

The Sri Lanka Rubber Supply Chain: Information deficits and knowledge gaps of smallholders

Nilusha Kapugama | Research Manager, LIRNEasia | nilusha[at]lirneasia[dot]net

Sriganesh Lokanathan | Senior Research Manager, LIRNEasia | sriganesh[at]lirneasia[dot]net

Ranjula Senaratna Perera | Junior Researcher, LIRNEasia | ranjula[at]lirneasia[dot]net

Iran Fernando | Junior Researcher, LIRNEasia | iransf[at]gmail[dot]com

2011



LIRNEasia is a regional information and communication technology (ICT) policy and regulation research and capacity-building organization active across the Asia Pacific. Its mission is *to improve the lives of the people of the emerging Asia-Pacific by facilitating their use of ICTs and related infrastructures; by catalyzing the reform of laws, policies and regulations to enable those uses through the conduct of policy-relevant research, training and advocacy with emphasis on building in-situ expertise*. For further information see www.lirneasia.net | Contact: 12 Balcombe Place, Colombo 00800, Sri Lanka. +94 11 267 1160. info[at]LIRNEasia[dot]net



Canada



This work was carried out with the aid of a grant from the International Development Research Centre (IDRC), Canada and the Department for International Development (DFID), UK.

Contents

1. Preamble.....	4
2. Introduction.....	5
2.1. Sri Lanka in the world rubber market	5
2.2. Growing rubber	6
2.2.1. Subsidy Schemes	8
2.3. Government institutions dedicated to the rubber sector	10
2.3.1. Rubber Research Institute (RRI).....	10
2.3.2. Rubber Development Department (RDD).....	11
2.3.3. The Thurusaviya Fund	11
3. The market for Rubber	12
3.1. Price trends in natural rubber.....	12
3.2. Forms of natural rubber.....	13
3.3. Price determination in local market	14
3.4. Mapping the value chain.....	16
3.4.1. Producers	16
3.4.2. Traders	17
3.4.3. Manufactures.....	18
3.4.4. Exporters	18
4. Information flows in the value chain.....	19
4.1. Know-how information	20
4.2. Input Information.....	21
4.3. Price Information	21
5. Identified Issues.....	23
5.1. Reduced productivity of the cultivations.....	23
5.2. Fair price for the smallholders	25
5.3. Obtaining required information.....	27
5.4. Availability of price information	27
6. Conclusion	28
Annex 1	30
Annex 2	33

Figures

Figure 1: World rubber production in USD, 2009	5
Figure 2: Tapping the rubber tree and collecting latex.....	6
Figure 3: Rubber cultivation in Sri Lanka by district	7
Figure 4: Average price of natural rubber per kg.....	12
Figure 5: Latex being processed into RSS Figure 6: RSS being air dried.....	14
Figure 7: Average RSS1 price at Colombo Auction	15
Figure 8: Core processes and the actors of the value chain	16
Figure 9: The product flow in the rubber value chain	19
Figure 10: Information flow of the rubber value chain	20
Figure 11: Use of rain guards in Kerala Figure 12: Use of rainguards in Sri Lanka	24
Figure 13: Use of an electronic scale to weigh RSS.....	25

1. Preamble

The focus of the research is to *seek an information strategy to help create a reliable internal source of high-quality natural rubber for the growing rubber-based manufacturing industries in Sri Lanka.*

A value chain analysis method is used as the primary method of investigation and the approach is two-fold;

- Desk Research
- Interviews and Focus Group Discussions (FGD)

In the first phase, desk research involved examining the existing literature in value chain analysis. A considerable amount of rubber industry value chain analysis has been conducted by development agencies; GTZ (Altenburg, 2006), DFID (M4P, 2008) and IDRC (Kaplinsky & Morris, 2001). Therefore the desk research looked at predominantly at the grey literature consisting of reports and publications by development agencies. In addition to the grey literature, the authors also looked at theoretical frameworks such as the national diamond of competitiveness (Michael E. Porter: 1990).

The initial desk research led to the following methodology:

- i. Mapping the core processes in the value chain
- ii. Identification of actors
- iii. Identification of related and supporting services that feed into the value chain
- iv. Mapping the relationships and linkages
- v. Mapping the flow of tangible products and services
- vi. Mapping the changes in the value and form of the products
- vii. Mapping the information and knowledge flows
- viii. Mapping the number of actors and tasks
- ix. Identification of the transaction costs and ways to reduce them

24 in depth interviews and 14 mini FGD discussions were conducted in the second phase of the project. The in-depth interviews involved industry experts from; government agencies dedicated to rubber industry development, regional plantation companies, rubber product manufacturers and exporters, rubber traders and industry associations. The mini FGD discussions involved 102 rubber smallholders. As per the data available from the Rubber Development Department (RDD) this accounted for about 0.1% of the rubber smallholders in Sri Lanka.

The report will begin with a brief overview of the rubber sector in Sri Lanka. This will be followed by an examination of the value chain and identification of a number of its problems. From its inception, the study intended to understand the gaps in the information and knowledge flows of the value chain. The report will conclude by looking at possible solutions for bridging several of the knowledge and information gaps identified.

As mentioned above, the study objective was to *seek to help create a reliable internal source of high-quality natural rubber for the growing rubber-based manufacturing industries in Sri Lanka.* While the study did examine the value chain, the inquiry is limited in its scope and looks predominantly at the producers of raw rubber with a particular emphasis on the smallholders.

The study does not examine the value chain components that involve rubber products manufacturing and rubber wood based industries.

2. Introduction

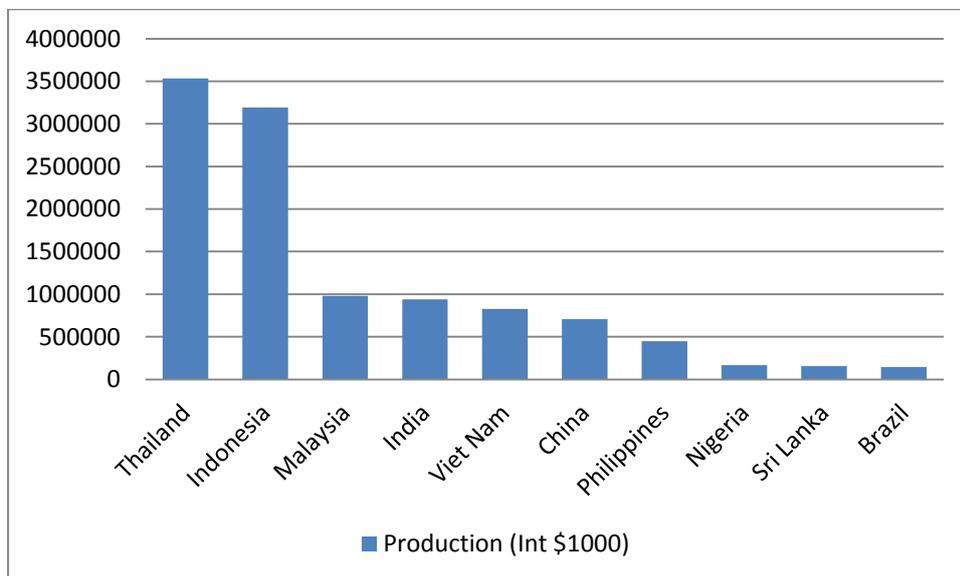
2.1. Sri Lanka in the world rubber market

The global demand for rubber is predominantly driven by the demand for tires. However, the medical supplies industry and household supplies also play a significant role. Both natural rubber (NR) and synthetic rubber (SR) types satisfy the global demand for rubber raw materials although by volume synthetics have an edge over natural rubber. Sri Lanka produces only natural rubber and currently (2010) it occupies 10th position as a producer supplying around 1.5% of global production.

As per data from the Food and Agriculture Organization (FAO), currently the world leaders in natural rubber production are Thailand, Indonesia and Malaysia respectively. In 2010, Sri Lanka has produced around 149,000 metric tons while the world total production is estimated around 9.5 million metric tons. Annual growth of NR production varies around 5-6%.

China, India and Malaysia accounted for nearly 47 per cent of the world's natural rubber consumption in 2009 whereas Sri Lanka consumed around 0.9% of world NR production that include certain volumes of imported NR. Consumption of rubber in the country is expected to grow over 8 per cent per year which may widen the gap between local supply and industry demand.

Figure 1: World rubber production in USD, 2009



Source: FAO, 2011, retrieved on 26 August 2011, <http://faostat.fao.org/site/342/default.aspx>

Rubber was first introduced to Sri Lanka in 1876 by the then colonial rulers, the British. It is one of the country's major exports even today. As of 2010 August, rubber was placed third in the composition of exports, behind textiles and garments and tea (CBSL, 2010). In a country where the

contribution of GDP from the agriculture sector is 11.9%, the rubber sectors contribution is 0.3% (CBSL, 2010).

However, 0.3% does not include the contribution made through the manufacturing sector by processing rubber. Of the rubber produced in Sri Lanka, over 65% is subjected to value addition. Furthermore, rubber based products industry, is Sri Lanka's second largest export oriented factory industry. Therefore the overall contribution to GDP is higher than 0.3%.

As per the figures provided by the Export Development Board of Sri Lanka (2011), the export performance of rubber grew by 72% in comparison to the previous year which showed a drop of 21%¹.

2.2. Growing rubber

Natural rubber is produced from the extract of rubber tree (*Hevea brasiliensis*). The extract is referred to as latex. The method used to extract the latex from the rubber tree is referred to as 'tapping'.

Figure 2: Tapping the rubber tree and collecting latex

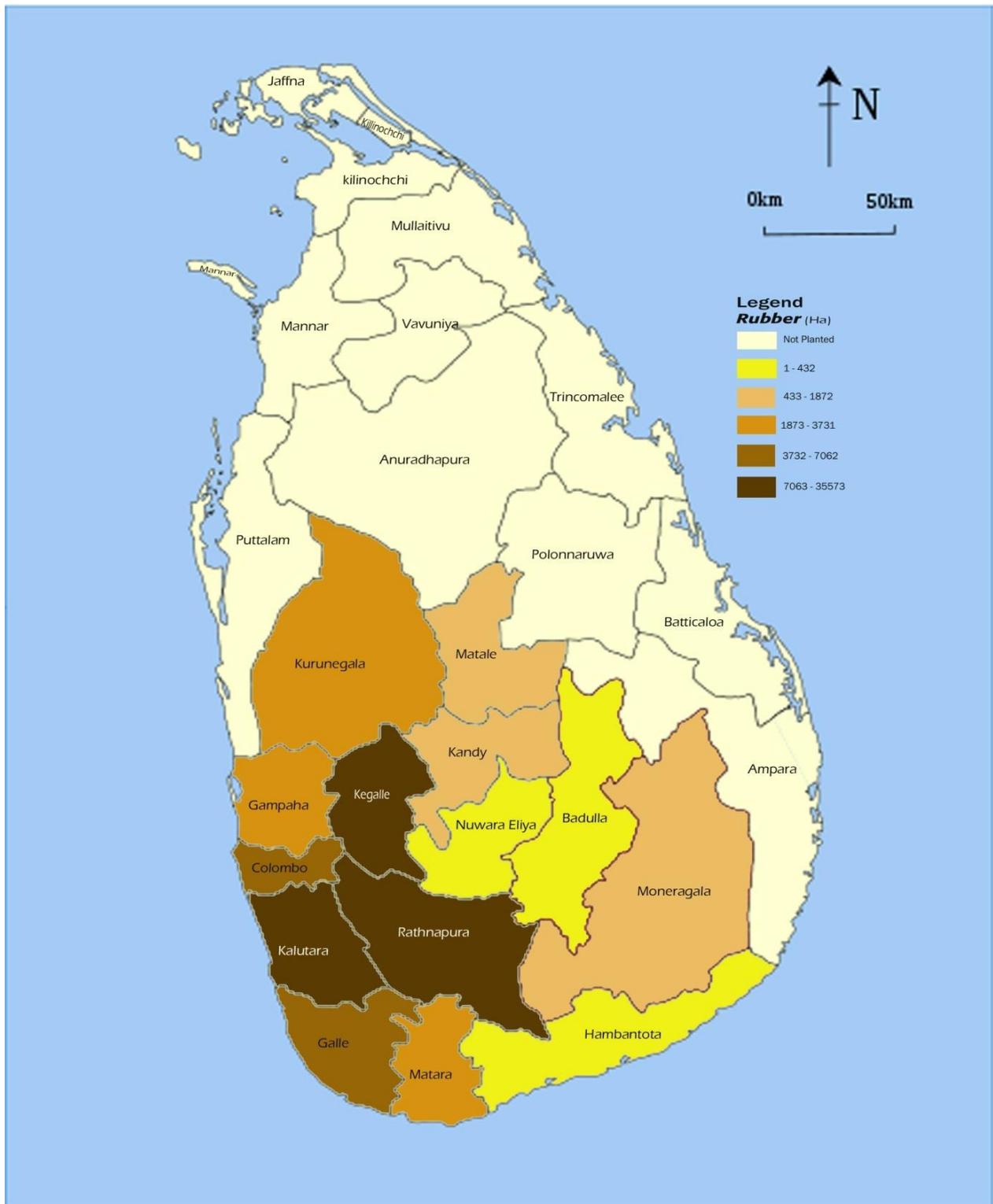


Source: Authors

According to the data available from the Ministry of Plantation Industries, Sri Lanka, as of 2008, rubber is grown in 13 of the 25 districts in Sri Lanka. Of these Kalutara, Kegalle and Ratnapura districts have the highest density as illustrated in figure 3. The three districts combined make up approximately 70% of total rubber produced in Sri Lanka (Ministry of Plantation Industries, 2009).

¹http://www.srilankabusiness.com/eresearch/pdf_files/Disaggregated%20export%20performance%202008,%202009%20&%202010.pdf

Figure 3: Rubber cultivation in Sri Lanka by district



Source: Rubber Development Department, Ministry of Plantation Industries

In addition to the areas shown in figure 4, rubber cultivation has also begun in Ampara and Batticaloa districts in the last few years, on trial basis. Recently, experiments have begun by RRI and RDD to assess the suitability of Kilinochchi district for growing rubber. The only large scale ongoing rubber planting project is the SPEnDP project that has been launched in the district of Moneragala

since 2007 with a target of cultivating 5,000 ha of integrated smallholdings using loan funds provided by the International Fund for Agricultural Development (IFAD), a specialized UN agency. This project is administered by the Ministry of Plantation Industries.

2.2.1. Subsidy Schemes

Necessity for subsidies or incentives arises from the fact that a rubber farm has a long gestation period owing to near 7 years immature period of a rubber tree. During this time it is not possible to extract latex in commercial volumes. Most rubber growers are smallholders who are unable to make such long-term investments on a commodity that has given mixed signals in term of profitability. The governments in most rubber producing countries therefore provide subsidies and technical assistance to rubber farmers as an incentive.

Rubber growers receive a planting subsidy of LKR 125,000 per hectare from the Rubber Development Department (RDD) of Sri Lanka. The subsidy is disbursed over a period of six years; starting from the time the land is cleared to plant the trees up until the time the tree is mature enough for the first tapping to be done. A rubber tree on average takes six to seven years to mature during which the growers receive no income from the trees. Therefore the subsidy is designed to encourage potential growers by ensuring that they do not suffer any financial burden until they begin to earn from their cultivation. To augment smallholder incomes, growing of intercrops such as vegetables, banana and fruits such as pineapple is also encouraged during the immature period.

According to the Rubber Development Department (As per the information available in the website), the subsidy includes funds for land preparation and planting material. The initial subsidy is provided in eight tranches and is given as reimbursements. The table below summarizes the disbursement process.

Table 2: Rubber subsidy disbursement plan

Installment	LKR. per hectare	Requirements to be fulfilled to receive the subsidy
1 st	6177.50	uprooting the old plantation and cleaning land
2 nd	30887.50	planting, preparation of soil conservation measures, establishment of cover crops and fencing
3 rd	10625.00	One year after planting, well maintained cover crops should be established with a minimum of 200 plants per Acre
4 th	14826.00	Two years after planting, girth of the plant should be 4 inches at four feet from the ground level with a minimum of 200 plants per Acre
5 th	14826.00	Three years after planting ,girth of the plant should be <ul style="list-style-type: none"> • 6 1/4 inches in areas where the annual rain fall is greater than 1000 inches • 5 1/4 inches in areas where the annual rain fall is lesser than 1000 inches at 4 feet from the ground level, a minimum of 190 plants per Acre

6 th	14826.00	Four years after planting, girth of the tree should be <ul style="list-style-type: none"> • 10 inches in areas where the annual rain fall is greater than 1000 inches • 9 inches in areas where the annual rain fall is lesser than 1000 inches four feet from the ground level with a minimum of 190 plants per Acre
7 th	15567.00	Five years after planting ,girth of the tree should be <ul style="list-style-type: none"> • 12 1/2 inches in areas where the annual rain fall is greater than 1000 inches • 11 inches in areas where the annual rain fall is lesser than 1000 inches at four feet from the ground level with a minimum of 190 plants per Acre
8 th	17264.40	6 years after planting ,there should be 180 trees attained the girth of 20 inches at 4 feet from the ground level

Source: Rubber Development Department, 2011, retrieved on 06 June 2011, http://www.rubberdev.gov.lk/web/index.php?option=com_content&view=article&id=86&Itemid=112&lang=en

The smallholders often stated that second and eighth were the most difficult to obtain. The second installment contains additional requirements such as adhering to best practices in the planting stage. These include the specified length, breadth and depth of the planting holes or the trenches that need to be put in place to ensure soil conservation. Any deviation from the specification may mean that the subsidy is not approved.

In addition to the reimbursements, the growers also receive planting material and fertilizer. The growers are given a choice of obtaining the planting material either from the government nurseries or from the government approved private nurseries. If the plants are obtained from the government nurseries, then the nurseries are paid directly by the rubber development department. If the plants are obtained from the private nurseries, then the growers will pay the nurseries upon delivery of the plants and receive a reimbursement from the RDD.

Fertilizer is provided for the immature plants in-kind.

In addition, a 30% fertiliser subsidy is given to mature trees to encourage increased fertilizer use by the growers. Furthermore, a separate subsidy scheme has been put in place in 2011 to provide rain guards to growers.

According to the available data, as shown in table 2, there has been an increase in the total land area of rubber cultivation. As of 2010, the total area of rubber cultivation is 124,000 Ha.

Table 3: Total area of rubber cultivation

	2005	2006	2007	2008	2009	2010
Total extent under rubber (Ha)	116,050	119,500	119,500	119,543	122,087	124,000

Extent under tapping (Ha)	91,233	96,760	96,760	94,317	93,549	96,720
Extent of Immature trees (Ha)	24,817	22,740	22,740	25,226	28,538	27,280

Source: Rubber development Department, www.rubberdev.gov.lk , retrieved on 26 April 2011

In comparison to tea and coconut, which also receives subsidies, the rubber sector appears to be more successful in increasing its area under cultivation. The data obtained from the annual reports of the Central Bank of Sri Lanka shows that in of the three sectors, rubber was the only sector successful in acquiring new land for cultivation. This may have been due to the increased rubber cultivation in the Moneragala district through the IFAD funded SPEnDP rubber project.

Table 4: Comparison on Tea, Coconut and Rubber sector cultivation areas

	Tea			Coconut			Rubber		
	2009	2010	% change	2009	2010	% change	2009	2010	% change
Replanting (Ha)	1126	1274	13%	3545	2684	-24%	1002	1493	49%
New planting (Ha)	12	3	-75%	3998	2920	-26%	715	1537	115%

Source: Central Bank of Sri Lanka, Annual report, 2010

2.3. Government institutions dedicated to the rubber sector

The rubber growing sector in Sri Lanka has three dedicated government agencies:

- Rubber Research Institute (RRI)
- Rubber Development Department (RDD)
- Thuru-saviya (village level rubber grower associations)

2.3.1. Rubber Research Institute (RRI)

The RRI was established in 1909. As the title indicates, the RRI is the apex agency for conducting research and development (R&D) in natural rubber. It has a “statutory responsibility for research and development on all aspects of rubber cultivation and processing for the benefit of the rubber industry”².

However, the in-depth interviews done during the course of the study showed that the main beneficiaries of R&D done by the RRI are the rubber growers. With regard to the manufacturing sector its input is said to be limited with the provision of knowledge to small enterprises on making simple products such as balloons and rubber bushes and such. The Industrial Development Board (IDB) operates a services centre for SME rubber products manufacturers, that provides variety of services including supplying rubber compounds and chemicals. R&D pertaining to the manufacturing sector is usually undertaken by the manufactures.

² http://www.rrisl.lk/sub_pags/aboutus_home.html

2.3.2. Rubber Development Department (RDD)

The RDD was created in 1994. Its predecessor was the Rubber Control Department, which was established in 1934, was mandated with enacting the legislative provisions of the rubber control act. The predominant functions of the RDD include:

- Implementation of the powers vested under principal statutes and legal sources.
- Registration of rubber lands and their owners through the Regional offices, issuance of licences, and the provision of planting material, fertilizer and subsidies.
- Administration of the system of subsidies for new planting and re-planting, and the distribution of subsidies through the district offices

The RDD is under the direct purview of the Ministry of Plantation Industries, Sri Lanka.

2.3.3. The Thurusaviya Fund

Established in 2000, the Thurusaviya Fund works towards improving the living standards of Rubber Small Holders. They aim to do so by facilitating the production of quality rubber sheets and ensuring fair price for their products. In order to do so, the Thurusaviya fund sets up Thurusaviya societies at GS division levels in the rubber growing districts. It is the task of the Thurusaviya Fund to register and regulate Rubber smallholdings development societies (Thurusaviya Societies) and to provide assistance to the members. On average each Thurusaviya branch has a membership of about 30 rubber smallholders.

Its objectives include³:

- inculcating and promoting the savings habit and uplift the economic and social status of rubber smallholders.
- promoting necessary investment related to the rubber industry.
- acquiring, developing or establishing rubber processing units, rubber factories and other facilities required for the manufacture of the latex based products of smallholders.
- promoting and developing marketing strategies for the production for the small holder productions.

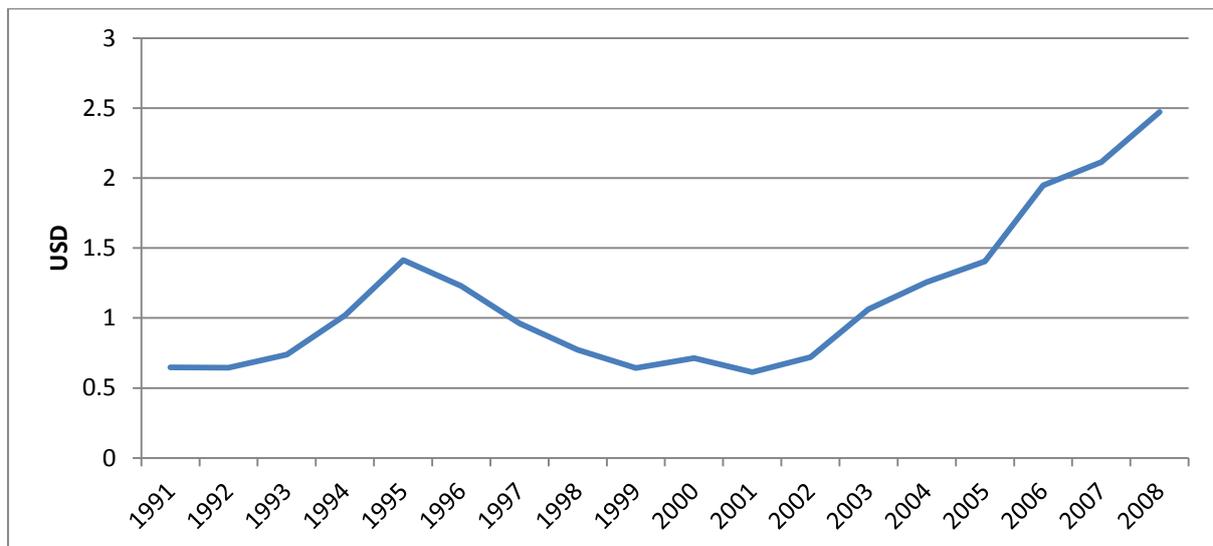
³ http://www.plantationindustries.gov.lk/dwnlds/english/8%20-%20Thurusaviya_en.pdf

3. The market for Rubber

3.1. Price trends in natural rubber

Rubber being a commodity is often subject to price volatilities. As figure 4 shows, the price of natural rubber declined since 1996 and reached rock bottom in 2001 but has been on a steady increase since then. Although not shown in the figure 4, the prices of natural rubber continued to increase through 2009 and 2010. Prices during the first half of 2011 averaged around US\$ 5000 per metric ton.

Figure 4: Average price of natural rubber per kg



Source: FAO, 2011

The increase in the prices have been attributed to increased demand due to global economic recovery in the international markets, short falls in supply from producers such as Thailand due to adverse weather and increased price of petroleum (CBSL, 2010).

The tire industry makes up a large proportion of the global demand for natural rubber. The economic recovery and the subsequent improved performance of the automobile industry have led to an increase in the demand for natural rubber. As mentioned early on the report, natural rubber is extracted from the rubber tree. The extraction process cannot be done if adverse weather conditions such as heavy rains prevail. Therefore adverse weather conditions often lead to shortages in supply.

Natural rubber and synthetic rubber are used in the production of tyres for the automotive industry and their prices tend to impact and move in tandem with each other. Synthetic rubber (a by-product of petroleum) and natural rubber sometimes act as substitutes for each other. However, switching costs are very high in many applications and many R&D programs initiated by large consumers such as Dunlop to substitute natural rubber have not produced intended results as yet. An increase in the price of petroleum causes higher synthetic rubber prices causing increased demand for natural

rubber and higher natural rubber prices increases the demand for certain grades of synthetic rubber such as SBR and therefore tend to push synthetic rubber prices further upwards.

3.2. Forms of natural rubber

Natural rubber is sold in multiple forms and they can be broadly categorized into the following types.

- Ribbed Smoked Sheets (RSS)
- Crepe Rubber
- Technically Specified Rubber (TSR) or Block Rubber
- Speciality rubbers (DPNR, SP)
- Centrifuged latex

Of the above, the RSS and crepe rubber are further broken down into separate grades.

According to the Ministry of Plantation Industries, of the natural rubber produced in Sri Lanka in 2008:

- 43% sold as RSS, grades 1-5
- 28% sold as latex or centrifuged latex
- 23% sold as various forms of crepe

Table 3: Grades of Natural Rubber

Grade
LC ⁴ No.1X
LC No.1
LC No.2
LC No.3
LC No.4
SC ⁵ (Br) No.1
SC (Br) No.2
SC (Br) No.3
SC (Br) No.4
Flat Bark
Skim Crepe
RS Sheet No.1
RS Sheet No.2
RS Sheet No.3
RS Sheet No.4
RS Sheet No.5

Source: Rubber Development Board, <http://www.rubberdev.gov.lk/web/index.php?lang=en>, retrieved on 15 April 2011

⁴ LC: Latex Crepe

⁵ SC: Scrap Crepe

Field Latex

Chemicals are added to the latex extracted from the rubber tree to prevent coagulation and then sold in liquid form for further processing.

Crepe rubber

Crepe rubber is defined as a type of crude natural rubber in the form of colorless or pale yellow crinkled sheets, prepared by pressing bleached coagulated latex through corrugated rollers. It is often used to produce shoe soles, clear adhesives and medical supplies.

Centrifuged latex

Centrifuged latex is produced by using specialized centrifuge machines. The purpose of centrifuging is to increase the concentration of dry rubber in latex to a standard 60% from around 25-30%. The centrifuged latex is then sold to manufactures for use in the production of gloves, foam mattresses, condoms and medical equipment, among others.

RSS

Ribbed Smoked Sheets or RSS is produced by processing the latex using chemicals and rollers. After the initial processing, the sheets are dried in a smoked room. The rollers are less expensive than the machinery used to make crepe rubber, therefore smallholders are able to make RSS and sell it to manufactures or traders. RSS is a general purpose rubber and predominantly used in tire manufacturing.

Figure 5: Latex being processed into RSS



Figure 6: RSS being air dried



Source: Authors

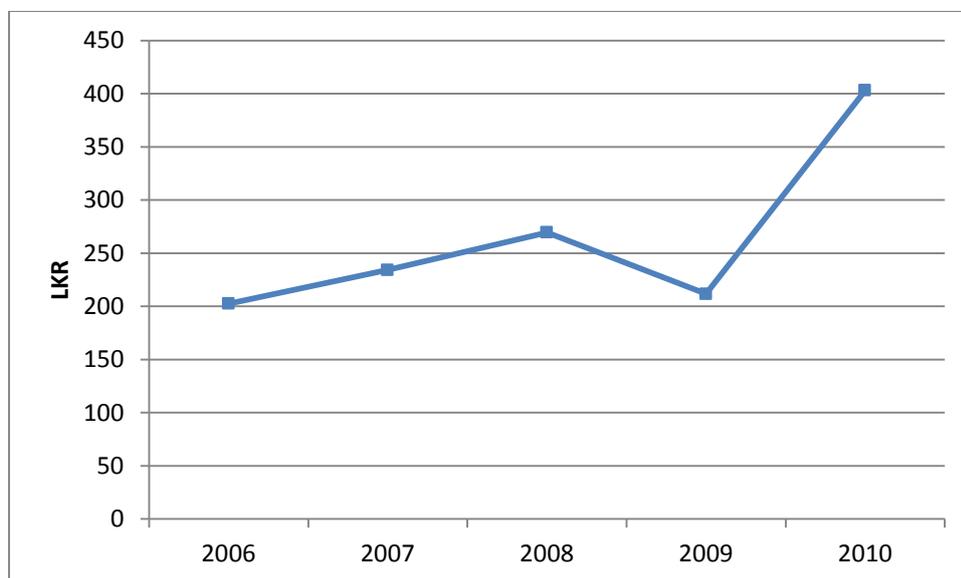
3.3. Price determination in local market

A rubber auction is held twice a week in Colombo, by the Colombo Rubber Traders Association (CRTA) at the Ceylon Chamber of Commerce premises. Latex Crepe rubber is the main type of rubber sold at Colombo auctions. The Colombo Auction price is partly influenced by the Singapore

Commodities Exchange (SICOM) prices. The auction attracts brokers purchasing for foreign buyers as well as local manufacturers. However, the auction does not attract all the rubber produced in the island⁶. Manufacturers source the natural rubber from the producers either directly or through intermediaries. Rubber sold away from the auction will be given a price that is often adjusted to reflect the cost of transportation and other logistics.

As per the data given by the FAO (Figure 4) the global rubber prices have seen an overall increase. Domestically, the rubber prices have seen an increase between 2006-2008 and again a sharp increase from 2009 onwards. This can be seen in figure 7, where the inference above the local price is made through the prices of RSS1.

Figure 7: Average RSS1 price at Colombo Auction



Source: CBSL, 2007, 2008, 2009 and 2010

This trend continued into 2011 and as of June 2011, the price RSS 1 stands at LKR 550 (RDD, 2011). The increased prices have renewed the interest in the rubber sector and have led to re-planting and new plantations as shown previously in table 4. Prior to the rise in the price levels, the growers were becoming disheartened with the price slump. This led to some leaving rubber cultivation.

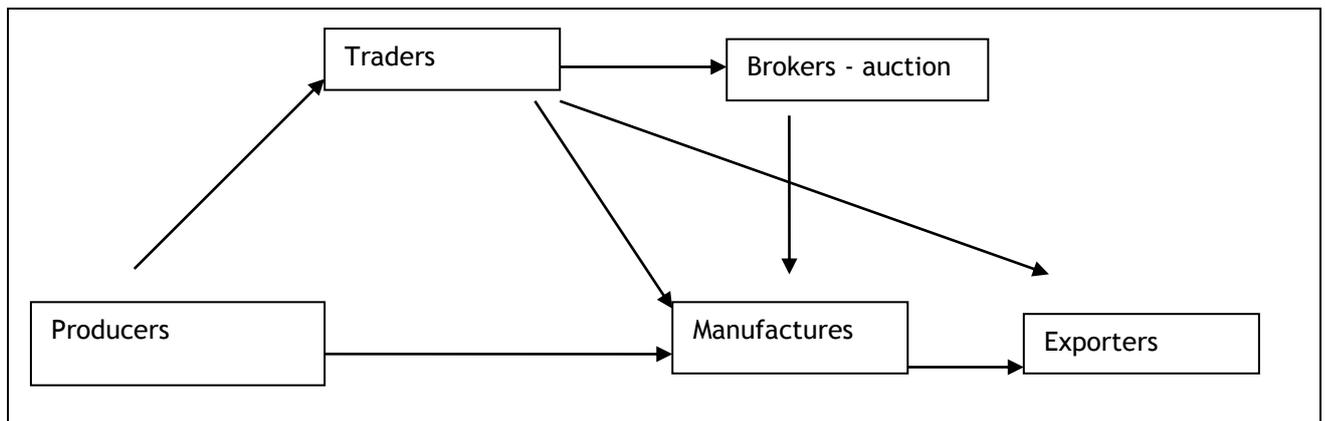
Of the natural rubber produced in Sri Lanka, approximately 65% is bought by local manufactures and subjected to value addition while the remaining 35% is exported either as RSS, crepe rubber or centrifuged latex (RDD, 2010). In order to encourage the value added exports of rubber, the export cess on raw rubber was also increased from LKR 4 per Kg to LKR 8 per Kg in 2010 (CBSL, 2010).

⁶ The authors attempted to identify the breakdown of the percentage of natural rubber funneled through the auction and those that by pass the auction. However, when inquired from the relevant authorities, the authors were informed that the data was unavailable.

3.4. Mapping the value chain

The figure below summarizes the core processes and the actors of the rubber supply chain in general.

Figure 8: Core processes and the actors of the value chain



Source: Authors

3.4.1. Producers

The natural rubber producers in Sri Lanka are divided into three main categories;

- Regional Plantation Companies (RPC)
- Medium sized estates – privately owned
- Smallholders

Small holders are classified as those having less than 50 acre land extent of rubber cultivation. According to figures published by the Rubber Development Department (RDD) of Sri Lanka 30% is produced by RPCs and the remaining 70% by smallholders.

The tapping of rubber trees has to be done by an individual trained in the task. They are referred to as rubber tappers. In the RPCs, the tapping is done entirely by hired labor while in the smallholdings the tapping is mostly done by family members and at other times by hired labor if the land extent is more than a couple of acres or if the owner of the cultivation is otherwise occupied.

Smallholders sell their produce in the form of RSS and latex while the RPCs sell either in the form of crepe or centrifuged latex.

The decision by smallholders on whether to sell RSS or latex is dependent upon the availability to buyers or latex collecting centres, the ability to make RSS, the ability to get a fair price for latex and the ability to store RSS safely.

Productivity

According to the figures published by the RDD, given in table 4, productivity of smallholders (1719 kg per hectare), exceeds that of the RPCs (980 kg per hectare).

Table 4: Average yield from rubber cultivations in Sri Lanka

	2005	2006	2007	2008	2009	2010
Ave. yield per Ha. (Kg)	1,144	1,128	1,128	1,246	1,382	1,437
a. Estates Yield per Ha. (Kg)					955	980
b. Small Holdings Yield per Ha. (Kg)					1,646	1,719

Source: Rubber Development Department, www.rubberdev.gov.lk

In comparison, India recorded an impressive 1903 kg/ha/yr average yield in 2008 and countries such as Thailand and Vietnam are closely catching up with yields over 1,700 kg/ha/yr.

In-depth interviews with experts revealed that on average, the productivity or the yield of the Sri Lankan rubber cultivations is said to be below its potential. A number of reasons have been cited;

- The aging cultivations and poor rate of replanting
- Limited or non-utilisation of fertilizer
- improper tapping techniques
- shortage of skilled tappers
- Theft
- Inability to tap due to rain
- Plant diseases

These will be discussed in further detail later in the report.

3.4.2. Traders

Traders in the rubber industry often form the link between the producers, the manufactures, the exporters and the auction.

Traders fall into two main categories. Small traders are those who operate at a local level in villages. They generally source their goods from the smallholders. The national level or larger traders will buy from other small traders or from RPCs. The larger traders also act as brokers if they possess a brokering license. The small traders will deal in RSS and latex while the larger or national level traders will also deal in crepe rubber in addition to RSS. There are registered traders who act as rubber exporters as well.

A license must be obtained in order to be able to engage in trading rubber and the licenses have to be renewed annually. The license has to be obtained from the RDD and the applicant should possess;

- an owned or leased permanent building
- a valid business permit issued by the local authority of the area
- a weighing machine with a capacity to weigh 50 Kg
- a company Registration certificate.

- a character certificate from the Grama Seva Niladarie

The traders provide logistical support such as transportation and storage or warehouse facilities. In some instances they may even provide financial assistance to smallholders. However, a common complaint among the smallholders is that traders often ‘cheat’ them out of a fair price either by manipulating the weight of the product sold or the quality. On the part of the traders, a similar complaints can be heard where the quality, especially in latex, is not up to the required standards due to adulteration.

3.4.3. Manufactures

Similar to the traders, manufactures too fall into two main categories;

Local market suppliers

Export market suppliers

According to the data available from the RDD, of the natural rubber sourced from plantations in Sri Lanka, approximately 65% is absorbed by the local manufacturing sector for value addition. Solid tires, gloves and mattresses are some of the main products produced by these manufactures. Of the world solid tire production, approximately 60% is met by the Loadstar, (<http://www.loadstar.lk/>), whose manufacturing plants are located in Sri Lanka.

Some of these manufactures obtain their raw materials straight from the producers. One such example is Loadstar, who operates their own collection centers in the rubber growing areas of the country. Another example of this is Hayleys (<http://www.dplgroup.com/>) who source approximately 30% of their latex requirement directly from the producers. Both Hayleys and Loadstar buy from smallholders and the procurement methods have been viewed as successful by the two companies and smallholders alike.

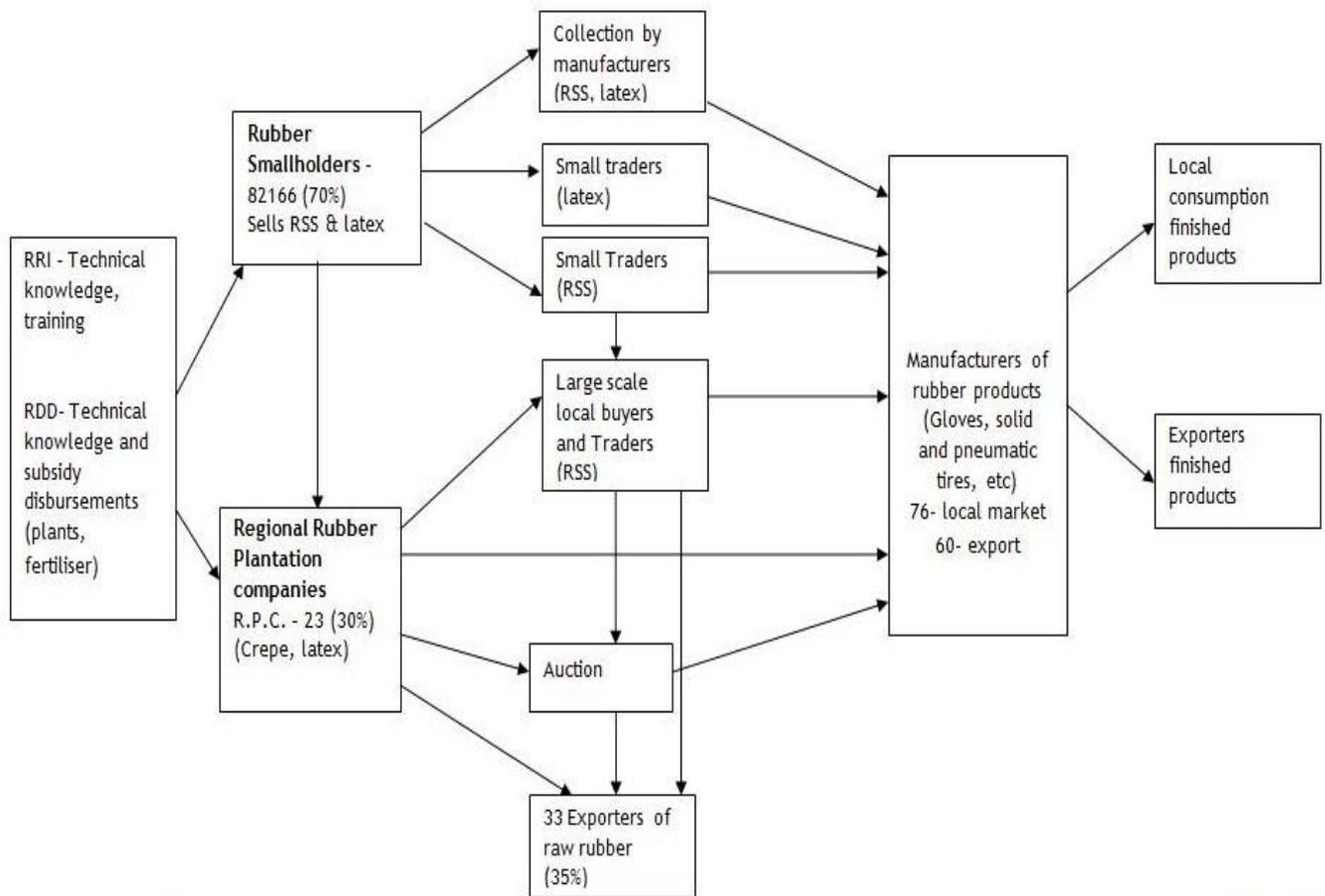
In addition to the domestic supply, manufactures often have to import natural rubber to meet the demand for the finished products as local supply is insufficient. However, imported natural rubber is subjected to an import tariff in case of non BOI manufacturers. In addition to natural rubber, the manufactures also import synthetic rubber and the imports are subject to duty. Synthetic rubber in some instances is seen as a substitute for natural rubber while in other instances it is required as an additional raw material for production.

3.4.4. Exporters

According to the data available at the RDD, 60 of a total of 136 rubber product manufactures in Sri Lanka also engage in exporting. In addition, another 33 are involved in exporting non-value added rubber in the form of RSS, crepe rubber or centrifuged latex.

Figure 8 provides a more detailed breakdown of the value chain actors. The diagram also gives an indication about the number of players at each state, where applicable and flow of products in the value chain.

Figure 9: The product flow in the rubber value chain

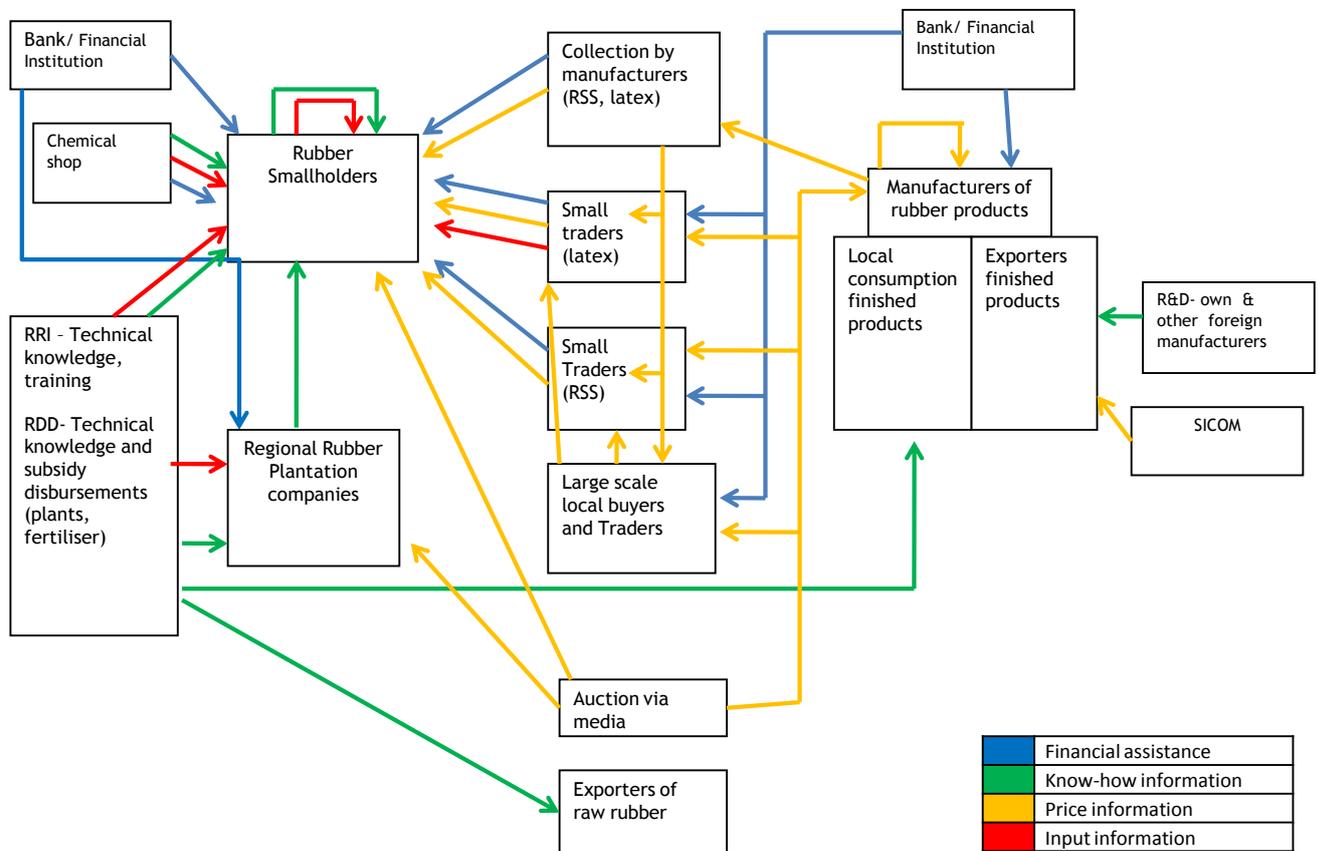


Source: Authors

4. Information flows in the value chain

The data gathered through in depth interviews and focus group discussions showed that the information flow is not as smooth as it should be. This is further discussed in the section below. The diagram below summarizes the information and services flows within a more simplified rubber value chain. Information, in this instance, refers to information on know-how, price and inputs.

Figure 10: Information flow of the rubber value chain



Source: Authors

4.1. Know-how information

Natural Rubber Producers

As mentioned before, RRI is responsible for conducting research pertaining to rubber cultivation and harvesting (or latex extraction). The RRI interact directly with the RPCs to disseminate the research findings and other information pertaining to cultivation of rubber through its workshops and training courses. These are often held at the RRI training centers. The same information is disseminated to the smallholders through extension services of RRI and RDD.

The RRI conducts its extension services for the smallholders through its regional extension officers (REOs). Extension services may take the form of training courses (conducted over a few days) or a visit to a cultivation. Training courses are organized often at grama seva division level.

The RDD utilizes the rubber development officers for its extension activities. However, a primary task of the rubber development officers is also the disbursement of subsidies to the smallholders. The rubber development officers are periodically trained by the RRI. Of the two, RDD has a bigger

cadre (136) in comparison to the RRI (XX). The RDD has vacancies for 53 more development officers as the approved cadre is 189. Therefore the existing number of extension officers on the ground may not be sufficient.

The smallholders often seek know-how from the RPCs as well. This is done by interacting with the workers of the plantation companies. In addition, information is often shared among the smallholders themselves about new methods and best practices.

Manufacturers

As mentioned before, RRI conducts very little R&D for the manufacturing sector. Most of its manufacturing know how is given to small or medium scale enterprises (SMEs) that produce balloons and rubber bushes and sold in the local market. As mentioned above the SMEs get most of their technology from the Industrial Development Board of Sri Lanka. A significant amount of R&D is done in-house by some of the local manufactures who compete in the international markets. As mentioned in the in-depth interviews, the manufactures also obtain know-how through copying prototypes and buying patents.

4.2. Input Information

Natural Rubber producers

The main inputs required for rubber cultivation are the rubber plants and fertilizer. As mentioned before, the growers receive subsidies for planting rubber and this includes the rubber plants and fertilizer for the first seven years of the cultivation. The plants can be obtained from government or government approved private nurseries and the information is often given by the rubber development officers of RDD. A variety of rubber clones exists. However, decision on what clone to be grown is often made by the rubber development officer of the RDD.

The rubber development officers also provide information on fertilizer and pesticides. In addition, smallholders can obtain information in this regard from fertilizer and pesticide suppliers.

In addition to planting material, the growers also require chemicals for processing the harvested latex. Smallholders, who produce RSS and latex, can obtain the information through the extension services or from chemical suppliers. Traders who buy latex from smallholders often in-turn provide them with the chemicals along with the information on usage.

4.3. Price Information

As mentioned earlier, rubber is sold in multiple forms and the determination of its prices depends upon a multitude of factors. The information on prices is often passed down the value chain.

Natural Rubber producers

The auction prices are made available through the media. However, prices received by smallholders in the rubber growing areas at farm-gate or delivered to trader are adjusted for transportation and other logistical costs. Therefore the local price information is obtained from the traders in the area as well. In addition, smallholders share price information among themselves. Smallholders also obtain the local price information from manufacturers such as Loadstar who have collection centers

in rubber growing areas. Loadstar has been often credited by smallholders for displaying the purchasing price clearly.

Manufactures

Manufacturers source directly from smallholders, buy directly from traders or through the auction. If they buy from the smallholders, then the price they offer will be based on the Colombo auction prices, rubber prices in the international markets as well as their prevailing stock inventories.

5. Identified Issues

In depth interviews and focus group discussions with producers, manufactures, traders and industry experts have revealed some inherent problems within the industry. All of which will not be highlighted in this report. Instead, the report will analyze a few of the problems faced by the industry that are related to the smallholders. As mentioned at the beginning the report looks at the information and knowledge gaps in the value chain. A list of the interview and discussion participants has been attached in annex 1.

Asymmetric information between the actors of the value chain leads to inefficiencies. Some of the forms of asymmetric information which have been identified are discussed in the following sections.

5.1. Reduced productivity of the cultivations

According to the information available from RRI, an average yield of approximately 2500 Kg/Ha can be obtained from Sri Lankan rubber cultivations by following RRI recommended agronomic practices. Variations in this number may occur due to differences in the clones used among other reasons. However, as mentioned previously, the productivity of rubber trees in Sri Lanka remains below par. As far as the RPCs are concerned, the age of the trees and theft were cited as the main reasons for the lower productivity. In addition, the unwillingness to invest in the plantations was also cited as a reason for lower productivity.

In terms of the lower productivity of the smallholders, improper tapping techniques, not safeguarding the tree in an appropriate manner and failure to apply fertilizer are cited as main concerns in addition to theft.

The underlying reasons for these problems maybe explained through the shortage of skilled tappers and insufficient financial capability of the growers. However, another possible reason may be insufficient information and knowledge to smallholders about the benefits of; looking after their investment in an appropriate manner, of application fertilizer and knowledge of proper tapping techniques to preserve the longevity of the tree.

One way of incentivizing the smallholders to look after their investment may be by making them understand and appreciate the Net Present Value (NPV) of their investment. The 2009 calculation done by the RRI, the NPV for a hectare is given in table 5.

Table 5: Net Present Value of a rubber hectare

	Estate sector (RPC)	Smallholder sector
Sum of Present Value of Income (PVB)	Rs. 3209150	Rs. 2920347
Sum of Present Value of costs (PVC)	Rs.1346571	Rs. 1166461
Net Present Value (NPV) = (PVB-PVC)	Rs.1862579	Rs.1753886

Source: Rubber Research Institute, 2009

*The above value is excluding the sale of old rubber trees for timber.

The focus group discussions brought out that a fair number of smallholders are unaware of the 30% fertilizer subsidy that is available for mature plants. According to the information received from RRI, the application of fertilizer leads to an increase in the yield by 22%. Considering the fact that all mature cultivations are qualified for the subsidy scheme, the lack of knowledge or information about it appears to be an extension failure.

The rain too plays a crucial role in reducing the number of days of tapping rubber and thereby reducing productivity. The RRI state that by using rain guards, the productivity can be increased by 30%. However, a considerable percentage of smallholders believe that rain guards are harmful to their trees. This too appears to be a break in the information flow, or worse yet, the communication of wrong information.

Figure 11: Use of rain guards in Kerala



Source: www.wikipedia.org

Figure 12: Use of rain guards in Sri Lanka



Source: Authors

A grievance of the extension and development officers involved in the rubber sector is that the farmers are myopic and often engage in practices that are detrimental to the rubber cultivation. These include slaughter tapping or daily tapping and starting to tap before the tree has reached the appropriate age and girth. The focus group discussions showed that the smallholders are knowledgeable on when the harvesting should begin. Therefore the alleged myopic behavior maybe due to financial problems or the current high rubber prices as opposed to a lack of information. The short-comings of the extension workers were also highlighted in the focus groups.

Measures have been put in place, through the subsidy scheme to reduce the incidence of tapping before the appropriate time. However, the extension department of the RRI also spoke about need to engage the farmers on a routine basis, where the field officers were in constant touch with the farmers and continuous monitoring takes place. The RRI is of the opinion that this will help change some of the perceptions of the farmers.

The rubber development officers, in addition to being the vehicle for transferring knowledge, are also in charge of disbursing the subsidies. A complaint frequently voiced by smallholders was that they do not visit the rubber cultivations other than during the period of subsidy disbursement.

An ideal situation will be to change the management and knowledge management systems used by the development officer however, this may be easier recommended than done. Therefore, it might be necessary to find alternative means of getting information across to smallholders. A practical method maybe to use existing means such fertilizer suppliers to inform the smallholders. Most rubber growers engage in at least one other cultivation and therefore interact frequently with fertilizer suppliers. Posters and leaflets printed by the RRI may be displayed and distributed through these fertilizer suppliers. Having the RRI branding on the information will give it legitimacy.

Fertilizer suppliers are already working with the RRI in providing funds for training exercises conducted by the extension officers at RRI.

5.2. Fair price for the smallholders

Another commonly voiced issue has been the issues with regards to the weighing mechanisms by the traders when they purchase latex or RSS from smallholders.

Smallholders who sell RSS are often of the opinion that the traders ‘cheat’ them by altering the scale balance which is used to weigh the sheets. Often the weighing is done using a balance that can be manipulated. Smallholders claim that traders that use electronic scales give them a fair deal due to the accuracy of the weighing; Revenue = LKR offered per unit of measurement X weight measured)

Figure 13: Use of an electronic scale to weigh RSS



Source: Authors

Smallholders claimed that the fact that collecting centers such as Loadstar display the daily purchase prices clearly for all to see has led to other traders in the area offering them a price reflecting the current market price, subject to transport and other logistics.

In addition to the issues in the measurement, buyers often claim that they often not rewarded for the quality of RSS they produce. Accordingly, the traders often pay the price for RSS 5, even if the quality of the RSS sheet is better.

Similar claims of cheating are also made by those who sell field latex. The focus group participants brought about numerous methods of cheating. They state that the latex buyers add more water than required. The measurement is done by adding two cups of water to one cup of latex to prepare the latex sample before inserting the metrolac device. Cheating happens where the amount of latex taken is less than one cup and the amount of water added is two whole cups. In addition cheating could happen if the metrolac (a kind of calibrated hydrometer) reading is improperly taken. The above two activities are often done in the presence of the supplier so therefore the fact that the supplier is aware of the cheating mechanism however are unable to prevent it may have something to do with the inability to be unassertive. Another way cheating may occur is to the metrolac reading is applied to the chart (ready reckoner) that may be erroneous by design. Field latex is a natural product, lacks consistency and subject to seasonal variations and no ready reckoner can provide an accurate estimate of dry rubber percentage in field latex. Therefore, some readings can be superfluous and some under estimate the Dry Rubber Content (DRC) in the latex sample. The DRC plays a crucial part in determining the value of the latex being sold.

The focus group participants were often vociferous on this issue. In some instances they had proof that cheating has in fact taken place, however in other instances, they were simply speculating that they were being cheated as they had heard about it from others. Regardless of whether they were being cheated or not, a common perception among smallholders was that they had no bargaining power with the traders.

A possible way of increasing bargaining power for the smallholders will be the formation of cooperatives. This can be done through the existing rubber farmer society, "Thurusaviya". The recommendation is by no means new as it has already been implemented in the 'Warakapola' divisional secretary's division in the Kegalle district. The cooperative has a total of 38 members. The latex produced by the members is collected to one location and RSS made at this common location. The sale happens once a month and multiple buyers bid for the products. The system has proven to be of benefit to the buyers as well, as they are able to obtain a larger quantity, with reduced search costs. However, mechanism must be set in place to deal with some of the financial mismanagements that have occurred in the past.

The same can be implemented with those who sell latex.

A common complaint voiced by traders and manufacturers who buy latex was that quality of the latex is sometimes compromised by the producers through adulteration. The adulteration may occur due to smallholders not providing the proper information about the latex preserving techniques. Alternatively smallholders may add foreign substances to increase the density or the volume of the

latex. The price paid for latex is dependent upon the dry rubber content in the latex which is calculated by taking into account both the volume and density of latex. Smallholders often believe that they are being cheated by the traders in measuring the volume and density and adulteration may be a response to the perceived cheating. This situation may be minimized through the formation of cooperatives as peer pressure will ensure quality with the cooperative as well as increase the bargaining power of the smallholders. The Gujarat Cooperative Milk Marketing Federation Ltd (GCMMF), more commonly known as Amul, has its roots in a cooperative system. The smallholders that provided milk to Amul at the beginning faced some of the same problems as some of the smallholders who supply latex. Latex also has some physical properties similar to milk and a metrolac was used to determine its density, which was then applied to a chart. Therefore it may be prudent to study how some of these factors were resolved successfully.

However, it is understood that the metrolac or density measurement based DRC determinations will never become sufficiently accurate to build trust of sellers and buyers alike. A more comprehensive but expensive solution may be to introduce mini or mobile laboratories in the field to do laboratory DRC determinations using a simple technique. The laboratory, however, should be owned by smallholders. If ICT applications are used, results can be computed automatically, displayed publicly and transmitted for payments.

Alternatively, a system may need to be set up where the latex can be traced to the cultivation it originated from. This is already being implemented by Hayleys, through their program 'first light', where samples are obtained at tested at the laboratory. The dry rubber content is calculated through the lab tests and the payment is made directly to the smallholder.

5.3. Obtaining required information

Shortcomings in the extension services have resulted in smallholders not being able obtain information necessary. The situation becomes more perilous where diseases are concerned. However, if smallholders are able to obtain the necessary information through an advisory service, it might prove to be more effective.

A toll free agriculture advisory service, 1920, currently exists in Sri Lanka. However, it is not currently focused on rubber cultivation. It might be prudent to utilize the existing system and strengthen it as opposed to attempting to create new ones. Furthermore, smallholders need to be informed of the existence of these services. An easy way to do this is through existing channels such as Thurusaviya. In addition, Information and Communications Technology (ICT) can be utilised in an innovative and efficient manner to enable communication between the smallholders and the extension or advisory services. An example would be the use of MMS to send pictures of diseased plants in order to obtain some preliminary advice to a rubber extension or advisory service.

5.4. Availability of price information

The RRS prices in Sri Lanka are determined at the Colombo auction which in turn is affected to a certain degree by the prices in the Singapore Commodity Exchange. For the large part, as the major portion of the rubber sold at CA is Latex crepe rubber which is not handled in Singapore or Tokyo markets, local Latex Crepe and Sole Crepe prices are determined by market dynamics that prevail in

Crepe supply chain. The buyers of course use SICOM prices for reference as a benchmark. The prices are made available to the public through news media. However, the prices determined at the Colombo auction are not necessarily the prices that are given to smallholders in rural areas. The traders often adjust the prices to reflect the transport costs and search costs. This in turn would leave some smallholders feeling cheated by the traders in spite of the fact that the price received may in fact reflect the cost of transport and handling charges. The availability of a regional price, based on the Colombo Auction prices, adjusted to the cost of transportation and other logistics through SMS may help reduce the discretion on the part of the trader and help build trust between the traders and the smallholders.

It should be noted that for RSS, the price displayed by Loadstar is taken as benchmark for the price for that particular area. Therefore, a regional price can be agreed upon through a public-private partnership. Platforms such as Tradenet⁷ already exist where subscribers are able to receive price information through SMS.

6. Conclusion

According to the information received from the RRI, approximately 150,000 smallholders engage in rubber cultivation. In addition, more people interact with the industry working for the RPCs, traders, manufactures and smallholders as well. Therefore number of people depending on the rubber value chain for their livelihood is considerable.

Rubber is a traditional export of Sri Lanka with no less than three government institutions dedicated to its service. In addition, multiple associations have been formed consisting of actors across the value chain. However, as in the case of an industry with multiple organizations and associations, the cooperation between them is an issue. Furthermore, the interests of one association may not align themselves with the interests of others. An example of is that while high rubber prices are good news for the rubber cultivators, it is bad news for the manufactures and vice versa. Increasing production (2010=150,000 tons from 2001=96,000 tons) means supply response is excellent to price increases. Smallholders are better off now realizing over 500 LKR per kilogram which is unprecedented.

The information and knowledge gaps identified in the previous section act as a considerable constraints to the development of the industry as whole and to improving the livelihoods of the smallholders in particular.

Some of the ways to minimize the identified gaps were discussed in the previous chapter. However, it is important to build or maintain the trust between the smallholders and the providers of information and knowledge. Bridging the information and knowledge gaps can bring about increased efficiency in the sector. This can be done through smallholder ownership (or partnership) of proposed systems.

⁷ “TradeNet encompasses the collation, comparison, qualification and subsequent dissemination of trade enablement information to large numbers of stakeholders minimizing information arbitrage”

As mentioned previously, the focus group discussion and the in-depth interviews also brought about other problems in the sector. Chief among these is the lack of or the declining number of rubber tappers. In addition many smallholders as well as estates complained about the increased pilfering of latex from the cultivations. The situation has seen an escalation in recent times owing to the increased rubber prices.

These maybe two of the main problems that need to be looked at and addressed along with the identified information and knowledge gaps in order to ensure the increased efficiency of the sector.

References

Altenburg, T. (2006), Donor approaches to supporting pro-poor value chains, Report prepared for the Donor Committee for Enterprise Development, Bonn

Kaplinsky, R. & Morris, M. (2001) Handbook for value chain research. Report prepared for IDRC, Canada

M4P (2008), Making Value Chains work better for the poor: A toolkit for practitioners of value chain analysis, Version 3 Making Value Chains work better for the poor project, UK Department of International Development (DFID), Agriculture Developmental International, Phnom Penh, Cambodia

Ministry of Plantation (2009), Statistical Information on plantation crops, 2008

Rubber Research Institute (2009), Analysis of project worth: smallholder and estate rubber cultivation.

Central Bank of Sri Lanka (2010), Annual Report, Accessed at http://www.cbsl.gov.lk/pics_n_docs/10_pub/docs/efr/annual_report/AR2010/English/content.htm

Central Bank of Sri Lanka (2009), Annual Report, Accessed at http://www.cbsl.gov.lk/pics_n_docs/10_pub/docs/efr/annual_report/ar2009e/ar09_content_2009_e.htm

Central Bank of Sri Lanka (2008), Annual Report, Accessed at http://www.cbsl.gov.lk/pics_n_docs/10_pub/docs/efr/annual_report/ar2008e/ar08_content_2008_e.htm

Central Bank of Sri Lanka (2007), Annual Report, http://www.cbsl.gov.lk/pics_n_docs/10_pub/docs/efr/annual_report/Ar2007/content.htm

Websites

Food and Agriculture Organisation, www.fao.org

Rubber Development Department, www.rubberdev.gov.lk

Rubber Research Institute, www.rrisl.lk

Export Development Board, www.srilankabusiness.com

Annex 1

List of interviewees

Organization	Name of person
A.M. Rahim & Co.	Mr. M.S. Rahim
Ceylon Chamber of Commerce	Dr. Anura Ekanayake
Colombo Rubber Traders Association	Mr. M.S. Rahim
DSI- Samson Group	Mr. Lalith Jayawardena
Hayleys Group	Mr. Mervyn De Silva
Kotagala Plantations- Lankem	Mr. Sriyan Eriyagama
Loadstar	Mr. Bhathiya Amarakoon
	Dr. Tissa Jinsena
	2 Loadstar collection centre managers
Quality International Certification Services	Dr. Srilal de Silva
Richard Pieris Natural Foam	Mr. Januka Jayanga
	Mr. Adrian
Richard Pieris Plantations	Mr. Sunil Poholiyadde
	Mr. Muditha Welihinda
Rubber Development Department	Ms. Rizmina
Rubber Research Institute	Dr. A. Nugawela
	Dr. Aruna Dissanayake
Sri Lanka Association of Manufacturers and Exporters of rubber products	Mr. Lalith Jayawardena
Sri Lanka Standard Institution	Mr. Kanchana Ratwatte
	Mr. Dharmawardene
Thurusaviya	Mr. Nihal Dissanayake
	Ms. Chandrika
Consultant	Mr. Lakna Paranawithana

Focus group discussion participants

Focus Group Ref #	Geographic Area	Total Rubber land Size - tapping, growing etc- acheres	Clone-1	Clone-2	Clone-3
1	Kalutara -Baduraliya	3	86	100	
1	Kalutara -Baduraliya	2	100		

1	Kalutara -Baduraliya	2.8	86	100	
1	Kalutara -Baduraliya	2	86		
1	Kalutara -Baduraliya	3	86		
1	Kalutara -Baduraliya	3.4	100		
1	Kalutara -Baduraliya	4	100		
2	Kalutara -Diyakaduwa	2	100		
2	Kalutara -Diyakaduwa	2	86		
2	Kalutara -Diyakaduwa	3	100		
2	Kalutara -Diyakaduwa	1 ½	86		
2	Kalutara -Diyakaduwa	3	100		
2	Kalutara -Diyakaduwa	1 ½	100		
3	Gampaha/Dompe/ Samanabadda	9	86	100	121
3	Gampaha/Dompe/ Samanabadda	¾	100		
3	Gampaha/Dompe/ Samanabadda	2	86	100	
3	Gampaha/Dompe/ Samanabadda	3	100		
3	Gampaha/Dompe/ Samanabadda	3	100		
3	Gampaha/Dompe/ Samanabadda	4	86	100	
4	Gampaha/Dompe/ Samanabadda	5	86	100	
4	Gampaha/Dompe/ Samanabadda	3.5	86		
4	Gampaha/Dompe/ Samanabadda	2.5	86	100	
4	Gampaha/Dompe/ Samanabadda	6	86	100	
4	Gampaha/Dompe/ Samanabadda	3	100		
4	Gampaha/Dompe/ Samanabadda	2	100	121	
5	Kegalle/ Bulathkohupitiya/ Ambawalla	15	86	100	
5	Kegalle/ Bulathkohupitiya/ Ambawalla	2	100		
5	Kegalle/ Bulathkohupitiya/ Ambawalla	3	100		
5	Kegalle/ Bulathkohupitiya/ Ambawalla	2 ½	100		
5	Kegalle/ Bulathkohupitiya/ Ambawalla	5	100		
5	Kegalle/ Bulathkohupitiya/ Ambawalla	7	100		
6	Kegalle	2	86	100	
6	Kegalle	3	86		
6	Kegalle	5	100		
6	Kegalle	8	86	100	
6	Kegalle	4	86		
6	Kegalle	3	86		
6	Kegalle	3 ½	86		
6	Kegalle	20	86	100	
7	Rathnapura/ Mawila	2	100		
7	Rathnapura/ Mawila	4	86		
7	Rathnapura/ Mawila	2	100		
7	Rathnapura/ Mawila	2	100		
7	Rathnapura/ Mawila	2 ½	100		
7	Rathnapura/ Mawila	2 ½	100		
8	Rathnapura/ Iddamalgoda	10	100		

8	Rathnapura/ Iddamal goda	3 ½	100		
8	Rathnapura/ Iddamal goda	12	86	100	
8	Rathnapura/ Iddamal goda	14	86	100	
8	Rathnapura/ Iddamal goda	4	100		
8	Rathnapura/ Iddamal goda	13	86	100	
9	Kandy/ Alagalla/ Thumpane	5	Don' t Know		
9	Kandy/ Alagalla/ Thumpane	3	Don' t Know		
9	Kandy/ Alagalla/ Thumpane	2 ½	Don' t Know		
9	Kandy/ Alagalla/ Thumpane	3	Don' t Know		
9	Kandy/ Alagalla/ Thumpane	2	Don' t Know		
10	Kandy/ Tharawatte/ Hataraliyadda	3	86		
10	Kandy/ Tharawatte/ Hataraliyadda	1	Don' t Know		
10	Kandy/ Tharawatte/ Hataraliyadda	3 ½	86		
10	Kandy/ Tharawatte/ Hataraliyadda	2	Don' t Know		
10	Kandy/ Tharawatte/ Hataraliyadda	5	100		
10	Kandy/ Tharawatte/ Hataraliyadda	10	Don' t Know		
11	Galle/ Agaliya	2 ¼	Don' t Know		
11	Galle/ Agaliya	2	Don' t Know		
11	Galle/ Agaliya	2	100		
11	Galle/ Agaliya	4	100		
11	Galle/ Agaliya	2	100		
11	Galle/ Agaliya	2	Don' t Know		
12	Galle/ Karandeniya	10	86		
12	Galle/ Karandeniya	7	100		
12	Galle/ Karandeniya	2	100		
12	Galle/ Karandeniya	2	100		
12	Galle/ Karandeniya	1 ½	100		
12	Galle/ Karandeniya	1 ½	100		
12	Galle/ Karandeniya	4	100		
13	Monaragala/ Badalkumbura/ Karawila	3	Don' t Know		
13	Monaragala/ Badalkumbura/ Karawila	6	Don' t Know		
13	Monaragala/ Badalkumbura/ Karawila	3	Don' t Know		
13	Monaragala/ Badalkumbura/ Karawila	5	Don' t Know		
13	Monaragala/ Badalkumbura/ Karawila	4	Don' t Know		

13	Monaragala/ Badalkumbura/ Karawila	4	Don' t Know		
14	Monaragala/ Bakinigahawela	2	Don' t Know		
14	Monaragala/ Bakinigahawela	6	Don' t Know		
14	Monaragala/ Bakinigahawela	30	100	121	
14	Monaragala/ Bakinigahawela	2	100		
14	Monaragala/ Bakinigahawela	2	121		
14	Monaragala/ Bakinigahawela	3 ½	Don' t Know		
15	Rathnapura/ Iddamalgoda	2 ½	86		
15	Rathnapura/ Iddamalgoda	2	100		
15	Rathnapura/ Iddamalgoda	3	Don' t Know		
15	Rathnapura/ Iddamalgoda	4	Don' t Know		
15	Rathnapura/ Iddamalgoda	2	100		
15	Rathnapura/ Iddamalgoda	4	100		
15	Rathnapura/ Iddamalgoda	5	100		

Annex 2

English Translation of the Focus Group Discussion Guideline

Instructions to the moderator:

Use only the time allocated for each section

The moderator should be familiar details of the participants such as their names, the details of the selection criteria.

Total time allocated 120 minutes

Introduce yourself, Nielsen/LIRNEasia

It is an open discussion, therefore no right or wrong answers

Importance of participating in the discussion and the exchanging of ideas

Permission to be sought for taping the discussion, ensure the discussants that privacy will be maintained.

The discussion is to take about 2 hours

Introduction (10 mins)

“Now I introduced myself as well as our organisation to you. I would like to know a little bit about yourselves so that everyone in the group is also familiar with you. Please state your name, some information about your families and what do you do in your free time?”

“We have learnt that you all engage in rubber plantation. We hope to conduct these discussions with rubber growers in this area as well as other areas in which rubber has been cultivated. Through your experience, knowledge and ideas we would like to find out the information necessary to see

how to take Sri Lanka forward, as a country, in the rubber industry. Therefore, if we find out the current true situation in the rubber industry, whether good or bad, it will be useful to us. This will enable us to identify the problems in the rubber industry and possible solutions for the problems. This will benefit you either directly or indirectly.

1. Entry into the industry (15 Mins)

- 1.1. How did you get involved in this industry? (Inherited property, leased land, other)
- 1.2. How was the acreage you have planted? How much of it is as untapped trees?? What is the acreage that is already being tapped? What is the acreage that has been abandoned or not tappable?
- 1.3. Are you involved with any other agriculture activity on a commercial scale? If so what are they? What is the acreage?
- 1.4. Have you received a subsidy of some kind for the rubber cultivation? If so, what is the acreage for which you received the subsidy?
- 1.5. Can please tell me the rubber clone that you have planted? (PB 86, RRI 100, RRI 120, RRI 121, other)
- 1.6. Why is it that you have selected rubber as your main source of income?
- 1.7. Is this area advantageous to rubber cultivation? In what way?
- 1.8. Who engages in rubber cultivation in this area? What is their land extent? Do they do it as their main income or an additional income? Why?

2. Rubber Planting Process (20 Mins)

“Rubber planting takes place in various stages. We will now have a look at the stage from planting the rubber plants to the day that you begin to tap the tree. As far as I know, this will take about 5-6 years. 2nd stage is the 15-20 year period starting from the time you tap the rubber tree up until the time of uprooting the tree. Let us think about the tasks that have to be done from the preparing the land for planting to tapping the rubber tree. I would like it if you would all get together and tell me what these tasks are.”

- 2.1. What is done initially?
- 2.2. Secondly? (Note down the process and then summarise it to them as you go along “Am I correct, if I summarise it as given below?”)
 - Clearing land
 - Putting the trenches
 - Preparing holes
 - Marking and digging the holes
 - Planting the trees
 - Applying fertiliser
 - Getting rid of weeds
 - Other

“Now let us think of the time after the tapping has begun. How are the tasks that have to be performed and what are the equipment and facilities required for that?”

- Equipment for tapping the rubber tree
- Utensils kept for collecting latex from the tree
- Utensils needed for collecting latex

- Raw materials and equipment needed for
- Making, drying and storing RSS sheets
- Collecting latex
- Storing latex
- Other

2.3. What are the raw materials needed at each stage of production? What equipment is needed at each stage?

- Equipment for preparing the land
- Tractor
- Equipment for planting
- Spray machine
- other

2.4. Where do you find them?

2.5. How often do you buy them?

2.6. How much is required for one acre of land

2.7. How much does one unit cost (1 kg/1 litre etc)

2.8. Where do you buy them from? (Village? Town? Main town close to the village?)

2.9. For an example, if you bought chemicals from a particular shop, or producer, after some time can you still find the place is needed?

2.10. From what you remember, has there been any difficulty in finding the material necessary, or a disruption to the supply?

2.11. How long can you wait without the raw materials mentioned above without any harm coming to your cultivation?

2.12. Other than the institution/place you make your purchase from, how many other places can you buy the raw materials from?

2.13. What the problems that you have had to face because of the inability to purchase these raw materials when needed?

2.14. What is the extra expenditure incurred by you when these problems materialise?

2.15. How can you be assured of the quality of raw materials that you buy? Is there a grading system?

2.16. How satisfied are you with the suppliers of the raw materials?

Instructions to the moderator

If the family members are engaged in the rubber cultivation process, when you think of those members of this area or village in general,

2.17. Who engages more in tasks such as Clearing land, Putting the trenches, Preparing holes, Getting rid of weeds? Men or Women?

2.18. After the tapping has commenced, who engages more in tasks such as tapping the rubber, collecting the latex, making, drying RSS? Men or Women?

2.19. Who engages more in the selling of the rubber sheets to the shops? Men or Women?

3. Selling your product (15 Mins)

3.1. In what form is the rubber sold as? As latex? As sheet rubber?

3.2. Where do you sell your rubber sheets to? (Nearest shop? A shop in town? Other?)

- 3.3. How are the rubber sheets weighed? How sure that this method is accurate?
- 3.4. How are the sheets graded? Who does the grading? Is the method used for grading a clear and transparent one?
- 3.5. If your rubber sheets are stored in a warehouse, can you identify your sheets?
- 3.6. What is the price per kilo? Is this price different from what the other traders pay?
- 3.7. Do you think that the price you get is the market price? Why do you think like that? What is the reason?
- 3.8. What are the fixed costs that have to be incurred whether you tap the rubber tree or not (or get an income or not)? (Salaries of non productive staff, Office supplies, Insurance, Legal and accounting fees, Travel, Utilities, Rent, Repairs and maintenance, Depreciation, Marketing expenses, interest and bank charges etc)
- 3.9. What are your variable costs? (wages corresponding directly to production, cost of holding inventory etc)
- 3.10. How did you find money for this? I will read out each of these
 - To buy land,
 - To buy spray machine, tractor, planting material, equipment for making rubber sheets, rainguards,
 - To buy fertilise and chemicals,
 - to build a smoke house,
 - for Bicycle or three wheeler for transportation,
 - daily salaries and raw materials,
 - other

4. Information (10 mins)

- 4.1. What kind of information is required for a person engaging in rubber cultivation? How do you get this information? ((Inputs, price, weather, markets, demand, quality standards etc)
- 4.2. Who do you get your information from? Do you give information back them? Do you pay for the information or not?
- 4.3. Has the information been correct/accurate? How do you know about its accuracy? If not, do you know of a more accurate source? Have you tried to obtain the more accurate information? Do you have to pay for this information? If yes why not subscribe to it?
0718039894
- 4.4. What other types of information (other than what you already get) would you like to get? Why is this information already not available for you? Do you know anyone/or source where you can get the information from? Why do you need this information?
- 4.5. Do you share information with anyone? If so, what type of information? How do you share this information?
- 4.6. If you share information, why? Are there benefits? If not, why don't you share the information?

5. Use of Information and Communication Technology (10 Mins)

- 5.1. Do you use ICTs in your work with regards to the rubber cultivation (Telephone, fax, Internet)? For what tasks?
- 5.2. How did you perform these tasks earlier?
- 5.3. What is the cost of using ICTs?
- 5.4. Has the use of ICTs increased efficiency?

5.5. Have you incurred any legal costs as a part of your business?

6. Technical Knowledge (15 mins)

- 6.1. Do you use any technical knowledge when planting rubber, making rubber sheets or selling in the form of latex or any other activity related to the rubber cultivation? Where do you get this knowledge from? Are the methods traditional? Or upgraded? Or state of the art?
- 6.2. Are you satisfied with the level of knowledge you have? If not why?

Moderator to ask from those not using rain guards

- 6.3. Have you heard of the method of putting rain guards for the rubber trees?
- 6.4. What have you heard about it?
- 6.5. Is a successful scheme? Or an unsuccessful one? Why do you think like that?
- 6.6. Now think that a new project is being implemented to introduce rain guards to the area. The responsibility of this project is given to this group. One of you will be made the director. How do you think other people can be convinced to use rain guards

7. Miscellaneous Questions (20 Mins)

- 7.1. What are the challenges/difficulties you faced as a rubber planter, before you started tapping the tree
- 7.2. What are the challenges/difficulties you faced as a rubber planter, after you started tapping the tree

Instructions to the moderator

If the discussion or the above question does not give rise to the questions below, then ensure that you bring up the issues below.

- 7.3. Shortage of skilled tappers
- 7.4. Inability to tap rubber in the rainy season
- 7.5. Even though a 30% fertiliser subsidy is given, some do not apply fertiliesr after starting to tap the tree
- 7.6. Problems in grading of RSS sheets
- 7.7. The cost of making RSS1 and RRS2, not being reflected in its price
- 7.8. Discrepancies in the weighing equipment used to weigh the RSS
- 7.9. Scrap rubber getting stolen
- 7.10. Nonexistence or inactivity of rubber farmer associations
- 7.11. Problems in selling latex
- Changing the measurement meter
 - Non-existence of an established price for latex
- 7.12. Problems between the rubber extension officer and the small holder
- Limited transportation facilities for officers
 - One officer having to be responsible for a large land extent