg

DEC	Dambulla		Thambuththegama		Keppetipola		Nuwaraeliya		Meegoda		Embilipitiya	
Type of Commodity	1-Dec	%	3-Dec	%	2-Jan	%	31-Dec	%	30-Dec	%	1-Jan	%
Rice	-	-	9,620	10	-	-	-	-	124,600	49	10,000	10
OFCs	592,608	59	3,070	3	3,100	4	12,700	8	29,600	12	2,500	3
Highland Vegetables	133,900	13	12,910	14	64,500	74	120,900	79	39,200	15	5,020	5
Lowland Vegetables	184,897	19	40,943	43	6,550	7	8,200	5	39,750	16	17,650	18
Yam & tubers	16,300	2	1,600	2	2,050	2	6,300	4	3,200	1	1,220	1
Leafy Vegetables	2,085	0	100	0	360	0	3,200	2	1,100	0	300	0
Fruits	47,370	5	12,550	13	800	1	2,700	2	7,900	3	44,500	45
Chicken	-	-	-	-	-	-	-	-	200	0	200	0
Eggs	-	-	-	-	-	-	-	-	900	0	2,160	2
Fish	2,000	0	-	-	-	-	-	-	400	0	300	0
Dried Fish	585	0	250	0	-	-	-	-	3,050	1	800	1
Coconut & oil	1,000	0	-	-	700	1	-	-	2,600	1	2,450	2
Betel & arecanut	2,500	0	12,500	13	-	-	-	-	-	-	6,000	6
Others	14,640	1	1,050	1	9,550	11	-	-	3,710	1	6,740	7
Total	997,885	100	94,593	100	87,610	100	154,000	100	256,210	100	99,840	100

Remarks: Commodities by quantity (kg) are compiled from the traders survey conducted in December 2012 and January 2013. Dates of survey are appropriately indicated below the name of DECs.
Source: JICA Sri Lanka Marketing Survey, Dec 2012.

In Dumbulla DEC, almost 1,000 mt of commodities are traded on the day of the survey. OFC, which shares 59% of the total volume of a day, lowland vegetables (19%), highland vegetables (13%) and fruits (5%) are major items. Here, OFC is dominant because of the higher dominance of big onions. Some 60 % of big onions are produced in the Matale district (Central province) and 30 % in Anuradhapura district (North Central). Both highland and lowland vegetables are also grown in nearby areas.

In Thambuththegama DEC, the total volume of a day trade was about 95 mt, one tenth of the volume of Dambulla. Major traded items are lowland vegetables (43%), highland vegetables (14%), fruits (13%), betel & arecanut (13%) and rice (10%). OFC shares only 3%.

In Kepetipola DEC, the total volume of a day trade was about 88 mt. Since the DEC is located in the highland, the share of highland vegetable is very high (74%). Lowland vegetables (7%) and OFC (4%) are also dealt with but their shares are limited.

In Nuwara Eliya DEC, the total volume of a day trade was about 154 mt. Since it is also located in the highland, the share of highland vegetables accounts for 79% of total volume.

In Meegoda DEC, the total volume of a day trade was about 256 mt. It is located in the consumption area and focused on the retailing. The major traded items are rice (49%), lowland vegetables (16%), highland vegetables (15%), OFC (12%) and fruits (3%).

[9] There were differences between the daily flow of Dambulla DEC and Thambuththegama DEC shown in Table IV-6 and Table IV-7. It was because 1) the data collection was done on the different day 2) some traders store the products they accept for a few days.

In Embilipitiya DEC, the total volume of a day trade was about 100 mt. Since this DEC is functioning as a trading spot of banana, fruits (45%) accounts for almost half of their traded volume. Other major items were lowland vegetables (18%), rice (10%), betel & arecanut (6%), highland vegetables (5%) and OFC (3%).

Out of 6 surveyed DECs, 3 of them deal with rice and the rest do not. Basically rice is sold through the other selling channels outside DEC (producer - collector - miller - wholesaler - retailer), therefore most of DECs do not involve in the trading of rice.

Table IV-7 Inflow and outflow of commodities by province of six DECs in the production areas

Unit:kg

Provinces	Dambulla DEC				Thambuththegama DEC			
	Inflow	%	Outflow	%	Inflow	%	Outflow	%
Central	526,316	39	5,925	20	5,925	4	13,745	10
North Western	110,887	8	8,971	16	8,971	6	36,128	26
North Central	342,702	25	132,582	17	132,582	89	75,216	53
Uva	73,311	5	1,800	2	1,800	1	150	0
Northern	51,000	4	-	6	-	-	-	-
Eastern	65,352	5	-	10	-	-	-	-
Sabaragamuwa	55,455	4	125	9	125	0	-	-
Southern	30,638	2	-	5	-	-	-	-
Western	107,498	8	250	15	250	-	16,080	11
Total	1,363,157	100	149,653	100	149,653	100	141,319	100

Provinces	Keppitipola DEC				NuwaraEliya DEC			
	Inflow	%	Outflow	%	Inflow	%	Outflow	%
Central	-	-	19,455	24	152,150	99	53,000	38
North Western	-	-	25,225	31	1,000	1	9,400	7
North Central	-	-	800	1	-	-	-	-
Uva	85,260	97	9,960	12	850	1	11,800	8
Northern	-	-	-	-	-	-	-	-
Eastern	-	-	1,800	2	-	-	100	0
Sabaragamuwa	800	-	9,475	12	-	-	2,000	1
Southern	-	-	900	1	-	-	3150	2
Western	1,550	2	13,060	16	-	-	60,980	43
Total	87,610	100	80,675	100	154,000	100	140,430	100

Provinces	Meegoda DEC				Embilipitiya DEC			
	Inflow	%	Outflow	%	Inflow	%	Outflow	%
Central	71,100	28	-	-	2,100	2	10,300	11
North Western	32,900	13	-	-	2,160	2	-	-
North Central	73,300	29	-	-	-	-	2,500	3
Uva	1,800	1	-	-	8,450	8	-	-
Northern	-	-	-	-	-	-	-	-
Eastern	500	0	-	-	-	-	-	-
Sabaragamuwa	9,350	4	-	-	81,730	82	29,110	32
Southern	-	-	-	-	4,000	4	26,370	29
Western	67,260	26	216,910	100	1,400	1	21,850	24
Total	256,260	100	216,910	100	99,840	100	90,130	100

Remarks: Inflow and outflow quantity of Dambulla and Thambuttegama DECs are averages of 2-day survey of the 2 DECs, and the rest are compiled from traders' survey (traders who own the stalls in DEC).
Source: JICA Sri Lanka Marketing Survey, Dec 2012 & January 2013.

4.3.3 Marketing flow ofagricultural products and vehicles

(1) Inflow and outflow survey at Dambulla DEC

1) Inflow survey

- **Origin of supply**

An average total quantity was 1,363 mt per day in the lean-supply period (Table IV-8). As such, an average supply on a normal day should be more than the quantity reported from this survey. Major origin is from the surrounding area that is the major production area of the lowland vegetables (Figure IV-16).

Table IV-8 Origin of supply by districts to the Dambulla DEC

Origin Districts	Day 1 (Dec 1, 2012)		Day 2 (Dec 5, 2012		Average	
	Quantity (kg)	%	Quantity (kg)	%	Quantity (kg)	%
Matale	452,434	32	291,751	22	372,093	27
Anuradhapura	288,695	21	333,626	25	311,161	23
Nuwara Eliya	105,356	8	131,490	10	118,423	9
Colombo	69,000	5	140,150	11	104,575	8
Other districts	482,908	35	430,905	32	456,906	34
Total	**1,398,393**	**100**	**1,327,922**	**100**	**1,363.157**	**100**

Source: Compiled from JICA Sri Lanka Marketing Survey (Dec 1 and Dec 5, 2012)

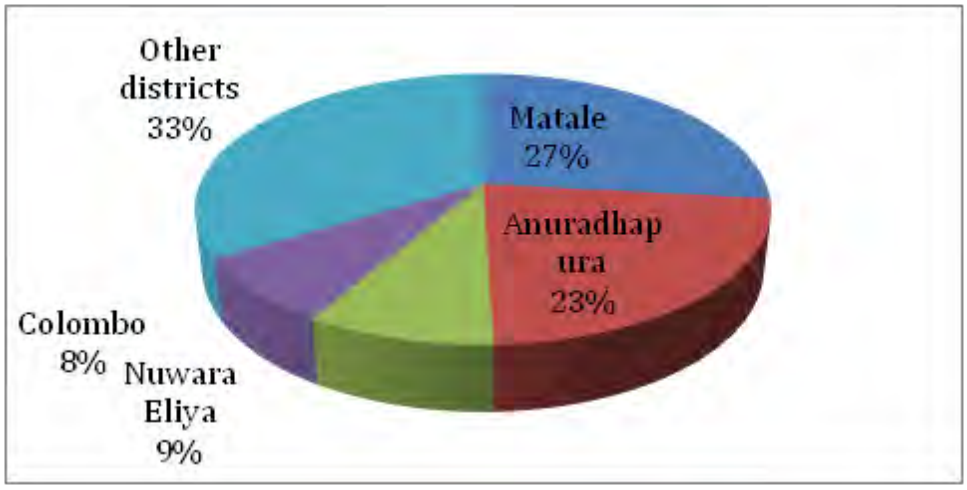


Figure IV-16 Origin of supply by districts to Dambulla DEC

- **Source of supply**

Three main suppliers, i.e., famers, collectors and transporters have been identified from the general survey conducted in November 2012 before the second survey. As shown in Table IV-9 and Figure IV-17 showing the supply quantity by type of suppliers, farmers are the main suppliers to the Dambulla DEC contributing nearly a half of the daily supplies (47%). The second important supplier group is collectors contributing 35 % of the daily market arrivals. The number of collectors arrived to the Dambulla DEC was 241 per day on average during the survey period.

Table IV-9 Supply quantity by type of suppliers to the DEC Dambulla

Type of Supplier	Day 1 (Dec 1, 2012)		Day 2 (Dec 5, 2012		Average	
	Quantity (kg)	%	Quantity (kg)	%	Quantity (kg)	%
Farmers	699,143	50	584,214	44	641,679	47
Collectors	488,883	45	470,138	35	479,511	35
Transporters	145,366	10	241,170	18	193,268	14
Other suppliers	64,875	5	32,400	3	48,638	4
Total	**1,398,268**	**100**	**1,327,922**	**100**	**1,363,095**	**100**

Source: Compiled from JICA Sri Lanka Marketing Survey (Dec 1 and Dec 5, 2012)

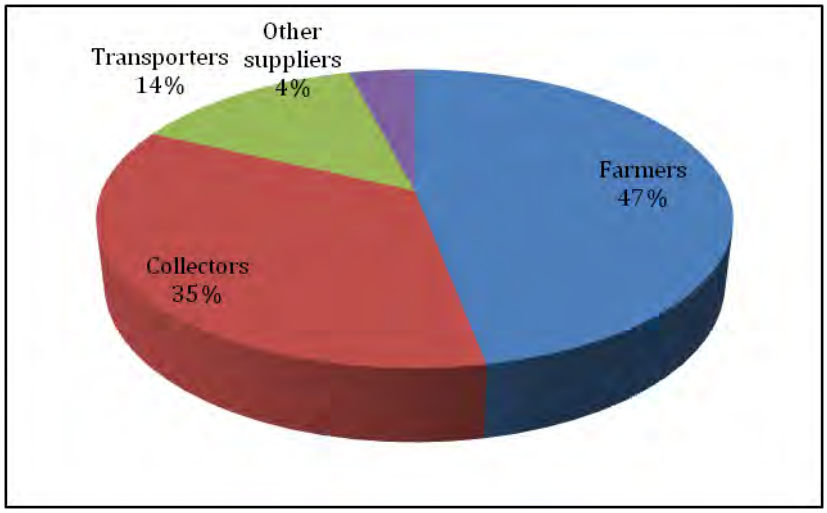


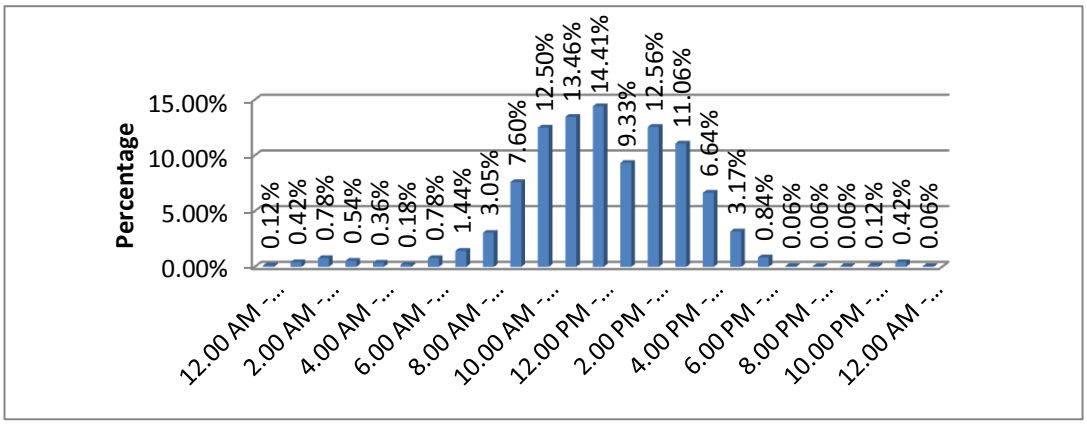
Figure IV-17 Type of suppliers according to quantity supplied (%) to Dambulla DEC

- **Type of incoming vehicles**

The total number of vehicles coming to the DEC amounted to 839 per day as shown in Table IV-10. The majority of vehicles (60%) belong to the category of small trucks with capacity of 1-3 tons. Even among them smallest truck (1ton) is dominant. The second largest category is the three-wheelers registering 19 % of the total vehicles. The dominance of small vehicles has number of implications such as high transport costs and market congestion. The higher numbers of small vehicles would be due to the higher number of individual business operation.

Table IV-10 Type of incoming vehicles

Type of Vehicles	Day 1 (Dec 1, 2012)		Day 2 (Dec 5, 2012)		Average	
	No of Vehicles	%	No of Vehicles	%	No of Vehicles	%
Three Wheeler (Small)	105	12	126	16	116	14
Three Wheeler (Large)	57	7	27	3	42	5
Tractor (4-wheel)	11	1	13	2	12	1
Tractor (2 -wheel)	53	6	28	4	41	5
Pick up	36	5	45	6	41	5
Small truck (1 ton)	223	25	169	21	196	23
Small Truck (1.5ton)	117	13	95	12	106	13
Small Truck (3ton)	146	17	154	19	150	18
Medium Truck (5 ton)	73	8	64	8	69	8
Large Truck (10 ton)	15	1	23	2	19	2
Other vehicles	42	5	95	12	47	6
Total	878	100	794	100	839	100



Source: Compiled from JICA Sri Lanka Marketing Survey (Dec 1 and Dec 5, 2012)

Figure IV-18 Time of vehicle entry to Dambulla DEC

- **Entry time of incoming vehicles**

An attempt was made to examine the vehicle entry time to the Dambulla DEC in order to find out busy hours of market operations. As shown in Figure IV-18, busy time period is between 9 am to 5 pm on the day. The total number of vehicles arrived in this time period was 735 out of 836 which is 88 %. The most busy time period is 10.00 am to 1.00 pm of the day in which 40 % of vehicles entered into the market. Again, more vehicles came to the market between 2.00 pm - 4.00 pm which was 23 % of the total.

2) Outflow survey

- **Destination of commodities**

The total outflow quantity was 1,201 mt per day in comparison to the inflow quantity of 1,363 mt; there was a balance of 162 mt that are not out flowed. Due to non-perishable goods especially imported items, which are not disposed on the day they arrived, inflow and outflow quantities do not match. Unlike inflow quantities, the outflow quantities move to several districts as shown in Figure IV-19. It is worth noting that goods move to all the districts. The smallest quantity of 3,050 kg was dispatched to Mullaitivu district and the largest quantity of 124,850 kg was dispatched to Anuradhapura district.

Table IV-11 Destination by dsistricts from Dambulla DEC

Destination Districts	Day 1 (Dec 1, 2012)		Day 2 (Dec 5, 2012)		Average	
	Quantity (kg)	%	Quantity (kg)	%	Quantity (kg)	%
Matale	125,885	10	102,700	10	114,292.5	10
Nuwara Eliya	57,750	4	28,900	3	43,325	4
Kandy	69,750	5	105,970	10	87,860	7
Kurunegala	193,900	15	102,800	10	148,350	12
Anuradhapura	86,950	7	162,750	15	124,850	10
Polonnaruwa	69,720	5	91,000	8	80,360	7
Trincomalee	80,800	6	70,150	7	75,475	6
Kegalle	98,900	7	78,450	7	88,675	7
Colombo	101,300	8	108,800	10	105,050	9
Other districts	437,650	33	227,700	21	332,675	28
Total	**1,322,605**	**100**	**1,079,220**	**100**	**1,200,913**	**100**

Source: Compiled from JICA Sri Lanka Marketing Survey (Dec 1 and Dec 5, 2012)

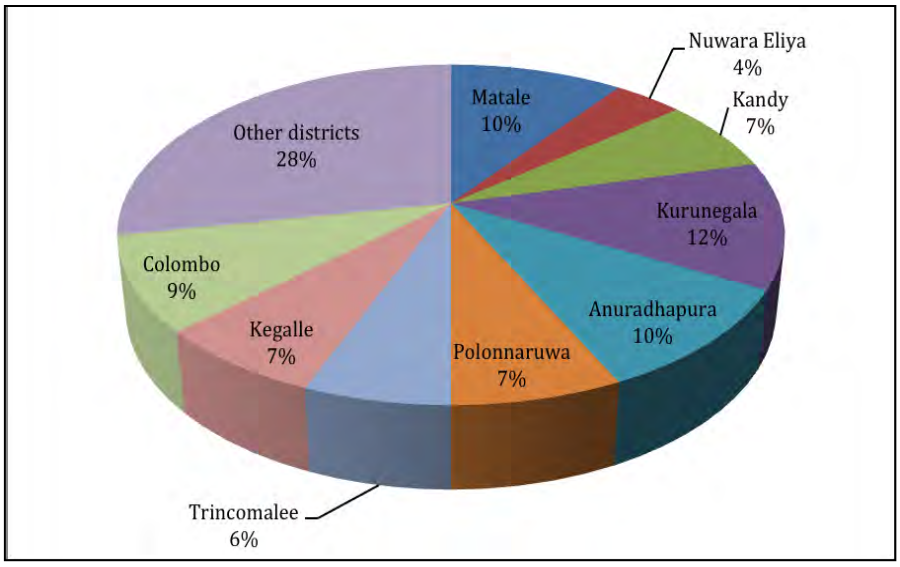


Figure IV-19 Destination of commodities (%) by districts from Dambulla DEC

- **Type of outgoing vehicles**

As shown in Table IV-12 and Figure IV-20, the total number of outgoing vehicles from DEC amounted to 523 per day as against incoming vehicles of 839 per day. The majority of vehicles (56%) belong to the category of small trucks with the capacity of 1-3 tons. As mentioned in the incoming section above, the dominance of small vehicles has number of implications such as high transport costs and market congestion. The higher numbers of small vehicles would be due to the higher number of individual business operation.

Table IV-12 Type of outgoing vehicles from Dambulla DEC

Type of vehicles	Day 1 (Dec 1, 2012)		Day 2 (Dec 5, 2012)		Average	
	No of Vehicles	%	No of Vehicles	%	No of Vehicles	%
Three Wheeler (Small)	38	7	47	10	43	8
Small truck (1 ton)	128	23	113	23	121	23
Small Truck (1.5ton)	77	14	46	9	62	12
Small Truck (3Ton)	124	23	93	19	109	21
Medium Truck (5Ton)	73	13	72	15	73	14
Large Truck (10Ton)	32	6	28	6	30	6
Other vehicles	75	14	90	18	85	16
Total	**547**	**100**	**489**	**100**	**523**	**100**

Source: Compiled from JICA Sri Lanka Marketing Survey (Dec 1 and Dec 5, 2012)

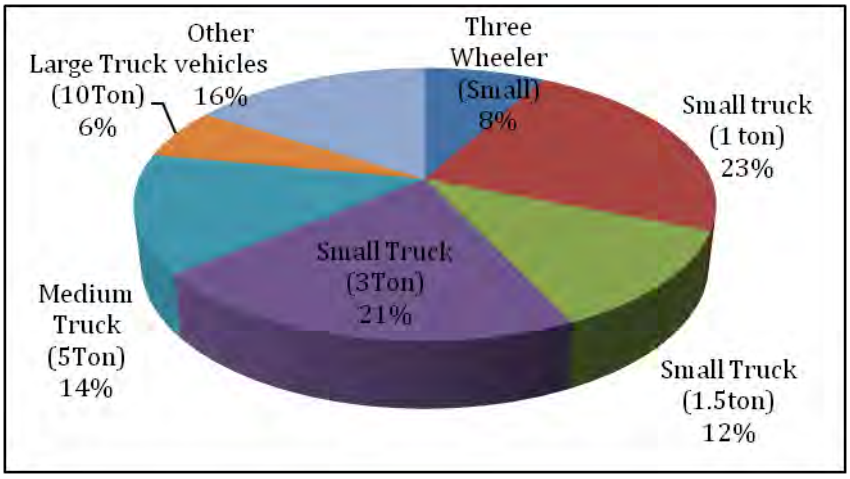
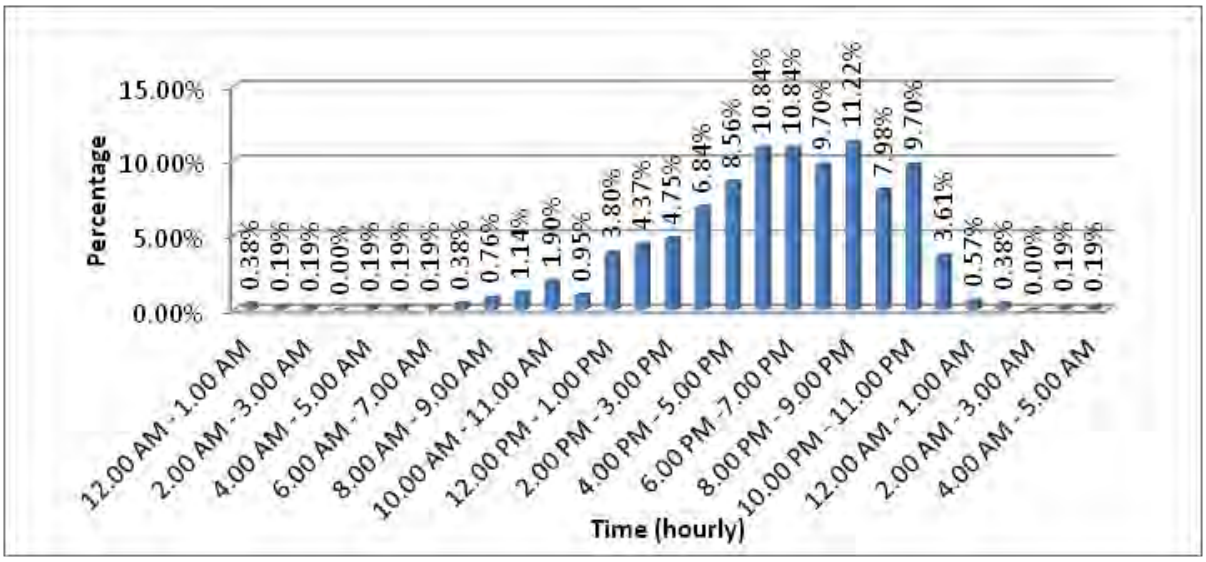


Figure IV-20 Type of outgoing vehicles (%) from Dambulla DEC

- **Time of vehicle departure**

Results of the departure time of the vehicles are depicted in Figure IV-21. Peak time of vehicles leaving is 3.00 pm – 11.00 pm. The total number of vehicles left during this time period was 398 out of 526. This represents 76 %. After mid night (12.00) of the day only 7 vehicles departed.



Source: Compiled from JICA Sri Lanka Marketing Survey (Dec 1 and Dec 5, 2012)

Figure IV-21 Time of vehicle departure from Dambulla DEC

- **Type of buyers**

Buyers who purchased from the Dambulla DEC are described in Table IV-13 and Figure IV-22. Accordingly wholesalers and retailers are the two major groups, and institutional buyers, processors and exporters are insignificant with less than one % of the total sales. Market share of the wholesalers was 34 %, which was the highest. Wholesalers mainly sell to retailers at public markets, Pola, roadside shops and groceries. Interviews with traders reveal that the number of wholesalers is on the increase because arrival of retailers has declined after increasing transport charges.

Table IV-13 Type of buyer by quantity from Dambulla DEC

Type of Buyers	Day 1 (Dec 1, 2012)		Day 2 (Dec 5, 2012		Average	
	Quantity (kg)	%	Quantity (kg)	%	Quantity (kg)	%
Wholesalers	495,690	37	318,855	30	407,273	34
Retailers	338,305	26	245,745	23	292,025	24
Pola Traders	304,450	23	220,700	20	262,575	22
Other Buyers	184,160	14	293,920	27	238.990	20
Total	**1,322,605**	**100**	**1,079,220**	**100**	**1,200,863**	**100**

Source: Compiled from JICA Sri Lanka Marketing Survey (Dec 1 and Dec 5, 2012)

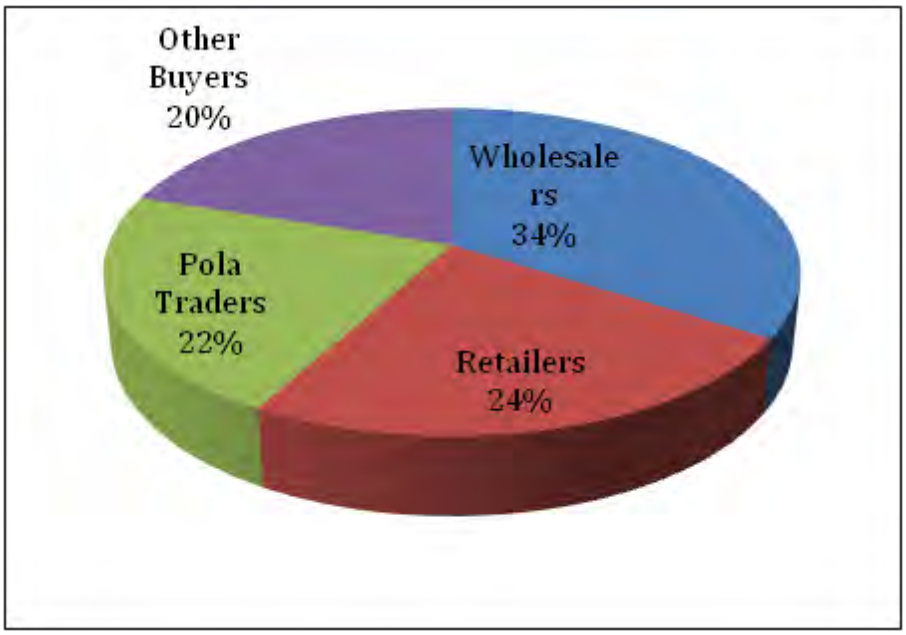


Figure IV-22 Type of buyers (%) from Dambulla DEC

3) Connectivity with other DECs

Outflow quantities to DECs from Dambulla DEC were studied. As shown in the Table IV-14 and Figure IV-23, the Dambulla DEC has connection with five DECs. The daily quantity dispatched to these markets was 50 Mt out of 1,225 mt, which is 4 % of the daily sale. Out of 50 mt, 41 % went to Meegoda DEC followed by Veyangoda (26%) and Thambuttegama (23%).

Table IV-14 Outgoing quantity from Dambulla DEC to other DECs

DECs	Day 1 (Dec 1, 2012)		Day 2 (Dec 5, 2012		Average	
	Quantity (kg)	%	Quantity (kg)	%	Quantity (kg)	%
Thambuttegama	3,550	7	20,000	66	11,775	22
Embilipitiya	5,000	10	-		5,000	9
Meegoda	20,700	42	-		20,700	38
Welisara	3,750	8	-		3,750	7
Veyangoda	16,000	33	10,500	34	13,250	24
Total	**49,000**	**100**	**30,500**	**100**	**54,475**	**100**

Source: Compiled from JICA Sri Lanka Marketing Survey (Dec 1 and Dec 5, 2012)

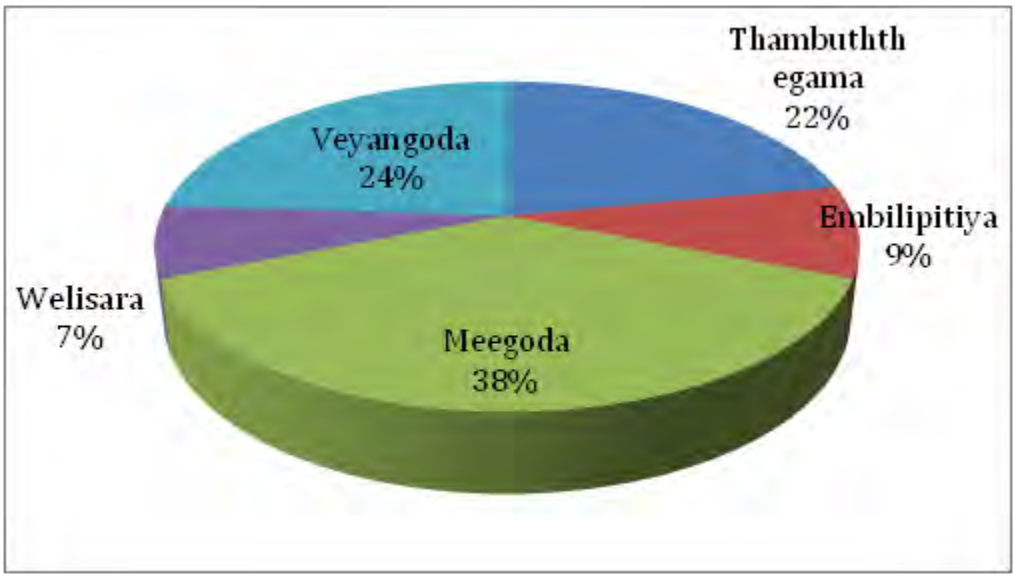


Figure IV-23 Outgoing quantity (%) from Dambulla DEC to other DECs

(2) Inflow and outflow survey at Thambuttegama DEC

1) Inflow survey

- **Origin of supply**

The origin of agriculture produce by districts to the Thambuttegama DEC is presented in Table IV-15 and Figure IV-24. Total quantity that in flowed to the DEC was around 150 mt per day, which was from 10 districts out of 25 in the country. Although supply arrived from ten districts Anuradhapura district alone contributed to nearly 90 % of the total daily supply. The Thambuttegama DEC is located in Anuradhapura district that means a large quantity of supply is coming from within the district.

Table IV-15 Origin of supply by districts to the Thambuttegama DEC

Districts	Dec 7, 2012		Dec 17, 2012		Average	
	Quantity (kg)	%	Quantity (kg)	%	Quantity (kg)	%
Anuradhapura	127,517	84	137,471	93	132,494	88
Other Districts	23,905	16	10,413	7	17,159	12
Total	**151,422**	**100**	**147,884**	**100**	**149,653**	**100**

Source: Compiled from JICA Sri Lanka Marketing Survey (Dec 7 and Dec 17, 2012)

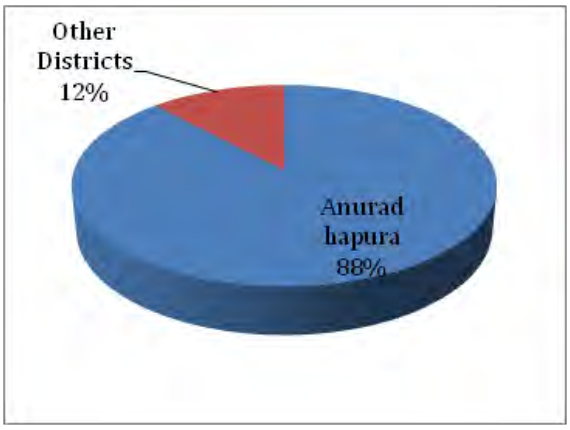


Figure IV-24 Origin of supply by districts to Thambuttegama DEC

- **Source of supply**

Three main suppliers, i.e., famers, collectors and transporters have been identified from the general survey conducted in November 2012 before this survey. As shown in Table IV-16 and Figure IV-25, farmers are the main suppliers to the Thambuttegama DEC contributing over 80 % of the daily supplies (82%). Of them, as expected, the vast majority (97%) visited from Anuradhapura district. The second important supplier group is collectors contributing 15 % of the daily market arrivals. The number of collectors arrived to the Thambuttegama DEC was only 27 per day on average during the survey period. The majority (74%) came from Anuradhapura district.

Table IV-16 Type of Suppliers by quantity to the Thambuttegama DEC

Type of Suppliers	Dec 7, 2012		Dec 17, 2012		Average	
	Quantity (kg)	%	Quantity (kg)	%	Quantity (kg)	%
Farmer	123,657	82	122,791	83	123,224	82
Collector	22,065	14	21,645	15	21,855	15
Transporter	5,700	4	80	0	2,890	2
Others	0	0	3,367	2	1,683	1
Total	**151,422**	**100**	**147,883**	**100**	**149,652**	**100**

Source: Compiled from JICA Sri Lanka Marketing Survey (Dec 7 and Dec 17, 2012)

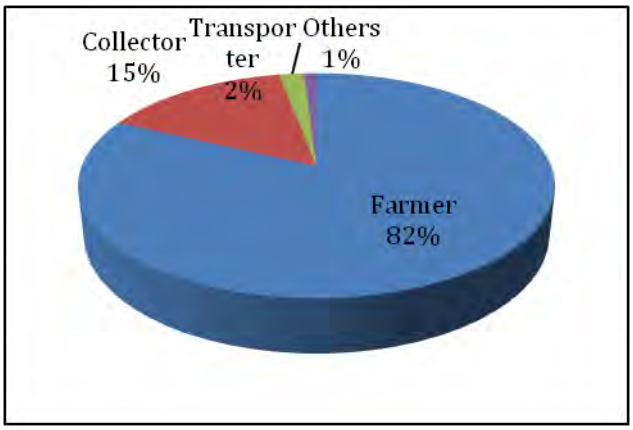


Figure IV-25 Type of suppliers by quantity (%) by districts to Thambuttegama DEC

- **Type of incoming vehicles**

The total number of vehicles coming to the DEC amounted to around 432 per day as shown in Table IV-17 and Figure IV-26. Out of them 150 or 35 % were motorcycles and 98 or 23 % were three-wheelers. The dominance of small vehicles has number of implications such as high transport costs and market congestion. The major bottleneck reported by market beneficiaries including farmers was inadequacy of market place and absence of parking space. The place allocated for parking is small and used by a trader in front of it. The higher numbers of small vehicles would be due to the higher number of individual business operation.

Table IV-17 Type of incoming vehicles to Thambuttegama DEC

Types of Vehicle	Dec 7, 2012		Dec 17, 2012		Average	
	No of Vehicles	%	No of Vehicles	%	No of Vehicles	%
Bicycle	32	8	68	14	50	12
Motor Cycle	134	35	165	35	149	34
Three Wheeler (Small)	80	21	102	22	91	21
Tractors (2-wheel)	24	6	19	4	21	5
Small truck (1 ton)	59	15	55	12	57	13
Small truck (3 ton)	20	5	8	2	14	3
Other Vehicles	37	10	55	12	50	12
Total	**386**	**100**	**472**	**100**	**432**	**100**

Source: Compiled from JICA Sri Lanka Marketing Survey (Dec 7 and Dec 17, 2012)

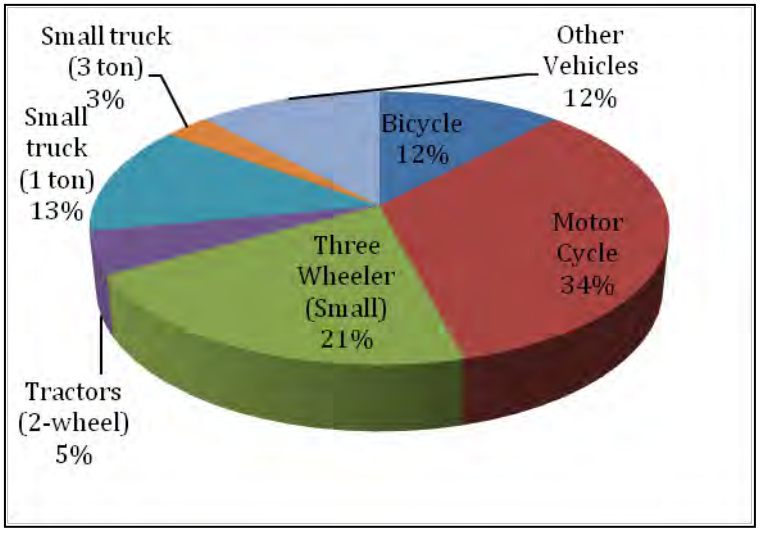


Figure IV-26 Type of incoming vehicles (%) to Thambuttegama DEC

- **Entry time of incoming vehicles**

An attempt was made to examine the vehicle entry time to the Thambuttegama DEC in order to find out busy hours of market operations. As shown in Figure IV-27, busy time period is between 5 am to 9 pm of the day. The total number of vehicles arrived in this period was 391 out of 434 which is 90 %. The busiest time period is 6.00 am to 8.00 am of the day. The gate is opened daily at 5.30 am. Unlike the other markets, transactions take place in a short-time period. After 9.00 in the morning of the day, market operation is almost completed. Most buyers are from Anuradhapura district itself, and they want to purchase early in order to sell fresh produce to the consumers on the same day.

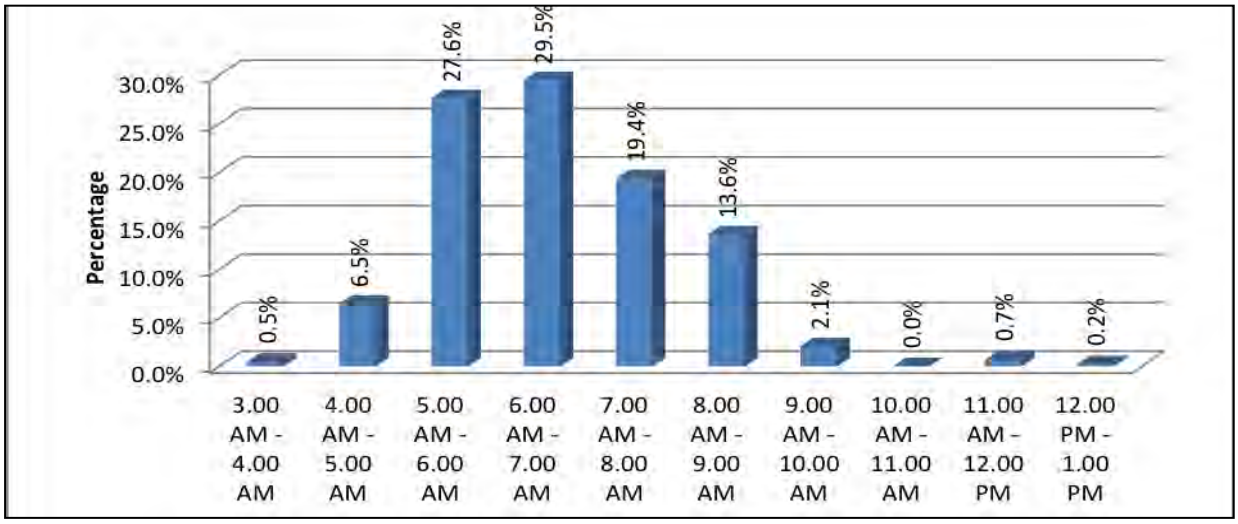


Figure IV-27 Time of vehicle entry to Thambuttegama DEC

2) Outflow survey

- **Destination of products**

Destinations of commodities by quantities are described in Table IV-18 and Figure IV-28. The total out going quantity was 142 mt per day. Compared to the incoming quantity of 150 mt, there was an excess of 8 mt. Due to non-perishable goods especially imported items which are not disposed on the day arrived, inflow and outflow quantities do not often match. Except Galle and Colombo all other districts are as same as origins. Notable feature is that 52 % of goods move to Anuradhapura district and 20 % to Kurunegala district. The next highest was Gampaha with 8 %.

An attempt was made to ascertain quantity moving to other DECs. It was found that Dambulla and Veyangoda are two DECs, which have connection with Thambuttegama. Total quantity moved to two DECs per day amounted to 10 mt out of 142 mt of the daily dispatch. This is a 7 % of the total volume. The amount move to Dambulla and Veyangoda DEC were 9450kg and 1000kg respectively. Thambuttegama DEC is famous for lowland vegetables including green chillies known as Wanni vegetables.

Table IV-18 Destination by districts from Thambuttegama DEC

Destination Districts	Dec 7, 2012		Dec 17, 2012		Average	
	Quantity (kg)	%	Quantity (kg)	%	Quantity (kg)	%
Matale	12,490	8	13,200	10	12,845	9
Kurunegala	40,655	26	16,000	12	28,328	20
Anuradhapura	69,562	45	78,620	60	74,091	52
Colombo	9,500	6	160	0	4,830	3
Gampaha	12,000	8	10,500	8	11,250	8
Other districts	9,350	6	11,600	9	10,475	7
Total	**153,557**	**100**	**130,080**	**100**	**141,819**	**100**

Source: Compiled from JICA Sri Lanka Marketing Survey (Dec 7 and Dec 17, 2012)

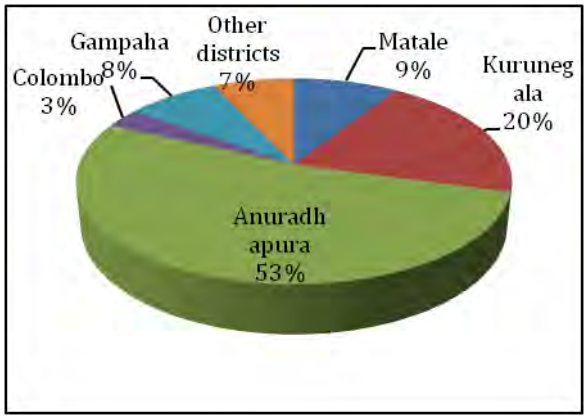


Figure IV-28 Destination of commodities (%) by districts from Thambuttegama DEC

Types of buyers are given in Table IV-19 and Figure IV-29. The majority (71%) are retailers. No processors and exporters purchased from Thambuttegama DEC.

Table IV-19 Type of buyers by quantity from Thambuttegama DEC

Type of Buyers	Dec 7, 2012		Dec 17, 2012		Average	
	Quantity (kg)	%	Quantity (kg)	%	Quantity (kg)	%
Wholesalers	24,030	16	42,640	33	33,335	24
Retailers	80,522	52	53,362	41	66,942	47
Pola Traders	35,100	23	33,078	25	34,089	24
Other Buyers	13,905	9	1,000	1	7,453	5
Total	**153,557**	**100**	**130,080**	**100**	**141,819**	**100**

Source: Compiled from JICA Sri Lanka Marketing Survey (Dec 7 and Dec 17, 2012)

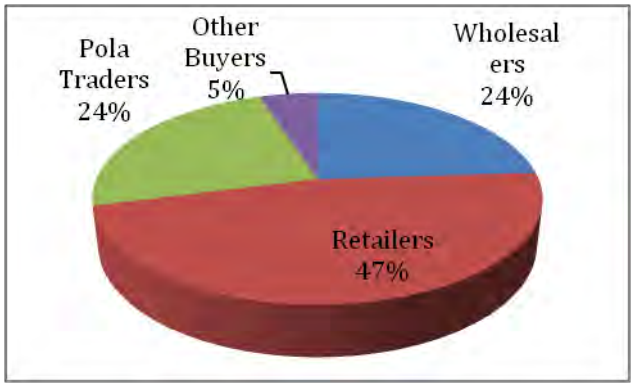


Figure IV-29 Type of buyers by quantity (%) from Thambuttegama DEC

Figure IV-30 show the time of movement of vegetables from the DEC. Out of total stock, 87 % went out during the time between 7.00 am to 11.00 am. After 1.00 pm wholesale business appears to have completed.

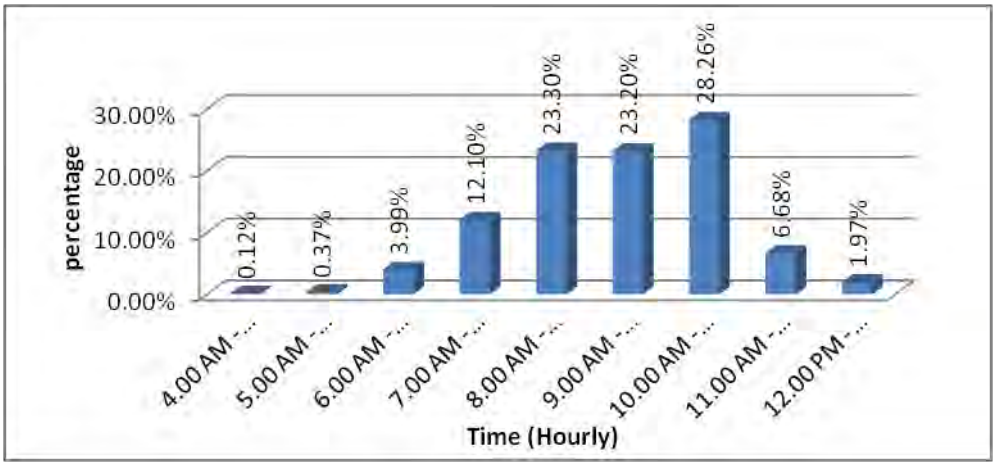


Figure IV-30 Time of vehicle departure from Thambuttegama DEC

- **Type of outgoing vehicles**

As shown in Table IV-20 and Figure IV-31, the total number of outgoing vehicles from the DEC amounted to 194 per day against incoming vehicles of 434 per day. The majority of vehicles belong to the category of small vehicles with small trucks, three wheelers and motorbikes. As mentioned in the incoming section, the dominance of small vehicles has number of implications such as high transport costs and market congestion. The higher numbers of small vehicles would be due to the higher number of individual business operation.

Table IV-20 Type of outgoing vehicles from Thambuttegama DEC

Vehicle Type	Dec 7, 2012		Dec 17, 2012		Average	
	No of Vehicles	%	No of Vehicles	%	No of Vehicles	%
Motor Cycle	19	10	27	15	23	12
Three Wheeler (Small)	65	33	51	28	58	30
Small truck (1 ton)	58	29	49	27	54	28
Small Truck (1.5ton)	12	6	16	9	14	7
Small Truck (3Ton)	18	9	9	5	14	7
Other vehicles	26	13	30	16	31	16
Total	**198**	**100**	**182**	**100**	**194**	**100**

Source: Compiled from JICA Sri Lanka Marketing Survey (Dec 7 and Dec 17, 2012)

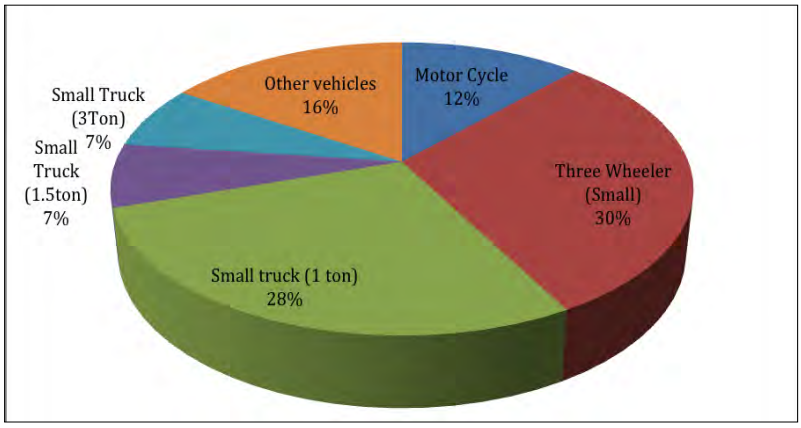


Figure IV-31 Type of outgoing vehicles from Thambuttegama DEC

4.4 Tracing survey (OFC and vegetable/ fruits)

In this section, results from the tracing Survey will be explained in relation with temporal price fluctuations and farmers' profits. Main survey was conducted in December 2012 in the middle of the lean harvest period of Maha season (2nd survey). This survey was done after the 1st survey was conducted in November only for certain crops, at the beginning of the lean harvest period of Maha season. In addition, while family labor costs are included in the production costs in the 1st survey, they are excluded at the 2nd survey (except for big onion). It was excluded at the time of 2nd survey due to the difficulty of receiving reliable information from the farmers. Therefore, the survey results are estimated by applying the statistical data and results of the previous research studies.

4.4.1 Results from the tracing survey

(1) Seasonal relation between cost and prices

Comparing the results from the tracing survey done by the Survey team and the figures from available statistics, it could be said that seasonal differences of the prices affect farmers' profit (Table IV-21).

First, producer prices fully cover production costs in any surveyed crop. This might be because the producer prices are relatively high in December, which is in the middle of a lean harvesting period (between harvest periods of Yala and Maha seasons). However, it is estimated that farmers are not able to even cover the production costs during the peak harvesting seasons in the bumper years, when looking at the statistical figures during the peak harvesting seasons (Table IV-21). Detailed breakdown of production costs are summarized in Appendix A-11.

Between the producer and wholesale stage, marketing services and costs are generally minimal. Between the wholesale and retail stage, marketing services and costs are rather high. Farmers shares in the retail prices in percentage terms range from **47 to 70%**. However, this would be much lower in the case of the value chains towards Colombo or its suburbs with the longer distance transport (estimated range is from **25 to 59%**). Furthermore, during peak harvest periods, farmers' share in the retail prices will be rapidly reduced, since retail and producer prices are reduced while production cost generally remains same throughout a year.

As for farmers' profit in percentage terms [(Producer price – Production cost)/Producer price * 100], it ranges from **16 to 72%** excluding the fruits (family labor costs are not considered in the calculation of Production cost). This comparably high profit would be largely due to the seasonal price increase of the survey period (December = lean period of Maha season). It could be estimated that, at the peak season with the minimum producer prices in Table IV-23, the range of farmers' profit would be from **minus 59 to plus 47%** (excluding the fruits), which might not be able to cover the production cost. In this case, farmers bear the risk of price inversion between production cost and producer price.

Table IV-21 Summary of results from the tracing survey (week 1-2 December 2012)

Unit: Rs/kg

Crops		OFC		Up-country vegetable				Low-country vegetable		Fruit	
		Big onion	Red onion	Tomato	Leek	Cabbage	Bean	Brinjal	Bitter gourd	Sour banana	Pineapple
Production cost	**Survey**	**21.3**	**33.7**	**6.6**	**59.0**	**19.3**	**17.2**	**12.4**	**24.0**	**7.2**	**5.2**
Producer price [1)]	**Survey**	**67**	**120**	**50**	**70**	**70**	**50**	**38**	**70**	**35**	**35**
	Statistics	Min: 43.3 Max: 57.9 AVD: 52.8	Min: 55.3 Max: 270.2 AVD: 105.8	Min: 13.3 Max: 77.4 AVD: 45.2	Min: 37.1 Max: 96.5 AVD: 57.5	Min: 19.1 Max: 43.9 AVD: 32.1	Min: 30.5 Max: 84.2 AVD: 46.5	Min: 13.7 Max: 48.5 AVD: 26.7	Min: 37.0 Max: 70.0 AVD: 55.6	Min: 17.9 Max: 29.3 AVD: 23.4	Min: 13.8 Max: 46.3 AVD: 27.8
Wholesale price [2)]	**Survey**	**70**	**120**	**72**	**80**	**75**	**60**	**40**	**73**	**50**	**45**
	Statistics	Min: 36.4 Max: 119.3 AVD: 66.5 (2010)	Min: 45.4 Max: 156.1 AVD: 74.0 (2010)	Min: 23.0 Max: 84.5 AVD: 50.5	Min: 49.0 Max: 116.4 AVD: 70.3	Min: 16.1 Max: 80.1 AVD: 37.7	Min: 56.2 Max: 101.7 AVD: 77.6 (2010)	Min: 18.0 Max: 67.8 AVD: 34.7	Min: 30.3 Max: 79.9 AVD: 57.6	NA	NA
Retail price [3)]	**Survey**	**100**	**180**	**90**	**110**	**110**	**90**	**80**	**100**	**70**	**60**
	Statistics (Colombo)	114.1	NA	120.4	141.6	126.4	170.0	130.0	169.1	NA	NA

Remarks
1): Average farm-gate price range and average monthly price of 2011 (Producer price includes transporting/handling costs and stall commission fees which are paid by farmers in addition to farm-gate price, depending on the situation)
2): Average wholesale price range and average monthly price of 2011 (big onion, red onion, bean = 2010)
3): Average retail price in Colombo (Open Market Weekly Average Retail Prices – 1st Week of December 2012 (Main Markets in Colombo District: Pettah-Manning, Maradana, Borella, Dematagoda, Grandpass, Kirulapone, Wellawatte, Kotte, Nugegoda, Dehiwala, Ratmalana, Kolonnawa). Cabbage = retail prices at Colombo and suburbs (December 13, 2012))

Source
Tracing survey by JICA Survey team (one sample for each crop)
1): Farm-gate prices: HARTI (2011)
2): Wholesale prices: Dambulla DEC (2010)
3): Retail prices: Department of Census & Statistics Sri Lanka (2012), prices of cabbage are sourced from HARTI (2012)

(2) Comparison between the 1st and 2nd tracing surveys

Value chains clarified through the tracing survey are shown in page 114-119. Comparison between the 1st and 2nd survey results provides findings in some crops as below.

Big onion: Issue of seasonal difference in shipment volume and storage for shipment adjustment

The retail price of big onion is much higher in the 2nd survey because December is the last month of a year for stock releasing of big onion. The farmer's profit is also higher in the 2nd survey, even assuming that the production cost of the 1st survey is Rs 21.3/kg with farmer's profit of 36%. It is said that most farmers sell big onion during harvest period (August-September), to repay debt on time, and also due to lack of proper storage. On the other hand, big traders who have proper storage purchase a large amount of big onion from farmers during the peak season when its price is the lowest. Then, they release these stocks to the market when its price gets higher (October-November).

Tomato: Issue of poor flow of demand information

At the 1st survey, the farmer's profit is only one percent of the total retail price, and transporting to the Pettah-Manning market accounts for 17%. These extremely low figures were caused by the extremely low wholesale price (Rs 15/kg) probably due to the low demand in the consumption area (retail price dropped down to Rs 5/kg in November 2012). The farmer might have had no information on the low demand in the consumption area maybe because of the sudden reduction of the retail price. If he knew the proper price information, he would not transport the produces to Colombo all the way from Balangoda to earn such a low profit.

Brinjal: Issue of ineffective value-chain

As for Brinjal, both of the value chains of 1st and 2nd surveys are concluded within the same district. Assuming that the production cost of the 1st survey is same as the 2nd one (Rs 12.4/kg), farmer's profit would account for 15%. It is lower in the chain of the 1st survey probably due to the more players (supply-side wholesaler and demand-side wholesaler) and higher transport/marketing costs involved in the 1st chain. The prolonged value-chain in the same district could be pointed out. Higher wastage rate in the 1st chain could be because of the repeated packing and unpacking by the various players, and also because of the larger volume of handling in November compared to December, the middle of the lean season.

1) OFC

- **Big onion**

1st survey

Price	Location (district)	Player	Description (payer)	Value (Rs/kg)	Share (%)	
Producer	Palatuwawa (Matale)	Farmer	Cost of production	35.0	54	71
			Farmer's profit	9.7	15	
			Transporting (Farmer)	1.0	2	
			Handling and packing (Farmer)	0.3	1	
Wholesale	Dambulla DEC (Matale)	DEC trader	Stall commission (DEC trader)	2.0	3	14
			DEC trader's profit	2.3	4	
			Transport (DEC trader)	4.7	7	
Retail	Pettah-Manning market (Colombo)	Retailer	Retailer's profit	3.7	6	15
			Transporting (Retailer)	2.2	3	
			Wastage	4.1	6	
	Nugegoda (Colombo)	Consumer	Retail price	65.0	100	100

Remarks: Imputed costs are considered in the calculation of Production cost

2nd survey

Price	Location (district)	Player	Description (payer)	Value (Rs/kg)	Share (%)	
Producer	Kalundawa (Matale)	Farmer	Cost of production	21.3	21	67
			Farmer's profit	44.0	44	
			Transporting (Farmer)	1.4	1	
			Handling and packing (Farmer)	0.3	0	
Wholesale	Dambulla DEC (Matale)	Farmer	Stall commission (Farmer)	3.0	3	3
Retail	Pallepola Pola (Matale)	Retailer	Retailer's profit	20.0	20	30
			Packing (Retailer)	0.2	0	
			Transport/loading (Retailer)	2.5	3	
			Wastage (4 kg out of 44 kg)	7.3	7	
		Consumer	Retail price	100.0	100	100

Distance: 60km [22km (Kalundawa>Dambulla), 38km (Dambulla>Pallepola)]

Duration: 2.5 hours

Remarks: Imputed costs are considered in the calculation of production cost

- **Red onion**

2nd Survey

Price	Location (district)	Player	Description (payer)	Value (Rs/kg)	Share (%)	
Producer	Kadugannawa (Kandy)	Farmer	Cost of production	33.7	19	63
			Farmer's profit	78.1	43	
			Transporting (Farmer)	2.2	1	
Wholesale	Kurunduwatta (Kandy)	DEC trader	Stall commission (DEC trader)	6.0	3	3
Retail	Norochcholai (Puttalam)	Retailer	Retailer's profit	56.7	31	33
			Handling and packing (Retailer)	2.3	1	
			Wastage (1.25 kg out of 150 kg)	1.0	1	
	Negombo (Negombo)	Consumer	Retail price	180.0	100	100

Distance: 115km

Remarks: Imputed costs are not considered in the calculation of Production cost

2) Highland vegetable

- **Tomato**

1st survey

Price	Location (district)	Player	Description (payer)	Value (Rs/kg)	Share (%)	
Producer	Balangoda (Ratnapura)	Farmer	Cost of production	7.0	20	39
			Farmer's profit	0.3	1	
			Packing (Farmer)	0.2	1	
			Transporting (Farmer)	6.0	17	
Wholesale	Pettah-Manning market (Colombo)	Farmer	Stall commission (Farmer)	1.5	4	4
Retail	Nugegoda (Colombo)	Retailer	Retailer's profit	12.1	35	57
			Transporting (Wholesaler)	4.7	13	
			Wastage	3.2	9	
		Consumer	Retail price	35.0	100	100

Distance: 134 km [125km (Balangoda>Colombo), 9km (Colombo>Nugegoda)]
Remark: Imputed costs are considered in the calculation of Production cost

2nd survey

Price	Location (district)	Player	Description (payer)	Value (Rs/kg)	Share (%)	
Producer	Bandarawela (Badulla)	Farmer	Cost of production	6.6	7	56
			Farmer's profit	43.4	48	
Wholesale	-	Collector	DEC trader's profit	13.6	15	25
			Transporting/loading/unloading (DEC trader)	3.5	4	
	Dambulla DEC (Matale)	DEC trader	Stall commission (DEC trader)	5.0	6	
Retail	Galewela (Matale)	Retailer	Retailer's profit	13.1	15	20
			Transporting (Retailer)	1.3	1	
			Wastage (1 kg out of 49 kg)	3.7	4	
		Consumer	Retail price	90.0	100	100

Distance: 184 km [144 km (Badullawela > Matale), 40 km (Matale > Galewela)]
Remark: Imputed costs are not considered in the calculation of production cost

- **Leek**

2nd survey

Price	Location (district)	Player	Description (payer)	Value (Rs/kg)	Share (%)	
Producer	Galpalama (Nuwara Eliya)	Farmer	Cost of production	59.0	54	73
			Farmer's profit	20.8	19	
Wholesale	Kandapola (NE)	Collector	DEC trader's profit	3.4	3	10
			Transporting (DEC trader)	4.1	4	
	Dambulla DEC (Matale)	DEC trader	Stall commission (DEC trader)	3.4	3	
Retail	Galenbidunuwewa (Anuradhapura)	Roadside retailer	Retailer's profit	4.8	4	17
			Transporting (Retailer)	2.6	2	
			Wastage (6 kg out of 49 kg)	11.5	10	
			Retail price	110.0	100	100

Distance: 196 km
Duration 7 hours (from origin to destination)
Remark: Imputed costs are not considered in the calculation of production cost

- **Cabbage**

2nd survey

Price	Location (district)	Player	Description (payer)	Value (Rs/kg)	Share (%)	
Producer	Kandapola (Nuwara Eliya)	Farmer	Cost of production	19.3	18	64
			Farmer's profit	47.1	43	
			Transporting (Farmer)	2.9	3	
Wholesale	-	Collector	DEC trader's profit	0.9	1	5
			Transporting (DEC trader)	2.1	2	
	Dambulla DEC (Matale)	DEC trader	Stall commission (DEC trader)	2.0	2	
Retail	Matale roadside stall (Matale)	Retailer	Retailer's profit	18.7	17	32
			Transporting	1.9	2	
			Wastage (7.5 kg out of 53.5 kg)	14.4	13	
			Retail price	110.0	100	100

Distance: 104 km
Remark: Imputed costs are not considered in the calculation of production cost

- **Bean**

2nd survey

Price	Location (district)	Player	Description (payer)	Value (Rs/kg)	Share (%)	
Producer	Welimada (Badulla)	Farmer	Cost of production	17.2	19	56
			Farmer's profit	32.8	36	
Wholesale	Keppetipola DEC (Kandy)	DEC trader	Stall commission (DEC trader)	6.0	7	11
			DEC trader's profit	1.2	1	
			Transporting (DEC trader)	2.7	3	
Retail	Panadura (Kalutara)	Retailer	Retailer's profit	26.5	29	33
			Packing (Retailer)	1.2	1	
			Wastage (1 kg out of 26 kg)	2.4	3	
			Retail price	90.0	100	100

Distance: 230 km
Duration: 9.5 hours (from origin to destination)
Remark: Imputed costs are not considered in the calculation of production cost

3) Lowland vegetable

- **Brinjals**

1st survey

Price	Location (district)	Player	Description (payer)	Value (Rs/kg)	Share (%)	
Producer	Anuradhapura (Anuradhapura)	Farmer	Cost of production	8.8	15	37
			Farmer's profit	12.3	20	
			Packing (Farmer)	0.3	1	
			Transporting (Farmer)	1.0	2	
Wholesale (A)	Thambuttegama DEC (Anuradhapura)	DEC trader	Stall commission (DEC trader)	2.7	5	21
			DEC trader 's profit	5.7	9	
			Packing (DEC trader)	0.4	1	
			Transporting (DEC trader)	2.6	4	
			Wastage	1.4	2	
Wholesale (B)	Anuradhapura (Anuradhapura)	Wholesaler	Wholesaler's profit	6.5	11	22
			Transporting (Wholesale)	1.3	2	
			Wastage	5.3	9	
Retail	Anuradhapura (Anuradhapura)	Retailer	Retailer's profit	6.2	10	20
			Transporting (Retailer)	1.0	2	
			Wastage (Retail)	4.8	8	
		Consumer	Retail price	60.0	100	100

Remark: Imputed costs are considered in the calculation of Production cost

2nd survey

Price	Location (district)	Player	Description (payer)	Value (Rs/kg)	Share (%)	
Producer	Pahalagama (Anuradhapura)	Farmer	Cost of production	12.4	15	51
			Farmer's profit	27.9	35	
			Packing (Farmer)	0.3	0	
Wholesale	Thambuttegama DEC (Anuradhapura)	Farmer	Stall commission (Farmer)	2.1	3	3
Retail	Eppawela (Anuradhapura)	Retailer	Retailer's profit	32.1	40	47
			Transporting (Retailer)	1.9	2	
			Packing (Retailer)	0.3	0	
			Wastage (3 kg out of 46 kg)	2.9	4	
		Consumer	Retail price	80.0	100	100

Distance: 29km
Duration: 5 hours
Remark: Imputed costs are not considered in the calculation of production cost

- **Bitter gourd**

2nd survey

Price	Location (district)	Player	Description (payer)	Value (Rs/kg)	Share (%)	
Producer	Pahalagama (Anuradhapura)	Farmer	Cost of production	24.0	24	73
			Farmer's profit	49.2	49	
			Packing (Farmer)	0.4	0	
Wholesale	Thambuttegama DEC (Anuradhapura)	Farmer	Stall commission (Farmer)	3.0	3	3
Retail	Eppawela (Anuradhapura)	Retailer	Retailer's profit	17.7	18	24
			Transport (Retailer)	1.9	2	
			Packing (Retailer)	0.4	0	
			Wastage (2 kg out of 46 kg)	3.6	4	
		Consumer	Retail price	100.0	100	100

Distance: 29km
Duration: 5 hours (from origin to destination)
Remark: Imputed costs are not considered in the calculation of production cost

4) Fruit

- **Sour banana**

1st survey

Price	Location (district)	Player	Description (payer)	Value (Rs/kg)	Share (%)	
Producer	Walsapugala (Hambantota)	Farmer	Cost of production	12.0	19	31
			Farmer's profit	8.0	13	
Wholesale	Embilipitiya DEC (Ratnapura)	Collector	Market trader's profit	9.5	15	30
			Packing (Market trader)	2.0	3	
			Transporting (Market trader)	0.7	1	
			Wastage	2.8	4	
	Pettah-Manning market (Colombo)	Market trader	Stall commission (Market trader)	3.5	6	
Retail	Colombo	Retailer	Retailer's profit	11.0	17	39
			Transporting (Retailer)	2.5	4	
			Wastage	11.5	18	
		Consumer	Retail price	63.5	100	100

Remark: Imputed costs are considered in the calculation of Production cost

2nd survey

Price	Location (district)	Player	Description (payer)	Value (Rs/kg)	Share (%)	
Producer	Sevanagala (Monaragala)	Farmer	Cost of production	7.2	10	50
			Farmer's profit	27.8	40	
Wholesale	Hathporuwa Pola (Hambantota)	Collector	Market trader's profit	6.4	9	21
			Transporting (Market trader)	1.6	2	
	Pettah-Manning market (Colombo)	Market trader	Stall commission (Market trader)	7.0	10	
Retail	Thotalanga (Colombo)	Retailer	Retailer's profit	13.6	19	29
			Transporting (Retailer)	1.1	2	
			Wastage (3 kg out of 29 kg)	5.3	8	
		Consumer	Retail price	70.0	100	100

Distance: 185 km
Duration: 6 hours 45 minutes (from origin to destination)
Remark: Imputed costs are not considered in the calculation of Production cost

- **Pineapple**

2nd survey

Sector	Location (district)	Player	Description (payer)	Value (Rs/kg)	Share (%)	
Production	Sevanagala (Monaragala)	Farmer	Cost of production	5.2	9	58
			Farmer's profit	29.5	49	
			Packing (Farmer)	0.3	1	
Wholesale	Hathporuwa Pola	Collector	Collector's profit	6.9	12	17
			Transporting (Collector)	3.4	6	
	Pettah-Manning market (Colombo)	Commission agent	Stall commission (Collector)	4.7	8	8
Retail	Thotalanga (Colombo)	Retailer	Retailer's profit	5.2	9	17
			Transporting (Retailer)	1.8	3	
			Wastage (4 kg out of 29 kg)	3.0	5	
			Consumer price	60.0	100	100

Distance: 185 km
Duration: 7 hours (from origin to destination)
Remark: Imputed costs are not considered in the calculation of Production cost

(3) Wastage rate

According to the tracing survey, wastage always came out in the open at the retail stage, of which rate was ranging from **1 to 14%** on the price basis including the fruits. As causes of wastage, followings were observed; injury caused during transportation, rotten produces intentionally hindered in a sack at farm-gate, immature or overmature produces, and diseased/insect-attacked produces. In addition, water evapolation during transportation caused 1-2% of weight loss, although it is not considered as wastage.

Such wastage eventually contributes to increasing the retail prices and it could be estimated that the figures might be even increased during the peak harvest period. It seems that farmers are not much aware of the quality of the produce, while, the consumers concern over the quality of the produce has been increasing in recent times. It seems that unsalable produces are often hidden in the middle of a sack at farm-gate. For example, during the tracing of carrot, 35% of wastage was reported with rotten ones hidden in a sack at farm-gate presumably with the farmer's intension. Due to this reason, carrot was excluded from the results of the tracing survey to eliminate the extreme case.

High percentages of wastage are also caused due to human errors during the harvest stage. This is generally due to the poor practices of farmers who are not aware that the low quality affects the prices, and also because of the improper harvesting timing. For example, when the Survey team purchased a sack of mango at Thambuttegama DEC, 5 kg of immature mango was found out of 19 kg, which should not have been put in a maketing channel. As it was clear that there would ne no afterripening on the mango of 5 kg due to the improper harvest timing, and it would be never eatable, the mango was considered as wastage. Another example of unsalable produces caused by inappropriate harvest timing was seen in okra. This is because farmers harvest every two days or even more with the intention of increasing the total weight of the produces, and as a result, overmatured okra are transported to a market hidden in a sack.

As for the high wastage percentage of cabbage and leek in the tracing survey, causes of the losses are mainly caused reomval of outer leaves or roots at the retail stage. In this respect, it was found that such leaves or roots are conventionally kept during transportation to keep the produces fresh, and especially the outer leaves are sold out at lower prices. Therefore, to obtain more accurate wastage rate, it is suggested to distinguish such removal loss from wastage.

(4) Wastage survey

Separately from the tracing survey mentioned above, an additional survey specific to wastage was conducted by the Survey team in February 2013 to supplement the statistical data by the Institute of Post-harvest Technology (page 21) and the results from the tracing survey mentioned above, through focus group discussions and interviews. The target vegetables were selected for their higher perishability. In this wastage survey, "wastage" was defined as follows: "Losses caused by players' carelessness which can be avoided by improving their awareness". Description and results of the wastage survey are summarized in Table IV-22 and IV-23.

Table IV-22 Summary of wastage survey

Survey location	Player	Town (method)	Vegetables
Matale district	Farmer	▪ Dambulla (group discussion) ▪ Naula (group discussion)	▪ Tomato ▪ French beans ▪ Okra ▪ Brinjal
	Retailer	▪ Dambulla pola (interview) ▪ Galewela pola (interview)	
Colombo	Retailer	▪ Ratmalana DEC (group discussion) ▪ Manalagama pola (group discussion)	

Remarks: This survey was conducted from 8th to 10th of February, 2013. Each focus group was comprised of 5-10 persons.

Table IV-23 Percentage of wastage occurred during marketing of the selected perishable vegetables

Unit: % on the weight basis

Player	Stage of wastage occurrence	Location	Way of getting information	Vegetables			
				Tomato	Bean	Brinjal	Okra
Farmer	Pre-harvest	Dambulla (Matale)	Discussion	5.0-12.0	not cultivated	8.0-10.0	5.5
		Naula (Matale)	Discussion	7.5-10.0	not cultivated	6.3	50.0-75.0
Retailer	Transport from wholesale to retail place	Ratmalana DEC (Colombo)	Discussion	10.0-15.0			
			Interview	0.3-10.0	1.0-10.8	4.4-16.0	20.0
		Maharagama Pola (Colombo)	Discussion	9.0-18.0	10.0	10.0	3.3-6.7
		Galewela Pola (Matale)	Interview	6.7-11.8	8.3	2.5-12.5	3.3-10.0
		Dambulla Pola (Matale)	Interview	4.6-6.3	1.1-4.5	6.7-20.0	25.0-33.0

Remarks:
1) Percentages collected from farmers are the ones of total weight of harvested produces.
2) Percentages collected from retailers are the ones of total weight of produces from farm-gate to the retail stage.
3) The extremely high percentage of okra reported by the farmers in Naula, is due to missing of harvest opportunities. The

discussion group claimed that bad weather or existing of non-working days of markets greatly affects the harvest timing of okra. Moreover, it is impossible for them to harvest all the produces due to lack of manpower available for okra harvesting, which requires a certain level of practical techniques.

Source: JICA Survey team

In most cases, wastage percentages are lower than the statistical figure (vegetables: 35.81% in total from "harvesting" to "selling"), presumably because the statistical one might have been calculated without excluding the weight of garbage generated at markets such as banana stems/leaves and coconut husks used as buffer materials during transportation. It could be also supposed that some kind of improvement had been done to reduce wastage over the past ten years.

With regard to wastage at the pre-harvest stage, unsoldable produces caused before marketing is non-negligible (from 5.0 to 12.0%, excluding the extreme figure of okra reported in Naula). According to the farmers (and even the retailers) in the discussion groups, the major reasons of the wastage occurrence are disease and insect damages caused by misuse of agrochemicals. Wrong harvest timing can also cause hardening of vegetables such as brinjal and okra, and these kinds of unsoldable commodities are often hidden in sucks at farm-gate according to the retailers.

As for wastage caused during transportation, major reasons were pointed out by the retailers. These include damages caused by careless handlings of the commodities (e.g. use of hooks by sack carriers at markets, overloading of vehicles). As an extreme but common case, rottenness of tomatoes in a wooden box was also reported. Tihs is because of the intentional increase in the box weight by soaking it in water at farm gate, to increase the weight and total income from selling. It would also appear that, mixing of stones or other unmarketable items to increase the total weight of commodities had been conventionally done.

Meanwhile, it was observed that some traders have put effort into obtaining vegetables of high quality. For example, roughly 5% of retailers in Maharagama Pola, purchases vegetables directly from farmers through network of personal connection. In another instance, 13% of traders of Ratmalana DEC purchases vegetables from Meegoda DEC, of which commodities are known for their freshness and quality, while the rest of them from the Pettah-Manning market. Regarding the chain through Meegoda DEC, most retailers own vehicles and purchase produces by themselves, directly from the production areas such as Nuwara Eliya (4.5- hour drive from Nuwara Eliya to Meegoda). This is the main reason of the shorter chain leading to relatively high quality and freshness of the commodities sold at Meegoda DEC. On the other hand, it will take more than two days for the commodities to be reached at Ratmalana DEC since the day of harvest, through the Pettah-Manning market, compared to the chain through Meegoda DEC. Due to this time delay, the quality and freshness of products would be less.

Specifically for okra, the problem of over-maturity was also reported by the retailers which can be caused when the commodities are left in outside air without being sold to consumers for more than three days after harvest. However, in general, commodities which could not be sold on the first day, or those of low quality, would be anyhow sold on a next day at discount prices, mostly to hotels, restaurants or to roadiside retailers.

4.5 Tracing surveys of fish and livestock

4.5.1 Tracing of fish

Tracing survey of fish was conducted to grasp the income shares (profit margins) of the fishers and the fish traders, and to examine what influences profit margins or income shares. The analysis was conducted for fish available at three landing sites: namely, Cod-Bay (Trincomalee District) and Valaichchenai (Batticaloa District) that are in the Eastern province; Pesalai (Mannar district) in the Northern Province, and Kudawella (Hambantota district) in the Southern Province. The tagged fishes were traced to wholesale fish markets in Peliyagoda and Negombo, and then to their final retail destinations in Maharagama Pola, Piliyangoda, Katunayaka, and Kudawella.

The results are summarized below. The production costs shared about 35 to 40 percent of the retail price in the multi-day boats for operating more than a week; the share for the day boat was about 19 percent. Fuel is the main cost in the fishing operation expenses besides the ice, food and labour cost (for crew members). The profit share of fisherman (multiday boat owners) ranged 16 to 19 percent for the multiday boats; similarly the retailers profit shares were around 19 percent. Marketing costs were relatively less in both from the landing sites to wholesale markets, and to the retail destinations. It is noticed the transport cost is around Rs 7/kg as large volume of fish are transported in insulated trucks. Waste is reported at the retail destinations only, and these wastes are the inedible parts (fins, gills, entrails, head) of large fish species.

(1) Fish landing port: Cod Bay – Trincomalee District
Boat type: Multiday boat (32 days fishing trip)
Total fish catch landed: 5.069 kg (Large pelagic fish species)
Selected fish for tracing: Yellow fin tuna
Distance and transport hours:
- From Cod Bay to Peliyagoda = 260 km (6 hours)
- From Peliyagoda to Maharagama Pola = 20 km

Stages	Location	Players	Description	Rs/kg	Share
Fish landing	Cod Bay (Trincomalee)	Fisherman (Boat owner)	Production cost	238	35%
			Fisherman profit	112	17%
Collection	Trincomalee	Collector	Marketing cost	13	2%
			Collector profit	42	6%
Wholesale	Peliyagoda	Wholesaler	Commission	45	7%
Retail	Maharagama Pola (Colombo)	Retailer	Marketing cost	103	15%
			Retailer profit	122	18%
		Consumer	Retail price	675	100%

Remarks: Beach price was Rs 350/kg and wholesale price was Rs 450/kg.
Source: Compiled from JICA Sri Lanka Marketing Survey (Dec, 2012 & Jan 2013.)

(2) Valaichchenai – Batticaloa District
Boat type: Multiday-boat (7 days fishing trip)
Total fish landing: 1,630 kg
Selected fish for tracing: Skipjack
Distance and transport hours:
- From Valaichchenai to Negombo = 290 km (6 hours)
- From Negombo to Katunayaka = 5 km

Stages	Location	Players	Description	Rs/kg	Share
Fish landing	Valaichchenai (Batticaloa)	Fisherman (Boat owner)	Production cost	164	40%
			Fisherman profit	66	16%
Collection	Valaichchenai	Collector	Marketing cost	15	4%
			Collector profit	31	7%
Wholesale	Negombo	Wholesaler	Commission (from Collector)	15	4%
Auction			Commission from Retailer)	10	2%
Retail	Katunayaka	Retailer	Marketing cost	32	8%
			Retailer profit	178	19%
		Consumer	Retail price	410	100%

Remarks: Beach price was Rs 230/kg; wholesale price was Rs 290/kg; auction price Rs 300/kg.
Source: Compiled from JICA Sri Lanka Marketing Survey (Dec, 2012 & Jan 2013.)

(3) Fish landing site: Pesalai – Mannar District
Boat type: Day-boat
Total fish landing: 650 kg
Selected fish for tracing: Wolf Herring
Distance and transport hours:
- From Pesalai to Peliyagoda = 210 km (7 hours)
- From Peliyagoda to Piliyangoda (within Colombo) = 22 km

Stages	Location	Players	Description	Rs/kg	Share
Fish landing	Pesalai (Mannar)	Fisherman (Boat owner)	Production cost	58	19%
			Fisherman profit	12	4%
Collection	Pesalai	Collector	Marketing cost	15	5%
			Collector profit	48	16%
Wholesale	Peliyagoda	Wholesaler	Commission	15	5%
Retail	Piliyangoda (Colombo)	Retailer	Marketing cost	17	6%
			Retailer profit	135	45%
		Consumer	Retail price	300	100%

Remarks: Beach price was Rs 70/kg and wholesale price was Rs 148/kg.
Source: Compiled from JICA Sri Lanka Marketing Survey (Dec, 2012 & Jan 2013.)

(4) Fish landing site: Kudawella – Hambantota District
Boat type: Multi-day boat (17 days fishing)
Total fish landing: 3,000 kg
Selected fish for tracing: Skipjack Tuna
Distance and transport hours:
- From Kudawella to Peliyagoda = 196 km (4 hours)
- From Peliyagoda to Dehiwela (within Colombo) = 16 km

Stages	Location	Players	Description	Rs/kg	Share
Fish landing	Kudawella (Hambantota)	Fisherman (Boat owner)	Production cost	152	36%
			Fisherman profit	48	11%
Collection	Kudawella	Collector	Marketing cost	6	1%
			Collector profit	46	11%
Wholesale	Peliyagoda	Wholesaler	Commission	28	8%
Retail	Dehiwela (Colombo)	Retailer	Marketing cost	86	20%
			Retailer profit	54	13%
		Consumer	Retail price	420	100%

Remarks: Beach price was Rs 200/kg and wholesale price was Rs 280/kg.
Source: Compiled from JICA Sri Lanka Marketing Survey (Dec, 2012 & Jan 2013.)

4.5.2 Tracing of milk

Tracing survey for milk conducted mainly on small-scale dairy farmers targeting in dry zone and intermediate zone. The results are summarized below. The farmers' profit per animal differs with and without feeding cattle feed; Rs 62/animal without feeding and Rs 313/animal with feeding. The collectors buying price depends on the fat contents and it varied from Rs 50/litre to Rs 54/litre and buffalo milk fetches high price due to high fat content and also used in curd processing.

(1) Location: Ambalantota – Hambantota District
Zone: Dry Zone
Channel: Farmer → Collector→ Processing
Number of milking cows: 30
Average production per cow: 1.5 litres

Stages	Location	Players	Description	Units	Share
Dairy farming	Ambalantota (Hambantota)	Farmer	Production cost	Rs 12.3/litre	23%
			Farmer profit/cow	Rs 41.45	77%
Collection	Ambalantota	Collector (Milco)	Collector purchasing price	Rs 53.75/litre	100%

Remarks: Production cost is mainly for transport and medicine; no feed cost as the cows graze in forest and fields. Total daily profit is Rs1,867 (from 30 milking cows) or daily Rs 62/cow without cattle feed.
Source: Compiled from JICA Sri Lanka Marketing Survey (Dec, 2012 & Jan 2013.)

(2) Location: Pellewella – Kurunegala District
Zone: Intermediate Zone
Channel: Farmer → Collector→ Processing
Number of milking cows: 4
Average production per cow: 8 litres

Stages	Location	Players	Description	Units	Share
Dairy farming	Pellewella (Kurunegala)	Farmer	Production cost	Rs 11.38/litre	23%
			Farmer profit/cow	Rs 39.22/litre	77%
Collection	Pellewella	Collector	Collector purchasing price	Rs 50.6/litre	100%

Remarks: Production cost includes cattle feed, labour, transport and medicine. Collector is the Pallewela Milk Cooperative Society (produces milk packets and yoghurt). Total daily profit is Rs 1,255 (from 4 milking cows) or daily Rs 313/cow with cattle feed.
Source: Compiled from JICA Sri Lanka Marketing Survey (Dec, 2012 & Jan 2013.)

(3) Location: Ambalantota – Hambantota District
Zone: Dry Zone
Channel: Farmer → Collector→ Processing
Number of milking Buffalo: 20
Average production per cow: 1.5 litres

Stages	Location	Players	Description	Units	Share
Dairy farming	Ambalantota (Hambantota)	Farmer	Production cost	Rs 16.9 /litre	28%
			Farmer profit/buffalo	Rs 43.1/litre	72%
Collection	Pellewella	Collector	Collector purchasing price	Rs 60.0/litre	100%

Remarks: Production cost is mainly for transport and medicine; no feed cost as the cows graze in forest and open fields. Total daily profit is Rs1,291 (from 20 milking cows) or daily Rs 64/buffalo without feed.
Source: Compiled from JICA Sri Lanka Marketing Survey (Dec, 2012 & Jan 2013.)

4.5.3 Tracing of Poultry (Broiler)

Tracing survey result of an out-grower of broiler chicken is shown below. The out grower receives day-old chicks from a processor (collector) including appropriate feeds. Feed cost amounts to about 54% of the production cost while day-old chicks share is 21%. Day-old chicks' cost about Rs 65/chick. The processor covers the marketing cost (i.e. packing and transport) to retailer. Profit to out-grower and retailer is around 7 to 9 percent of the retail price.

Location: Kadugoda village (Colombo)
Type of farmer: Out grower
Total number of birds (broilers): 8,000
Selected for trace: 100 birds (starting from day old chicks)
Mortality of chicks: 5%
Live weight of broilers (95 birds): 175 kg
Channel: Out-grower → Collector/Processor → Retailer

Stages	Location	Players	Description	Rs/kg	Share
Out-growing	Kadugoda (Colombo)	Out grower	Production cost	174	48%
			Out grower profit	33	9%
Collection	Colombo	Collector/Processor	Processing & marketing cost	20	6%
			Collector/Processor profit	108	30%
Retail	Colombo	Retailer	Retailer profit	25	7%
		Consumer	Retail price	360	100%

Remarks: Buying price of processor Rs 207/kg; Collector's marketing cost comprises transport, processing and packing and wholesale price (to retailer) is Rs 335/kg.
Source: Compiled from JICA Sri Lanka Marketing Survey (Dec, 2012 & Jan 2013.)

V. SUMMARY OF ISSUES AND MEASURES FOR IMPROVEMENT OF AGRICULTURAL MARKETING SYSTEM

5.1 Summary of present status of agricultural marketing system

As described in Chapter 2, with expanding urbanization and increasing incomes, consumer food preferences for agricultural products are shifting and demand is growing for a diversity of high quality products. Accompanying this shift, imports of agricultural products are rising and competition with domestic products is expected to intensify in future.

Chapter 3 outlines the players involved in agricultural marketing and the policies and systems surrounding them, and analyzes the quality control mechanism in the supermarket chains and agri-business companies. In addition to them, it summarized the present situation with regard to the existence of DECs which occupy an important role as players in agricultural marketing.

The supply chain and value chain are analyzed for each agricultural product in Chapter 4, revealing that many players are involved in the supply chain and that a margin for each one is added on at each stage, depressing the profits of the producers. In addition, the results of estimation of the marketing amount handled by DECs based on a survey of DEC traders showed that 38% of total domestic agricultural products are traded through DECs throughout the country and the DECs play an important role as agricultural marketing bases. Furthermore, a survey of the inflow and outflow of vehicles revealed the formation of irrational distribution routes with domestic agricultural products collected from all over the country at Dambulla DEC and then transported back again. Analysis of wholesale prices of agricultural products also showed that the prices of agricultural products fluctuate greatly on a daily basis and producer prices sometimes fall below production costs during the peak season.

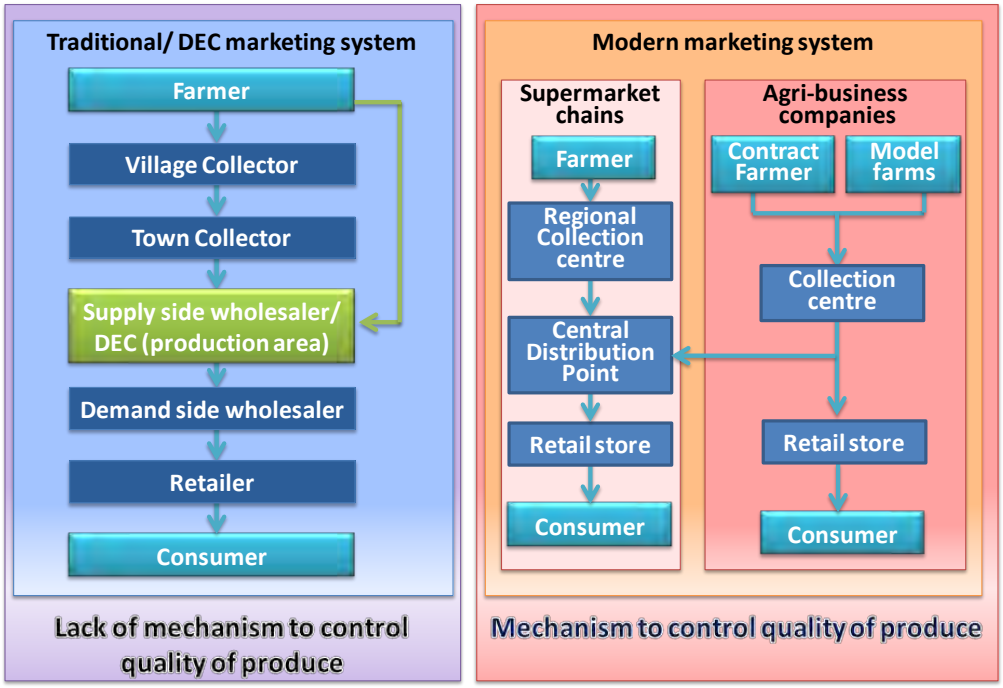
This chapter extracts the "bottlenecks" in the Sri Lankan agricultural marketing system based on the survey results analyzed in each chapter, identifies the issues arising from them and proposes measures to deal with such issues.

5.2 Difference between the "conventional marketing system" and the "modern marketing system"

As shown in Chapter 4, there are numerous problems in the conventional marketing system of the agricultural products marketed through the DECs or other wholesale markets. However, it is the most common marketing channel for the transaction of agricultural products in Sri Lanka. In this survey, conventional marketing channel is called as "conventional marketing system". It is compared with the "modern marketing system", which is a streamlined supply chain run by the supermarket chains and agri-business companies. Each supply chain is shown in Figure V-1[10]. First, it can be seen that the supply chain of "conventional marketing system" is long and there are 5 intermediaries between the farmers and consumers. In the contrary, the "modern marketing system" contains only 3 facilities

[10] The supply chain of "conventional marketing system" is a modeling pattern based on the Marketing flow survey. The supply chain of "modern marketing system" is drawn based on the interviews held with Cargilles (the largest super-market chain) and the CIC (the largest agri-business company).

(collection centre, distribution centre and retail store) between the farmers and the consumers.



Source: Prepared by the Survey team

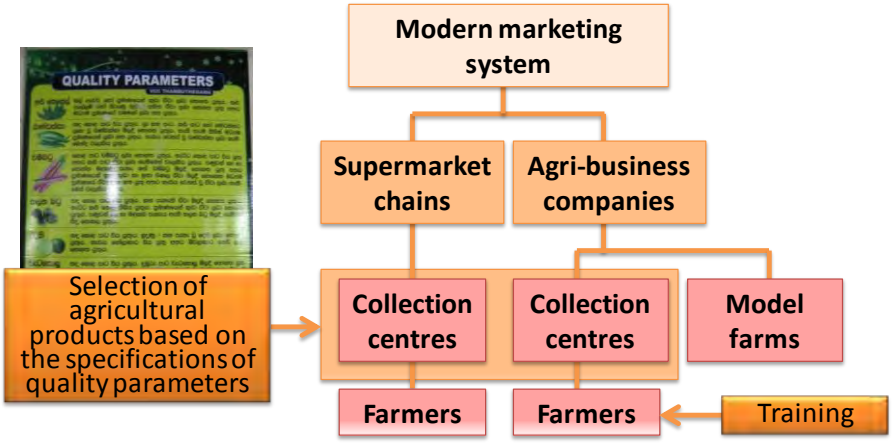
Figure V-1 Supply chains of "modern marketing system" and "conventional marketing system"

(1) Mechanism of quality control by the modern marketing system

The crucial factors of the difference between the "modern marketing system" and the "conventional marketing system" are "with/without a quality control system" and "with/without a mechanism to feedback consumers' needs". In the "modern marketing system", the collection centres, where farmers bring their products, are functioning as a base of quality control and feedback of consumers' needs (Figure 6). The collection centres announce their needs of items and quantities of them on the day to the farmers who have business relationships with the supermarket. At the collection centres, agricultural products brought by farmers are selected based on the quality parameters specified by the headquarters. Farmers should bring back the products which do not meet the standard. Through this selection process, farmers bring about the better understanding of "quality requirement by the consumers". At each collection center, agiricultural officers are assigned and they provide training for the quality improvement of products in response to the request by farmers. Farmers are obliged to use plastic crates to bring their products into the collection centres. The selection criteria specified by the supermarket chains are relatively strict but farmers are able to obtain the higher price from them than collectors because supermarket chains pay the same amount as the wholesale price of the day in cash.

Also, in the "modern marketing system", plastic crates or cardboard boxes are used for the transportation of commodities to maintain the quality of agricultural products from the collection centres to the distribution centres.

As shown above, "modern marketing system" controls the quality of commodities at collection centres and they have a mechanism to feedback consumers' needs to producers. On the contrary, "conventional marketing system" does not have a system to control the quality of products or to feedback consumers' needs to producers because there is no mechanism to convey the information through the entire chain. This is the crucial factor that makes the difference of the quality of the commodities between the conventional system and the modern system.



Source: Prepared by the Survey team

Figure V-2 Mechanism of quality control in the modern agricultural marketing system

5.3 Bottlenecks in marketing of agricultural products and resulting issues

As summarized in 5.2, while supermarkets and agribusiness companies with a "modernized marketing system" are boosting their efforts toward quality control and increasing their presence in marketing based on changes in the demand side for agricultural products, under the "conventional marketing system" through DECs and wholesale markets, awareness of quality control and consumer needs is low and there is a failure to respond adequately to market changes.

This study, therefore, focused on the "conventional marketing system" which accounts for much of the agricultural marketing in Sri Lanka, and identified the bottlenecks when considering revitalization of the system. Figure V-3 summarizes the bottlenecks in the conventional marketing system and the issues arising from them, and shows the relationship with the present situation that has resulted.

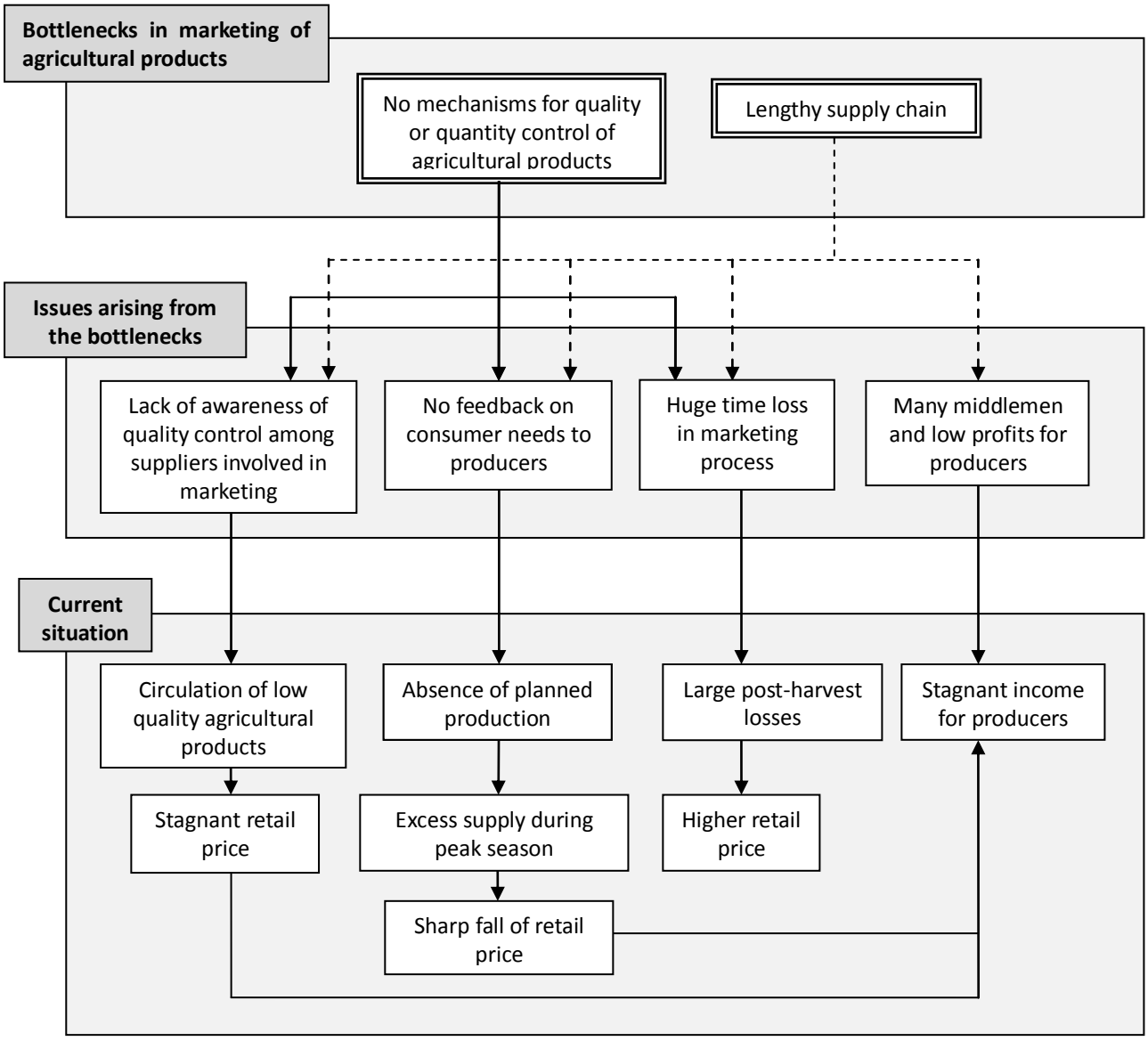


Figure V-3 Bottlenecks in conventional marketing system and resulting issues

5.3.1 Bottlenecks in conventional marketing system

As shown in Figure V-1, under the conventional marketing system, sometimes as many as five players stand between the producer and the consumer, forming a long supply chain. The result is problems of major time loss in the marketing process and many middlemen and little profit for the producers. In addition, a system has been created in which each player's role in the supply chain ends by "passing the agricultural products on to the next player," so no responsibility is borne for the quality of the products further along the supply chain. With regard to the quantity and varieties of agricultural products, the producers produce without any grasp of the needs of the consumers, so sometimes profits fall below production costs when prices collapse as a result of excess supply.

Based on the situation described above, in this study the bottlenecks in the conventional marketing system and the resulting issues and present status are summarized as shown below.

Bottlenecks in conventional marketing system	Issues arising from bottlenecks	Present status
・No mechanisms for quality or quantity control of agricultural products	・Lack of awareness of quality control among suppliers involved in marketing	Under the conventional marketing system, many players intervene as shown in Fig. V-2, but none of the players bears any responsibility for the quality of the agricultural products and there is an absence of any player who serves as a base for quality control. For this reason, low quality agricultural products are in wide circulation under the conventional marketing system and prices are accordingly low. This results in stagnant incomes for the producers.
	・No feedback on consumer needs to producers	As there are no mechanisms for grasping the quantities or varieties required on the demand side or for feedback to the producers, the producers cannot engage in planned production. For this reason, excess supply occurs during peak periods, causing prices to collapse and resulting in stagnation of producers' incomes.
・Long supply chain	・Huge time loss in marketing process	Time loss arises in the marketing process due to the long supply chain and intervention by many players, bringing post-harvest losses. This leads to higher retail prices as a result.
	・Many middlemen and low profits for producers	Middlemen margins are generated at each stage by the intervention of many players, depressing the profits of the producers while retail prices are relatively high.

5.3.2 Measures to solve the issues

To solve these issues, "strengthening of DEC functions as marketing hubs" is proposed in this study. Concrete measures include assignment of marketing advisors, review of transportation routes and means from production areas to consumption areas, and development of marketing channels linking the DECs in the production areas and consumption areas and the producers. Figure V-4 shows the measures to solve the problems, and the issues, current approaches by relevant agencies and details of countermeasures are shown in the following page.

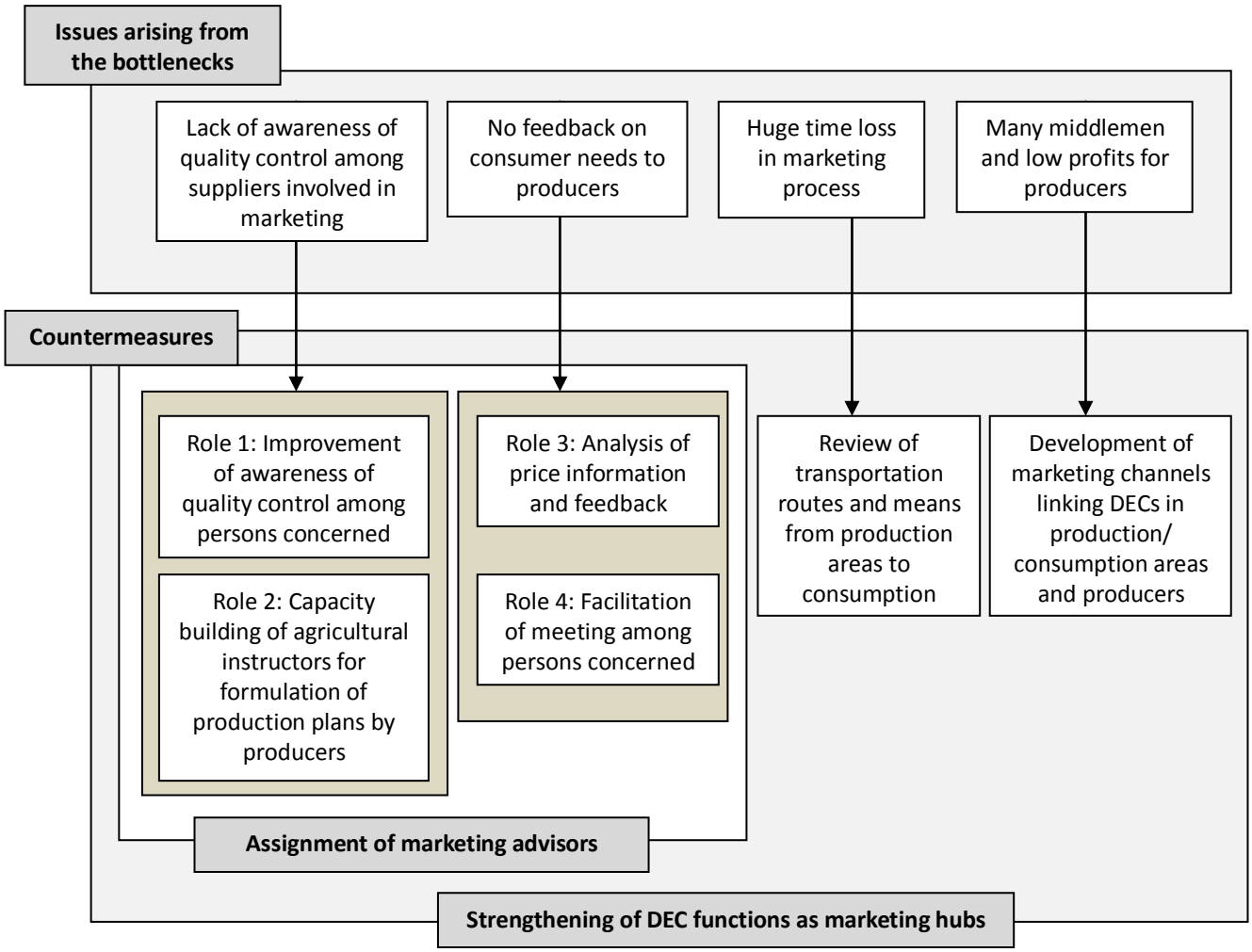


Figure V-4 Countermeasures to solve the problems

Issues arising from bottlenecks	Current approach by relevant agencies	Agency concerned	Countermeasures	Details
Lack of awareness of quality control among players involved in marketing	Marketing activities by DECs entail individual traders conducting their own sales activities and there is no marketing policy for the entire DEC. In addition, DEC managers participate in regular meetings with management trust board members including trade union representatives, but no discussions are held or guidance is given relating to marketing policy.	MoCIT DECs	Assignment of marketing advisors (Role 1. Improvement of awareness of quality control among persons concerned)	A marketing advisor is assigned to each DEC and seminars are held for producers, traders and DEC managers.
	DoA agricultural instructors are the extension workers closest to the producers and a personal relationship with the producers has already been built through the regular meetings. As the instructors provide instruction in agricultural skills, they lack knowledge related to production plans or marketing, and instruction for producers in these fields is inadequate.	DoA/ MOA DECs	Assignment of marketing advisors (Role 2. Capacity building of agricultural instructors for formulation of production plans by producers)	Marketing advisors are assigned at division level, the marketing skills of the agricultural instructors who are the extension workers closest to the farmers are reinforced, and instruction is provided to farmers in drawing up production plans based on market trends.
No feedback of consumer needs to producers	DECs gather price information for each crop daily and this information is provided through mobile phone services, but no analysis is carried out of seasonal price fluctuations or long-term price trends for each crop. In addition, similar price information is collected and provided by HARTI, but it is not analyzed either.	MoCIT HARTI DECs	Assignment of marketing advisors (Role 3. Analysis of price information and feedback)	The wholesale price information collected by each DEC is analyzed by time series, information on seasonal fluctuations of each crop is organized, and feedback is provided to producers and traders.
	MoCIT calls DEC managers to irregular meetings, but discussions mainly focus on facility management duties, and marketing is not discussed. In addition, traders in the production and consumption areas trade by individual routes, and no introduction of DECs is attempted.	MoCIT DECs	Assignment of marketing advisors (Role 4. Facilitation of meetings among persons concerned)	The opportunity is provided for regular meetings between the persons concerned in the DECs in the consumption areas and DECs in the production areas, and feedback on consumer needs is provided.
Huge time loss in marketing process	MoCIT plans to increase the current 13 DECs to 16 DECS in 2013, including one DEC to be established for the first time in the north and one in the east. For efficient use of DECs, the entire marketing system including the new DECs needs to be reviewed, but MoCIT has not yet started this task.	MoCIT	Review of transportation routes and means from production areas to consumption areas	Distribution of functions from Dambulla DEC to other DECs is promoted and transportation routes are made more efficient.
				Transportation centered on small vehicles is reviewed and large vehicles are used efficiently.

Many middlemen and low profit for producers	No support for development of marketing channels by producers is provided by the DECs.	MoCIT DECs	Development of marketing channels linking DECs in production areas and consumption areas and producers	Producers are organized into groups to ensure shipping lots of a certain size and direct trading is promoted with DEC traders in the production and consumption areas instead of going through middlemen.

5.3.3 Coordination with relevant agencies

In the explanations and discussions of the draft final report of this survey held on during February 21 - 22, 2013, with MoFP, NPD, MoA, MoED and MoCIT. In response to the "Assignment of marketing advisors" proposed by the Servey team, MoED and MoA explained about the plan for the development of information system of agricultural production and marketing. They pointed out that the plan included the development of computer network system connecting all Agrarian Service Centers (ASC) and assignment of computer operators to all ASC[11]. A synergistic effect is anticipated by linking the above-mentioned measures by the Survey team and with the plan of information system.

[11] This proposed plan by MoA is under deliberation at MoED as of February 2013.

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Appendices

Appendix 1 Survey team members

Position/Work description	Name
Team leader/ Institutions & Administrative policies	Mr. Tateo Kusano
Deputy team leader/ Marketing economy & marketing information	Ms. Chiaki Kido
Value-chain analysis-1 (Agriculture products)	Prof. S.M.P Senanayake
Value-chain analysis-2 (Livestock & fishery)	Dr. K. Allahpichay
Market infrastructure-1	Mr. Keiichi Yamamoto
Market infrastructure-2	Mr. Masahiko Watanabe
Market infrastructure-3	Ms. Eiri Kaku

Appendix 2 List of interviewees

Colombo – Central Government

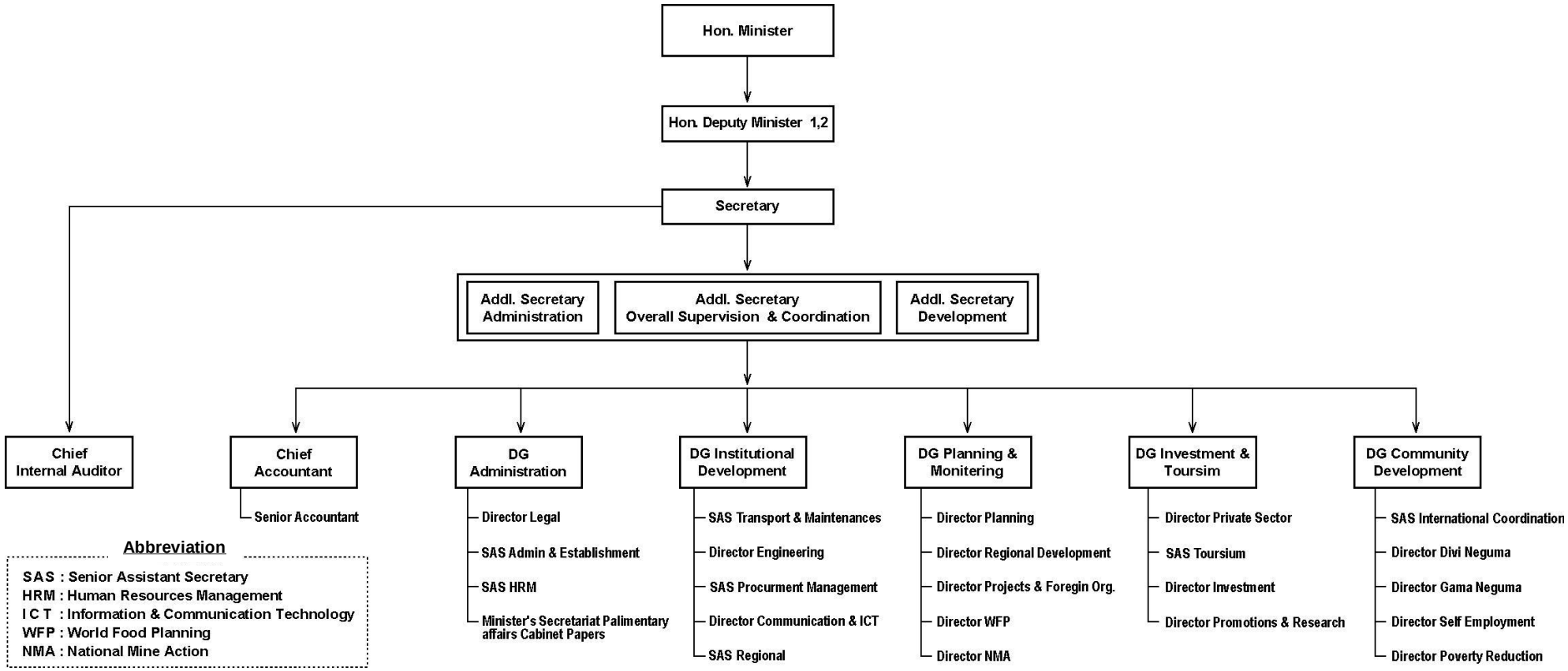
	NAMES	DESIGNATION	INSTITUTIONS
01	Mr. Mapa Pathirana	Director General	External Resources Development
03	Mr. Sarath De Silva	Chairman	International Foodstuff Group of Companies
04	Dr. W.G. Somaratne	Additional Project Director	Second Community Development & Livelihood Improvement Project (SCDLIP) - World Bank Project
05	Ms. Chandra Wickramasinghe Mr. Sunil Hettiarachchi Ms. N. Jeyavathani	Additional Secretary Director General (Investment) Assistant Director	Ministry of Economic Development
06	Mr. H. Leslie Tissera Dr. P. Sivayoganathan Dr. S.B.A. De Mel Dr. Anoma Senaratne	Additional Secretary Director (Animal Breeding) Deputy Director Deputy Director	Ministry of Livestock & Rural Community Development
07	Mr. Manjula Jayamanne	Executive Manager	Ceylon Fisheries Corporation
08	Mr. D. Jeevanathan	Additional Secretary, Marketing Development	Ministry of Cooperative and Internal Trade
09		Manager	Dedicated Economic Centre – Narahenpita
10	Mr. Lal Ratnaweera	Additional Secretary	Ministry of Transport
11	Mr. K.B. Jayasinghe	Additional Secretary	Paddy Marketing Board
12	Dr. D.B.T. Wijeyratne	Additional Secretary	Ministry of Agriculture
02	Dr. L. Rupasena	Additional Director	Hector Kobbekaduwa Agrarian Research & Training Institute
13	Dr. Damitha De Zoysa	Secretary	Ministry of Fisheries & Aquatic Resources Dev.

Outside Colombo

	NAMES	DESIGNATION	INSTITUTIONS
01	Mr. Christy Wijerathna Mr. I.G. Vijanathan Mr. H.M.I.R.B. Heart	Manager Secretary (Trader's Asso) President (FO)	Dedicated Economic Centre – Dambulla
02	Mr. Prashantha	Manager	Dedicated Economic Centre – Thabuththegama
03	Ms. Hasamalika Karunaratne	Development Assistant	Dedicated Economic Centre – Kurunduwatta
04	Mr. Isuru Udayanga	Manager	Dedicated Economic Centre – Kappetipola
05	Mr. E.M.S.B. Jayasundara	Divisional Secretary	Welimada, Badulla District
08	Mr. P. Shaktiyavelu	Assistant Director	District Project Management Unit – Nuwara Eliya SCDLIP
10	Mr. E Jhoti Velu	Dairy Farmer	Pedro Gamaneuma Peoples Company Ltd.
11	Mr. B.R. Ranjan	President	Jaffna District Development Corporative Society (YARLCO)
13	Mr. Thana Balasingam	Officer-in charge of Vegetables	Jaffna District Agriculture Office
14	Ms. R. Mohaneswaran	Director (Planning)	Jaffna District Planning Office
15	Mr. Sunatharam Arumainyaham	District Secretary	Jaffna District

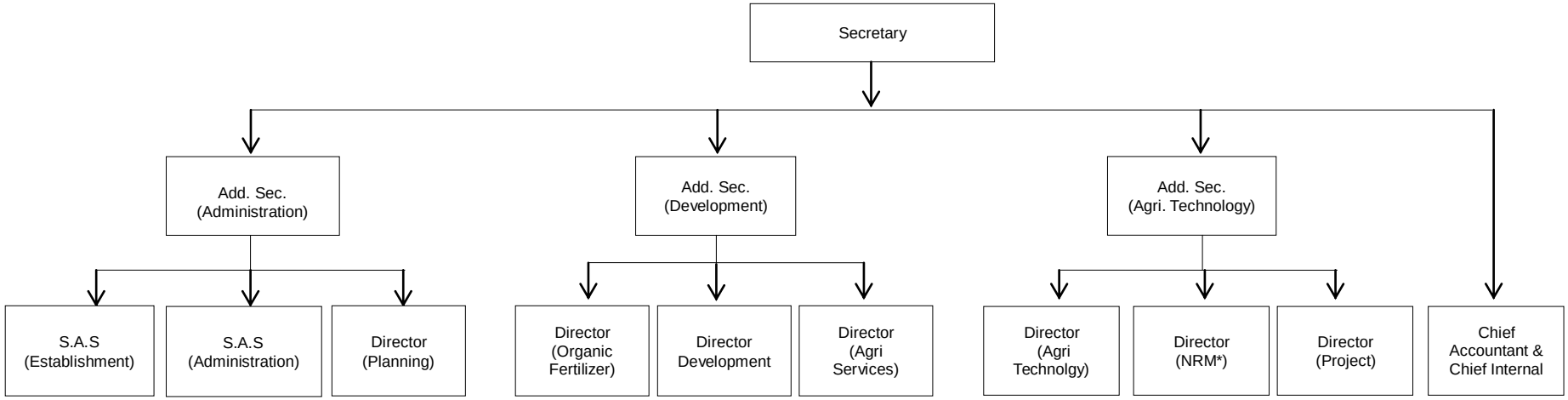
Appendix 3 Organization chart of the government

Ministry of Economic Development



Source: Prepared based on information from MoED website

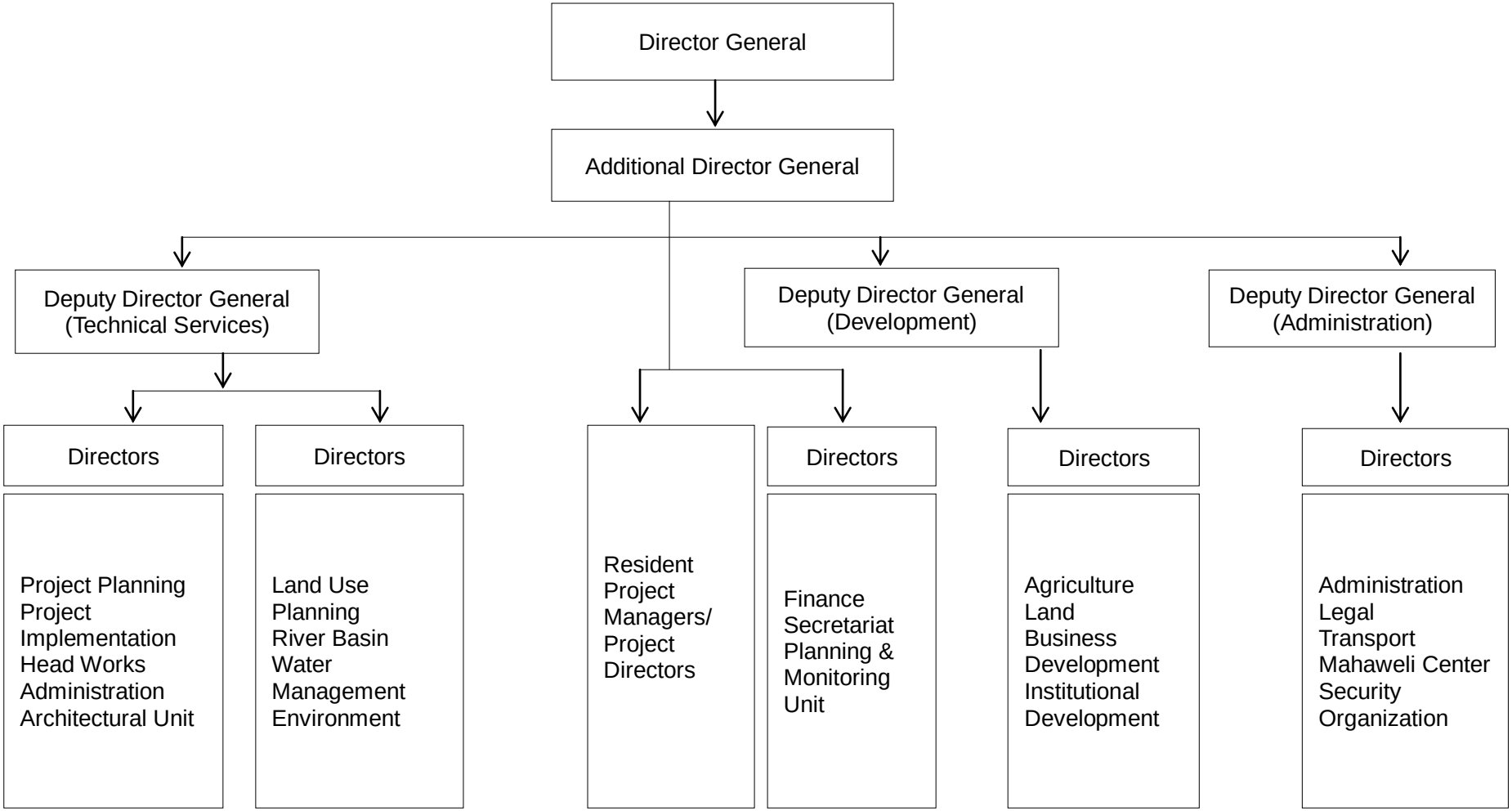
Ministry of Agriculture



*NRM= Natural Resource Management

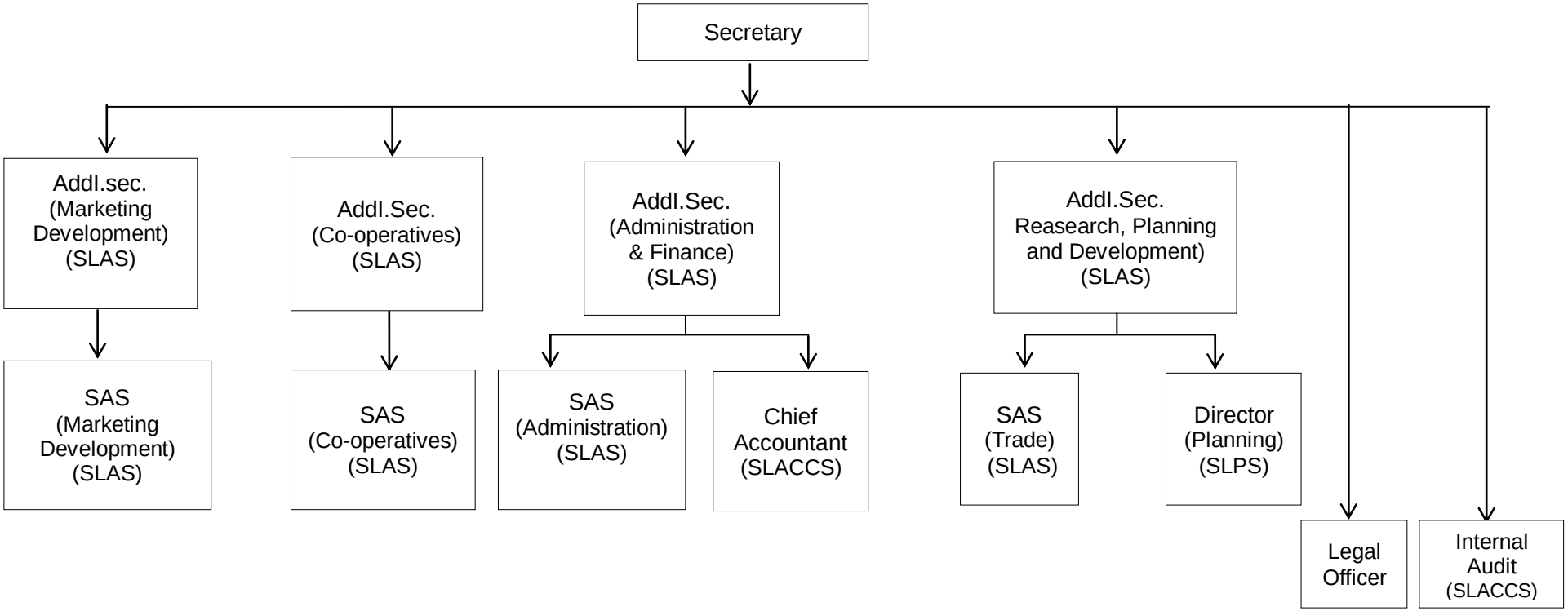
Source: Prepared based on information from MoA website

Mahaweli Authority



Source: MoA website

Ministry of Cooperative and Internal Trade

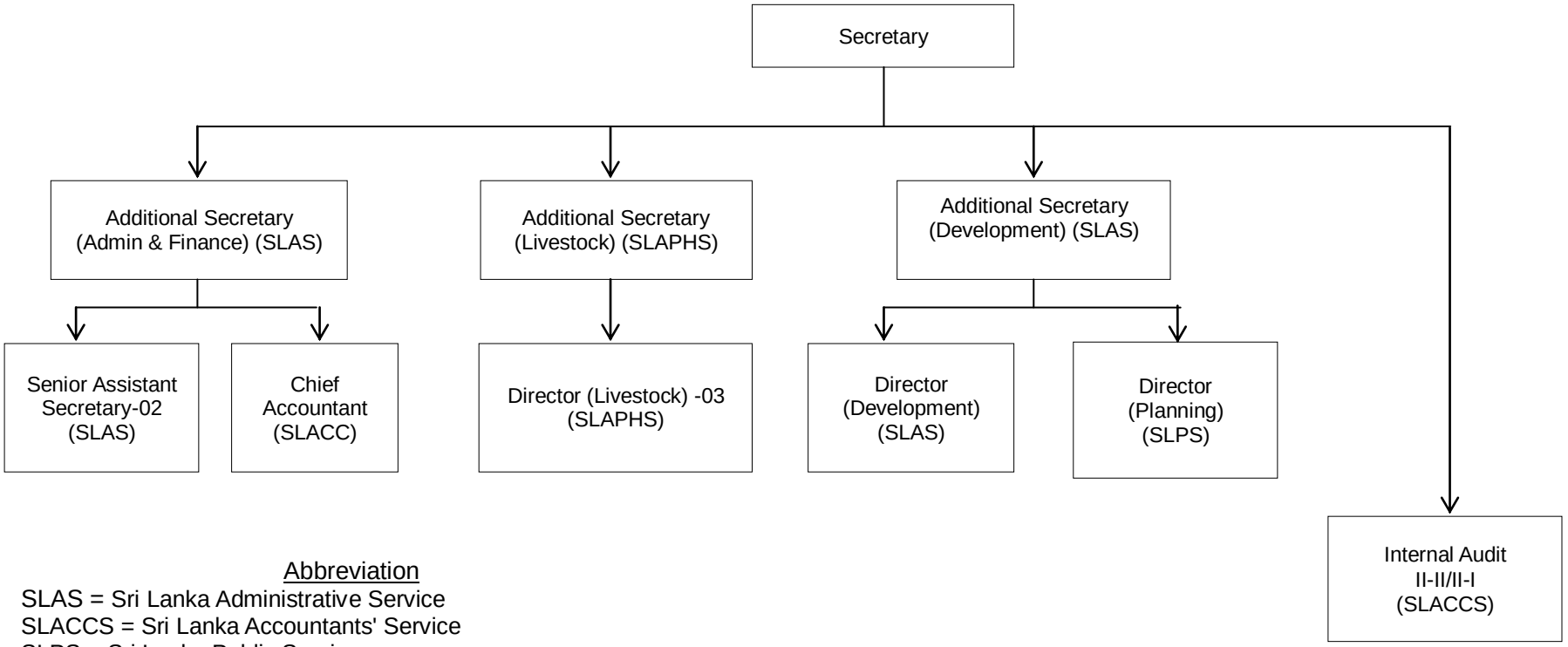


Abbreviation

SLAS = Sri Lanka Administrative Service
SLACCS = Sri Lanka Accountants' Service
SLPS = Sri Lanka Public Service

Source: Prepared based on information from MoCIT website

Ministry of Livestock and Rural Community

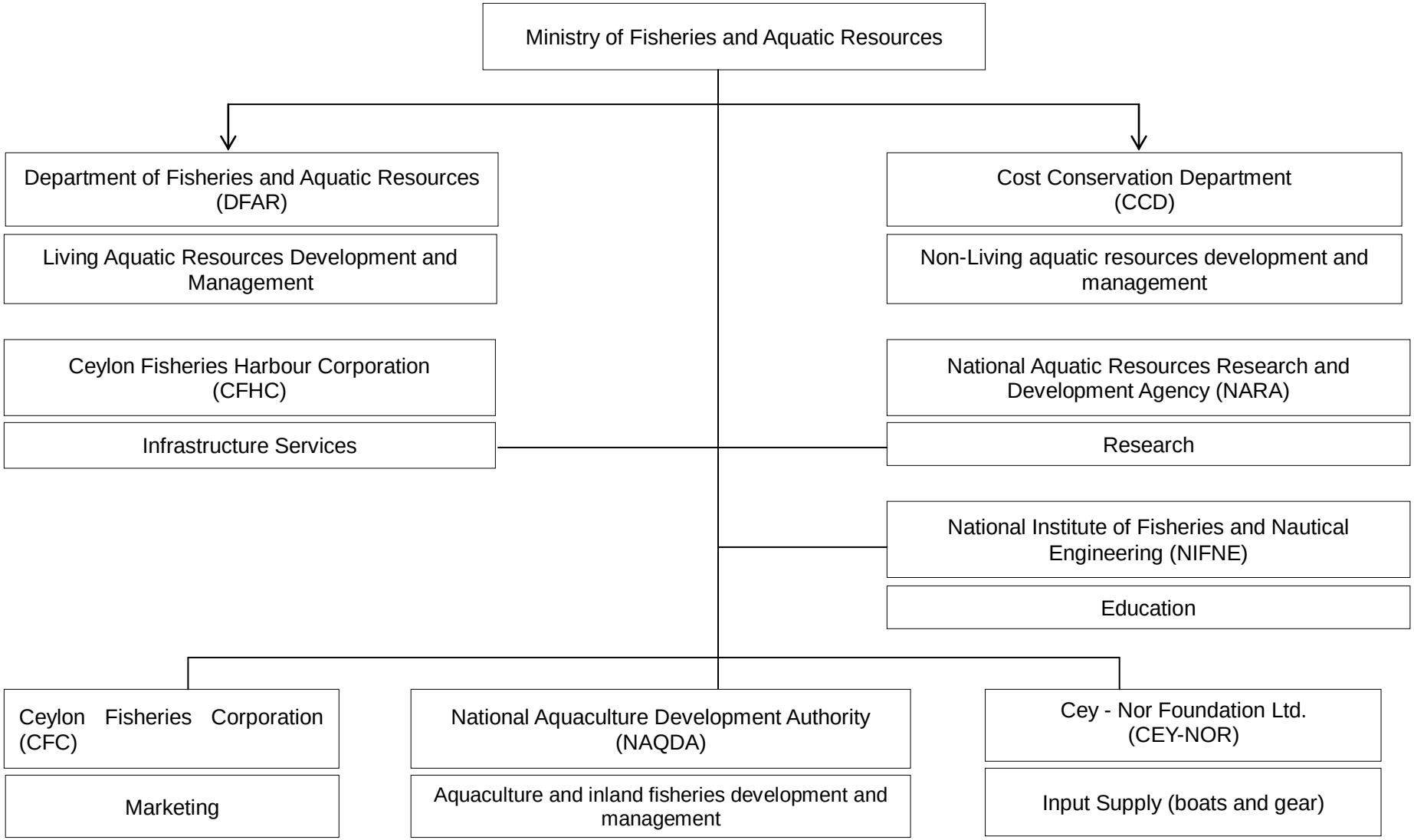


Abbreviation

SLAS = Sri Lanka Administrative Service
SLACCS = Sri Lanka Accountants' Service
SLPS = Sri Lanka Public Service
SLAPHS = Sri Lanka Animal Production & Health Service

Source: Prepared based on information from MoLRC website

Ministry of Fisheries and Aquatic Resources Development



Source: MoFAR website

Appendix 4 Sector shares of Gross Domestic Product (GDP) 2002-2011

Sector	Share of GDP (%)									
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Agriculture	**14.3**	**13.7**	**13**	**12.5**	**12.3**	**11.9**	**12.1**	**12**	**11.9**	**11.2**
1. Agri. Livestock & Forestry	12.7	12.3	11.7	11.7	11.3	10.8	10.9	10.9	10.7	9.9
2. Fishing	1.6	1.4	1.3	0.8	1	1.1	1.2	1.1	1.2	1.3
Industry	**28**	**27.7**	**27.7**	**28.1**	**28.2**	**28.5**	**28.4**	**28.6**	**28.7**	**29.3**
3. Mining & Quarrying	1.2	1.3	1.3	1.5	1.7	1.9	2	2.1	2.3	2.5
4. Manufacturing	18.5	18.1	18.1	18.1	17.7	17.7	17.5	17.4	17.3	17.3
5. Electricity, Gas & Water	2.2	2.2	2.2	2.4	2.5	2.5	2.4	2.4	2.4	2.4
6. Construction	6.1	6	6	6.2	6.3	6.4	6.5	6.6	6.7	7.1
Services	**57.7**	**58.6**	**59.3**	**59.4**	**59.5**	**59.6**	**59.5**	**59.3**	**59.3**	**59.5**
7. Wholesale & Retailing	23.8	24.3	24.7	24.7	24.6	24.5	24.2	23.3	23.2	23.6
8. Hotels & Restaurants	0.2	0.5	0.6	0.5	0.5	0.4	0.4	0.4	0.5	0.6
9 Transport & Communication	10.6	11.1	11.5	11.9	12.4	12.8	13.1	13.5	13.9	14.3
10. Banking, Insurance, Real estate, etc.	8	8.4	8.4	8.4	8.5	8.7	8.7	8.9	8.9	8.8
11. Ownership of dwellings	4.2	4	3.8	3.6	3.4	3.2	3.1	3	2.8	2.6
12. Govt. services	8.5	8.1	8	7.9	7.7	7.7	7.7	7.8	7.6	7.1
13. Private services	2.4	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4
GDP	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: Central Bank of Sri Lanka

Appendix 5 Chicken population by provinces 2003-2011

Unit: Nos.

Provinces	2003	2004	2005	2006	2007	2008	2009	2010	2011
Western	2,306,700	2,434,700	2,572,960	2,365,910	3,305,370	3,078,780	2,716,000	3,150,740	3,161,590
Central	1,112,400	1,179,900	1,555,890	1,379,240	1,473,270	1,568,250	1,240,410	1,309,030	1,140,070
Southern	374,800	507,660	486,400	495,060	508,080	444,180	428,000	395,690	374,580
Northern	820,900	803,900	880,420	868,050	787,210	746,210	645,570	706,520	865,650
Eastern	696,400	611,300	562,630	689,120	804,240	871,940	785,770	764,000	704,140
North West	3,506,700	4,205,800	4,117,570	5,752,000	5,428,120	5,727,490	5,975,460	6,061,440	6,186,200
North Central	431,200	515,800	637,030	814,080	685,820	1,064,360	850,220	783,910	782,110
Uva	207,400	220,900	260,260	278,840	284,410	289,010	315,580	262,740	287,350
Saba'gama	315,600	562,000	562,610	474,620	502,090	540,950	658,280	584,250	697,510
Total	9,772,100	11,041,960	11,635,770	13,116,920	13,778,610	14,331,170	13,615,290	14,018,320	14,199,200

Remarks: Chicken population comprises hens, chicks and cock birds.

Source: Dept. of Census and Statistics

Appendix 6 Egg production by province 1998-2007

Unit: 1,000 nos

Provinces	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Western	267,840	274,620	282,276	289,344	272,400	169,980	159,948	167,580	167,580	174,408			
Central	100,164	102,684	105,564	108,192	101,856	83,988	82,692	101,988	92,100	95,232			
Southern	46,056	47,208	48,528	49,740	46,836	40,128	53,736	51,624	46,344	47,940			
Northern	37,188	38,148	39,216	40,188	37,836	48,036	46,284	70,740	51,468	49,884			
Eastern	48,516	49,752	51,132	52,416	49,344	50,784	53,004	314,856	39,960	38,748			
North West	289,932	297,264	305,556	313,188	294,864	419,028	408,360	90,036	436,740	439,848			
North Central	32,292	33,108	34,044	34,884	32,844	28,572	27,492	25,248	27,960	22,668			
Uva	21,312	21,852	22,452	23,016	21,672	16,896	17,592	18,852	17,280	20,016			
Sabagamawa	32,532	33,348	34,284	35,136	33,084	27,600	25,476	27,480	22,224	26,856			
TOTAL	**875,832**	**897,984**	**923,052**	**946,104**	**890,736**	**885,012**	**874,584**	**868,404**	**901,656**	**915,600**	866,000	951,000	941,470

Source:- Dept.of Census and Statistics

Estimated from available monthly avearge

Planning and Economics Division (DataBank), Department of Animal Production and Health

Appendix 7 Poultry breeder farms

No	Name & Address	Prov	Type
1	Aladin Farm, Inchestelly Estate, Eladuwa Rd,Wattegama	C	B
2	Asha Farm No.905/1, Ethgalawatte, Gampola	C	B
	Interbrid (Pvt) Ltd, 356/1 Walahena, Alawathugoda	C	B
4	Karandagolla Farm, NLDB, Karandagolla,Kundasale	C	B
5	Midland Breeders (Pvt) Ltd, No: 272, Jayamalapura,Gampola	C	B
6	Nawgala Breeders farm, 57,Mahawela,Matale	C	B
7	Nova Breeders, Sudugmage Estate, Matale	C	B
8	Sri Lanka Air Force Farm - Sigiriya, Commando Agro Unit, Sri Lanka Air Force, Katunayake	C	B
9	Upland Estate, Galaha Road, Peradeniya	C	B/L
10	Nawgala Breeders (Pvt) Ltd. (B) 57, Mahawela, Matale	C	B
11	Bairaha Farms Ltd, & Hill Country Farms Ltd, No 407, Galle Road, Colombo 3	W	B
12	CIC Feeds (Pvt0 Ltd, No.252, Kurunduwatte Road, Ekala	W	B
13	Dalugama Hatcheries 145,Kandy Road, Dalugama, Kelaniya	W	B/L
14	Dikkande Plantations Limited, Dikkande Estate, Waturugama	W	B/L
15	Green Valley Faem (Pvt) Ltd, No.05, Arthurs Place, Nugegoda	W	B
16	Kawatayagoda Farm & Hatchery, No: 100, Moronthudawa Road, Wadduwa	W	B
17	Miriswatte Farm (NLDB), Millewa, Horana	W	B
18	The Marist Brothers of Sri Lanka, Agaradaguru Mawatha, Thudella, Ja-ela	W	B
19	Nishadhani Breeder Farm (Pvt) Ltd No: 49/a7,Jaya Mawatha, Kothalawala, Kaduwela	W	B
20	Ravi Farms (Pvt) Ltd, Bollatha, Ganemulla	W	B
21	Three Acres Farms Ltd, No: 15, Rock House Lane, Colombo 15	W	B/L
22	Babywatte Farm, Newkade Road, Udubaddawa.	NW	B/L
23	Marawila Farm (NLDB), Marawila	NW	L
24	NEL Farm & Hatchery, Noorani Estate Limited, 481, Prince of Wales Avenue, Colombo 14	NW	B/L
25	Our Lady of Lourdes Poultry Breeding Farm (Pvt) Ltd, Delpakandarawa, Badalgama	NW	B
26	Red Farm, Guruge Wendesiwatta, Kadawa, Doonagaha	NW	
27	Sandalankawa Farm House, Irabadagama, Sandalankawa	NW	B
28	"Srilal", Three Star Farms, Dummaladeniya Road, Bandirippuwa, Lunuwila	NW	B
29	Regional Hatchery, Dep. Of Anmial Production & Hea Poonthotum, Vavuniya	N	B/L
30	Regional Hatchery, Dep. Of Anmial Production & Health, Uppuweli, Trincomalee	E	B/L
	Managing Director, Hettipola Estate & Farm, Hettipola Estate, Ella	Uva	B
31	Mahaweli Livestock Enterprise Ltd Queen Elizabeth Jaya Mawatha, Thambuthegama	NW	B
32	Nelna Breeders (Pvt) Ltd, No: 3A, Hathaduwa Estate, Ranwala, Meethirigala, Kerindiwela	Saba	B
33	Regional Poultry Farm & Hatchery Dep. Of Anmial Production & Health, Kekandura, Matara	S	B

Remarks: B = Broiler; L = Layers, C=Central; W=Wstern; NW=North Western; Saba=Sabagamawu

Source: Ministry of Livestock and Rural Community Development

Appendix 8 Fishery harbours information and available facilities

Harbour	District	Year of Commission	Land Area (Ha)	Basin Area (Ha)	Break Water Length (m)	Dredging Depth (m)	Quay Wall Length (m)	Jetty Length (m)	Berthing Capacity (No of Vessels 3.5 - 5 tonnage)	Market Area (Auction Hall) (sq.m)	Net Mending Area (sq.m)	Fuel Storage Capacity - Disel (Liters)	Water Storage (Liters)
1. Kalpitiya	Puttalam	1968	0.30	2.00	na	4.0-6.0	100.0	61	500	300			50,000
2. Chilaw	Puttalam	2009	1.00			2.5	136.0		250		444	36,000	34,000
3. Negombo	Gampaha	2007	0.42	2.00				88	60	421	**212**		50,000
4. Dikkowita(1)	Gampaha		8.10	11.70	1100	3.5-5.0			455	950			
5. Modara	Colombo	1965	3.24	2.15	140	4.0-6.0	119.2	64	100	60	120	91,000	50,000
6. Panadura	Kalutara	1998	0.48	2.80	200	2.5-3.0	50.8		100		**159**		30,000
7. Beruwala	Kalutara	1965	4.16	11.99	426	2.5-3.0	215.0	60	400	60	120		26,500
8. Ambalangoda	Galle	2010	1.74	6.40	375	3.5	112.0		150		315.5	36,000	26,000
9. Hikkaduwa	Galle	2001	0.54	6.90	335	2.5-3.0	135.0		250		**150**	36,000	30,000
10. Dodanduwa	Galle	2010	1.41		100	3.0	139.5		50	186	95	14,000	14,000
11. Galle	Galle	1965	6.05	5.00		6.0	265.9	91	350	1580	225		341,000
12. Mirissa	Matara	1966	1.54	7.00	456	2.5-3.0	256.0		245	120	145	91,000	49,000
13. Puranawella	Matara	1980	1.75	11.00	400	2.5-3.0	165.0	121	400	360	116	25,000	250,000
14 Kudawella	Hambantota	1998	3.78	10.10	677	2.5-3.0	203.0		350		**256**	36,000	
15. Tangalle	Hambantota	1965	1.24	2.18	221	2.5-3.0	258.5		230		180	36,000	14,000
16. Hambantota	Hambantota	2010	1.65	5.80	275	3.5	150.0		125		553	36,000	12,000
17. Kirinda	Hambantota	1985	3.50	2.54	440	2.5-3.0	173.0		150	365	120		26,500
18. Oluvil(1)	Ampara												
19. Valaichchanai	Batticaloa		1.24			3.0	151.0		400				
20. Cod-bay	Trincomalee	1965	13.05	20.00	na	6.0	152.0	30	200	155	136	24,000	150,000
21. Myliddy(2)	Jaffna		0.69	3.00		2.5	64.0		120				
22. Silawathura*	Mannar		0.80	5.60		2.5			224				
23. Nilwella(3)	Matara		1.00	5.00		3.0	100.0		200	108	90	36,000	12,000

Source: Ceylon Fisheries Harbours Corporation (CFHC)

(1) Under construction

(2) To be rehabilitated

(3) Upgrading Anchorage to a harbour

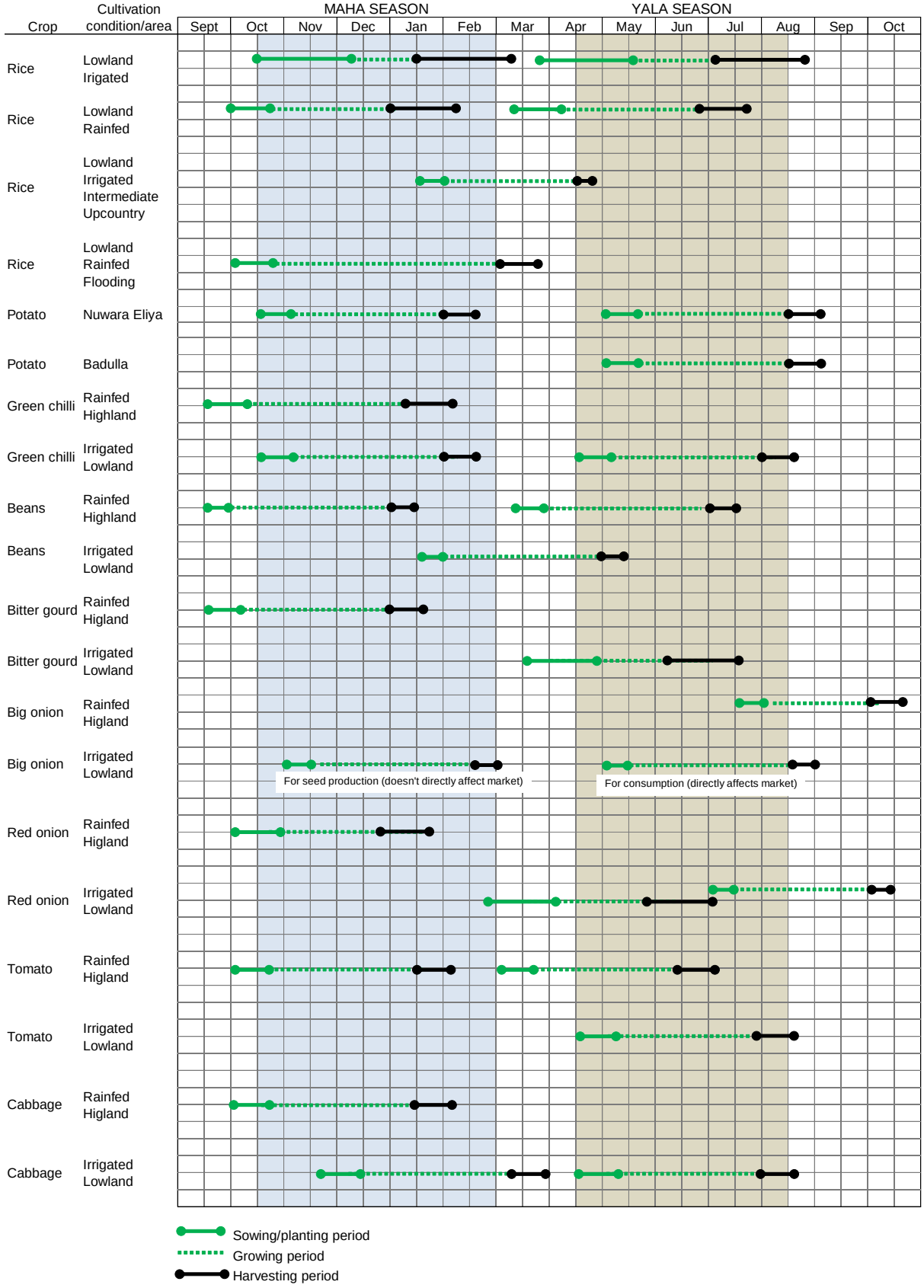
Appendix 9 Refrigeration facilities by harbours

Harbour	District	Block Ice (t/d)	Flake Ice (t/d)	Ice Storage (t)	Blast Freezer (t/d)	Frozen Fish Storage (t)	Holding Room Fish on Ice (t)
1. Negombo	Gampaha			10			
2. Modara	Colombo		5	10	6		
3. Panadura	Kalutara		10	50			
4. Beruwala	Kalutara	10	5	10	6		
5. Dodanduwa	Galle			10			
6. Galle	Galle	10	55	70	16		
7. Mirissa	Matara	5				10	5
8. Puranawella	Matara	5		20			
9. Kudawella	Hambantota		10	10			
10. Tangalle	Hambantota	10	5	5		25	50
11. Kirinda	Hambantota	10	5	10	6		
12. Valaichchanai	Batticaloa			10			
13. Cod-bay	Trincomalee			60	10	1,200	
Source: Ceylon Fisheries Harbours Corporation (CFHC)							

Appendix 10 Active ice plants and cold rooms - 2010

District	Active Ice Plants		Active Cold Rooms	
	Number	Production Capacity (tons/ day)	Number	Storage Capacity (Mt)
Colombo	3	25	2	1,230
Gampaha	13	555	2	305
Kalutara	6	245	3	530
Kandy	-	-	1	10
Galle	5	185	2	330
Matara	8	225		
Hambantota	9	189	3	30
Jaffna	8	17	5	41
Mannar	4	36	1	6
Batticaloa	6	44	2	15
Ampara	2	20	2	13
Trincomalee	4	313		
Kurunegala	-		1	5
Puttalam	5	148		
Chilaw	6	140		
Anuradhapura	1	10	1	5
Polonnaruwa	-	-	1	10
Badulla	-	-	1	5
Ratnapura	-	-	1	5
Kegalle	-	-	1	6
Total	**80**	**2,152**	**29**	**2,546**
Source: Ice Plant Survey 2010/ Statistics Unit				
Ministry of Fisheries and Aquatic Resources Development				

Appendix 11 Cropping calendar



Source: JICA survey team

Appendix 12 Breakdown of production cost per acre (only 2nd survey)

Big onion

Category	Item	Value (Rs.)	Share (%)
Material Cost	Seeds/Seedlings/Suckers/Nursery trees	27,000	8
	Organic Fertilizers	5,000	1
	Chemical Fertilizers	31,000	9
	Agro-Chemicals	43,250	12
	Fuel Expenses	46,000	13
Machinery Cost	Tractor	11,000	3
	Maintenance	3,000	1
	Others	2,500	1
Labour Cost		67,750	19
Interest on Working Capital		13,500	4
Extra Expenses		5,000	1
Total Cost		255,000	100
Total Production (kg/acre)		12,000	
Cost per kg		21.3	

Red onion

Category	Item	Value (Rs.)	Share (%)
Meterial Cost	Seeds/Seedlings/Suckers/Nursery trees	75,000	37
	Organic Fertilizers	15,000	7
	Chemical Fertilizers	11,000	5
	Agro-Chemicals	7,000	3
	Irigation Charges	12,000	6
	Fuel Expenses	6,750	3
	Other Expenses	3,450	2
Machinery Cost	Tractor	2,000	1
Labour Cost		70,000	35
Total Cost		202,200	100
Total Production (kg)		6,000	
Cost per kg		33.7	

Tomato

Category	Item	Value Rs	Share (%)
Material Cost	Seeds/Seedlings/Suckers/Nursery trees	8,000.00	6
	Organic Fertilizers	7,500.00	6
	Chemical Fertilizers	11,800.00	9
	Agro-Chemicals	10,800.00	8
	Sticks	14,000.00	11
Machinery Cost	Tractor	10,000.00	8
Labour Cost		70,000.00	53
Total Cost		132,100.00	100
Total Production (kg)		20,000.00	
Cost per kg		6.6	

Leek

Category	Item	Value (Rs.)	Share (%)
Material Cost	Seeds/Seedlings/Suckers/Nursery Trees	124,000	15
	Organic Fertilizers	144,000	17
	Chemical Fertilizers	42,000	5
	Agro-Chemicals	200,000	24
	Fuel Expenses	60,000	7
Machinery Cost	Tractor	16,000	2
	Maintenance	40,000	5
Labour Cost		202,400	24
Total Cost		828,400	100
Total Production (kg/acre)		16,000	
Cost per kg		52	

Cabbage

Category	Item	Value (Rs.)	Share (%)
Material Cost	Seedlings (Rs. 1.5/sdlg)	15,000	16
	Organic fertilizers	5,000	5
	Chemical fertilizers	2,600	3
	Agro-chemicals	10,000	10
	Irrigation charges	15,000	16
	Fuel expenses	15,000	16
Others (interest)		9,000	9
Tools		5,000	5
Labour Cost		20,000	21
Total Cost		96,600	100
Total Production (kg)		5,000	
Cost per kg		19.3	

Bean

Category	Item	Value (Rs.)	Share (%)
Material Cost	Seeds/Seedlings/Suckers/Nursery trees	13,800	12
	Organic Fertilizers	8,000	7
	Chemical Fertilizers	12,000	11
	Agro-Chemicals	9,000	8
	Fuel Expenses	8,500	7
	Sticks	22,500	20
Machinery cost	Tractor	5,000	4
Labour Cost		35,000	31
Total Cost		113,800	100
Total Production (kg/acre)		6,600	
Cost per kg		17.2	

Brinjal

Category	Item	Value (Rs.)	Share (%)
Material Cost	Seeds/Seedlings/Suckers/Nursery trees	24,000	8
	Chemical Fertilizers	67,200	23
	Agro-Chemicals	161,200	56
	Fuel Expenses	13,000	5
	Other Materials	15,600	5
Labour Cost		8,000	3
Total Cost		289,000	100
Total Production (kg)		25,000	
Cost per kg		11.6	

Bitter gourd

Category	Item	Value (Rs.)	Share (%)
Material Cost	Seeds/Seedlings/Suckers/Nursery trees	12,000	7
	Chemical Fertilizers	98,200	54
	Agro-Chemicals	17,000	9
	Fuel Expenses	6,000	3
	Sticks	28,000	15
	Coir	6,000	3
Machinery Cost	Tractor	12,000	7
Labour Cost		3,600	2
Total Cost		182,800	100
Total Production (kg)		8,000	
Cost per kg		22.9	

Banana

Category	Item	Value (Rs.)	Share (%)
Material Cost	Seeds/Seedlings/Suckers/Nursery trees	15,000	17
	Chemical Fertilizers	28,800	32
	Irrigation Charges	100	0.11
	Other	7,500	8
Labour Cost		39,000	43
Total Cost		90,400	100
Total Production (kg)		12,500	
Cost per kg		7.2	

Pineapple

Category	Item	Value (Rs)	Share (%)
Material Cost	Seeds/Seedlings/Suckers/Nursery trees	60,000	13
	Chemical Fertilizers	112,400	24
	Agro-Chemicals	66,950	14
	Fuel Expenses	15,000	3
	Hormone	6,650	1
	Coir dust	70,000	15
	Baber wire (Fence)	10,000	2
Machinery Cost	Tractor	13,000	3
Labour Cost		121,000	25
Total Cost		475,000	100
Total Production (kg)		20,000	
Cost per kg		23.8	

Source: Tracing survey by JICA survey team (December 2012)

Appendix 13 Minutes of wrap-up meeting

Date/time	February 20, 2013/13:45-15:15
Place	MOFP/ERD (External Resources Department)
Participants from the Sri Lankan side (honorifics omitted)	<NPD> K.D.A. Munasinghe (Director: Agriculture and Irrigation), B.A. Rathnaseela (Director: Internal Trade), Yasantha Munasinghe (Assistant director), Jayani Wickrama Arachchi (Assistant director) <MOFP/ERD> Menaka Rajaguru (Assistant director), R.D.R. Perera (Assistant director)
Distributed documents	Presentation material: "Finding of Data Collection Survey on Agricultural Distribution Network and Marketing" (attached)
Contents	Presentation of the survey outcomes and exchange of opinions

Comments from NPD and MOFP/ERD

- The Sri Lankan Government has been sharing the same recognition over the issues presented by the Survey team, and the question is how to solve the issues.
- It would be necessary to encourage farmers to become more aware of the issues such as improvement of distribution and wastage occurrence, which are already being implemented by ASC extension officers.
- It is said that the introduction of train in the agricultural distribution could reduce the transportation costs.
- The Sri Lankan Government has been promoting the extension of plastic crates, but it would be also needed to promote financial support for procurement.
- Current cropping pattern should be improved according to the consumers' demand and seasonal price fluctuations.
- Considering the importance of information distribution for prices, etc., the IT programme using PCs has been promoted by Agrarian Division since 2012 (training on data analysis already started toward ASC extension officers). This service is under the control of MoED and is separated from the control of Ministry of Agrarian Service and Wildlife.
- It would be difficult to exclude the existing marketing players such as middlemen, and the issue is how to improve farm income without excluding them (the Survey team answered as follows: Current small-scale farming will be organically developed in the future, and the consumers' demand would be increased. Under such circumstances, it would be necessary to cover the increasing demand by enlarging the modern marketing system aiming at improvement of the distribution system and business skills of farmers, also keeping the conventional distribution system).
- MoED is at presents promoting vegetable extension for the low-income population through Divi Neguma programme, which is aiming at production improvement at the household level. It is encouraged to market surplus but this is only small-scale marketing.
- In conclusion, the Sri Lankan Government would intervene in agricultural distribution through awareness creation, training implementation, and maintenance and improvement of roads/DECs. The idea itself is included in the Mahinda Chintana Vision, but the implementation is being delayed. Furthermore, DECs are being operated mainly with stall commission and the Government has currently allocated little costs after DEC construction. Management Committee of a DEC is the one who makes a decision over the improvement of DEC management.
- How are the production and distribution systems of Japanese small-scale farmers? (the Survey team answered as follows: Agricultural Cooperatives are well developed and firmly established in Japan. Some farmers individually intervene in agricultural distribution, but basically, Japanese agriculture is highly based on organizational power, with strong branding and marketing techniques.

Appendix 14 Minutes of meetings with relevant ministries

MoA

Date/time	February 21, 2013/10:00-10:30
Participants from Sri Lankan side (honorifics omitted)	<MoA> L.K. Hathurusinghe, Director of donor funded project

Comments from MoA

- MoA understands well the necessity of improving agricultural distribution, but its priority would be preferably production improvement and then distribution.
- As for "Agricultural department IT project", MoA has already submitted a proposal and is just waiting for budget approval from NPD.
- "Agricultural department IT project" is a project which provides information on prices and production to farmers, through the computer network connecting the research center in Peradiniya and ASCs across the nation. Allocation of PCs and 2 staff is being planned.

MoED

Date/time	February 21, 2013/13:00-13:30
Participants from Sri Lankan side (honorifics omitted)	<MoED> Priyantha Mayadunne, Additional secretary of project

Comments from MoED

- There has been so far no concrete solution for the issues of many players intervening in agricultural distribution and the large price fluctuations of agricultural commodities, although they have been recognized and tackled by the Sri Lankan Government since 1970's.
- To cope with the price fluctuations of agricultural commodities, it would be necessary for farmers to recognize cropping situations in other areas. Then, information on cropping situations at the national level should be disseminated to farmers, considering the decrease in prices caused by the concentration of similar crops in same harvesting periods. Specifically saying, for price stabilization, the use of advanced technologies such as GIS would help grasp the cropping situations across the country, control imports by taxing based on local shipment time.
- The idea of providing information to farmers from ASCs would not function. Use of masmedia would work better, because farmers (FO) have linked with ASCs only to obtain supplies such as agrochemicals from the government.
- Sri Lanka does not need hundred-million-rupee-projects anymore. Small-scale pilot projects are not needed, either. National-level projects would be preferable.

MoCIT

Date/time	February 21, 2013/15:00-16:00
Participants from Sri Lankan side (honorifics omitted)	<MoCIT> D. Jeevanathan, Additional Secretary, Marketing Development

Comments from MoCIT

- The idea of using DEC as a hub of quality control sounds fine. However, allocation of marketing advisors is doubtful considering costs. It should be also taken into account that DEC managers have already worked on marketing activities.
- Services for farmers such as marketing training are done under the jurisdiction of MoA officers.
- To involve farmers in marketing, they should be released from the situation under heavy debts from collectors. Public loaning would be better, which should be also worked on by MoA officers.
- As the coordination organization for the proposed future project, "Cabinet sub-committee for food security and cost of living would be appropriate.
- As for establishment of DECs, construction of Ampara DEC, rather small-scale DEC, would start in the near future and there will be 16 DECs within 2013. The original plan was to establish 18 DECs but it was not possible to find places for 2 DECs, of which plan was canceled.