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National Plantation Industry Policy (NPIP) Framework

1. Introduction

In Sri Lanka, the plantation sector comprises of the 'traditional triples – tea, rubber, and coconut, and sugar, oil palm, cashew and palmyrah. The main thrust of the plantation sector is to increase the productivity and the profitability of both corporate and the small-holding sector of the plantation industry through product and market integration – agro-based industries, aiming at long term sustainability. The plantation sector which was privately owned was nationalized in the mid 1970s. The two government sector Corporations (JEDB and SLPC), which managed the plantations since the nationalization for nearly two decades with huge losses and greater burden to the exchequer, were once more partially privatised between 1995 and 1997. The ownership was transferred to 20 Regional Plantation Companies (RPCs) on the basis of a 53 year-lease. These structural changes have assisted little to improve the viability of the large plantation sector apart from the application of agricultural practices and factory modernization to improve the quality and quantity of the products concerned in the recent decade. The tea small-holding sector was blessed with the establishment of the Tea Small-holding Authority (TSHDA) in the mid 1970s to assist in improving the industry through diffusing new technology, provision of a replanting subsidy and integration of the small-holding tea sector. Within the tea small-holding sector, a clear improvement in productivity and profitability fronts was observed. Tea, Rubber, sugar, cashew and palmyrah sub-sectors were operated/functioned through establishing various research (eg. TRI, RRI, and SRI) and other development/marketing oriented organizations (eg. Department of Rubber Development , Sri Lanka Cashew Corporation; and Palmyrah Development Board).

As the highest foreign exchange earner, plantation industry was the leading industry until about the mid eighties when it was overtaken by foreign employment, garments and tourism, but it still plays a significant role by contributing 2.6 percent to the GDP (2005) in the country's economy[1]. The total land extent utilized in the plantation sector is about 750,000 hectares. The direct and indirect employment generated through the sector is about 1.5 million (MPI, 2006). As shown in the Statistical Pocket Book of the MPI, (2006), during the last 24 years (1980-2004), the average annual growth rates of relevant major plantation crops are as follows – tea (2.5%); rubber (-0.6%);

[1] The contribution of the plantation sector (production plus processing of tea , rubber and coconut kernel products), to the GDP is about 4.8% (Source: Central Bank of Sri Lanka, 2006)

coconut (1.2%) and sugarcane (0.8%). Further, the land productivity (average yield) for tea was 1461 kg/ha, Rubber 1171 kg/ha, Sugar cane 60 MT/ha and Cashew 315 kg/ha.

In this context, the sector is still faced with low productivity and high production cost relative to that in other countries and low profitability, which are in turn due to the poor social condition of the estates, rigidities in the labor market and low level of product and market integration. The existing banking system does not provide long-term financing for long-term investments with long – gestation periods. Besides, some RPCs which are functioning in the tea, rubber and coconut sub-sectors are considered no longer credit-worthy because of their weak financial position and heavy borrowings. Further, the sector also faces looming labour shortages due to out-migration with high marginal value for labour (i.e. wages) offered by other manufacturing and service sectors, voluntary unemployment and ageing workforce stemming from poor living and working conditions of estate workers. In addition, with respect to foreign exchange earnings, the plantation sector as a whole still falls in the category of high net -foreign exchange earning sectors.

The Sri Lankan plantation agriculture is not an exception for facing global, regional and domestic challenges. Particularly, global movement of financial capital and technology; recent oil crisis with attendant higher energy cost; establishing the South Asian Regional Trade Groupings – SAPTA and SAFTA and trends in consumerism – changing of consumer attitudes and habits may directly or indirectly pose challenges to the plantation sector. There are three main opportunities opened for the same sector through the globalized and dynamic policy environment, namely, integration into higher and regional niche markets and the global economy; improving the climate for agro-enterprises through market integration; and investments in human and social capital and technology.

The strengthening of integration with the international markets leads to improvement in the value addition or changing the form of the products in line with the international standards (eg. EU Food Standards), other WTO-based sanitary and phyto-sanitary measures (ie. non-tariff barriers – NTBs) and the changes in the trends in ‘consumerism’. It will inevitably strengthen the possibilities for integrating with the international markets while offering niche, natural, health and ‘green’ products from the plantation industry.

2. Policy Mix on the Plantation Sector

The decline in the relative importance of the plantation sector (from 4.1 percent of the GDP in 1993 to 2.6 percent in 2005) [Annual Reports, (1997 and 2006), Central Bank of Sri Lanka], reflects the normal pattern of structural transformation during economic development, as well as the impact of specific liberalized policy interventions. The changes in structural transformation through global, regional and domestic market dynamics created a vacuum in the policy environment in relation to the sector. Consequently, it was the main theme in most policy analysis circles.

In this context, it is expected to achieve long term sustainable development comprising economic, social, and environmental viability by formulating strategic policy and operational options. Further, operationalizing such policies and operational options/programmes in collaboration with the public and private stake-holders of the industry is vital to achieve the said objectives.

2.1 The Vision and Mission of the Plantation Sector

Vision:

"Achieving national prosperity through development of the plantation industry".

Mission:

"To enhance the productivity, profitability and sustainability of the plantation industry through ensuring an economically, socially and environmentally viable plantation sector"

In line with the 'Mahinda Chintana' programme, it is expected to achieve sustainable development in the sector through the following broader policy alternatives of the Government of Sri Lanka.

- **Transforming the plantations into engines for pro-poor growth and regional development;**
- **Private sector led growth through establishing and promoting Public-Private Partnership (PPP) and Private-Private Partnership – Economic Viability (through integration);**
- **Promoting downstream activities and diversification to improve profitability in the sector;**

- **Promoting the well-being of the Plantation Communities – Social Viability; and**
- **Encouraging the production of "Green Products" to achieve environmental Sustainability– Environmental Viability;**

Along with the broader government policy framework under the 'Mahinda Chintana' programme, the National Plantation Industry Policy (NPIP) framework comprises of the following specific strategic policy alternatives to achieve long term sustainability of the sector by strengthening the role of the state sector as facilitator, regulator and moderator to enable the state sector to participate effectively with the private sector as a strategic partner in the process in moving towards the intended goal of achieving the goal of sustainability of the sector.

- Policy on economic governance in the plantation sector – Establishing a 'Policy Analysis Circle' within the MPI;
- Information and communication technology (ICT) policy – 'Digital Divide' on dynamics in the global market;
- Research and development (R&D) policy (for productivity enhancement and product/market Integration);
- Human Resource Development (HRD) Policy (it is necessary to deal with issues of the ageing workforce, out-migration, and opening opportunities for the 2nd generation and empowerment of the workforce with new technology);
- Land use policy – (adopting environmentally friendly land use and management practices and re-clustering of estates, managed by the corporate sector based on the economic size of the estates to develop sustainable business units);
- Development-Oriented Plantation Management Policy (ie. Building financial capital through capping of the management fee charged by the RPCs and freezing the lease rental charged by the government (extending the pre-conditions of the ongoing Plantation Development Project for a further period of 10 years));
- Investment policy – [to be facilitated through establishing a Plantation Development Fund (PDF), the Public-Private Partnerships – PPPs]; and
- Policy on targeted subsidy/incentives (for replanting/ new planting/ diversification/integration of plantation crops/products);

In line with the Mission of the plantation sector, the objectives of the National Plantation Industry Policy (NPIP) framework would be:

(a) to contribute to GDP by 8.6 percent per year (average) from the plantation sector during the ten year - period;
(b) to increase the growth rate of the plantation sector by 2 percent per annum during the next 5 years;
(c) to increase the level of productivity by 5 percent (average) per annum in the plantation sector;
(d) to improve the livelihood/welfare of the plantation community (Small-holders/workers), by increasing investment in human, financial, physical, natural and social capital in the sector.

In keeping with the policy targets, the following general strategic policy mix is proposed, to cater to the specific development and social needs with the emphasis on gender needs of the plantation sector in Sri Lanka.

A. Strategic Policy Mix on the Plantation Sector

MAIN ISSUES/ PROBLEMS	POLICY DEVICE	OBJECTIVES	STRATEGIES
1. GENERAL – PLANTATION SECTOR			
i. Necessity to strengthen the decision making in the plantation sector- 'Institutional Development Policy' on 'economic governance'	• Institutional reform policy	• To strengthen the policy formulation and analysis in investment, HRD, land use, subsidy/incentives, (ie. fiscal, tariff, price etc.) and R&D for the plantation sector);	i. Establish a **'Policy Analysis Circle (PAC)'** within the MPI to formulate, analyze, evaluate and disseminate the policy mixes relevant to the sector; working in association with a Steering Committee composed of the relevant public and private partners ii. Appoint professionals to the PAC with experience in economic governance; iii. Database development {including land use planning through Geographic Information System (GIS) and GPS)}, management and dissemination. iv. Assign the responsibility to the PAC to make decisions for the benefit of the industry, including the management of the Cess Fund – (For rationalization, prioritization, analysis and management of the Cess Fund);
ii. 'Digital divide' on dynamics in the global market among stake holders	• Policy on the provision of product and market intelligence	• To minimize the risk in production and marketing of plantation crops	i. Establish an Information and Communication Technology (ICT) network linking national and global information on plantation crops; iii. Disseminate global information (both generic and specific) through ICT devices among both the private and state stake holders;
iii. Low productivity and profitability in the plantation crops production	• R&D Policy	• To increase productivity and profitability through diffusing targeted R&D based technology	• Develop a target oriented, demand driven R&D policy framework through the PAC; • Implement such policy framework through the existing institutional policy framework;

MAIN ISSUES/ PROBLEMS	POLICY DEVICE	OBJECTIVES	STRATEGIES
	• Product and Market Integration policy	• To transform primary producers to agri-business entities;	• Encourage product and market integration;
iv. Out-migration and ageing population	• HRD Policy	• To open up opportunities and empower the 2nd generation in the sector	• Formulate a HRD policy framework through the proposed PAC; • Train the workforce with new technology-based systems; • Provide better working and living facilities; • Empower the workforce and initiating programmes to reduce social stigma;
v. Maintaining economically unviable estates in the corporate sector	• Land Use Policy	• To improve productivity and profitability per unit area of land	• Adopt proper land use practices; • Re-cluster estate lands in the corporate sector, based on economic size to develop sustainable business units; • Develop a special purpose vehicle (SPV) to concentrate on marginal estates;
vi. Absence of a well designed assistance scheme for replanting/ new planting / diversification/ integration	• Targeted Incentive/ subsidy Policy	• To increase the levels of productivity and profitability	• Formulate a targeted incentive policy framework for replanting/ new planting / diversification/ integration
vii. Dearth of investment in the sector on product and market integration	• Development oriented Plantation Management Policy	• To build financial capital within the corporate sector	i. Cap the management fee charged by the RPCs; ii. Freeze the lease rental charged by the government; for a mutually agreed period
viii. -do-	• Investment policy	• To increase investment in the plantation sector	i. Establish a Plantation Development Fund for the provision of short/medium/long term capital on loan; ii. Promote public-private (PPPs) and private-private partnerships to attract global and regional capital and technology;

Based on the above policy mix, the strategic policy options relevant to each sub sector (ie. tea, rubber, sugar, cashew and palmyrah) are formulated.

2.2 Investment and Expected Gains through the Proposed Policy Mix in the Plantation Sector

The total estimated investment for the plantation sector (except coconut) would be Rs. 254,570 Million for the 10 year period from 2007 to 2016 (Table 1). The increase in the total estimated cost in the sugar sub-sector is higher compared to that of the other sectors due to the proposed establishment of 3 new sugar factories and the processing cost of expected increase of sugarcane during the period of 2007-2016. This is with the expansion of milling capacity in the sugar sub-sector and the opening up of opportunities for rural folks in the areas where lands are more abundance and suitable for sugar cultivation than other crops. Further, it is estimated that the value of expected gains through the proposed policy framework in the plantation sector would be Rs 1,813,259 Million (Rs 181,325 million per year) (2006 prices). The expected gains as a percentage of GDP is 8.6 per year within the period 2007 to 2016 (Table 2).

Table 1: Total Estimated Cost of Investment in the Plantation Sector (except Coconut) in Sri Lanka (2007-2016)

(Rs. Million)

Sub-Sector	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Tea	7,332	7,111	7,277	7,811	7,838	8,227	8,663	9,161	9,766	10,503	**83,689**
Rubber	2,833	3,303	3,020	3,338	3,249	3,390	3,659	3,932	4,038	4,122	**34,884**
Sugar #	7986	10786	7856	15565	14965	15401	12899	16083	14423	14391	**130,355**
Cashew	395	455	504	564	544	504	504	504	504	504	**4,982**
Palmyrah	44	78	81	84	77	73	65	50	54	54	**660**
Grand Total	**18,590**	**21,733**	**18,738**	**27,362**	**26,673**	**27,595**	**25,790**	**29,730**	**28,785**	**29,574**	**254,570**

 # The total cost of investment in the sugar sub-sector includes the establishment of two new sugar factories and modify the existing mill at Hingurana for expansion of milling capacities, (Rs. 32800 million) and processing cost of expected sugar cane production, Rs. 42405 Million for the period of 2007-2016.

Table 2: Total Expected Gains through the Proposed NPIP Mix in the Plantation Sector (except Coconut) in Sri Lanka (2007-2016)

Sub-Sector	Total Expected Gains (Rs Million)	% Share
i. Tea	**667,355**	**36.8**
ii. Rubber	**807,532**	**44.5**
iii. Sugar	**298,600**	**16.5**
iv. Cashew	**39,379**	**2.2**
v. Palmyrah	**387**	**0.02**
Grand Total (2007-2016)	**1,813,253**	**100.0**
Grand Total per year (Average)	**181,325**	
Aggregate expected gains per year as a % of GDP (2005) #	**8.6**	

 # Based on the value of GDP relevant to the year 2005.

3. Policy Mix on the Tea Sub-sector

3.1 Introduction

Sri Lanka is world-renowned for quality tea and it is the leading tea exporter in the world exporting 320 million kg. per annum (on average), with this commodity being placed among one of the top foreign exchange earners for the country. Tea is categorized as a tradable product.

Tea sector is managed by both the corporate (35%) and the small-holder (65%) sector. After privatization in the 1990s, most tea plantations were managed by private sector companies in the corporate sector. The level of integration in the tea market is maintained at around 42%, which means 58% of the supply of tea to the international market is still black tea. Importers worldwide mainly manage to obtain their requirements through the Colombo Auction via brokers. Direct sales to international markets have been maintained at a minimum level. The tea sector is also facing the problems of labour shortages due to ageing workforce and out-migration and voluntary unemployment stemming from the poor living and working conditions of estate workers.

The necessity for investment in the tea industry is very high, owing to the need to cater to the international market needs, particularly maintaining the demand driven quality of the product; form, packing, taste etc. In the meantime, most consumer countries are resorting to purchase quality assured products under the WTO Agreements on Sanitary and Phyto-Sanitary Measures. Consequently, the corporate sector (Regional Plantation Companies-RPCs) have to invest heavily on factory modernization, integration of tea based products, market promotion/sales promotion etc. to transform the RPCs from primary processors to agro-based fully diversified/integrated entities. In addition, RPCs need to invest on maintaining a higher level of social welfare among the community, while opening up opportunities for the second generation of plantation workers through product and market integration.

3.2 Present Status of the Tea Sub-sector

The present status of the Sri Lankan tea sub-sector is specified below, (MPI,,2006).

- Total Production (Kg) - 320 M
- Total Extent (Ha) - 222,000
- Average Colombo Auction Price# - Rs 185.84/kg (2005)
- Contribution to the GDP - 1.2% (2005)
- Tea as a percentage in agricultural exports - 70%
- Land Productivity (Average) - 1418 kg/ha (2005) (Average for all Elevations)
- Contribution to the Total Tea Production:
  - Corporate Sector – 35%;
  - Small-holding Sector - 65%
- Tea Sector - Growth Rate - 2.5% (Average-1980-2005);

Further, the country earns around Rs.71 billion annually from tea exports, which accounts for 13% of the national foreign exchange earnings. Average cost of production of made tea in the year 2005 was Rs.168/85 per kg, which is somewhat higher, compared to that of other

competitors due to various reasons viz, rigidities in the labour market, high input costs and comparatively low land and labour productivity.

At present, the following are the major issues/problems affecting the growth of the sector, identified at the various development policy analysis circles, namely:

- Weak strategic R&D and extension programmes;
- Increased ageing workforce and the high rate of out-migration of labour in the plantation sector;
- High incidence of negative externalities in the non-adoption of proper land use practices in the high and midland regions;
- Insufficient financial capital for the RPCs;
- Declining land productivity in the up and mid country regions;
- Low investment in factory modernization;
- Low level of quality certification in tea factories;
- Dearth of product integration and diversification programmes;
- Lack of crop diversification drives;
- Increasing unauthorized expansion of tea cultivation;
- Declining share of tea in the world beverage market;
- Global over-supply of tea shifting 'orthodox tea' to 'CTC' tea;
- Reducing market share in the traditional Middle Eastern markets for the Sri Lankan tea;
- Blending/ mixing low quality tea with 'pure Sri Lankan tea'; and
- Lack of policy analysis and marketing intelligence relevant to the tea market

3.3 Challenges and Opportunities

Since tea is a tradable product, the impacts from the world market directly influence the whole spheres of domestic production and marketing processes of this commodity. Particularly global and regional market dynamics have a direct impact upon the changes in the tea market, while opening opportunities for integration. Seemingly, the tea sector is facing challenges of integration in line with the global trends in production (from conventional tea products to consumer friendly natural or health products), consumption (from black tea to instant/health/natural/green tea) and product integration (i.e. packeted tea, tea drink, and decaffeinated tea). The tea sub-sector is at a stage where it faces the challenges of finding financial, human and social capital to be invested in modernization of the product and marketing processes. A golden opportunity was opened for the corporate sector with the allocation of Rs 3.7 billion[2] as financial capital through the Plantation Development Project (PDP) for opening investment opportunities for factory modernization, crop diversification, non-crop diversification, and product integration to transform the sector into fully-fledged agri-business entities, by catering to the global market needs. Once the transformation is completed, it is expected to be strengthened through the formation of human and social capital, to transform the sector into a sustainable industry in the long run. Further, there is an opportunity for the small holder sector to receive concessionary loan facilities through a revolving fund (Rs. 1.2 billion) for crop development and factory modernization, established under the completed Tea Development Project (TDP).

[2] The total funds allocated can be used for development of tea, rubber, coconut, and oil palm sub-sectors in the plantation economy.

3.4 Policy Mix – Tea Sub-sector

Considering the long term sustainability in the tea sector, it is aimed to achieve the following Mission for the same sub-sector in line with the vision of the plantation sector, over the next 10 year period by implementing the strategies proposed below (Table 1), through building public-private & private-private partnerships (PPPs) as the key policy variables. The mission of the tea sub – sector is: To become the leader in the global tea market through product and market integration.

In line with the foregoing challenges, opportunities and issues/problems relevant to the tea sub-sector in Sri Lanka, a strategic policy mix is formulated to overcome such problems and issues.

Table 1: Policy Mix – Tea Sub-Sector

MAIN ISSUES/ PROBLEMS	POLICY INSTRUMENT	OBJECTIVES	STRATEGIES
I. R&D and EXTENSION POLICY			
i. Need for strengthening R&D	i. Targeted R&D policy package;	• Introduce viable innovations in production, processing, value addition, marketing and integration to meet global needs.	i. Conduct a 'needs assessment' of R&D through a panel of experts; ii. Develop a 'demand driven' R&D package catering to the tea sector considering the domestic and global market dynamics;
ii. Insufficient need- based Extension services	iv. Targeted demand driven extension package	• To effectively transfer the tested technology and facilitate necessary requirements aimed at increasing the level of productivity and improvement of profitability	i. Strengthen demand driven extension through building PPPs within the corporate sector; ii. Devise a government sponsored 'demand driven' extension package for the tea small-holding sector; iii. Build a strong link between research institutions and extension services for effective technology transfer; iv. Facilitate organizations of producer societies for effective group action for the small holder sector

MAIN ISSUES/ PROBLEMS	POLICY INSTRUMENT	OBJECTIVES	STRATEGIES
iii. Insufficient financial allocation and flow of funds for Research & Extension	iii) Allocation and regular flow of cess funds based on Institute's needs	Effective implementation of identified R&D program to produce viable innovations/technologies on time	Regularize and implement need based financial allocation
iv. Lack of flexibility in human resource development for Research and Development	Recruitment and training on R & D needs	Effective implementation of identified R&D program to produce viable innovations/technologies on time	Relaxation of regulations to facilitate need based recruitment
II. HRD POLICY			
i. Increased ageing workforce and the high rate of out-migration of managerial and labour categories	i. HRD Policy on the second generation of the plantation community and the managerial categories.	• To promote capacity building, attitude changes, and empowerment by opening up of opportunities	i. Initiate a HRD programme with emphasis on new technology; ii. Change the attitudes from 'labourer' to 'partner', in the process (eg. Labourer to Field Operator/ Field Assistant); iii. Introduce 'Quality Circles and 5S principles' to empower the partners iv. Provide necessary training and skills for the managerial grades

III. LAND USE POLICY			
i.High incidence of negative externalities in the non-adoption of proper land use practices	i. Policy on sustainable land use (eg. Adopting recommended soil conservation measures)	• To maintain long term sustainability in the tea sector by preserving the natural capital	i. Facilitate the adoption of recommended packages of soil conservation measures; i. Devise an additional incentive package to encourage farmers/producers to undertake proper land use ii. Formulate an assistance scheme to promote conservation of the environment/soil, in line with the 'Green Box' of the AOA of the WTO;

MAIN ISSUES/ PROBLEMS	POLICY INSTRUMENT	OBJECTIVES	STRATEGIES
IV. DEVELOPMENT ORIENTED INVESTMENT POLICY			
i. Insufficient of financial capital for the RPCs and in the small holding sector	i. Policy on Building Financial capital	• To increase the financial capital needed for development	i. Cap the management fee charged by the RPCs; ii. Freeze the lease rental charged by the government from the RPCs iii. Establishment of the proposed Plantation Fund with assistance from local and foreign investors.
V. POLICY ON PRODUCTION, MANUFACTURING AND MARKETING IMPROVEMENT			
i. Declining land productivity	**i. Replanting policy** on tea particularly for the up and mid country regions to replace over-age plants;	• To increase the land productivity (yield/ha) by growing high yielding varieties	i. Initiate specific replanting and infilling programmes in both corporate and small-holding sectors; ii. Promote good crop management and processing practices to boost productivity; iii. Identify marginal tea lands and facilitate alternative crop production activities,
ii. Low investment in factory modernization	**ii. Policy on Investment in factory modernization**	To improve quality and quantity of tea	i. Develop a programme for tea factory modernization in the Corporate and Non-corporate sectors;
iii. Low level of quality certification in tea factories	**iii. Policy of quality certification**	To improve the standards of 'Sri Lankan' tea in the international markets	i. Initiate a 'Quality Certification Drive' for tea;
iv. Dearth of product integration and diversification programmes	**iv. Policy on tea-based product integration/ value addition (i.e. Integration Drive)**	To transform conventional bulk/ black tea production into high value/ integrated products to cater to the markets	i. Encourage RPCs, factory owners and small-holders through the provision of targeted credit facilities for production of 'value added products'; ii. Offer a specific incentive package for initiating specific value adding/marketing programmes (on par with the BOI projects); iii. Encourage building of 'private– private' partnerships;

MAIN ISSUES/ PROBLEMS	POLICY INSTRUMENT	OBJECTIVES	STRATEGIES
VI. CROP DIVERSIFICATION POLICY			
i. Lack of crop diversification	**i. Crop diversification policy** in the tea sub- sector	• To increase the profitability per unit area (square meter) of land through product integration (e.g. Tea to forestry; tea to spices; tea to green-house farming)	i. Identify the suitable crops depending on the suitability of lands and economic viability; ii. Attract new technology, capital and crop management practices through the corporate sector by introducing a 'Diversification Drive';
VII. REGISTRATION OF LANDS UNDER TEA			
i. Increasing unauthorized expansion of tea cultivation	i. Policy on registration of lands under tea cultivation	• To establish and maintain a database on seasonal/annual replanting, and new planting of tea to facilitate monitoring & policy formulation	i. Build awareness among GSs and the Tea Inspectors on the need for prevention of new cultivation of tea; ii. Fix a penalty for unauthorized new cultivation of tea to reduce over-supply of tea to the market**;**
VIII. POLICY OF MARKETING AND PROMOTION			
i. Declining share of tea in the world beverage market	i. Global generic and uni-national promotion policy (Tea as a health/ natural drink with a Sri Lankan image)	• To increase and strengthen the market share of tea in the global beverage market	i. Use strategic promotional mechanisms/devices through global ICT networks to promote tea as a 'Health/ Natural Drink' in developed and tea consuming countries.

MAIN ISSUES/ PROBLEMS	POLICY INSTRUMENT	OBJECTIVES	STRATEGIES
ii. Global over supply of tea	ii. Regulatory policy on supply of tea	• To reduce the price risk at the global market using the 'market power'	i. Increase the volume of production of high demanded/targeted varieties of tea (ie. green tea/ flavoured/ instant tea/ chai tea/ tea drink) rather than generic black tea marketed in bulk; ii. Raise awareness among producers and exporters on limiting the volume of export through 'PAC'

MAIN ISSUES/ PROBLEMS	POLICY INSTRUMENT	OBJECTIVES	STRATEGIES
iii. Shifting 'orthodox tea' to 'CTC'	iii. Policy on establishing a 'Regional Specialization Production Drive'	• To promote the establishment of contract marketing ventures with the end user (demand driven tea products)	i. Develop forward marketing ventures to minimize production, market and price risks
iv. Reducing market share in the traditional Middle Eastern markets for the Sri Lankan tea	iv. Market 'diversification policy' v. Product diversification policy (shifting black tea to green tea)	• To increase market share in the 'Middle Eastern Markets'. • To find new markets from the other regions	i. Identify the largest buyer within the Middle Eastern Market and initiate an aggressive promotional campaign; ii. Expand the tea trade into other countries through identifying new markets within the same region; iii. Find new markets within the East Asian region
v. Blending/ mixing low quality tea with 'pure Sri Lankan tea'	vi. Strengthening a brand promotion drive	• To promote target products by building brand loyalty among consumers	i. Devise mechanisms for brand promotion; ii. Increase the share of grants through the SLTB for brand promotion; iii. Strengthen the regulations on import of tea
vi. Lack of policy analysis and marketing intelligence relevant to the tea market	vii. Establishment of a Marketing Policy and Intelligence Unit (MPIU) for tea	• To collect, analyse and disseminate timely pertinent market information to the target clients – producers, brokers, exporters, and others • To analyse the likely impacts of policy changes considering dynamic environment in the domestic and global markets • To formulate conducive policies, strategies, and operational options to maintain sustainability in the tea industry;	i. Establish the MPIU within the MPI/SLTB in collaboration with the TASL; ii, Recruit competent officials with knowledge of International Economics, Marketing, and Marketing Intelligence, (preferably with MSc or PhD with experience); iii. Device a target oriented dissemination process; iv. Evolve an annual performance evaluation process of the MPIU

3.5 Investment Plan

In line with the proposed policy framework in the tea sub sector, the following financial investment plan is designed, considering the global and regional dynamic needs to facilitate the take- off of the industry (Table 1).

Table 1: Investment Plan for the Development of Tea Sector (2007-2016) **(Rs. Million)**

Cost Components	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	TOTAL
Field Development											
1. Infilling	**142.5**	**298**	**381.5**	**189.5**	**113.5**	**37.5**	**37.5**	**37.5**	**37.5**	**37.5**	**1,313**
Small Holder sector	22.5	30	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	
Corporate sector	120	268	344	152	76						
2.Replanting	**3541.5**	**4475**	**5064.5**	**5555**	**5375**	**5375**	**5375**	**5375**	**5375**	**5375**	**50,886**
Small Holder sector	2191.5	2060	2244.5	2555	2375	2375	2375	2375	2375	2375	
Corporate sector	1350	2415	2820	3000	3000	3000	3000	3000	3000	3000	
3. Diversification	**222.5**	**385**	**410**	**410**	**410**	**535**	**560**	**560**	**560**	**560**	**4,613**
Small Holder sector	35	35	35	35	35	35	35	35	35	35	
Corporate sector	125	275	300	300	300	425	450	450	450	450	
JEDB +SLSPC	62.5	75	75	75	75	75	75	75	75	75	
a. Total Investment on Field Development	**3,907**	**5,158**	**5,856**	**6,155**	**5,899**	**5,948**	**5,973**	**5,973**	**5,973**	**5,973**	**56,811**
Small Holder sector	2249	2125	2317	2627.5	2447.5	2447.5	2447.5	2447.5	2447.5	2447.5	
Corporate sector	1595	2958	3464	3452	3376	3425	3450	3450	3450	3450	
b. Factory Development & Quality Certification	**2450**	**820**	**100**	**110**	**121**	**133**	**146**	**161**	**177**	**195**	**4,414**
c. Human Resource Development	**250**	**275**	**303**	**333**	**366**	**403**	**443**	**487**	**536**	**589**	**3,984**
d. R&D and Technology Transfer	**325**	**358**	**393**	**433**	**476**	**523**	**576**	**633**	**697**	**766**	**5,180**
e. Marketing and Promotion	**400**	**500**	**625**	**781**	**977**	**1221**	**1526**	**1907**	**2384**	**2980**	**13,301**
TOTAL EXPECTED INVESTMENT	**7,332**	**7,111**	**7,277**	**7,811**	**7,838**	**8,227**	**8,663**	**9,161**	**9,766**	**10,503**	**83,690**

a. Expected Gains through the Proposed Policy Mix

The major expected gains through new policy mix proposed in the tea sub-sector are as follows (Table 2):

Table 2: Expected Gains (2007-2016)

Policy Option	Investment (Rs.)	Expected gains	Value of the Gains/year (Rs. million)	Value of the Total Expected Gains (Rs million.)
1.Investment Policy				
• Field Development	• Rs 56.8 billion on replanting, infilling	• Improvement in Production from 318 - 340 mn kg/year	3946	39455
		• Release of 36000 ha of lands from tea cultivation for diversification		
• R&D	• Rs 5.1 billion	• Improvement in Land Productivity from 1655 – 2057 kg/ha/year		
• HRD	• Rs 3.9 billion	• Building new skills and empowerment of the workforce		
2. Land Use Policy				
• Rs 5 billion on diversification of 39700 ha into:	• Agro-forestry -Timber - maintaining available 4000 ha and cultivation of another 6000 ha	• Selling high value Timber within 10-15 years		#
	• Fuel wood - maintaining of available 15,000 ha and harvesting annually on replacement basis	• Cost saving in the tea sector by replacing thermal energy requirement	6250	62500
		• selling fuel wood to the other sectors	2200	22000
	• Energy cultivation - in 6000 ha	• In terms of energy and fertilizer replacement	30	300
	• Rubber - cultivation in 12500 ha	• In terms of growing natural rubber in mid and low country regions	##	##
	• Dairy cattle management – 5000 ha	• extra income in terms of fresh milk production	600	6000

Policy Option	Investment (Rs.)	Expected gains	Value of the Gains/year (Rs. million)	Value of the Total Expected Gains (Rs million.)
	• Horticulture/home gardens/Controlled Agriculture	• extra income in terms of production of fruits and vegetables	250	2500
	• Eco –Tourism (5200 ha)	• extra income in terms of tourism	350	3500
	• Thatch banks (5000 ha)	• Improvement in field productivity of tea lands		-
3. Factory Development & Quality Certification	• 4.4 billion	• Ensure increased future market share		-
4. Marketing & Promotion	• 13.3 billion	• Ensure future market share and increase average price		
		○ From 2 to 4 $/kg	15033	150330
		• Increase value added tea production from 36% to 65%	38077	380770
Value of Expected Aggregate Gains (Rs. Million)			**66,736**	**667,355**

The value of expected gains from the Agro-forestry sector will commence 15-20 years after planting of the forestry plantations.

Gains from land use changes – particularly new planting of rubber will not be estimated through tea sector to avoid double counting. The value of such gains is estimated through the rubber sector.

Table 3: Investment on Field Development of Tea

Components	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
A. Replanting											
i. Small Holder Sector											
• Extent	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
• Cost ***(Rs.mn)***	***2191.5***	***2060***	***2244.5***	***2555***	***2375***	***2375***	***2375***	***2375***	***2375***	***2375***	***23301***
ii. Corporate sector											
• Extent	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
• Cost (Rs.mn)	***1350***	***2415***	***2820***	***3000***	***3000***	***3000***	***3000***	***3000***	***3000***	***3000***	
Sub Total	***3541.5***	***4475***	***5064.5***	***5555***	***5375***	***5375***	***5375***	***5375***	***5375***	***5375***	***50886***
B. Infilling											
i. Small Holder Sector											
• No of Plants	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	
• Cost(Rs.000/ha)	22,500,000	30,000,000	37,500,000	37,500,000	37,500,000	37,500,000	37,500,000	37,500,000	37,500,000	37,500,000	
• Cost ***(Rs.mn)***	***22.5***	***30***	***37.5***	***37.5***	***37.5***	***37.5***	***37.5***	***37.5***	***37.5***	***37.5***	
ii. Corporate sector											
• No of Plants	5000000	9500000	9500000								
• Cost (Rs.mn)	***120***	***268***	***344***	***152***	***76***						
Sub Total	***142.5***	***298***	***381.5***	***189.5***	***113.5***	***37.5***	***37.5***	***37.5***	***37.5***	***37.5***	***1312.5***
C. Diversification	***222.5***	***385***	***410***	***410***	***410***	***535***	***560***	***560***	***560***	***560***	***4612.5***
i. Small Holder Sector											
Extent	700	700	700	700	700	700	700	700	700	700	
Cost (Rs.mn)	***35***	***35***	***35***	***35***	***35***	***35***	***35***	***35***	***35***	***35***	
ii.Corporate sector											
Extent	1000	2000	2000	2000	2000	3000	3000	3000	3000	3000	
Cost (Rs.mn)	***125***	***275***	***300***	***300***	***300***	***425***	***450***	***450***	***450***	***450***	
iii. JEDB &SLSPC - Extent	500	500	500	500	500	500	500	500	500	500	
Cost (Rs.mn)	***62.5***	***75***	***75***	***75***	***75***	***75***	***75***	***75***	***75***	***75***	
TOTAL	**3907**	**5158**	**5856**	**6155**	**5899**	**5948**	**5973**	**5973**	**5973**	**5973**	**56,811**

The expected output target and annual changes in tea extent, production and land productivity in line with the proposed policy mix in the tea sub-sector is explained in Table 4 and 5 below.

Table 4: Expected Output Target for the Tea Industry (2006-2016)

Components	Unit	2005	2016	% Change
Extent cultivation	'000 Ha	222	176	-20
Extent in bearing	'000 Ha	204	170	-17
Production	Mn kg	318	340	7
Land Productivity	Kg /ha/year	1655	2057	24
Exports in bulk	Mn kg	185	113	-39
Earnings from bulk tea export	Rs.Mn	37,000	45,200	22
Exports in value added form	Mn.kg	124	210	69
Earnings from value added tea export	Rs. Mn	44, 481	125,970	183
Total Export	Mn.kg	309	323	4.5
Total export earnings	Rs.Mn.	81,481	171,170	111

Table 5: Expected Annual Changes of National Tea Area, Production[3] and Productivity[4]

Year	Tea area in Bearing (ha)	% Change	Tea Production (mn kg)	% Change	Land Productivity	% Change
2007	198,057		326.4		1,655	
2008	195,557	-1.3	327.8	0.4	1,676	1.3
2009	192,057	-1.8	332.0	1.3	1,729	3.2
2010	189,557	-1.3	339.3	2.2	1,790	3.5
2011	187,057	-1.3	349.2	2.9	1,867	4.3
2012	183,557	-1.9	352.6	1.0	1,921	2.9
2013	180,057	-1.9	352.5	-0.03	1,958	1.9
2014	176,557	-1.9	351.9	-0.2	1,993	1.8
2015	173,057	-2	350.6	-0.37	2,026	1.7
2016	169,557	-2	348.7	--0.5	2,057	1.5

[3] National Tea area and production is computed form the information given for the corporate sector (MPI, Statistical Pocket Book ,2006) and for the smallholder sector (Census of tea smallholdings, TSHDA, 2005)

[4] Land Productivity was computed by using area weighted average for the corporate, the small holder and state sectors (SLSPC, JEDB etc.), considering the bearing extent in each sub-sector.

4. Policy Mix on the Rubber Sub – Sector

4.1 Introduction

As one of the tradable products in Sri Lanka, rubber is catering to the needs of the global markets. Rubber plantations in Sri Lanka peaked in 1978 with 202,000 hectares producing 165,000 Metric Tons. A dramatic decline in prices owing to competition from synthetic rubber has led to reduced level of extent. The current extent is 116,471 hectares (Plantation Sector Statistical Pocket Book-2006), of which 43 per cent is owned by smallholders (<8 ha). However, the rubber product industry in the country has recorded a remarkable development and at present 70% of the natural rubber (NR) production is used locally in the local rubber manufacturing and value addition industries. Rubber production continued to decline up to 2002, mostly due to unfavourable international prices and low productivity. Nevertheless, with the economic recovery in the Asia/Pacific Region, the NR prices are becoming very attractive for investment. Growing of rubber coupled with competing parallel commercial crops provides the ideal combination to assure the sustainability of the sub-sector.

4.2 Present Status of the Rubber Sub-sector

The present status of the Sri Lankan rubber sub-sector is specified below, based on MPI (2006).

- Total Production - 104,352 MT
- Total Extent - 111,681 (Ha)
- Average Colombo Auction Price# - Rs 138/kg (2005)
- Contribution to the GDP - 0.4% (2005)
- Rubber as a percentage of agricultural exports - 70%
- Employed Workforce – Rubber Industry - 200,000
- Employed Workforce – Rubber based Value added industries – 30000
- Land Productivity (Average) - 1171kg/ha (In all Elevations)
- Rubber Sector - Growth Rate - (-) 1.6% (Average-1980-2005);

Source: MPI, (2006)

In the year 2005, export of rubber products and raw rubber earned a revenue equivalent to Rs. 39,836 million and Rs. 4,694 million respectively. In the year 2005, Sri Lanka has imported 10,305 MT of NR with a value of Rs. 2,885 million for value addition (Table 1).

Table 1: Rubber Sub-Sector: Exports, Imports and Domestic Consumption (2005)

Items/Components	Quantity (mt)	Value (Rs.mn)
Raw rubber-exports	31,633	4,694
Rubber Products-exports	51,849	39,836
Domestic Consumption (20%)	20,870	7,722
Imports of NR	10,305	(1,331)
Wood based products (Table 2G)		3,008
Total (*GDP in 2005=2,098,323 mn)*	104,352	53,929

Source: Plantation Statistical Pocket Book – 2006 & Rubber Industry Cluster Report 2002

Note: Domestic product consumption was estimated as 250% of FOB raw rubber (Rs. 370/kg)

4.3 Challenges and Opportunities

The present gap (deficit) between demand and supply of NR expected to be continuing feature and it is projected by the International Rubber Organization, that even by the year 2020, world NR demand will exceed the supply, thus leading to an increasing trend in the future rubber prices. Local industry has begun to import rubber since early 1990s and during 2005, 10,305 mt of NR were imported. Furthermore, world Synthetic Rubber production and prices are affected by the fluctuating crude oil prices, thus increasing the cost of production of synthetic rubber. To remain competitive, Sri Lanka has to maintain the critical mass of raw rubber required by the industry (local & export demand), expected to be amounting to at least 180,000 mt by 2016, with a land productivity of 1,800 kg/ha.

Seventy percent of the total rubber production is locally consumed by the value addition industries. The Sri Lankan rubber industry has shown extremely rapid growth in products-manufacture and export activities over the last decade. Compounded annual growth rate (CAGR) of the rubber sector has shown a remarkable increase in the recent past and it shows a increase of 9.8% between the period 1995 and 2005, 23% between 2001-2005 and 47% increase during 2004-2005 period. The decline in the CAGR of the Raw Rubber export value reflects that there was continuous improvement in the local consumption of NR.

In general, every two mt of raw rubber provides employment to one person and each kilogram of rubber converted to products earns over US$ 4.00 in net foreign exchange, depending on the product. Following the escalation of petroleum prices, current rubber prices are very encouraging and rubber records the highest profit among the plantation crops. According to the predictions of the International Rubber Study Group, world demand for natural rubber is likely to double during the next 2 decades to a figure of 36 million tons. Thus, rubber production is likely to be a highly viable enterprise in the immediate future.

4.4 Objectives of the Policy Mix

The NR industry needs to be supported by a national policy to ensure its long term sustainability and to meet the international and domestic growing demand. The policy for the rubber sub sector will consider all aspects relevant to planting, harvesting, processing, manufacturing and marketing. The main objectives of the policy mix are as follows:

- *Achieving competitiveness through improving productivity and quality,*
- *Reducing costs of production and obtaining high NSA;*
- *Meeting the growing international and domestic demand;*
- *Increase the profitability and thereby ensuring the sustainability of the rubber sub sector;*
- *Minimizing the adverse effects on the environment in order to ensure environmental sustainability;*

The Mission of the rubber sub-sector is: 'To enhance the productivity, profitability and sustainability of the rubber industry'.

TABLE 2: POLICY MIX – RUBBER SUB SECTOR

	Main Issues/ Problems		**Policy Instruments**	**Objectives**	**Strategies**
I. R & D and Extension Policy					
i.	Low productivity	I.	Targeted R&D policy package;	• To develop suitable high yielding clones; • To develop new technological innovations for crop production and management; • To introduce new technology for rubber and rubber wood based products; • To liberalize the authority of the RRI	I. Conduct a need assessment of R&D through a panel of experts; ii. Develop R&D projects to produce high yielding clones/ varieties and come up with suitable new recommendations for rubber production iii. Upgrade current facilities at research institutions on technological development aspects of rubber iv. Permit RRI to undertake contract and client based research
ii.	Insufficient adoption of recommended agronomic practices	I.	Demand driven Extension policy	• To establish strong research/ extension linkages • To effectively transfer the tested technology and facilitate necessary requirements to cater to the industry needs	i. Establish extension/ advisory services; ii. Develop a data base for growers to smoothen subsidy administration & extension iii. Facilitate organizations of producer socities for effective group action for the small holder sector

	Main Issues/ Problems		Policy Instruments	Objectives	Strategies
II. HRD Policy					
i.	Shortage of skilled tappers & resource personnel	I.	HRD policy	• To promote capacity building, attitude changes and empowerment by opening opportunities.	i. Conduct programmes on tapper training annually covering major rubber growing districts. ii. Develop a programme for training/capacity building among small-holder farmers through RPCs iii. Conduct programs on raw rubber processing technology & recommended agronomic practices for rubber. iv. Initiate a systematic training programme for capacity building of the resource personnel v. Recognize workers' services by re-designating the job (eg. Changing 'Tapper' status as 'Field Assistant') and also by providing appropriate uniforms & productivity- based incentives;
III. Rubber Production Policy					
i.	Low production of rubber	i	Medium and Long-term Production Enhancement Policy	• To increase the production to meet the domestic and global demand.	i. Identify potential areas for new planting ii. Develop and Implement programmes for new planting with state assistance iii. Facilitate re-planting at the required rate of 3% per annum through a 10 year program supported by suitable incentives (CESS etc.). iv. Facilitate the establishment and maintenance of nurseries (public & private) to meet the demand for certified planting materials of suitable high yielding verities. v. Increase average stand (plant density) up to 500 trees/ ha; from 300 trees/ha. to increase the production through the infilling campaign in the first three years
		ii.	Short-term Production Enhancement Policy	• To increase the production in the short-term	i. Promote the application of developed latex stimulants; ii. Promote the application of rain guards;

	Main Issues/ Problems		Policy Instruments	Objectives	Strategies
IV.	**Processing Policy**				
i.	Lack of Quality improvement and standards in primary processing	i.	Quality Improvement Policy	• To Improve the quality and standards of processing in keeping with international trends • To Produce more grade 1 RSS • To improve quality in fluid latex supplies to latex centrifuging factories • To promote value added timber based products & exports	i. Establish a laboratory for quality certification ii. Modernize the processing sector iii. Devise a technical data sheet for RSS based on consumer requirements iv. Develop a programme to upgrade & certify collecting centers v. Provide necessary assistance to existing wood based manufactures for upgrading & capacity expansion
V. Institutional Reform Policy					
i.	High cost of extension delivery and advisory services	i.	Institutional reform policy	• To strengthen the extension services and avoid duplications	i. Design demand driven extension programmes on cost recovery basis; ii. Assign extension/ advisory services to one state institution in order to avoid unnecessary duplication of work
ii.	Inefficiency in the 'Turusaviya Fund'	ii.	Policy on strengthening of the Thurusaviya" Fund	• Improve performance of "Thurusaviya" Fund and Commence commercial activities	i. Develop & implement a 5- year Strategic Business Development Plan (based on mandated activities)
iii.	Non-rationalize cess investment	iii.	Policy on Cess Investment	• To allocate funds to industry development and R&D programmes	i. Implement a targeted incentive/subsidy scheme ii. Provide Cess funds to institutes on programme budget system iii. Establish a subsidy administration system through proposed PAC in the MPI (with a data base management system)

	Main Issues/ Problems		Policy Instruments	Objectives	Strategies
VI. Investment Policy					
i.	Necessity of investment	i	Investment policy	• To build investment opportunities	i. Establish a revolving Fund to meet the credit needs of the RPCs and small holding sector
VI. Rubber Marketing Policy					
i.	Dearth of marketing facilities and integration options	i.	Production & market integration policy	• To develop linkages between Group Processing Centers (GPC) and product manufacturers • To assist industrialists, investors & policy makers • To strengthen grass-root level organisations	i. Establish a Joint venture "Lankaprene Marketing Ltd.' and Promote premium Sri Lankan latex crepe rubber under the brand "Lankaprene" in US & EU markets ii. Establish a Market Research and Industry Information Center for collecting, analysing and disseminating market information on rubber/rubber products iii. Organise grass-root level societies in major rubber growing districts iv. Form & strengthen the "Thurusaviya" Societies
VII. Environmental Policy					
i.	Environmental degradation through affluent from rubber processing	i.	Environmental policy on effluent treatment	• To encourage rubber-based producers to apply environmentally friendly technology for effluent treatment plants.	i. Install effluent treatment plants to treat the effluent generated from rubber processing operations. ii. Make compulsory for rubber and rubber based production factories to apply measures on effluent treatment
ii	Gaining environmental benefits	i	Policy on carbon trading	• To formulate carbon trading mechanisms	iii. Develop a programme of carbon trading through new planting of rubber

4.5 Investment Plan (2007-2016)

In line with the proposed policy framework for the rubber sub-sector, the following investment plan was designed, considering the global and regional dynamic needs in the industry (Table 2A).

Table 2A: Investment Plan for the Development of Rubber Sector (2007-2016) (Rs.Million)												
	Cost Component	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
1	**Rubber Production & Productivity Policy**											
	***a. Re-Planting* for Improving productivity & production**											
	i. Identifying potential areas for planting	10	7	5	4	4						**30**
	ii. Maintaining a 3% replanting rate	874	892	913	934	956	982	1,012	1,046	1,087	1,132	**9,828**
	b. New Planting											
	iii. Implementation of new planting	625	688	688	750	875	1,000	1,125	1,375	1,500	1,500	**10,125**
	iv. Interest rebate for loan scheme	6	14	27	45	68	86	105	122	137	150	**760**
	v. Nursery development & certification	18	14	9	9	9	9	10	10	11	11	**109**
	vi. Application of latex stimulants	10	10	11	11	12	12	13	13	14	14	**118**
	Sub Total	**1,542**	**1,624**	**1,652**	**1,752**	**1,924**	**2,090**	**2,265**	**2,566**	**2,749**	**2,807**	**20,970**
	Replanting Extent (ha)	***3,494***	***3,569***	***3,652***	***3,734***	***3,824***	***3,929***	***4,049***	***4,184***	***4,349***	***4,529***	***39,313***
	New Planting extent (ha)	***2,500***	***2,750***	***2,750***	***3,000***	***3,500***	***4,000***	***4,500***	***5,500***	***6,000***	***6,000***	***40,500***
	Smallholder sector (63%)	972	1,023	1,040	1,104	1,212	1,317	1,427	1,617	1,732	1,768	**13,211**
	Corporate sector (37%)	571	601	611	648	712	773	838	950	1,017	1,039	**7,759**
	c. Insufficient adaptation of recommended agronomic practices											
	i. Promotion of rain guard application	100	100	100	100	100	100	100	100	100	100	**1,000**
	ii. Soil and moisture conservation	27	28	29	29	30	31	32	33	34	35	**309**
	iii. Rational fertilizer application	584	604	624	644	665	687	746	770	793	818	**6,935**
	iv. Improving subsidy administration	10	5	5	5	5	5	5	5	5	5	**55**
	Sub Total	**721**	**737**	**758**	**778**	**800**	**823**	**883**	**908**	**932**	**958**	**8,299**
	Smallholder sector (66%)	476	486	500	514	528	543	583	599	615	632	**5,477**
	Corporate sector (34%)	245	251	258	265	272	280	300	309	317	326	**2,822**

2	**Quality Improvement in Primary Processing**											
	i. Increase crepe rubber production	140	140	140	140	140	140	126	126	126	126	1,344
	ii. Production of RSS-Grade1	3	3	4	4	6	8	8	8	8	8	60
	iii. Quality improvement in field latex	2	3	3	4	5	5	3				25
	iv. Promote value added timber based production	50	150	150	150	150	100	150	100			1,000
	Sub Total	**195**	**296**	**297**	**298**	**301**	**253**	**287**	**234**	**134**	**134**	**2,429**
	Smallholders (10%)	20	30	30	30	30	25	29	23	13	13	243
	Corporate sector (90%)	176	266	267	268	271	228	258	211	121	121	2,186
3	**Rubber Marketing Policy**											
	3.1 Product and Market Integration											
	i. Promote "Lankaprene" in the EU & the USA	20	270	5	255							550
	iI. Provide market information	25										25
	iii. Strengthening grassroots level organizations	2	1	1	1	1	0.5	0.5				7
	Sub Total	**47**	**271**	**6**	**256**	**1**	**0.5**	**0.5**				**582**
	Smallholders (2%)	6	1	1	1	1	0.5	0.5				11
	Corporate sector (98%)	41	270	5	255							571
4	**HRD Policy**											
	I. Development of a HRD programme	10	10	10	10	10	10	10	10	10	10	100
	ii. Programme for training/capacity building.	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	25
	iii. Training of resource personnel	10	10	10	10	5	5	5	5	5	5	70
	Sub Total	**22.5**	**22.5**	**22.5**	**22.5**	**17.5**	**17.5**	**17.5**	**17.5**	**17.5**	**17.5**	**195**
5	**R & D and Extension Policy**											
	i. Plant productivity enhancement	30	30	30	30	30	30	30	30	30	30	300
	ii. Developing R & D & testing capabilities	100	150	100	50	50	50	50	50	50	50	700
	iii. Diffusion of new technology	20	20	20	20	20	20	20	20	20	20	200
	Sub Total	**150**	**200**	**150**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**1,200**
	Smallholders (25%)	38	50	38	25	25	25	25	25	25	25	300
	Corporate sector (75%)	113	150	113	75	75	75	75	75	75	75	900
6	**Institutional Reforms**											
	6.1 High cost of service delivery	5	2									7

	6.2 Improve performance in Thurusaviya Programme	20	20	5	1	1	1	1	1	1	1	52
	6.3 Refocusing Cess investment	100	100	100	100	75	75	75	75	75	75	850
	Sub Total	**125**	**122**	**105**	**101**	**76**	**76**	**76**	**76**	**76**	**76**	**909**
7	**Environmental Protection**	30	30	30	30	30	30	30	30	30	30	300
	Sub Total	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**300**
	Corporate sector (100%)	30	30	30	30	30	30	30	30	30	30	300
	Total Investment (Rs. million)	**2,833**	**3,303**	**3,020**	**3,338**	**3,249**	**3,390**	**3,659**	**3,932**	**4,038**	**4,123**	**34,883**

4.6 Expected Gains Through the Proposed Policy Mix

The major expected gains through the new policy mix proposed in the rubber sub-sector (Table 2B) are as follows:

Table 2B: Value of Expected Gains Through the Proposed Policy Mix (2007-2016)

Policy Option	Investment (Rs.)	Expected Gains	Value of the Gains/year (Rs. million)	Value of the Gains/after 10 year period (Rs million.)
1. Production & productivity policy	Rs. 21 billion on productivity & production improvement	• Improvement in production (from 104,352 mt to 215,750 mt)		
	• Rs. 8.3 billion on the adaptation of recommended agronomic practices	• Improvement in field Productivity (from 1,171 – 1,800 kg/ha/year)	73,353	733,533
		• Generation of employment opportunities (from 200,000 to 250,000)		
2. Quality improvement in primary processing	• Rs. 2.4 billion on primary processing including timber based products	• Exporting 10,000 mt of "Lakprene" quality crape • Production of RSS – 1 grade (mt) • Increased timber and products quality	3,131 4,269	31,312 42,687
3. Rubber marketing	• Rs.0.6 billion on marketing integration	Ensuring increased future market share		
4. Production of HRD	• Rs. 0.2 billion on HRD	• Capacity building and improved human capital		
5. R & D and Extension	• Rs. 1.2 billion on R & D and Extension	• Creation of demand driven extension		
6. Institutional reforms	• Rs. 0.9 billion on institutional reforms	• Improved decision making in the sector		
7. Environmental protection	• Rs. 0.3 billion on environmental protection	• Establish environmental friendly effluent treatment plat		
Aggregate Total	• **Rs. 34.9 billion**			
Value of expected aggregate gains (Details are given in Table 2G) (Rs. Million)			**80,753**	**807,532**

4.7 Expected Output Targets

The following are the expected output targets in the rubber-sub sector through the proposed policy mix during the period from 2007 to 2016 (Table 2C).

Table 2C: Expected Output Targets from the Rubber Industry (2005-2016)

Components	Unit	2005	2016	% Change
Extent –Cultivation	**Ha**	**116,471**	**157,712**	35
Extent-tapping	**Ha**	**89,114**	**119,861**	35
Production	**Mt**	**104,352**	**215,750**	107
Exports	**Mt**	**31,633**	**35,750**	13
Domestic Consumption	**Mt**	**72,719**	**180,000**	148
Export earnings-Raw rubber	**Rs mn**	**4,694**	**10,955**	133
Rubber products exports	**Rs mn**	**39,836**	**124,640**	213
Total Export earnings	**Rs mn**	**44,530**	**135,595**	205
Timber based products	**Rs mn**	**3,008**	**16,295**	442
Land Productivity	**kg/ha/year**	**1,171**	**1,800**	54

(US $=SL RS 103.35 - buying rate as at 04.10.2006)

Table 2D: Replanting and New Planting of Rubber (ha)

Year	New Planting Extent	Replanting Ext. (3%)	.05% losses Devt act.	Total extent	Net extent	New+Re planting extent	Total Plants Requirement
2006	2,000	3,200		116,471	116,471	5,200	2,860,000
2007	2,500	3,494	582	118,971	118,389	5,994	3,296,772
2008	2,750	3,569	595	121,721	121,126	6,319	3,475,522
2009	2,750	3,652	609	124,471	123,862	6,402	3,520,897
2010	3,000	3,734	622	127,471	126,849	6,734	3,703,772
2011	3,500	3,824	637	130,971	130,334	7,324	4,028,272
2012	4,000	3,929	655	134,971	134,316	7,929	4,361,022
2013	4,500	4,049	675	139,471	138,796	8,549	4,702,022
2014	5,500	4,184	697	144,971	144,274	9,684	5,326,272
2015	6,000	4,349	725	150,971	150,246	10,349	5,692,022
2016	6,000	4,529	755	156,971	156,216	10,529	5,791,022
Total	**42,500**	**42,514**	**6,552**	**158,471**	**157,712**		

New Planting (ha)

IFAD assistance (Mon)	5,000
RDD (Mon)	25,000
RDD (Ham)	2,000
RDD (traditional)	8,000

Average yield per ha from new planting and replanting = 1800kg /ha/ year

Average yield per ha from old planting = 1264kg /ha/ year

Table 2E: Rubber Production

Year	Total Extent (ha)	*Bearing Extent ha (76 %)	Productivity** kg/ha/yr	Total Production mt	Domestic Consumption mt.	Exports mt. (Raw rubber)	Raw rubber value of domestic consumption (US$.mn)	Raw rubber value of export(US$.mn)	Raw rubber value US$/Kg#	Value of finished product export US$ mn #	Value of finished product export US$/Kg #
2005	116,050		1,171	104,352	72,719	31,633	102	44.3	1.40	313	4.3
2006	116,471	88,518	1,200	106,222	77,359	28,863	112	41.9	1.45	340	4.4
2007	118,139	89,786	1,230	110,436	82,000	28,436	123	42.7	1.50	369	4.5
2008	120,627	91,677	1,260	115,512	89,000	26,512	138	41.1	1.55	409	4.6
2009	123,615	93,947	1,290	121,192	98,000	23,192	157	37.1	1.60	461	4.7
2010	127,100	96,596	1,400	135,234	107,000	28,234	177	46.6	1.65	514	4.8
2011	130,832	99,432	1,450	144,177	116,000	28,177	197	47.9	1.70	568	4.9
2012	134,814	102,459	1,500	153,688	125,000	28,688	219	50.2	1.75	625	5.0
2013	139,294	105,863	1,630	172,557	144,000	28,557	259	51.4	1.80	734	5.1
2014	144,771	110,026	1,680	184,844	154,000	30,844	285	57.1	1.85	801	5.2
2015	150,994	114,755	1,750	200,822	175,000	25,822	332	49.1	1.90	926	5.3
2016	157,712	119,861	1,800	215,750	180,000	35,750	351	69.7	1.95	972	5.4

* Yielding extent estimated based on average re-planting rate and time taken to maturity;

** Productivity expected to be increased up to 1500 kg/ha/yr in 2016, introducing high yielding clones, simultaneously low yielding clones will disappear from the system;

- Export volume estimated based on 2005 export volume excluding raw rubber imports;
- Average raw rubber value = (Price of L.Cr.1+ Sc.Cr.2X+ RSS2) / 3;
- Value of domestic consumed rubber based on raw rubber export rates;
- # Export value of finished product calculation - 2005 = Domestic consumption(72,719 mt) + Imports (18,885 mt) = 91,604 mt
- Finished product value (Rs/kg) = Total finished product value (39,836.3/91,604) = Rs. 435/kg
- # Domestic consumption of Finished product value has been treated as Finished product export value;
- # Considering 2005 as base year:

Total production (mt)	=	104,352	Raw rubber value	=	Rs 4693.5 M
Exports (mt)	=	31,633	Finished product	=	Rs 39,836.3 M
Domestic consumption (mt)	=	72,719	Total	=	Rs 44529.8 M
Imports (mt)	=	18,885	Value of finished product	=	Rs. 435/kg
Total (mt)	=	91,604			

- [(US$ = SLRs.103.35 (buying rate 04.10.2006)]

Table 2F: Plant Production & Supply

Year	RDD Nurseries							RDD Total	Other Nurseries			Tota
	Welikadamulla	Meerigama	Egal-oya	Gurugoda	Karapinche	Monaragala	Katuwana		Wellassa	Private	RPCs	
2006	425,000	319,000	250,000	200,000	180,000	400,000	0	1,774,000	110,000	100,000	1,241,032	3,22
2007	450,000	325,000	250,000	200,000	200,000	450,000	0	1,875,000	150,000	150,000	1,245,000	3,42
2008	450,000	325,000	250,000	200,000	200,000	450,000		1,875,000	200,000	200,000	1,245,000	3,52
2009	485,000	350,000	250,000	200,000	200,000	475,000	15,000	1,975,000	200,000	250,000	1,245,000	3,67
2010	500,000	350,000	250,000	200,000	200,000	475,000	30,000	2,005,000	300,000	300,000	1,245,000	3,85
2011	500,000	350,000	300,000	250,000	200,000	475,000	75,000	2,050,000	350,000	400,000	1,245,000	4,04
2012	500,000	375,000	325,000	250,000	200,000	480,000	75,000	2,230,000	450,000	500,000	1,300,000	4,48
2013	500,000	400,000	350,000	250,000	200,000	480,000	75,000	2,230,000	450,000	1,110,000	1,300,000	5,09
2014	525,000	400,000	375,000	250,000	200,000	500,000	75,000	2,325,000	500,000	1,300,000	1,350,000	5,47
2015	525,000	400,000	400,000	300,000	200,000	500,000	75,000	2,395,000	550,000	1,400,000	1,350,000	5,69
2016	525,000	400,000	400,000	350,000	200,000	500,000	75,000	2,450,000	550,000	1,400,000	1,400,000	5,80

Table 2G: Timber Production

Year	Total Ext. (ha)	Removable Extent (ha)	Timber Vol. m3	Value (Rs. Mn)		
				Tree	Untreated timber	Treated Timber
2006	116,471	3,494	1,002,815	1,468	17,610	60,169
2007	118,139	3,544	1,017,177	1,489	17,863	61,031
2008	120,627	3,619	1,038,598	1,520	18,239	62,316
2009	123,615	3,708	1,064,325	1,558	18,691	63,860
2010	127,100	3,813	1,094,331	1,601	19,218	65,660
2011	130,832	3,925	1,126,464	1,648	19,782	67,588
2012	134,814	4,044	1,160,749	1,699	20,384	69,645
2013	139,294	4,179	1,199,321	1,755	21,061	71,959
2014	144,771	4,343	1,246,478	1,824	21,889	74,789
2015	150,994	4,530	1,300,058	1,903	22,830	78,004
2016	157,712	4,731	1,357,900	1,987	23,846	81,474

Note: Annual Replanting rate 3%;
Average trees/ ha 350;
Average timber volume/tree 0.82 m^3 ;
Average price of a tree Rs.1200/-
Average price of a untreated timber Rs. 12,000/- per m^3

Table 2H: Expected Targets – Rubber Sub-Sector

Major Issues/Problems	Strategies Proposed	Expected Targets (2007- 2016)
1. Low Production of Rubber	i. New planting: • In traditional areas; • In non-traditional areas	 8,000 ha 34,500 ha
	ii. Maintain recommended (3%) annual replanting rate per annum. • By RPCs and the small holding sector	39,313 ha
	iii. Conduct a New planting programme of rubber to meet the growing demand of 215,750 mt in 2016	42,500 ha
	iv. Provide 50% interest subsidy through the Cess Fund for the medium sized holders (2-20 ha) through Commercial banks	60% of Rs 250,000/ha
	v. Produce of 100% certified rubber plants through developing nurseries in • 2007 • 2016	 3.3 mn 5.8 mn
	vi. Promote the application of developed latex stimulants	22,855 ha (expected productivity increase by 20%)
	vii.Promote the application of rain guards	5 Million per annum
	viii. Conserve soil & moisture levels through terracing with cover crop application in 60% total extent	110,121 ha
	ix. Provide fertilizer through credit incorporated in the plantation subsidy scheme;	137,652 ha (by 2015)
	x. Increase plant density per hectare	500 trees/ ha;

2. Lack of Quality improvement and standards in primary processing	i. Increase crepe rubber production (20,000 mt/year) through introduction of Technicl Standards in factories;	60 factories
	ii. Produce grade 1 (RSS) Ribbed Smoked Sheets by introduction of Technical standards • Establish processing units with standard facilities	13,750 mt per year 110 processing units
	iii. Establish certified collection centers to improve quality in fluid latex supplies to latex centrifuging factories	250 Centres
	iv. Promote value added timber based products & exports from Rs. 3,008 M to:	Rs. 16,295 M (2016)

Major Issues/ Problems	Proposed Strategies	Expected Targets (2007- 2016)
3. Dearth of marketing facilities and integration options	i. Link Group Processing Centres (GPCs) ii. Establish a Joint venture "Lankaprene Marketing Ltd " iii. Export through 'Lankaprene Marketing Ltd' iv. Promote premium Sri Lankan latex crepe rubber under the brand "Lankaprene" in US & EU markets v. Establish a Market Research and Industry Information Center; vi. Organise grass-root level organizations 'as Thurusaviya Societies' in major rubber growing districts;	60 Centres 10,000 mt per annum
4. Shortage of skilled tappers & resource personnel	i. Develop a HRD programme ii. Conduct Tapper Training programs per year iii. Conduct training programmes on processing technology & recommended agronomic practices; iv. Organize capacity building programmes: • Short term training Programmes; • Post Graduate training programmes	100 programmes/year; 50 programs per year 10 programmes/year 2 programmes/year
5. Low productivity	**I.** Develop R&D projects to produce high yielding clones/varieties; ii. Upgrade current facilities at research institutions on technological development aspects of rubber; iii. Establish the extension/ advisory services; iv. Develop a data base of growers to smoothen subsidy administration & extension	
6. Insufficient adoption	i. Establish strong research/ extension linkages	

of recommended agronomic practices	ii. Increase adaptive research to cater to the needs of smallholders iii. Assign extension to one state organisation iv. Recover part of the extension cost from beneficiaries v. Formulate the "Thurusaviya" Fund to generate 50% of recurrent funds vi. Commence commercial activities through 'Thurusaviya'; vii. Design a planting subsidy scheme for smallholders up to 2 ha viii. Make growers (>2ha) eligible for an interest rebate on relevant credit ix. Establish a Revolving Fund to meet the credit needs of the sub-sector	
7. Environmental protection activities to be put in place by all raw rubber factories	i. Establish rubber processing units with effluent treatment plants	60 rubber processing units with effluent treatment plants.

5. Policy Mix on the Sugar-sub Sector

5.1 Introduction

Sugar is an important sub-sector in the plantation economy of Sri Lanka. Based on per capita consumption of 31.6 kg (F.O.Licht, 2005) and population of 19.668 million (Central Bank of Sri Lanka, 2005), the present total domestic requirement of sugar is estimated at about 622,000 m/tones. The projected requirement by the year 2016, is estimated to be 693,400 tonnes. In 2005, domestic production was about 54,000 tonnes which was sufficient to meet less than 10% of the total requirement in the country. The maximum production achieved so far is 71,416 tonnes in 1995. In 2005, 418,000 tonnes of sugar have been imported costing nearly Rs 13.30 billion which amounted to 0.57% of the GNP (at current market prices) and 1.2% of the outlay on total imports and 6.8% that of the imported consumer goods (Central Bank of Sri Lanka, 2005), while accounting for nearly 41% of the total cost on imports of the three basic food commodities, rice, wheat flour and sugar.

In addition, importation of products which can be produced from sugarcane such as vinegar, alcohol, etc. costs nearly Rs. 5 billion annually. World sugar price has been moving up from 2004 and currently stands at about US$450/t and hence the out-flow of foreign exchange on sugar imports will significantly increase, resulting in a severe adverse impact on the country's balance of payments. In the existing far undeveloped situation, the local sugar industry does not make a significant contribution to the national income and employment generation, but if appropriately expanded, it has the potential to generate income and employment and uplift social and economic standards of the undeveloped and underdeveloped areas in the dry and intermediate zones of Sri Lanka, where there are no other means of sustainable alternate livelihoods for the rural folk.

Even though vaccum-pan sugar manufacture in Sri Lanka has been carried out for nearly a half a century, it has not been establish as a viable industry due to numerous reasons. The sugar industry has been in a state of contraction due to the closure of the two mills at Hingurana (2000 TCD) and Kantale (1200 TCD) after their privatization. Currently, only two sugar mills at Sevanagala and Pelwatte with a processing capacity of 1,250 TCD and 3,300 TCD respectively are functioning. Each mill has an alcohol production plant with a daily production capacity of 15,000 liters at Sevanagala and 30,000 liters at Pelwatte. Total processing capacity of the two sugar mills is 4,550 TCD and thus for a 200-day crushing season, a total of 910,000 tonnes of cane can be processed and at an average sugar recovery rate of 8.5%, 77,350 tonnes of sugar can be produced annually. Nearly 41,000 tonnes of molasses can also be produced (4.5% of cane weight) as a by-product which can be processed into about 10.3 million litres of alcohol (at 250l/t) annually. However, the current annual levels of production vary between 55,000-65,000 tonnes of sugar and 7-9 million litres of alcohol indicating that there is good scope for improvement, even with the existing processing capacities.

5.2 Major Development Issues

The sluggish status of the sugar industry has been due to a multitude of technical, management, economic, institutional, environmental and social factors and issues, that the sub-sector faces. Viz.

a) Low Sugarcane yields averaging at about 60 t/ha, the main limiting factor for cane yield being water availability;

b) Recovery rates have been low; averaging at about 8.4%, mainly due to the poor quality of cane (Pol % in cane is about 10-11%) and low level of processing efficiencies (below 78%).
c) Consequent low sugar yields averaging at about 5 t/ha which is far below that of corresponding levels realized in countries like India (7.3 t/ha) and Thailand (6.2 t/ha) (F.O.Licht, 2006).
d) Non-utilization of the full capacity of the mill capacities (mostly below 80 %) due to insufficient cane supplies and regular disruptions to mill operations. More often, mill capacity utilisation has been below 80%.
e) Alcohol yields have been low (about 250 l/t) mainly due to the use of inefficient yeast strains for the fermentation of molasses.
f) Smaller size of the Sri Lankan sugar mills coupled with the poor quality cane and low levels of processing efficiencies and capacity utilization has led to high cost of production which is currently about Rs 50-51/kg.
g) Ageing sugar mills which are more than 20 years old, requiring modernization to improve the efficiency in the sector.
h) Dwindling land area under sugar cane due to diversification into other competing crops such as rubber, coconut, paddy, banana, etc.
i) Majority of cane lands are small holdings; less than 1 ha in size and the income levels are hardly sufficient for the sustenance of farm families unless they have additional avenues of income. One hectare of sugarcane generates an income of about Rs 54,000 per year under irrigation and Rs18,000- 30,000 under rain fed conditions .
j) Sugarcane cultivators do not receive any assistance provided to other food crop sectors by the government such as free water, subsidized fertiliser, etc. This could lead to further reduction of sugar production and increased costs due to further reduction of mill capacity utilisation.
k) Scarcity of labour has become a serious problem for sugarcane production specially during harvesting periods. In addition, spread of diseases due to negligence of both sugar companies and cane growers has also become a serious threat to the development of the sugar industry in the country.
l) Product diversification of the Sri Lankan sugar industry has been minimal. Sugarcane has been primarily used for sugar manufacture while a small quantity has been processed into jaggery and syrup. The main by-product is alcohol produced from molasses.
m) There has been no proper pricing policy formulated for sugarcane, sugar and its by-products. Sugarcane has been paid on a weight basis which has no encouragement at all for the sugarcane growers to improve the sugar content in cane and the mills to improve processing efficiencies, with no appropriate division of proceeds of sugar and by-products.
n) Import tariff has been imposed on protecting the local producer and consumer.
o) The world market prices are on an upward trend and currently hover at around US$450/t. It has been forecast that high price levels will prevail for another few years (FAO, 2006). But downward movement should be expected according to changes in supply of and demand for sugar and alcohol in response to these price movements.
p) There have been no proper institutional arrangements for the development of the sugar industry in Sri Lanka. While the subject of

sugar is assigned to Ministry of Plantation Industries at present, with modifications in such assignment with the change of governments, the only Government body that has existed to cater to the specific needs of the sugar sub-sector is the Sugarcane Research Institute (SRI), which is also responsible for providing technical guidance for the sugar industry development. However, since the Sri Lanka Sugar Corporation (SLSC) does not exist any more, there has been no representation from the sugar manufacturers in the governance of the Institute. There is no Apex Body to oversee and facilitate the functions such as planning and implementation of sugar industry development, promotion of investment, administration of development funds, allocation of lands, fixing cane sugar and by-product prices, determining tax/tariff rates, licensing, arbitration in labour disputes, etc.

5.3 Policy Objectives

Building public-private partnerships in the development of the sugar sub-sector is required as the major thrust of the policy mix to achieve the following broad objectives:

i. Social and economic development of the under-developed areas in the dry and intermediate zones of Sri Lanka which will also facilitate uplifting of the living standards of the people in those areas.
ii. Increasing contribution to GDP and generation of employment opportunities by expansion of sugarcane production and diversification of the sugarcane industry with sugar, jaggery, syrup, vinegar, fruit-flavoured drinks, alcohol, electricity, fertilizer, animal feed, etc.
iii. Saving foreign exchange by applying import substitution industrialization (ISI) policy for sugar, alcohol and allied products;
iv. Assisting to ensure food and energy security in the country;
v. Stabilization of the domestic sugar price; and
vi. Improving processing efficiencies at mill level of the processing chain

5.4 Policy Mix

Based on the foregoing analysis on issues and problems relevant to the sugar industry of Sri Lanka, the following policy mix relevant to the sub sector is formulated:

Table 1: Policy Mix for the Sugar –Sub Sector

Main Issues/ Problems	Policy Instruments	Objectives	Strategies
I. Productivity and Production Policy			
i. Low productivity and production of sugar cane	i. Productivity and Production enhancement Policy	• To increase Productivity and Production	i. Replace the existing inferior sugarcane varieties with superior high-sugar cultivars; ii. improve processing efficiencies of mills; iii. Develop a pricing policy (based on high prices for sugar varieties with higher sugar content than for the presently cultivated inferior varieties) – Price discrimination; iv. Develop mechanisms to encourage mill owners and cane growers to undertake: • New planting/replanting with new superior varieties, • Adoption of disease control measures and improved management practices; and • Establishment of hot water treated nurseries to control diseases and small-scale machinery centers etc. v. Develop a targeted replanting/new planting of sugar cane programme in high potential growing areas;
II. Land Use Policy			
i. Diversification of sugar lands to other crops and fragmentation of sugar lands	ii. Land Policy	• To rationalize the land use in sugar cultivation	i) Ensure sufficient extent of land (ie. break-even land size) for each mill to meet its cane requirement to operate at its full capacity through out the year, while the cane holdings should be large enough to assure sufficient income for the growers; ii)Allocate bigger land holdings for individual growers

Main Issues/ Problems	Policy Instruments	Objectives	Strategies
III. Investment Policy			

i. Non-availability of incentives for investment in sugar and sugar product integration	i. Investment policy	• To rationalize the investment activities	i. Promote investment (Developing an incentive scheme) aimed at private investors for the establishment of: • New sugar mills, • Alcohol plants - distilleries, • Power generation plants and • Other processing industries for sugar -by products and • Expansion and modernization of the existing mills over an agreed period on par with the BOI incentives;
ii. Non-availability of sufficient finance for sugar sector development	i. Investment policy (to build financial capital)	• To assist building financial capital for the sugar sub-sector	ii. Establish a "Sugar Industry Development and Price Stabilization Fund" (under the proposed "Sugar Industry Development Act" to finance the proposed SIRDISL and to provide assistance to growers and millers; iii. Provide necessary funds from the proposed Plantation Fund;
iii. Insufficient processing capacity and the need for modernization of sugar mills and alcohol plants	- do -	• To establish and modernize capacities in sugar production and processing	i. Set up new mills with sufficiently high capacities and ii. Modernize the existing mills and expanding their capacities.
IV. Pricing Policy			

i. Non-adoption of quality-based equitable cane pricing mechanism	i. Pricing Policy for Sugar Cane	• To rationalize the farm gate price formula to attract farmers for sugar cane growing;	i. Develop an effective pricing formula for determining the farm gate price to attract farmers for sugar cane growing (determine the price of cane based on the sucrose content in cane by taking into consideration the revenue that the miller realizes through sugar plus the sugar based by-products,as well)
ii. Insufficient funds for sugar industry development	ii. Tariff policy	• To establish a separate fund for development of sugar industry	ii. Establish a 'Sugar Development Fund' by imposing a specific tariff rate for sugar imports

Main Issues/ Problems	**Policy Instruments**	**Objectives**	**Strategies**
iii. Non-existence of a proper pricing mechanism for sugar (and its by-products) to minimize the effects of fluctuation of world prices	ii. Pricing Policy for sugar and its by-products	• To formulate an efficiency price mechanism for sugar and its by-products	i. Impose a variable tariff regime for sugar to stabilize the market prices of sugar and safeguard the interests of farmers and consumers; ii. Determine an efficiency price which is the ex-factory price for locally-produced sugar taking into consideration the cost of production, processing efficiency, profit and risk margins sufficient for

			investment, production taxes, etc. iii. Impose a variable tariff regime on imported sugar to maintain the efficiency price at import price and a certain level of fixed tariff to ensure revenue for the government. The efficiency price should be the basis for determining the level of variable tariff. iv. Develop a competitive pricing formula for by-products of sugar v. Remove Excise duties and VAT on alcohol to facilitate its use as a fuel.
V. Institutional Development Policy			
i. Non-availability of an Apex Body to regulate and oversee the functions relevant to sugarcane industry development	i. Institutional Development Policy	• To Formulate new institutional mechanisms to cater to the current needs in the industry	i. Establish a body with sufficient authority, to cater to the needs of the sugar sub-sector, with representation from all relevant Ministries and institutions, to undertake all functions relevant to sugar development. ii. Enact legislation proposed as a "Sugar Industry Development Act" to foster and regulate sugarcane industry development in the country iii. Establish an apex body proposed as "Sugar Industry Research and Development Institute of Sri Lanka (SIRDISL)" by amending the Sugarcane Research Institute Act, backed by the proposed "Sugar Industry Development Act" to

			undertake all research, development and regulatory functions for the sugarcane industry in the country.

5.5 Development Targets and Investment Requirements

As per target set, local production should be expanded to 346,700 tonnes, if we are to meet 50% of the national requirement of sugar, by the year 2016. Assuming a sugar recovery rate of 8.9% (targeting a 5% increase from the current level, assuming 0.5% annual increase) total cane requirement would be 3.90 million tonnes. If the cane yield is increased to 66 t/ha (10% from the current level, nearly 1% annual increase) total cane area harvested per year should be about 59,000 ha assuming; harvested area of– 85%, stand over and fallow area - 15% (of commercial cane area) and the total area under the sugar projects should be about 80**,**000 ha, assuming nursery area - 10% and 5% of total cane area - for buildings, roads, etc.

Assuming a 200-day crushing season per year, the total mill capacity should be 19,500 TCD. Available mill capacity is 4,550 TCD and hence mill capacities should be expanded by 14,950 TCD. Assuming Sevanagala mill is expanded to 2,000 TCD and that at Pelwatte to 4,000 TCD, new mills with 13,500 TCD should be set up. Kantale and Hingurana mills are also planned to modernize. Further, two mills each with 5000 TCD at Siyambalanduwa and Bibile areas and another with 3,500 TCD in Hingurana area could be established. Each mill at Siyambalanduwa and Bibile should be integrated with a distillery plant with a capacity of 125 tonnes of molasses per day and 80 tonnes of molasses for the Hingurana mill. Thus production capacity of alcohol would be increased to 132,000 litres per day (48 million litres per year).

5.6 Investment Plan and the Expected Gains

The summary of the proposed investment plan designed, considering the dynamic needs of the sugar sub-sector is explained in Table 2 below.

Table 2: Summary of the Investment Plan in the Sugar sub-Sector – (2007-2016)

Cost Component	Estimated Cost (Rs Billion)	Total (Rs Billion)
• Expansion of Sugar mills and capacity of distilleries:		
o Existing mills	3.2	
o New mills	29.1	
o Distilleries	0.5	32.8
• Modernization of the existing mills		4.0
• Cane production		30.6
• Cane processing #		42.4
• Alcohol production		19.9
• Other industries (eg. jaggery, syrup, vinegar, animal feed, compost etc.)		0.4
• Infra-structure development		0.3
AGGREGATE TOTAL (Rs. Billion)		**130.4**

Note: The above cost estimates are without import duties and VAT and /or other taxes.

The cost of cane processing was estimated based on the weight of cost of production (38.1%) for cane processing given by the Pelawatte Sugar Company (2006) (see Table 4).

The detailed investment plan and the expected gains through the proposed policy mix in the sugar sub-sector are shown in Table 3.

Table 3: Investment Plan and Benefits of Sugar Industry Development (2007-2016)

Component	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Cane area required (ha)	21412	21200	20990	59606	59015	64904	64281	85591	84743	83904	
Mill capacity (TCD)	4550	4550	4550	13050	13050	14500	14500	19500	19500	19500	**19500**
Distillery capacity (TMD)	150	150	150	355	355	355	355	480	480	480	**480**
Investment (Rs billion)											
Mill and distillery expansion	4.7	7.5	4.5	4.0	3.4	4.9	2.2	1.6	-	-	**32.8**
Mill and distillery modernisation	-	-	-	2.0	2.0	-	-	-	-	-	**4.0**
Infrastructure #	-	-	-	0.09	0.09	-	0.06	0.06	-	-	**0.3**
Other industries #	-	-	0.07	0.07	0.07	-	-	0.07	0.07	-	**0.4**
Cane production	1.1	1.1	1.1	3.1	3.1	3.5	3.5	4.7	4.7	4.7	**30.6**
Cane processing ##	1.5	1.5	1.5	4.3	4.3	4.8	4.8	6.6	6.6	6.6	42.4
Molasses processing	**0.7**	**0.7**	**0.7**	**2.0**	**2.0**	**2.2**	**2.3**	**3.1**	**3.1**	**3.1**	**19.9**
Total Cost of Investment	**8.0**	**10.8**	**7.9**	**15.6**	**15.0**	**15.4**	**12.9**	**16.1**	**14.4**	**14.4**	**130.4**
	Outputs (Quantities)										
Sugar ('000 tons)	77.35	77.74	78.13	225.19	226.32	252.72	253.99	343.29	344.99	346.72	
Alcohol (million litres)	10.24	10.34	10.44	30.25	30.55	34.29	34.63	47.04	47.51	47.99	**318.36**
	Benefits (Rs billion)										
Production Value of – Sugar	4.0	4.0	4.1	11.7	11.8	13.1	13.2	17.9	17.9	18.0	**115.8**
Alcohol	1.0	1.0	1.0	2.9	2.9	3.3	3.3	4.5	4.5	4.6	**28.8**
SUB- TOTAL	5.0	5.0	5.1	14.6	14.7	16.4	16.5	22.3	22.5	22.6	**144.6**
Tax revenue	0.2	0.3	0.4	0.7	1.0	1.1	1.1	1.4	1.6	1.6	**9.4**

AGGREGATE TOTAL	**298.6**

Notes:

- Mill expansion cost @ US$20000/TCD; Mill modernisation @US$8000/TCD; Distillery expansion @ US$12500/TMD;
- Exchange rate 1US$=Rs 108; Cost of cane production (Rs/t) = 1200;
- Cost of sugar production (Rs/t) = 50,000;
- Cost of alcohol production (Rs/litre)= 65;
- Price of sugar (Rs/t) = 52,000;
- Price of alcohol (Rs/lit) = 95.00;

Cost of infra-structure (Offices, Labs, quarters, roads, electricity, water supply, transport, machinery, etc.) = 1% of investment in mill expansion. Investment in other industries includes 1% of investment in sugar and alcohol production and related infrastructure.

The cost of cane processing was estimated based on the weight of cost of production (38.1%) for cane processing given by the Pelwatte Sugar Company (2006) (see Table 4).

Table 4: Cost of Production of Sugar-2006

Item	Cost (Rs/kg)	%
Cane	31.02	61.9
Materials and Labour	8.12	16.2
Depreciation	4.50	9.0
Administration	6.65	13.3
Other	4.78	9.5
Less – molasses	(5.00)	(-10.0)
Total	**50.07**	**100.0**

Source: Pelwatte Sugar Company, (2006).

6. POLICY MIX FOR THE CASHEW SUB-SECTOR

6.1 Introduction

Cashew[5] nut has developed a distinct identity in the world as a snack food even in comparison with other competing tree nuts such as almond, pistachio, and walnuts. Cashew is cultivated in almost all the districts in Sri Lanka. The extents are substantial in the high potential dry zone districts specially in Puttalam, Vavunia, Jaffna, Kllinochchi, Trincomalee, Kurunegala and Hambantota. Statistics show a slow and steady increase in production over the last few years in other districts (SLCC, 2006).

The Sri Lanka Cashew Corporation (SLCC) in the 1970's developed successful programmes to promote the cultivation and increase production of cashew[6]. State owned commercial plantations were established, and cashew became one of the important export crops in Sri Lanka, generating employment opportunities to a large number of farmers and small-scale processors in certain districts. Though cashew is a crop that yields well even when minimum care is given, it will show tremendous response to intensive cultivation.

6.2 Present Status

During 2005, 38,816 ha of cashew had been grown and produced 9036 MT of raw nuts which is only about 50% of the local demand. During the year 2005, 73% of the requirement of cashew kernel had been imported for local consumption. The national average yield per tree is approximately 1.5 kg/year, which is far below the potential yield (8 – 10 kg/tree/year) and yield obtained by many other cashew growing countries (SLCC, 2005). The statistics of exports show that during 2005 Sri Lanka has exported 279 MT of Cashew kernels worth of Rs. 178 million (SLCC, 2006). Further, the following indicators show the present status of the cashew-sub sector in Sri Lanka.

- Average annual growth rate - 10.21% (1996 – 2003)
- Contribution of Cashew production to the GDP - 0.06%
- Contribution to total exports - 0.02%
- Contribution to agricultural product exports - 0.15%
- Composition of the cashew extent:
    - Extent under SLCC subsidy scheme (small holdings) - 62%
    - Extent under Private Plantation - 18%
    - Extent under Collaborative projects with SLCC (Small holdings) - 11%
    - SLCC Plantations - 9%
- Cashew processing sector:

[5] Cashew (*Anacardium occidentale L*) was introduced from Brazil to Sri Lanka by early Portuguese settlers in the 16th century and later spread as a dry land crop in the drier parts of the country and now has become an important agricultural crop. However, cashew cultivation caught the eyes of agriculturists only after the independence, particularly after the establishment of the Sri Lanka Cashew Corporation (SLCC) in 1973.

[6] The distinguishing features of the Cashew crop are: it is highly drought tolerant and can be cultivated in the drier areas; it gives good yields even under water scarcity conditions; it gives highest return for a given investment among horticultural crops; it is not as labor intensive as other plantation crops; and it is an easily marketable commodity with an export demand

- Small & medium scale factories - 85%

The exports in the year 2005 had shown an approximate increase of 49%, in relation to 2004 exports (187 MT) (SLCC, 2006). Therefore, the production trend has to catch up fast so that during the next 10 to 15 years, the country could produce sufficient quantities to fulfill the local as well as the export demand.

6.3 Salient Features of the Cashew Industry

1. It is a highly labour intensive industry and has maintained gender perspectives where over 90% of the work force comprises of the rural women;
2. It requires no other material or inputs for completion of processing;
3. It does not generate any waste or harmful effect on the environment.

It is surprising to note that, the two by-products, cashew apple and shell, are still not being utilized commercially. Many countries use these two by-products on a commercial level to produce cashew apple wine, juice, oils etc. Therefore, there is a greater potential to innovate cashew based new products. The full potential of the export market can be comprehensively exploited only if sufficient raw nuts are made available through increased production and sold at competitive prices, catering to the demand in the international market. Particularly, it should be market oriented, based on international quality standards, packing, promotion, value addition etc.

The following are some important issues, which are being addressed in developing this policy mix:

- Generation of quality planting materials
- Intensive cultivation to increase production
- Application of improved agronomic practices (including pest management)
- Development of adequate infrastructure and other facilities for processing and marketing
- A strong R&D backup system
- Effective farmer education and extension programmes
- Development of alternate uses of by products
- Promotion in the international market

6.4 Proposed Policy Mix – Cashew Sub-sector

Unlike in other crops in the plantation sector, cashew has received the least priority in development from the Government during the past and hence significant investment programs have not been implemented to uplift this industry. Cashew is a crop with tremendous potential, especially in the dry zone, where no other competing plantation crops can be grown successfully, under conditions of water scarcity. There is a potential of increasing productivity up to 22kg/tree/year with applying the improved crop management practices (SLCC, 2005). It is a crop which resource-poor farmers could grow with minimum inputs and could also bring in significant foreign exchange earnings, as world production is only 50% of the total demand (Cashew Export Promotion Council, India, 2004). It could generate employment among the rural women and gain much needed income through establishing cashew processing facilities in the form of Small and Medium Enterprises (SMEs).

The following policy mix (Table 1) is formulated to resolve the specified issues and fulfill the objectives of the cashew sub-sector. Through the proposed policy mix, it is expected to cultivate 50,000 ha. of cashew under new planting and 10,000 ha. of replanting of existing low productive cashew plantations. Further it is anticipated to increase the level of productivity from 1.5 kg/tree to 10kg/tree per year within the 10 year period (2007-2016). It is necessary to maintain sustainability of the sector while boosting the production and productivity of cashew in the country.

The Mission of the cashew sub-sector would be: 'To make Sri Lanka a leading producer and exporter of quality cashew products'.

Table 1: Policy Mix – Cashew Sub-Sector

Main Issues/Problems	Policy Instrument	Objectives	Strategies
I. Productivity and Production Policy			
i. Low productivity and profitability levels	**i.** Productivity and Production Enhancement Policy	• To increase productivity and production of cashew	i. Design a cultivation plan (including a programme for new planting and replanting of cashew) for all potential growing districts. ii. Design and implement a production and distribution plan for planting materials of improved high yielding varieties of cashew; iii. Develop the 'Cashew Productivity Villages' within the high potential growing districts; iv. Encourage private sector for commercial cashew production (by attracting new processing technology, capital and crop management practices); v. Provide financial, and technological assistance through both private and public sector;
II. Marketing Policy			
i. Dearth of marketing improvement	i. Marketing Policy	• To formulate a marketing policy and implementation mechanisms	i. Link growers and processors through 'Productivity Village' programmes ii. Intensify the processing by introduction of new technology (ie. machinery) through private sector investments; iii. Develop a strategic 'Marketing Mix' – product, price, promotion and distribution; iv. Develop a 'Market Research Wing' within the SLCC to carryout market research; v. Introduce proper storage facilities and packing methods vi. Develop a database for cashew – on production, prices, exports and imports vii. Initiate a programme to register all cashew processing centers in the country.

Main Issues/Problems	Policy Instrument	Objectives	Strategies
ii. Low quality and hygienic conditions of products	ii. Policy on maintaining Quality Standards	• To promote quality standards in line with the global market needs	i. Develop the HACCP or GMP standards in the cashew industry for maintaining international competitiveness; ii. Introduce organic and GAP products; iii. Build awareness programmes among processors on quality & hygiene. iv. Introduce 'Quality Standards' for processing centers
III. Investment Policy			
i. Insufficient financial capital	i. Investment Policy	• To promote investment in the cashew sector	i. Promote cashew-based products through private sector investment facilitated through an appropriate credit scheme ii. Facilitate provision of Capital through the proposed Plantation Fund for cultivation, processing, value addition and marketing.
IV. Land Use Policy			
i. Necessity for allocation of lands to investors	i. Land allocation policy	• To allocate lands to attract investment for cultivation	i. Identify uncultivated state land suitable for the cultivation of cashew ii. Suitably amend the land policy for allocation of lands for large/medium scale investors in the cashew industry on lease;
V. Institutional Development Policy			
i. Insufficient Legal and Administrative authority for the SLCC	i. Institutional strengthening policy	• To strengthen and promote the rational/ independent decision making;	i. Enact a separate Parliamentary Act; with sufficient administrative and legislative powers to the Sri Lanka Cashew Corporation which was established under the Industry Corporation Act.
VI. Import Policy			
i. Market distortions due to Imports of Cashew	i. Import policy	• To control market distortions and promote competitiveness of 'Sri Lankan Cashew'	i. Introduce a regulatory mechanism for importing of cashew to safeguard the quality of products and also to ensure that plant quarantine stipulations are adhered to in effecting imports

Main Issues/Problems	Policy Instrument	Objectives	Strategies
VII. R&D and Extension Policy			
i. Dearth of R&D programmes on cashew production;	i. Policy on R&D	• To improve productivity and profitability	i. Develop a long term research plan for cashew and cashew based products (for integration), based on the needs of the market ii. Conduct research on varietal development, cultivation practices, management, post harvest, processing, and marketing; iii. Develop a 'product research wing' within the SLCC to coordinate R&D programmes;
ii. Inefficient Extension services	ii. Policy on Extension	• To rationalize the existing extension system	i. Provide sufficient infra-structural and other facilities; ii. Develop a demand driven extension system to transfer new technology on production, crop management, processing etc. by effectively Linking R&D with Extension. iii. Maintain an extension system with the accent on improved agronomic and pest management practices.
VIII. Policy on HRD			
i. Insufficiency of suitable human capital	i. Policy on Human Resource Development	• To promote capacity building in the sector	i. Develop HR programmes to promote required human capital aimed at younger generation ii. Develop a target oriented capacity building programme (aimed at relevant staff including extension personnel of the SLCC) through local/foreign training to increase/improve technical competency.

Table 1: Present Status of Cashew Sector - Extent and Production of Cashes in Sri Lanka (1996-2005)

Year	Extent (Ha)		Produ-ction (Mt)	Per Ha Production (Kg)	Kernel Production (Mt)	Domestic Market (Mt)	Export (Mt)	Value (Rs.Mn.)	
	Total	Bearing						Domestic	Export
1996	20,807	16,008	4,796	300	838.60	583	437.60	233.20	135.40
1997	22,311	16,287	6,715	412	1,343.20	718	625.20	287.20	191.70
1998	24,348	16,646	6,592	396	1,320	894	426	357.60	154.50
1999	25,961	17,641	5,060	287	1,014	861	153.30	344.40	72.73
2000	29,136	17,584	4,678	267	935	840.47	94.50	336.18	47.35
2001	32,873	24,752	6,192	250	1,239	1,091.91	147.09	436.77	73.84
2002	34,260	25,593	7,258	280	1,451	1,308.10	142.90	656.05	75.92
2003	35,646	26,435	8,319	315	1,663	1,596.77	135.44	798	42.49
2004	37,197	28,641	8,660	302	1,732	1,544.80	187.20	865	121.57
2005#	38,846	28723	9036	314	1,807	1527.75	279.45	1222	178.41

Source: Sri Lanka Cashew Corporation, (2006)

 # - Projected values (except volume and value of exports)

Table 2: Investment Plan for Cashew Sub-Sector (2007-2016)

(Rs Million)

Component	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
New planting – Extent (ha).	3,000	4,000	5,000	6,000	7,000	5,000	5,000	5,000	5,000	5,000	**50,000**
Replanting - Extent (ha.)	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	**10,000**
TOTAL EXTENT Ha.	**4,000**	**5,000**	**6,000**	**7,000**	**8,000**	**6,000**	**6,000**	**6,000**	**6,000**	**6,000**	**60,000**
Cost of Cultivation -New Planting Rs.60,000 per ha. -Replanting Rs.75,000 per ha	255	315	375	435	495	375	375	375	375	375	**3,750**
Establishment and Management of Cashew Plant Nurseries											
Research and Development	15	17	6	6	6	6	6	6	6	6	**80**
Human Resources Development	8	8	8	8	8	8	8	8	8	8	**80**
Marketing Development	7	5	5	5	5	5	5	5	5	5	**52**
Development of Processing Industries t	10	10	10	10	10	10	10	10	10	10	**100**
Institutional Strengthening & Maintenance.	100	100	100	100	100	100	100	100	100	100	**1,000**
TOTAL COST	**395**	**455**	**504**	**564**	**544**	**504**	**504**	**504**	**504**	**504**	**4,982**

- **Research & Development**
  - – Plant Breeding
  - -Agronomy
  - -Fertilizer Management
  - -Post Harvest Technology
- **Marketing Development**
  - - Export Market Promotion
  - - Sri Lanka Cashew Brand Production
  - -Trade fair Participation
  - - Local Market Promotion – Up Market
- **HRD – Farmer Training**
  - - SLCC & other associated officer Training
  - - Entrepreneur Development
- **Processing Industry Development**
  - - Up grading of factories & other
  - - HACCP Standards
  - - Modern Equipments

Table 3: Expected Gains from Investment on New Planting and Replanting Programmes of Cashew (2007-2016), (Rs.Mn)

Components	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Kernel Production (MT)	-	-	240	940	2000	3860	6180	9880	11480	13960
• For Local Market	-	-	76.8	300.8	640	1235.2	988.8	1580.0	1836.8	2233.6
• For Export Market	-	-	183.6	719.1	1530	2952.8	6303.6	10077.6	11709.6	14239.2
Sub Total - Earnings from Kernels	**-**	**-**	**260.4**	**1019.9**	**2170**	**4188.1**	**7292.4**	**11657.6**	**13546.4**	**16475.8**
Cashew Nut Shell Liquid (CNSL) Production (MT).	-	-	208	814	1720	3340	5334	8532	9332	12066
• Cashew Nut Shell Liquid (CNSL) Sales	-	-	12.48	48.88	104	200.72	321.36	513.76	596.96	725.92
Cashew Apple Wine Production (Bottles)	-	-	9000	18000	27000	36000	45000	54000	63000	72000
• Cashew Apple Wine Export Market	-	-	6.7	14.25	21.0	28.5	36.0	43.5	51.0	58.5
• Cashew Apple Wine Local Market.	-	-	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Total Income	**-**	**-**	**280**	**1084**	**2296**	**4418**	**7651**	**12215**	**14195**	**17261**
Expenditure	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Fixed Assets	-	-								
• Factory Building	23	23								
• Equipments – Kernels	20	20								
Winery –	5	5								
Cashew Nut Shell Liquid (CNSL)	6	6								
Working Capital										
Raw Material			120	470	1060	1930	3070	4940	5740	6980
Processing Cost			30	117.5	250	482.5	772.5	1235	1435	1745
Apple Wine			2.25	4.5	6.75	9.0	11.25	13.5	15.75	18.0
Cashew Nut Shell Liquid (CNSL)			3.12	12.22	26	50	80.0	128	149	181
Total Cost	54	54	155.37	604.22	1342	2471.5	3933	6316.8	7339	8924
Surplus/(Deficit)	(54)	(54)	127.71	479.81	955.0	1947	3717	5899	6856	8337
Balance B/F		**(54)**	**(108)**	**16.71**	**496**	**1451.0**	**3398**	**7115**	**134714**	**20272**
Balance C/F	**(54)**	**(108)**	**16.71**	**496.52**	**1451.0**	**3398**	**7115**	**13414**	**20272**	**28609**

- Kernel Products - Ratio is - 5:1 (Raw nut: Kernel)
- Local Market - 25% of total production
- Export Market - 75% of total production
- 25% - Conventional products
- 75% - Value added products

TABLE 4: COST OF INSTITUTION STRENGTHENING IN THE SLCC (2007-2016)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	TOTAL
• Recurrent Expenditure including Salary	50	52	54	62	64	68	72	74	76	80	652
• Nursery Establishment (Permanent Structure)	30	2	9	2	2	2	2	10	2	2	63
• Head office New building & Maintenance	05	46	01	0.5	0.5	04	0.5	0.5	0.5	0.5	59
• Regional Office 08 with training Centers.	-	-	06	10.5	13.5	25	24.5	15.5	-	-	95
• Purchase of office & Land Vehicles	15	-	30	25	20	01	01	-	21.5	17.5	131
Grand Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**1000**

Table 5: Extent of Cashew Plantation (Ha) (2007-2016)

Components	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Extent of Existing Planting (Ha)	37,000	36,000	35,000	34,000	33,000	32,000	31,000	30,000	29,000	**28,000**	
• New Planting (Ha)	3,000	4,000	5,000	6,000	7,000	5,000	5,000	5,000	5000	5,000	**50,000**
• Replanting (Ha)	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1000	1,000	**10,000**
Sub Total	**4,000**	**5,000**	**6,000**	**7,000**	**8,000**	**6,000**	**6,000**	**6,000**	**6,000**	**6,000**	**60,000**
Cumulative Total Extent (Ha)	**41,000**	**45,000**	**50,000**	**56,000**	**63,000**	**68,000**	**73,000**	**78,000**	**83,000**	**88,000**	

7. Policy Mix for the Palmyrah Sub-Sector

7.1. Introduction

The Palmyrah palm is one of the most potentially useful but under-utilised palms in the world. It grows quite exclusively in the drier regions of Sri Lanka, where it is found in thick clusters or groves. It is estimated that there are about 11 million palms covering an extent of 24260 hectares of land in the country . It has been just allowed to grow on its own, nurtured by nature.

Palmyrah has a great capacity to produce several palmyrah-based products of economic importance namely sap, fruit, fibre, leaf, timber and tuber products. These products have a great potential to integrate with the international markets through the promotion of tourism and hotel industries. During the latter part of 80's, it was estimated that if properly exploited, the Palmyrah palm could generate an annual income in the region of Rs 10.0 billion. (Palmyrah Development Board, 2006). Although Palmyrah- based products have such a high potential, even 2% of the palms has not been exploited. Unlike the other sub-sectors of the plantation industry, Palmyrah has still not been developed systematically despite the efforts of the Government during the early 80's. The conditions arising out of the security situation in the major growing areas (Northern and Eastern Provinces) during the last two decades may also have contributed significantly to this situation for under-exploitation. It is apparent from the foregoing, that Palmyrah-based products have the potential to make a significant positive impact on the national economy if it could be exploited properly, given the right conditions.

7.2. The Mission

The Mission of the palmyrah sub sector is as follows:

Mission: "To be a significant contributor to the national economy of the country while sustaining the Palmyrah resource and its environment".

7.3. Policy Mix for the Palmyrah Sub-sector

The following strategic policy mix for the palmyrah sub-sector is formulated with the objective of promoting the sector through diffusing new technologies, particularly for cultivation, product and market integration on palmyrah-based products etc. (Table 1). In the present context, through this policy mix, it is expected to develop the existing palmyrah production systems in the Northern and Eastern regions and encourage to grow new cultivation in the down-south districts.

Table 1: Strategic Policy Mix for the Palmyrah Industry

Main Issues/ Problems	Policy Instrument	Objectives	Strategies
I. Policy on Production			
i. Lack of a commercially oriented palmyrah industry	i. Strategic Production enhancement policy – (ie. Sustaining and developing Palmyrah production and palmyrah-based products);	To make a commercially viable industry	i. Identify the high potential palmyrah production regions; ii. Establish 'Palmyrah Productivity Industry Villages' (PPIVs) for palmyrah- based products to promote production and marketing through a 'Regional Specialization Drive' (RSD); iii. Develop a 10 year production plan for palmyrah and palmyrah-based, market-oriented products; iv. Establish palmyrah nurseries; v. Develop a marketing plan by identifying the role of the Palmyrah Development Board, private sector and the community. vi. Popularize palmyrah-based products through media and other promotional mechanisms. vii. Organize community based awareness programmes to reduce the felling of palmyrah trees; viii. Plan, implement and monitor capacity building prgrammes in existing Palm Resources Development Cooperative Societies;

Main Issues/ Problems	Policy Instrument	Objectives	Strategies
II. Policy on R&D			
Dearth of development of new products	ii. R&D Policy	• To increase the level of productivity	i. Establish a R&D wing on developing plamyrah - based new products and its extension; ii. Implement a R&D programme based on actual needs
III. HRD Policy			
iii. Necessity for capacity building on the production of palmyrah-based products	iii. HRD Policy	• To build human capital required for the integration of palmyrah-based products	i. Develop a HRD plan for the palmyrah industry (ie. Tapping, processing of palmyrah products and developing palmyrah-based new-products – handicraft, cottage industry products – tea packs etc.); ii. Plan and implement training programmes for transferring technology for plant management, palmyrah-based product development etc.

7.4. Expected Gains

The expected gains of production of combination of potential products and their values are shown in Table 2 and 3 respectively.

Table 1: Investment Plan for the Palmyrah Industry (2007-2016)

Components	Investment (Rs.Million)										Total
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	
1. Establishment of Palmyrah based Productivity Industry Villages (PPIVs) in collaboration with the private sector and the community based organizations.	5	30	30	30	22	20	20	15	15	10	197
2. Training on tapping, processing of Palmyrah based edible and non edible products and Palmyrah based handicraft production.	15	11	11	11	11	4	3	3	3	3	75
3. Training the R&D personnel to upgrade their knowledge for Palmyrah based new product development/ innovation.	2	10	10	10	10	10	0	0	0	0	52
4. Establishment of a Research and Development wing with extension within the PDB	8	8	5	5	5	5	5	5	5	5	56
5. Capacity building, in existing Palm Resources Development Cooperative Societies through training;	0	5	10	10	10	10	10	0	0	0	55
6. Initiating a Promotional campaign on Palmyrah products through media and other possible means -trade fair, tourism fairs etc.	3	3	3	3	2	2	2	2	2	2	24
7. Introduction of a community based new planting program in the Down-South districts.	5	5	6	9	12	17	20	20	24	29	147
8. Establishment of Palmyrah Nurseries.	3	3	3	3	2	2	2	2	2	2	24
9. Conducting a community based awareness program on the felling of Palmyrah trees.	1	1	1	1	1	1	1	1	1	1	10
10. Promoting a campaign on Palmyrah products through media and other possible means.	2	2	2	2	2	2	2	2	2	2	20
GRAND TOTAL	**44**	**78**	**81**	**84**	**77**	**73**	**65**	**50**	**54**	**54**	660

Table 2: Expected Annual Gains from Palmyrah Sub Sector (2007-2016) (at 50% Exploitation Level)

Type of Product s	Unit	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	TOTAL
Toddy	Litres (M)	0.17	0.25	0.34	0.59	0.68	1.01	1.02	1.01	1.01	1.19	7.27
Fibre	Kg (M)	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0	0.1
Fruits	No. (M)	0.25	0.25	0.5	0.5	0.5	0.5	0.75	0.75	1	1.25	6.25
Tuber	No.(M)	3.75	3.75	7.5	15	15	15	15	15	15	15	120
Tender Leaves	No.(M)	0.02	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.02	0.02	0.33
Mature Leaves	No.(M)	0.04	0.08	0.08	0.08	0.08	0.08	0.08	0.06	0.04	0.04	0.66
Ekel	Kg (M)	0.03	0.05	0.05	0.05	0.05	0.05	0.05	0.03	0.03	0.02	0.41

Table 3: Expected Value of Annual Gains from Palmyrah sub Sector (2007-2016) (at 50% Exploitation level)

Type of Products	Rs. Million										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	TOTAL
Toddy	2.6	3.7	5.1	8.9	10.2	15.1	15.3	15.2	15.1	17.9	109.1
Fibre	1.2	1.3	1.2	1.3	2.5	1.2	1.3	1.2	1.3	0	12.5
Fruits	0.5	0.5	1	1	1	1	1.5	1.5	2	2.5	12.5
Tuber	7.5	7.5	15	30	30	30	30	30	30	30	240
Tender Leaves	0.3	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.3	0.3	5
Mature Leaves	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0	0.1	1.3
Ekel	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.2	3.3
Firewood	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	2.8
TOTAL	**12.6**	**14.4**	**23.8**	**42.6**	**45.1**	**48.8**	**49.5**	**49.2**	**49.2**	**51.3**	**386.5**

Appendix 1: Estimated Income per year from a Palmyrah palm as primary product (Year 2006) at full exploitation level

Product Detail	Unit	Average annual output of a palm	Average annual losses from a palm	Total annual net output	Unit Price of the output (Rs.)	Total Income (Rs.)
Toddy	Litre	338.0	38.0	300.0	15.00	4500.00
Fibre	Kg	1.1	0.1	1.0	125.00	125.00
Fruits	No.	50.0	-	50	2.00	100.00
Tuber	No.	150.0	75.0	150	2.00	300.00
Tender Leaves	No.	4.0	-	4.0	15.00	60.00
Mature Leaves	No.	8.0	-	8.0	2.00	16.00
Ekel	Kg	5.0	-	5.0	8.00	40.00
Firewood	-	-	-	-	10.00	10
					Estimated total annual income from a Palm	**5151.00**

Appendix 2: Estimated Income per year from a Palmyrah palm as value added product (Year 2006) at full exploitation level

Primary Product Detail	Unit	Average annual output of a palm	Average annual losses from a palm	Total annual net output	Value added product detail	Quantity to be produced	Unit Price of the output (Rs.)	Total Income (Rs.)
Toddy	Litre	338.0	38.0	300.0	Sap based (Arrack)	30 litre	350.00	10500.00
Fibre	Kg	1.1	0.1	1.0	Fibre based (Brush)	2 Nos.	205.00	410.00
Fruits	No.	50.0	-	50	Fruit Based (Dried Fruit pulp)	8.0 Kg	220.00	1760.00
Tuber	No.	150.0	75.0	150	Tuber Based (Flour)	4.5 Kg	160.00	720.00
Tender Leaves	No.	4.0	-	4.0	Leaf based (Bag)	2 Nos.	190.00	380.00
Mature Leaves	No.	8.0	-	8.0	Naar (Stalk Strand)	16 Nos.	2.00	32.00
Ekel	Kg	5.0	-	5.0	-	5.0 Kg	8.00	40.00
Firewood	-	-	-	-	-	-	10.00	10.00
						Estimated total annual income from a Palm		**13852.00**

Background Information for Estimation of Gains from Cultivation of Palmyrah (Approximate Values)

Population of the palms: 11,000,000
- Female palms: 3,500,000
- Male palms: 3,500,000
- Young palms (15-20 Years of age): 2,000,000

Appendix 3: Present Potential of Palmyrah Palms at full exploitation level (Year 2006)

Product Detail (Primary products)	Unit	Number of Palms utilized		Total number of palm utilized	Average annual output of a palm	Average annual losses from a palm	Total annual net output (Millions)	Unit Price of the output (Rs.)	Total Income (Rs. million)
		Male	Female						
Toddy	Litre	3,500,000	2,500,000	6,000,000	338.0	38.0	1,800.0	15.00	27,000
Fibre	Kg	1,000,000	1,000,000	2,000,000	1.1	0.1	2.0	125.00	250
Fruits	No.	0	1,500,000	1,500,000	50.0	-	75.0	2.00	150
Tuber	No.	0	1,500,000	1,500,000	150.0	75.0	112.5	2.00	225
Tender Leaves	No.	3,500,000	3,500,000	7,000,000	4.0	-	28.0	15.00	420
Mature Leaves	No.	3,500,000	3,500,000	7,000,000	8.0	-	56.0	2.00	112
Ekel	Kg	3,500,000	3,500,000	7,000,000	5.0	-	35.0	8.00	280
Firewood	-	-	-	10,000,000	-	-	-	10.00	100
								Grand Total	**28,537**

Appendix 4: Estimated income from Palmyrah sub sector in year 2006 as primary product (at 50% exploitation level)

Product Detail (Primary products)	Unit	Number of Palms utilized		Total number of palm utilized	Average annual output of a palm	Average annual output at 50% exploitation	Total annual net output (Millions)	Unit Price of the output (Rs.)	Total Income (Rs. million)
		Male	Female						
Toddy	Litre	50,000	50,000	100,000	338.0	169.0	16.90	15.00	253.50
Fibre	Kg	100,000	100,000	200,000	1.1	0.55	0.11	125.00	13.75
Fruits	No.		2,000,000	2,000,000	50.0	25.0	50.00	2.00	100.00
Tuber	No.		2,000,000	2,000,000	150.0	75.0	150.00	2.00	300.00
Tender Leaves	No.	100,000	100,000	200,000	4.0	2.0	0.40	15.00	6.00
Mature Leaves	No.	100,000	100,000	200,000	8.0	4.0	0.80	2.00	1.60
Ekel	Kg	100,000	100,000	200,000	5.0	2.5	0.50	8.00	4.00
Firewood	-	-	-	2,000,000	-	-	-	10.00	20.00
								Grand Total	**698.85**

Appendix 5: Total number of Palmyrah Palms expected to be utilized after the investment (Cumulative Value)

Product Detail (Primary products)	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Toddy	100,000	101,000	102,500	104,500	108,000	112,000	118,000	124,000	130,000	136,000	143,000
Fibre	200,000	215,000	235,000	255,000	280,000	300,000	320,000	340,000	360,000	375,000	390,000
Fruits	2,000,000	2,010,000	2,020,000	2,040,000	2,060,000	2,080,000	2,100,000	2,130,000	2,160,000	2,200,000	2,250,000
Tuber	2,000,000	2,050,000	2,100,000	2,200,000	2,400,000	2,600,000	2,800,000	3,000,000	3,200,000	3,400,000	3,600,000
Tender Leaves	200,000	210,000	230,000	250,000	270,000	290,000	310,000	330,000	345,000	355,000	365,000
Mature Leaves	200,000	210,000	230,000	250,000	270,000	290,000	310,000	330,000	345,000	355,000	365,000
Ekel	200,000	210,000	230,000	250,000	270,000	290,000	310,000	330,000	345,000	355,000	365,000
Firewood	2,000,000	2,020,000	2,050,000	2,075,000	2,100,000	2,130,000	2,160,000	2,190,000	2,220,000	2,250,000	2,280,000