

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

**MINISTRY OF INDUSTRIAL DEVELOPMENT
THE DEMOCRATIC SOCIALIST REPUBLIC OF
SRI LANKA**

**MASTER PLAN STUDY
FOR
INDUSTRIALIZATION AND INVESTMENT PROMOTION
IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
(Phase II)**

MAIN REPORT

July 2000

KRI INTERNATIONAL CORP.

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PREFACE

In response to a request from the Government of the Democratic Socialist Republic of Sri Lanka, the Government of Japan decided to conduct the Master Plan Study for Industrialization and Investment Promotion in the Democratic Socialist Republic of Sri Lanka (Phase II); the study was implemented by the Japan International Cooperation Agency (JICA).

JICA sent a study team, led by Mr. Hajime Koizumi, (Managing Director of KRI International Corporation) and organized by members of KRI International Corporation, to the Democratic Socialist Republic of Sri Lanka twice from November 1999 to June 2000. The team held discussions with the people concerned with the study in the Democratic Socialist Republic of Sri Lanka and conducted related field surveys.

This study was implemented in close cooperation with the UNIDO project entitled “the Integrated Program of Technical Assistance to Sri Lanka”. In the sector study, the UNIDO team covered the apparel and leather industries, while JICA team covered the rubber, plastic, machinery, electric/electronic, and information technology service industries. During the study, both teams shared study results with each other, which made the Master Plan for Industrialization and Investment Promotion more comprehensive and detailed. The results of the study on the apparel and leather industries are compiled into this report with the cooperation of UNIDO.

I hope this report will contribute to industrialization and investment promotion in the Democratic Socialist Republic of Sri Lanka and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the people concerned for their close cooperation throughout the study.

July 2000

Kimio Fujita
President
Japan International Cooperation Agency

July 2000

Mr. Kimio Fujita
President
Japan International Cooperation Agency (JICA)

Letter of Transmittal

It is with great pleasure that we submit the final report of the Master Plan Study for Industrialization and Investment Promotion in Sri Lanka. The Master Plan has been completed by joint efforts of nine Working Groups formed by the Ministry of Industrial Development (MID) and our study team, as well as UNIDO experts who collaborated in studying some specific subsectors.

The Master Plan presents sector development strategies and targets formulated on the basis of studies on seven subsectors selected through the Phase I study. The Plan also proposes various programs and suggestions for industrial development in Sri Lanka at the sector and subsector levels. Our study team hopes that the Master Plan will serve as a guideline for accelerated development of industries and that the proposed programs are implemented with cooperative efforts of the private, public and academic institutions in Sri Lanka.

Our study team would like to express its heartfelt gratitude for the kind cooperation extended by the MID management, Working Group members and all other parties concerned in Sri Lanka, as well as by the UNIDO team that joined this study. The final report is a fruit of excellent collaboration of all participants in this Master Plan Study.

Hajime Koizumi
Study Team Leader

**MASTER PLAN STUDY ON
INDUSTRIALIZATION AND INVESTMENT PROMOTION
IN SRI LANKA (Phase II)**

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ABBREVIATIONS

AAGR	Annual Average Growth Rate
ACI	Advisory Council for Industry
ACTOS	Association for Computer Training Organization
ASEAN	Association of Southeast Asian Nations
BOI	Board of Investment, Sri Lanka
CAD	Computer Assisted Design
CEA	Central Environmental Authority
CI	Competitiveness Index
CINTEC	Council for Information Technology, Sri Lanka
CKD	Complete Knock-Down
DAPH	Department of Animal Production and Husbandry
DFI	Development Finance Institutions
DOCS	Department of Census and Statistics
EDB	Export Development Board, Sri Lanka
EPZ	Export Processing Zone
EU	European Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GST	Goods and Services Tax
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (German Technical Cooperation)
GVA	Gross Value Added
HRD	Human Resources Development
IC	Industrialization Commission
ICOR	Incremental Capital Output Ratio
IDB	Industrial Development Board
ILFTA	Indo-Lanka Free Trade Agreement
IPC	Industrial Policy Council
IPO	International Procurement Operation
ISIC	International Standard for Industrial Classification
ISO	International Organization for Standardization
IT	Information Technology
ITI	Industrial Technology Institute
JBIC	Japan Bank for International Cooperation
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency
JV	Joint Venture

MFA	Multi-Fiber Agreement
MID	Ministry of Industrial Development, Sri Lanka
MOFP	Ministry of Finance and Planning
MOST	Ministry of Science and Technology
MVTRI	Ministry of Vocational Training and Rural Industries
NGO	Non-governmental Organization
NIBM	National Institute of Business Management
NICs	Newly Industrialized Countries
OECF	Overseas Economic Cooperation Fund (now JBIC)
OEM	Original Equipment Manufacturer
PCAF	Pollution Control and Abatement Fund
PCB	Printed Circuit Board
PRI	Plastic Rubber Institute
QC	Quality Control
RCA	Revealed Competitiveness Advantage
R&D	Research and Development
RRI	Rubber Research Institutes of Sri Lanka
SAARC	South Asia Association for Regional Cooperation
SAFTA	SAARC Free Trade Area
SKD	Semi-Knock-Down
SLAT	Sri Lanka Association of Tanners
SLIIT	Sri Lanka Institute of Information Technology
SLSI	Sri Lanka Standard Institute
SMI	Small and Medium Industry
SMIDEC	Small and Medium Industry Development Cooperation
TT	Turnover Tax
UNDP	United Nations Development Program
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
WG	Working Group
WTO	World Trade Organization

Currency Equivalents

US\$1 = 70 Sri Lanka Rupees

Sri Lanka Rupee 1 = US\$0.0143

As of January 2000

I. INTRODUCTION

1.1 Background

Since Sri Lanka shifted to a market-oriented economy in 1977, the national economy has attained a steady growth with GDP increasing from US\$4.1 billion in 1977 to US\$15.8 billion in 1999. The open market policy has been adopted, including trade liberalization, and Sri Lanka is now reputed for the most open economy in South Asia. Under the open market policy, major efforts for industrialization have been directed towards promotion of export-oriented industries and creation of employment. These efforts have resulted in an increase in labor-intensive industries, particularly the textile, apparel, and leather industries (ISIC 32) which accounted for nearly 37% of value added, 55% of total export, and 61% of total employment in the manufacturing sector. The excessive dependence on a single labor-intensive industry is not necessarily a desired outcome of the industrialization efforts, from the viewpoint of the economic and industrial structure.

On the other hand, the economic environment surrounding Sri Lanka has been changing in recent years. As a member of WTO, Sri Lanka follows the non-discrimination rules in trade and promotes free trade regimes in the region. The SAARC countries agreed on free trade under SAFTA. Further, the Indo-Lanka Free Trade Agreement was signed in December 1998 and came into force in March 2000. Under such changes, the open market policy of Sri Lanka is applauded and should be maintained in the future.

The recent changes in free trade regimes are not limited to WTO rules, SAFTA and the Indo-Lanka Free Trade Agreement. The Multi-Fiber Agreement (MFA), which allocated quotas for apparel exports from developing countries, including Sri Lanka, will expire in 2005 and Sri Lanka will face the challenge of free competition for exports of the apparel industry on which it has been excessively dependent. Some shifts in paradigm for industrial development are required under the recent changes in the environment surrounding Sri Lanka.

The open market policy in Sri Lanka has been promoted with less attention to the national policy for industrialization, partly because the industrialization policy has not been clearly defined. Now, the Government of Sri Lanka, through the Ministry of Industrial Development (MID), intends to work out the policy and strategies for industrialization in the coming decade and to reflect it to the national economic policy. It is under this background that the Master Plan Study for Industrialization and Investment Promotion was requested, and the Government of Japan decided to cooperate in this study through JICA.

1.2 Phased Studies

The objectives of the master plan study are to formulate new strategies for industrialization in the coming decade and to prepare a master plan for industrialization and investment promotion in Sri Lanka with the target year 2010.

The Master Plan for industrialization and investment promotion has been studied and worked out in two phases. Phase I study in February-August 1999 selected several target industries out of 28 subsectors classified by ISIC 3-digit codes. For selection of the target subsectors, an analysis was first made on export strength (through the RCA analysis), competitiveness index (CI) and prospective intra-trade with SAARC and ASEAN, and this Step-1 analysis identified 14 promising subsectors. The subsequent Step-2 analysis was made on productivity, profitability and marketability of manufactured products, as well as capability of satisfying required conditions for industrial promotion and investment potentials, to select 11 promising subsectors. These subsectors were further analyzed under the Step-3 screening from the viewpoints of employment generation, value added, structural diversification, and promotion of linkages/clusters among industries, as well as in terms of environmental protection. A total of six subsectors were selected as the target industries.

In addition to analysis on the manufacturing subsectors, the information technology (IT) service industry has been studied, and it has been recommended to take up the IT industry as another target industry. As a result, the following subsectors have been selected as the target industries on which to base the master plan study:

- | | | |
|-----|---------------------------------|----------------|
| (1) | Apparel industry | (ISIC 322) |
| (2) | Leather industry | (ISIC 323/324) |
| (3) | Rubber industry | (ISIC 355) |
| (4) | Plastic industry | (ISIC 356) |
| (5) | Machinery industry | (ISIC 382) |
| (6) | Electric/Electronic industry | (ISIC 383) |
| (7) | Information technology industry | |

Phase II study has been made for master planning of the selected target industries. The apparel and leather industries have been studied by experts of UNIDO (as UNIDO extended assistance under its integrated program for technical assistance to Sri Lanka). The master plans for the remaining five target industries have been worked out by JICA experts.

Although the food processing subsector (ISIC 312) was identified as promising under Phase I study, Phase II study has precluded it because the USAID cooperation in this subsector was not found to cover comprehensive studies at the subsector level.

Based on the master plans for seven target industries, as well as by studies made on the administrative/legal/institutional affairs, financial and fiscal aspects, and studies on investment and trade, the sector level master plan has been formulated under the Phase II. Although the master plan has been worked out on the basis of seven target industries, it will serve for other industries as well, because the framework, scenarios and strategies have been formulated so as to be applicable to all the manufacturing industries in Sri Lanka.

1.3 Execution of The Study

Phase I and Phase II studies have been executed by JICA Study Team organized by experts of KRI International Corp. (an affiliate of Nippon Koei Co., Ltd. specialized in economic and social studies) in collaboration with Sri Lankan experts assigned by MID. To apply a participatory approach to the master plan study, seven working groups (WGs) were formed. Each WG is composed of 6-15 Sri Lankan experts nominated from the public, private, and academic sectors. WGs convened to discuss major issues in respective industries as well as issues at the sector level, and formulated the basis of this master plan.

At the same time, MID organized the Steering Committee (SC) composed of representatives from other ministries and public institutions concerned, universities, and associations of private enterprises. SC convened three times, for the initial and interim discussions and for the discussion on the draft final report. The comments and opinions raised by SC have been reflected in preparing the final report of the master plan. SC members, as well as WG members and JICA-UNIDO experts, are listed in Annex I of the Main Report.

In preparing this master plan, a workshop was held to study the industrial policies applied in India, Malaysia, Singapore, Sri Lanka, and Japan, under the sponsorship of JICA and UNIDO. Some JICA experts and WG members also visited India, Malaysia and/or Singapore to get acquainted with and discuss on strategies for development of the target industries. Through the two-day workshop, as well as the survey in the third countries, some ideas and lessons were obtained for preparation of this master plan.

Phase II study has been executed in a relatively short period. JICA experts were assigned to the field works for three months from the beginning of November 1999 to the end of January 2000, and the draft final report was compiled thereafter within one and a half months. The completion of the master plan study within the short period was made possible due mainly to the efficient field operation in Sri Lanka, thanks to the close cooperation of the MID management, WG members, and all the parties concerned with this master plan study.

1.4 Report

The Final Report presents all the results of the Phase II study on the master plan for industrialization and investment promotion in Sri Lanka. The Final Report is composed of the following volumes:

Summary

Main Report

Appendix-I (Sector Level Studies)

A: Administrative/Legal/Institutional Affaires

B: Financial Sector and Fiscal Policy

C: Investment and Trade

Appendix-II (Subsector Level Studies by UNIDO)

D: Apparel Industry

E: Leather Industry

Appendix-III (Subsector Level Studies by JICA)

F: Rubber Industry

G: Plastic Industry

H: Machinery Industry

I: Electric/Electronic Industry

J: Information Technology Service Industry

The Main Report presents the master plan proposed for the accelerated industrialization and investment promotion. In Chapter II of the Main Report, an overview of the industrial evolution is presented in a summarized form. In Chapter III, the industrial sector development scenario and framework are proposed, by defining objectives of industrial development, basic concept and approach, development scenario, and frameworks to put up some targets for industrial development and investment promotion. The strategies for development of the manufacturing sector are further discussed and proposed in Chapter IV. Master plans for

development of the target industries are presented in Chapter V, summarizing the discussion made in Appendices A to J. In Chapter VI, action programs are proposed for implementation of the master plan in the short term (2000-2004). Finally, in Chapter VII, some recommendations are presented together with the conclusion of the master plan study.

The results of studies on the apparel and leather industries by UNIDO experts are compiled without any modification by JICA team, both in Chapter V of the Main Report and in Appendices D and E.

II. EVOLUTION OF INDUSTRIAL SECTOR

2.1 Economic Performance

1) Overview

Sri Lanka is a lower-middle-income country, according to the World Bank's classification, with a GNP per capita of US\$840 as in 1998, which is one of the highest in the South Asian region.

Since the introduction of the market-oriented open economy in 1977, Sri Lanka has made significant progress in its macroeconomic situation as key economic indicators in the table below shows. Despite prolonged ethnic conflicts, GDP grew at an average rate of above 5%. Inflation has been reduced to a non-volatile level, though still high. The current account balance stands at a manageable level and continuously declines. Savings and investment performances have been improving, though domestic savings as a percentage of GDP has never matched the level of investment.

Key Economic Indicators of Sri Lanka

	<i>1977</i>	<i>1987</i>	<i>1997</i>	<i>1998</i>	<i>1999</i>
GDP (US\$ billions)	4.1	6.7	15.1	15.7	15.8
Gross Domestic investment/GDP (%)	14.4	23.3	24.4	25.1	27.1
Exports of goods and services/GDP (%)	33.8	25.2	36.5	36.0	35.3
Gross domestic savings/GDP (%)	18.1	12.8	17.3	19.1	19.8
Current account balance/GDP (%)	3.5	-4.9	-2.6	-1.4	-3.1
Total debt/GDP (%)	27.6	71.1	62.3	61.9	63.0
Total debt service/exports (%)	18.7	23.2	13.3	13.3	15.2
Inflation, consumer prices (%)	na	7.7	9.6	9.4	4.7
Fiscal balance/GDP (%)	na	na	-7.9	-9.2	-7.5
	<i>1977-87</i>	<i>1988-98</i>	<i>1997</i>	<i>1998</i>	<i>1999</i>
	<i>(average)</i>	<i>(average)</i>			
GDP growth	5.0	5.2	6.3	4.7	4.3
GNP per capita growth	3.5	3.7	5.5	3.3	1.2

Source: World Bank, Central Bank of Sri Lanka

2) Economic Structure

Parallel to the changing pattern of international trade, during the last two decades the relative importance of the industrial sector and its contribution to the economic growth has been changing over the years. This has been pronounced through the relative decline in the traditional agriculture sector while other sectors such as manufacturing and services have

begun to prosper. From 1988 to 1998, when the GDP grew at 5.2% per annum, agriculture grew at an annual average of 2.0% while industry grew at 7.1% per annum and services at 5.4%. Of the industry, the manufacturing sector recorded an annual average growth of 8.4% during the same period. It is obvious that the manufacturing sector has been an engine of growth for the last ten years.¹

Sector Shares of GDP

	<i>1977</i>	<i>1987</i>	<i>1997</i>	<i>1998</i>	<i>1999</i>
(% of GDP)					
Agriculture	30.7	27.0	21.9	21.1	20.7
Industry	28.7	27.4	26.9	26.0	25.8
Manufacturing	23.1	16.0	16.4	16.5	16.4
Services	40.6	45.6	51.2	52.9	53.5
	<i>1977-87</i>	<i>1988-98</i>	<i>1997</i>	<i>1998</i>	<i>1999</i>
(average annual growth: %)					
Agriculture	3.5	2.0	3.0	2.5	4.5
Industry	5.0	7.1	7.8	5.8	4.5
Manufacturing	5.3	8.4	9.1	6.3	4.4
Services	6.4	5.4	7.1	5.2	4.0

Source: World Bank, Central Bank of Sri Lanka

A share of the manufacturing sector is still relatively low compared with other SAARC and ASEAN countries as shown below.

Sector Shares and Growth in Selected Asian Countries

(%)

	Sri Lanka	India	Indonesia	Malaysia	Philippines	Singapore	Thailand
GDP Structure (1996)							
Agriculture	22	28	16	13	21	0	11
Industry	25	29	43	46	32	36	40
Manufacturing	16	20	25	34	23	26	29
Services	52	43	41	41	47	64	50
Average Growth Rate (1990-1996)							
Industry	6.6	6.8	10.2	11.2	3.1	9.1	10.3
Manufacturing	8.8	7.5	11.1	13.2	2.6	7.9	10.7

Source: World Bank

¹ The reason why the manufacturing share in total GDP has not increased enough despite its higher than average growth is because the deflator of the manufacturing has been lower than other sectors. Sectors' share in GDP is based on current prices.

3) International Trade

Among various policy measures for economic liberalization introduced since 1977, trade liberalization was one of the most important measures. A key feature of the trade liberalization program was its emphasis on export promotion. Export duties were gradually lowered and ultimately eliminated by the end of 1992. Export promotion was also supported by liberalization of the external payment system. For generations the country had a highly differentiated tariff structure, a variety of non-tariff barriers, including quantitative restrictions and licensing and foreign exchange restrictions. However, with liberalization the government radically altered its trade policy by lowering tariff rates, dismantling quantitative restrictions, eliminating discretionary measures, and liberalizing import administration. The export-led industrialization strategy has yielded some results. Agriculture, which once dominated the export sector, has given up its position to industrial export, which surpassed agriculture export in 1987.

Among industrial exports, labor intensive manufacturing goods have become major exports, replacing primary agricultural products or traditional exports. As shown in the table below, industrial exports have been increasing its share rapidly, led by the dominance of the textile and apparel industry, which accounts for more than half of total exports now, whereas tea export, once being the single most major export of Sri Lanka, has reduced its share year by year, with some fluctuations caused by the changes in international market price.

Composition of Exports

	<i>1977</i>	<i>1990</i>	<i>1995</i>	<i>1998</i>	<i>1999</i>
Agricultural	79.3	37.7	21.8	22.9	20.6
Tea	n.a.	25.9	12.6	16.4	13.5
Industrial	14.2	54.2	75.4	74.9	77.0
Textile & Garments	n.a.	31.8	48.7	52.0	52.7
Mineral & Unclassified	6.5	8.1	2.9	2.2	2.4
Total	100.0	100.0	100.0	100.0	100.0

Note: Share based on the US dollar value.

Source: Central Bank of Sri Lanka, *Annual Report*, various issues.

4) Employment

The following table demonstrates the decline in unemployment, both for male and female, since 1991. The changing pattern of employment share by the industrial sector clearly shows a tendency parallel to the change in the GDP share. Agriculture, which accounted for more than half of total employment before liberalization, reduced its employment share to 38% in

1997. The decline of employment in agriculture was mainly due to the rapid increase in employment opportunities in the manufacturing sector as well as in the construction and service sectors. As for the last decade, however, the industry sector has not increased its employment share, while the sector's GDP share has also remained unchanged for this period.

Employment Pattern

	<i>1981</i>	<i>1991</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>
Labor Force (mn)	5.0	5.9	6.1	6.2	6.2	6.6
Unemployment Rate (%)	17.9	14.7	12.3	11.3	10.5	9.5
Male (%)	13.3	9.9	9.0	8.2	7.7	6.6
Female (%)	31.0	23.4	18.7	17.7	16.1	14.6
Employment Share (%)						
Total	100.0	100.0	100.0	100.0	100.0	100.0*
Agriculture	45.2	42.5	36.7	34.4	36.2	38.1
Industry	14.1	20.7	21.7	21.6	23.6	21.6
Manufacturing	10.1	15.0	14.7	14.6	16.4	15.3
Services	40.7	36.9	41.6	44.0	40.2	40.3

Note: *As of Third Quarter

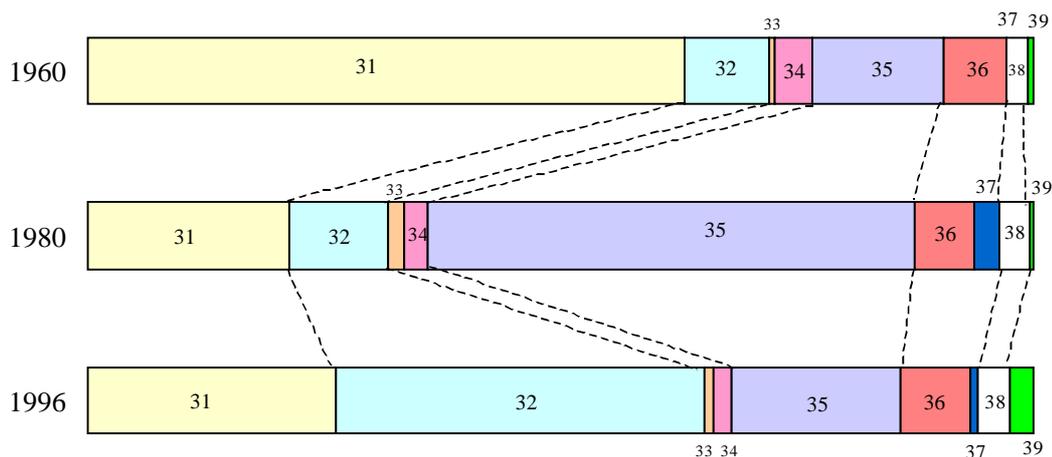
Source: Department of Census and Statistics, Central Bank

2.2 Manufacturing Sector

1) Structure

As seen in the previous section, the manufacturing sector has undergone major structural changes since 1977 increasing its share in overall output, total employment and export earnings of the country. The relative share of agricultural processing industries for exports has declined, while factory industries have become the largest contributor to the manufacturing sector.

There has been diversification in industrial production to a certain extent in the long run. In the early 1960s, the food, beverage and tobacco subsector (ISIC 31) dominated the manufacturing output, accounting for more than 60% of the total manufacturing, but its contribution decreased substantially in the 1980s.



Structure of Manufacturing Production

Note:	31	Food Processing	36	Non-metallic
	32	Textile, apparel, leather	37	Basic Metal
	33	Wood processing	38	Machinery/equipment
	34	Paper	39	Others
	35	Chemical, rubber, plastic		

Although diversification of the manufacturing sector has advanced since 1977, the sector still remains heavily dependent on a few labor-intensive industries, especially apparel manufacturing. In the 1990s, the wearing apparel and leather subsector rapidly increased its share in the total manufacturing in terms of value added.

Structure of Manufacturing Value Added (Current Prices)

(%)

	1990	1995	1996	1997	1998	1999
31 Food, beverage and tobacco	38.9	36.1	34.5	31.7	31.2	31.0
32 Textile, wearing apparel and leather	23.1	30.4	32.7	36.3	36.7	38.5
33 Wood	1.6	1.4	1.3	1.1	1.0	1.0
34 Paper	3.3	3.0	2.7	2.3	2.0	1.9
35 Chemical, petroleum, rubber and plastic	7.8	8.4	9.4	9.6	11.0	9.6
36 Non metallic mineral	15.3	11.9	11.0	10.3	9.6	9.6
37 Basic metal	0.6	0.4	0.5	0.5	0.5	0.5
38 Fabricated metal, machinery and transport eqpmt	8.9	5.6	5.0	5.3	5.2	5.1
39 Other manufacture	0.4	2.8	2.9	2.8	2.6	2.6
Total Manufacturing	100.0	100.0	100.0	100.0	100.0	100.0

Source: Central Bank

The manufacturing GVA structure in Sri Lanka is compared with that of selected Asian countries as shown in the following table. It is clear that Sri Lanka is much more dependent on the textile, apparel and leather subsector and less dependent on the machinery and equipment subsector.

Manufacturing Structure in Selected Asian Countries

(%)

	Sri Lanka (1995)	India (1994)	Indonesia (1995)	Malaysia (1994)	Philippines (1994)	Singapore (1995)	Thailand (1994)
31 Food, beverage, tobacco	33.2	12.4	19.0	9.4	32.3	3.6	16.1
32 Textile, apparel, leather	30.2	15.1	18.8	5.4	9.9	1.3	17.7
33 Wood and products	1.1	0.3	8.9	7.8	1.7	0.8	1.6
34 Paper, printing	2.7	3.8	5.1	4.4	3.5	5.8	6.3
35 Chemical, rubber, plastic	15.9	25.4	13.2	19.2	24.5	16.9	16.8
36 Non-metallic mineral	5.8	4.5	3.8	5.7	4.7	2.1	4.6
37 Basic metal	1.3	12.4	7.6	1.8	5.7	0.5	3.4
38 Machinery, equipment	6.1	25.2	23.0	44.6	16.8	68.3	32.1
39 Other Manufacture	3.7	0.9	0.6	1.7	0.9	0.7	1.4
Total Manufacturing	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: Figures for Sri Lanka based on Annual Survey of Industries are different from statistics compiled by the Central Bank
Source: Annual Survey of Industries

With promotion of the export-oriented industries, the textile and wearing apparel group became the largest exporter, accounting for more than 50% of the total export in 1998.

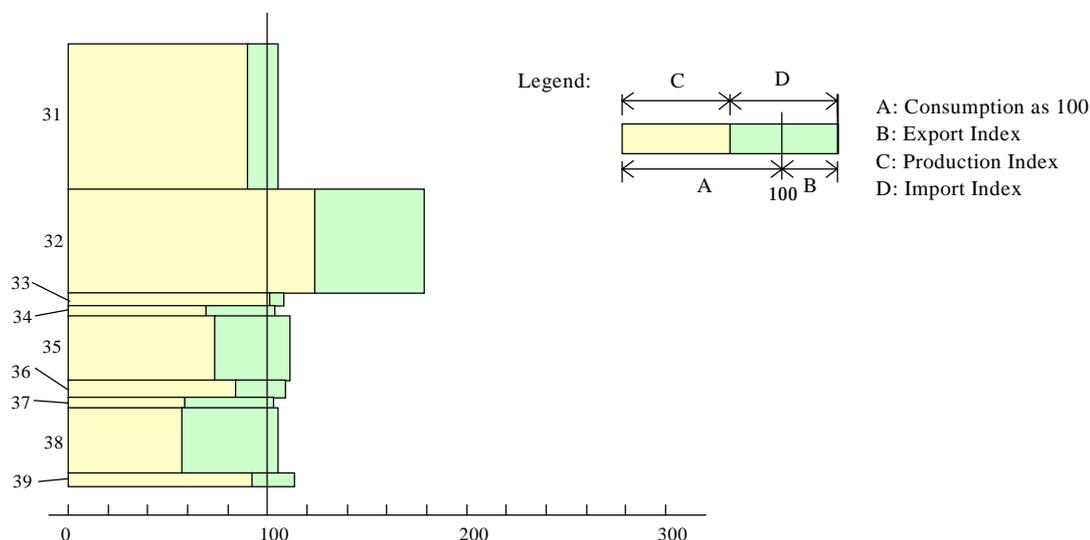
Exports from Sri Lanka in 1998.

		US\$ million	Percent Shares	Growth (97-98)			US\$ million	Percent Shares	Growth (97-98)
Sri Lankan Total exports		4,721	100.0	2.1%					
Traditional	Total	908	19.2	-0.3%					
-Tea		775	16.4	7.8%					
-Rubber		43	0.9	-45.3%					
-Coconut		90	1.9	-21.0%					
Non-traditional	Total	3,814	80.8	2.6%					
-Other Export Crops		162	3.4	18.5%					
Coffee		27	0.6	90.7%					
Cinamon		50	1.1	8.1%					
-Unmanufactured Tobacco		41	0.9	19.0%					
-Fisheries Products		103	2.2	38.5%					
Prawns		69	1.5	86.0%					
-Manufactures	Subtotal	4,138	87.6	-2.6%					
Food Beverage/tobacco		17	0.4	-6.4%					
Textiles/Garments	(Subtotal)	2,450	51.9	8.3%					
Woven Fabrics		115	2.4	5.8%					
Garments		2,194	46.5	7.2%					
Leather Products	(Subtotal)	148	3.1	31.6%					
Travel Goods etc.		139	2.9	40.1%					
Footwear		65	1.4	-7.4%					
Wood Prods./Furniture	(Subtotal)	11	0.2	-17.3%					
Wooden Craft items		5	0.1	-17.3%					
Furniture		2	0.0	4.2%					
Paper/Paper Products	(Subtotal)	22	0.5	-2.0%					
Stationery		9	0.2	-9.0%					
Chemicals/Plastic Products	(Subtotal)	57	1.2	-4.3%					
					Plastic Products		30	0.6	-11.2%
					Activated Carbon		19	0.4	-1.7%
					Rubber Products (Subtotal)		178	3.8	0.1%
					Tyres/Tubes		85	1.8	16.0%
					Clothing Accessories		66	1.4	-15.6%
					Unhardened Rubber		20	0.4	4.7%
					Non-metallic Mineral Prods. (Subtotal)		61	1.3	-3.8%
					Ceramic Products		54	1.1	-2.3%
					Graphite		3	0.1	1.2%
					Glass/Glassware		2	0.0	111.7%
					Base Metal Products (Subtotal)		18	0.4	-33.8%
					Iron/steel Products		11	0.2	-28.6%
					Machinery/Equipment (Subtotal)		228	4.8	-8.6%
					Boiler etc.		12	0.3	-89.1%
					Electrical Products/Parts		10	0.2	-56.2%
					Transport Equipment		7	0.1	-13.4%
					Ships/Boats		3	0.1	55.3%
					Toys/Games/Sporting Equip.		49	1.0	-10.1%
					Electronic Products		139	2.9	244.3%
					Jewelry etc. Subtotal		124	2.6	-45.0%
					Diamonds		58	1.2	-53.4%
					Gems		55	1.2	-33.8%
					Jewelry		11	0.2	-39.2%
					-Petroleum Products		72	1.5	-25.9%
					-Re-exports		41	0.9	-19.0%
					-Others		33	0.7	-14.2%

Note: Manufacturing exports include exports of tea and coconut product, and excluded fisheries exports.

Source: Export Development Board (EDB)

Illustrated below is a ‘skyline map’ of Sri Lanka in 1994, which visually represents a country’s manufacturing structure in terms of domestic and international supply and demand. It should be noted that the map was drawn on the basis of data from a provisional ‘Input-Output Table for 1994’ prepared by the National Planning Department.



Skyline Map of Sri Lanka 1994

The following is information observed from the skyline map:

- (i) It is obvious that in Sri Lanka the food, beverages and tobacco subsector (ISIC 31), the textiles, wearing apparel and leather product subsector (32), the chemical, petroleum and plastic subsector (35) and the machinery and equipment subsector (38) have larger shares in total manufacturing production.
- (ii) The value of exports (the area of the rectangle beyond 100 line) of food manufacturing is small in proportion to the value of domestic consumption (the area of the rectangle up to 100 line), while the value of imports (the area of the shaded rectangle) is much less than the domestic production (the area of the white rectangle).
- (iii) As for textiles, the subsector is heavily dependent on imports, nearly equal to a third of total supply (domestic production plus imports) while it is simultaneously export dependent, as export accounts for about 40% of the total demand (consumption plus exports).
- (iv) The features of chemicals (mainly rubber products in Sri Lanka) are similar to the food processing (31), but the former is more import dependent than the latter.

- (v) Basic metal (37) and machinery (38) have scarcely provided exports and their domestic demand depend heavily on imports

The latest statistics of the Sri Lankan manufacturing sector classified under ISIC 3-digit code are available in the 1996 Annual Survey of Industries by the Department of Census and Statistics. The table below shows the number of enterprises and workers in 1995, as well as GVA and its annual average growth rate (AAGR).

Manufacturing Statistics 1995

	No. of Establish-ment	No. of Workers	Gross Value Added (GVA)			GVA Ratio
			GVA (Rs. million)	Percent Shares	AAGR (90-95)	
Manufacturing Total	3,030	477,664	103,011.3	100.0	20.4%	42%
311/312 Food Processing	654	63,619	19,755.0	19.2	15.4%	41%
313 Beverage	17	5,288	3,639.8	3.5	-5.1%	58%
314 Tobacco	159	6,999	10,776.4	10.5	11.6%	88%
321 Textiles	519	51,629	7,643.8	7.4	18.3%	38%
322 Garments/Apparel	430	200,887	20,991.6	20.4	28.8%	45%
323 Leather/Leather Products	30	3,959	515.4	0.5	36.7%	25%
324 Footwear	14	6,654	2,003.5	1.9	20.5%	53%
331 Wood Products	123	4,030	999.4	1.0	22.9%	76%
332 Furniture/Fixture	68	2,432	126.5	0.1	32.5%	41%
341 Paper/Paper Products	30	5,512	1,586.1	1.5	15.8%	46%
342 Printing/Publishing	76	8,521	1,260.9	1.2	16.4%	40%
351 Industrial Chemicals	23	1,750	962.1	0.9	19.7%	37%
352 Other Chemicals	88	6,614	5,768.8	5.6	34.5%	51%
353/354 Petroleum Products	2	1,230	1,599.5	1.6	30.4%	8%
355 Rubber Products	213	31,041	6,663.7	6.5	36.4%	44%
356 Plastic Products	57	7,164	1,326.1	1.3	29.5%	39%
361 Pottery/China etc.	34	7,052	1,260.4	1.2	13.7%	54%
362 Glass/Glass products	9	972	270.4	0.3	11.6%	59%
369 Other Non-metallic Mineral Products	155	9,029	4,463.0	4.3	37.0%	45%
371 Iron & Steel Basic Indrys.	12	2,184	1,071.7	1.0	28.2%	50%
372 Non-Ferrous Metals	7	617	331.3	0.3	24.2%	49%
381 Fabricated Metal Products	94	4,985	899.9	0.9	18.0%	37%
382 General Machinery	42	4,019	812.5	0.8	18.8%	26%
383 Electrical machinery etc.	42	6,793	1,803.5	1.8	44.8%	48%
384 Transport Equipment	38	9,544	2,668.1	2.6	21.8%	49%
385 Precision Instruments	8	380	42.2	0.0	21.4%	67%
390 Other Mfg. Industries	86	24,760	3,769.8	3.7	55.2%	26%

Source: 1996 Annual Survey of Industries (Department of Census and Statistics)

4) Small and Medium Industries (SMIs)

In Sri Lanka, there is no clear definition of small and medium industries (SMIs). Various government agencies use different criteria to identify SMIs, such as the number of employees and the size of fixed capital asset. However, the definition by the National Development Bank is the most commonly used, according to which SMIs are “companies with total fixed asset of Rs. 20 million or less, excluding real estate”.

According to the most recent industrial census conducted in 1983, there were 102,721 registered and informal industrial units in Sri Lanka with employment of 639,256. Among them; the number of industries with less than five employees accounted for 84.3% of the total, contributing 7.5% to the total production value, 7.0% to GVA, and 28.4% to the total employment of the manufacturing sector. A recent survey conducted by UNDP estimates that SMIs with total fixed asset of Rs. 16 million or less accounted for 90% of the establishment, 70% of employment, and 55% of GVA in the total private sector.

From the questionnaire survey conducted in the course of this study, SMIs in the target industries are found to be as follows:

SMIs in Target Industries

Subsector	Establishment in Statistics* ¹	Enterprises Surveyed* ²	No. of SMIs	Rate of SMIs (%)
322 Apparel	430	104	29	27
323 Leather	30	50	35	70
355 Rubber	213	50	37	74
356 Plastic	57	53	31	58
382 Machinery	42	50	49	98
383 Electric/Electronic	42	50	40	80
Total	814	357	221	62

Note: *1 Number of establishments recorded in 1996 Annual Survey of Industries, MID

*2 Number of enterprises surveyed by JICA and UNIDO
Random sampling for the apparel and leather industries

Source: Questionnaire Survey

Considering such a large number of employment by SMIs, and the fact that many SMI units, unlike factory industries, are located in the rural area where unemployment level is higher, SMIs are quite important in the Sri Lankan economy. It is pointed out that there are a number of problems associated with SMIs. Among them are:

- (i) Low level of technology, marketing knowledge and management skill,
- (ii) High production cost caused by high electricity tariff, and various taxes such as import duty on capital goods, defense levy and GST,
- (iii) Difficulty of financing due to various reasons including high interest rates, shortage of collateral, and lack of knowledge of bank procedures,
- (iv) Lack of know-how to deal with rather complicated government procurement procedures, and
- (v) Lack of entrepreneurship.

3) Regional Distribution

Around 80% of industries are located in Colombo or Gampaha districts, in the Western Province, as seen in the table below. This is because relatively better infrastructure facilities are available; e.g., Colombo seaport and airport are of close proximity, human resources are relatively abundant, and access to information and capital is better, in these neighboring districts. Cottage industries and small scale industries are well distributed all over the country while agricultural processing factories are located in the outstations, based on resource availability.

The concentration of industries in the two districts has created several social, economic and environmental problems, such as pollution, congestion in the capital area, and an increase of squatters. Though the government has taken several measures to modify and minimize excessive concentration of industries in these districts, it does not appear that the situation has been changing rapidly.

Regional Distribution of Industries

District	1997		1998		1999	
	Number	Share (%)	Number	Share (%)	Number	Share (%)
Colombo	1,742	59.8	1,842	57.9	1,893	55.7
Gampaha	563	19.3	630	19.8	659	19.4
Kalutara	118	4.1	140	4.4	149	4.4
Galle	69	2.4	76	2.4	94	2.8
Puttalam	77	2.6	102	3.2	113	3.3
Kandy	69	2.4	82	2.6	94	2.8
Kurunegala	50	1.7	58	1.8	70	2.1
Matara	34	1.2	37	1.2	52	1.5
Hambantota	28	1.0	29	0.9	40	1.2
Nuwara Eliya	28	1.0	30	0.9	40	1.2
Ratnapura	28	1.0	29	0.9	35	1.0
Anuradhapura	23	0.8	26	0.8	27	0.8
Badulla	25	0.9	26	0.8	30	0.9
Kegalle	16	0.5	25	0.8	28	0.8
Matale	12	0.4	15	0.5	21	0.6
Moneragala	8	0.3	7	0.2	14	0.4
Polonnaruwa	8	0.3	6	0.2	10	0.3
Ampara	9	0.3	12	0.4	11	0.3
Trincomalee	2	0.1	3	0.1	6	0.2
Batticaloa	2	0.1	4	0.1	6	0.2
Vavuniya	2	0.1	2	0.1	2	0.1
Jaffna	0	0.0	1	0.0	3	0.1
Manner	0	0.0	0	0.0	0	0.0
Total	2,913	100.0	3,182	100.0	3,397	100.0

Source: Central Bank 'Annual Report 1999'

Note: Industries Registered under MID and BOI.

III. DEVELOPMENT SCENARIO AND FRAMEWORK

3.1 Objectives of Industrial Development

The Sri Lankan government announced the Six-Year Development Program (1998-2004) in November 1998, and set the principal objectives of the Program as follows:

- (i) to accelerate economic growth,
- (ii) to distribute the realized gains of growth equitably among all classes of people, and
- (iii) to ensue a higher quality of life for all.

The Program places much importance on equitable distribution of income, or gains from the growth to be achieved during the plan period.

On the other hand, the New Industrialization Strategy for Sri Lanka released by the Government in November 1995, describes the main objectives of the industrial policy as 'to create more employment and income opportunities', while placing more emphasis on regional distribution of industrial activity in order to provide more opportunities to unemployed youths. The Strategy recognizes that a key to employment generation is export orientation and the industrial sector requires further diversification for sustainability.

It is expected that the manufacturing sector will continue to be an engine of growth of the Sri Lankan economy up to the year 2010 and a major source of employment creation. With this expectation and with the Six-Year Development Program and New Industrialization Strategy in view, this Master Plan sets the objectives of industrial development as follows:

- ① The manufacturing sector is developed to provide a solid foundation of sustainable development of Sri Lanka in the first decade of the 21st century:

The manufacturing sector is expected to contribute to formation of a solid foundation for development as a leading sector of the economy. The manufacturing structure should be consolidated and make the economy less vulnerable to the external factors.

- ② The manufacturing sector is developed to contribute to generation and stabilization of employment opportunities conducive to higher income and better quality of life for all Sri Lankan people, irrespective of gender in both urban and rural areas:

The balanced growth of manufacturing sector should offer job opportunities for all classes of people and improve working environment.

- ③ The manufacturing sector is developed to contribute to the enhancement of Sri Lankan productivity and competitiveness through technological upgrading, diversification and specialization, in the context of free trade regimes:

In the global economy, competitiveness of the manufacturing sector is of vital significance, which will not be attainable without technological improvement and upgrading.

- ④ The manufacturing sector is developed to contribute to creation of an environment-friendly and sustainable society:

In the course of industrial development, much attention must be paid to the natural and social environment, in order to achieve sustainable development.

With the objectives of industrial development set as above, it is not always considered sufficient to selectively promote the globally competitive industries and enhance their competitiveness. Attention should be paid, at the same time, to the manufacturing activities of SMIs in which nearly 70% of employment is absorbed, as well as to the industries that are currently less competitive but important to consolidate foundation of industrial development in the long run.

3.2 Concept for Industrial Development Planning

1) Industrial Policy of Sri Lanka

The industrial policy of Sri Lanka significantly changed in 1977, when it shifted from the import substitution and the expansion of public sector industries, to the promotion of private sector led export-oriented industries. This change of industrial policy under the overall economic reform was necessary and resulted in considerable changes in the industrial structure and export structure, strengthening manufacturing subsectors with comparative advantages, like the apparel industry which enjoyed rapid growth under the MFA quota system. Nevertheless, as seen in the previous chapter, the country's manufacturing still has much room to be improved: the magnitude of the manufacturing sector in the total economy is insufficient and the structure of the manufacturing must be diversified.

There seem to be several features in Sri Lanka's industrial policy that failed to fully utilize the country's potential in the past.

- Sri Lanka started opening the market without preparing a sufficient infrastructure for the industry, both physical and institutional, hindering local market oriented industries (especially SMIs) from growing enough to match foreign competitors even with their best efforts.
- Although a large number of FDIs have flowed into Sri Lanka, attracted by its economic environment, the most liberal in South Asia, most of them are labor-intensive and self-sufficient and have hardly disseminated their technology into local industries.
- With the lack of a long-term development plan or ‘grand design’ of the industry sector, it is nearly impossible to create an image of the industrial structure in the future. Without continuous and sound government direction, such as priority sector promotion and industrial location policies, the private sector tends to be somewhat hesitant in its business and investment activities.
- The above factors brought in dual-structure of the industry, i.e. BOI-industry vis-à-vis non-BOI industry, and factory industry vis-à-vis cottage industry.
- Too much reliance on a few industrial subsectors, especially the apparel industry, without enthusiastic and systematic efforts to diversify and upgrade the sector, has now brought about critical challenges in the face of elimination of the quota scheme under MFA.
- Knowledge-based industries, IT industry in particular, have yet to develop despite the country’s advantageous human resources, because of insufficient research and development activities, which should be led by the government rather than left out to the private sector.

2) Industrial Policy in East Asia

It is beneficial to take an overview of the industrial policy of the East Asian countries before discussing the plan formulation of Sri Lanka’s industrial development programs, since East Asian experiences would provide meaningful lessons to Sri Lanka.

Over the last three decades, most of the East Asian economies have undergone three stages of industrial policy. They started with import substitution. When import substitution became saturated, the policy shifted to export orientation. However, since the mid-1980s, East Asians adopted deregulation and liberalization, not only under the pressures from major markets and

the Uruguay Round commitments, but also due to their own needs to attract FDIs for technology and market access.

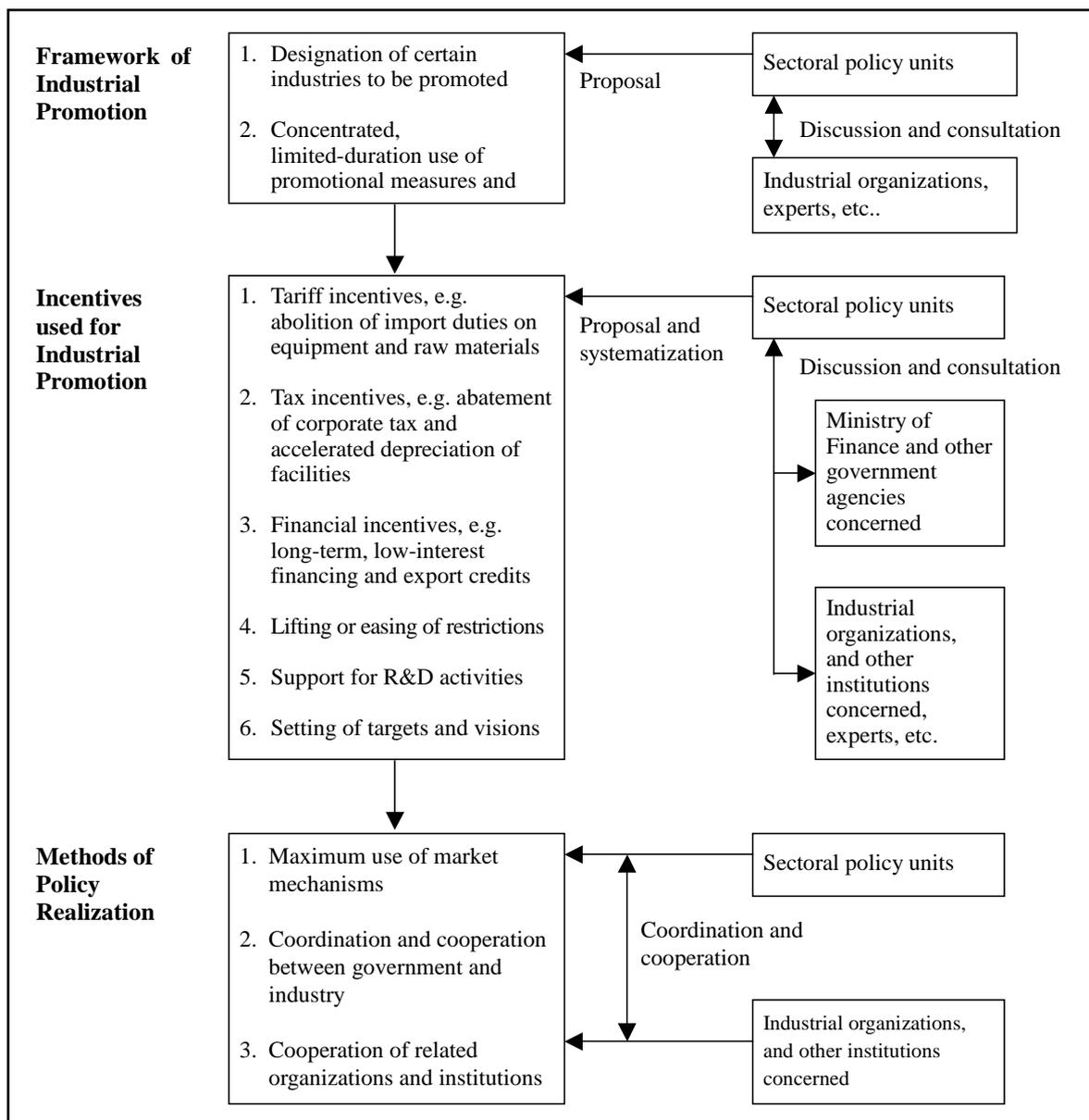
In the first two stages, the East Asian countries, especially Japan, Korea and Taiwan, adopted the sectoral approach in their industrial policies: the designation of specific industries for promotion and the granting of various incentives to these sectors for limited periods of time. The selection of industries was considered necessary to effectively utilize available funds, foreign exchange, resources and manpower and other measures for the promotion of selected industries. In general, the following industries were targeted in order as the countries developed:

- (i) Import substitution industries able to reduce outlays of foreign currency;
- (ii) Labour-intensive export industries capable of earning foreign exchange;
- (iii) Heavy machinery and chemical industries for the supply of raw materials and machinery;
- (iv) Capital- and technology-intensive export industries; and
- (v) Technologically advanced export industries.

To promote target industries, Japan, Korea and Taiwan adopted similar policy measures, namely;

- (i) Tariff incentives,
- (ii) Tax incentives,
- (iii) Financial incentives,
- (iv) Easing of controls,
- (v) Support to R&D activities, and
- (vi) Establishment of vision and targets

Another important point which the East Asian governments emphasize is coordination between the public and private sectors. In the case of Japan, the sectoral policy units, the organization inside the Ministry of International Trade and Industry in charge of various industries, maintained close ties with respective industrial associations, allowing them to obtain the information and ideas to formulate policies and prevented conflicts between the public and the private sector. The salient features of the East Asian style industrial policy are summarized in the following figure:



Source: Inoue, R., H.Kohama and S.Urata eds. Industrial Policy in East Asia, JETRO, 1993. Modified by JICA Study Team.

Features of Industrial Policy in East Asia

In addition to the incentive schemes mentioned above, East Asia also adopted some protective policy measures, such as import restrictions, in the process of promoting specific industries. The question then arises whether Sri Lanka should totally follow suit. It may be irrelevant for Sri Lanka to adopt protective measures in the current global environment of economic liberalization, especially after the country had successfully introduced the open market policy. Even some tax, tariff and fiscal incentives may result in controversy because they could distort the markets as sorts of subsidy to specific industries. In this sense, policy measures that

Sri Lanka can apply for the promotion of industries may be more limited than the measures East Asian countries applied in the past. Nevertheless, some measures, notably “establishment of visions and targets” “coordination between the public and private sectors”, “support for R&D and training activities”, apart from several incentive schemes, are essential policy measures for Sri Lanka to adopt.

3) **Framework Approach and Ingredient Approach¹**

Following the overview of industrial policy in Sri Lanka and East Asia as presented above, it is now hypothesized that one of the reasons for the slow development of the Sri Lankan manufacturing sector is that the policy measures adopted so far have been more oriented towards the “framework” approach in which ‘environment’ or ‘framework’ is the most important factor for economic development. This approach assumes that ‘if a country has a market-oriented free economic environment or framework, then the private sector prospers in itself and vitalizes the economy as a whole, thus the government should concentrate on preparing such environment through deregulation and privatization and avoid intervening with the market as much as possible’.

On the other hand, as seen in the previous section, the East Asian countries adopted an industrial policy which may be called the “ingredient” approach. This approach puts more importance on the contents, or ingredients, of development than on the environment surrounding economic activities. “Ingredients” refer to factors that constitute economy, such as industries, companies and projects. Therefore, when a country creates any development plan, it is essential to imagine and establish the idealistic future of the country in an educated but bold manner. With the future image of the country’s economy determined, planning is to be made about who, when, where, what and how to do to achieve the development goals. As for industry, for example, after the manufacturing structure is observed for ten years, target growth or production is set out at the subsector level, and specific and realistic policy measures and programs are to be formulated to accomplish those targets.

This “ingredient approach”, which involves comprehensive governmental initiatives in driving economic activities and fostering specific sectors, has a good contrast with the “framework approach”, when an industrial development policy is planned. While the

¹ The concepts of framework and ingredient approaches presented here are based on Yanagihara, Toru, *Keizai Hatten to Kozou Chosei [Economic Development and Structural Adjustment]* in Kohama, Hirohisa. and Yanagihara, Toru eds. ‘Higashi Ajia no Kozou Chosei [Structural Adjustment in East Asia], JETRO, 1995. Yanagihara introduces the concept of the ingredient approach as an alternative to the World Bank’s framework approach to structural adjustment.

“framework approach” is quite logical and relevant to macroeconomic theory, the policy-driven development through the “ingredient approach” places more emphasis on micro level economic activities and sees the development as accumulation of such economic activities.

It is therefore proposed that an approach closer to the “ingredient approach” be adopted by Sri Lanka in formulating the industrial development master plan, as it seems that in the past government efforts in industrial development have not been specific enough to realize the target, if any. It is desirable for the sake of development of the industrial sector that the government deliberately think about promotion of specific subsectors and specific programs more than before, in addition to improving the economic “framework.”

The proposed approach closer to “ingredient approach” is particularly required for development of SMIs. As noted earlier, nearly 90% of the manufacturing establishments are SMIs in Sri Lanka.

3.3 Development Scenario

The development scenario of the industrial sector in Sri Lanka from the year 2000 to 2010 is formulated through the following steps:

- (i) Review of changes of environment surrounding the Sri Lankan economy,
- (ii) Discussion on the basic framework for industrialization,
- (iii) Discussion on the basic approach to develop the target industries, and
- (iv) Formulation of the development scenario.

1) Environment Surrounding Industrial Development of Sri Lanka

The industry of Sri Lanka has been experiencing substantial change of the environment in recent years. Some changes have already affected Sri Lankan industries while others are expected to expose major influences in the near future. Among the changes are the following factors, considered to have major impacts on industrial development of Sri Lanka:

- (i) Progress of Indo-Lanka Free Trade Agreement (ILFTA),
- (ii) Promotion of South Asia Free Trade Area (SAFTA),
- (iii) Expiration of the quota system under the Multi-Fiber Agreement (MFA) in the year 2005,
- (iv) Consolidation of the rules under the World Trade Organization (WTO), and
- (v) Recent economic and financial crisis in East Asia.

Besides the last factor regarding the East Asian crisis, all are in line with global trade liberalization, or globalization in the more general term. Therefore, it is essential for Sri Lanka to adapt to and exploit this global trend.

While the Indo-Lanka free trade pact finally came into effect in March 2000, it seems to be taking some time and effort before SAFTA's realization designed in 2008 to 2010. Nonetheless, Sri Lanka definitely has a good opportunity to attract more investment and to have more access to the markets in the South Asia region with the progress of trade liberalization. Easier access to the Indian market, in particular, can make Sri Lanka an export base to the large market, which will therefore invite massive FDIs, both from India itself and from other countries. A number of studies have been made to date on the effects of ILFTA and SAFTA, and some of them suggest that Sri Lankan manufacturers would not benefit from the pacts as much as Indian counterparts and Sri Lankan consumers². Even so, it is certain that Sri Lanka will have more chances to expand its export market by diversifying the manufacturing sector.

Elimination of the textile and apparel quota in North America and European countries under MFA, is one of the most serious issues facing Sri Lanka, as the subsector is the largest export earner and employment creator. It is reasonable to suppose that the textile and apparel will gradually decrease its share in the economy and the manufacturing sector, with the MFA expiration. However, this is also an opportunity for Sri Lanka to shift its apparel products to a more high-value-addition-oriented market, and diversify and upgrade its manufacturing structure by promoting the selected target industries.

The consolidation of the WTO rules, seemingly advanced by the industrialized countries, strongly encourages freer trade environment for the member countries, including Sri Lanka. But a country, if some of its manufacturing sector is still in an initial developing stage, needs to be careful in opening its market across the border. For the purpose of fostering local industries that will have a comparative advantage in the future, deliberate strategies and measures should be formulated under the consistent and sound industrial development policy.

As for the East Asian crisis, the economy of these countries have been showing rapid recovery, which would place the economy of Sri Lanka in a favorable position in general, since Sri Lanka can expect (i) more FDI inflow from East Asia, (ii) more exports to East Asia

² For example, "*Sri Lanka: State of the Economy 1999*", Institute of Policy Studies, 1999.

with their increasing demand, and (iii) restoration of Sri Lanka's export competitiveness against East Asia, with their currencies bouncing back in the foreign exchange market. Although Sri Lanka at present does not necessarily have a strong tie with East Asia as far as economic relations is concerned, it is expected that East Asia, particularly ASEAN countries, and Sri Lanka, together with other SAARC member countries, will deepen their mutual economic relationship through trade and investment, as the economic liberalization of both regions progresses further. This is why Sri Lanka, in the coming years, should look more towards Eastern neighbors than before.

2) Basic Framework for Industrialization

(1) Philosophy

The basic principle, or philosophy for industrial development that Sri Lanka should follow for the coming years 2000-2010, is:

Free Business Environment with Clear and Appropriate Government Directions.

As reviewed earlier in Chapter III, Sri Lanka has lagged behind the East Asian countries in developing the industry sector, despite having the most liberal economy in South Asia, mainly because of the lack of the government's proper policy directions. It is required for the government to provide the private sector with institutional and physical (infrastructure) support so that the private sector can fully display their capability in a level playing field for every market contender. Further, it is necessary for the national interest to pay much more attention to foster industries within the country, with sound strategies accompanied by concrete target figures and time schedule.

(2) Time Frame

On the basis of the above philosophy, the Master Plan divides its scheduled period into two stages, i.e., 2000-2004 and 2005-2010. The first half period is designed for "consolidation of foundation" for industrial development, whereas the second half will be the period for 'acceleration of growth' of the industry. Therefore, the growth target figures are set out in such a way that the second period has a more challenging task than the first period.

(3) Concept of “glocalization”³

Sri Lanka’s industrial policies in principle should be adopted in line with the world trend of “globalization” which was discussed in the earlier section, under the market-oriented economy. In this context, the following fundamental strategies are mostly desired under the current regional and world trend:

- Development of export oriented industries,
- Promotion of Sri Lanka as ‘gateway to South Asia’, and
- Strengthening relations with rapidly growing East Asia.

It is expected that Sri Lanka will become a hub of South Asia being the most liberal economic environment as well as with its strategic location. Therefore, it is justified that Sri Lanka claim itself as a gateway to South Asia supported by the emerging free trade regime between Sri Lanka and India, and among South Asian region as a whole. The Asian Development Bank, in its report⁴, argued that South Asia will become the growth center in Asia in the next 30 years, but it is quite possible that accelerated free trade regime in the region will make South Asia the most buoyant growth zone much before this.

It is also expected, for the same reason, that Sri Lanka will be among the first of the SAARC member countries to strengthen relations with East Asia, especially the advanced ASEAN member countries, by promoting itself as a “linkage point” between SAARC and ASEAN. The much-quicker-than-expected recovery of the ASEAN countries from economic crises has proved the fundamental soundness of the region’s economy and the increasing demand of ASEAN may favorably affect the Sri Lankan economy through Sri Lanka’s increasing exports to ASEAN and the ASEAN’s increasing investment in Sri Lanka. Sri Lanka should take advantage of its strategic location by paying more attention to the East Asian countries, ASEAN in particular, as the country’s export to Asian developing countries at present account for less than 10% of total exports.

On the other hand, however, Sri Lanka must at the same time attend to the problems of local industries and resolve constraints for industrialization through innovative policy measures. To pay attention to the local situation and to encourage local industries to grow can be described

³ Glocalization is originally the term of business management to mean that companies have to deal not only with world-wide considerations, but also with the specific rules and conditions of each country in which they operate. Here, however, glocalization means a country’s strategy to deal with global and local conditions simultaneously. The term ‘localization’ might be misleading as it could sound like nationalization of foreign firms investing in Sri Lanka, but in the context here it only means paying enough attention to local situation even when global views are required in the course of industrial development, as stated in the text.

⁴ Asian Development Bank, *Emerging Asia: Changes & Challenges*, Asian Development Bank, 1977.

as “localization”. In this context, the following issues, among others, should be taken with clear policy directions. The government’s initiatives are far more indispensable in tackling these issues.

- Upgrading of local industries, notably, SMIs,
- Balanced regional distribution of industries, and
- Employment creation through promotion of local industries.

Thus these twin policies, “globalization” and “localization”, should be combined together as one word namely “**glocalization**” as the policy under which Sri Lanka’s industrialization should be accelerated.

3) Target Industries

Promotion of industrialization in Sri Lanka should be carried out in a selective and strategic manner through promotion of the target industries. They are classified into two categories, following their features,

Global-linked industries:	Apparel industry Leather industry Rubber industry
Policy-driven industries:	Electric/Electronic industry Plastic industry Machinery industry Information technology (IT) industry

Basic strategies to promote the target industries should be formulated separately for each category, as various aspects of current conditions of these industries (e.g., resource availability, market, and notably, the stage of development) differ from each other.

Industries categorized under ‘global-linked industries’ have somehow already established their status in the Sri Lankan economy as leading industrial subsectors, with massive production and exports to the world market. Those are the industries which should be promoted by enhancing competitiveness in the global market. Competitive products should be manufactured in Sri Lanka with advanced technology and at a higher productivity for this purpose.

Industries classified under ‘policy-driven industries’, on the other hand, are still at the initial stage of the product cycle, as most of the domestic demand for products produced by these industries relies on imports while exports are negligible. Those industries should be developed strategically to be leading industries in the year 2010, or to serve as basic industries to support other categories of industries in Sri Lanka. For them to survive and achieve rapid growth, deliberate support by the government is indispensable, which is why they are to be called ‘policy-driven’. In the years 2000-2004, the first half of the Master Plan period, supportive policy measures to those industries are especially required.

4) Development Scenario

Taking into consideration the discussion above, the development scenario of Sri Lanka’s industry is proposed as summarized in the table below. In the first stage the growth target is moderate as this period should be devoted to consolidation of foundation, while the second stage will see accelerated growth with a more challenging target. The details of targeted figures are explained in the subsequent section.

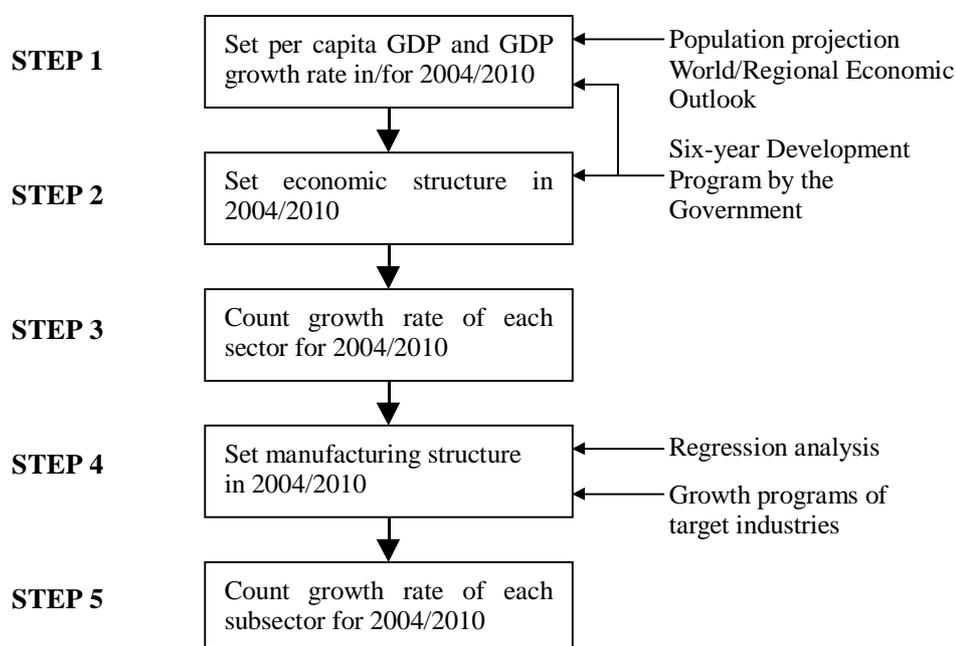
Development Scenario

	Short-term (2000-2004)	Medium/Long-term (2005-2010)
Philosophy	Free business environment with clear and appropriate government directions	
Policy Objective Measures	Consolidation of foundation Institutional reform Infrastructure development Fiscal incentives	Acceleration of growth Fiscal incentives R&D support
Linkage	SAARC countries	ASEAN countries
Growth Targets		
GDP growth	6.5%	7.5%
Mnfg. growth	9.6%	10.6%
GDP/person	US\$1,100 (in 2004)	US\$1,600 (in 2010)
Structure (share)	(in 2004)	(in 2010)
Mnfg. in GDP	19.2%	23.0%
Target subsectors in total mnfg.	32:Textile 36.0% 35:Chemical 10.7% 38:Machinery 5.5%	32:Textile 32.6% 35:Chemical 12.3% 38:Machinery 8.4%
FDI as % of GDP	2.3%	3.0%
Event (Free Trade Regime)	↑ (2000) Indo-Lanka FTA	↑ (2005) (2008-) ↑ MFA Expiration SAFTA

3.4 Economic Growth Towards 2010

1) Methodology

The economic framework is set out in accordance with the concept mentioned earlier in this Chapter. More specifically, the economic growth target levels of per capita GDP for 2004 and 2010 are determined as US\$1,100 and US\$1,600, respectively (at 1998 price) with the assumption that population constantly grows at the annual rate of 1.2%, followed by the setting of desirable (and not totally unlikely) structures of the economy and the manufacturing sector, which are reasonably derived from regression analyses. The Six-Year Development Program prepared by the government and other projections and forecasts by various sources have been studied and incorporated to a certain extent.



Steps to Set the Growth Targets

2) Economic Growth

A target of the economic growth in Sri Lanka has been set out through Step 1 to Step 3 in the following manner:

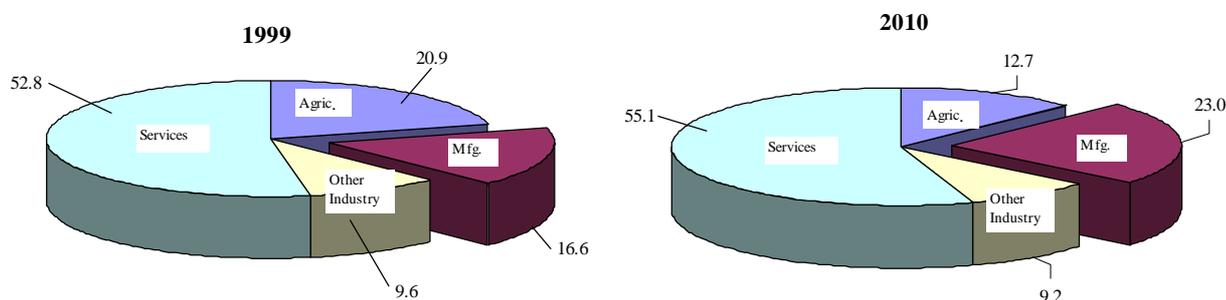
- (i) A target of the annual average growth rate of Gross Domestic Products (GDP) is set at 6.5% during years 2000-2004, and 7.5% during 2005-2010. The manufacturing sector plays a lead role, growing at 9.6% annually until 2004 and 10.6% annually in 2005-2010

whereas the services sector is expected to also experience higher growth than other sectors, led by the rapid development of information technology (IT) service industries.

- (ii) The target growth rate until 2004 is set out based on the projection prepared by the Department of National Planning of Sri Lanka, while the target rate from 2005 to 2010 is set at a more challenging figure taking into consideration the expected rapid industrialization.
- (iii) Industrial structure, or the share of each industrial sector in total GDP, will change in such a way that the manufacturing positively increases from 16.5% in 1998 to 19.4% in 2004, and 23.0% in 2010, which is equivalent to the level of the Philippines' manufacturing share in 1998. On the other hand, the services sector slightly increases from 52.8% in 1998 to 53.8% in 2004, and 55.1% in 2010.
- (iv) The estimated growth will result in the per capita GDP of around US\$1,100 in 2004, and US\$1,600 in 2010 (at 1998 price), which is almost double the present figure of US\$840 in 1998⁵.

Target Economic Growth and Industrial Structure

Growth Rate	1980-90 Average	1988-98 Average	1998	1999	2000-04 Average	2005-10 Average
GDP	4.0	5.3	4.7	4.0	6.5	7.5
Agriculture	2.2	1.5	2.5	2.4	2.6	2.2
Manufacturing	4.6	6.5	6.3	5.4	9.6	10.6
Non-manufacturing Industry			4.3	4.2	6.7	6.7
Services	4.7	6.3	5.2	4.2	6.8	7.9
Industrial Structure	1978	1988	1998	1999	2004	2010
GDP	100.0	100.0	100.0	100.0	100.0	100.0
Agriculture	30.4	26.3	21.1	20.9	17.3	12.7
Manufacturing	18.5	15.4	16.5	16.6	19.2	23.0
Non-manufacturing Industry	7.1	10.0	9.5	9.6	9.7	9.2
Services	43.9	48.2	52.8	52.8	53.7	55.1
Per capita GDP	-	-	837	867	1,110	1,594



Industrial Structure

⁵ Data based on the Central Bank of Sri Lanka, slightly different from the World Bank's figure.

Economic Outlook towards 2010

According to 'Global Economic Prospects and the Developing Countries 2000', the World Bank's report released in November 1999, growth in developing countries (excluding the transition economies) is projected to be 4.9% on an annual average in 2002–2008, a much faster rate of growth than in industrialized countries. However, this will be significantly lower than the growth achieved during the pre-economic crisis in East Asia in the 1990s. The lower growth projection reflects assumptions that capital flows will take time to recover and they will remain volatile, and that commodity prices are unlikely to stage a strong recovery from their recent historic lows. In addition, the crisis has uncovered structural weaknesses in developing countries, particularly in financial systems and fiscal positions, that will take considerable time to resolve. These weaknesses leave developing countries exposed to a high degree of uncertainty.

GDP Growth Forecast

	1999	2000	2001	2002-2008
World	2.6	2.9	2.8	3.2
OECD member countries	2.6	2.5	2.3	2.6
Developing countries	2.7	4.2	4.5	4.9
East Asia and Pacific	5.5	6.2	6.2	6.3
Europe and Central Asia	0.3	2.5	3.3	4.0
Latin America and Caribbean	-0.6	2.7	3.5	4.2
Middle East and North Africa	2.0	3.2	3.5	3.7
South Asia	5.4	5.5	5.3	5.1
Sub-Saharan Africa	2.3	3.1	3.4	3.6

Source: World Bank 'Global Economic Prospects and the Developing Countries 2000', 1999.

As for the South Asian countries, despite cautious optimism concerning a near-term increase in economic activity in the region led by India, the prospects covering 2002–08 are rather prudent, with a GDP growth projection of 5.1% a year, much lower than that of East Asia. The main requirement for a strong long-term outlook is economic reform: in Pakistan, the implementation of key reforms in banking, power, taxation, and public spending; and in Bangladesh, the improvement of macroeconomic management, governance, and infrastructure. But critically, India's long-term potential output growth is linked to policy actions, which must redress the current fiscal deficit, continued high and increasing tariff barriers, and increases in non-performing loans and other structural problems in the banking system.

Although the report does not mention Sri Lanka as far as long term prospects are concerned, it recognizes Sri Lanka as the most open among the South Asian economies with exports accounting for 37% of GDP and well situated to benefit from an acceleration in world trade growth. This implies that Sri Lanka's growth in the next decade will be dependent on world trade volume as well as commodity prices, which are external factors determined by world demand.

3.5 Growth Target in Manufacturing Sector

Following Steps 4 and 5 of projection of the economic growth, the growth target in the manufacturing sector has been set out in the following manner:

- (i) The target growth rate of manufacturing stands at 9.6% in 2000-04 and 10.6% in 2005-10. The growth should be accelerated in the later period as the foundation for industrial development is to be consolidated in the years up to 2004.
- (ii) The textile, wearing apparel and leather industry will experience an annual growth of 9.2%, slower than the average towards 2005, affected by the phasing out of Multi-Fiber Agreement (MFA). After 2005, when the quota is totally eliminated, the growth rate may be even slower, at an annual 8.8%, resulting in the gradual decrease in subsector's share in total manufacturing to 32.6% in 2010, or down from 36.7% in 1998.
- (iii) The chemical, petroleum, rubber and plastic industry, under the target, will achieve an annual average growth rate of 8.9% and 13.2% in 2000-04 and in 2005-10 respectively. Although the growth rate in the first period is a little lower than the average, the second half will see the subsector's high performance, with the achievements led by rubber and plastic, which will be improved with some strategic measures.
- (iv) The fabricated metal, machinery and transport equipment industry will be the most prominent industry during the Master Plan period. At the end of the period, the subsector's share will reach 8.4% of manufacturing, a significant increase from the present 5.2%. The subsector is expected to grow at the rates of 10.5% per annum until 2004 and 18.8% thereafter, which will be achieved through the strategic promotion of the electric/electronic industries.
- (v) The development of IT industry, though it is not classified as a specific category of industrial classification, will have a positive impact on almost all economic sectors, including manufacturing. However, the direct effects of the rapid growth of computer software development and telecommunications will surely raise the services sector's share in the economy as a whole.

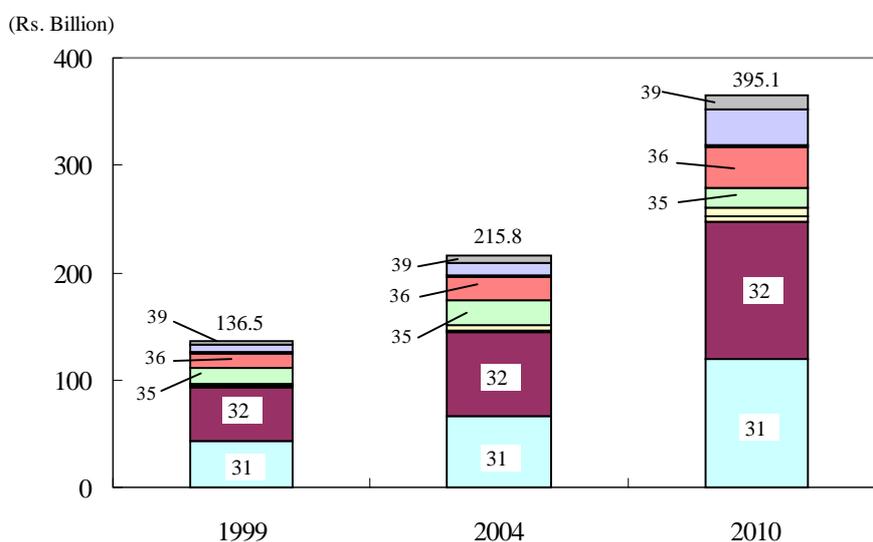
Manufacturing Value Added at Current Price

(Rs. million)

	Actual			Estimate*	Target*	
	1990	1997	1998	1999	2004	2010
31 Food, beverage and tobacco	12,065	35,585	40,452	42,636	66,745	118,969
32 Textile, wearing apparel and leather	7,167	40,714	47,494	50,059	77,730	128,911
33 Wood	485	1,257	1,312	1,383	2,247	3,877
34 Paper	1,019	2,633	2,578	2,717	4,693	8,135
35 Chemical, petroleum, rubber and plastic	2,428	10,745	14,274	15,045	23,080	48,442
36 Non metallic mineral	4,742	11,600	12,463	13,136	21,939	39,288
37 Basic metal	194	598	710	748	1,118	2,054
38 Fabricated metal, machinery and transport eqpmt	2,746	5,924	6,779	7,145	11,784	33,072
39 Other manufacture	138	3,157	3,426	3,611	6,501	12,303
Total Manufacturing	30,984	112,213	129,488	136,480	215,836	395,051
	Average annual growth rate (%)			Share (%)		
	1990-98	2000-04*	2005-10*	1998	2004	2010
31 Food, beverage and tobacco	16.6	9.4	10.1	31.2	30.9	30.1
32 Textile, wearing apparel and leather	26.5	9.2	8.8	36.7	36.0	32.6
33 Wood	11.4	10.2	9.5	1.0	1.0	1.0
34 Paper	14.8	11.5	9.6	2.0	2.2	2.1
35 Chemical, petroleum, rubber and plastic	16.8	8.9	13.2	11.0	10.7	12.3
36 Non metallic mineral	29.5	10.8	10.2	9.6	10.2	9.9
37 Basic metal	28.0	8.4	10.7	0.5	0.5	0.5
38 Fabricated metal, machinery and transport eqpmt	14.7	10.5	18.8	5.2	5.5	8.4
39 Other manufacture	45.5	12.5	11.2	2.6	3.0	3.1
Total Manufacturing	20.6	9.6	10.6	100.0	100.0	100.0

Source: Projected by JICA Study Team, based on data in Central Bank of Sri Lanka "Annual Report 1998".

Note: with zero inflation assumed



Growth of Manufacturing Value Added

3.6 Social Framework (Employment)

With the targeted value added as set out above, it is expected that the manufacturing sector will create new employment of 365,000 in 2000-2004 and 712,000 in 2005-2010. The number of total employment in manufacturing, which stood at 931,000 in 1998, will increase to 1,321,000 in 2004 and 2,032,000 in 2010. The employment projection has been made by applying the change of value added per person to the target value added of each subsector for 2000-2010, with an assumption that the labor productivity of the subsectors would continue to increase (or decrease) at the same rate as recorded from 1995 to 1998.

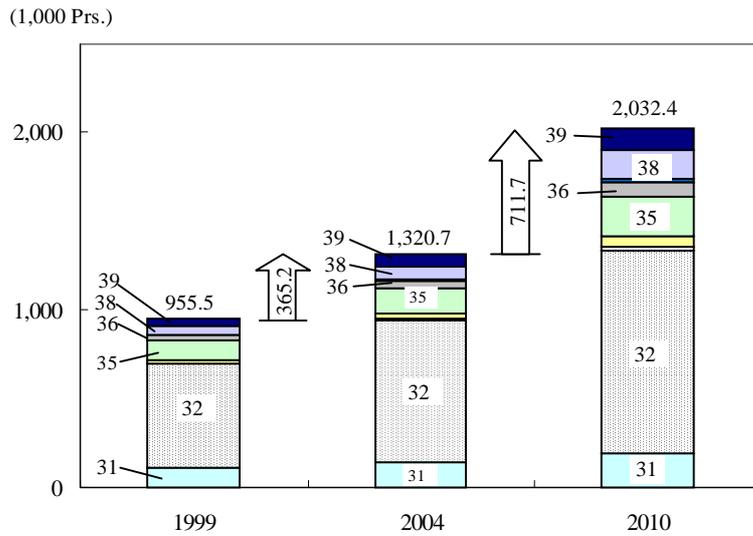
Apart from textile, wearing apparel and leather (ISIC 32), two subsectors will contribute most to the total increase in number due to their already sizable share. Chemical, petroleum, rubber and plastic (35) and fabricated metal, machinery and transport equipment (38) will generate a remarkable number of jobs especially after 2004, mainly because of high growth rates of value added of the target industries, even after taking into account the improvement of labor productivity.

The implication of the rapid increase in employment in the manufacturing sector is the need of the shift of employment from other sectors, notably agriculture, to manufacturing and an increasing demand for new graduates in manufacturing. This may subsequently require the institutional support for training and educational facilities in order for the smooth transfer and entry of human resources to the manufacturing sector.

Projection of Employment 2000 to 2010

	Actual		Estimate	Projection		No. of Increase		Average Growth (%)	
	1995	1998	1999	2004	2010	2000-04	2005-10	2000-04	2005-10
31 Food, beverage and tobacco	75,906	111,092	112,120	141,291	194,126	29,171	52,835	4.7	5.4
32 Textile, apparel and leather	263,129	567,049	582,892	798,602	1,139,712	215,710	341,111	6.5	6.1
33 Wood	6,462	8,646	9,074	14,427	24,262	5,353	9,835	9.7	9.0
34 Paper	14,033	18,077	19,117	33,577	59,386	14,460	25,808	11.9	10.0
35 Chemical, rubber and plastic	47,799	106,907	108,341	136,579	226,501	28,237	89,922	4.7	8.8
36 Non metallic mineral	17,053	26,491	27,894	46,354	82,516	18,460	36,162	10.7	10.1
37 Basic metal	2,801	6,859	7,191	10,460	18,623	3,269	8,162	7.8	10.1
38 Machinery and equipment	25,721	43,375	44,628	65,245	158,453	20,617	93,209	7.9	15.9
39 Other manufacture	24,760	42,604	44,265	74,175	128,789	29,910	54,614	10.9	9.6
Total Manufacturing	477,664	931,100	955,523	1,320,711	2,032,367	365,188	711,657	6.7	9.0

Source: Projected by JICA Study Team, based on data in Central Bank of Sri Lanka "Annual Report 1998" and Department of Census and Statistics "Annual Survey of Industries 1996 Preliminary Report".



Manufacturing Employment

3.7 Foreign Direct Investment

The targeted economic growth rate set out previously is to be achieved by the higher investment rate and the higher investment efficiency because the economic growth (GDP growth) rate consists of these two factors⁶. For the last five years investment rates have been around 25% and the ICOR (incremental capital output ratio) a little under 5, resulting in the annual average GDP growth rate of 5.2%. Assuming that investment efficiency during the Master Plan period will slightly improve with the ICOR of 4.7 in 2000-2004 and further improve to 4.3 in 2005-2010, it is necessary to keep investment rates of 30.6% and 32.3% in 2000-2004 and 2005-2010, respectively, in order to achieve the targeted GDP growth rates. On the other hand, national savings, the major source of financing investment, has been around 20% of GDP since 1994, though the rate rose to 23.2% in 1998.

The gap between investment and national savings must be filled with foreign savings viz. foreign capital inflow, which consists of private investment and foreign official aid. As the latter is not expected to increase in the future, the foreign investment, especially direct investments (FDIs) must predominantly finance the higher total investment. With the

⁶ GDP growth rate (increased amount of GDP/GDP) can be mathematically expressed as the product of investment rate (investment amount/GDP) and investment efficiency (increased amount of GDP/ investment amount). A reciprocal of the latter is called incremental capital output ratio (ICOR) and the smaller number of ICOR indicates that investment is more efficient.

assumption that the national savings⁷ rate will be 25% in 2000-2004 and 26% in 2005-2010, additional foreign capital inflow should be 0.9% and 1.6% of GDP for the respective periods. Thus, if FDIs should account for the most part of these portions, the amount of FDIs is to be increased by the same percentage points in addition to the current level of 1.4% of GDP. Consequently, the resultant 2.3% and 3.0% of GDP worth of FDIs are figures to be targeted in 2000-2004 and 2005-2010, respectively.

Though do the target figures appear challenging, it is possible for Sri Lanka to reach them with well-planned promotion of FDI itself and the manufacturing sector. It is also noted that many of the East Asian countries already have more FDI than these targets, in terms of percentage of GDP.

Targeted Investment, Savings and FDIs

	GDP Average Growth	Investment	ICOR	National savings	Foreign savings	FDIs
1994-98 Actual	5.2	25.2	4.9	20.5	4.7	1.4
2000-04 Target	6.5	30.6	4.7	25.0	5.6	2.3
2005-10 Target	7.5	32.3	4.3	26.0	6.3	3.0

Note: Figures shown as percentage of GDP, except for GDP growth and ICOR.

It should be noted that FDIs to Sri Lanka have been affected substantially by ethnic conflicts. The risky investment environment arising from ethnic conflicts has also affected the industrial structure to a certain extent, as it is conducive only to investment in light industries such as apparels where fixed capital costs are limited. Although it is quite difficult to forecast the future course of the ethnic problems, it is apparent that the solution of the conflicts will certainly increase FDIs into the country, while an increase in public investment in infrastructure and the manufacturing sector will lead acceleration of industrial development. As IPS report⁸ put it, “the country’s development prospects depend heavily on how speedily a lasting peace can be achieved.”

⁷ Domestic savings plus net factor income including Sri Lankan workers’ remittances from abroad.

⁸ Institute of Policy Studies “*Sri Lanka: State of the Economy 1999*”, Institute of Policy Studies, 1999.

IV. MASTER PLAN FOR INDUSTRIAL DEVELOPMENT (THE RAINBOW PLAN)

4.1 Development Strategies

1) Paradigm Shift

Formulation of the master plan for industrial development and discussion on development strategies starts with making all Sri Lankan people aware of the problems that the manufacturing industry faces and the challenges that the Sri Lanka industry must give in the coming decade. As reviewed in Chapter II, the Sri Lankan industry is fragmented in its structure and vulnerable to the external influences. The fragmented structure and vulnerability would be aggravated unless Sri Lankan people are problem-conscious and take up the challenges.

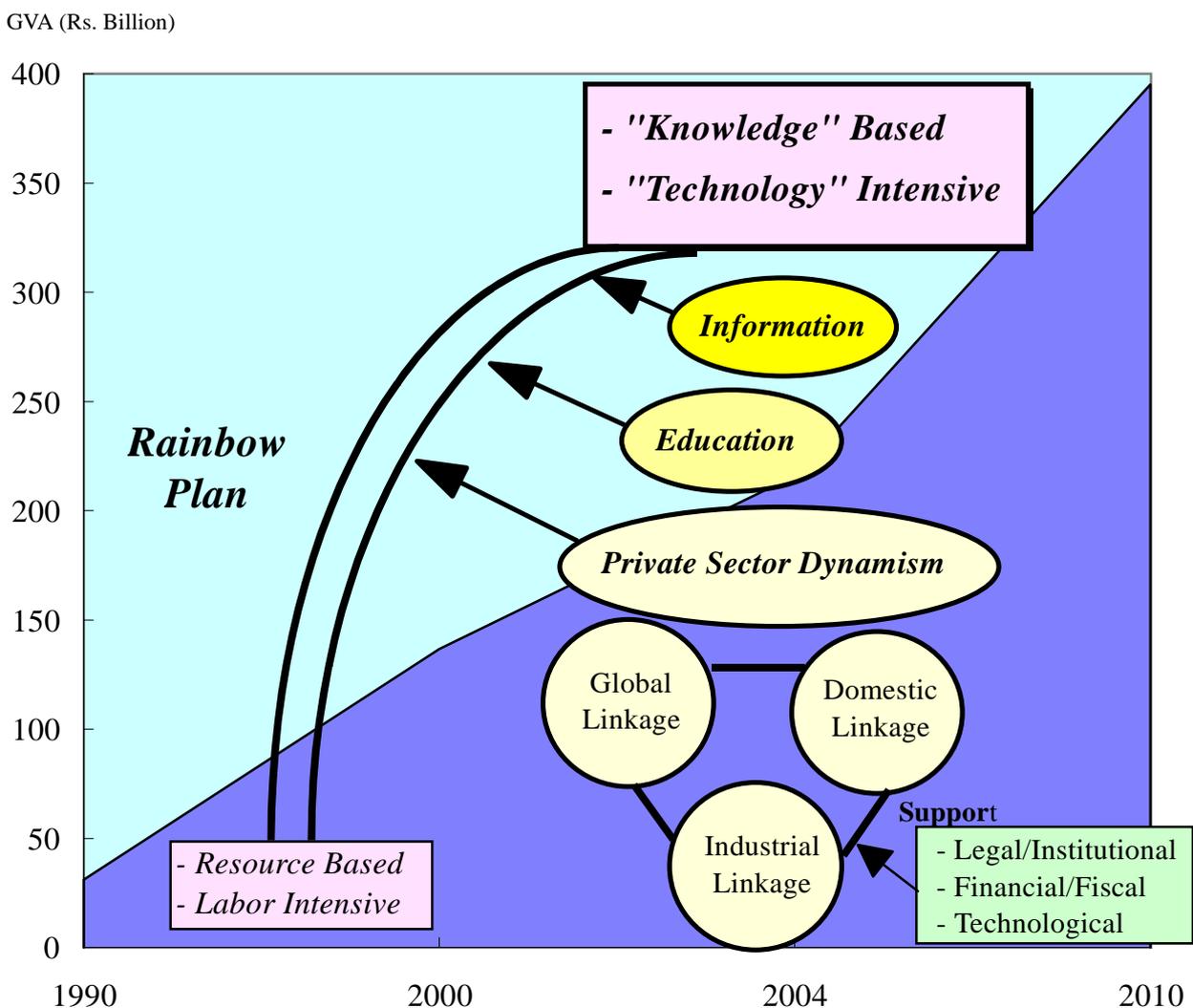
An example is the machinery industry. Fundamentally, the machinery industry is the basic industry, and it is not only a consumer product maker but also a production-machinery and production-equipment manufacturer. The machinery industry is considered in many countries a “Mother Industry”. The Sri Lankan machinery industry had specialties and markets overseas in the past, but the industry now faces the crisis of being driven out of manufacturing due mainly to import at marginal prices. Most Sri Lankan people are unaware of the current critical situation. The machinery industry itself is forced to challenges not to be protected under the import substitution policy but to develop new products different from the currently imported products. Both the private and public sectors should seriously consider whether Sri Lanka should give up the mother industry or accept the challenge of opening a new way for development.

The challenges of the Sri Lankan industry should start under a new paradigm. The new paradigm of industrial development in Sri Lanka is proposed to stand on “knowledge-based” and “technology-intensive” industrial development. The proposed paradigm is a shift from the “resource-based” and “labor-intensive” industries that Sri Lanka has developed to date.

An example is the electric/electronic industry. The Sri Lankan electric/electronic industry has developed starting with imports of finished products and most enterprises are now manufacturing SKD (semi-knock-down) and CKD (complete knock-down) products. They should be advanced to the stage of “domestic design and buy parts” and further to the stage of “own design” in order to enhance productivity and competitiveness. They must shift the paradigm from “labor-intensive” to “technology-intensive” manufacturing.

For the paradigm shift from “resource-based” and “labor-intensive” manufacturing to “knowledge-based” and “technology-intensive” manufacturing, it should be emphasized that “information” and “education/training” are major factors to be focused on. Information means market, product, and technology information, and information sharing among the private, public, and academic circles is of prime significance. Information sharing is advanced through information technology (IT) and networking. The current IT revolution provides equal opportunity to access and utilize high level information to enhance knowledge and technology. Meanwhile, education and training is to develop human resources and to realize practical and technology-oriented education at all educational levels.

An image of the paradigm shift is illustrated below. This Master Plan will bridge to the new paradigm, and it is proposed that the Plan be called “**The Rainbow Plan**”.

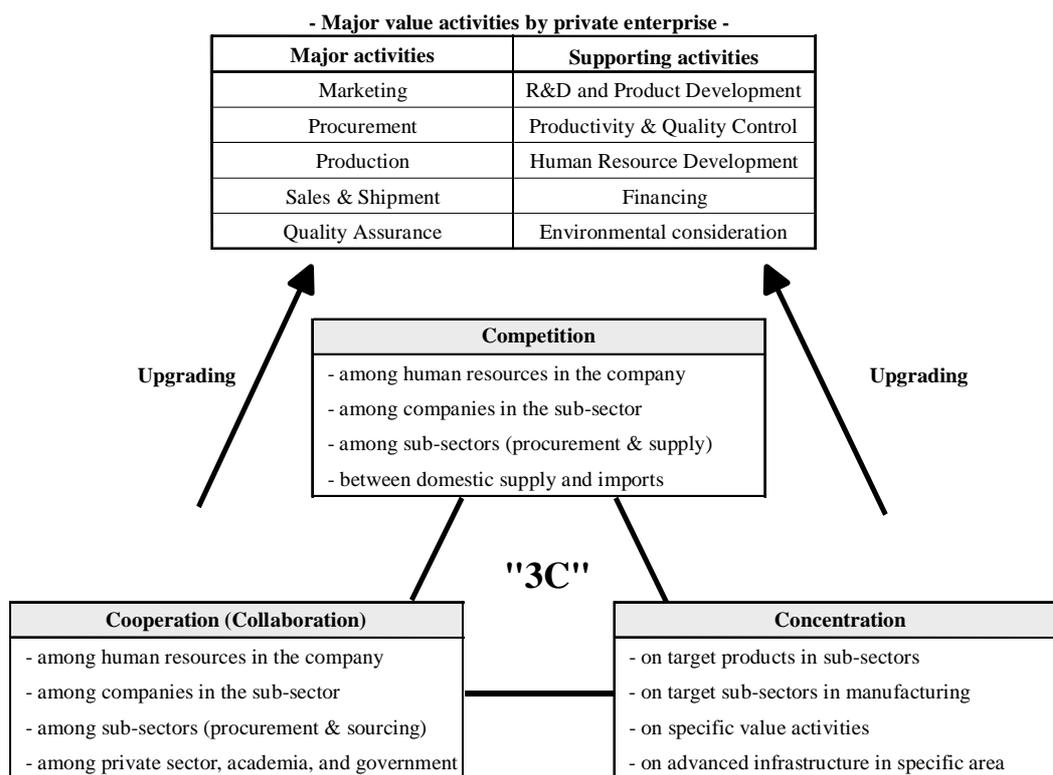


2) Private Sector Dynamism

The most important players of the paradigm shift and implementation of The Rainbow Plan are private enterprises and entrepreneurs. The private sector should take initiatives and responsibilities to upgrade its capabilities, since The Rainbow Plan will prove to be a big challenge.

To activate the private sector dynamism, The Rainbow Plan proposes to introduce a concept of “3C”, i.e., Competition, Cooperation (Collaboration), and Concentration. **Competition** is a basic factor which enhances efficiency and motivation. Competition among enterprises will improve quality and price of products, as well as services to the customers, and it will encourage their efforts/challenges to develop products of higher competitiveness. Some framework and mechanism are proposed for design to encourage fair competition. For instance, quantitative targets should be given to improve productivity and quality in some production lines in the factories. Evaluation system and incentives to those who achieved such targets should be implemented at the same time. **Cooperation** through information sharing is to be promoted, for collaboration and networking at various levels. At the factory level, individual performances should be integrated into the overall manufacturing capability of enterprises through cooperation among individuals. At the subsector level, cooperation and collaboration should be promoted for information sharing in the respective subsector and with the related subsectors, which will promote clustering. Cooperation and collaboration should further be extended to the international level, through integration with manufacturing in SAARC, ASEAN and other countries. Both private and public sectors should jointly take steps to promote cooperation and collaboration. **Concentration** is required, as limited available resources cannot be allocated to every requirement both at the enterprise level and at the public administration level. The Rainbow Plan proposes to concentrate resources on the selected “focal products” in the “target industries”.

The Rainbow Plan proposes to call the private sector dynamism through the above “3C” principle. The proposed concept is illustrated in the following figure:



Strengthening Private Sector Dynamism through “3C” Principle

3) Development through Linkages

The paradigm shift to the knowledge-based manufacturing and the call for the private sector dynamism will be difficult to implement by individual efforts alone. The Rainbow Plan, therefore, proposes to promote linkage at 3-levels in the manufacturing sector; i.e., “global linkage”, “local linkage”, and “industrial linkage (clustering)”.

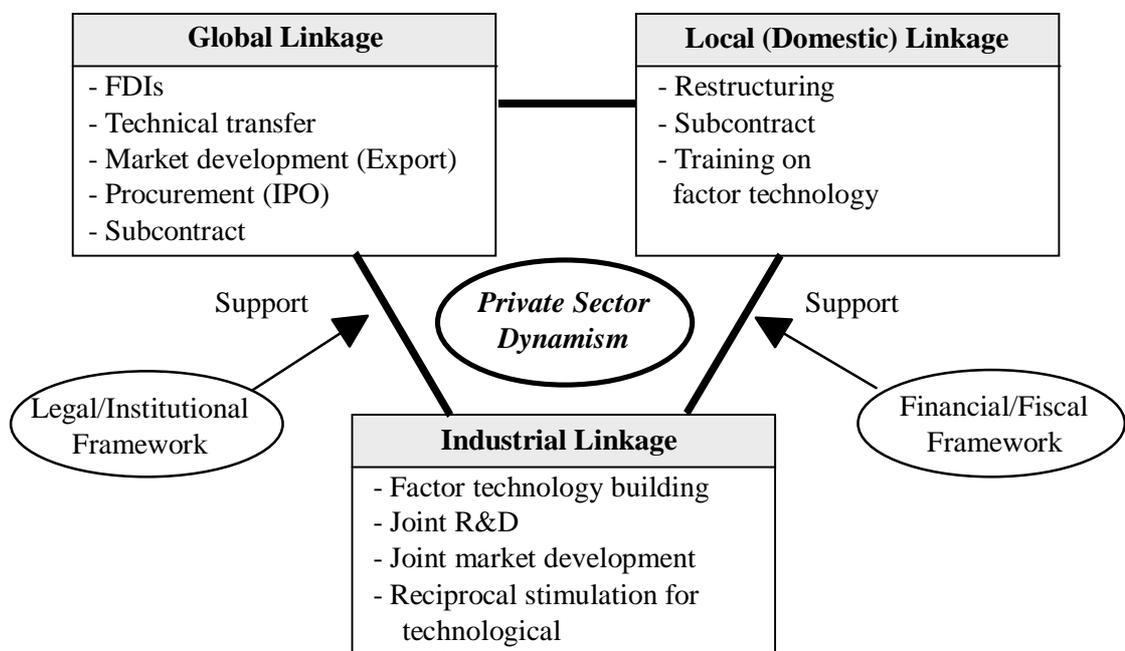
Global linkage is defined as a business relationship between global enterprises and Sri Lankan enterprises, or access by Sri Lankan enterprises to global markets and vice versa. (The concept of “globalization” discussed in Section 3.3.(2) applies to promotion of global linkage.) This linkage is attained through FDIs, J/V or partnership, technical transfer, international procurement, subcontracting beyond borders, export-market development and so on. Global linkage will facilitate a paradigm shift to “knowledge-based” and “technology-intensive” manufacturing in Sri Lanka.

Local or domestic linkage is defined as the relationship among enterprises in the same subsector, as well as relationships between core companies and regional SMIs. (The concept of “nationalization” discussed in Section 3.3.(2) also applies for promotion of local linkage.)

The current system to produce every component in small production scale at a factory should be changed to the subcontract system or merger and joint ventures of complementary enterprises. This linkage is required to enhance productivity and profitability.

Industrial linkage or clustering is defined as a positive relationship among industries. It will include collaborative efforts for technology development and/or product development. An example is the technology and product development for rubber and plastic blending.

The strategies to attain manufacturing development through “3-Level Linkage” are illustrated below. It is noted that the initiatives to promote 3-Level Linkage should be taken not only by the private sector but also by the public sector in a collaborative manner.



Manufacturing Development through “3 Level Linkage”

4) Combined Promotion of Private Dynamism and Industrial Linkage

The private enterprises and entrepreneurs play a leading role in implementing the paradigm shift, as well as promoting linkages at global, local, and industrial levels. It is worthwhile, however, for The Rainbow Plan to put up some strategic directions and possible supporting measures for implementation by the government, as the basic philosophy of The Rainbow Plan is to create a “free business environment with clear and appropriate government directions” (refer to Section 3.3.(2)).

For strengthening of the private sector dynamism through “global linkage”, various strategies are conceived. It is proposed that the strategies explained below be adopted and implemented by the private sector with the support of the public sector.

Strategies for Promotion through Global Linkage

Major activities	Strategies	Supporting Measures	
		Institutional/Legal Framework	Financial Framework
FDI	<ul style="list-style-type: none"> - Attract "new product" FDIs (Focal product related investment) - Attract "Sub-contract" FDI with SAARC and ASEAN (see below) 	<ul style="list-style-type: none"> - BOI reform 	<ul style="list-style-type: none"> - Investment Tax Allowance for advanced technology for SMIs
Technical transfer	<ul style="list-style-type: none"> - Attract assembling type FDI - Attract JVs in focal products - Invite foreign experts - Prepare mechanism to disseminate transferred technology 	<ul style="list-style-type: none"> - Vitalization of chamber activities (Deregulation for JV activities) 	<ul style="list-style-type: none"> - The same above - Zero-rated import duties for "modernization" of policy-driven industries - Utilize resources in SMIDEC
Market development (Export)	<ul style="list-style-type: none"> - Develop markets through sub-contract with SAARC & ASEAN - Promote exports of focal products to SAARC & ASEAN 	<ul style="list-style-type: none"> - Strengthen Embassy functions for global market development - Strengthen Market Promotion Division in EDB 	<ul style="list-style-type: none"> - Double tax deduction of marketing focal products of target industries - Utilizes resources in SMIDEC
Procurement (IPO: Import)	<ul style="list-style-type: none"> - Promote integration of procurement - Introduce International Procurement Operation (IPO) - Introduce "Safe guard" against unfair import 	<ul style="list-style-type: none"> - Strengthen MOF on custom system - Anti-dumping legislation - Provision of import duties 	
Sub-contract	<ul style="list-style-type: none"> - Promote international sub-contract (parts & components manufacturing & export) - Utilize global network of FDI companies 		

An example is the promotion of collaboration between the Sri Lankan rubber industry and the Malaysian rubber industry. Collaboration could be initiated and promoted if RRI (Rubber Research Institute of Sri Lanka) and MRRB (Malaysian Rubber Research Board) come to agree on the exchange of technical information under the intervention of MID.

Strengthening of the private sector dynamism through “local linkage” should be implemented in principle by the private sector initiative. As noted before, the I-O Table indicates that a lot of fields remain to be integrated and linked. Some strategies for this integration and linkages are demonstrated in the following table:

Strategies for Promotion through Local Linkage

Major activities	Strategies	Supporting Measures	
		Institutional/Legal Framework	Financial Framework
Restructuring	<ul style="list-style-type: none"> - Concentrate capital & human resources to core (new JV) companies - Build DB for information sharing - Establish core industrial sites (e-Park, etc) 	<ul style="list-style-type: none"> - Strengthen policy-making mechanism in MID, establish IPC - Build DB of manufacturing enterprises in MID 	<ul style="list-style-type: none"> - Two-year accelerated depreciation for "plant relocation cost" - Zero-rated import duties for modernization of policy-driven industries
Sub-contract	<ul style="list-style-type: none"> - Promote sub-contract through promotion of specialization in manufacturing - Promote information sharing inside the industry and among sub-sectors 	<ul style="list-style-type: none"> - Information sharing between MID and MVTRI (DB exchange) 	<ul style="list-style-type: none"> - Introduction of GST (promoting horizontal integration)
Manpower development and R&D	<ul style="list-style-type: none"> - Prepare proficiency test system - Enhance basic facilities for R&D, testing, and training in association - Increase training opportunities 	<ul style="list-style-type: none"> - Strengthen and utilize resources in academia and institutes - Utilize regional resources of MVTRI 	<ul style="list-style-type: none"> - Double tax deduction of R&D for focal products - Double tax deduction of training cost for R&D staff and skilled labors
Procurement (Domestic procurement)	<ul style="list-style-type: none"> - Promote information sharing inside the industry and among sub-sectors - Utilize DB information and resources 		<ul style="list-style-type: none"> - Tax incentives to encourage domestic procurement of currently produced items

For strengthening of the private sector dynamism through “industrial linkage” or “clustering”, some strategies are proposed in the table below.

Strategies for Promotion through Industrial Linkage

Major activities	Strategies	Supporting Measures	
		Institutional/Legal Framework	Financial Framework
Basic/core Technology Building & Upgrading	<ul style="list-style-type: none"> - Improve basic "basic/core" technology (Focal product related investment) - Utilize know-how of foreign experts 	<ul style="list-style-type: none"> - Merger among ITI, SLSI, and IDB - Consolidation of IDB 	<ul style="list-style-type: none"> - Investment tax allowance for advanced technology for SMIs - Zero-rated import duties for modernization of policy-driven industries
Joint R&D among Sub-sectors	<ul style="list-style-type: none"> - Identify core technology and potential products of common interests - Share resources among associations 	<ul style="list-style-type: none"> - Rationalization of R&D institutes - Establish R&D supporting infrastructure 	<ul style="list-style-type: none"> - Double tax deduction of R&D for focal products
Joint Market Development	<ul style="list-style-type: none"> - Marketing through identifying focal products requiring collaborative technological and product development - Share information of customer needs 	<ul style="list-style-type: none"> - Initiatives by Chambers for global marketing - Strengthen Market Promotion Division in EDB 	<ul style="list-style-type: none"> - Utilize resources in SMIDEC
Reciprocal Technological Upgrading	<ul style="list-style-type: none"> - Promote information sharing (D/B) - Create forum among associations 		<ul style="list-style-type: none"> - Utilize resources in SMIDEC

Promotion of industrial linkages is of particular significance for the Sri Lankan industry, judging from the provisional 1994 Input-Output Table. The I-O Table figures out that the “intermediate demand ratio” is quite low in all subsectors. The low figures indicate that input of domestically produced intermediate products are marketed quite limitedly; hence relationships among industries are quite weak even though a majority of enterprises are SMIs.

This demonstrates a big difference from the SMI-centered industrial structure in Taiwan (see for reference “Structural Linkage in Taiwan” below).

The Rainbow Plan proposes the public, private and academic circles to first analyze the I-O Table in detail and to work out ideas to promote local linkages among enterprises. This will contribute to finding areas for new products for challenge in the manufacturing sector in Sri Lanka.

Structural Linkage in Taiwan

An example of SMI-based industrial development that has effectively developed solid foundation of an integrated industrial structure is Taiwan. The I-O Table below shows how industrial structure has been well consolidated.

Industrial structure in Taiwan (I-O Table)

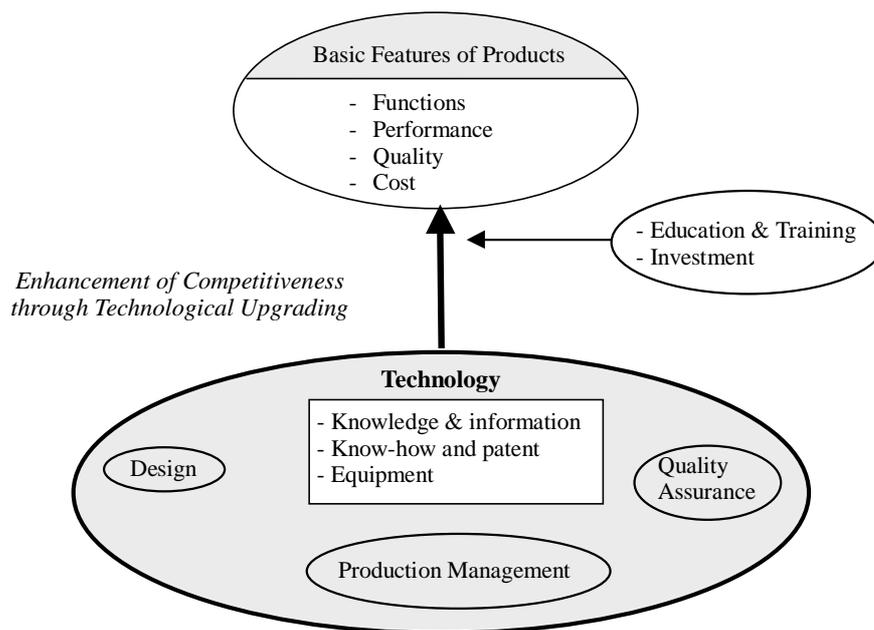
	Intermediate demand ratio			Export ratio			Import ratio		
	1981	1986	1994	1981	1986	1994	1981	1986	1994
Food processing	34.2	34.3	29.8	14.0	19.9	14.5	8.3	12.5	15.5
Textile/Garments	70.4	71.8	49.0	27.2	30.6	53.8	8.8	9.3	20.3
Apparel	16.7	19.2	21.2	65.0	66.1	50.6	11.3	9.6	29.6
Plastic products	46.2	47.0	54.5	50.4	51.8	44.0	3.2	3.9	11.0
Basic metal and metal products	61.0	51.0	52.7	31.9	45.5	44.6	9.4	7.6	14.4
General machinery	21.2	29.2	21.2	36.6	42.7	50.4	63.7	53.8	56.8
Electric appliances	31.6	38.5	34.2	64.3	67.6	79.8	46.0	51.5	70.4
Transport machinery	27.4	31.7	29.4	23.7	34.0	27.4	24.3	23.2	33.5

4.2 Technology Upgrading and Environmental Consideration

Technology is a key factor to develop globally-competitive manufacturing industries, as well as to attain the paradigm shift in Sri Lanka. While the current technological capabilities of manufacturers vary widely, they are still behind the global standard at present. Manufactured goods “made-in-Sri Lanka” do not have a good image nor establish a brand name. Many enterprises do not use patents, nor have experienced any technology transfer. This situation is observed even in the “global-linked” rubber industry. Although concentration of technological bases are seen in a limited number of large enterprises, there is no interaction and dissemination of technological information to SMIs. Under The Rainbow Plan, more attention is paid to technology upgrading of Sri Lankan enterprises, particularly SMIs.

1) Phased Technology Upgrading

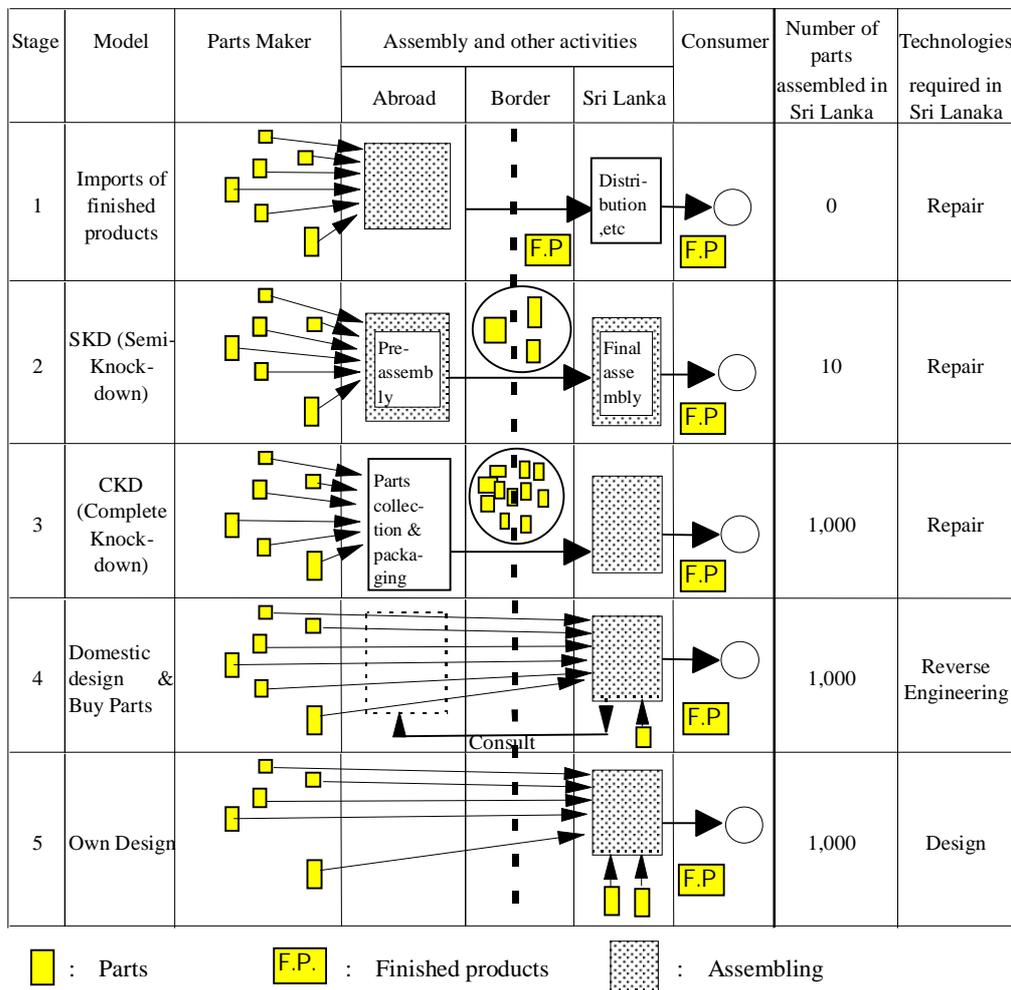
Technology covers four important features of manufactured products; i.e., functions, performance, quality and costs. All of these features are to be properly designed into products to meet and satisfy customers' requirements. To enhance and upgrade technological capabilities, "knowledge", "information", "equipment", "know-how" and "management" are required. Both human resources development and investments in machinery and equipment are engines to realize technological upgrading.



The first step in promoting technological upgrading is to make a clear recognition about the strengths and weaknesses of the current technological bases. Obsolete manufacturing facilities in machinery and equipment are typically seen in most of SMIs, and their weaknesses should be properly evaluated. Further research on the technological level of each product should be performed to find out competitive products to be developed as "focal products". Successive factory inspection and diagnosis by experts, sometimes from advanced countries, is a practical and effective approach to making a proper assessment of the current capabilities. This is an interactive approach through successive discussions between experts and factory engineers to encourage their own efforts for problem-solving and improvements.

One possible way for effective technological upgrading is to analyse different manufacturing models on the basis of the levels and stages of industrialization and technology

transfer/upgrading. An example is cited from the manufacturing models in the electric/electronic industry, as follows:



Manufacturing Model and Technology Upgrading

Most of electric/electronic enterprises, as well as enterprises in other subsectors, lack the design function in manufacturing. As it is one of the most decisive factors of low productivity and competitiveness of Sri Lankan manufactured products, technology upgrading should first focus on reinforcement of the design function. In this context, it is proposed to start with “reverse engineering” by studying products of advanced technology. Reverse engineering will help enterprises proceed in their own design in manufacturing.

In some product areas, licensing of foreign advanced technology should be considered to enhance productivity and competitiveness. Introduction of foreign advanced technology will also be promoted through formation of JV with foreign manufacturers. Private enterprises

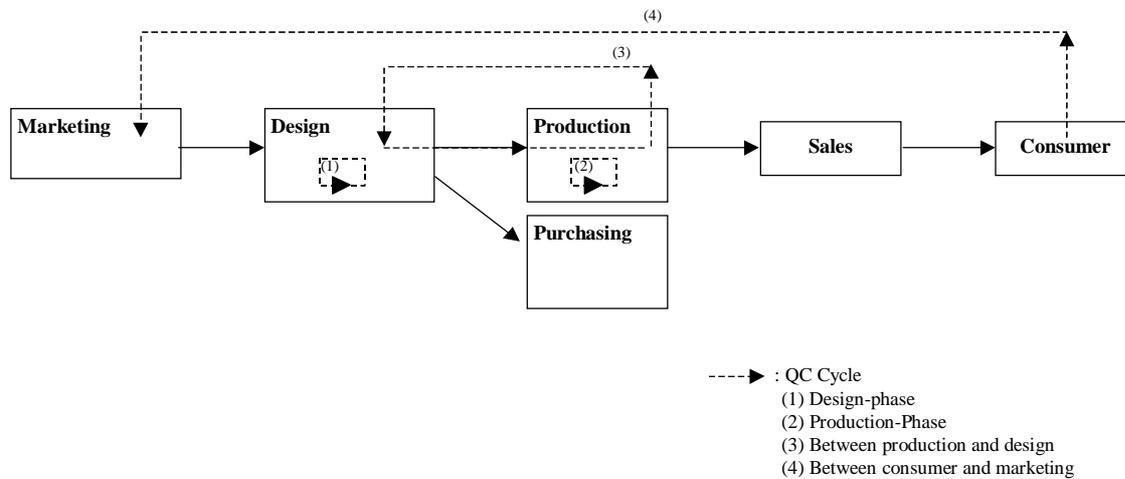
should devote themselves to upgrading their technologies, particularly engineering design and product design.

Research and development (R&D) in private enterprises is quite limited at present. The limited resources for R&D, both in private enterprises and in public institutions, should be focused on some selected areas and focal products in respective industries. Promotion of a private-academic-public partnership is of particular importance for R&D to attain technological upgrading.

2) Quality Improvement Initiatives

Quality is an important feature for manufactured goods, and a proper mechanism for quality control should be established to attain “technology-intensive” manufacturing development. By learning concepts and techniques of quality control (QC), each enterprise in Sri Lanka is expected to draft an original QC plan. QC on product design, process operation and process maintenance should be enhanced at each shop and by individual workers. “5S” activities are practical and effective methods for introduction. Leadership of middle managers to QC on-the-job is of vital importance. 5S activities should be gradually integrated to “small group activities”, “zero defect in each shop” and overall quality improvement program in the factory as a whole. Activities to apply for ISO 9000 and ISO 14000 would be a good way to set a clear target to improve the level of QC.

The quality improvement initiative should proceed to “QC cycle”. QC cycle between production and design is required to improve overall quality level. This approach would decrease defect rates at the production level, and consequently decrease trouble rates at the market level. Only engineers at the design level can change or modify design and specification sheets for products; therefore, overall quality assurance depends on both capabilities of design and good communication between production and design. Unfortunately, most manufacturers in Sri Lanka do not have functions of “marketing” and “design”, and a feedback of information from production to design and a feedback from consumer level to marketing level is quite limited. In this context, too, enhancement of design capabilities in Sri Lanka is of vital significance.



Desirable QC Cycle (Case of Electric/Electronic Industry)

Management quality control and quality assurance should also be emphasized to promote technological upgrading. Currently, overall productivity as a group has lagged, because the system or principles to work together is not well prepared. It is important for managers and foremen to understand that they should take initiatives to improve overall productivity in a factory by establishing a total system and procedures. The concept of “Total Quality Control (TQC)” should be introduced. When an official quality assurance system backed by formal testing institutes is enhanced, a better “brand name” and competitiveness will be established.

3) Quality Assurance and Testing

It is essential for the manufacturing industry to create a good image of “made-in -Sri Lanka”. To this end, the industry should have a fair and open quality assurance and testing system, and disclose results to the public, with the assistance and collaboration of the public institutes. Although there is a positive image of “made-in-Sri Lanka” in some manufactured products, this image has not been well managed to disseminate in world markets. Therefore, under The Rainbow Plan, it is planned to set up some testing centers as follows:

- (i) Reinforcement of the Rubber Research Institute (RRI) by incorporating the “Inspection and Testing Department”
- (ii) Establishment of the Plastic Technology Center in ITI or IDB
- (iii) Establishment of the Electro Technology Center in IDB or MOST

The planned centers are designed to provide services for inspection and testing of local products as well as imported products to ensure quality and safety. These centers will also perform official tests for exporting products and issue an “approval seal” for inspected products to establish a quality assurance system in Sri Lanka. Inspection and approval seals would be executed under the cost-sharing system.

If the target industries in Sri Lanka succeed in establishing such a system effectively, testing engineers would be able to accumulate their knowledge base of products through daily operation of testing. This leads to a situation in which testing engineers are educated by “learning by doing” making them able to work as consultants for reverse engineering. Testing should focus on focal products at the beginning, and should be gradually expanded to other products.

To heighten the level of the proposed official testing organization in Sri Lanka, technical assistance may be sought from advanced countries, as in the case of SILIM, an official testing organization in Malaysia. Such experts assigned to Sri Lanka should have experiences in product design.

4) Environmental Consideration

As stated in the objectives of industrial development in Section 3.1, the manufacturing sector is to be developed to contribute to creation of an environment-friendly and sustainable society. The Rainbow Plan aims not to develop heavy “smoke-stack” industries, but to develop “knowledge-based” and “technology-intensive” industries, particularly of “engineering type” subsectors. However, industrialization may bring about some negative impacts on environment, and attention must be paid to the natural environment to mitigate such impacts.

One important concept in environmental consideration is “**3R**”, i.e., Reuse, Reduce, and Recycling. When a manufacturing company installs an effective recycling system of raw materials, utilities and off-specification products in its production activities, it would attain improvements in both productivity and environment control. Likewise, efforts to save energy and water are important aspects for technological upgrading that will result in productivity increase and environmental control.

At the same time, a total system in production, distribution, usage, and recycling or disposal of manufactured goods should be designed with cooperation among the private sector, institutions and academia. This is an issue of “Product Life Cycle”. For example, with the

growth of plastic consumption, packaging products are spread unless a proper system is introduced for handling plastics in distribution, collection, and disposal (refer to Section 5.4).

Establishment of an environment-friendly manufacturing sector sometimes requires certain level of investments for environmental protection of air-pollution, water treatment and industrial waste disposal. These investments can be more effectively made if and when SMIs are collectively located and preventive measures are jointly taken. An example is tyre manufacturers. 30 out of 40 tyre manufacturers surveyed are SMIs and have no proper system for control of bad odor and waste water treatment. If they are merged through restructuring or if they are collectively located, appropriate measures can be taken in an economical way.

Restructuring and creation of a custom rubber compound manufacturer is another plan to mitigate environmental impacts and to improve working conditions of SMIs in the rubber industry (refer to Section 5.3). Initiatives and a collaborative approach should be taken by industrial associations to promote such plans for collective environmental protection. At the same time, to vitalize and realize environment-friendly investments in restructuring efforts, some institutional/legal and financial/fiscal frameworks to support these private initiatives should be strengthened.

Some schemes for financial support to environmental-conscious investments have been prepared in Sri Lanka, and effective use of those mechanism should be encouraged. Development Financing Institutions (DFIs) provide concessional loans for environment-conscious projects through funds provided by foreign financial institutions. PCAF (Pollution Control and Abatement Fund) is provided by the Government of Germany, mainly for procurement of equipment for end-of-pipe treatment and equipment that contributes to improving the safety of the workplace, and the relocation of polluting industries to industrial estates equipped with waste treatment plants. JBIC (Japan Bank for International Cooperation) provides “e-friend (Environmentally Friendly Solutions Fund) for promotion of pollution control facilities in industrial enterprises. This fund should be actively utilized in conjunction with efforts to improve both technological capabilities and environmental conditions. Initiatives by private enterprises toward environmental investments will be more effectively promoted when they are planned and implemented together with the restructuring and enterprise development as discussed in Section 4.4.

4.3 Human Resource Development and R&D

1) Human Resource Development

Human resource development (HRD) through higher education and training is an important part of The Rainbow Plan to promote “knowledge-based” and “technology-intensive” manufacturing development.

The result of the questionnaire survey indicates that there are shortages in “skilled-manpower” in many manufacturing enterprises. On-the-job training is a major program for many manufacturing companies, but the level and extent of training are limited at present. Many managers in the industry cite that an effective training system to introduce a practical training for their young workers is necessary, particularly for SMIs which do not have an integrated in-house training center.

The Ministry of Vocational Training and Rural Industries (MVTRI), which was established in 1997, has been actively promoting its programs for vocational training. Their efforts in the past, however, have been more oriented towards training for the cottage industry than for the factory industry. As MVTRI is trying to focus also on training of manpower in the thrust industries, their efforts should be encouraged to further promote vocational training not only in rural areas but in the urban centers.

One of the major constraints of MVTRI’s vocational training, as well as training in other public institutes, is the lack of an adequate number of teaching staff or trainers. This is particularly true in the IT service industry which depends heavily on HRD. Under The Rainbow Plan, therefore, it is planned to set up a center for trainers’ training and re-training of manpower (refer to proposed plan for the Smart Center in Section 5.7).

A shortage of designers and engineers in enterprises, which is one of the reasons for low technology level of manufacturing as pointed out in preceding Section 4.2, is partly attributable to the higher education system in Sri Lanka. Current weaknesses in university education in Sri Lanka are analyzed as: (i) lack of cadre provisions for research, (ii) no funds for human resource development and training on the advanced fields, (iii) lack of trained technical staff to maintain sophisticated equipment, (iv) lack of facilities and equipment, and (v) limited opportunities for students to experience an operational training.

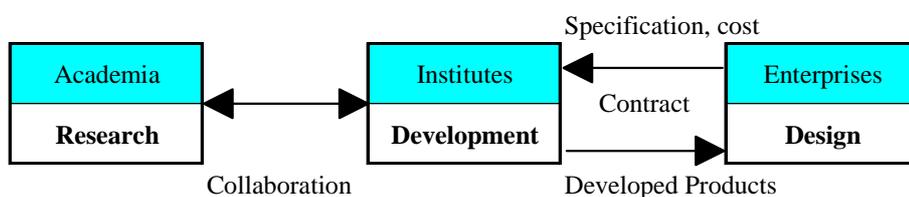
Under such circumstances, The Rainbow Plan proposes to promote an initiative for the “industry-academia partnership”. With this initiative, industries will offer opportunities for

academia and students to have practical experience in learning-by-doing at factories/enterprises, while the academic sector will offer opportunities for re-training or research of private enterprises. It is planned that a model of the industry-academia partnership be implemented when the Technopark or e-park is realized as proposed in the IT industry development plan (refer to Section 5.7). Another area of the industry-academia partnership is preparation/publication of engineering handbooks which are insufficiently available in every specialty.

Management skill development is another important issue to be addressed in HRD. It is observed that most enterprises in Sri Lanka utilize less than 50% of potential power of human resources. The leading figures of production such as foremen and supervisors should be educated at first by practical training in terms of production technology as well as management capability so that they can instruct other employees under them.

2) Research and Development (R&D)

R&D efforts should focus on the selected areas of technology that might result in greater efforts of application and manufacturing by private enterprises. To this end, an integrated approach by academia, public institutes and the industry is required. Frequent and effective information sharing and joint R&D activities is strongly recommended. Enterprises may ask research to the public institute by proposing a theme of their interest by sharing appropriate cost. The institute, in turn, may depend on joint research activities with academia, when required, to promote effective research for enterprises and industry as a whole. The private sector may concentrate its efforts on enhancement of designing capacity and creation of new products.



Collaboration in R&D

Establishment of an industry-wide association in the specific technological areas is also proposed to encourage an industrial linkage in technological upgrading, human resource development and R&D. An example is formation of a “Packaging Technology Association” to improve and disseminate packaging technologies as proposed in the plastic industry (refer to Section 5.4). The activities of the Association will not be limited to improvement and

dissemination of technologies, but will be expanded to inter-disciplinary and practical R&D. This kind of association of enterprises may work as an inviting organization of foreign experts to receive technical assistance in R&D, technology transfer, and training of engineers and workforce for technologies, including technical assistance to SMIs.

4.4 Restructuring and Enterprise Development

Most of the manufacturing subsectors in Sri Lanka have dual structures of large FDI enterprises and many SMIs without any strong linkages. To enhance productivity and competitiveness, it is necessary to rebuild the industrial structure and to make the operation more efficient through “3C”, i.e., competition, cooperation and concentration.

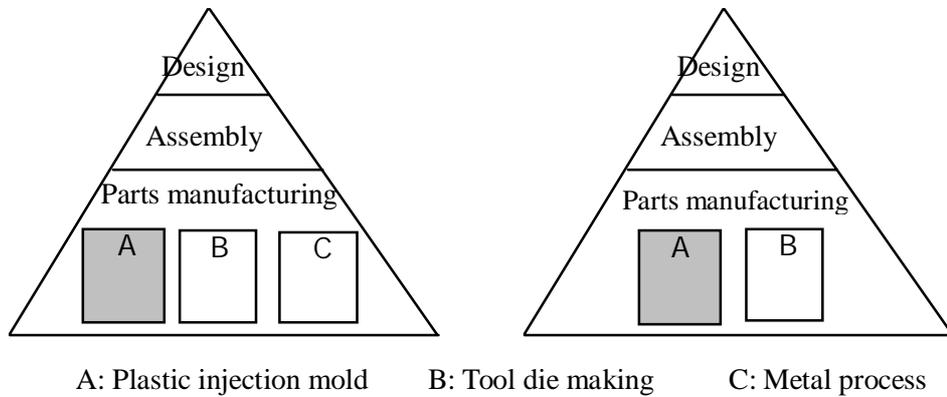
1) Concentration on Specific Products through Subcontracting

Most enterprises in the manufacturing sector are SMIs having no economy of scale. Major constraints of SMIs in Sri Lanka are:

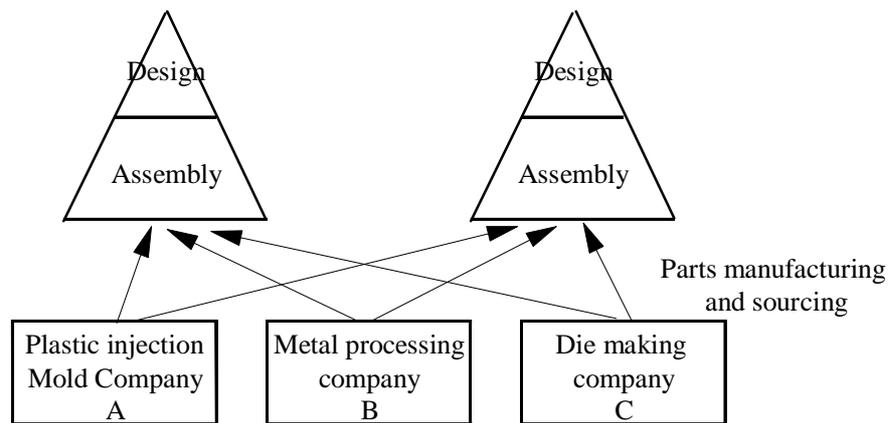
- (i) Each enterprise has or intends to have an integrated structure of manufacturing activities without a division of labor, even though they are small. Thus, efficiency in terms of the economy of scale is low and actual operation rate of equipment is quite limited, which leads to an increase in fixed costs.
- (ii) Wide manufacturing activities with a limited human resources in each enterprise brings a fragmentation of scarce resources, and makes it difficult to accumulate technological bases for their original and specialty area.
- (iii) There is no cooperation nor collaboration among enterprises, and there are limited numbers of specialized parts suppliers in the domestic market. When an entrepreneur intends to start his/her own business, he/she has to prepare all functions and activities of manufacturing, which requires a lot of financial resources.

A simple schematic diagram of the current Sri Lankan industrial structure in assembling type manufacturing and a recommendation for restructuring is shown on the following page. Most enterprises currently have all 3-levels of function; i.e., design, assembly and parts manufacturing. After restructuring, upper-stream enterprises concentrate their operations on design and assembly, and rely parts manufacturing on down-stream specialized parts manufacturers. This approach will lead to a concentration as such important resources of equipment and specialized labors and to bring about a larger economy of scale. Concentration

of work on specific areas brings about high learning effects; hence, higher productivity in the future.



Current Industrial Structure



Restructuring of Industrial Structure

Mergers promote not only concentration of work in centrally located enterprises, but also local linkages among local SMIs. For example, this is applicable to small local rubber producers. It is proposed that small holders form associations of rubber producers, which undertake businesses of manufacturing sheet rubber and centrifuged latex by building up new factories. The factories can be equipped with facilities for environmental protection. Merger among small tyre enterprises and formation of JV company for production of by-as pneumatic tyres, re-treated, and small size radial tyres is another example (refer to Section 5.3).

Industrial restructuring through cooperation and concentration encourages promotion of the subcontracting system. Recently, GST (Goods and Services Tax) has been introduced in

replacement of TT (Turnover Tax) , which is encouraging for promotion of subcontracting. Concentration of technologies, equipment, human resources and capital on some specific product should be realized through subcontracts. Otherwise, a machinery efficiency ratio and a labor equipment ratio will not be improved and the productivity is lowered in SMIs.

2) International Procurement

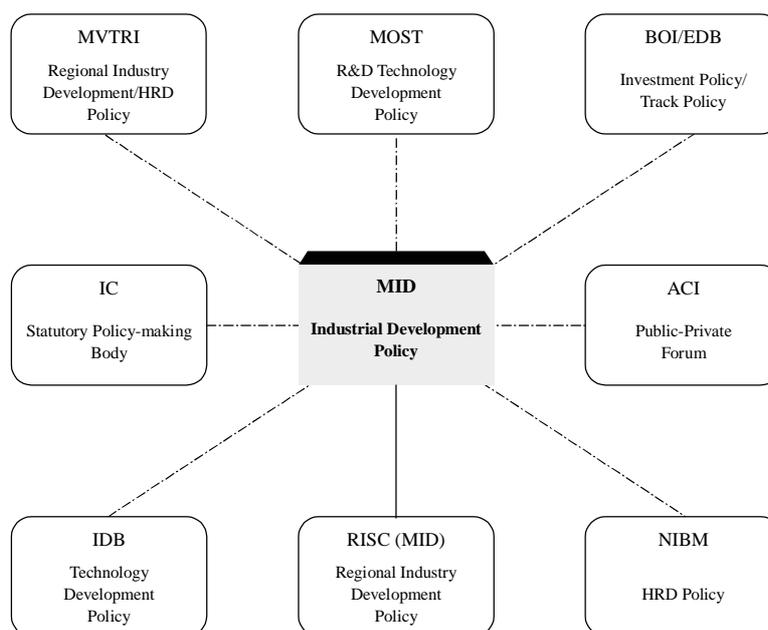
Concentration and cooperation can be promoted not only by mergers, but also by collaboration in other activities of business. One example is procurement of raw materials and parts. Most enterprises are independently purchasing in a small lot, and unit cost of parts become expensive. A concept of the International Procurement Operation (IPO) is practical to address such an issue. This is a centralized organization that receives orders of parts and components from domestic manufacturers, finds best suppliers in international markets, and purchases and delivers those parts and components to domestic enterprises. This system is particular applicable to assembling-type manufacturing (refer to Section 5.6).

4.5 Administrative/Legislative/Institutional Rationalization

1) Issues to be Addressed

It is important to set up an effective framework for administration, legislation and institution to stimulate and support the private sector dynamism for industrial development. The role of the public and private sectors should be defined and responsibility shared to achieve common targets and goals for industrial development.

Currently, major organizations dealing with industrial development are the Ministry of Industrial Development (MID, with 24 affiliated institutions), the Ministry of Science and Technology (MOST, with 12 affiliates), the Ministry of Vocational Training and Rural Industries (MVTRI), Board of Investment (BOI), and Export Development Board (EDB). Affiliated policy-making bodies have been established outside the respective ministries and discussed the relevant policies independently. Eventually, interface or adjustment function among affiliates and ministries, as well as inter-ministry has become quite weak and various fragmented policies have been sporadically adopted.



**Diversified Policy Making Mechanism
(Lack of Coordination/Dialogue)**

Lack of a unified and comprehensive industrial policy has also been caused by heavy duplication of similar functions by different ministries, affiliates and inter-ministry bases as shown below.

Current Functions of Industry-related Institutions

	MID	IDB	MOST	MVTRI	BOI	EDB
Industrial Development Policy	○			○		
Science & Technical Development Policy			○			
SMI Development	○	○		○	○	
Trade Promotion Policy	○			○		○
Investment Promotion	○	○			○	
Grant/Scholarship			○	○		
Financial Assistance						
Fiscal Incentives	○				○	
Industrial Estate Development	○	○			○	
Research & Development			○			
Extension Services		○	○			
HRD Professional			○	○		
Vocational Training		○	○	○		

Source: Brochures from the respective institutions and face-to-face interviews.

The sporadic adoption of fragmented policies and heavy duplication of functions have also resulted in lack of a unified policy for SMI development. This consequence is quite critical because most manufacturing enterprises are SMIs and Sri Lanka's industrialization is largely dependent on SMIs. A mechanism should be worked out to effectively tackle with SMI development.

While participation of the private sector is fairly observed in the government policy-making mechanism, such an opportunity is still limited and the public-private dialogue is insufficient. Participation of academia has been scarce except for such cases as ad-hoc base invitation by the relevant ministry. One of the reasons for heavy duplication of functions and sporadic adoption of policies might be partly attributable to the lesser participation by knowledgeable academia toward policy-making mechanisms.

2) **Proposed Rationalization**

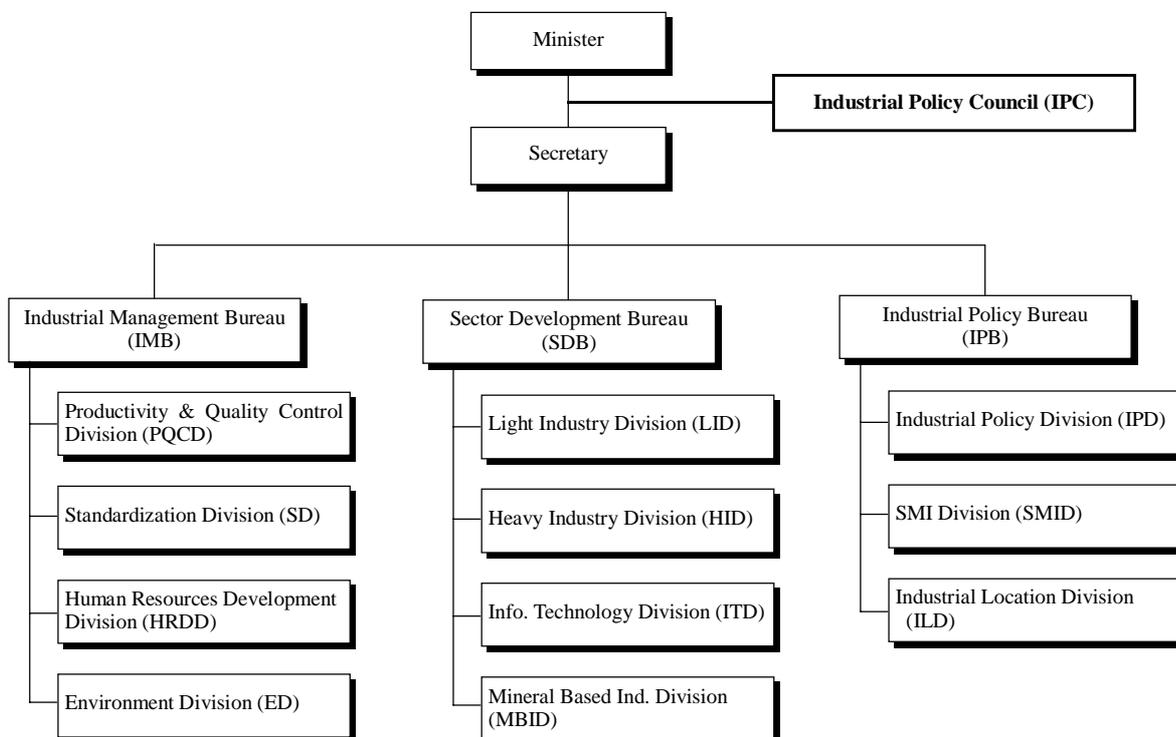
In order to consolidate a foundation for industrialization under "globalization" and "localization" (See Chapter 3, Footnote 3 for the terminology used here) towards 2004 and to further accelerate industrialization towards 2010, the administrative/legislative/institutional framework should be set and implemented by all the related organizations. Directions and strategies for rationalization of administration, legislation and institution proposed under The Rainbow Plan are mainly composed of (i) unification of a policy-making mechanism, (ii) institutional rationalization of respective organizations, and (iii) legislation related to rationalization and consolidation process.

The rationalization should be launched from the unification of all policy-making mechanisms that ever existed in the Industrialization Commission (IC), Advisory Council for Industry (ACI), and Industrial Development Board (IDB) toward "**Industrial Policy Council**" (IPC). The IPC, a statutory policy-making body, is established under the authority of the MID Minister and deals with all the policies concerning industrial development and regularly recommends a national industrial policy to the Minister. Thus, a centralized policy-making mechanism is established in MID.

Under the IPC, either sector or subject-based committees are established, e.g., the Committee for SMIs, Regional Industrial Development and Productivity Enhancement, as well as General Committee as a coordination body between the respective Committee and IPC. The Committees should discuss sector issues and recommend them to the IPC. The IPC and the Committees should have more participation of the private sector and academia. The Chairman

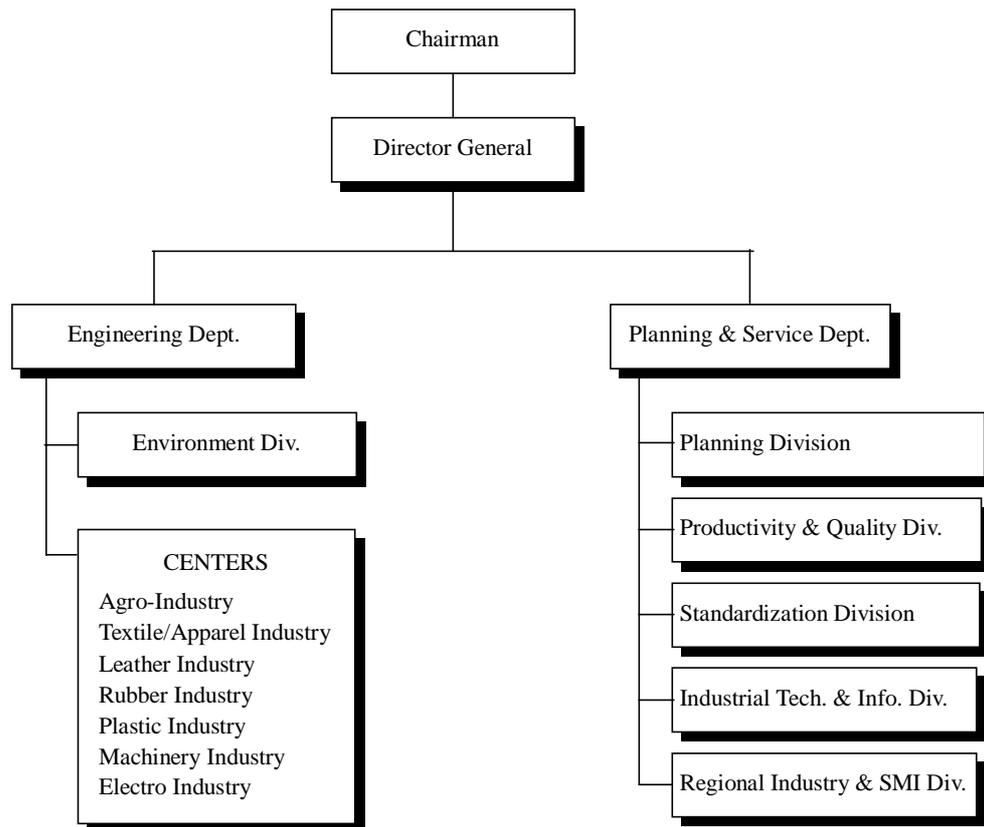
of the IPC should be from a competent academia that can moderate and chair the IPC from a neutral point of view, with global experience and knowledge on macro and micro economy. More representatives of the private sector especially from private sector institutions and company owners, as well as a sizable number of knowledgeable academia from a faculty of industry and social science, should be employed. The ideal industrial development plan should be drafted upon absorbing as wide issues as possible from the private sector, unlike the former policy-making bodies where the issues from the public sectors were the majority. Participation of the private sector and academia should be emphasized at regional levels as well.

Institutional rationalization and consolidation of administrative organs in MID, MOST and IDB should follow after the unification of the policy-making mechanisms. The new organization of MID would include (i) Industrial Policy Bureau to fully support IPC, (ii) Sector Development Bureau to consolidate the foundation of priority sub-sectors, and (iii) Industrial Management Bureau to strengthen productivity, competitiveness, standardization, human resources development, and the environment.



MID Organization (Proposed)

IDB should also be fully consolidated to the implementation arm of the policies adopted by MID. The vertical organs and sector-oriented divisions are established to develop industrial technology and relevant services towards industrialists. On the other hand, horizontal organs dealing with productivity, quality control, standardization and the environment are also established. In the medium and long term, a merger among ITI, SLSI and IDB is also envisaged.



IDB Organization (Proposed)

A comprehensive SMI policy should be provided to foster sound development of SMIs and eventually build up high standard subcontract systems for assemblers. There is also an urgent need for quickly consolidating the technical and managerial foundation of the “policy-driven industries” toward the year 2004. In line with the consolidation process of MID, the requirement for the establishment of SMI Development Corporation (SMIDEC) should be planned by MID, DFIs and other related organizations (refer to Section 4.6).

In the legislation arena, a Cabinet Decision should be fully utilized for the establishment of IPC as a kick-off action for the entire rationalization process. The same procedure would be

applied to the consolidation of IDB, if it is appropriate, and to establish and restructure other organizations, including the establishment of SMIDEC. It is also suggested that the border arrangement for international trade be maintained at the current level at least until the year 2004 in order to consolidate the foundation for development of the “policy-driven industries”. The enactment of an anti-dumping regulation will also be required for consolidation of the foundation to prevent unfair trade practices.

3) Rationalization of Other Institutional Mechanism

The last Industry Census was conducted in 1983 and the forthcoming one is scheduled for 2001. In order to fill up the absence of the industry census, the Department of Census and Statistics (DOCS) has been executing Annual Survey of Industry and MID has been executing industrial statistics annually. However, there is no compatibility between the two statistics, and the fact that there is no solid statistical bases to analyze an industrial structure is one of the bottlenecks to design a comprehensive industrial development program. In 1999, a Working Group on Upgrading Management Information System was established by MID, DOCS, MOST, BOI and Central Bank under the coordination of MID, which is a good initiative taken by MID to continuously provide the quality industrial statistics.

In parallel with the provision of quality industry statistics, the problem under the current information arena in MID and IDB is the lack of information sharing among top management, between top management and middle management and at the inter-division levels. One of the best alternatives in realizing the information sharing in MID and IDB is the adoption of computerization. Technical hurdles should be cleared for installation of the computer-aided information sharing system.

4) Role of Public and Private Sectors

In connection with the rationalization in the industrial arena, it is important that both public and private sectors exchange their frank views regarding comprehensive industrial development issues. Industrial Policy Council (IPC) should have a vital role in this respect on a top-to-top basis. The sector and detail issues should be discussed at the committees to be established under IPC.

The most important and urgent task for the private sector under the current situation would be the identification of problems and issues to be solved on the respective subsectors and/or enterprise basis. The necessary survey should be undertaken under the good coordination of the relevant private sector associations, and under joint execution with MID. Thereafter, a

summit meeting can be convened among the horizontal associations, as well as the associations of target industries, in order to identify and clarify the problems and issues being encountered by the private sector. The conceivable issues to be addressed at the meeting must be:

- (i) Establishment of a common premise where the private sector can discuss the relevant issues,
- (ii) Improvement of accounting and financial skills of enterprises, particularly of SMIs, to maintain sound accounting practices and to increase transparency,
- (iii) Promotion of collaboration and cooperation among enterprises in the same subsector or with the related industries,
- (iv) Promotion of licensing of foreign advanced technologies to supplement new design development and to promote high value added products,
- (v) Establishment of ground to discuss and implement the division of labor and/or subcontract system in the target industries,
- (vi) To discuss strategies to increase local contents over 35% to enhance export towards India and other SAARC countries,
- (vii) Feasibility of establishing a common procurement system regarding parts and components to cut back import prices and to lead to cut back of production costs
- (viii) Feasibility of restructuring SMIs by formulating joint venture companies for processing,
- (ix) Feasibility of formation of associations to set up new factories (as proposed in the case of small rubber holders to set up new factories for field latex, centrifuged latex and sheet rubber),
- (x) Necessity of merger and/or business associations in order to convert businesses that are too small into appropriate-sized businesses to develop new products.
- (xi) To discuss strategies to strengthen international marketing focusing on target countries and products, including the provision of a persuasive marketing documentation and the maximum use of the Internet,
- (xii) Promotion of clustering among industries and with the related industries

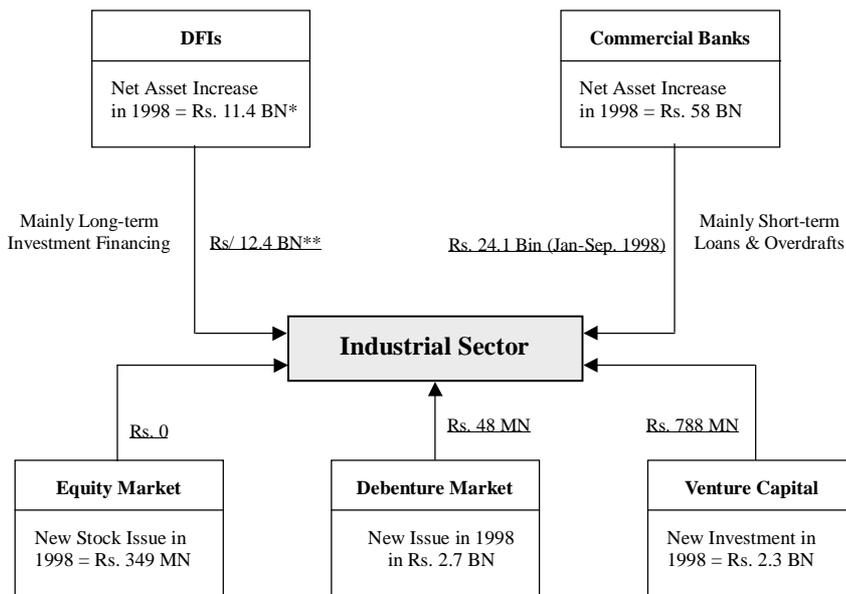
Those issues that will require a public sector intervention or support should be brought to a relevant Committee to be established under IPC for a solution.

Details of the analysis made and the framework formed/proposed for rationalization of administrative/legal/institutional affairs are presented in Appendix A.

4.6 Financial and Fiscal Support

1) Issues to be Addressed

The table below shows the flow of funds to the industrial sector in 1998. Commercial banks are by far the largest source of short-term loans, while DFIs are the source of long-term loans to the industrial sector.



* Rs.5.1 BN for NDB in 1998 and Rs. 6.3 BN for DFCC in 12 months to March 1999

** Rs.10BN for NDB and Rs.2.4BN for DFCC

Inflow of Funds into the Industrial Sector in 1998

Major constraints found in the financial system for sustained development of the industrial sector are summarized as follows:

(i) High Interest Rate

The bank-lending rate has come down over the past years but still remains high even for concessional loans. The high interest rate dampens the private sector initiatives for capital investment. The interest cost accounts for 3.7% of the total cost in the manufacturing sector on an average. There are many companies that refrain from borrowing from banks and use the same production machinery for decades, leading to low productivity, low efficiency and weak competitiveness of the industry as a whole.

(ii) Lack of Long-term Funding at Reasonable Cost

Concessional long-term loans provided by development refinancing schemes, particularly through DFIs, are scarce while commercial banks are rather short-term oriented with most of their liabilities shorter than 18 months. The limited amount of long-term loans that commercial banks do provide to the industrial sector bear a higher interest rate, requires more security and more cumbersome application procedures. Consequently, those enterprises which need to borrow at all from a commercial bank prefer (or are obliged) to borrow short-term loans and roll them over even in the case of financing a long-term project, resulting in bearing the maturity risk. The capital market, both equity and debentures, is still too small to be an effective funding source for the SMI sector.

(iii) Security-driven Bank Loan

Basically, bank loans are provided against securities including concessional loans. This implies that small companies and start-up companies have difficulty in obtaining loans from banks. They are also unwilling to lend to SMIs for the small loans that require high transaction costs.

(iv) Lack of Effective Credit Guarantee System

There is no properly operated credit guarantee system. The Credit Guarantee System of the Central Bank, set up in the mid-1970s for SMI loans, has remained ineffective.

(v) Poor Credit Analysis and Management on the Part of Banks

Bankers are not well trained in the area of credit analysis and management, which leads to high non-performing loans and poor financial status of banks. Lack of these skills also makes banks dependent on securities. Meanwhile, enterprises, especially SMIs, do not employ qualified accountants and this proves to be an obstacle when obtaining financial assistance or when monitored for progress by banks. There are cases when small enterprises lack financial discipline.

(vi) Lack of Policies

Institutional financial policy is not well incorporated into the industrial policy. It is the Central Bank and DFIs that take initiatives in implementing institutional financing for the industrial sector, and MID is not properly involved in this important operation in the industrial sector.

Although some fiscal incentives are extended to the industrial sector, industrial development still has various difficulties under the current fiscal policy as pointed out hereafter.

- (i) Revenue constraints in the public sector that directly relate to lower public investment are one major problem in the expansion in production capacity in the economy. Inadequate infrastructure causes higher costs in marketing, transportation and communication, as well as instability of energy supply.
- (ii) There is favoritism for BOI companies over non-BOI companies and exporting companies over non-exporting companies, which should be gradually remedied.
- (iii) There is a need to move from a subsidy-based investment culture to an efficiency-based investment in order to efficiently use the limited amount of resources.
- (iv) Inadequate development of infrastructure led to unequal regional distribution of industries. Although the government in the recent past has given several incentives to disperse industries to the regions, further encouragement should be given to the regionalisation of industries.
- (v) The commercialization of new research findings and new innovations is essential to continuous enhancement of productivity and competitiveness of the industrial sector. However, institutional arrangements for commercialization of research and development in Sri Lanka have not improved to the required level.

2) Financial/Fiscal Improvement for Industrial Development

Analysis of the current situation and constraints of financial/fiscal policy classifies the requirements for financial and fiscal improvement related to industrial development as summarized below.

- (i) There is a strong need in the industrial sector for concessionary loans at a low interest rate, particularly in SMIs.
- (ii) There is also a strong need in the industrial sector for fiscal incentives to promote introduction of advanced technologies, marketing, training and R&D for SMIs.
- (iii) Establishment of an effective system of credit guarantee for SMIs and support to venture companies is required.
- (iv) Commercial banks, both state and private, need to improve their financial status, especially by improving loan recovery rates through reinforced credit analysis and management skills.

- (v) Enterprises, on the other hand, should improve their accounting and financial skills and increase transparency and accountability.
- (vi) A stable and efficient financial infrastructure (e.g., currency, structure, stability of interest rate) is indispensable for the accelerated industrial development.
- (vii) Development of a capital market is also expected to contribute to the expansion of the industrial sector by providing long-term funding.

To meet the requirement for financial and fiscal improvement, The Rainbow Plan proposes to extend public support for industrial development, particularly for SMIs, by means of (i) provision of concessional loans, (ii) introduction of tax incentives, and (iii) establishment of SMI Development Corporation. Outline of the proposed support is presented below.

3) Financial Support through Provision of Concessional Loans

The questionnaire survey revealed the magnitude of requirements for the future borrowing in the target industries as summarized below.

Future Borrowing Plan by Subsector

(Rs. million)

	Leather	Rubber	Plastic	Machinery	Electrical/ Electronic	Total
Public Loan	240	2,060	440	100	430	3,270
Commercial Loan	170	2,160	330	110	470	3,240
Total Borrowing Plan	410	4,220	770	210	900	6,510

Note: Data on the apparel sector have been incomplete.

Source: Questionnaire Survey

In order to meet the strong demand for industrial credits, the resources of concessional loans should be increased and the interest rate further decreased. The concessional loans should be offered for the purpose of investment in equipment and facilities, reinforcement of product design and R&D and promotion of technical collaboration with foreign enterprises. These concessional loans, with the establishment of the Credit Guarantee Organization, should be provided particularly to the SMI sector, in which an adequate amount of loans is secured for support to the SMI sector for at least a 5-year period of consolidation of the industrial foundation. Such concessional loans are part of the industrialization strategy for the SMI sector and do not contradict with the idea of promoting the efficient financial sector. The coordination between MID and DFIs should be enhanced for effective operation of the concessional loans.

The concessional loans are extended with preference to the target industries, particularly for the “policy-driven industries”. In order to support consolidation of foundations for development of policy-driven industries, the concessional loans are regarded as indispensable.

4) Fiscal Support by Tax Incentives

It is desirable that some tax incentives be introduced to help promote the industrial sector, particularly SMIs. It is proposed that the following tax incentives be studied and implemented to attain specific goals within a limited time span or for a period of consolidating foundation for industrialization up to the year 2004.

To Promote Advanced Technology

- Resumption of “Investment Tax Allowance” from 2000 to 2004 for new capital asset with advanced technology for the SMI sector
- Zero-rated import duties of plant, machinery and equipment for the purpose of modernizing for the SMI sector in case that they are not currently produced (and will not likely to be produced in the near future) in Sri Lanka.

These two incentives are to replace the “Fiscal Incentives for New Investments Utilizing Advanced Technology”.

- Maintain the custom tariff structure of finished products at the current level at least for the period of consolidation of foundation of the target industries.
- Make “plant relocation cost” eligible for the category of “Accelerated Depreciation Allowance”.
- Modification of BOI criteria to allow incentives to smaller IT enterprises.

To Promote Training

- Double tax deduction of costs for training of R&D staff and design staff both for “global-linked” and “policy-driven” industries
- Double tax deduction for procurement of equipment at private IT institutes

To Promote Marketing

- Double tax deduction of costs for marketing of focal products both in “global-linked” and “policy-driven” industries

To Promote R&D

- Double deduction of computerization and R&D expenses of product development of the focal products as well as those of production technology and design development (both for in-house R&D and contract out R&D to outside organizations) for both “global-linked” and “policy-driven” industries.
- Zero-rated duty for machinery/equipment, raw material/component parts and samples used for R&D of the above-nature both for “global-linked” and “policy-driven” industries.
- Introduction of “Investment Tax Allowance” for R&D equipment of the above nature for the SMI sector.

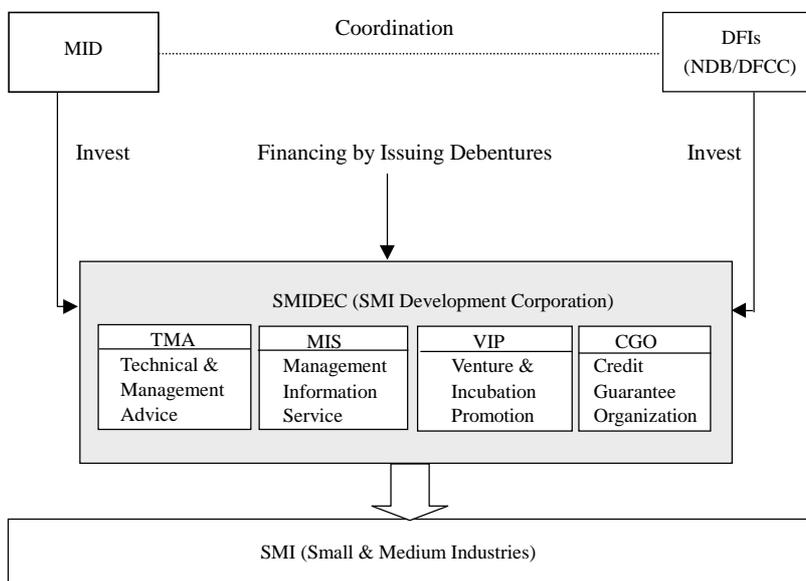
5) Establishment of SMI Development Corporation (SMIDEC)

In addition to introducing fiscal incentives and concessional loans, The Rainbow Plan proposes that a special organization be established to provide various required services to the SMI sector. The organization is named the SMI Development Corporation (SMIDEC), or alternatively the SMI Development Fund. The main objective of SMIDEC is to promote the SMI sector by providing them with technological, management and financial services, as well as a credit guarantee system and venture capitalists’ role, which are unavailable under the present conditions in Sri Lanka.

SMIDEC will be established as a corporation by MID with the funds procured by the national budget, two Development Finance Institutions (NDB and DFCC) and, if appropriate by international financing agencies. Investment from local non-governmental organizations such as Sri Lanka Chamber of Small Industries will also be invited. SMIDEC will also make borrowings from foreign donor agencies and raise their own money by issuing debentures. SMIDEC will replace some of the functions of IDB and will become a focal place to address issues and problems of the SMI sector. The services of SMIDEC will be made available island-wide through two development finance institutions’ network. It is expected that MID and DFIs will work closely through SMIDEC and by doing so, the financial policy will follow the overall industrial policy. In order to maximize the efforts and budget, as well as to achieve sustainability of SMIDEC, it is proposed to increase coordination with other existing institutions of similar functions from private, governmental and industrial, as well as academic sectors.

SMIDEC will have four functions, i.e., (i) Technical/Management Advice (TMA), (ii) Management Information Services (MIS), (iii) Venture & Incubation Promotion (VIP), and (iv) Credit Guarantee Organization (CGO). Each function will be financially independent

though there is only one common fund from which separate accounts are made. The diagram below summarizes the concept of SMIDEC.



Schematic Diagram of SMIDEC

TMA is to contribute to SMIs by providing them with the required technological advice in order to consolidate foundation for development and enhance their competitiveness. MIS is to contribute to SMIs by extending the required management advice services including corporate strategy, financial management and marketing information. VIP is to support the new venture industry by providing various kind of support such as project planning know-how, legal issues, start-up procedures, as well as funding opportunities. CGO is to contribute to SMIs by extending a credit guarantee scheme in order to facilitate the procurement of loans from the banks.

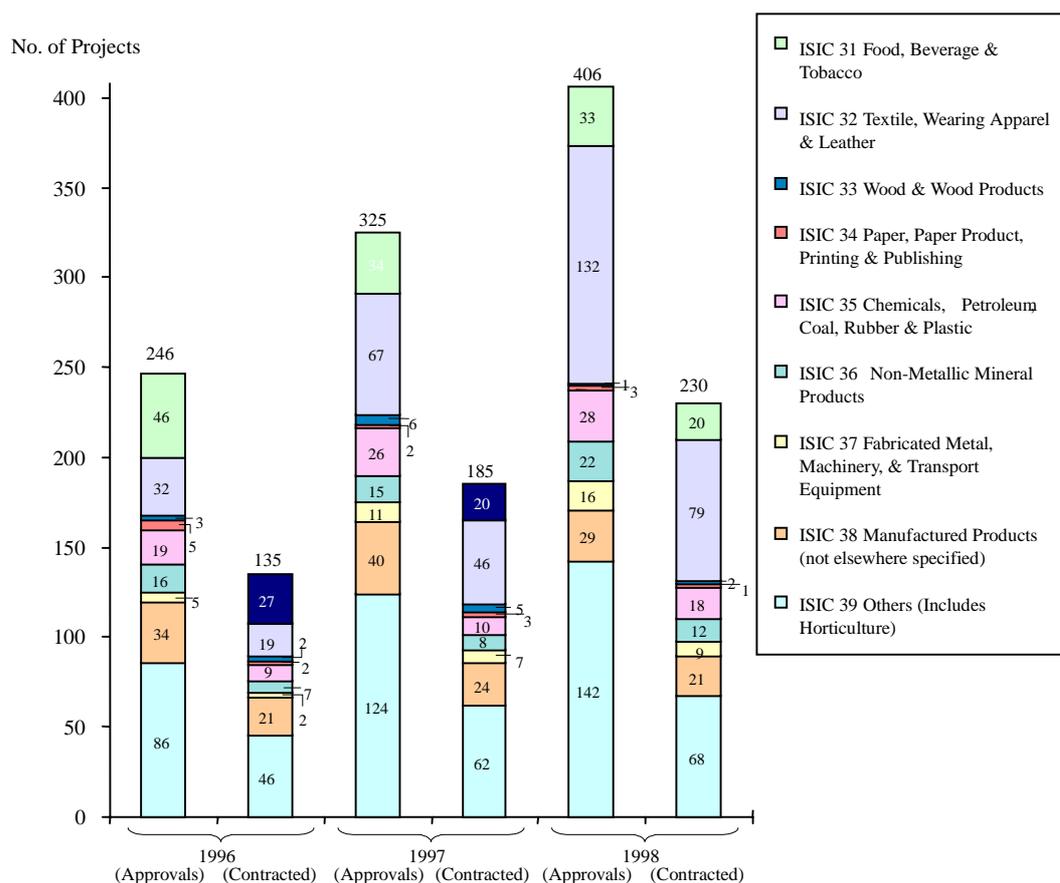
Operation of SMIDEC will be entrusted to a management consulting firm in Sri Lanka or its joint venture with an international management consulting firm to be selected through a public open bid. The selected firm may mobilize, if needed, some professional staff from the Central Bank (for CGO) and DFIs (for VIP and CGO).

Details of the analysis and framework proposed for the financial sector and fiscal policy are presented in Appendix B.

4.7 Promotion of Trade and Investment in Industrialization

1) Issues to be Addressed

According to BOI, total cumulative investment by 1998 amounted to Rs.151 billion, of which 66% or Rs.100 billion were foreign direct investments (FDIs). This investment, however, still represents only 6% of total investment made to the SAARC countries.



Source: BOI

Numbers of Projects Approved/Contracted under Section 17 of BOI Law

While it can be concluded that the investment environment in Sri Lanka is relatively attractive, when compared with SAARC and ASEAN countries, the following issues should be addressed to attract more investment in industrialization:

- (i) Settlement of ethnic conflicts that negatively affected foreign potential investors,
- (ii) Less developed transportation infrastructure,
- (iii) Unstable power supply and relatively higher tariff of electricity,
- (iv) Shortage of managers, skilled and semi-skilled workers, and
- (v) Undeveloped supporting industries and subcontract systems

For investment promotion, various incentives are being offered. However, some constraints are observed from the viewpoint of acceleration in industrial development:

- (i) Lack of tax incentives applicable for supporting industries in the SMI sector except for trust industries and export-based industries;
- (ii) Lack of tax incentives applicable for SMIs;
- (iii) Too widely clarified categories in terms of project scale, products export share; and
- (iv) Opaque incentive-granting process.

Further, it is noted that, Sri Lanka's investment promotion policies are less competitive in the following respects:

- (i) Not only Sri Lanka but also India and Pakistan offer a bewildering array of tax incentives that are available for all new investments. The complexity of tax incentives confuses foreign investors and brings a possibility of negative influence.
- (ii) India and Pakistan increase their tax incentives package with the provision of specialized infrastructure, increased sales to the domestic market linked to increased value-added.
- (iii) In India, the specialized fiscal incentives are provided for targeted industrial and service activities (e.g., IT service industry and infrastructure).

The trade policy of Sri Lanka is basically a open market policy, and it is considered the most open market in South Asia. Currently Sri Lanka adopts a three-band import duty structure; i.e., 5% for raw materials, 20% for intermediate goods, and 30% for final consumer goods. In principle, export subsidy is not granted in Sri Lanka.

As discussed in Section 3.3, environment surrounding trade and industrialization of Sri Lanka has been changing under; (i) introduction of the Indo-Lanka FTA, (ii) promotion of SAFTA, (iii) expiration of MFA, and (iv) consolidation of rules under WTO. The impacts of these free trade regimes are assessed from the viewpoint of industrial development as shown in the following.

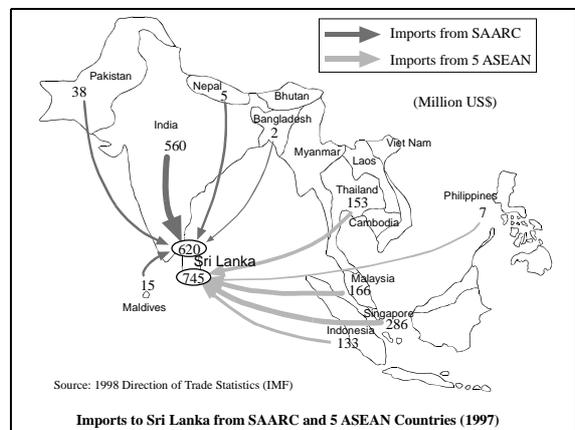
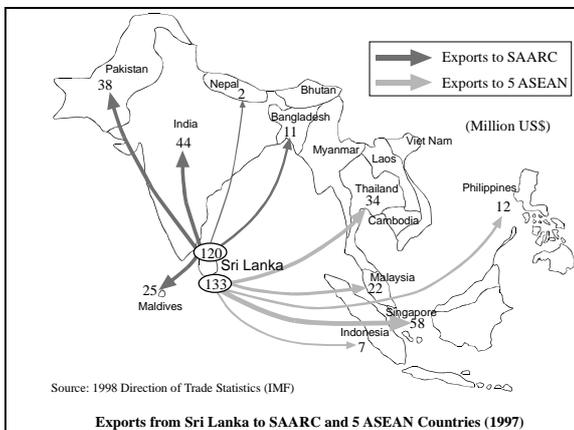
Impacts by Free Trade Regimes

Items of Impact	Impact (Positive /Negative)	Impact by Free Trade Regimes
(1) Impact of Free Trade and Globalization	Positive Impact	<ul style="list-style-type: none"> ① Comprising relaxed FDI, J/V and technical partnership with foreign partner ② Progress of technology transfer ③ Liberalization of information
	Negative Impact	<ul style="list-style-type: none"> ① Abolition of subsidy for export industries ② Protection of intellectual property rights ③ Limitation of production monopoly ④ Liberalization of domestic market ⑤ Severe competition
(2) Impact of Tariff Reduction or Duty-free	Positive Impact	<ul style="list-style-type: none"> ① Import-processing industries oriented to domestic market • Cost reduction due to non-tariff importation of its inputs conducive ② Localized exporting industries • Switching raw materials to imported ones to expand export • Increase of exports by using lower price-imported raw materials
	Negative Impact	<ul style="list-style-type: none"> ① Import-processing and localized processing industries • Stiff competition with duty-free imported products

N.B :Impact on concerned investment :Impact on concerned trade

According to the questionnaire survey, various impacts of the Indo-Lanka FTA and SAFTA are felt by Sri Lankan industrialists. In general, industrial enterprises are aware of intensified competition under the free trade regimes. They, however, expect that the Indo-Lanka FTA and SAFTA will bring about expansion of raw material sourcing and expansion of export markets for Sri Lankan products.

Another trade characteristic is that Sri Lankan linkage with the ASEAN countries is still at a lower level when compared with India's relation with ASEAN. Sri Lanka exports US\$133 million to ASEAN while importing US\$745 million from ASEAN.

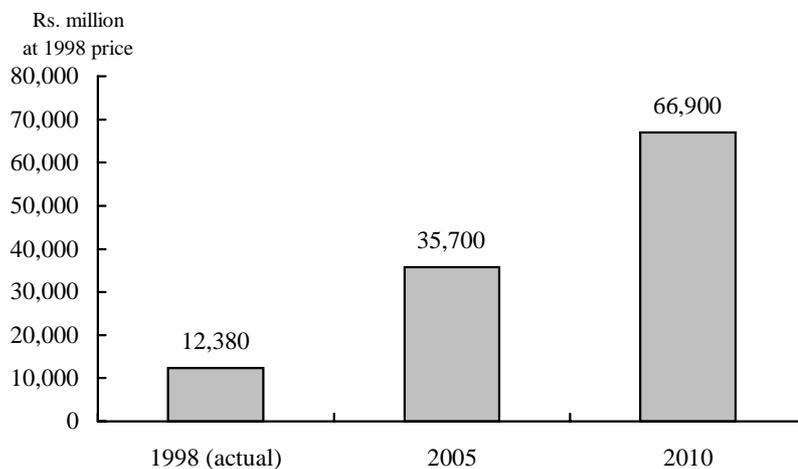


2) Framework for Promotion of Investment in Industrialization

A basic policy for promotion of investment in industrialization is defined to be:

- (i) Acceleration of FDIs in target industries,
- (ii) Acceleration of J/V and technical collaboration for technology transfer, particularly for SMIs, and
- (iii) Promotion of local investment in industrial development.

Through discussion on macroeconomic framework in Section 3.6, the target of FDIs under The Rainbow Plan is set to be 2.3% of GDP in 2000-2004 and 3.0% of GDP in 2005-2010 as shown below.



Target Amounts of FDI in 2005 and 2010

Promotion of investment is particularly important for development of the target industries. For instance, it is estimated that investment in the total amount of nearly Rs. 20 billion is required to implement the plastic sector development as contemplated in the sector development plan.

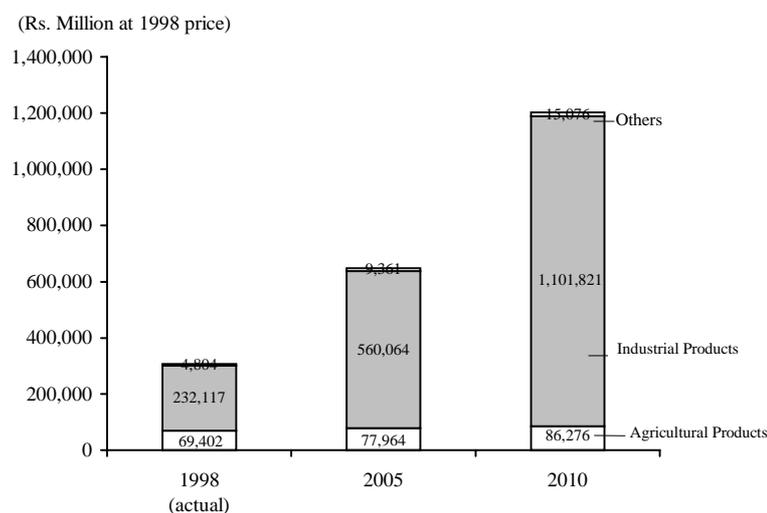
BOI efforts should also be directed to promotion of technical collaboration and technology transfer. For instance, the machinery industry is not designated as a thrust industry but it needs for technical collaboration and licensing of foreign advanced technology to reactivate the machinery manufacturers. Likewise, efforts are necessary to mitigate the difference between the BOT-status enterprises and non-BOI status enterprises.

3) Framework for Trade Promotion

A basic policy for trade promotion is defined as follows:

- (i) Acceleration of exports through enhancement of quality and competitiveness in global markets and concentration on competitive products,
- (ii) Diversification of exports through promotion of export industries other than the apparel industry, and
- (iii) Promotion of fair trade, including prevention of dumping and export at marginal prices.

The target of export set up by EDB will be followed by The Rainbow Plan. The export value of the industrial products will be increased to Rs. 560 billion in 2005 and Rs. 1,100 billion in 2010, or 2.4 times and 4.8 times the current export value.



Target Values of Exports in 2005 and 2010 (by EDB)

Although some decline in export of the apparel industry is foreseen after expiration of MFA in 2005, increase in export is expected in the rubber industry, electric/electronic industry, and IT service industry.

Since the trade policy has been adopted in the past with less attention to the industrial policy, it is expected that the future trade policy will be adopted through consultation with MID and its Industrial Policy Council (IPC). From the viewpoint of industrial development, the following policy and measures should be taken into account:

- (i) Prevention of dumping, including anti-dumping legislation,

- (ii) Maintenance of the tariff structure at the current level, at least during the period of consolidation of industrial foundation
- (iii) Promotion of local contents through encouragement of supporting industries

4) Investment and Trade Promotion Plan

For industrial development of Sri Lanka, it is planned that The Rainbow Plan will incorporate the investment and trade promotion plan as follows:

① Selective Promotion of Investment in Industrialization

It is planned that efforts for investment promotion be selectively focused on several target industries and countries. The focus is directed as proposed in the table below.

Countries to be Focused for Promotion of Investment and Export

Category	Target Industry	Countries to be Focused on for Promoting Investment and Export
Global-linked industries	Apparel industry	USA/NAFTA, EU mainly UK, Germany, France, Italy
	Leather industry	EU, USA, ASEAN
	Rubber industry	EU, USA, Japan, Middle East, AESAN, etc.
Policy-driven industries	Electric/Electronic industry	SAARC, EU, Japan, USA, ASEAN(Singapore), etc.
	Plastic industry	SAARC, EU, Singapore, Japan, Middle East, etc.
	Machinery industry	SAARC(India)
	IT industry	EU(UK), USA, Japan, ASEAN(Singapore), SAARC(India)

In this connection, it is desired that BOI incentives be revised in the following manner:

- (i) The BOI designated thrust industry should include the plastic industry to promote investment and export.
- (ii) The criteria applicable for incentives should be revised so that smaller enterprises in the IT service industry would be promoted.

② Selective Promotion of Focal Products

Sri Lanka has been focusing on investment promotion for the thrust industries identified by MID, BOI and EDB. However, it is not so effective to focus only on the category of the thrust industries. Desirably, the focus of investment should be more strategically placed on the

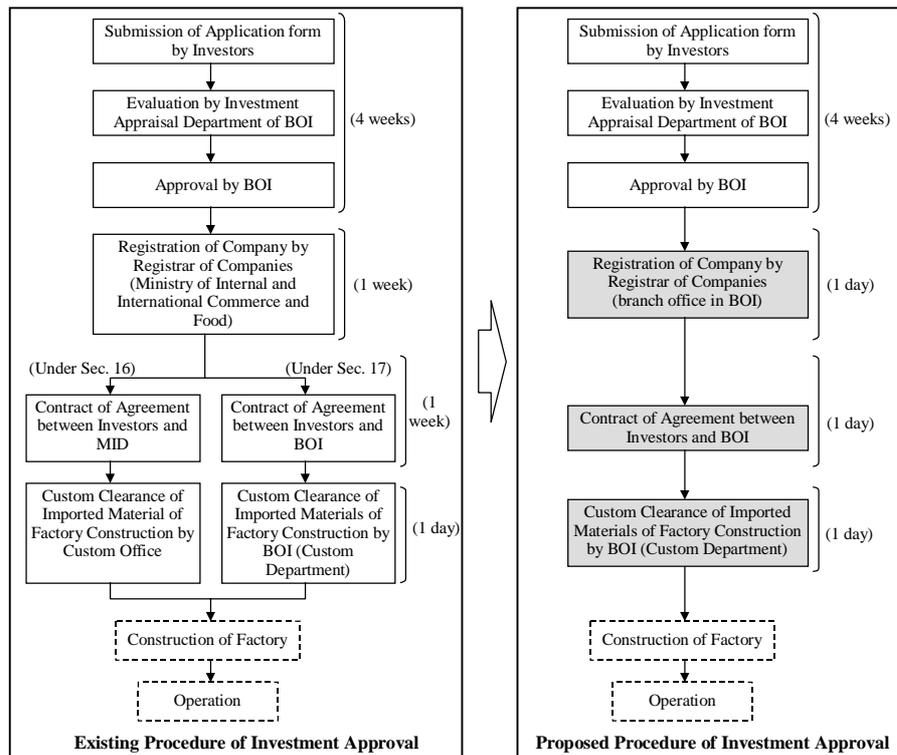
specific focal products. It has been identified through this master plan that such focal products in the target industries are as follows:

Focal Products in Target Industry

Target Industry	Focal Products
Apparel Industry	Mens outerwear/casuals, ladies outerwear/casuals, childrens were, ladies underwear, lingerie
Leather industry	Wastbelt, luggage/cases, shoe uppers
Rubber industry	Molded and Extruded products; e.g., Steel radial Tyre, byas Tyre, rubber roller, industrial mat, Latex products; e.g., Surgical/examination gloves, condoms, rubber thread, adhesive/bonding agents
Machinery industry	Agricultural machinery
Plastic industry	Plastic packaging products Plastic for electric/electronic use
Electric/Electronic industry	Home appliance: e.g. Color TV, cassettes Electrical appliance: bulbs, socket, etc. Electrical parts; e.g. semi-con, coils Industrial products; e.g. telephone accessories

③ Creation of Better Business Environment

Political stability and national security should be maintained in the long term. To facilitate procedures for FDIs, application of more simple procedures is planned as follows:



④ Improvement of Infrastructure and Utilities

To accelerate investments in the industrial sector, further efforts should be made to improve infrastructure and utilities required for industrialization. Major requirement for improvement will include:

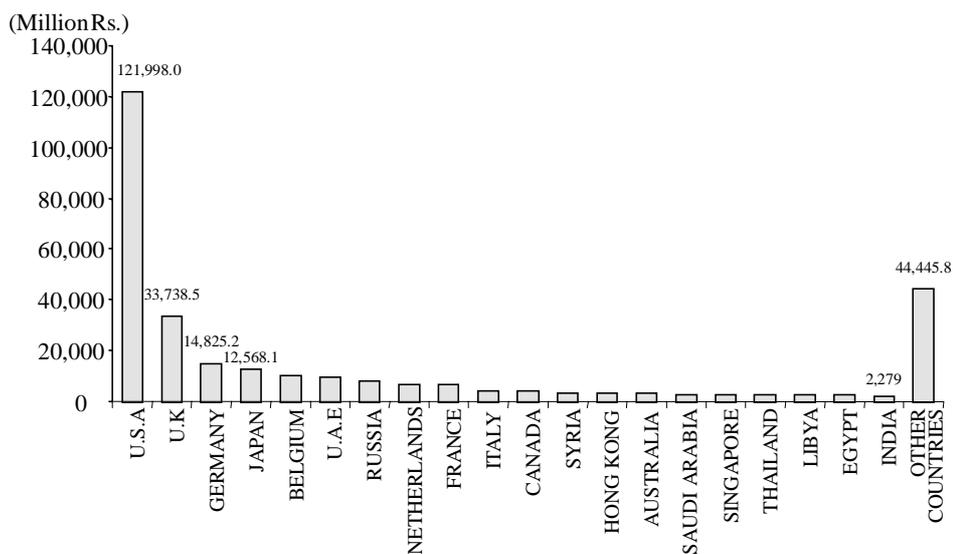
- (a) Improvement of power tariff structure,
- (b) Development of transportation infrastructure (e.g., port and highway),
- (c) Development of telecommunications (particularly for IT industry), and
- (d) Establishment of technopark to locate IT and other high-tech industries.

⑤ Upgrading of Local Industries

Under the Indo-Lanka FTA and SAFTA, local contents of traded products should be enhanced to exceed 35% of the FOB value. In this context, development of the supporting industries will be a key for export promotion to India and other SAARC countries. Promotion of the supporting industries should be planned in line with restructuring and subcontracting as discussed in Section 4.4.

⑥ Expansion of Export Markets

The current export markets, as shown below, will be modified when the industrial structure is diversified and consolidated under The Rainbow Plan. In the future, the industrial linkages with SAARC and ASEAN will be strengthened, and the trade pattern with these regions may be gradually shifted, vertically and horizontally. Execution of a market survey is planned in these regions, in addition to the market expansion in the traditional markets.



Sri Lanka's Exports in 1998

⑦ Adoption of Excellent Promotion System

Investment promotion through the Internet should be further strengthened by BOI to attain the target for investment. In this relation, BOI's function will be reviewed whether it should concentrate on policy issue and promotional activities or continue operation of the EPZs. Likewise, BOI and EDB should study if a trade/investment promotion center could be set up in the centers of SAARC and ASEAN to attain the target set up for investment and exports.

Details of the analysis and study on promotion of investment and trade are presented in Appendix C.

V. MASTER PLAN FOR TARGET INDUSTRIES

5.1 APPAREL INDUSTRY DEVELOPMENT PLAN¹

1) Overview

The Sri Lankan apparel industry has an overwhelming importance within the manufacturing industry in terms of output and employment. The survival and the further development of this industry is a vital issue for the economy. Consequently, the Master Plan for the apparel industry takes a high priority in the industrial development of the country.

One of the supportive developments for the birth and the growth of the Sri Lanka apparel industry was the Multi-Fiber Arrangement (MFA) that introduced a quota system for exports of textile and apparel products to developed countries, mainly to USA and the EU. The government of Sri Lanka was able to negotiate favorable quotas and was successful in creating a positive environment for its growth.

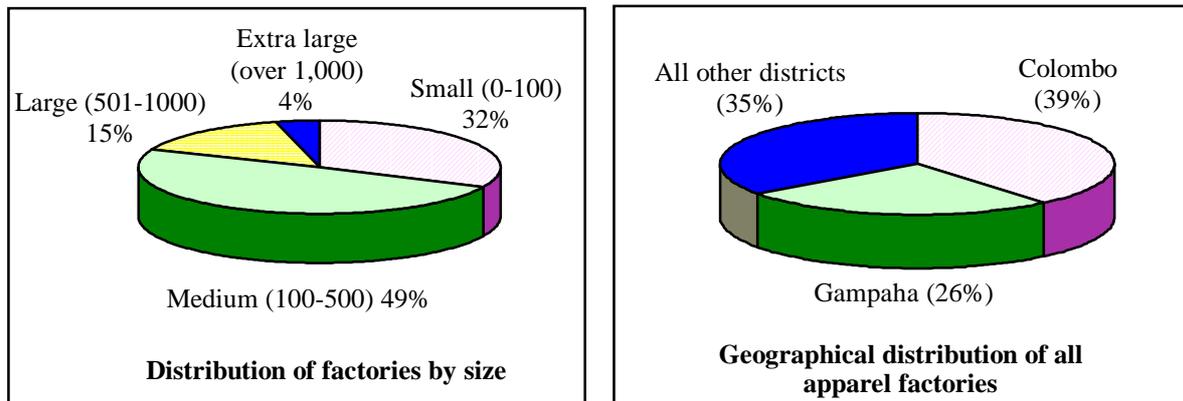
The definition of enterprise is a factory or establishment as a production unit irrespective of whether the factory belongs to a company with only one factory or to a larger group with several factories in the country. Each factory in Sri Lanka is relatively self-sufficient; it processes the raw material, fabrics, and accessories, to a ready-made garment. In large companies, only functions like marketing and administration are centralized.

The number of enterprises grew rapidly up to 1996. In the last years the number remained constant but the size increased. Currently there are 891 apparel factories in Sri Lanka. As shown in the next graph most of the enterprises are of medium size. Only one third are small. This is not typical for an apparel industry. The main reasons for this are:

- The strong volume orientation of the Sri Lanka industry with a high number of pieces per style. This requires a sufficient size to allow an acceptable throughput time.
- The low degree of subcontracting from large companies to smaller units. In other countries hundreds of smaller factories work for other companies without any marketing activities of their own and with little administration.
- The allocation of quotas. Smaller factories can hardly obtain quotas because of the limited production capacity.
- The “200 factory program” of the 1980s and the new “50 factory program” give incentives

¹ Apparel Development Plan has been formulated by UNIDO.

only for factories that create high levels of employment.



2) Development Framework for Apparel Industry

The apparel industry is developed with its vision towards 2010 that states:

“By enhancing productivity, marketing and product knowledge to consolidate the position of the industry (MFA phasing out period until 2004) and to prepare the enterprises for open global competition thereafter (after 2005). The Sri Lankan apparel industry to manufacture high(er) value-added products combined with high specialization, high quality standards, excellent delivery service and strong customer orientation; with an aggressive marketing approach to penetrates into new markets in Europe and Asia”.

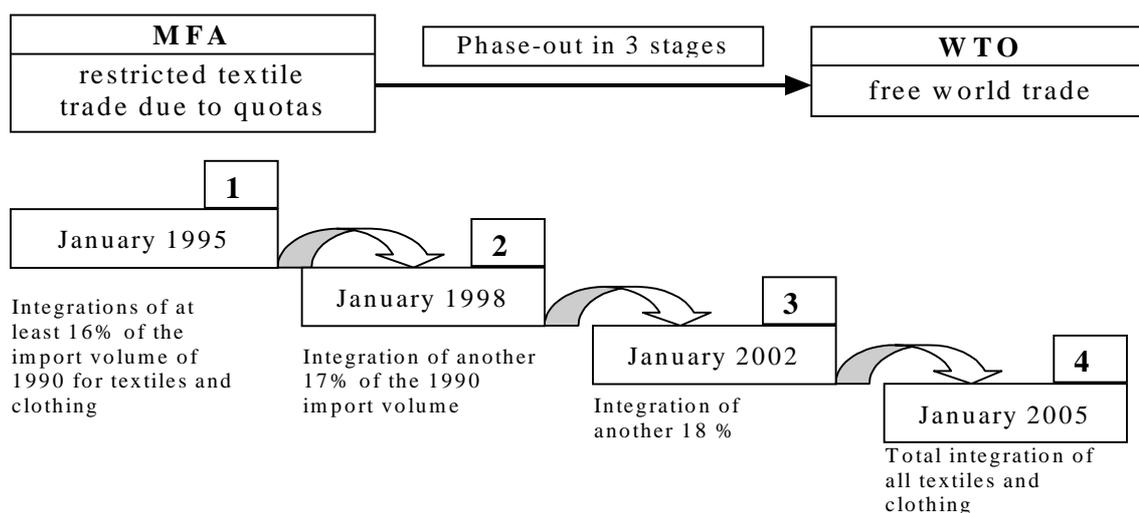
Main targets for developments of the apparel industry towards 2010 are set:

- (i) Increase of the total exports from US\$2.3 billion in 1999 to US\$3.0 billion in 2004; and to US\$4.5 billion in 2010.
- (ii) Promote the exports in the EU, primarily in the large individual member states markets where the position of Sri Lanka is weak.
- (iii) Enter the completely "new" markets like Japan, Indo-Lanka, FTA, SAARC and ASEAN and the Gulf total sales of US\$300 million in 2010.
- (iv) Doubling the number of joint ventures with strategic investors until 2005 and further increase of this by 2010. At least 10 factories should start operations as JV by 2005.
- (v) Increase GVA by 20% by 2005 and by 30% by 2010.

3) Development Plan for Apparel Industry

To achieve the above targets, it is programmed to implement the strategic plans that includes the following:

① Grasp the Opportunities after Phasing out of MFA



The 1994 GATT agreement provided a legal framework for the phasing out of the MFA and its integration into the WTO framework by the year 2005. This process takes place in three stages. Products for integration were chosen from a comprehensive list of categories.

In January 2005, all remaining products, representing 49% of the 1990-import volume may be integrated into WTO and the quotas abolished.

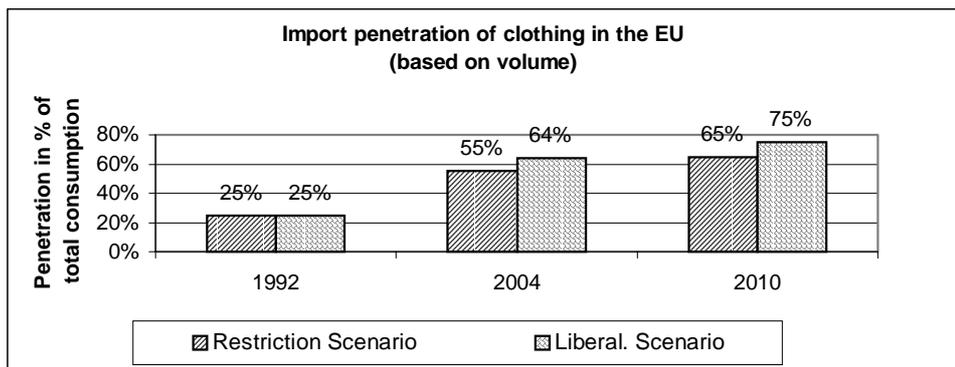
Trade liberalization for apparel will not emerge on a significant scale until the year 2005 when the remaining product categories are removed from the MFA list.

The removal of the MFA trade restrictions is for the Sri Lanka a mixture of threats and opportunities. Some strong Asian competitors could take business away especially in the mass market. On the other hand, there are good opportunities to enter into new markets in which the Sri Lankan apparel industry is currently not active.

② Promotion of Globalization of Apparel Industry

The importing countries request considerable flexibility when implementing the product integration process. Because of the different market situation the USA and the EU have adopted different routes. The imports of apparel will progressively increase in both markets and the domestic production will decrease.

The EU import penetration will rise dramatically also during the last phase of MFA. Under the assumption of a full liberalization of the EU clothing market, the import penetration is expected to reach 75% or 65% though, some restrictions for sensitive products are likely to remain.



③ Consolidation of Existing Markets and Promotion of New Markets

The current position, in international comparisons, of the industry is good. This industry has the opportunity to play a role in the global textile and apparel world. The next four years offer, under the protective umbrella of the MFA, the opportunity to further develop the current strengths and to reduce or even eliminate the weaknesses at both macro and micro levels. The efforts require a close cooperation between all players involved.

The years up to 2004 are to be considered as a consolidation and preparation period for the next "open market" phase. After 2005, an aggressive strategy will be required not only to consolidate the position achieved, mainly in the USA and in UK, but also to gain market shares in the larger markets where Sri Lanka has a weak position. The markets concerned will be primarily the USA and the EU and perhaps Japan; secondarily the domestic market and the regional markets of SAARC, which have been neglected in the past.

④ Concentration on Specific Product Categories

Restructure enterprises with a particular focus on shifting to product specialization (from the present manufacture of a range of items by most to meet quota allocations) as specialist manufacturers of specific product lines as shirts, underwear, etc. Also diversify and expand

the product range manufactured in Sri Lanka. These would have certain in-built advantages and strengths to compete in globally competitive markets.

⑤ Enhancement of Competitiveness

The Sri Lankan apparel industry has an acceptable level of productivity in comparison with countries in the region. However, further improvements are necessary to enhance the competitiveness mainly against the “cheap” (low wage) countries and the “near” (to the markets) countries.

The main areas for improvement are:

- (i) Production: Workplace engineering, improvement of internal workflow, introduction of modern processing systems
- (ii) Quality: Quality audit, professional quality management, quality control mechanisms, systematic quality check; in the long-term ISO 9000
- (iii) Profitability: Cost analysis systems, rationalization programs to cut production costs, overhead value analysis

⑥ Promotion of R&D and Investments

The Sri Lankan apparel industry competing in world markets and marching towards a knowledge based high-tech environment should have its own indigenous R&D back up through local centers of higher learning. This should cover areas of production, marketing and management. Institutions such as University of Moratuwa (postgraduate research), Institute of Policy Studies, etc. Research is expensive and needs a mechanism to evaluate research proposals and provide funding to carry out the necessary research.

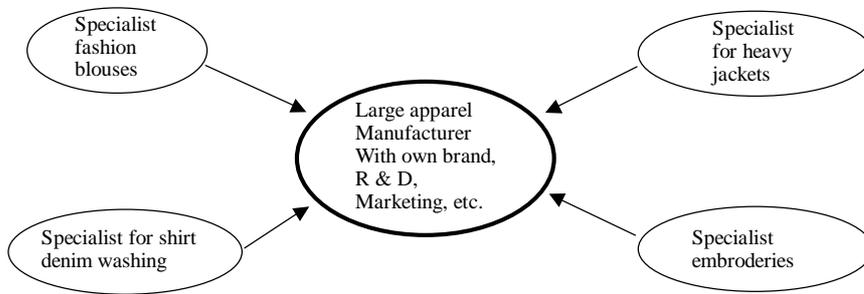
The enterprises have to invest in new equipment and machinery during the next five years. Investments are required to enhance the productivity and the quality. However, most of the companies, mainly the SMEs, do not have sufficient resources of their own. The creation of special investment fund providing credit lines at concessionary terms would assist the modernization of the factories.

FDI will also play an important role for the development of the industry. The government and BOI should improve the incentives for the setting up of joint ventures and/or strategic partnership between local entrepreneurs and foreign investors.

⑦ Support of Clustering

The apparel industry is a supplier of goods that go directly to the retail outlets and usually sold to the end consumer without any transformation. A clustering program should be developed with backward linkages to the suppliers of textile products, mainly fabrics and the suppliers of the many accessories required. Further, the provider of services, like logistics, should be integrated in a complete clustering program of manufacturers and service providers.

The development of a sub-contracting system should be considered. Most of the SMEs, more than 500, will depend heavily on a system of a close cooperation with larger enterprises with own marketing and product development. A large distributor and his sub-contractors:



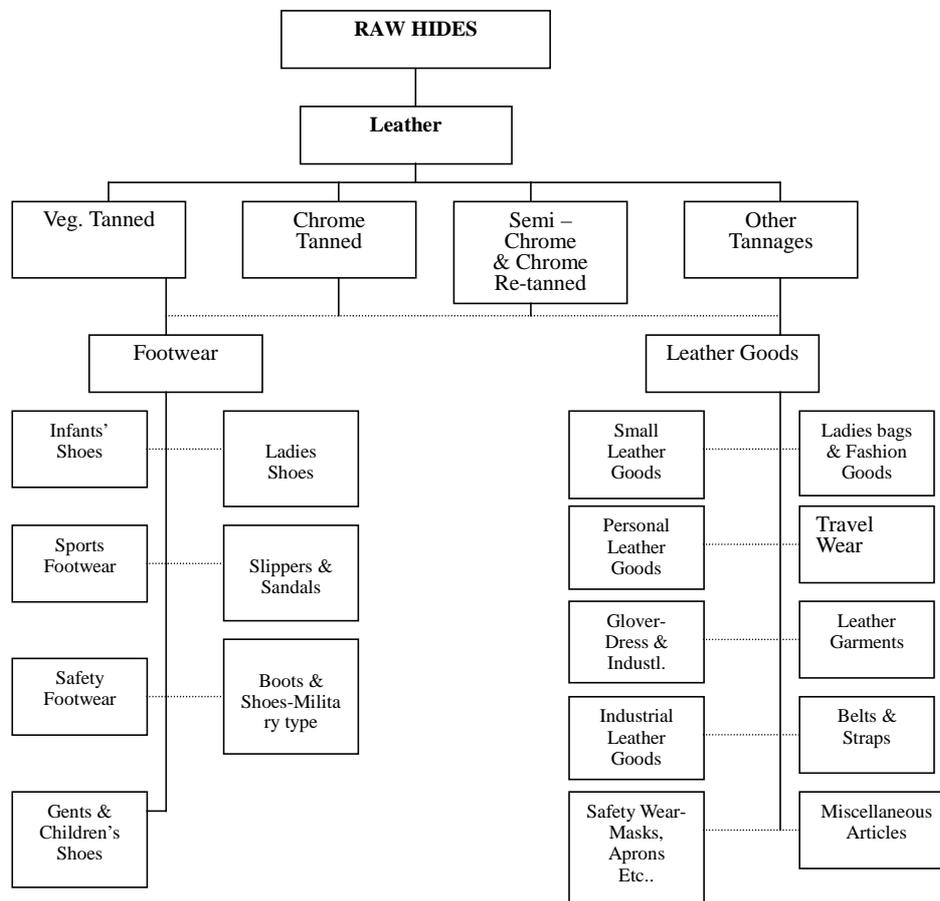
Details for the Master Plan for the apparel industry are presented in Appendix D.

5.2 LEATHER INDUSTRY DEVELOPMENT PLAN¹

1) Overview

The leather industry in Sri Lanka as in the world over is a traditional labour intensive industry. In Sri Lanka it is dominated by the small sector with 70% of the enterprises having less than 50 employees in each, and 80% of the enterprises having only 11% of the total paid-up capital. Of the 20 public companies (which is 40% of the enterprises) 6 have a foreign share holding.

The Industry consists of 3 types of manufacturing activities classified according to product groups ie. leather, footwear, and other leather goods, and the range of products manufactured under these groups are shown below.



The capacity of the industry is limited by supply constraints of raw hide, which is around 43 tons per day. This is from 2000 Cow Hides, 1000 Buffalo Hides and 1800 Goat Skins.

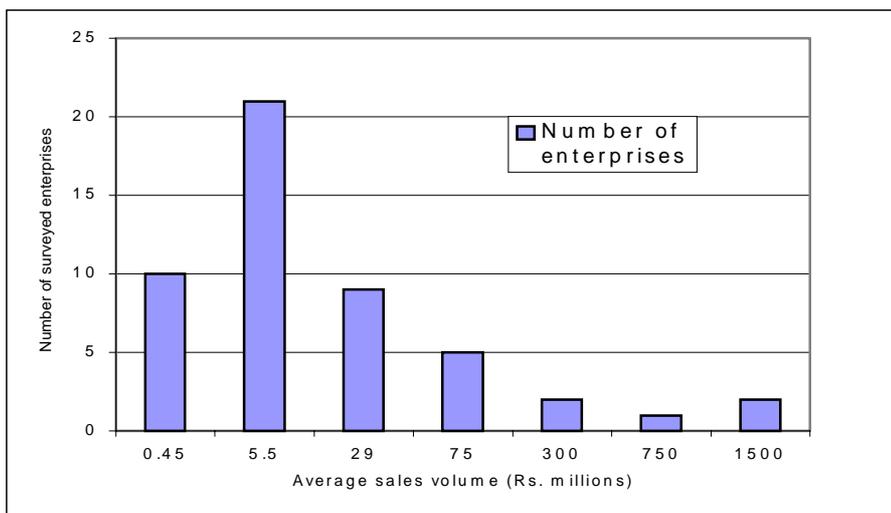
¹ Leather Development Plan has been formulated by UNIDO.

Analysis of the livestock shows that they are distributed in many parts of the country indicating a potential to develop the industry in other parts of the country, while it is now concentrated mainly in the Western Province.

The capacity has been further reduced to 28 tons by environmental restrictions imposed by Central Environmental Authority (CEA). The planned relocation of the tanning sector to the complex being currently developed at Bata Atha in the South will remove this constraint because of the specialised waste water treatment facilities to be provided there. This will enable an expansion by 15 tons daily or over 50% on the current levels. Tanning industry is already gearing-up to grasp this opportunity and move their new facilities and commence operations in 2001 which will also result in costs being shared.

The total sales of the industry for 1998 from the survey was Rs. 5,106 million (US \$ 72 Million). Of this the sales volume of 31 enterprises (ie. 62%) were less than Rs. 10 million, and only 5 enterprises (ie. 10%) had sales over Rs. 100 million.

Distribution of Enterprises by Sales Volume



Hide quality pose a major limiting factor in the industry unless measures are taken to control the resource more effectively, as the current situation is that the basic raw material (hide or skin) is under utilised and heavily devalued by the treatment the animal receives before and after slaughter. The current methods of removal of hide from the carcass in the abattoir also causes widespread damage; this and the damage due to branding often extends to 40% of the area of the hide.

Due to this low quality the wet salted hide sells for Rs. 22 per kilo (US\$ 0.31) compared to corresponding price in UK for this of US\$ 1.44. Therefore there is scope for improvement of quality which would lead to improvements down the supply chain.

The fineness of grain and aesthetic quality of the leather from indigenous Sri Lankan hide would lend itself to premium grade products and high selling prices if the desired improvements can be made.

Despite existing constraints, the exports of leather and leather goods have been increasing steadily from less than Rs. 2,000 million in 1993 to over Rs. 8,000 million in 1997, as seen from the following graph. However, these exports are not mainly from the indigenous leather nor from the traditional “small sector” which dominates the industry in terms of numbers of manufacturing units.



This increase is due mainly to the expansion of the export oriented BOI companies in this sector whose products include part processed, rough-tanned and crust leather; shoes using leather mixed with synthetic materials and canvas; and leather clothing jackets and work gloves from imported leather.

In the technical area, weaknesses exist in the level and quality of measurements taken for QC and QA functions in the enterprises visited. This is exemplified by the low level of understanding of the processes involved in many cases and failure to grasp the degree of

“performance” that the customer may require from the finished article and how leather can contribute to this.

The machinery also in most of the enterprises are old and outmoded and it may be more cost-effective to replace them with re-conditioned second hand machinery; and only in exceptional cases will there be a need to have modern machinery.

2) Development Framework for Leather Industry

The leather industry is developed with its vision towards 2010 that states:

“To earn for itself a place in the niche market for high value articles of leather aiming for up-grading of the raw material at base and leading to the manufacture of innovative technically enhanced quality products”.

The targets for development of the leather industry towards 2010 are set as follows:

- (i) To achieve following reduction in damages to the raw hides, and by this, increase the value down the supply chain.

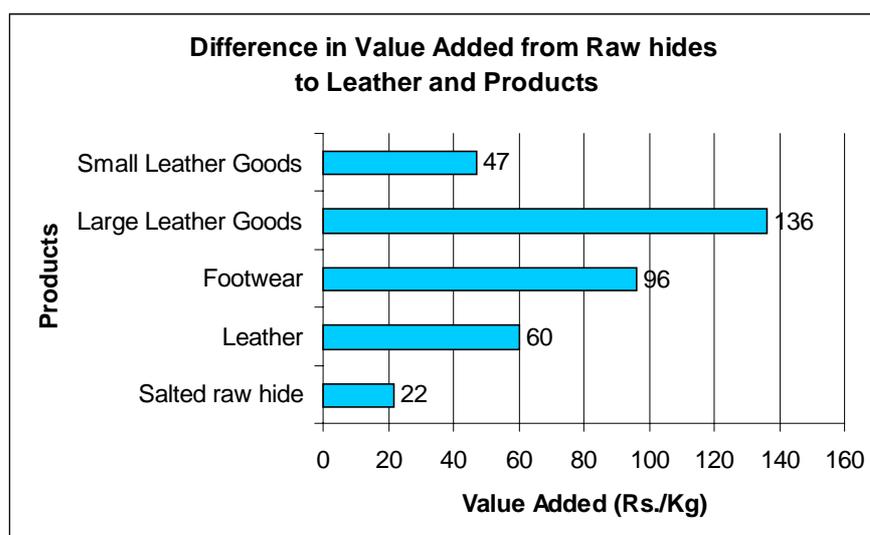
	Current	2004	2010
Manufacturing damage	30%	2%	2%
Flaying damage	40%	5%	2%
Branding damage	40%	15%	2%
Finished leather waste	60%	15%	5%

- (ii) To increase tanning capacity by 50% to 50 tons /day by 2004 and to 60 tons per day by 2010.
- (iii) To achieve at least 20% high quality leather products of the total production by 2004; and 40% by 2010, using better indigenous leather and improved manufacturing techniques.

3) Development Plan for Leather Industry

To attain the above targets a strategic plan containing the following program elements should be implemented.

- ① Quality improvement in raw hides down the line to finished goods by introduction of policies and regulations (with required incentives to farmers and animal breeders) for better animal protection and husbandry methods and improved abattoir practices. This to be done by the DAPH in cooperation with Provincial Councils, MID and SLAT.
- ② Upgrade and improve the skills in the industry through the setting up of a Skill Development Co-ordinating Agency (SDCA) for the leather industry which would effectively co-ordinate and improve the present training and skill development programmes under different agencies.
- ③ Establish a Leather Industry Development Centre (LIDC) under a public-private institutional arrangement operated jointly by the IDB (of the MID) and the Industry Associations by the expansion and strengthening of the present leather related Skill Development Unit under the IDB. This centre to be equipped with the required machinery and instrumentation to:
 - (a) conduct regular leather design and skill development programmes;
 - (b) demonstrate critical leather manufacturing processes so as to improve QC and QA in the industry;
 - (c) possess facilities and know-how for testing, setting standards in the leather manufacturing processes and for quality certification of leather products.
- ④ Enhance the value addition by earlier outlined measures which will eliminate waste at all stages in the production process and effect improvements so as to increase area yield and optimise the utilization percentages of the raw material



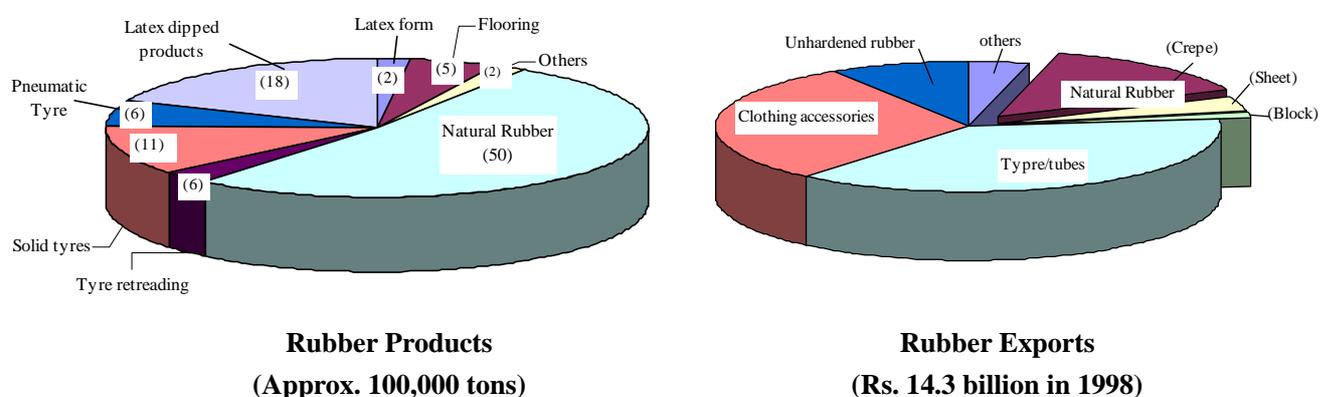
- ⑤ Initiate promotion of the high quality leather products and the development of a niche market by strengthening the industry's market intelligence and export promotion through a joint programme with the EDB.
- ⑥ After the commissioning of the Bata-Atha leather-tanning complex resulting in increased throughput and effective environmental controls to establish close to its vicinity an industrial park for footwear and leather goods industry. This clustering will provide greater linkages within the industry reducing costs and improving the overall competitiveness of the industry.
- ⑦ Review with a view to reduce the tariff structure of improved raw material input to industry.

Details of the Master Plan for the leather industry are presented in Appendix E.

5.3 RUBBER INDUSTRY DEVELOPMENT PLAN

1) Overview

The rubber industry is a traditional industry in Sri Lanka. It is a “resource-based” and “global-linked” industry utilizing high quality rubber produced in the country. Natural rubber produced in Sri Lanka is known for its low content level of proteins, making it competitive in international markets. Natural rubber production, however, has been decreasing in the past decade, and it is now at the level of 100,000 tons per annum. About half of this production is exported as natural rubber, and the remaining half is processed domestically for various rubber products.

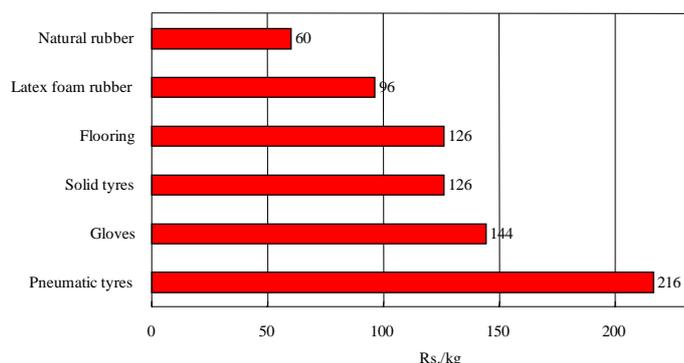


Figures in parentheses show 1,000 tons

Major export destinations are EU, USA, the Middle East, Canada, and Japan. The export value of natural rubber is vulnerable to international market prices. Investments in the rubber industry have been increasing since 1997, both in number of projects and investment amount. Local investment in equity accounts of 70%.

A notable distinction is observed between value added by natural rubber for exports and value added by manufactured rubber products. It is further noted that Sri Lankan manufacturers of rubber products utilize 55% of natural rubber for manufacturing on an average which is higher than the world average of about 50%, as natural rubber is relatively economical in the country.

Value Added: Natural Rubber vs Rubber Products



Use of Natural Rubber for Rubber Products

	Production (1,000 tons)	Natural Rubber Used	
		(1,000 tons)	(%)
Tyre retreading	7	6	75
Solid Tyres	26	11	43
Pneumatic Tyres	15	6	40
Latex dipped prod.	20	18	91
Latex foam rubber	2	2	83
Flooring	15	5	33
Others	5	2	40
Total Products	91	50	55

Rubber enterprises in Sri Lanka consist in dual structures; i.e., SMIs of nearly 75% and a dozen of large enterprises of domestic and foreign capitals. Nearly 70% of rubber enterprises earn an annual revenue of less than Rs. 100 million. Technology level is low, in general, and more than 70% of enterprises do not use patents and have no experience in technology transfer, according to the questionnaire survey. Profitability of rubber enterprises depends heavily on material costs (approx. 90% of production cost in latex processing, 65% in re-treaded tyres, and 50% in pneumatic tyres).

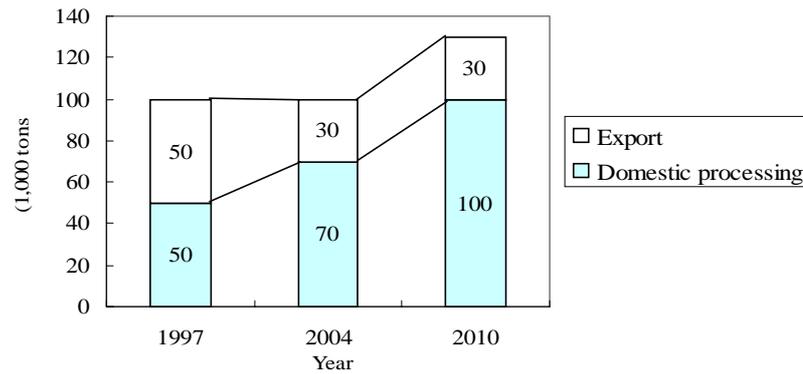
2) Development Framework for Rubber Industry

The rubber industry is developed with its vision towards 2010 that states:

“By enhancing a higher technological base to manufacture higher value added products, the rubber industry in Sri Lanka should lead industrialization of the country by means of maximum utilization of high quality natural rubber produced and by heightening competitiveness in global markets”.

Targets for development of the rubber industry towards 2010 are set:

- (i) To heighten productivity in natural rubber, and secure 130,000 tons of natural rubber production by 2010.
- (ii) To decrease export of natural rubber from 50,000 tons to the level of 30,000 tons, and increase higher value added rubber processing from 50,000 tons to the level of 100,000 tons.



Future Image of Natural Rubber Utilization

- (iii) To concentrate on processing of “focal products” to enhance competitiveness in global markets. The selected focal products are:

Focal Products in Rubber Industry

Category	Products	Key technology
Dry rubber based products	Steel radial tyre	Road endurance, cost
	Bias tyre	Road endurance, cost
	Rubber roller for machine	Quality, technology
	Mat: shoes soles, floor, can & bottle seal	Quality, cost
	Industry mat: bridge, rail pad, machine	Quality, cost
	Hose & pipe: oil resistive, mobile use	Quality, cost
Latex based products	Surgical gloves	Thin & tough
	Examination gloves	GMP systems
	Household gloves	Formulation for dermatitis
	Condoms	High tech. & investment
	Rubber thread	High tech. facility
	Adhesive/bonding agents	Formulations

- (iv) To attain an increase in GVA of up to Rs. 23 billion by 2010, through introduction of higher value added processing products.

3) Development Plan for Rubber Industry

To attain the targets above in line with the Development Strategy as discussed in Section 4.1, implementation of the plans that include the following is planned:

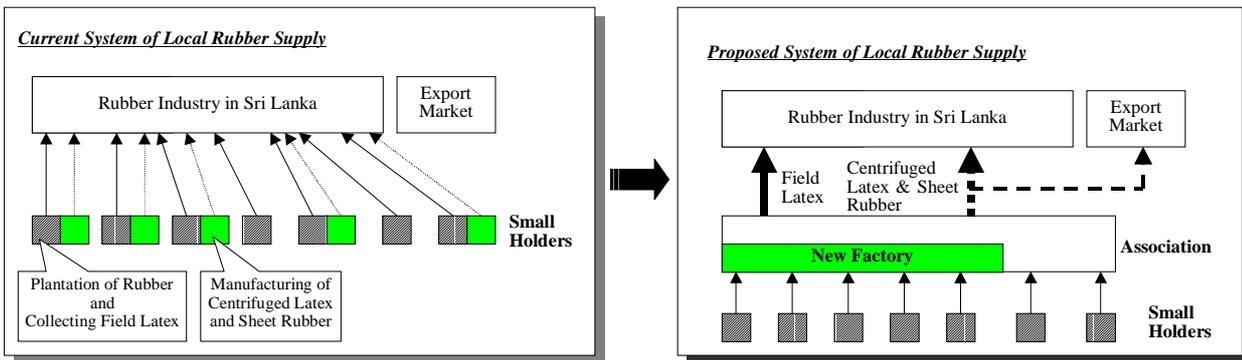
① Increase in Natural Rubber Production

Natural rubber production has been decreasing in the past, but it should begin to increase gradually, through improvement in productivity. The target of 130,000 tons a year is attainable

through cooperation with the Ministry of Plantation and Rubber Research Institute (RRI), as well as cooperatives of rubber plantations.

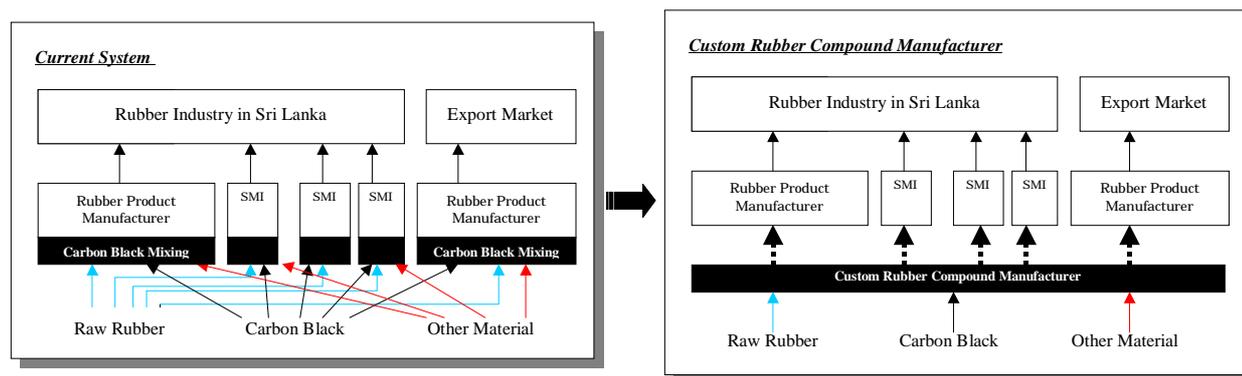
② Enforcement of Small Rubber Holders

To attain the increased natural rubber production and to enhance productivity and profitability in rubber processing, associations are planned to be formed by small holders and associations will be encouraged to set up factories in rural plantation areas for processing of field latex and centrifuged latex.



③ Creation of Custom Rubber Compound Manufacturer

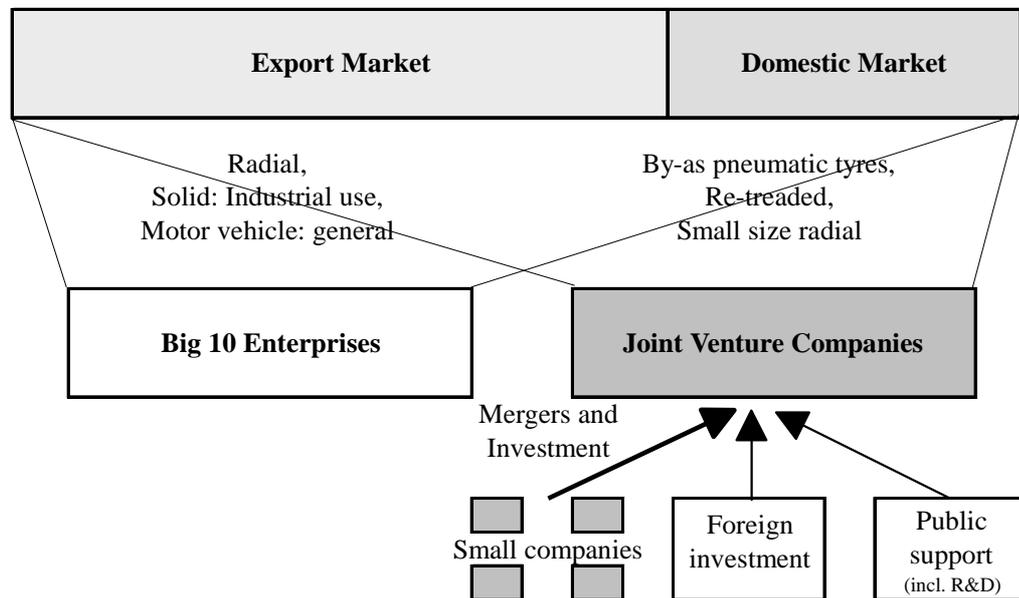
To improve working conditions and inefficiency in carbon block mixing at rubber product manufacturers and SMIs, a new enterprise specialized in custom rubber compound is planned to be set up.



④ Restructuring of Small Tyre Enterprises

Currently, 30 out of 40 tyre manufacturers are SMIs with weak management forces and inefficient production facilities. SMIs are planned to be encouraged to merge and form JV

companies for production of such focal products as bias pneumatic tyres, re-treated, and small size radial tyres.



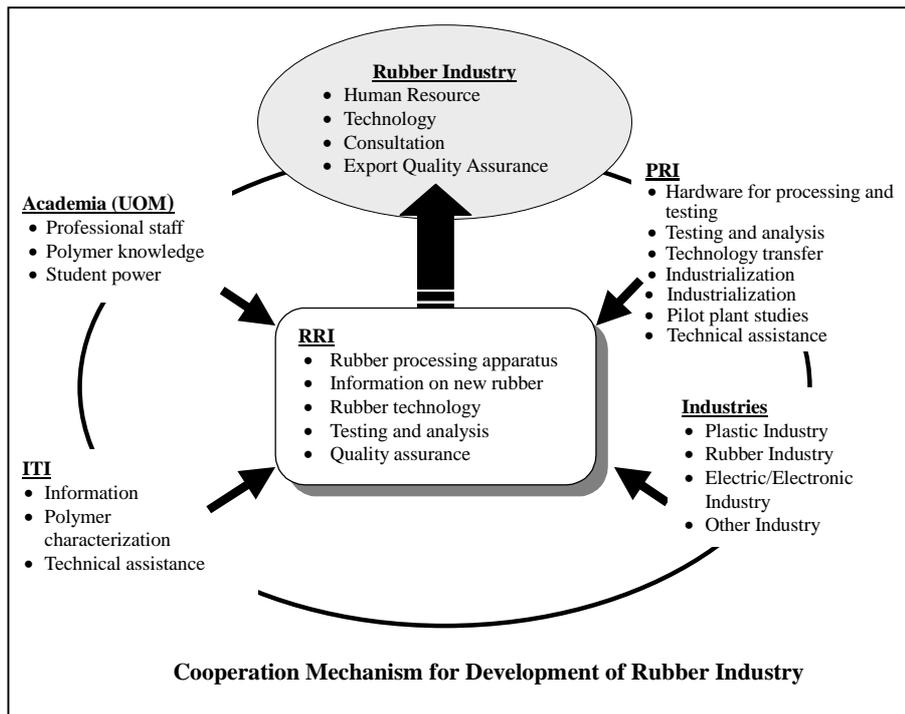
An idea of Restructuring Tyre Industry

⑤ Promotion of FDIs in Rubber Industry

FDIs in rubber processing are further promoted, particularly in the selected focal products (e.g., steel radial tyres, bias tyres, rubber roller, industrial mat, surgical and examination gloves, rubber thread, condoms, and adhesive/bonding agents). Cooperation of BOI is sought to effectively invite FDIs in these focal products that utilize Sri Lanka’s high quality natural rubber and heighten value addition in processing.

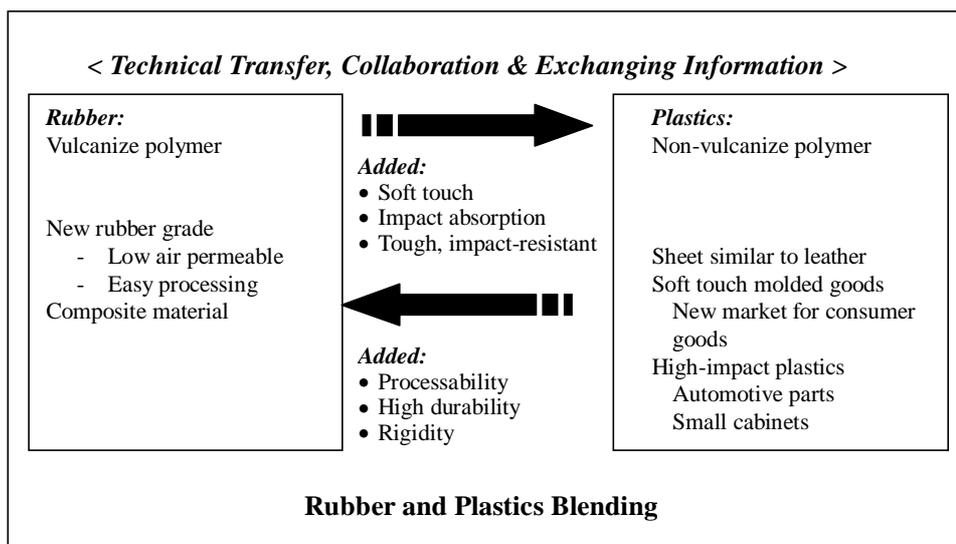
⑥ Reinforcement of RRI

The functions of the Rubber Research Institute of Sri Lanka (RRI) are to be reinforced for technology development, testing, marketing and training in the rubber industry. It is planned that RRI be reinforced to have the “Rubber Products Inspection and Testing Department” in addition to the currently available four technological and chemical departments. RRI also plans to receive cooperation from ITI, PRI, and academia.



⑦ Promotion of Clustering

The rubber industry is in a position to promote clustering with the plastic industry, electric/electronic industry and machinery industry. An example is clustering with the plastic industry to promote rubber/plastic blending. It will contribute to creating specific products of higher value added and to enhance competitiveness in global markets.



Details of the Master Plan for the rubber industry are presented in Appendix F.

5.4 PLASTIC INDUSTRY DEVELOPMENT PLAN

1) Overview

The plastic industry is still in the infant stage of development in Sri Lanka. Nearly 60% of plastic manufacturers are SMIs. Plastic products currently manufactured are dominantly for end-use consumer goods (e.g., buckets, containers). Recently, however, production of engineering plastics has increased.

Production of Major Plastic Products

(1,000 tons)

Raw Materials	Major Applications	1992	1996	1998	AAGR (92-98)
PVC	Pipes, Shoes, Hoses	14.0	18.0	24.0	9.4%
LDPE	Bags, Films, Tanks	9.5	12.0	15.0	7.9%
PP	Crates & containers	7.5	10.0	13.5	10.3%
HDPE	Consumer goods	7.2	9.0	12.0	8.9%
Others	Industrial uses	12.5	26.5	34.0	18.1%
Total		50.7	75.5	98.5	11.7%

Source: PRI and partly estimated by JICA Study Team

Most of the raw materials are imported (e.g., from Singapore, Korea, the Middle East, Japan, India). Import of raw materials reached 84,000 tons, while import of plastic products amounted to 13,200 tons in 1997. On the other hand, Sri Lanka exported about 20,000 tons of plastic products.

Imports/Exports of Plastics (1997)

Imports			Exports		
Products	Quantity (tons)	Amount (Rs. Million)	Products	Quantity (tons)	Amount (Rs. Million)
Raw Materials					
Polyethylene	39,000	2,007	Polyethylene/polypropylene products	17,300	1,700
Polypropylene	15,000	682	Article for conveyance	1,500	150
Polystyrene	2,000	150	Statuettes/ornamental	200	398
Polyvinylchloride	18,000	920	Builders ware	354	171
Engineering plastics	10,000	919	Carboys, bottles	150	38
(Sub-Total)	(84,000)	(4,678)	Bobbins, spools	70	28
Plastic Products			Table wares	50	10
Polyvinylchloride product	1,540	225	Shatters, blinds	8	7
Adhesive sheet	1,200	290	Gloves	4	0.2
Film certified	2,500	500			
PVC sheet	1,410	200			
Packaging	2,100	480			
Engineering plastics	1,650	580			
Consumer goods	2,800	610			
(Sub-total)	(13,200)	(2,885)			
Total	97,200	7,563	Total	19,636	2,502

Major technology and process used for production are injection molding, compression molding, mixing, assembly, and sub-assembly. Technologies applied for manufacturing of products for domestic markets are good enough to meet the demands at present, as the level of customers' needs for product quality is not so high. Technologies, however, are far behind the global standards. The productivity is also found to be low. About 60-75% of production costs are raw material costs.

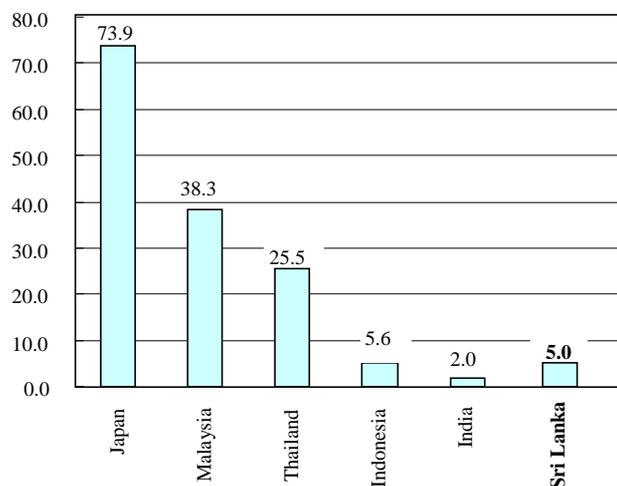
2) Development Framework for Plastic Industry

The plastic industry is developed with its vision towards 2010 that states:

“By supplying high value added materials and by establishing stronger linkages with major plastic-using industries, Sri Lanka’s plastic industry should support an upgrading and consolidation of industrialization of the country”.

Targets for development of the plastic industry towards 2010 are set:

- (i) To expect that per capita consumption of plastic products would increase from 5.0kg in 1998 to 12.7kg in 2010.



Consumption per Capita of Plastic Products (1998)

- (ii) To triplicate production capacity of plastics up to 300,000 tons by 2010 (270,000 tons for domestic consumption, 60,000 tons for exports, and 30,000 tons for imports)

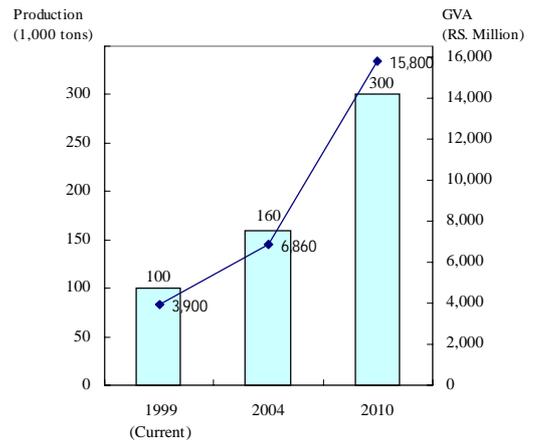
Growth of Plastic Consumption and Production

(Thousands Tons)

	1999	2004	2010
GDP Growth Rate (%)	5.5	6.5	7.5
Plastic Consumption per Capita (kg)	5.0	7.6	12.7
Growth Rate (%)	-	7.2	9.0
Domestic Consumption [C]	90	150	270
Exports of Plastics [X]	20	30	60
Imports of Plastics [I]	10	20	30
Production [P]	100	160	300

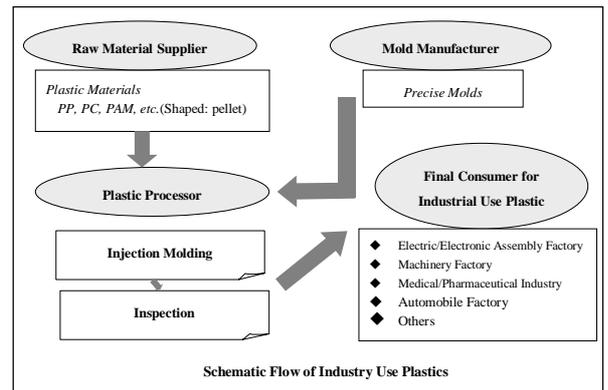
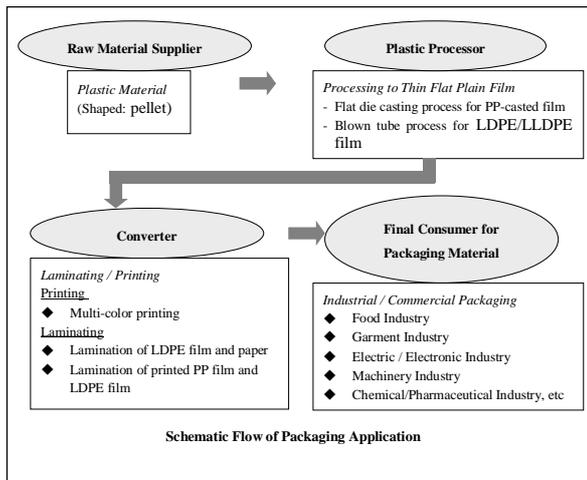
Note: $[P]=[C]+[X]-[I]$
 Source: JICA Study Team

Growth of Production and GVA



(iii) To concentrate on processing of “focal products”; i.e. plastic packaging products and plastics for electric/electronic industry. To this end, plastic film production will be introduced.

(iv) To attain an increase in GVA to exceed Rs. 15 billion by 2010.



3) Development Plan for Plastic Industry

To attain the targets above in line with the Development Strategy as discussed in Section 4.1, implementation of the plans that include the following is planned:

① Product Development and Market Expansion

Expansion of domestic markets will be promoted through product development in the application fields by modifying the current product design, as well as production and quality control. At the same time, a technological base of producing “plastic film” will be established. Expected production of plastic film will be 100,000 tons in 2010.

② Promotion of FDIs in plastic Industry

Large investments are required (nearly Rs. 20 billion), and a majority of investments are expected to be made by FDIs. Foreign investment in packaging film is of prime importance. It is expected that BOI will designate the plastic industry as a thrust industry and extend incentives.

③ Promotion of Plastic Packaging Products

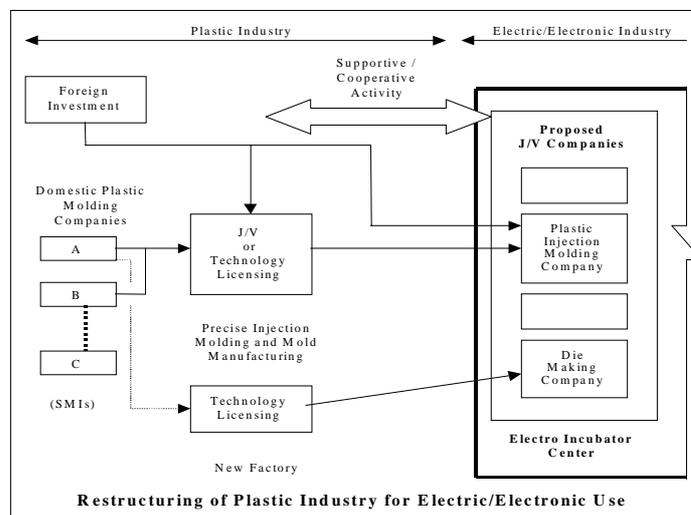
The revolution of packaging materials is in progress, and it is planned to set up plastic packaging enterprises. As the same time, organization of a “Packaging Technology Association” with package-related industries as its members is planned.



Concept of Packaging Technology Association

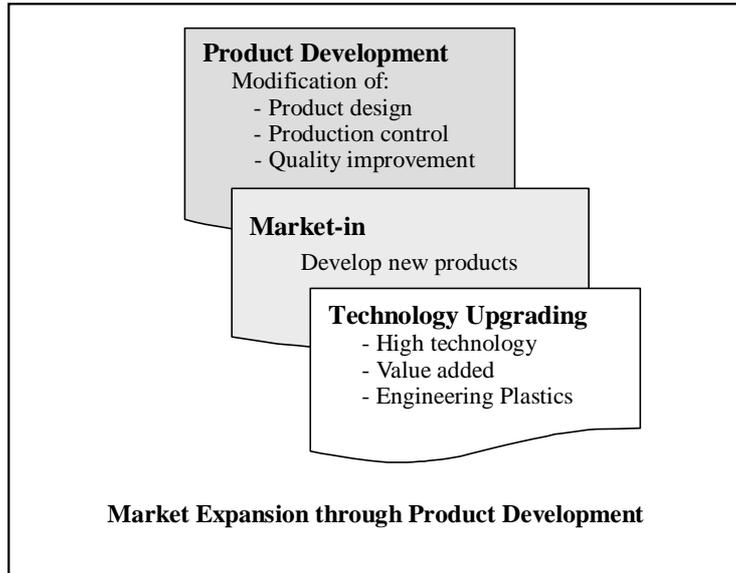
④ Promotion of Plastic Manufacturing for Electric/Electronic Use

SMIs in the plastic industry are expected to merge and establish joint cooperative companies and concentrate technologies, equipment, human resources and capital. When they are merged, the SMIs plan to manufacture plastic products for electric/electronic use, and to form clusters with the electric/electronic industry.



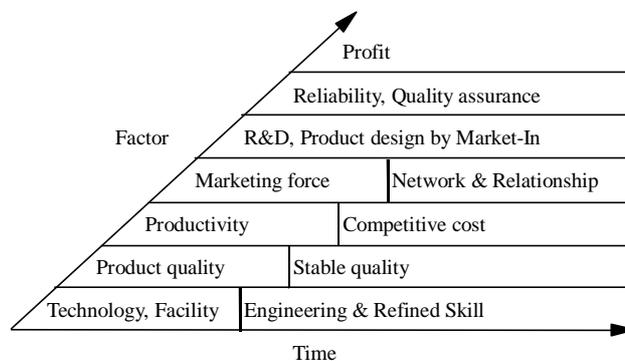
⑤ Market Expansion through Product Development

Many application fields of plastic products exist, and expansion is planned of domestic markets through product development. For product development, it is important to introduce “market-in” for selection of focal products to meet the customers’ needs and requirements.



⑥ Promotion of R&D and Enhancement of Competitiveness

Although there is a limitation of R&D resources, the limited resources are planned to be directed to some specific areas of technology that might result in greater effects on application and manufacturing by private enterprises. Such specific areas would be (i) composite technology, and (ii) co-extrusion technology. On the other hand, marketing and management systems should be improved to make the plastic industry competitive in domestic and international markets. To this end, enhancement of management factors should be carefully examined.



Management Factors to Enhance Competitiveness

⑦ Environmental Protection and Recycling

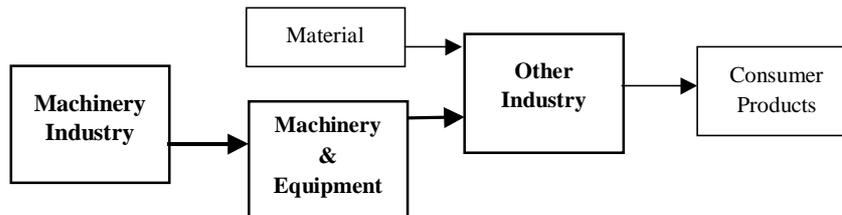
Inferior plastics produced in factories can be recycled and reused by controlling quantity and quality (up to 10-20% of raw plastic materials). When 300,000 tons of plastic products are consumed in 2010, plastic waste of approximately 400 tons/day will be disposed. Garbages containing plastics up to 25% might be incinerated. Collection and recycling systems of polyethylene terephthalate (PET) bottles are desirably introduced with the cooperation of customers and venders.

Details of the Master Plan for the plastic industry are presented in Appendix G.

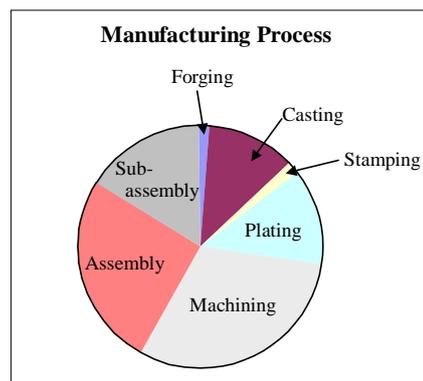
5.5 MACHINERY INDUSTRY DEVELOPMENT PLAN

1) Overview

The machinery industry is not only a consumer good producer but also a supplier of production machinery and equipment. The machinery industry can provide its products to every industry, including itself, and improve productivity of such industries. It is called a “Mother Industry”.



In Sri Lanka, machining, assembling and sub-assembling are common practices in factories. Casting and plating also prevail; however, forging and stamping are weak in technology.



The machinery industry in Sri Lanka had a good history, even exporting some specific products (e.g., tea processing machinery). After major factories were nationalized, their manufacturing activities become volatile. Moreover, they were unable to recover after the market-oriented economy was introduced in 1977. The machinery industry now is in a critical situation defeated by import at margined prices under the open market policy with less attention to the industrialization policy.

Judging from the Input-Output Table, current contribution of the machinery industry to other industries is quite limited, though relations and ties with other industries are required to consolidate foundation of industrial development as a whole. This is a big constraint for Sri Lankan industrialization.

In fact, all machinery enterprises are SMIs, except for one large enterprise having paid-up capital of more than Rs. 10 million. Their productivity remains at the level of US\$ 3,500 per employee, which is far less than China and ASEAN countries (around US\$ 10,000 per employee) and NIEs (US\$ 50,000-100,000 per employee). The equipment and facilities used in manufacturing are old and inefficient, and labor equipment ratio is quite low. The only favorable condition is that a larger proportion of skilled workers remain employed in the machinery industry.

Notwithstanding the aggravated situation that the machinery industry now faces, this Master Plan takes up the machinery industry as one of the target industries. The Master Plan calls for challenges to reactivate the machinery industry to consolidate foundation of industrial development. If the challenges turn out to be fruitless in five years, the strategy will have to be duly modified.

2) **Development Framework for Machinery Industry**

The machinery industry is developed with its vision towards 2010 that states:

“By introducing new products of machinery and equipment, the machinery industry in Sri Lanka should be reactivated and serve for consolidation of foundation for industrial development of the country.”

It should be noted that the input substitution policy is not desirable for the Sri Lankan machinery industry, and it is far from the scenario of this Master Plan. The strategy is to manufacture new products different from the currently imported products. Return to the production of conventional machines under protection is not intended, as it might repeat the same course after the provisional protection or support is terminated.

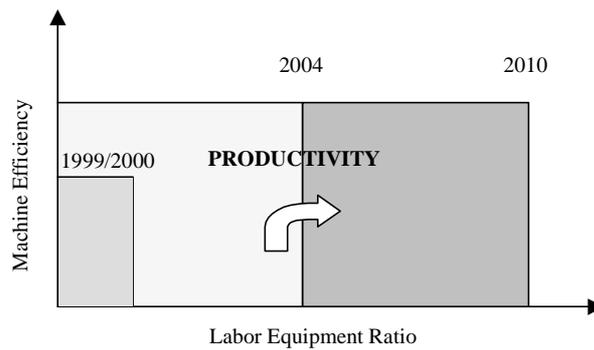
Targets for development of the machinery industry towards 2010 are set:

- (i) To start with development of new agricultural machinery and equipment for domestic markets in view of the current and potential supply of machinery and equipment.

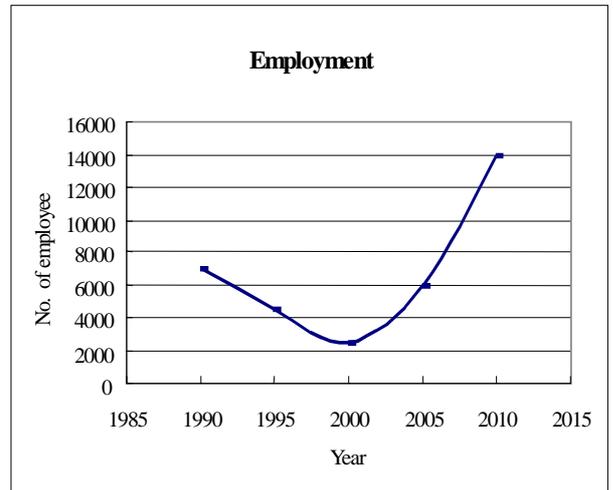
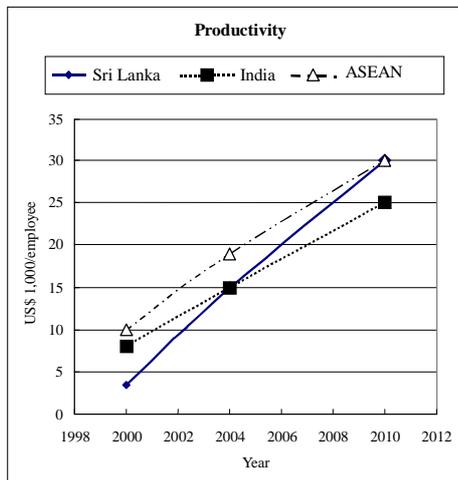
(The I-O Table indicates that input of the machinery industry to agriculture is Rs. 256 million, which accounts for 0.11% of total agricultural output. This endorses a big potential for the machinery industry to develop.)

- (ii) To introduce advanced design and technology and modernize facilities to manufacture new products.

- (iii) To quadruplicate the productivity by 2004 (up to the level of US\$ 15,000 or Rs. 1.05 million per employee), and further double the productivity in 2005-2010 (up to the level of US\$ 30,000 or Rs. 2.1 million per employee).
- (iv) To attain the machinery efficiency ratio of 4 by 2004, and the labor equipment ratio of Rs. 532,100 per employee. The amount of investment required for development of the machinery industry is estimated to be Rs. 1.5 billion by 2004 and Rs. 7.5 billion by 2010.



- (v) To increase employment from the current 2,500 workers to 5,700 workers in 2004 and 14,000 workers in 2010.



3) Development Plan for Machinery Industry

To attain the targets above in line with the Development Strategy as discussed in Section 4.1, implementation of the plans that include the following is planned:

① Production of Agricultural Machinery

A lot of agricultural machineries are used, and skills accumulated by workers can be utilized if improvement is achieved in design. Some possible areas to be studied further for development of agriculture related machineries are listed below.

- (i) Mechanization and automation of tea industry
- (ii) Leaf picking machine for tea agriculture
- (iii) Small, powerful, and lightweight compact tractors
- (iv) Can and bottle making plant
- (v) Press for coir
- (vi) Agricultural tools and wood-machine tools
- (vii) Heat treatment
- (viii) Welding fabricated products
- (ix) Conveyer and belt drive equipment (cluster with rubber industry)
- (x) Vacuum evaporation plating and metal plating on plastic (cluster)
- (xi) Consumer packing and labeling machine
- (xii) Labeling machine

② Concentration on Specific New Products

Restructuring is planned of the current manufacturing system in which several machine makers are producing the same type of products in a closed market. Desirably, each enterprise concentrates on a small number of products in accordance with the “products portfolio”. Unprofitable business should be discontinued.

③ Introduction of New Design and Licensing of Foreign Advanced Technology

New advanced machines should be designed. Automation and energy saving should be combined in the new design. At the same time, foreign advanced technology should be actively introduced by licensing in order to supplement new design development.

④ Investment in Production Factories

For production of new products and to enhance productivity, investment should be effectively made in individual factories. The labor equipment ratio to be attained by 2004 should be more than Rs. 263,000 per employee.

⑤ Promotion of Subcontract System

Promotion of the subcontract system or division of labor is of particular significance for the machinery industry, because almost all enterprises are SMIs and the labor equipment ratio should be elevated in the machinery industry. An image of the subcontracting system is illustrated as follows.

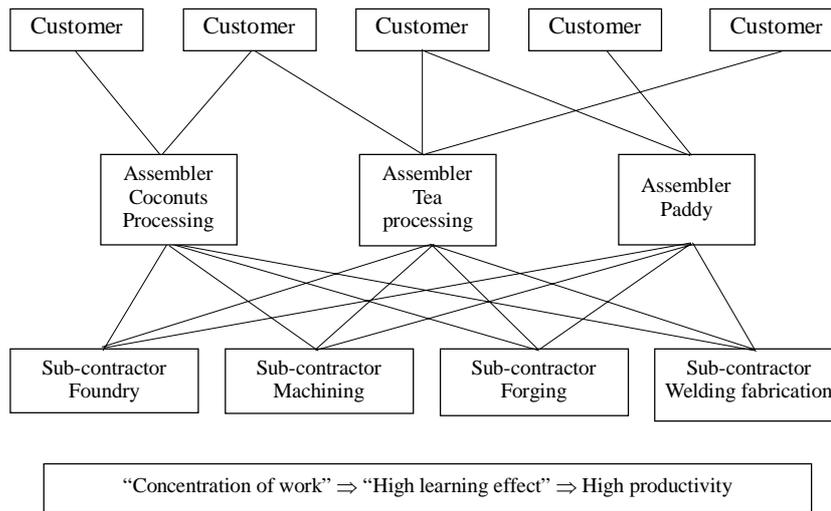


Image of Subcontract System for Machinery Industry

⑥ Promotion of Clustering

Reactivation of the machinery industry is programmed to start with the machinery production for agriculture, fishery and forestry, and it should be expanded to other industries. For example, the rubber industry proposes a clustering with the machinery industry in providing processed rubber that is effective for reduction of noise and vibration of machinery.

⑦ Integrated Program for Promotion of Machinery Industry

In order to reactivate the machinery industry and to consolidate foundation for industrial development in Sri Lanka, integrated efforts should be made not only by machinery enterprises but also by the public sector. An image of collaboration for development of the machinery industry in the short term is illustrated as follows:

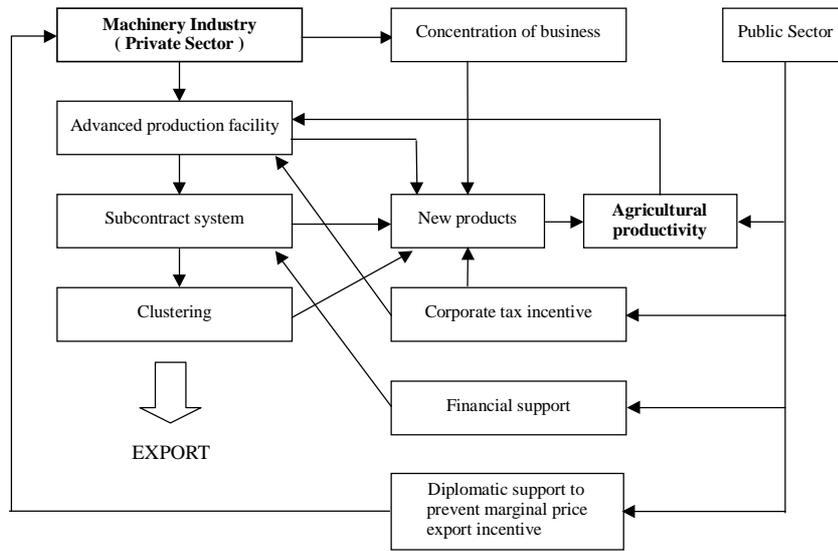


Image of Collaboration for Development

Details of the Master Plan for the machinery industry are presented in Appendix H.

5.6 ELECTRIC/ELECTRONIC INDUSTRY DEVELOPMENT PLAN

1) Overview

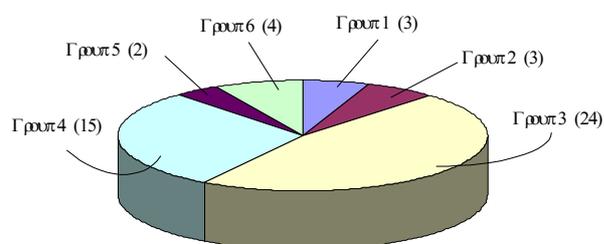
The electric/electronic industry is a relatively new industry developed in Sri Lanka. Most enterprises (42 out of 50 surveyed enterprises) were established after the shift to the market-oriented economy in 1977. About 80% of enterprises are SMIs, but 10 enterprises are J/V with or operated by foreign capital.

Electric/electronic enterprises operated in Sri Lanka are classified into six groups based on their products, production type, and technology bases, as shown below.

Classification of Electric/electronic Industry in Sri Lanka

No	Group	Products (example)
1	Home appliance/Electronic	Television, Video Cassette Recorder, Radio cassette recorder
2	Home appliance/Electric	Air conditioner, Refrigerator, Washing machine
3	Electrical appliance	Electric bulbs, Fluorescent light, Switch, Socket, Breaker
4	Electrical parts	Semiconductor, Resistor, Capacitor, Coil, Transformer, PCB
5	Industrial products/Electronic	Telephone accessories, Ringing and tone generator, Telegraph multiplex system
6	Industrial products/Electric	Generator, Transformer, Electrical Power panel

Classification of Electric/Electronic Enterprises

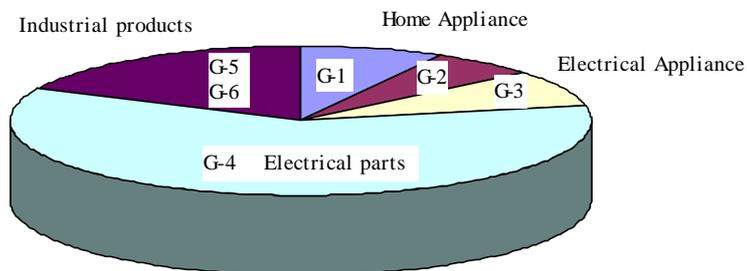


Each group of enterprises is at different stages of technology level. In general, manufacturing of home appliances (electric and electronic) is mostly CKD (complete knock-down) while manufacturing of industrial products is applying a certain technology of high levels, and production of electrical parts is mostly dependent on foreign technology.

General Evaluation of Technology Level

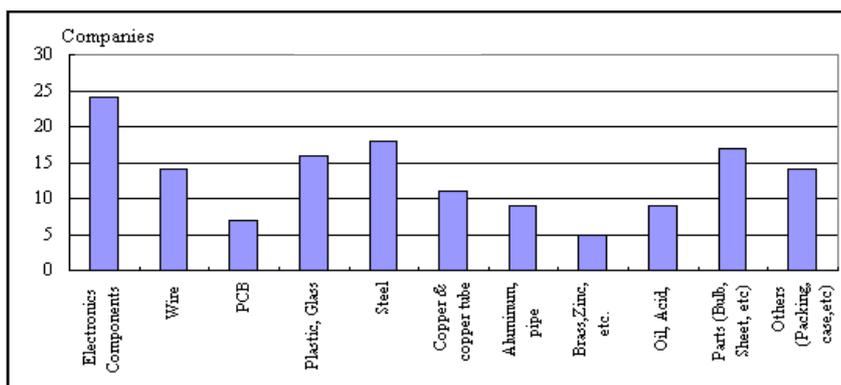
No	Group	Technological Level
1	Home appliance/Electronic	Complete Knock-Down (CKD) is major activities. Progress of technology transfer is quite late.
2	Home appliance/Electric	
3	Electrical appliance	Technology transfer is gradually progressing. Some companies are capable of designing partly.
4	Electrical parts	Most enterprises rely on foreign technology. Fundamental technology is required.
5	Industrial products/Electronic	Many are established & runned by local engineers and have a certain high level technology.
6	Industrial products/Electric	Many are established & runned by local engineers, or technology transferred by JV and have high level.

Turnover of the electric/electronic industry amounted to Rs. 3.8 billion in 1998. Manufacturing of electrical parts accounted for nearly 60% of total turnover.



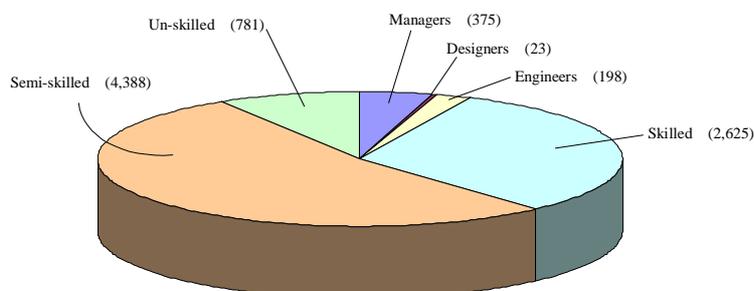
Turnover of Electric/Electronic Industry

Import of raw materials and parts widely ranges. The quantity of material import by each enterprise is quite small, which might have resulted in relatively high import prices.



Major Import Items of Raw Materials and Parts

The electric/electronic industry is employing about 9,300 workers. The majority of employees are semi-skilled workers, and there is a limited number of designers and engineers.



Skill Level of Workers

2) Development Framework for Electric/Electronic Industry

The electric/electronic industry is developed with its vision towards 2010 that states:

“Sri Lanka’s electric/electronic industry should lead further industrialization of the country and promote industrial integration in SAARC”.

Targets for development of the electric/electronic industry towards 2010 are set:

- (i) To selectively promote investment and production of “focal products” in each group.

Selected Focal Products

No	Group	Focal Products
1	Home appliance/Electronic	Color television, Radio cassette recorder
2	Home appliance/Electric	Washing machine, Refrigerator
3	Electrical appliance	Switch, Socket, Breaker, etc.
4	Electrical parts	Coil, Transformer, PCB*
5	Industrial products/Electronic	Accessories of Information system
6	Industrial products/Electric	Power distribution panel

* PCB: Printed Circuit Board & its assembly

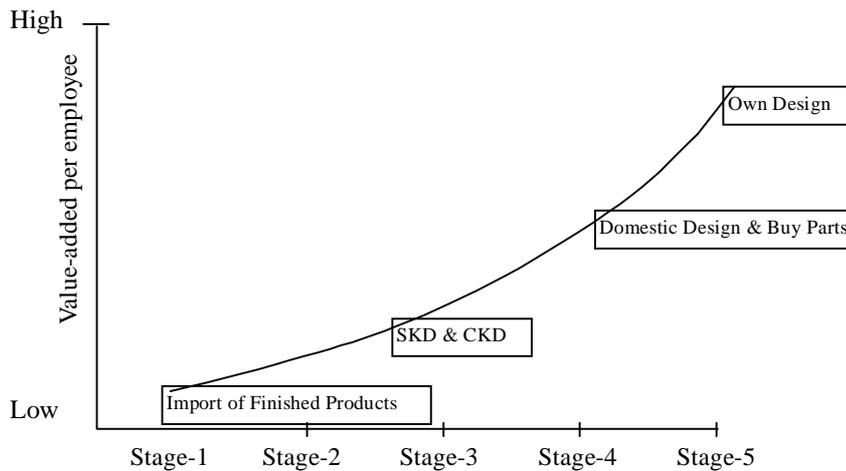
- (ii) To increase domestic production ratio of focal products to share 50% of domestic consumption and establish a solid foundation of the manufacturing bases by 2004.
- (iii) To promote OEM (Original Equipment Manufacturer) and export of focal products at the later stage.
- (iv) To attain a sharp increase in GVA to exceed Rs. 4 billion by 2004 and Rs. 15 billion by 2010.

3) Development Plan for Electric/Electronic Industry

To attain the targets above, implementation of the plans that include the following is planned:

① Manufacturing Level-up

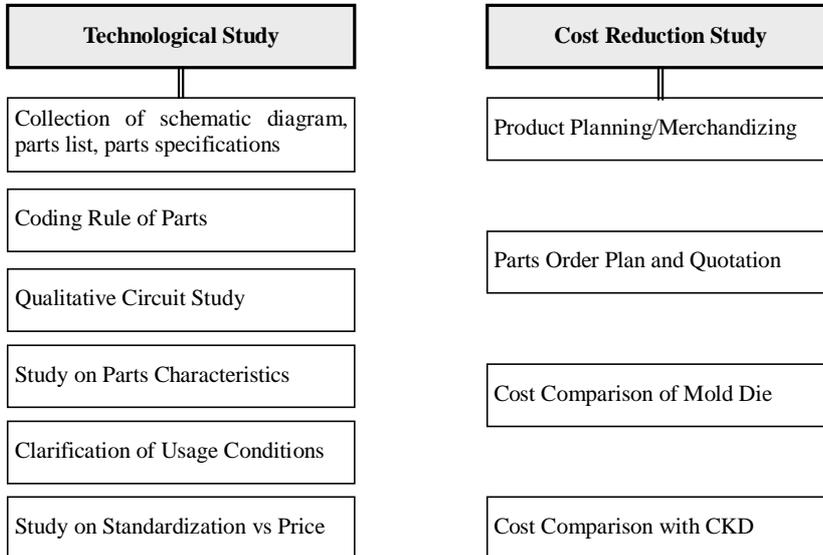
Most electric/electronic enterprises are at the level of SKD (semi-knock-down) and CKD (complete-knock-down) at present with little design input. To enhance productivity and competitiveness, these enterprises are planned to be stepped up to the level of “domestic design and buy parts” and “own design”.



Productivity Enhancement by Technology

② Introduction of Reverse Engineering

To step up to the level of “domestic design and buy parts” and “own design”, it is planned to start with “reverse engineering” which calls for study on products of advanced technology. Reverse engineering consists of technological study and cost reduction study.



③ Promotion of Product Design

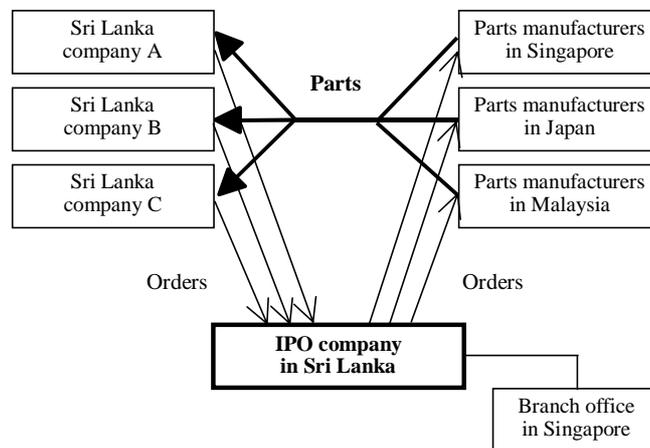
In parallel with the introduction of reverse engineering, promotion of “product design” to create and produce “differentiated” products is planned. Product design may proceed to “functional development” in the short term and further to research activities in the medium and long term.

Product Design to R&D

	Main features	Example	Required Period	Possibility of use	Investment
D: Design	Product design	New model of Color TV, Washing Machine	less than 1 year	100%	Short term
D: Development	Function development	New IC, New feature, New circuit	around 3 years	50%	Middle term
R: Research	Basic theory	Hi-vision system, DVD system	over 5 years	30%	Long term

④ Efficient Procurement through International Procurement Operation

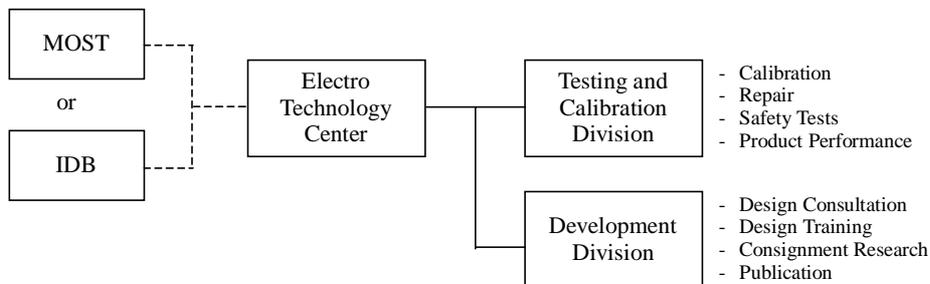
The current procurement system by individual enterprise in small lots makes the parts and component prices relatively high. To economize the procurement costs, several manufacturers can jointly set up a firm for International Procurement Operation (IPO) and purchase parts and components in a larger lot of orders.



Proposed IPO in Sri Lanka

⑤ Establishment of Electro Technology Center

Locally manufactured products, as well as imported products, are marketed without assurance of quality and safety at present. Therefore an Electro Technology Center is planned to be set up with the function of testing, calibration, and design development.



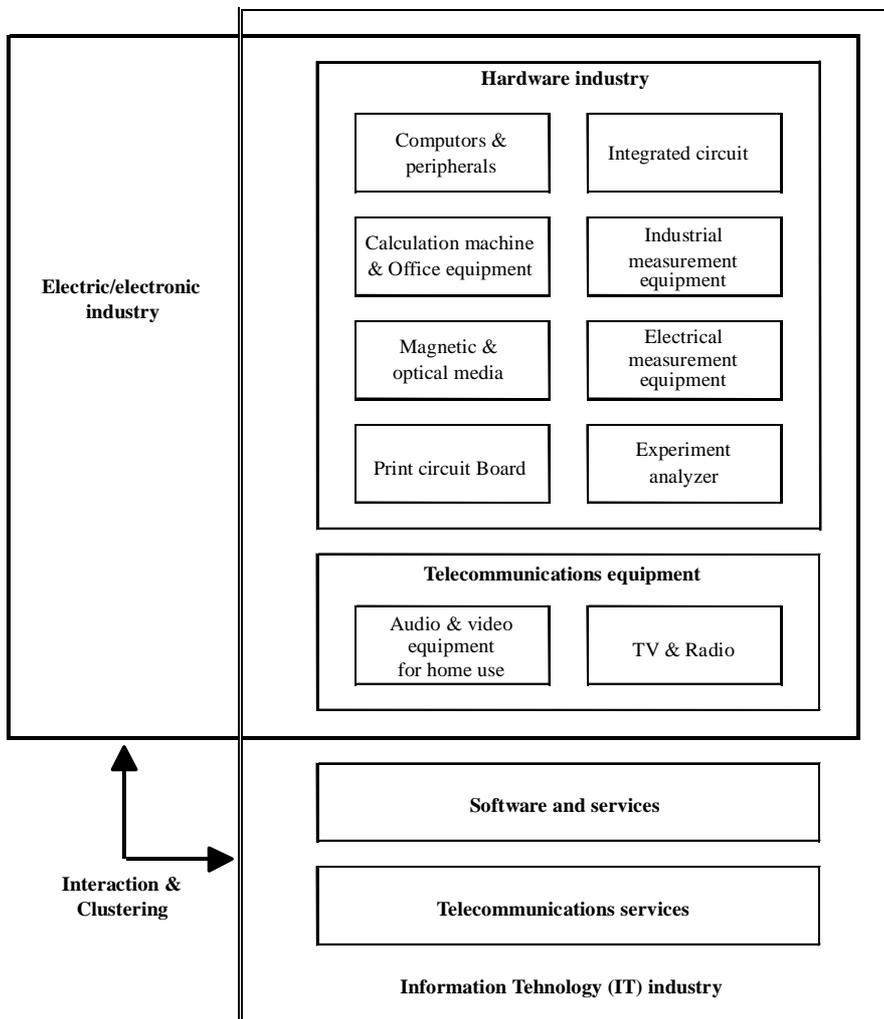
Function of Electro Technology Center

⑥ Establishment of PCB Center

A PCB (printed circuit board) is installed in almost all electric/electronic products, and it is a basis of designing for these products. Imports of PCB have increased in recent years. It is planned, in the medium/long term, to set up a center for design and manufacturing of PCB in Sri Lanka.

⑦ Promotion of Clustering with IT Industry

The electric/electronic industry is closely related to hardware of the IT industry, and promotion of the clustering of these industries is planned. Possible fields of clustering are illustrated below.



Clustering between Electronic Industry and IT Industry

Details of the Master Plan for the electric/electronics industry are presented in Appendix I.

5.7 INFORMATION TECHNOLOGY SERVICE INDUSTRY

1) Overview

The information technology (IT) service industry is a new industry developed in the 1990s. In the last decade, 82% of 51 surveyed enterprises were established, and 59 projects were approved by BOI for investment in the IT industry (of the approved projects, 17 are in the operation status). Nearly 50% of the surveyed enterprises are SMIs with paid-up capital of less than Rs. 10 million. In the IT industry, there are approximately 3,500 employees, of which IT professionals account for about 35%.

The turnover of the IT industry in 1998 was estimated to be around Rs. 5.4 billion. If the value added ratio is assumed to be about 40%, GVA in 1998 was around Rs. 2.5 billion. The total export value of the IT industry was estimated to be around Rs. 1 billion in 1999. In the event that all BOI approved enterprises (59 projects) are in operation, the expected export value would amount to Rs. 7.7 billion which is equivalent to double the export value of gems and jewelry in 1998.

Bottlenecks for development of the IT industry in Sri Lanka are: (i) manpower resource, (ii) infrastructure, (iii) markets, and (iv) organizations for IT development. The manpower supply is quite limited at present. University graduates in computer science, electronic and telecommunications engineering are limited to around 200 a year. Although there are 150 institutes offering computer training courses, the training level is too low to supply IT professionals. Although the Sri Lanka Institute of Information Technology (SLIIT) started a Diploma course for 200 students, the Institute of Computer Technology (ICT) launched 3 year course for 500 students, and the National Institute of Business Management (NIBM) started B.Sc. degree programs, the supply capacity is still insufficient. For reference, the BOI approved and agreement-status projects would require more than 6,000 workers in the IT industry.

Telecommunications is the basic infrastructure for the IT industry. Although subscribers to fixed telephone increased by 2.5 times in the last 5 years, the telephone density is still 2.8 per 100 habitants. Computerization is still in the initial stage, with a total number of PCs estimated to be around 200,000 or 1% of population. Internet subscribers are limited to around 22,000, or 0.1% of population. The domestic markets are still small for the IT industry. Further, apex organization for IT is less capable, and there is little cooperation and coordination among the related ministries and institutions for development of the IT industry.

2) Development Framework for IT Service Industry

(i) Vision 2010

Despite various constraints faced at present, the IT service industry is expected to be a leading industry under the new paradigm of industrial development in the future. In the short terms (2000-2004), the IT service industry in domestic markets will grow steadily and the export services will grow rapidly with FDIs and J/V enterprises. It is envisaged that the prestige of the Sri Lankan IT service industry will be established by 2004. In the medium and long term (2005-2010), the IT industry will grow further and become boosted. The structure of the IT industry will be shifted to technological affiliation and merger, and some large enterprises will expand their offshore software development.

(ii) Targets

The targets for development of the IT service industry in 2004 and 2010 are set as follows:

Targets of IT Service Industry

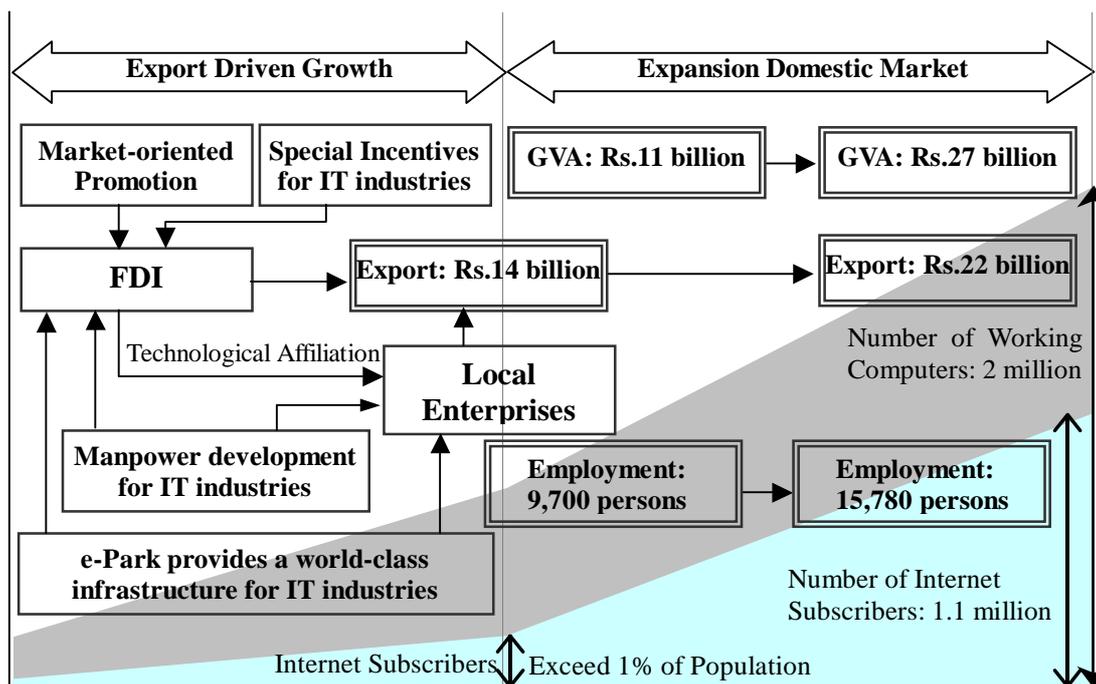
	2004	2010
Turnover (Rs. million)	24,800	57,000
Value Added (Rs. million)	10,500	27,000
Export (Rs. million)	14,100	21,800
Employment (Person)	9,700	15,800
Of which S/E & Programmers	4,400	8,600
Demand SEP / year	670	760

Source: JICA Study Team estimates.

(iii) Scenario

To attain the targets, computerization in Sri Lanka will be accelerated to the level of 800,000 units in 2004 and 2.1 million units in 2010. The Internet subscription rate will be elevated to 1% of population by 2004. The telephone density will be further improved to be around 5 per 100 inhabitants in 2004 and 7 in 2010. It is also expected that nearly 200 investment projects, both FDIs and domestic investments, will be agreed and/or operated under BOI status by 2004.

To accommodate such investment projects in a collective manner, it is urgently required to set up technoparks with adequate telecommunications and other infrastructure, and to train more IT professionals.



Scenario for Development of IT Service Industry

3) Development Plan for IT Service Industry

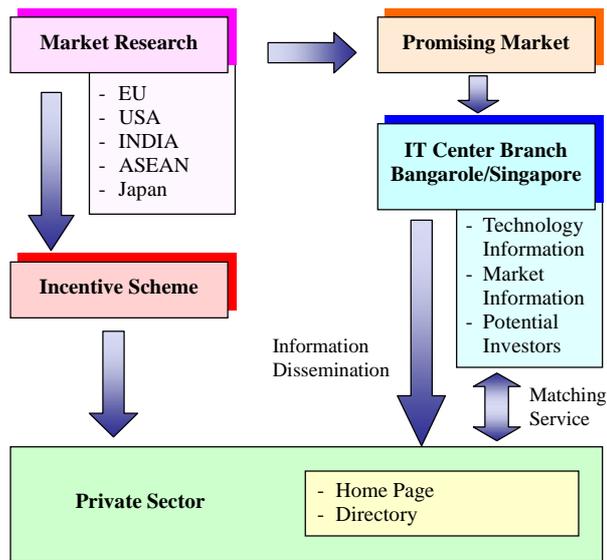
To attain the targets above in line with the Development Strategy as discussed in Section 4.1, implementation of the following programs is planned:

① Expansion of Domestic Markets

Promotion of computerization in the public and private sectors is planned, including promotion of computer aided education. The private sector computerization can be promoted if fiscal incentives are granted (e.g., double tax deduction for IT related investment/equipment) and if e-business is promoted. The public sector computerization is expected to promote information sharing, to improve efficiency, and to guarantee transparency. In this context, computerization of MID and IDB is planned in combination with the institutional rationalization as planned in Section 4.5.

② Export market Development

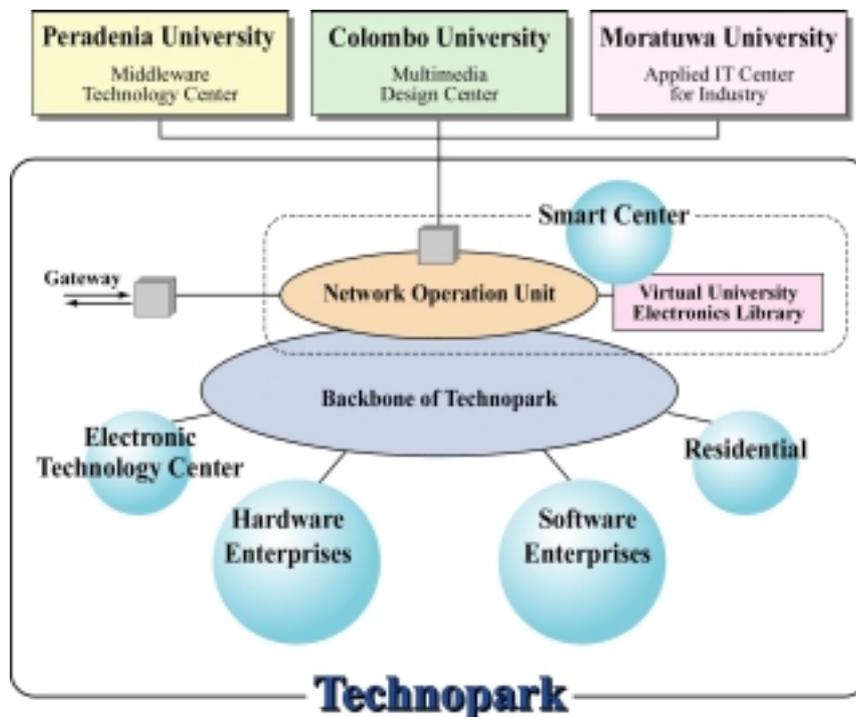
The IT industry is developed as an export-oriented industry. In the expansion of export markets, FDIs will play a primary role. In parallel with the promotion of FDIs, promising markets for exports should be selected and market researches should be conducted.



Market Oriented Promotion / FDI

③ Implementation of Flagship Projects

As a flagship project, e-park or Technopark is planned to be implemented. The Park is designed to serve not only software services but also the hardware industry. The Electro Technology Center proposed in the master plan for Electric/Electronic Industry will be located in the Park.



Concept of Technopark

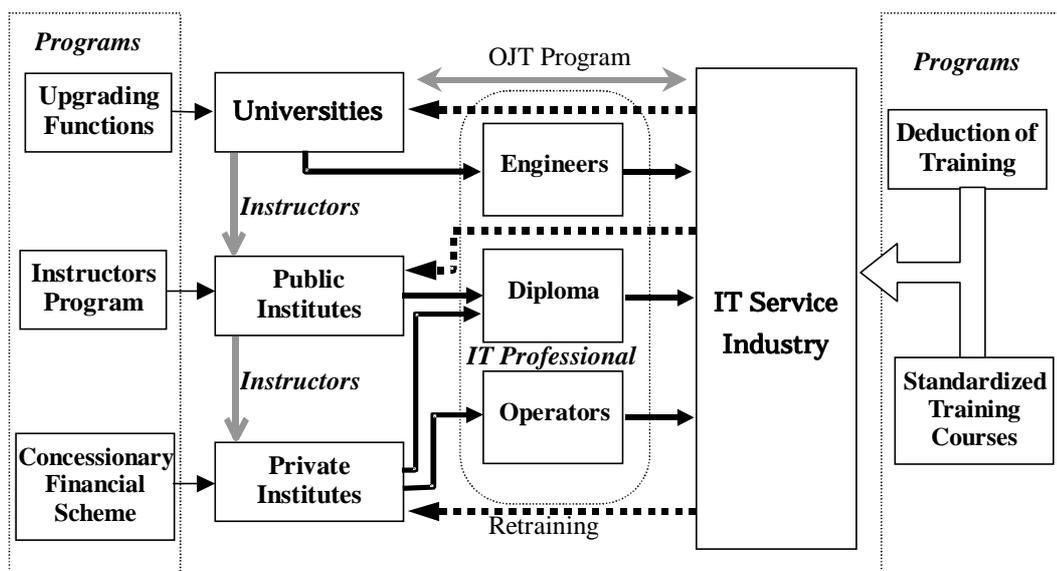
In the long term, the concept of the Sri Lanka Intelligent Superstructure (SLIS) will be developed and implemented.

④ Establishment of Smart Center

The Smart Center is planned in the proposed e-park or Technopark. The Center will function as a training and education center, and it will be equipped for (i) virtual university, (ii) re-training center, and (iii) instructors' training center.

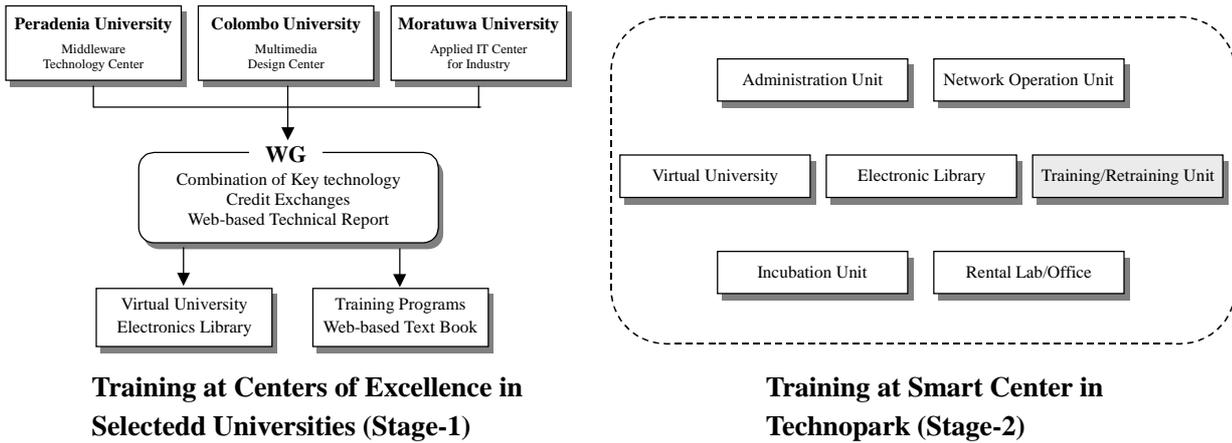
⑤ Increased Supply of IT Professionals

The supply capacity of IT professionals will be increased through (i) establishment of faculty in IT at universities, (ii) expansion of the public and private institutions, (iii) training of instructors, (iv) promotion of linkages between IT industry and academia, and (v) establishment of re-training systems. Establishment of 50 IT training institutes announced by the Budget Speech 2000 will be integrated into this program.



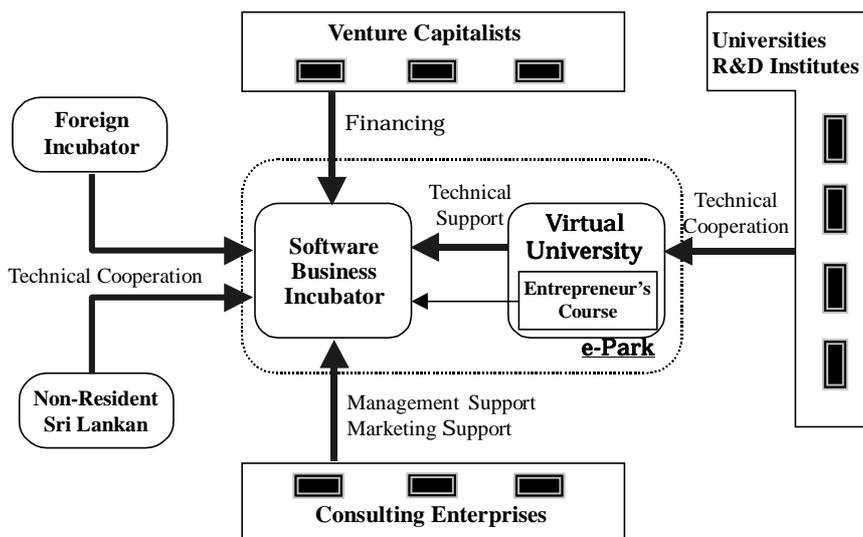
Supply of IT Professionals

Training of IT instructors is in urgent need. In the initial stage, instructors will be trained at some selected universities where the Centers of Excellence will be set up for some selected IT technologies. In the later stage when the Smart Center is established in the proposed Technopark, the training and re-training unit will be established to offer courses for training of IT instructors.



⑥ Creation of New Business through Software Business Incubator

Individual technology and/or ideas are seeds of big enterprise. A technical and financial support to incubators will bring up entrepreneurs in new business. It will also prevent brain drain experienced in the past.



Proposed Software Business Incubator (SBI) Scheme

⑦ Promotion of Cluster with Other Industries

IT is an indispensable tool for the paradigm shift from a resource-based and labor-intensive industry to a knowledge-based and technology-intensive industry. The IT service industry may be linked with any other target industries studied and planned in the Master Plan.

Details of the Master Plan for the IT service industry are presented in Appendix J. A conceptual plan for development of Technopark is presented in ANNEX to Appendix J.

VI. ACTION PROGRAM (2000-2004)

In the Main Report and Appendices, The Rainbow Plan proposed a number of plans and programs to be implemented for industrial development in Sri Lanka. Most of these plans and programs should be initiated as early as possible, though some plans might be executed in the latter stage of the plan period.

Major plans and programs to be implemented in 2000-2004 are summarized below as **Action Program**, by specifying the agency responsible for implementation of each program.

Responsible Agency	Related Agency	Action Program	Reference	
			Main Report	Appendix
		Private Sector Action Program		
FCCI CCI	SLCSI P-S	➤ Establishment of a common premise where the private sector can discuss the relevant issues	4.5 (5)	A.3.7 (2)
P.S		➤ Participation in industrial policy making through IPC and its Committees	4.5 (2)	A.3.1
P.S		➤ Collaboration in a paradigm shift towards technology-intensive industries	4.1 (1)	-
P.S		➤ Promotion of collaboration and cooperation among enterprise in the same subsector or in associations	4.1 (2)	A.3.7 (2)
P.S		➤ Establishment of ground to discuss and implement division of labor and subcontract system	4.4 (2)	A.3.7 F.3.5 G.3.5
P.S		➤ Promotion of merger among SMIs to consolidate basis for development	4.4 (1)	D.3.5 E.3.5
P.S		➤ Improvement of accounting and financial skills to maintain sound accounting practices	4.6 (2)	B.3.1
P.S		➤ Promotion of licensing of foreign advanced technology	4.2 (1) 4.7 (3)	D.3.3 E.3.3 F.4
P.S		➤ Promotion of JV with foreign investors to manufacture new products	4.7 (2) 5.3 –5.7	D.4 E.4 F.4 G.4
P.S		➤ Establishment of a common procurement system regarding parts and components (e.g., IPO)	5.6 (3)	G.3.5
P.S		➤ Formation of new associations/cooperatives to set up new factories for processing	5.3 (3)	D.3.5

Responsible Agency	Related Agency	Action Program	Reference	
			Main Report	Appendix
P.S		➤ Strengthening international marketing focusing on target products	4.8 (3)	C.2.3
P.S		➤ Promotion of clustering among industries and with the related industries	5.3 (3) 5.4 (3) 5.6 (3)	D.3.6 E.3.6 G.3.6
P.S		➤ Environmental protection inside and outside the factories	4.2 5.4 (3)	D.3.3 E.3.3
P.S		➤ Enhancement of quality control (QC)	4.2 (2)	D.3.3 E.3.3 F.3.3 G.3.3
Academic Sector Action Program				
a.s		➤ Participation in industrial policy-making through IPC and its Committees (including nomination of IPC Chairman)	4.5 (2)	A.3.1
a.s		➤ Strengthening linkage between academia and industry	4.3	H.3.3 (4)
a.s		➤ Collaboration in promoting paradigm shift towards technology-oriented industrial development	4.1 (1)	
a.s.		➤ Enhancement of practical engineering for HRD by reorganizing curricula to cope with changing needs of manufacturing enterprises	4.3 (1)	6.3.5
a.s		➤ Collaboration in R&D	4.3 (1)	D.3.3 E.3.3 F.3.4
a.s		➤ Collaboration in operating technology centers in respective subsectors	5.6 (3)	D.3.7 E.3.7 G.3.7
Public Sector Action Program				
MID		➤ Foundation of Industrial Policy Council (IPC) for rationalization of industrial policy-making mechanism	4.5 (2)	A.3.1 (1)
MID		➤ Legislative reform related to rationalization of policy-making mechanism	4.5	A.3.1 (2)
MID	MVTRI	➤ Adjustment of regional industry development policy		A.3.1 (3)

Responsible Agency	Related Agency	Action Program	Reference	
			Main Report	Appendix
MID		➤ Institutional rationalization of MID	4.5 (2)	A.3.2 (1)
IDB	MID	➤ Institutional rationalization of IDB	4.5 (2)	A.3.2 (2)
MOST	MID IDB	➤ Adjustment of applied technology management system, including management of ITI and SLSI		A.3.2 (2) (3)
MID	BOI IDB UDA	➤ Discussion on rationalization of industrial estate management		A.3.2 (4)
MID	DOC	➤ Preventive measures to be taken for export at marginal price and enactment of anti-dumping regulation and diplomatic negotiation	4.5 (1) 4.7 (3)	A.3.3 (2) F.2.2 (3)
MVTRI	MID	➤ Provision of vocational training in target industries		A.3.5 (1)
MID IDB		➤ Establishment of information sharing system and computerization as a model for public computerization	4.5 (3)	A.3.6 (2) H.4.1
MID	DOCS	➤ Compilation of industrial statistics and preparation of database	4.5	A.3.6 (1)
MID	ERD	➤ Provision of concessional loans for development of target industries and SMIs	4.6 (3)	B.3.1 B.4.1 (1)
MID	ERB IDB	➤ Arrangement of finance for institutional strengthening of industrial development through establishment of information sharing system and computerization, as well as through establishment/reinforcement of testing facilities in rubber, plastic and electronic industry	4.5 (3) 5.3 (3) 5.6 (3)	A.3.6 D.3.3 E.3.3 G.3.7 H.4.1
MOPF	MID	➤ Introduction of tax incentives for promotion of advanced technology, R&D, training, and marketing	4.6 (4)	B.4.1 (2)
MID	NDB DFCC CB MOPF	➤ Establishment of SMI Development Corporation (SMIDEC)	4.6 (5)	B.4.2
MOPF		➤ Incorporation of industrial policy into financial and fiscal policies	4.6. (1)	B.3.2
BOI	MID	➤ Acceleration of FDIs in target industries, particularly in focal products	4.7 (2) 4.7 (4)	C.2.1 (2)
BOI	MID	➤ Acceleration of JV and technology transfer in target industries	4.7.(2)	C.2.3 (3)

Responsible Agency	Related Agency	Action Program	Reference	
			Main Report	Appendix
MID	BOI	➤ Promotion of local investment in industrial development, including mitigation of deference between BOI and non-BOI status enterprises	4.7 (2)	C.2.3 (5)
MID	IDB	➤ Upgrading of local industries and enhancement of local contents in manufacturing	4.7 (4)	C.2.3 (5)
DOC	MID	➤ Maintenance of tariff structure at the current level at least during the period of consolidation of industrial foundation	4.7 (3)	C.2.3 (5)
MID	RRI IDB	➤ Reinforcement of Rubber Research Institute (RRI) through establishment of Inspection and Testing Department	5.4 (3)	D.3.3 (4)
MOP	MOI RRI	➤ Increased production of natural rubber through improvement in productivity	5.3 (3)	D.3.2 (1)
MID	IDB	➤ Product development and market expansion of plastic product, including establishment of technological base of plastic film production	5.4 (3)	E.3.2 (2)
BOI	MID	➤ Designation of plastic industry as a thrust industry for BOI incentives	4.7	E.3.7 (2)
BOI	MID	➤ Promotion of FDIs, particularly in production of packaging film	5.4. (3)	E.3.7 82)
IDB	PRI	➤ Promotion of plastic packaging products and formation of Packaging Technology Association	5.4 (3)	E.3.5
MOI	IDB ITI	➤ Establishment of Plastic Technology Center in IDB or ITI		E.3.3 (4)
MID		➤ Adoption of policy to develop agricultural machinery industry	5.5 (3)	F.3.2 F.4.2
MID	MOST	➤ Establishment of Electro Technology Center for calibration and testing of local, imported and export products	5.6 (3)	G.3.7 (3)
MID	PRI	➤ Study on establishment of PCB Design and Sample Complex	5.6 (3)	G.3.5 (3)
MID	P.S	➤ Support to bringing up specialists in engineering procurement and product marketing in electric/electronic industry		G.4 (3)
MID	MOST CINTEC	➤ Establishment of a common premise where development of IT industry can be discussed		H.3.3

Responsible Agency	Related Agency	Action Program	Reference	
			Main Report	Appendix
BOI	MID MOST	➤ Revision of BOI incentive criteria to allow smaller IT enterprises	4.7	H.3.3
MID	a.s	➤ Promotion of e-Park or Technopark project to promote software industry and hardware/electronic industry	5.7 (3)	H.3.3 (3)
MID	MVTRI a.s	➤ Establishment of Smart Center for IT in the e-Park or Technopark	5.7 (3)	H.3.3 (4)
MVTRI	MID MOST	➤ Establishment of trainers' training and re-training system	5.7 (3)	H.3.3 (4)
MID	P-S	➤ Creation of new business through Software Business Incubator scheme	5.7 (3)	H.3.3 (5)

Note: P.S = Private Sector
a.s = Academic Sector

VII. CONCLUSION AND RECOMMENDATION

The master plan for industrial development in Sri Lanka or The Rainbow Plan has been elaborated as presented in the foregoing chapters. Some conclusions of the master plan study and some recommendations to MID and the related organizations, both public and private, are summarized hereunder.

- (1) In the event that the plans and programs proposed in the sector and subsector studies are implemented by the private, academic and public sectors, the targets set out in Section 3.5 for the growth in the manufacturing sector for the years 2004 and 2010 will be attained, and the manufacturing sector will provide a solid foundation of sustainable development in Sri Lanka. The objectives of industrial development, as set forth in Section 3.1, will be attained through implementation of The Rainbow Plan.
- (2) Implementation of each plan and program, however, is not always an easy task. Challenges are inevitable in the implementation by the private, academic and public sectors. Besides, most plans and programs require collaboration among the private, academic and public sectors. Joint efforts should be made to realize these plans and programs. The private-academic-public partnership should be established and directed for realization of The Rainbow Plan.
- (3) This master plan may serve as a basis for formulation of the National Plan for Industrialization. For further refinement and concurrence on the master plan, it is recommended that The Rainbow Plan be publicized and discussed widely. It is also recommended that the actions and steps be taken for implementation of the accepted plans and programs by the private, academic and public sectors even before finalization of the National Plan for Industrialization.
- (4) Implementation of The Rainbow Plan must start with the establishment of the **Industrial Policy Council (IPC)** on the part of the public sector. It is recommended that IPC be set up at the earliest by the initiative of MID. Various policy issues may be discussed at IPC and direction for implementation of the proposed plans and programs may be given by IPC to the parties concerned.
- (5) For implementation of some plans and/or programs proposed in The Rainbow Plan, external financial and technical assistance might be required. In this context, it is recommended that appropriate measures be taken by MID, the External Resources

Department of MOPF and the related organizations requesting for such assistance and cooperation.

- (6) Implementation of The Rainbow Plan should be monitored by MID's Industrial Policy Bureau every year. As there might be some changes in the environment surrounding industrial development in Sri Lanka and some modification might be required as a result of monitoring, it is recommended that The Rainbow Plan be reviewed and updated in the year 2004.
- (7) Implementation of The Rainbow Plan may be affected by the ethnic conflicts in the country. If they are settled in the short term, industrial development of Sri Lanka would be more accelerated than projected in this master plan. It is recommended that further efforts be made by all the people to settle the conflicts as early as possible.

LIST OF PARTICIPANTS IN MASTER PLAN STUDY

Members of the Steering Committee (SC)

Institution	Name	Position
Dept. of External Resources	Mr. J.H.J. Jayamaha	Director-Japan Division
Dept. of National Planning	Mr. M. Susiriwardana	Addl. Director General
Ministry of Science & Technology	Mr. P. Subasinghe	S.A.S
Ministry of Vocational Training and Rural Industries	Mr. P.W. Seneviratne	Addl. Secretary
Dept. of Census & Statistics	Mr. D.C.Gunawardena	Dty. Director
Dept. of Commerce	Mr. M. Sundaralingam	Addl. Director
Board of Investment	Ms. R.M. Weerakoon	Manager
Export Development Board	Ms. J.B. Shiffar	Actg. Director
Industrial Development Board	Mr. W.I. Mendis	Actg. General Manager
Sri Lanka Standards Institution	Dr. A.R.L. Wijsekera	Chairman
University of Peradeniya	Prof. W.J.N.Fernando	Dean, Fac. Engineering
University of Moratuwa	Prof. Lal Balasooriya	Dean, Fac. Architecture
University of Kelaniya	Prof. Lalith Munasinghe	Head, Industrial Manag.
Ceylon Chamber of Commerce	Mr. P. Deva Rodrigo	Vice President
National Chamber of Commerce	Mr. Neil Seneviratne	Secretary General
National Chamber of Industry	Mr. Ninmal Samarakkody	Chairman
Federation of Chambers cum UNIDO-Project Director	Mr. Nihal Abeysekera	Vice President
USAID	Mr. Seneka Abeyratne	AgEnt Policy Advisor
MID	Mr. S. Hulugalle	Secretary
	Mr. W.C. Dheeraseskara	Addl. Secretary
	Mr. H.L.A. De Silva	Director, Investment
	Mr. Hettiarachchi	Dty. Director
	Ms. Elsie Ponnampereuma	Asst. Director

Working Group (WG) Members

Name	Position	Institution
(1) Administrative/Institutional WG		
Mrs. Chitra Perera,	Director	Ministry of Finance & Planning
Mr. Subasinghe	A.S.A	Ministry of Science & Technology
Mr. Seneviratne	Adtl.Secretary	Ministry of Vocational Training and Rural Industries
Mr. Perera	Dty. Director	Ministry of Internal and External Trade
Mr. Gunawickram	Director	Industrialization Commission
Ms. M. Chandrasiri	Dty. Director	Advisory Council for Industry
Mr. Mendis	Gen. Manager	IDB
Mr. Tutly Coorey	Dty. Director	BOI
Ms. M. Pandithasekara		EDB
Ms. Nirmala Peiris		Industry Technology Institute
Mr. Mendis	Dty. Director	S.L.S.I
Mr. C. Fernando	Director Gen.	N.I.M.B.
Mr. Lal de Mel	President	FCCI
Mr. Jayasooriya		Ceylon Chamber of Commerce
Mr. N. Abeysekara		Chambers of Small Industries
Mr. K. Wickramanayak		Project SMED
Mr. Ranjith Fernando		N.D.B
Mr. M. Prelis		DFCC
Ms. Shanthi Fernando	Dty. Director	MID (Coordinator of WG)
Mr. A.K. Seneviratne	Dty. Director	MID (Coordinator of WG)
(2) Financing WG		
Mr. Gamini Lankathilake	Sr. Economist	Central Bank
Mr. K.A.S. Perera	Asst. GM	Bank of Ceylon
Mr. Sunil de Silva	Vice President	DFCC
Mr. Nihal Welikala	Dty. GM	NDB
Mr. Jeyavarman		National Assistant Management
Mr. R. Bandaranaike	Sr. Manager	Colombo Stock Exchange
Mr. H.M.T.R. Herath	Sr. Lecturer	University of Jayawardanapura
Ms. T.M.B. Manike	Asst. Director	MID (Coordinator)

(3) Investment/Trade WG

Dr. Nihal Samarappuli	Director	BOI
Mr. M. Sundaralingham	Addl. Director	Department of Commerce
Mr. S.J. Silva	Dty. Director	EDB
Mr. Ananda Wehalla	Dty. GM	National Chamber of Commerce
Mr. A.K. Ratnarajah	Vice Chairman	National Chamber of Industries
Ms. Elsie Ponnampereuma	Asst. Director	MID (Coordinator)

(4) Apparel WG (UNIDO)

Mr. W. Jayamaha	Chairman	Textile Quota Board & Consultant to MD
Mr. Mahesh Amalean	Chairman	Sri Lanka Apparel Exporters' Association
Mr. Ajith Wijesekera	Chairman	National Apparel Exporters' Association (2000-gfp)
Mr. Neil Uamagiliya	Chairman	FTZ Manufacturers' Association
Mr. Cassian Fernando	Chairman	Sri Lanka Chamber of Garment Exporters
Mr. Errol Weerasinghe	Chairman	Sri Lanka Buying Officers Association
Dr. Nirmali de Silva	Senior Lecturer	Department of Textile & Clothing Technology, University of Moratuwa
Ms. Manel P. Rodrigo	Director	Product Development, Sri Lanka Export Development Board
Mr. Keerthi Rasaputra	Director	Clothing Industry Training Institute, MID

(5) Leather WG (UNIDO)

Mr. R V D Piyathilaka	Director	Project Co-ordinator, MID
Mr. S R S Senanayaka	Deputy Director	MID
Dr. S S E Ranawana	Director	Department of Animal Production & Health
Mr. Nihal Sammarakkody	Chairman	Ceylon Leather Products Co.

(6) Plastic/Rubber WG

Mr. S. Sivakumaran	(Plastic)	St. Antonies Group
Mr. Vajira Wijewardena	(Plastic)	Anglow Asian Plastic Industry

Mr. W. Don. Karunaratne	(Plastic)	Mikechris Industries Ltd.
Mr. Tilak de Soysa	(Rubber)	Plastic & Rubber Institute
Mr. Premalal Fernando	(Rubber)	Richard Peiris Exports
Mr. Abhik Mitra	(Rubber)	Kelani Tyres Ltd.
Mr. Ananda Caldera		Plastic & Rubber Institute
Dra. Manomi Perera		University of Moratuwa
Mr. S.W. Pathiraja		MID (Coordinator)

(7) Machinery WG

Mr. S.L.P. Stembo	Chief Engr.	Industrial Development Board
Mr. J.A.J.T.De Saram	Dty. G.M.	National Engineering Research & Development Center
Mr. M.D.P Dias	Chairman	Agricultural Machinery Manufac.
Mr. Rohan Jinasena	Director	Jinasena Group
Dr. M.A.R.V. Fernando	Sr. Lecturer	University of Moratuwa
Mr. R.M. Abeyaratne	Dty. Director	MID (Coordinator)

(8) Electric/Electronic WG

Mr. Sahen Sonnadara	Manager	Singer Industries Ltd.
Mr. Piyal Aponso	R&D Manager	Clipsal Lanka (Pvt) Ltd.
Mr. Nihal Gunasekara	Head-Calibration	CISIR
Dra. Dileeka Dias	Head, Dept. of Electronics	University of Moratuwa
Mr. Ruchira Witharana	Asst. Sec.	MID (Coordinator)

(9) Information Technology WG

Mr. Chris Parakrama	President	Association of Software Industry
Mr. Lionel Perera	President	Association of Computer Training
Mr. A.R. Ekanayake	Tech.Director	CINTEC
Dr. N.Wickramaarachychi	Head of Dept.	University of Moratuwa
Mr. T. Nandasara	Sr. Lecturer	University of Colombo
Mr. L. Munasinghe		University of Kelaniya
Mr. H.D.J.Mudugamuwa	Director	N.I.B.M
Mr. U.L. Silva	Director	Board of Investment
Mr. Lalith Samarawickrama	Consultant	Private Sector Promotion Project
Mr. Sirisena Jayawardena		MID (Coordinator)

JICA Advisory Team

Mr. Y. Koyama Advisor

JICA Study Team

Mr. H. Koizumi Team Leader
Mr. Y. Mano Industrial Sector Planner (up to November 1999)
Mr. N. Iwase Industrial Sector Planner (from December 1999)
Mr. T. Izumi Adm./Institutional Planner
Mr. I. Sakaya Industrial Economist
Ms. K. Fukuda Financial Expert
Mr. N. Oshima Investment Promotion Expert
Mr. S. Masuda Rubber/Plastic Expert
Mr. K. Yamane Machinery Expert
Mr. S. Mastumoto Electric/Electronic Expert
Mr. S. Aoki Information Technology Expert

UNIDO Study Team

Mr. Ranjith Withana Team Leader
Mr. Nihal Abeysekera National Program Director
Dr. C N Aspes Consultant/Apparel Industry
Dr. John Avery Consultant/Leather Industry
Dr. Adam McCarty Consultant/Industrial Survey
Prof. L Fernando National Consultant/Apparel Industry
Mr. C Batuwangala National Consultant/Leather Industry