A SITUATION ANALYSIS OF
MANGOSTEEN

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Research Study No. 109 October 2003

Hector Kobbekaduwa Agrarian Research and Training Institute
No.114, Wijerama Mawatha
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FOREWORD

The objective of this study, a situation analysis of mangosteen, is to analyze the present situation regarding the fruit and to provide the information needed on which to base a sound export development programme. The HARTI was commissioned to undertake this study by the Export Development Board (EDB). Accordingly the Marketing and Food Policy Division (MFPD) of the institute carried out this study.

The major part of the study consisted of an enumeration of mangosteen trees in the seven main producing districts of the country. Agricultural Research and Production Assistants (ARPA) of the Department of Agrarian Services were engaged for this task. I thank the Commissioner of Agrarian Services for organizing this activity.

The findings of this study are encouraging. Over 11 million fruits are produced annually. Most of the holdings are small but there are some large ones that belong to the big land owners. The report stresses the need for a nexus between the big time producers and the exporter.

Research also needs to be done to reduce post harvest losses, extend shelf life, to develop off season cultivation and to control the latex in the fruit.

Product development is another one that require special attention as the fruit is known to have medicinal properties. The EDB organized a workshop to discuss the recommendations of the study with the relevant agencies and prepared an action plan to implement them.

I would like to express my thanks to the EDB for inviting us to do this study and I must also thank Mr. L.P. Rupasena, Marketing Economist, who carried out this study.

Prof. M.O.A de Soyza
Director

ACKNOWLEDGEMENT

This report is mainly based on the information collected by the Agricultural Research and Production Assistants of the Department of Agrarian Services. I thank them for their valuable service. Thanks are also due Mr. K. Murugasu, Deputy Commissioner of the Department of Agrarian Services for coordinating this task. Mr. M.L. Nandasiri and Mr.Upul Arunasantha helped me to conduct the Rapid Appraisal Survey. They also carried out data analysis. I acknowledge their contribution to the study with sincere thanks.

Feeding data into the computers was a heavy job because over 10,000 schedules were received from the enumeration survey conducted in the top seven mangosteen producing districts in the country. The statistical staff of the Marketing and Food Policy Division under took this responsibility and completed it in good time. I thank all of them .

I must thank Dr. Daya Wijewardena, Director, Export Agricultural Division of EDB for his guidance given to carry out the study and Mr. M.Z.M. Farhad, Assistant Director of the same division for helping to interview the exporters, timely co-ordination and organizing a workshop to present the findings of the study.

Finally, I greatly appreciate the support and encouragement given us by Dr. S.G. Samarasinghe, former Director, HARTI.

L.P Rupasena

EXECUTIVE SUMMARY

At a request of Export Development Board the Hector Kobbekaduwa Agrarian Research and Training Institute carried out this study. The purpose of the study is to provide information on mangosteen for an export development programme. To meet this requirement the study focuses on collection and analyzing of information pertaining to the production and marketing of mangosteen. In this context, this study was based on primary data, which was gathered in two ways. There was an enumeration survey conducted by the Agricultural Research and Production Assistants of the top seven mangosteen growing districts in the country. In addition to counting the trees, information on age, distribution, size of holdings, productivity and production was collected. The second method was conducting a Rapid Appraisal Survey by the researcher along with two research assistants in the highest producing districts of Kalutara and Ratnapura.

The seven districts have over 33,000 trees producing over eleven million fruits annually, Among the seven districts, Kalutara, Ratnapura and Kandy account for nearly 75 percent. The potential for increasing production appears to be high because majority of the trees are still in the highly productive stage. Most of the yield comes from the small-holdings with less than five trees. The village elite has relatively large-holdings due to large homesteads, some estates having over 20 trees. The largest holding with 900 trees was found at Kuruwita.

The yield varies by locations: 1000-2000 in Kalutara, 750-1500 in Ratnapura and around 1500 in the Kandy District. The weather affect yields. Many reported that yields have declined in the Kalutara area due to excess rains prevailed during last three years especially at the time of flowering. There was little rain in the harvesting season, April to May in Kalutara, May to June in Ratnapura and July to August in Kandy. The great advantage of this tree is the absence of pest attacks or diseases. Nevertheless two main problems were reported by the respondents: (1) containing of latex inside

and outer surface of the fruit and (2) appearance of a yellow resin inside the fruit causing bitterness of the fruit. The major constrains in expanding this fruit are being space requirement due to many branches, gloomy environment due to shade of the tree, difficulties in harvesting due to height of the tree and yield declining trend.

Marketing system for mangosteen remains at rudimentary level. Consequently, producers get less than 25 percent of the consumer price. Petty traders who reside in the production areas are involved in purchasing fruits from farmers. Many go and harvest by themselves. They mainly sell to the retailers. During the harvesting period there are many retailers on the roadside of the production areas selling mangosteen to the travellers. There are about 5 commission agents who are selling mangosteen with other fruits in the Manning wholesale market at Pettah, the biggest in the country. They mainly sell to the hotel suppliers in and around Colombo. Exporters obtain fruits through collectors. Quantity of exports fluctuated sharply with 7000 kg in 1996 to 2521 kg in 1999. The major problems cited by exporters are high prices, competitiveness, content of latex inside the fruits and irregular supply.

The study has made recommendations towards the development of production and marketing. Research and Development are focusing on post harvest activities, product development, controlling content of latex in the fruit, promotion of new planting on the riverside and abundant rubber plantations and establishment of forward and backward linkages between the innovative farmers/collectors and exporters among others. Recommendations were discussed with the relevant agencies at a workshop organized by the EDB and an action plan was prepared at the end of the workshop.

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CHAPTER ONE

Introduction

1.1 Background

With a view to promoting Mangosteen as an export crop, the Export Agricultural Division (EAD) of the Export Development Board (EDB) needed to have as much information on the fruit as possible. Neither the Department of Census and Statistics (DCS), nor the Department of Agriculture (DOA) were able to supply the required information regarding the extent of land planted with Mangosteen or the number of fruits produced annually. Accordingly the EDB commissioned the HARTI to undertake the study which was carried out by the institute's Marketing and Food Policy Division.

1.2 Study Objectives

The principal objective of the study was to collect and analyze the information on the production and marketing of mangosteen . The specific objectives were to

(a) study aspects such as the age, the structure and distribution of trees by households and harvesting seasons.

(b) estimate the out put of the major producing districts.

(c) ascertain marketing channels, type of market participants and marketing functions

(d) examine the problems in promoting this fruit, and

(e) make recommendations to solve these problems

1.3 Research Methodology

This study largely depends on primary data as secondary information is limited. Information related to the other countries was obtained though the Internet. Primary data was gathered in two ways. First, a survey was conducted using Agricultural Research and Production Assistants, (ARPA) (earlier known as *Goviniymakas*) in the major producing districts, namely, Kalutara, Ratnapura, Kandy, Gampaha, Galle, Kegalle and Colombo . There are 5690 ARPAs covering 174 Agrarian Centers in these seven districts as shown in Table 1.1

Table 1.1 : Distribution of Agricultural Research and Production Assistants in the Major Production Districts of Mangosteen

District	ASC[1] Division	ARPA[2] Division
Kalutara	20	762
Ratnapura	30	575
Gampaha	26	1139
Galle	33	894
Kegalle	14	573
Kandy	44	1189
Colombo	07	558
Total	174	5690

1 - Agrarian Service Center,
2 - Agricultural Research and Production Assistant

A schedule was prepared for collection of information on the number of trees, their age, the area of tree spread and the production of each household (Annex 1). Schedules along with instructions were distributed to all ARPAs in the district concerned through Divisional Officers (DOs). The ARPAs were asked to fill the forms from every house with mangosteen. Initially one-month was given to complete the schedules and later this was extended by another month. Accordingly, the last day of submission

of the schedules was 30th June 2000. 80 percent of the schedules were returned. All the information was computerized at the village, divisional and district levels.

Next the research team consisting of the researcher and two research assistants conducted a rapid appraisal survey in the districts of Kalutara and Ratnapura during the months of May and June, 2000. Key personnel representing producers and traders were interviewed during the course of the survey to collect specific information on production and marketing. Likewise wholesalers at the Pettah market, retailers in the Colombo metropolitan areas and major exporters were interviewed for information on aspects of demand. Government officials of the Ministry of Agriculture and Lands, Provincial Councils, the Export Development Board and the Department of Agriculture were also interviewed.

The findings of the study were presented at a workshop held on 7 December 2000. Comments of the workshop participants have been incorporated in the final report. Minutes of the workshop are attached in Annex six.

1.4 Study Limitations

The literature available on this subject is limited and much of the information available deals with technical aspect of the fruit. However, some information was had through inter-net. The methodology itself has had some limitations. There was no mechanism to supervise the work of ARPAs. However, this did not affect seriously the accuracy of the data because the ARPAs live in the village and the respondents provided the information especially the age of the trees and production based on their personal knowledge. This limits the accuracy, somewhat. Nevertheless, the accuracy of production data is reasonably high because the survey was conducted during the harvesting period.

1.5 Organization of the Report

Chapter one provides the background, objectives, methodology and limitations of the study. Production is discussed in Chapter 2 followed by marketing in Chapter 3. The final chapter presents the conclusions and recommendations.

CHAPTER TWO

Production

2.1 Introduction

Mangosteen belongs to family of Guttiferae and is botanically known as *garcinia mangostana*. It is native to Asia, but its place of origin is really unknown, but it is believed that its place of origin is Malaysia as there are wild trees in the forests of Kemaman in Malaysia. It is said that planting of mangosteen first started in Thailand where there were 4,000 ha in 1965 and it gradually expanded to Kampuchea, Southern Vietnam, Burma, Malaysia and Singapore. Cultivation of mangosteen in Sri Lanka dates back to around 1800 and India in 1881. In Sri Lanka, mangosteen trees were initially planted along the roadsides of the bungalows of rubber and coconuts planters and this could be observed in some places even today.

Mangosteen is ultra-tropical. It cannot tolerate temperatures below 40° F (4.44° C) and above 100° F (37.78°). Nursery seedlings die at 45° F (7.22°C). Further, lower temperature below 20° C results in slow growth. The tree requires high atmospheric humidity and an annual rainfall of at least 50 inches (127 cm) but no long periods of drought. The ideal condition is a temperature of 25° - 30° C with a relative humidity of over 80 percent (Dassanayake, undated). As regard soil, the tree is adaptable to limestone and grows well in deep, rich organic soil, especially sandy loam or laterate. It needs a good drainage system and the water table ought to be about 6 ft (1.8 m) below ground level. In considering all these requirements mangosteen is specially suited for planting along river banks, canals or near ponds or lakes (Dassanayake, undated).

2.2 Dispersion of Production

Mangosteen cultivation does not extend throughout the country due to climatic reason as explained earlier. Its cultivation is limited to the wet zone of the country. Seven districts namely, Colombo, Gampaha, Kalutara, Kandy, Kegalle, Ratnapura and Galle are the major producing districts in the wet zone. Table 2.1 summaries the survey results on production. The number of trees in these seven districts amounted to be 33,000 which produces 11 million fruits per annum. Of the seven districts, Kalutara, Ratnapura and Kandy are most productive contributing nearly 75 percent of the overall out put of the seven districts. Within the district some locations are more important as shown in Annex 2-4. For example, one-third of the production in the Kalutara district (3.6 million fruits) and in the Ratnapura district (2.5 million) is had from Baduraliya Agrarian Service Center (ASC) area and the Kuruvita ASC area respectively. Even within the ASCs certain villages have larger productions.

Table 2.1 : Distribution of Mangosteen by Major Districts

District	Trees		Area Spread		Production		
	No	% of Total	Acre	No of Tree Per Acre	No	% of Total	Per Tree
Colombo	2237	7	48.67	46	586185	5	262
Gampaha	1919	6	120.96	16	64425	6	336
Kalutara	8330	25	520.66	16	3571405	32	429
Kandy	7243	22	217.39	33	2267381	20	313
Kegalle	3968	12	167.51	24	793279	7	200
Ratnapura	6516	20	383.40	17	2483705	22	381
Galle	3020	9	92.84	32	862709	8	286
Total	33233	100	1551.43	21	11209089	100	315

Source : Survey Conducted by Agricultural Research and Production Assistants, June 2000

Table 2.2: Age Distribution of Mangosteen by Districts

Years	Kalutara		Ratnapura		Kandy		Galle		Kegalle		Gampaha		Colombo	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
00-10	397	4.77	413	6.34	226	3.12	136	4.50	47	1.18	17	0.89	51	2.28
11-20	593	7.12	362	5.56	634	8.75	303	10.03	422	10.64	29	1.51	69	3.08
21-30	725	8.70	1285	19.72	1018	14.05	321	10.63	226	5.70	169	8.81	159	7.11
31-40	1304	15.65	912	14.00	1407	19.43	310	10.26	905	22.81	352	18.34	318	4.22
41-50	1658	19.90	1174	18.02	1347	18.60	741	24.54	581	14.64	621	32.36	759	3.93
>50	3653	43.58	2370	36.37	2611	36.05	1209	40.03	1787	45.04	731	38.09	81	9.38
Total	8330	100	6516	100	7243	100	3020	100	3968	100	1919	100	2237	100

Source: Survey Conducted by Agricultural Research and Production Assistants.

Table 2.2 depicts the distribution of the trees according to age. Trees over 50 years old are dominant in all the districts concerned, and are about 40 percent in all the locations except in Ratnapura and Kandy districts. Similarly trees less than 5 years old are less than 5 percent except in Ratnapura where the figure is little higher (6%). The Table 2.2 further shows that percentage figures for younger trees are low because most of these trees have grown from seedlings of fruits from the old trees eaten by bats and squirrels. However, few seeds germinate and hence the spread of trees is naturally restricted. Overall results indicate that a considerable number of trees, over 40 percent, are still in the high productive stage. Many reported that yield has a positive correlation with age till the tree is 50 years old.

Mangosteen could be seen largely in home gardens. Since the size of home-gardens in the wet zone is small, often less than one acre, the number of trees in the home garden is limited. As shown in Table 2.3 over 80 percent of households have five or less than 5 trees, and the number of trees increases with the size of the home garden. The landed elite in the village have more trees than the others. Instances of these are about 50 trees in the "Diyagama Walawwa" at Bolossagama in the Kalutara District, 900 trees at Pahala Kuruwita in the Ratnapura District and 200 trees at Kadugama (near Avissawella) in the Colombo District. Also mangosteen has been planted in rubber and coconut estates in the wet zone along the pathway leading to the bungalow of the estate. A few examples are the Sri Nivasawatta rubber estate with 28 trees at Waga in Avissawella, Nugahena rubber estate with 32 trees at Panawala in the Ratnapura district and the Leenawatta coconut estate with 50 trees at Padukka. Annex five provides a list of persons who have large holdings of over 20 trees.

Table 2.3 : Holding Size of Mangosteen

No.of Trees	Kalutara	Ratnapura	Kandy	Galle	Kegalle	Gampaha	Colombo	Total
5<	3,963	2,870	3800	1,812	2,283	975	806	16,509
6-10	131	81	98	26	35	32	10	413
11-20	26	5	27	1	3	3	1	66
21-30	8	3	3	1	2	2	1	20
31-40	3	-	1	1	3	2	-	10
41-50	3	-	-	1	-	-	2	6
50>	3	2		2	2	-	-	11
Total	4,137	2,961	3,931	1,844	2,328	1,014	820	17,035

Source: Survey Conducted by Agricultural Research and Production Assistants

2.3 Harvesting

Harvesting is carried out once a year and it lasts for two to three months depending on the weather. There are a few cases where trees bear fruits twice per year, depending on the weather. Harvesting takes place about the same time in the Kalutara, Ratnapura and Kandy districts. In Kalutara the harvesting season commences in April and peaks in May; in Ratnapura the season starts in May and peaks in June. The Kandy season commences later in July and peaks in August. The Sri Lankan fruit season coincides with other major producing countries except the Philippines. In India, there are two distinct fruit bearing seasons, one in the monsoon period (July-October) and another from April through June. In Thailand 20 percent of Mangosteen are available in May, 35 percent in June, 35 percent in July and 10 percent in August. In Malaysia, the season continues from May to August. The Philippine mangosteen is available from August to November.

Fruits are usually plucked every other day. It was reported that the fruit is ready for plucking when a red spot appears on the surface of the fruit. The common plucking method is that a person climbs a tree with a poli-sack bag, plucks the fruits and fills the bag. Letting fruits fall to the ground is very rare because of the high percentage of fruit damage. Although small

traders in the village pluck fruits themselves, hired labour is mainly used for plucking on a mass scale and the trader often provides the labour themselves. Payments to the labourers vary; one-third/ half of the fruits harvested or cents 50 per fruit or daily payment of Rs. 150- 200 with meals. A person can pluck 400-500 fruits per day on an average. Harvesting of mangosteen in estates is done on a tender basis.

2.4 Yield

There is a big variation in the yield depending on the age of tree and weather pattern. The tree starts bearing fruits at the age of 8-10 years with 25-50 fruits per season and the yield increases rapidly. But, when the tree is 50 years old the fruit bearing declines. Also, after about 50 years the size of the fruits becomes small. The average yield per tree reported by many respondents was in the range of 1000-2000 fruits per season in Kalutara and 750-1500 in Kuruwita areas. The minimum yield reported was 250 fruits per tree. It was observed that most of the trees are in the high productive stage. In Madras individual trees between 25 and 45 years yield 2000-3000 fruits per season.

The maximum yield that can be obtained under ideal condition i.e. excellent weather condition and trees not covered by other trees, is about 5000 fruits per season. However, it was reported in all areas that yield has declined considerably. For example the yield has dropped from 4500/3500 to 3000/2000 fruits in Kalutara during the last 5 years, due to the rainy weather condition experienced before the flowering stage. Farmers in Kalutara are of the view that rainfall has increased during the last three years, which is harmful for mangosteen.

2.5 Pests and diseases

There were no mangosteen pests or diseases reported. However, there were two problems in connection with the fruit after harvest. First, the fruits contained latex inside and on the outer surface, making the fruit very hard and unsuitable for eating. This problem is greater in Kalutara and less in Kandy probably due to climatic conditions. Second, a yellow resin appears inside the fruits, which may cause an unpleasant taste although

the appearance of the fruit may be good.

2.6 Problems

As mentioned earlier, presently mangosteen grows naturally except in few cases as no one applied fertilizer or agrochemicals. As such production costs are zero. Nevertheless, farmers are reluctant to plant this tree as

* This tree requires considerable space thus leaving little room to grow other plants with mangosteen.

* The environment becomes gloomy due to shade of the trees. Villagers reported that they do not like such an environment in the vicinity of their houses. Also there is a popular belief that no prosperity can come to a house if this tree is in front of the house.

* Harvesting is difficult because the tree is tall and has many branches.

* Yield is on the decline due to excess rains.

CHAPTER THREE

Marketing

3.1 Introduction

Marketing is the process of moving of a product from where it is produced to where it is consumed. In this process, various activities such as buying, selling, processing, packing, transporting and storing are involved as well as different types of intermediaries such as collectors, processors, exporters, transporters, wholesalers and retailers. This entire process refers to the marketing system. Activities and intermediaries connected to the system are called marketing functions and market participants respectively. A marketing system is often analyzed under three categories; organization, operation and performance. In this chapter the marketing system for mangosteen is reviewed under these three categories.

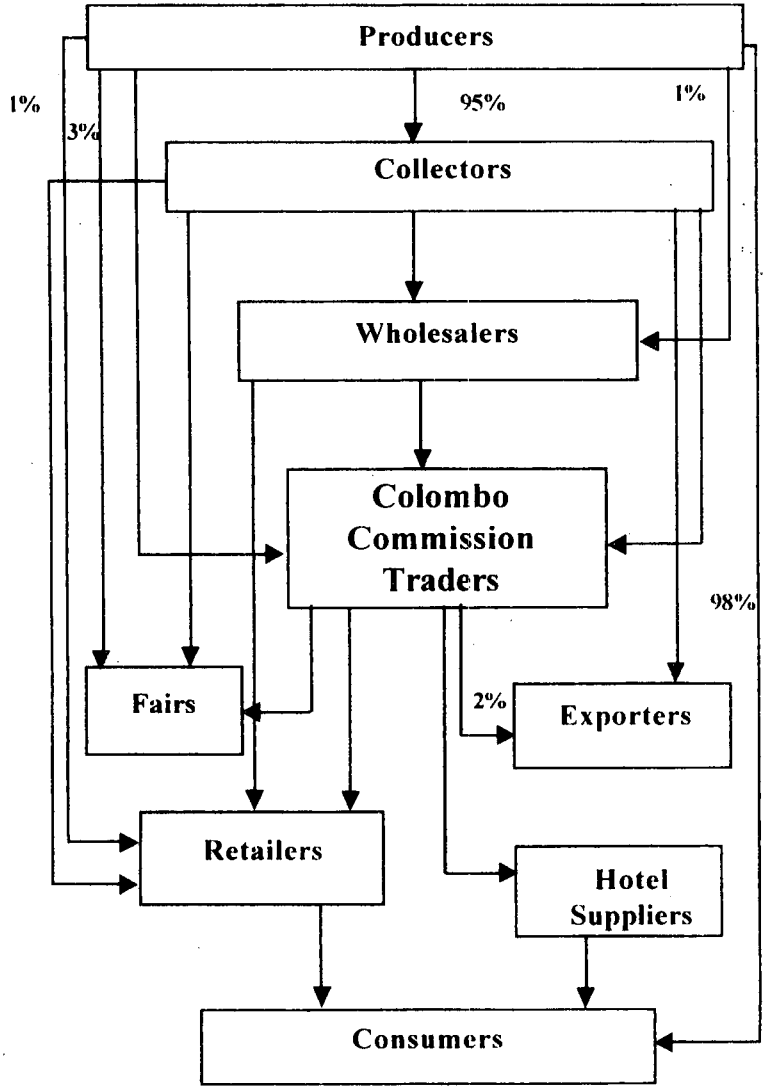
3.2 System Organization

Marketing systems organization refers to how the product moves to the end users and the types of market participants involved in it. At the initial stage of marketing, the producer sells his products directly to the consumer who lives in the same village. With time the physical distance between the producer and the consumer widens where direct selling is impossible. As a result, a number of ways to get the product to the consumer has developed gradually. These are called marketing channels and function through various types of personnel such as collectors, transporters, wholesalers and retailers. They are called market participants or intermediaries.

3.2.1 Marketing Channels

Figure 1 explains the marketing channels for mangosteen. These are the

Figure 1 : Marketing Channels for Mangosteen



Source : Rapid Appraisal Survey

various ways and means by which mangosteen reaches the consumer. Of them, the major one is the producer--collector---retailer--- consumer chain. It was observed that collectors purchase 95 percent of the mangosteen from the producers. Producers prefer to sell the produce to collectors who are involved in harvesting, collecting and packing. Wholesalers do not play a major role and many collectors sell to the retailers directly at the retail point. This often takes place on an individual basis. Nevertheless, there is a place called Higgastenna at Kuruwita where around 30 collectors gather and look for vehicles to send the fruits to Colombo. They also sell mangosteen to retailers who come from Badulla and Kalmunai to this spot.

With regard to retailing in Sri Lanka, roadside traders are common for seasonal fruits such as rambutan, durian, mangosteen, and they usually form groups in certain locations in the producing areas. For example the three biggest retail centers along the roadside for selling mangosteen are located in Kalutara, Parakaduwa in Ratnapura and Puwakpitiya in Avissawella. Details are given below.

Kalutara Retail Center - There are about 15 retailers along the Galle Road at the Thotupola junction in Kalutara North. They themselves build small huts temporally during the harvesting season. Some have more than one. It was reported that trading has taken place for more than 75 years, and that only two were in the trade at the outset. The majority of traders are youths but women traders are limited. Generally, there are two persons in a stall; one person is involved in getting customers and the other person does the business. These boutiques are open for about six months of the year commencing from April with the Kalutara fruit season, which lasts for three months. After that the Ratnapura and Kandy seasons mangosteens are sold. Major buyers are local tourists passing this area especially towards Colombo. Sales are high during weekends when more travel. In addition there are two traders who supply to exporters and some who send mangosteen to the Colombo market for sales on a commission basis, when they have "excess" supply. The only problem reported by traders is lack of permanent place, which gives rise to problems with the police.

Table 3.1 : Exports of Mangosteen by Country

Country	1994		1995		1996		1997		1998		1999	
	Kg	Rs	Kg	Rs	Kg	Rs	Kg	Rs	Kg	Rs	Kg	Rs
Malaysia	-	-	-	-	-	-	13	652	-	-	-	-
Maldives	56	5,571	574	14,896	968	162,202	222	35,762	-	-	167	16,188
Saudi Arabia	-	-	-	-	245	24,987	800	153,523	1,642	384,454	68	10,134
U.A.E.	248	17,100	70	1,800	1,865	37,750	725	15,700	20	750	18	200
U.K.	800	17,100	70	1,800	1,865	37,750	725	15,700	20	750	18	200
Canada	-	-	-	-	-	-	45	15,611	-	-	145	55,261
Austria	-	-	-	-	50	1,000	-	-	-	-	-	-
Singapore	-	-	-	-	31	27,649	-	-	-	-	-	-
South Korea	-	-	-	-	30	3,200	-	-	-	-	-	-
Oman	-	-	-	-	-	-	-	-	-	-	-	-
Belgium	-	-	-	-	288	4,581	-	-	-	-	-	-
France	-	-	-	-	-	-	-	-	10	100	-	-
Germany	-	-	-	-	90	11,712	-	-	15	375	-	-
Switzerland	15	1,638	-	-	-	-	-	-	-	-	-	-
Netherland	-	-	-	-	-	-	-	-	8	300	-	-
U.S.A	-	-	-	-	-	-	-	-	-	-	1,421	613,36
Lebanon	20	1,265	-	-	-	-	-	-	-	-	-	-
Kuwait	-	-	-	-	-	-	-	-	-	-	63	8,801
TOTAL	1,139	46,598	860	21,210	7,023	600,548	3,131	341,336	2,267	448,751	2,2151	797,815

Source : Department of Customs

Parakaduwa Retail Center - is located between Parakaduwa and Thiriwana, four miles away from the Parakaduwa junction. There are about 10 traders. Many of them are youths and three are children. All of them sell fruits like rambutan and papaya in addition to mangosteen. Traders themselves go to purchase mangosteen from the farmers in production areas such as Eratta, Kuruwita, Diddeniya and Ehaliyagoda. The main buyers are local travellers especially from Badulla, Ampara, Moneragala and Colombo.

Avissawella Retail Center - is located at Puwakpitiya along the Colombo road. There are about 25 traders but only a few traders sell mangosteen. The supply is mainly from surrounding areas such as Kadugama. Traders themselves pluck the fruits. Compared to the other two locations this is small.

The exporters obtain their supply of mangosteen from collectors. Seven exporters were interviewed and none of them have direct link with the producers. The major export markets are Maldives and Dubai. A very few stocks are sent to the European markets notably, Germany and UK as shown in Table 3.1. In 1996, the quantity exported to UK was 1.9 Mt., which was the highest quantity exported to a European market.

3.2.2. Market participation

These are intermediaries between producer and the consumer. Figure 1 shows different types of intermediaries. In addition, transporters who are involved in moving the products from one place to another are also in the system. In this section, the role of different types of intermediaries will be described.

Collectors - They are petty traders who are residents in the production areas and collect various kinds of fruit. There are only a few collectors operating in the designated areas. Only one or two collectors could be seen in most of the villagers. The quantity handled by each is small around 500 fruits per day, which is about as much as they could handle. However, there are a few collectors who handle over 1000 fruits per day. There is a collector at Panawala close to Eahaliyagoda who usually col

lects 1500 fruits per day. He sends the stocks to the Colombo market and the exporters. Another collector at Erathagoda, Kuruwita collect over 3000 per day during the peak harvesting period. He often leases three spots: one has 200 trees, another has 70 trees and the third one has 15 trees. The last spot had 50 trees which have now been replaced with tea.

Among collectors, there are women too. A group of women traders were found in a village called "Darmagrama" at Kosgoda. This is a group consisting of 10 women who collect items like mangosteen, rambutan, king coconut and ambaralla from the villagers and take them to Colombo for sale.

Wholesalers - purchase in bulk mainly from collectors and sell to retailers. Such traders are limited in the mangosteen trade because the quantity demanded is small that can be provided by a collector. There are two locations where a few wholesalers operate. One is Bellana in Kalutara where there are four wholesalers who mainly purchase from collectors and send to Kalutara and Colombo. Another is located at Thoranagoda, Kuruwita where three traders purchase mangosteen from collectors and sell to retailers who come from Badulla and Dambulla and also send to Colombo.

Commission Agents - Colombo is the only place where commission trading takes place for mangosteen. There are about 5 commission agents in the Manning fruit market selling mangosteen. They sell other fruits as well. The commission fee is 10 percent of the sales value. Collectors are the major suppliers, and retailers and hotel suppliers in and around Colombo are the principal buyers.

Retailers - retailers of fruit are small-scale business men who usually have small huts or an open space in areas such as bus stands and waiting places where people gather. Retailers sell more than one kind of fruit mostly bananas.

3.3 System Operation

This section describes the marketing function in relation to mangosteen. Marketing functions are divided into three categories: 1) exchange func

tions, 2) physical distribution functions, and 3) facilitating functions.

3.3.1 Exchange Functions

This includes buying and selling activities. At farm level, buying largely takes place at the farmer's house for spot cash and collectors usually deliver fruits to the retailers. Buyers determine the price. Collectors decide the farm price based on the price paid by retailers for their stocks. Price difference between the price paid to the farmer and collector's selling price varies from cents 25 to Rs.1.50 per fruit. The collector adds cents 25 if he purchases at his collecting point. This was observed at Bopatta in Ratnapura district. When the collector goes and purchases from house to house he keeps a margin of cents 50 per fruit. This is the practice at Yakupitiya and Ilukpothe in the Baduraliya Agrarian Service Center area in Kalutara District. If the collector picks up fruits he usually keeps Rs.1.00 or Rs.1.50 per fruit. This is common in many places. As regard the retailer' margin roadside retailers in Kalutara reported that their mark-up price is Rs.2.00 or Rs.2.50 per fruit. The reported figures by roadside traders at Parakaduwa ranged from Rs.2.50 to Rs.3.00 per fruit. Exporters' buying price is based on the reported price in the order. Exporters survey reveals that the price paid to the supplier was in the range of Rs.40-65 per kg during the fruit season in 2000.

3.3.2 Distribution Functions

The distribution function consists of grading, packing, transporting, storing and processing. There are two grades at farm level. Large and medium and three grades at retail level: large, medium and small. At farm level two medium size fruits are equal to a large fruit. Retailers grade into three grades based on the size of the fruit. As reported by retailers in Kalutara, 25 percent are large, 50 per cent medium and the balance is small out of the total stock. Exporters maintain two grades: large which includes 8-9 fruits per kg and medium which includes 10-12 per kg. Fruits are generally packed in poli-sack bags with banana leaves or grass at the bottom of the bag. Usually the bag contains 200 fruits. It costs Rs.6-8 per bag. A very few use cardboard boxes such as Anchor or Apple boxes, which cost Rs.5

each. There are two ways of packing for exports: bulk packing in boxes at Rs.30 per each and small packing in trays at Rs.2.00 each.

Pedal cycles are used by small collectors and three-wheelers are used by big collectors in collecting fruits in the village. In Kalutara, collectors pay Rs.125-150 to the three wheeler per trip, which includes 6-8 bags (200-300 fruits per bag). Fruits are transported to the Kalutara market using public transport. Public transporters charge Rs.10/bag to Kalutara. Collectors who send fruits to the Colombo market do not have their own lorries and have to wait for lorries travelling to Colombo for the purpose. Collectors who gathered at the Kosgama junction reported that they have to wait for hours to get a vehicle. The transport cost from Kosgama to Colombo is Rs.10/bag. Collectors at Bellana reported that they could easily find vehicles because vegetable lorries pass the place. They pay Rs.10-15/bag to Colombo. During the survey period only one collector at Panawala in the Ratnapura district had hired an Elf-lorry to send mangosteen to Colombo at Rs.1500 and loaded 50 bags with 150 fruits per a bag. For export, supplier deliver fruits to the exporter in hired vans.

Mangosteen can keep for 7-10 days under normal conditions. The available literature indicates that mangosteen has medicinal values. Filipinos employ a decoction of the leaves and bark as a febrifuge and to treat thrush, diarrhea, dysentery and urinary disorders. In Malaya, an infusion of the leaves, combined with unripe banana and a little benzoin is applied to the wound after circumcision. Researchers at the University of Western Australia's Agricultural Department have been investigating the medicinal values of the mangosteen.

3.3.3 Facilitating Functions

This mainly includes market information, credit facilities and standardization. None of these operate for mangosteen.

3.4 System Performance

Marketing system performance refers to an analysis of price spread. To calculate the price spread, producer, wholesale, and retail prices were col

lected for five days in May, 2000. Producer prices were obtained at Diyagama and Galpatha in the Kalutara District, wholesale price at the Manning market, Colombo and retail prices from retail markets in and around Colombo. The results presented in Table 3.2 show that farmers get

Table 3.2: Price Spread for Mangosteen (Rs/Fruit)

Date	Produ-cer (1)	Whole-sale (2)	Retail (3)	Price spread			
				(3)-(1)	(3)-(2)	(2)-(1)	(1)/3*100
13-May 2000	1.75	4.74	9.00	7.25	4.26	2.99	19.44
19-May 2000	2.00	6.25	10.00	8.00	3.75	4.25	20.00
20-May 2000	2.00	6.80	10.40	8.40	3.60	4.80	19.23
23-May 2000	2.25	7.00	10.00	7.75	3.00	4.75	22.50
27-May 2000	3.00	7.80	10.00	7.00	2.20	4.80	30.00

Source: Survey done by the HARTI

Table 3.3: Producer and Retail Price Range - Kalutara

Date	Producer (Rs/Fruit)	Retail (Rs/Fruit)		
		Small	Medium	Large
06/05/2000	2.00-3.00	2.50-3.00	3.50-4.00	5.00-6.00
06/06/2000	2.00-2.50	2.50-3.00	3.50-4.00	5.00-6.00
06/07/2000	1.00-1.50	2.00-2.00	3.00-3.50	4.00-4.50
06/08/2000	1.00-1.00	2.00-2.00	3.00-3.50	4.00-4.50
06/09/2000	1.00-1.00	2.00-2.00	3.00-3.50	4.00-4.50
06/10/2000	1.00-1.25	3.00-3.50	4.00-4.00	5.00-5.00
06/11/2000	1.00-1.25	3.00-3.50	4.00-4.00	5.00-5.00
06/12/2000	1.50-2.00	2.50-3.50	4.00-4.00	5.00-5.00
06/13/2000	1.50-2.00	2.50-3.50	4.00-5.00	6.00-7.00
06/14/2000	2.50-3.00	3.00-4.00	5.00-5.00	6.00-8.00
06/15/2000	3.00-4.00	3.00-4.00	5.00-5.00	6.00-8.00

Source: Retail Appraisal Survey

less than 25 percent of the consumer price. As shown in Table 3.3., there is a vast gap in price at producer and retail level in the Kalutara market. Since consumers receive the product in the same form this margin appears to be high. There are a number of reasons for this. First, traders bear the harvesting cost of cents 50 per fruit on an average. Second, marketing is not organized. Third, the volume sold by collector, wholesaler and retailer is small. Fourth, wastage is high: a 10 percent at farm level, 5 percent at wholesale level and 20 percent at retail level.

Price information is not available to calculate the price spread for the export market. However, export performance could be examined based on the export figures available in the Department of Customs. Table 3.4 presents the quantity and value of mangosteen exports during the period 1990-99. It shows the fluctuation of both quantity and value, due perhaps to changes in domestic production and world market prices. The highest export of 7 Mt. was registered in 1996 and exports for the last two years were around 2.5 Mt. The reasons for the drop in exports are high prices, content of latex inside the fruit and irregular supply.

Table 3.4: Exports of Mangosteen 1990-1999

Year	Quantity (Kg)	Value (Rs)
1990	27	29,472
1991	408	56,948
1992	1,490	31,252
1993	2,918	256,284
1994	1,139	46,598
1995	860	21,210
1996	7,023	600,548
1997	3,131	341,336
1998	2,267	448,751
1999	2,521	797,815

Source: Department of Customs.

CHAPTER FOUR

Conclusions and Recommendations

4.1 Conclusions

* Sri Lanka has over 33,000 mangosteen trees and produces 11 million fruits annually. The production potential is high because nearly 40 percent of the trees are still at a high productive stage being less than 50 years old. Mangosteen cultivation is limited to the Wet Zone of the country. Kalutara, Ratnapura and Kandy are the three major producing districts and contribute nearly 75 percent of the country's production. Within the districts certain locations are more productive.

* Mangosteen is a home garden fruit. Although mangosteen had been planted in the past, it is no longer cultivated as a crop.

* The holdings are small, in most cases about 5 trees or less. However, the big land owners have large holdings. There are also a large number of trees in some rubber and coconut plantations.

* Harvesting techniques have improved. Fruits are harvested into the bag and not on to the ground as in the past. Since harvesting is the business of the trader he takes care of it. Crop damage at the harvesting stage is generally limited to less than 10 percent.

* The average yield has declined during last three years due to excessive rain. Yield varies according to the locations. The Kalutara district registered the highest yield followed by Ratnapura and Kandy. Kandy produces the best fruits but the yield is low.

* Marketing is disorganized. Trading is in the hands of small traders.

Marketing activities such as grading, packing, transporting etc. are poor. As a consequence, the producer gets less than 25 percent of the consumer price. Spot market operates in both domestic and export trading.

* Both the quantity and value of exports fluctuate due to erratic supply and high competition in the international market. Maldives and Dubai are the two major export markets and Thailand is the major competitor.

4.2 Recommendations

* Research and Development (R&D) need to be strengthened as they have been neglected so far. Major areas that need investigation are the relationship between yield/quality, weather, identification of best areas for planting in order to staggering of harvesting period, controlling content of latex in the fruit and possibilities of reducing the size of the trees. It is also important to investigate techniques, handling and packing. This will improve the quality of the fruit as well as its shelf life .

* The cultivation of mangosteen by the riverside and in abandoned rubber plantation is suggested. Cultivation could be expanded as the crop is easy to manage. The possibilities of off season cultivation in suitable areas should be explored.

* Due to a weak domestic demand in the face of a variety of substitutes, export promotion is needed. It appears that innovations such as identification of new markets, product development, establishment of backward and forward trade links are lacking. Exporters do business in areas where risk is low. In these circumstances Export Agricultural Division of EDB has to play a major role in development of export market. Two major areas that need attention in this regard are the establishment of forward and backward linkages with exporters and the provision of market information through market research. In connection with backward linkages large producers and collectors should be linked with exporters. The findings of research have confirmed such possibilities. A list of large producers is given in Annex five.

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Annex I :

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Annex 2 : Distribution of Mangosteen in Kalutara District

DS/ASC	Trees		Areas of Trees Spread (Acre)	Annual Production		
	No	% of Total		No	% of Total	Yield per Tree
Walallavita						
Palawatta	497	5.97	60.50	425265	11.91	856
Ittapana	155	1.86	2.75	22660	0.63	146
Kalutara						
Nagoda	230	2.76	5.78	51090	1.43	222
Moronthuduwa	326	3.91	37.92	15607	0.44	48
Agalawatte						
Agalawatte	898	10.78	105.25	279630	7.83	311
Bulathsinghala						
Bulathsinghala	1180	14.17	68.63	403683	11.30	342
Warakagoda	352	4.23	7.85	80417	2.25	228
Dodamgoda						
Dodamgoda	1069	12.83	48.46	595272	16.67	557
Beruwala						
Halkandawila	40	0.48	0.03	8575	0.24	214
Padagoda	78	0.94	6.29	58610	1.64	751
Bandaragama						
Bandaragama	178	2.14	1.63	43085	1.21	242
Horana						
Ingiriya	313	3.76	45.36	100743	2.82	322
Madurawala						
Madurawala	975	11.70	82.22	223845	6.27	230
Palindanuwara						
Baduraliya	1507	18.09	32.80	1198810	33.57	795
Mathugama						
Mathugama	514	6.17	13.16	59863	1.68	116
Panadura						
Panadura	18	0.22	2.02	4250	0.12	236
Total	8330	100.00	520.66	3571405	100.00	429

Annex 3 : Distribution of Mangosteen in Ratnapura District

DS/AC	Trees		Areas of Trees Spread		Annual Produciton		
	No	% of Total	Acre	% of Total	No	% of Total	Per Tree
Kuruwita							
Dodampe	112	1.72	4.31	1.12	9075	0.37	81
Kuruwita	2112	32.41	26.27	6.85	721250	29.04	342
Namaldeniya	268	4.11	41.08	10.71	82595	3.33	308
Godakawela							
Palebadda	6	0.09	0.38	0.10	85	0.00	14
Godakawela	174	2.67	1.16	0.30	163445	6.58	939
Imbulpe							
Rathmalwinna	23	0.35	0.28	0.07	7900	0.32	343
Ehaliyagoda							
Ehaliyagoda	519	7.97	51.07	13.32	199970	8.05	385
Balangoda							
Damahna	48	0.74	0.29	0.07	5380	0.22	112
Rassagala	38	0.58	1.80	0.47	7930	0.32	209
Kiriella							
Kiriella	252	3.87	37.45	9.77	57375	2.31	228
Kalawana							
Pothupitiya	243	3.73	1.28	0.33	79720	3.21	328
Kalawana	593	9.10	46.03	12.01	474825	19.12	801
Kahawatta							
Kahawatta	186	2.85	13.00	3.39	62195	2.50	334
Ratnapura							
Babarakotuwa	138	2.12	16.88	4.40	72485	2.92	525
Geleemale	271	4.16	20.23	5.28	61250	2.47	226
Ratnapura	339	5.20	53.56	13.97	48350	1.95	143
Elapatha							
Elapatha	410	6.29	7.09	1.85	139470	5.62	340
Weligepola							
Weligepola	22	0.34	2.52	0.66	3720	0.15	169
Ambanwilla	6	0.09	0.10	0.03	2100	0.08	350
Palmadulla							
Palmadulla	83	1.27	12.14	3.17	56310	2.27	678
Marapana	168	2.58	23.72	6.19	116850	4.70	696
Nivithigala							
Nivithigala	178	2.73	3.18	0.83	19570	0.79	110
Opanayaka							
Opanayaka	66	1.01	10.31	2.69	13325	0.54	202
Ayagama							
Ayagama	228	3.50	8.75	2.28	74680	3.01	328
Kollonc							
Kollonc	33	0.51	0.53	0.14	3850	0.16	117
Total	6516	100.00	383.40	100.00	248305	100.00	381

Source : Survey Conducted by Agricultural Research and Production Assistants

Annex 4: Distribution of Mangosteen in Kandy District

DS/AC	Trees		Areas of Trees Spread		Annual Produciton		
	No	% of Total	Acre	% of Total	No	% of Total	Per Tree
Thumpane							
Hathraliyadda	11	0.15	5.69	2.62	0	0.00	0
Walivita	46	0.64	4.69	2.16	20715	0.91	450
Aludeniya	60	0.83	0.03	0.01	17190	0.76	287
Galagedara	330	4.56	7.14	3.28	102515	4.52	311
Kundasale							
Gunnepana	27	0.37	0.45	0.21	5606	0.25	208
Mawinna	93	1.28	6.25	2.88	23570	1.04	253
Digana	16	0.22	0.50	0.23	9200	0.41	575
Manikhinna	2	0.03	0.01	0.01	450	0.02	225
Akurana							
Alwawathugoda	267	3.69	24.76	11.39	131550	5.80	493
Udunuwara							
Abanwela	258	3.56	3.68	1.69	116075	5.12	450
Alapalawa	162	2.24	4.86	2.24	21942	0.97	133
Pathiyagoda	157	2.17	1.14	0.52	46298	2.04	295
Imbulgeniya	279	3.85	7.84	3.60	41706	1.84	149
Thalawahura	126	1.74	0.22	0.10	32845	1.45	261
Medadumbara							
Uddispaththuwa	87	1.20	15.38	7.08	23280	1.03	268
Theldeniya	4	0.06	0.04	0.02	550	0.02	138
Harispaththuwa							
Madewela	325	4.49	16.97	7.81	53915	2.38	166
Yattawela	1060	14.63	18.74	8.62	230310	10.16	217
Pujapitiya							
Wawalal	1100	15.19	10.48	4.82	317737	14.01	289
Batugoda	519	7.17	0.00	0.00	29830	1.32	57
Gangawatakorale							
Katawelalewla	6	0.08	0.00	0.00	100	0.00	17
Bowala	434	5.99	9.98	4.59	172675	7.62	398
Yatinuwara							
Giragama	220	3.04	6.96	3.20	94605	4.17	430
Edanduwawa	302	4.17	1.38	0.63	49775	2.20	165
Manikdiwela	575	7.94	21.84	10.05	418665	18.46	728
Gangaihlakorale							
Kurunduwatta	188	2.60	26.42	12.16	103392	4.56	550
Pasbagekorella							
Rambukpitya	149	2.06	4.34	2.00	33820	1.49	227
Udapalatha							
Gampola	97	1.34	2.00	0.92	22405	0.99	231
Pathadumbara							
Waththegama	172	2.37	6.33	2.91	69520	3.07	404
Doluwa							
Madepitiya	126	1.74	9.23	4.25	67540	2.98	536
Panvilla							
Huluganga	42	0.58	0.01	0.01	8350	0.37	199
Medamahanuwara							
Medamahanuwara	1	0.01	0.00	0.00	250	0.01	250
Ududumbara							
Kulunaththana	2	0.03	0.01	0.01	1000	0.04	500
Total	7243	100.00	217.39	100.00	2267381	100.00	313

Annex 5: List of Growers Having More Than 20 Mangosteen Trees

1. Ms.K. Manoja Kumuduni
Maduluwawa (North)
Padukka.

2. Mr. W.A. Ranjith Padmasiri
Wataraka (South)
Homagama.

3. Mr. Caminda Geewandara
Liyanwala.
Padukka.

4. Ms. W.A.D. G. Prishanthimala
Pitipana
Homagama.

5. Ms. D.M.C. Malkanthi
Planwatta.
Kesbewa.

6. Mr. W.K.A.J. Fonseka
Kudagama.
Hanwella.

7. Mr. M. Priyal Nandika
Kaluaggala.
Kosgama.

8. Mr. N.J.A. Daya Chandana
Walpitamulla.
Minuwangoda.

9. Mr. Wimal D. Sirimanna
Keenadeniya.
Meerigama.

10. Mr. G.A.B.C. Ganepola.
Talgasmote.
Attangalla.

11. Ms. Ratna Edirisinghe.
252-C.
Nittambuwa.

12. Mr. A.D. Warnasiri.
Bataleeya.
Mirigama.

13. Mr. S.P. Esuramuni
Uduwara (Western)
Millaniya.

14. Ms. A.A.Kalyani Sriyalatha
Lihiniyawa (West)
Walallawita.

15. Mr. J.K. Indralal
815-C
Madurawala.

16. Mr. K.D. Sisira Kumara
Serupita (Western)
Dodamgoda.

17. Ms. B. Roshini Weerasinghe.
Bolossagama.
Dodamgoda.

18. Mr. L.W.G.A.S. Gamage
Nahinna.
Dodamgoda.

19. Mr. P.D. J. Pushpakumara.
Gatawara (South)
Millaniya.

20. Mr. H.A. Shantha Kumara.
843-C-(North)
Walallawita.

21. Mr. K.D. Sisira Kumara.
Serupita (Western)
Dodamgoda.

22. Mr. Amith Chandana.
Hukpotha.
Palindanuwara.

23. Ms. U.A.D. M. Athukora.
Kapugedara.
Palindanuwara.

24. Ms. T.M. Damayanthai.
Palada (Western)
Palindanuwara.

25. Ms. R.M.S. Sepali Ranasinghe.
Yakupitiya.
Palindanuwara.

26. Ms. K.M. Reeta Rathnayake
Alagallawatta.
Yatinuwara.

27. Ms. C.G. Anusha Namalgoda.
Bogahakanda.
Harispattuwa.

28. Mr. E.W.S. Jayathilaka.
Yatawawala.
Harispattuwa.

29. Ms. W.G. Swarnalatha.
Dodamwala.
Gangawatakorale.

30. Mr. R.D. Dharmasiri.
Patlebokalawela.
Harispattuwa.

31. Mr. G.G. Manilaratne.
Kadanhena.
Thumpane.

32. Mr. Susantha Premathilaka.
Watagoda.
Pujapitiya.

33. Ms. D.G.A. Namalgoda.
Boghakanda.
Harispaththuwa.

34. Ms. Sunethra Padmawathi.
Areyawa.
Rambukkana.

35. Mr. Nihal de Silva.
Warallapana.
Rambukkana.

36. Ms. P.M. Malani.
Thabadiya.
Warakapola.

37. Mr. Asanka M. Dasanayake.
Neduwaththana.
Bulathkohupitiya.

38. Mr. M.G.C. Mallangoda.
Mahawatta.
Mawanella.

39. Mr. N.R. Gunathilaka.
Lassanakanda.
Kuruwita.

40. Mr. U.L. L. Wasantha Kumara.
Eknaligama.
Kuruwita.

41. Mr. D.M. Sripal Wasantha.
Pahala Kuruwita.
Kuruwita.

42. Mr. W. Nelson Ranaraja.
Guruluwana.
Ratnapura.

43. Mr. Ariyapala Pathirage.
Kotagoda.
Baddegama.

44. Ms. K. Shanthi.
Batapola.
Ambalangoda.

45. Mr. C. Liyanage.
Werapana (South).
Tawalama.

46. Mr. U.G. Kithsiri.
Uduwalagala.
Yakkalamulla.

Annex 6: Minutes of the meeting held on 07-12-2000 at the HARTI to discuss the "Status Report on Mangosteen"

Present :

Name	Designation	Institute
Dr. G.A.C. de Silva	Director	Perennial Crop Dev. Project (PECRODEP)
Dr. C. Kudagamage	Director	HORDI
Dr. S.G. Samarasinghe	Director	HARTI
Dr. G.A. Dayatilake	Senior Lecturer	University of Ruhuna
Dr. Mrs. Shanthi Wilson	Director	Post Harvest Unit, Industrial Tech. Institute
Dr. Mrs. M. Dassanayake	R.O.	PVIC - Homagama
Miss. M.K. Thantirige	R.O.	HRU- Horana
Mr. A.L.V. Fernando	DD,	Kalutara Agric. Dev. Authority
Mr. H.A. Atapattu	Director	
Mr. Anton Wimalaratne	DD	Provincial Agric. Office Central Province
Mr. Prasanna Pallemulla	DD	
Mr. M.B. Dissanayake	DD, Kegalle	Provincial Agric. Office Sabaragamuwa

Mr. D.R. Indrajit	AD, Agri.	Provincial Agric. Office, Southern Province
Mr. Upasena Werakoon	AD, Agri.	Provincial Agric. Office, Western Province
Mr. U. Mendis	AD, Agri.	Provincial Agric. Office, Western Province
Mrs. I. Medagoda	RO	HORDI
Mr. L.P. Rupasena	Marketing Economist	HARTI

The decisions taken at the meeting are given below:

	Activity	Location/Area	Responsibility
1.	Adaptive research to evaluate fertilizer response on productivity of existing mangosteen trees in selected locations.	Agric. Dept. farms Eg. Horana, Labuduwa DTC Homagama	Director -HORDI
2.	Pilot project to demonstrate fertilizer application and use of other crop management practices to improve the yield & quality of the fruit	Private/individual lands in selected provinces	Provincial Director of Agri. Growers, Exporters & EDB
3.	Research to identify measures to minimize	Selected mangosteen growers in the	HORDI Provincial

	the latex exudate and gamboge distorder	provinces	Director of Agric.
4.	Pre and post harvest handling to extend shelf life of the fruit	Selected fields in provinces	Growers ITI (CISIR) HORDI Provincial D. of Agric. EDB
5.	Identification of possible intercropping patterns, suitable areas for off season cultivation of mangosteen	Areas/Provinces to be identified	Provincial Director of Agri. HORDI ADA

The Director "PERCRODEP" Dr. G.A.C. de Silva outlined the schemes available for investors and indicated that funds could be made available for collaborative research to develop suitable planting material with a view to shortening the gestation period. He also stated that funds are available for other research programmes provided that they are done in collaboration with the private sector.

He also informed that it would be difficult for a funding agency to provide funds for Crops that have a long gestation period specially for mangosteen which requires about 8-10 years. It was therefore decided that the Director "PECRODEP" in consultation with the DOA draw up a suitable package for funding the cultivation of the crop. In doing so it would be useful to recommend suitable intercrops in early stages to generate an income.

M.Z.M. Farhad
Asst. Director/Export Agriculture Division
Sri Lanka Export Development Board
08-12-2000