

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)**

SUMMARY

July 2000

KRI INTERNATIONAL CORP.

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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, and Sri Lanka is now reputed for the most open economy in South Asia. The efforts for industrialization in the last two decades were directed towards promotion of export-oriented industries and creation of employment, and these efforts have resulted in an increase in labor-intensive industries, particularly the apparel industry. Industrialization in the coming decade, however, cannot be promoted as an extension of the performance in the past, as the economic environment surrounding Sri Lanka has been notably changing. Such changes include conclusion of the Indo-Lanka Free Trade Agreement (March 2000), expiration of MFA (2005), free trade under SAFTA (2008-2010), and consolidation of the WTO rules. These free trade regimes will open the Sri Lankan industries to global competition. Now, the Government of Sri Lanka intends to work out the policy and strategies for industrialization in the next decade.

This Master Plan Study has been conducted by experts assigned by JICA in collaboration with the Working Group members appointed by the Ministry of Industrial Development (MID). During Phase I of the Master Plan Study, seven target industries were identified, on which to base the formulation of the master plan for development of the manufacturing sector; i.e., (i) apparel industry; (ii) leather industry, (iii) rubber industry, (iv) plastic industry, (v) machinery industry, (vi) electric/electronic industry, and (vii) information technology (IT) service industry. Plans and strategies for development of these target industries have been worked out through Phase II study, and they have been integrated into the master plan together with the sector level studies on administrative/institutional affairs and financial/fiscal support, as well as promotion of investment in industrialization. UNIDO has cooperated in executing the study on the apparel and leather industries.

This master plan may be called **The Rainbow Plan**, as implementation of the proposed plans will bridge a paradigm shift from the labor-intensive industry to the knowledge-based and technology-intensive industry in the coming decade, and the master plan has been formulated on the basis of seven colored target industries.

Sri Lanka has made significant progress in its macroeconomic situation as key economic indicators in the Table shows. Despite prolonged ethnic conflicts, GDP grew at an average annual rate of above 5%. Inflation has been reduced to a non-volatile level, and the current account balance stands at a manageable level and is continuously declining. Savings and investment performances have also been improving.

Key Economic Indicators of Sri Lanka

	1977	1987	1997	1998	1999
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	19.4	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
	1977-87	1988-98	1997	1998	1999
	<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

From 1988 to 1998, when GDP grew at 5.2% per annum, the agriculture sector grew at an annual average of 2.0% while the industry sector grew at 7.1% and the service sector at 5.4%. Of the industry, the manufacturing sector recorded an annual average growth of 8.4% during the same period. The manufacturing sector was really an engine of growth for the last ten years. The pattern of employment shows a tendency parallel to the change in the GDP share.

Sector Share of GDP

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

Note: See Main Report, Chapter 2 for detail.
Source: World Bank, Central Bank of Sri Lanka

Employment Pattern

	1981	1991	1998
Labor Force (mn)	5.0	5.9	6.6
Unemployment Rate (%)	17.9	14.7	9.5
Male (%)	13.3	9.9	6.6
Female (%)	31.0	23.4	14.6
Employment Share (%)			
Total	100.0	100.0	100.0*
Agriculture	45.2	42.5	38.1
Industry	14.1	20.7	21.6
Manufacturing	10.1	15.0	15.3
Services	40.7	36.9	40.3

Note: *As of Third Quarter
Source: Department of Census and Statistics

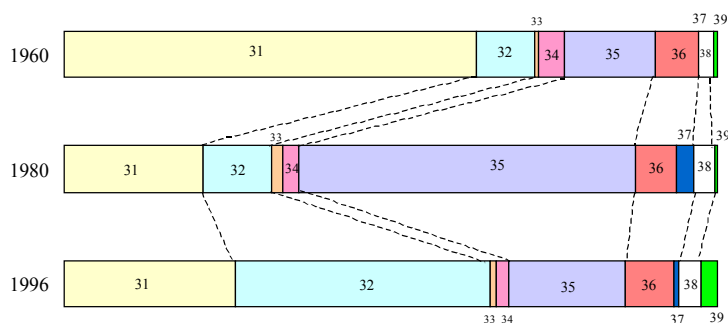
Despite the growth attained in the past decades, a share of the manufacturing sector is still relatively small compared with other SAARC and ASEAN countries.

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

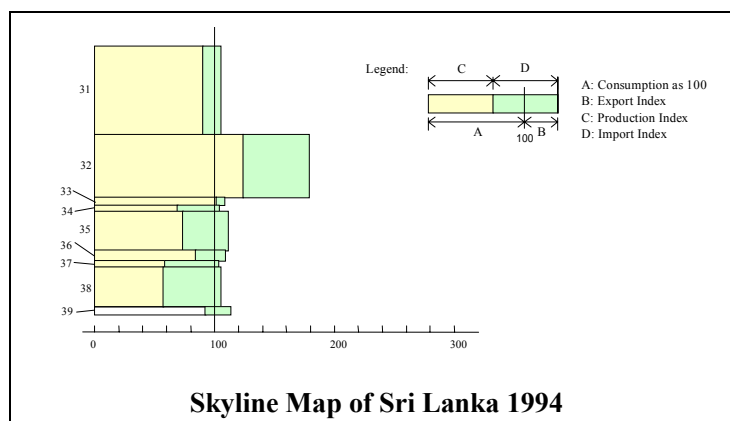
Source: World Bank

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 manufacturing sector, however, remains heavily dependent on a few labor-intensive industries. Over two-thirds of manufacturing value added derive from the textile, apparel and leather subsector (ISIC 32) and the food, beverage and tobacco subsector (ISIC 31).



Structure of Manufacturing Production

A ‘skyline map’ of Sri Lanka, which visually shows a manufacturing structure in terms of domestic and international supply and demand, also demonstrates the heavy dependence on production of these two subsectors, as well as the heavy dependence of the textile and apparel subsector on imports.



Skyline Map of Sri Lanka 1994

A comparison of the manufacturing GVA structure in selected Asian countries also demonstrates a salient feature of Sri Lanka that depends heavily on the textile, apparel and leather subsector and much less 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

3 REFLECTION OF PAST INDUSTRIAL PERFORMANCE

Through review of the performance and achievements in the manufacturing sector in the past two decades, several features are pointed out in the Sri Lanka's industrial policy that have failed to fully utilize the country's potential.

- (i) Sri Lanka started opening the market without preparing a sufficient infrastructure for the industry, both physical and institutional, hindering local market oriented industries particularly SMIs.
- (ii) Although a large number of FDIs have flowed into Sri Lanka, most of them are labor-intensive and self-sufficient and have hardly disseminated their technology to local industries, including SMIs.
- (iii) 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.
- (iv) Knowledge-based industries have yet to develop despite the country's advantageous human resources.
- (v) With the lack of a long-term development plan or 'grand design' of the industrial sector, it is nearly impossible to create an image of the industrial structure in the future.

Under the open market economic policy and the policy to promote FDIs, less attention has been paid to SMIs which account for nearly 90% of the industrial establishments and 70% of employment in the manufacturing sector (See Main Report, Chapter 2 for the definition of SMIs). In fact, the target industries studied under this master plan are largely composed of SMIs, and their technological and management levels remain too low to face the global competition.

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 is applied for the apparel and rubber industries

Source: Questionnaire Survey (JICA and UNIDO)

The master plan for industrial development, or The Rainbow Plan, is formulated on the basis of reflection of the past industrial policies, as well as through the review of the sector performance and achievements in the past.

It is expected that the manufacturing sector will continue to be an engine of growth of the Sri Lankan economy and a major source of employment creation in the coming decade (2000-2010). With this expectation, The Rainbow 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.
- 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.
- ③ The manufacturing sector is developed to contribute to the enhancement of Sri Lankan productivity and competitiveness through technology upgrading, diversification and specialization, in the context of free trade regimes.
- ④ The manufacturing sector is developed to contribute to creation of an environment-friendly and sustainable society.

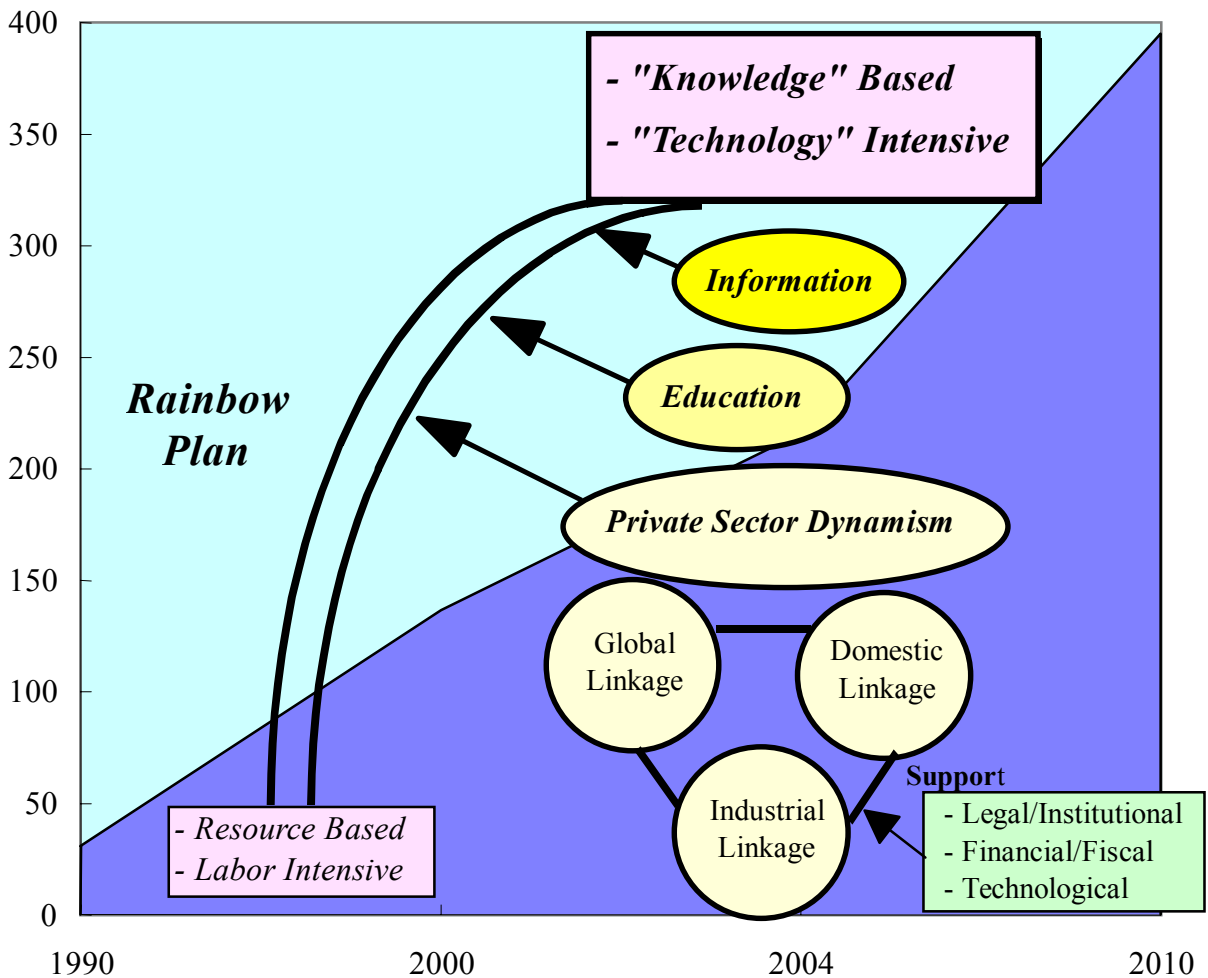
With the objectives of industrial development set as above, it is not always considered sufficient to selectively promote the globally competitive industries and enhance their competitiveness. Attention should be paid, at the same time, to the manufacturing activities of SMIs in which nearly 70% of employment 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.

To attain the objectives, the government may deliberately think about promotion of specific subsectors and specific programs by setting some targets, in addition to improving the macroeconomic framework and institutional environment. Therefore, the basic philosophy for industrial development that Sri Lanka should follow in the coming decade, is:

“Free Business Environment with Clear and Appropriate Government Directions”

The Rainbow Plan intends to give the government directions toward a **paradigm shift**. The new paradigm of industrial development in Sri Lanka will stand on “knowledge-based” and “technology-intensive” industrial development. This paradigm is a shift from the “resource-based” and “labor-intensive” industries that Sri Lanka has developed in the past two decades. An image of the paradigm shift is illustrated below.

GVA (Rs. Billion)



The paradigm shift is not attainable by only the government efforts. The shift requires dynamism of the private sector, as well as collaboration with the academic sector. A key to this paradigm shift is the “**private-academia-public partnership and collaboration**”.

5 DEVELOPMENT SCENARIO

Promotion of industrial development in Sri Lanka is planned for implementation in a selective and strategic manner through promotion of the target industries. The target industries identified under The Rainbow Plan are classified into two categories:

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

The Rainbow Plan divides its scheduled period of implementation into two stages; i.e., 2000-2004 and 2005-2010. The first half of the period is designated 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.

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%
Mfg. growth	9.6%	10.6%
GDP/person	US\$1,100 (in 2004)	US\$1,600 (in 2010)
Structure (share)	(in 2004)	(in 2010)
Mfg. in GDP	19.2%	23.0%
Target subsectors in total mfg.	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

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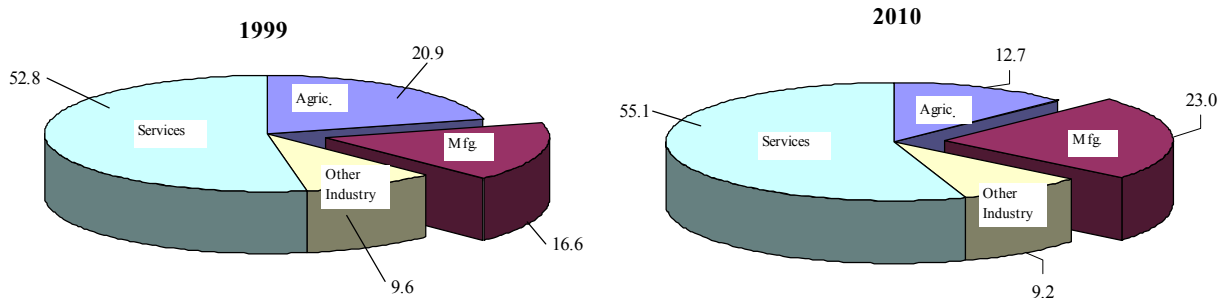
GROWTH TARGET

The Rainbow Plan sets out the economic framework during the plan period. Based on the economic outlook and the past achievements, the economic growth target levels of per capita GDP for 2004 and 2010 are determined as US\$ 1,100 and US\$ 1,600, respectively, 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.

Consequently, a target of the annual average growth rate of 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% per annum until 2004 and 10.6% annually in 2005-2010.

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

By analysing the potentials and constraints, the growth target in each subsector of the manufacturing industry has been planned as shown in the following table:

Manufacturing Value Added at Current Price

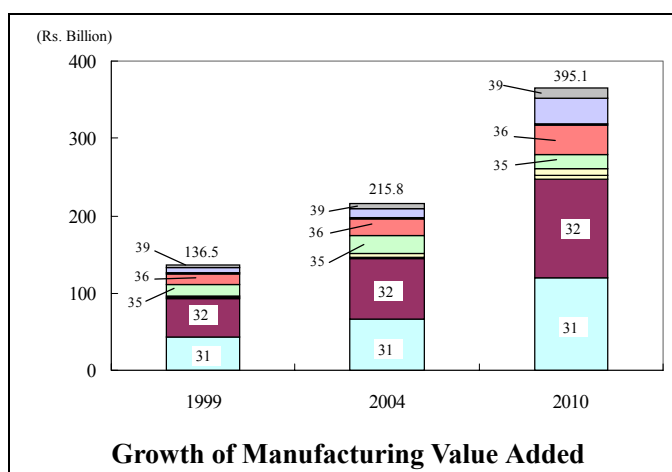
(Rs. million)

	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

The textile and apparel industry plans to experience a lower growth rate, affected by the expiration of MFA, while the chemical, rubber and plastic industry will achieve a higher growth towards 2010. The machinery and equipment industry, particularly the electric/electronic industry, is expected to attain a significant increase in the share of the manufacturing sector.



Development of the 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.

With the targeted value added as set out earlier, 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 will continue to increase (or decrease) at the same rate as recorded from 1995 to 1998.

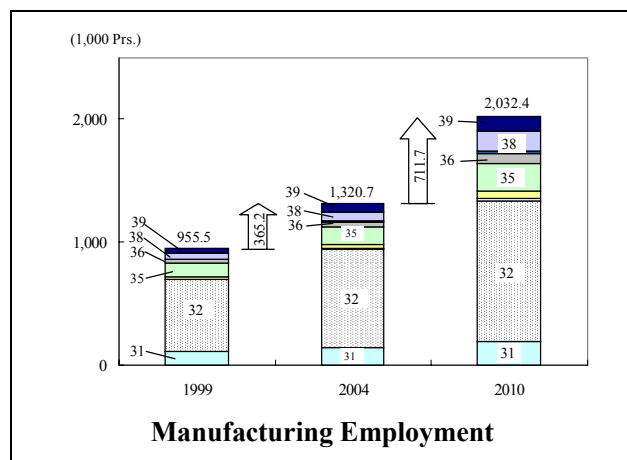
The implication of the rapid increase in employment in the manufacturing sector is the need of the shift of employment from other sectors, notably agriculture, to manufacturing and an increasing demand for new graduates in manufacturing. This may subsequently require the institutional support for training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

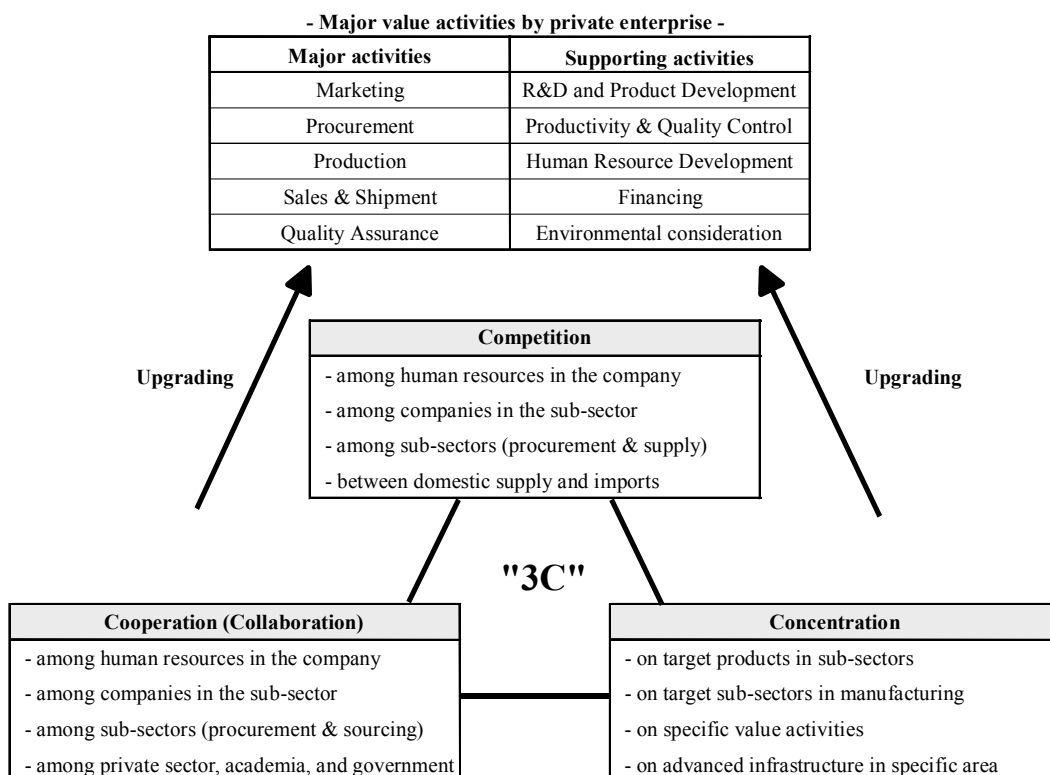
Source: Projected by JICA Study Team, based on data in Central Bank of Sri Lanka "Annual Report 1998" and Department of Census and Statistics "Annual Survey of Industries 1996 Preliminary Report".

The unemployment rate of Sri Lanka has been gradually decreasing from 17.9% in 1981 to 12.3% in 1995 and 9.1% in 1998. The rate still remains high. The Rainbow Plan intends to create new jobs for the people who have been mostly educated through the strenuous efforts of the government.



To attain the growth targets set out previously and to realize the paradigm shift from the “resource-based” and “labor-intensive” industry to the “knowledge-based” and “technology-intensive” industry, The Rainbow Plan intends to introduce some strategies. The first strategy is to activate the **private sector dynamism** through “3C”, i.e., Competition, Cooperation (Collaboration), and Concentration.

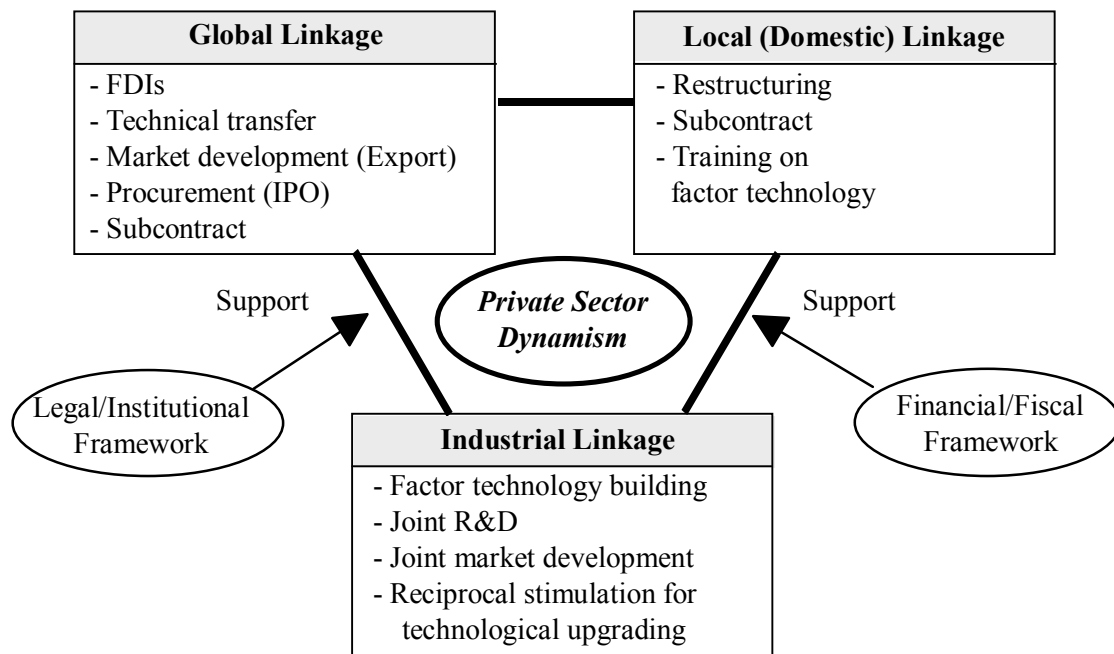
Competition is a basic factor which enhances efficiency and motivation of private enterprises. Competition among enterprises will improve quality and price of products, as well as services to the customers, and it will encourage their efforts/challenges to develop products of higher competitiveness. **Cooperation** is to be promoted through information sharing for collaboration and networking at various levels. Cooperation with the related subsectors will promote clustering. Cooperation and collaboration should further be extended to the international level, through integration with manufacturing in SAARC, ASEAN and other countries. **Concentration** is required, as available resources cannot be allocated to every requirement both at the enterprise level and the public administration level. The Rainbow Plan intends to concentrate resources on the selected “focal products” in the target industries.



Strengthening Private Sector Dynamism through “3C” Principle

Another strategy that The Rainbow Plan intends to apply is to promote linkage at 3-levels in the manufacturing sector: i.e., “**global linkage**”, “**local linkage**”, and “**industrial linkage (clustering)**”.

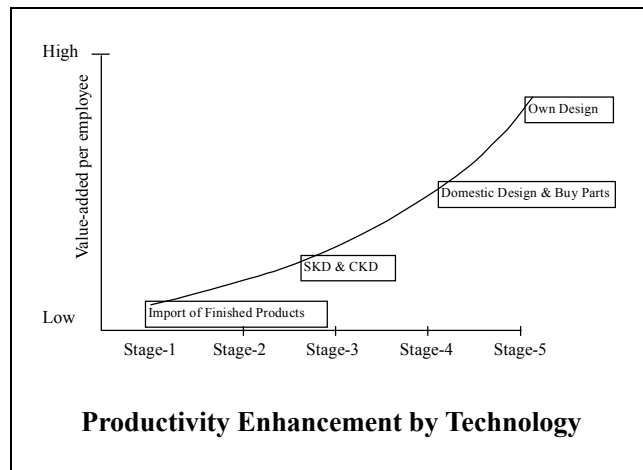
Global linkage is a business relationship between global enterprise and Sri Lankan enterprises, or access by Sri Lankan enterprises to global markets and vice versa. This linkage is attained through FDIs, J/V or partnership, transfer of advanced technology, subcontracting beyond borders, international procurement, and so on. Local or domestic linkage is the relationship among enterprises in the same subsector, as well as relationships between core companies and regional SMIs. The current system to produce every component in a small production scale at a factory should be changed by means of subcontracting, merger, or joint ventures of complementary enterprises. Industrial linkage or clustering is a positive relationship among industries, and it will include collaborative efforts for technology development and/or product development.



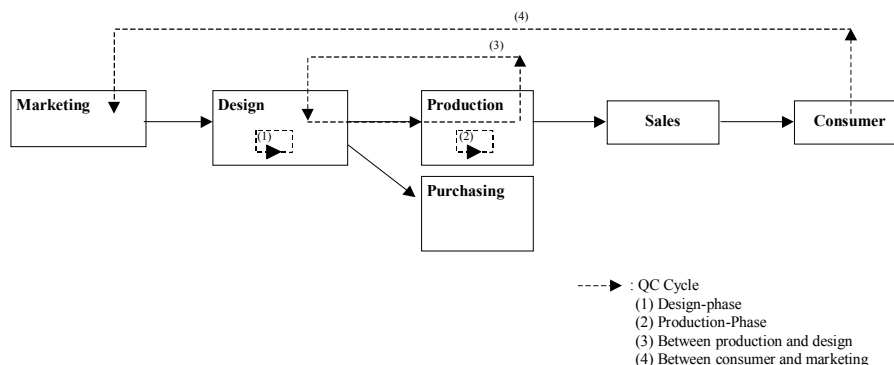
Manufacturing Development through “3 Level Linkage”

Productivity and competitiveness cannot be enhanced without technology upgrading in manufacturing enterprises, particularly SMIs. Obsolete manufacturing facilities in machinery and equipment are typically seen, and product value is not added by design. The paradigm shift to the “knowledge-based” industry is attained only through upgrading of technology and quality improvement.

An example is the assembling industry, like the electric/electronic industry and the machinery industry. Currently, most electric/electronic enterprises are manufacturing by SKD (semi-knock-down) or CKD (complete-knock-down). It is suggested that the design function of these factories be upgraded so they will step up to the model of “domestic design and buy parts” and further up to the “own design” level.



In parallel with technology upgrading, The Rainbow Plan intends to promote a “**quality improvement initiative**”. It is encouraging that many factories have applied a “5S” movement. Now, 5S activities should be gradually integrated to “small group activities”, “zero defect in each shop” and “overall quality improvement program” in the factory. The quality improvement initiative should further proceed to a “QC cycle”. For promotion of a QC cycle, the functions of “design” and “marketing” should be integrated into the manufacturing activities.

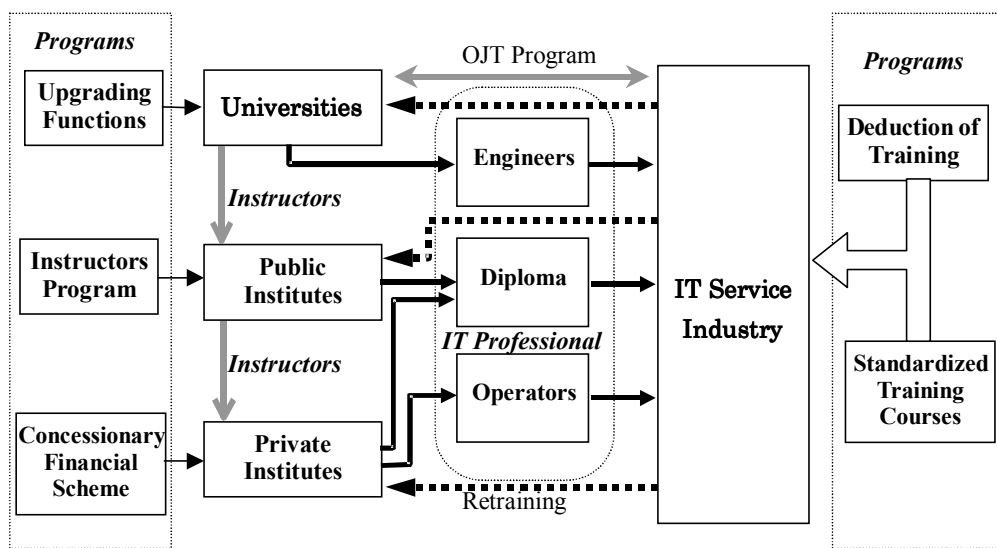


Desirable QC Cycle (Case of Electric/Electronic Industry)

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.

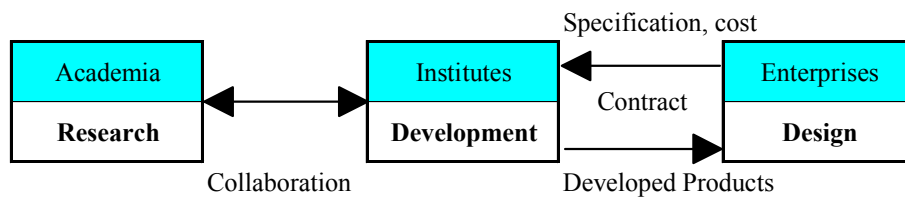
A shortage of designers and engineers in enterprises, which is one of the major reasons for the low technology level of the manufacturing sector, is partly attributable to the higher education system in Sri Lanka. Some improvement should be attained through promotion of the “industry-academia partnership”. Through this initiative, the academia will recognize the requirement for practical engineering, while private enterprises understand technologies to be applied for their production.

HRD is of particular significance for promotion of the IT service industry. In this case, the industry-academia partnership should be promoted to “**industry-academia-public partnership**”. An integrated program is proposed as illustrated below.



Supply of IT Professionals

The industry-academia-public partnership initiative is also indispensable for promotion of R&D. A practical way applicable under the current situation is that the academia will devote itself to “research” and the public institutes to “development”, while private enterprises will concentrate on “design”.



Collaboration in R&D

Most of the manufacturing subsectors have dual structures of large FDI enterprises and many SMIs without any strong linkages. Besides, enterprises intend to have every facility for their manufacturing without introducing a subcontract system or division of labor. These factors are seriously affecting the productivity in respective industries. Further, there is no cooperation nor collaboration among enterprises, and there are a limited number 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 of manufacturing which require a lot of financial resources.

The Rainbow Plan intends to promote the subcontract system in the manufacturing activities, in line with the “3C” principle proposed under the Development Strategy. It will improve the operation rate of equipment and enhance the labor-equipment ratio. Promotion of subcontracting is particularly required for enhancement of the “local content” ratio under the Indo-Lanka FTA and SAFTA. An image of the subcontracting system is illustrated for the case of the machinery industry.

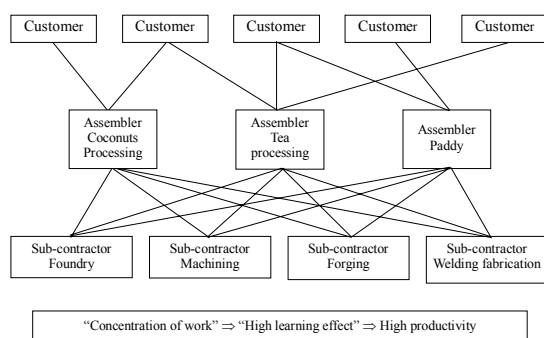
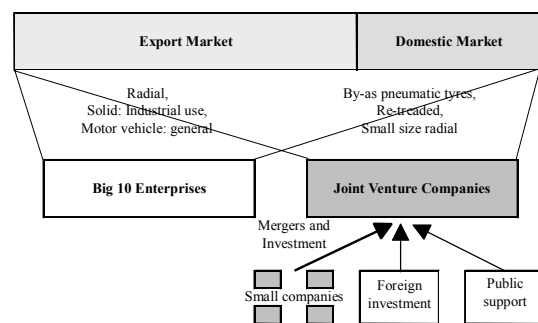


Image of Subcontract System for Machinery Industry



An idea of Restructuring Tyre Industry

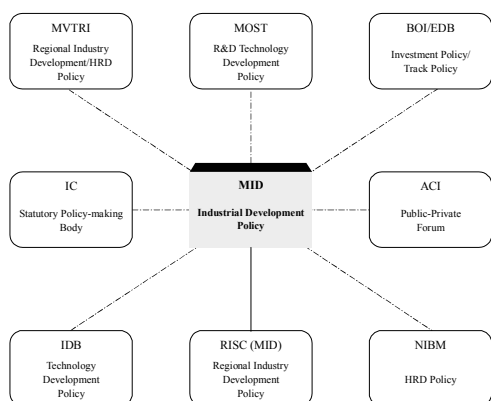
Following the “3C” principle proposed under the Development Strategy, SMIs should promote mergers to improve the economy of scale and to concentrate on production of specific products. An example of formation of JV companies by merger is illustrated above for the case of the tyre manufacturing industry.

Concentration of technologies, equipment, human resources and capital on some specific products should be realized through subcontracts and mergers. Otherwise, the machinery-efficiency ratio and the labor-equipment ratio will not be improved, and SMIs will be unable to enhance their productivity.

11 INSTITUTIONAL RATIONALIZATION

The requirement for restructuring is not limited to the private sector. The public sector related to industrial development should also be restructured in order to promote the “private-public partnership”, as well as to clearly define the policy for industrialization and reflect it to the national policy for economic and social development of Sri Lanka. The role of the public and private sectors should also be defined and responsibility shared to achieve common targets and goals for industrial development.

Currently, major organizations dealing with industrial development are MID (with 24 affiliated institutions), MOST (with 12 affiliation), MVTRI, BOI, and EDB. Affiliated policy-making bodies have been established outside the respective ministries and have discussed the relevant policies independently. Eventually, interface or adjustment functions among affiliates and ministries, as well as inter-ministry, has become quite weak and various fragmented policies have been sporadically adopted. 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.



	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 interview.

Diversified Policy Making Mechanism (Lack of Coordination/Dialogue)

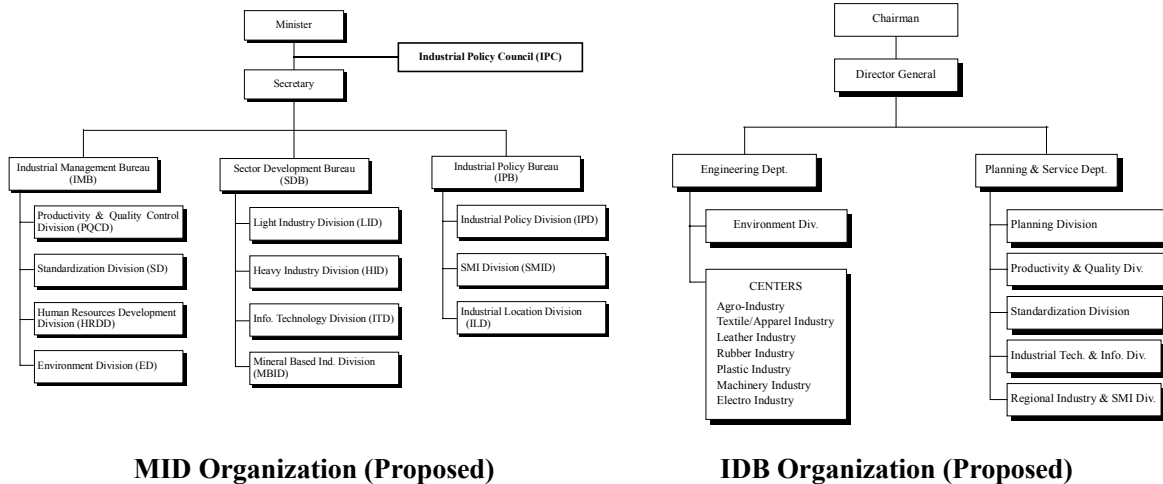
Current Functions of Industry-related Institutions

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 specifically tackle with SMI development.

In order to consolidate a foundation for industrialization under “globalization” and “localization” (See Main Report, Chapter 3, Footnote 3 for the terminology used here), and to promote the private-academia-public partnership, The Rainbow Plan proposes to realize the unification of a policy-making mechanism and the institutional rationalization of respective organizations.

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). The IPC and the Committees should have more participation of the private sector and academia (IPC Chairman should be from a competent academia).

After the unification of the policy-making mechanism, institutional rationalization and consolidation of administrative organs should follow in MID, IDB and other industry related institutions. It is proposed that MID and IDB be re-organized as shown below, and the new administrative systems be strengthened by introduction of the information sharing system and computerization.

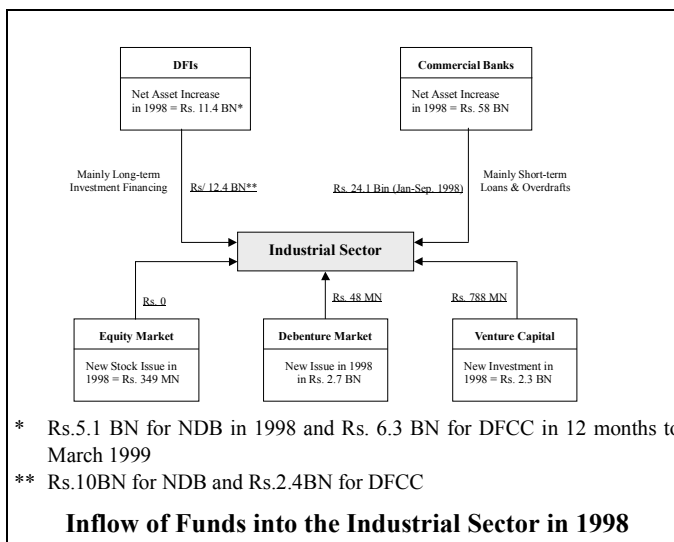


12 FINANCIAL AND FISCAL SUPPORT

Currently, the funds for the industrial sector derive from commercial banks (mostly for short-term loans) and DFIs (only source of long-term loans).

Major constraints found in the financial system for sustained development of the industrial sector are: (i) high interest rates, (ii) lack of long-term funding at reasonable cost, (iii) loans provided against securities, (iv) lack of effective credit guarantee system, and (v) poor credit analysis and management on the part of banks.

It is also noted that the industrial policy is not well incorporated into the institutional financial policy.



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

- (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.

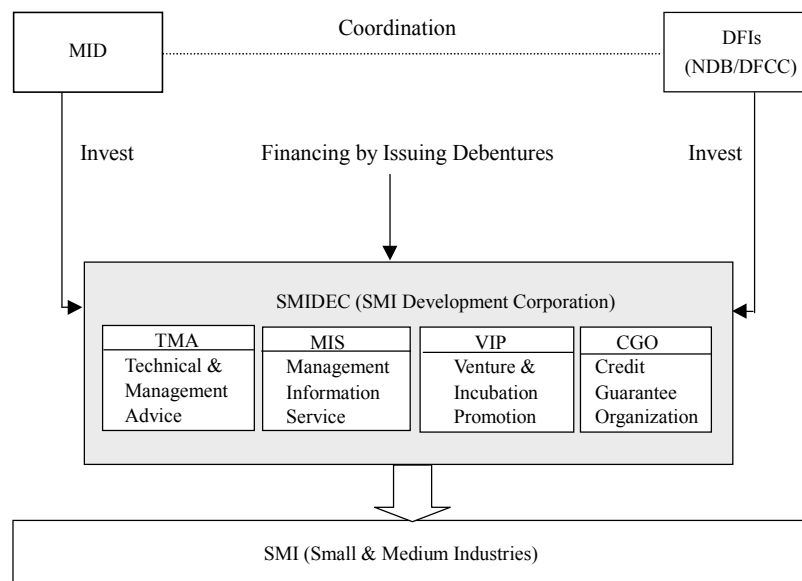
To meet the requirement for financial and fiscal improvement, The Rainbow Plan proposes to extend public support for industrial development, particularly SMIs, by means of (i) provision of concessional loans, (ii) introduction of fiscal incentive, and (iii) establishment of the SMI Development Corporation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

The demand for industrial credits is found to be quite strong, and the resources of concessional loans should be increased. These concessional loans should be extended particularly 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 promotion of the efficient financial sector.

To help promote the industrial sector, particularly SMIs, it is desirable that some tax incentives be selectively introduced; e.g.

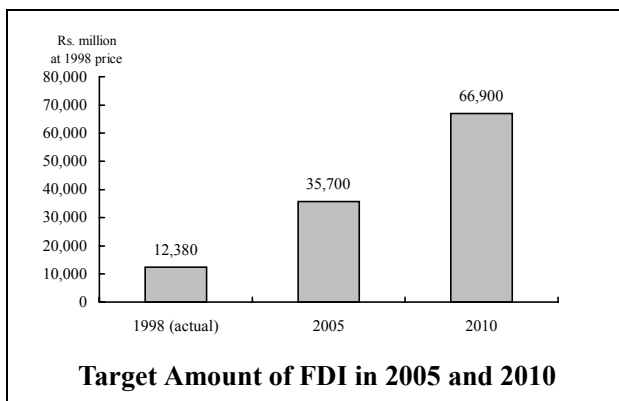
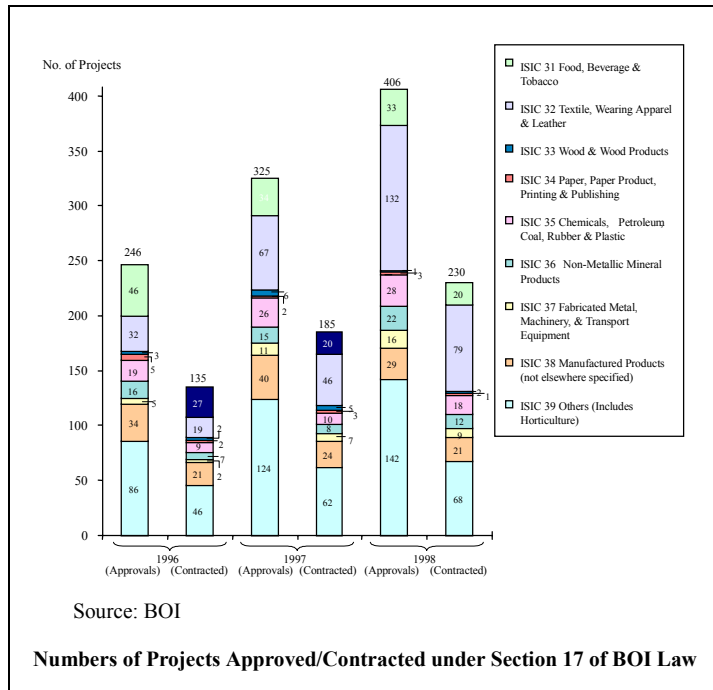
- (i) Incentives to promote advanced technology
- (ii) Incentives to promote training and HRD
- (iii) Incentives to promote marketing of focal products
- (iv) Incentives to promote R&D (including computerization)

Specifically to support development of SMIs, The Rainbow Plan proposes to set up SMIDEC with the fund procured through MID, DFIs (NDB and DFCC) and, if appropriate by international financing agencies. SMIDEC will have four functions; (i) technical/management advice for technological upgrading of SMIs, (ii) management and information services such as corporate strategy, financial management and marketing information, (iii) venture and incubation promotion to support new venture industries, and (iv) credit guarantee organization to facilitate the fund flow to SMIs.



Schematic Diagram of SMIDEC

Sri Lanka obtained substantial investments in the industrial sector in the last decade. During the period from 1993 to 1998, the investments amounted to Rs. 151 billion, of which Rs. 100 billion or 66% were FDIs. The amount of FDIs has been about 1.4% of GDP. The investments in Sri Lanka, however, represent only 6% of total investments made to the SAARC countries. Further, the investment to the SAARC countries accounted for only 5% of total investments to Asia in 1997.



To attain the growth target set under The Rainbow Plan, a further increase in FDIs is required. According to the macroeconomic analysis, FDI requirement is estimated to be 2.3% of GDP in 2000-2004 and 3.0% of GDP in 2005-2010.

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.

To increase FDIs in Sri Lanka, further efforts are required for promotion. Although the investment environment is relatively attractive, when compared with other SAARC countries and ASEAN, some issues should be addressed to attract more investment in industrialization in Sri Lanka. These issues are:

- (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 promotion of investment in industrialization programmed in The Rainbow Plan, it is suggested that the promotional activities be directed selectively towards the “focal products” in the targeted countries/regions, in line with the principle of “Concentration” proposed in the Development Strategy.

Focal Products in Target Industry

Target Industry	Focal Products
Apparel Industry	Mens outerwear/casual, ladies outerwear/casual, childrens wear, ladies underwear, lingerie
Leather industry	Wastbelts, luggage/cases, shoe uppers
Rubber industry	Molded and Extruded products; e.g., Steel radial Tyre, bias 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, casset Electrical appliance: bulbs, socket, etc. Electrical parts; e.g. semi-con, coils Industrial products: e.g. telephone accessories

Countries to be Focused for Promotion of Investment and Export

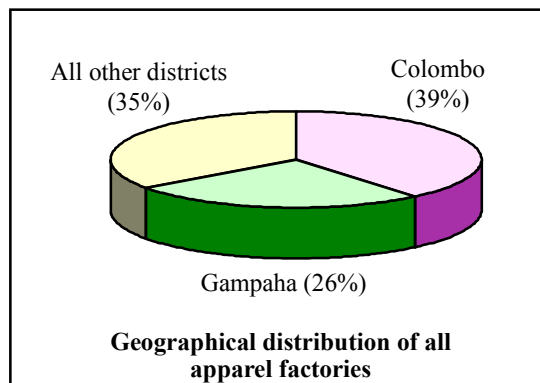
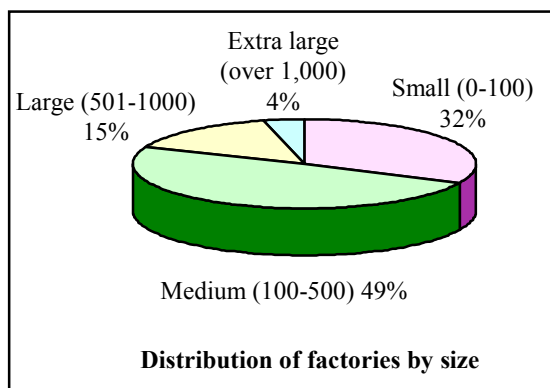
Target Industry	Countries to be Focused for Promoting Investment and Export
Apparel industry	USA/NAFTA, EU, mainly UK, Germany, France, Italy
Leather industry	EU, USA, ASEAN
Rubber industry	EU, USA, Japan, Middle East, AESAN, etc.
Electric/Electronic industry	SAARC, EU, Japan, USA, ASEAN(Singapore), 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 general, investment incentives granted in Sri Lanka are relatively attractive when compared with those granted in SAARC and ASEAN. However, some issues should be addressed to make them more attractive and to attain the target set for FDIs. These issues are:

- (i) To designate the plastic industry as a thrust industry under BOI
- (ii) To modify criteria to extend incentives to SMIs
- (iii) To take measures to extend incentives to supporting industries
- (iv) To modify criteria applicable to the IT industry (e.g., scale of project, export share)
- (v) To improve incentive-granting process.

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 are 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 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. Most of the enterprises are of medium size. Only one third are small.



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”.

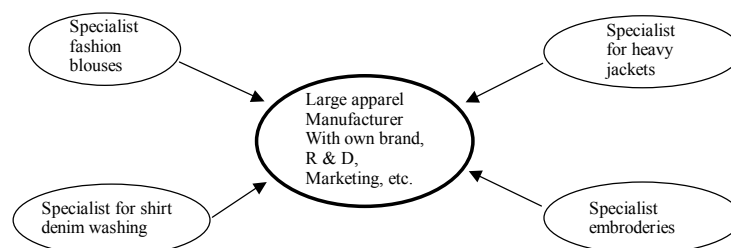
Main targets for developments of the apparel industry towards 2010 are set:

- (i) Increase of the total exports from 2.3 in 1999 to 4.5 billion USD in 2010.
- (ii) Promote the exports in the EU, primarily in the large individual member states.
- (iii) Enter the completely "new" Asian markets like Japan, SAARC and others.
- (iv) Doubling the number of joint ventures with strategic investors until 2005.
- (v) Increase GVA by 20% by 2005 and by 30% by 2010.

¹ Apparel Development Plan has been formulated by UNIDO.

To attain these targets, The Rainbow Plan proposes various programs. They include:

- ① 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. Products for integration were chosen from a comprehensive list of categories.
- ② 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. Under the assumption of a full liberalization of the EU clothing market, the import penetration is expected to reach 65% to 75%.
- ③ 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. 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
- ④ Restructure enterprises with a particular focus on shifting to product specialization as specialist manufacturers of specific product lines as shirts, underwear, etc. Also diversify and expand the product range. These would have certain in-built advantages and strengths to compete in globally competitive markets.
- ⑤ 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: Production, Quality and Profitability.
- ⑥ 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. The enterprises have to invest in new equipment and machinery during the next five years.
- ⑦ 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.



In Sri Lanka the leather industry 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.

The Industry consists of 3 types of manufacturing activities ie. leather, footwear, and other leather goods. The capacity of the industry is limited by supply constraints of raw hide, which presently is around 43 tons per day. This is from 2000 Cow Hides, 1000 Buffalo Hides and 1800 Goat Skins.

Hide quality poses a major limitation unless measures are taken to improve this. Currently the hide or skin is under-utilised and heavily devalued by the treatment the animal receives before and after slaughter. This and the damage from branding often extends to 40% of the hide. Therefore there is scope for improvement of hide quality which would lead to improvements down the supply chain. Such improvements and the fine grain and aesthetic quality of the indigenous leather would lend itself to premium grade leather products at high selling prices.

How to make use of the potentially high quality indigenous leather is the main focus of the Development Plan. The targets for development of the leather industry towards 2010 are planned to be 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%

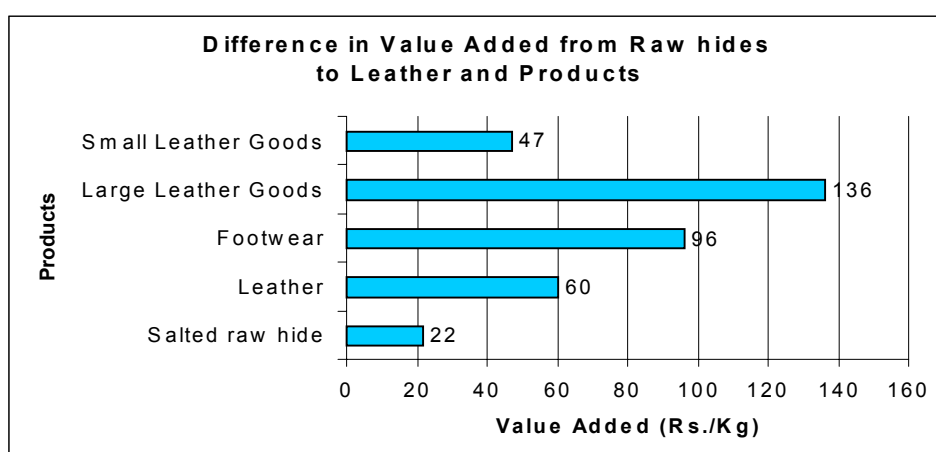
- (ii) To increase tanning capacity by 50% to 50 tons/day by 2004 and to 60 tons/day by 2010.
- (iii) To achieve at least 20% high quality leather products by 2004; and 40% by 2010, using better processed indigenous leather and improved manufacturing techniques.

To attain these targets, The Rainbow Plan proposes various programmes. They include:

- ① Improve quality of raw hide by policies and regulations for better animal protection and husbandry and improved abattoir practices.

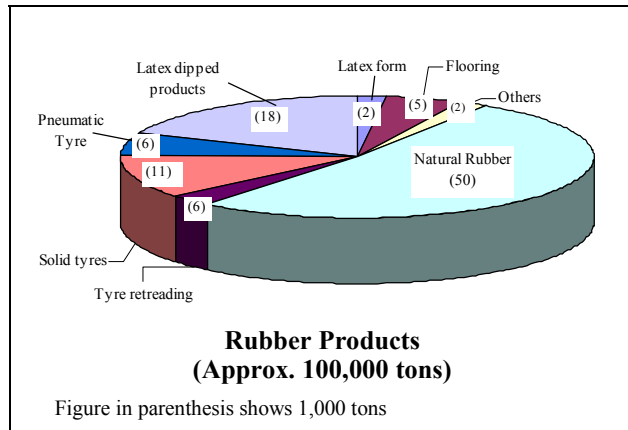
¹ Leather Development Plan has been formulated by UNIDO

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- ② Upgrade skills in the industry through the setting up of a Co-ordinating Agency in MID to co-ordinate and improve training and skill development programmes under different agencies.
 - ③ Strengthen Leather Development Centre of IDB under a public-private institutional arrangement operated jointly with Industry Associations. This center is to do program in design development; demonstrate critical leather manufacturing processes to improve QC and QA in the industry; testing and setting standards in manufacturing processes; and quality certification.
 - ④ Enhance the value addition in leather industry by earlier outlined measures which will eliminate waste at all stages.



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

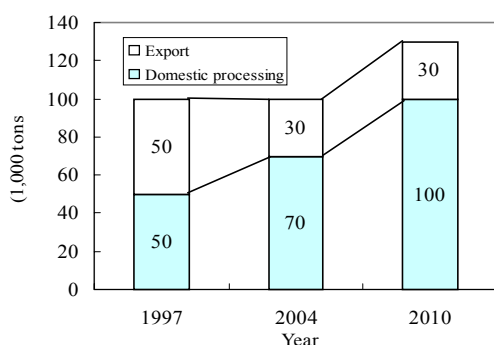
The rubber industry is a traditional resource-based industry. Sri Lankan natural rubber is reputed for its quality (low content level of proteins). Natural rubber production, however, has been decreasing and it is now at the level of 100,000 tons per annum. At present, about half of this production is exported as natural rubber, and the remaining half is processed for various rubber products.



How to make maximum use of high quality natural rubber is the main focus of The Rainbow Plan. The targets for development of the rubber industry towards 2010 are planned to be set as follows:

- To heighten productivity in natural rubber and increase up to 130,000 tons of natural rubber production by 2010.
- To decrease export of natural rubber to the level of 30,000 tons and increase higher value added rubber products to the level of 100,000 tons.
- To concentrate on processing of “focal products” to enhance competitiveness

The focal products in the rubber industry are identified as listed below.



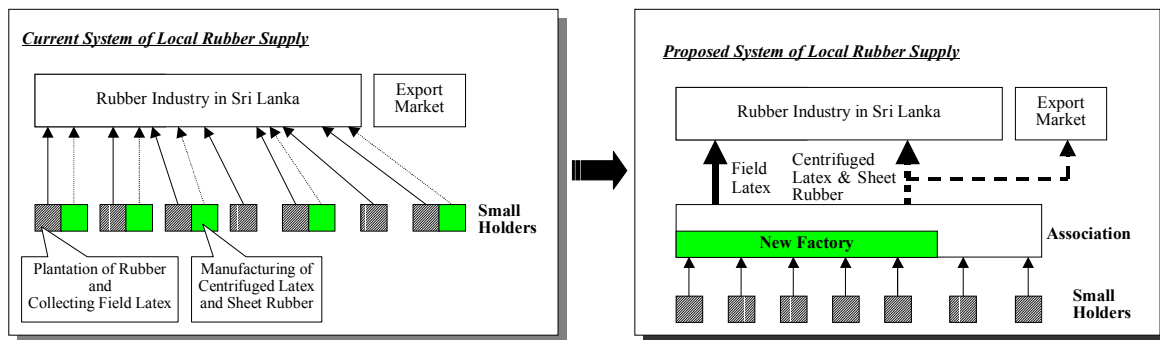
Future Image of Natural Rubber Utilization

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

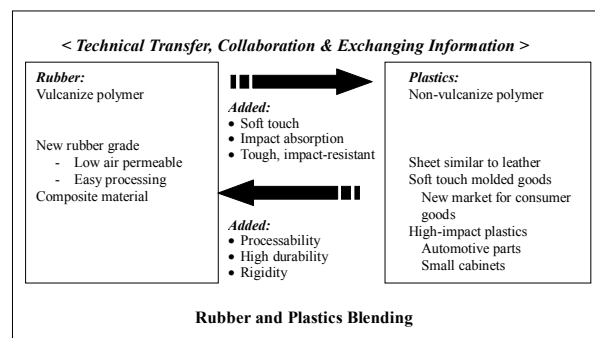
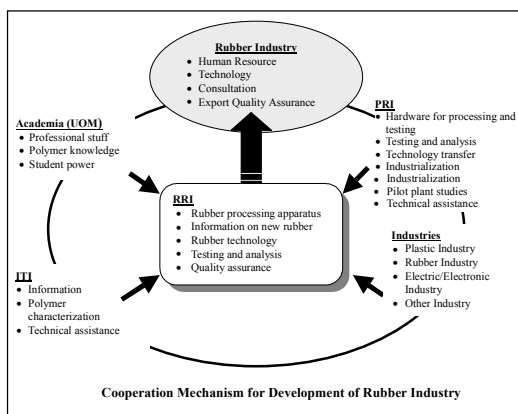
Focal Products in Rubber Industry

To attain these targets, The Rainbow Plan proposes various programs. They include:

- ① Increase in natural rubber production is to be realized through cooperation of RRI and other related agencies.
- ② Associations of small rubber holders are formed to set up factories in rural plantation areas for processing of field latex and centrifuged latex.



- ③ A new enterprise specialized in “custom rubber compound” is to be set up to improve efficiency and the working environment.
- ④ SMIs in tyre manufacturing are encouraged to merge and form JV companies for production of bias pneumatic tyres, re-treated and small radial tyres.
- ⑤ FDIs in focal products of the rubber industry are to be further promoted.
- ⑥ Rubber Research Institute (RRI) is to be reinforced for technology development, testing, marketing and training. Cooperation among the rubber-related institutions is to be strengthened.
- ⑦ Clustering with other industries is to be promoted, including clustering with the plastic industry for rubber/plastic blending.



17 PLASTIC INDUSTRY DEVELOPMENT PLAN

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

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

Technologies applied for manufacturing of products for domestic markets are good enough to meet the local requirement, but they are far behind the global standard. How to diversify the products to meet the changing domestic demand and to increase export is the main focus of The Rainbow Plan. The targets for development of the plastic industry towards 2010 are planned to be set as follows:

- (i) To expect that per capita consumption of plastic products in Sri Lanka will increase from 5.0 kg in 1998 to 12.7 kg in 2010.
- (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 import)
- (iii) To concentrate on processing of “focal products”, i.e., plastic packaging products and plastics for electric/electronic use, in line with the proposed Development Strategy.

Growth of Plastic Consumption and Production

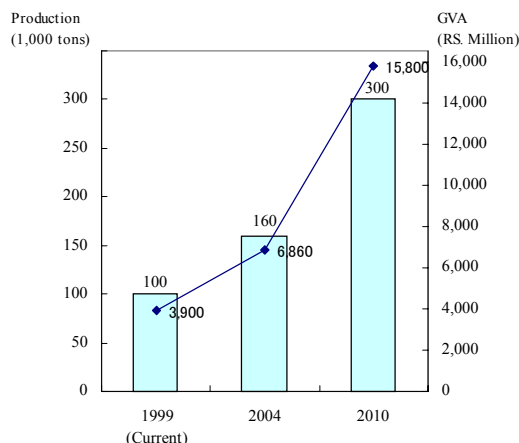
(Thousands Tons)

	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: $[P]=[C]+[X]-[I]$

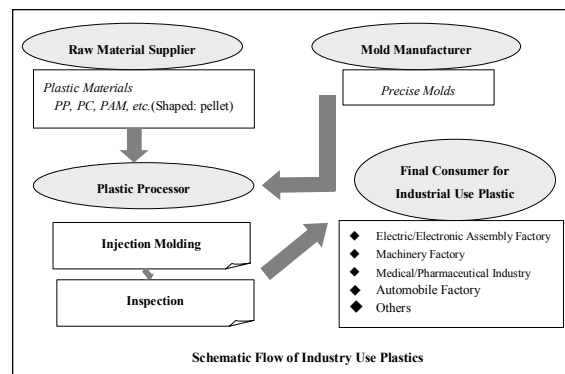
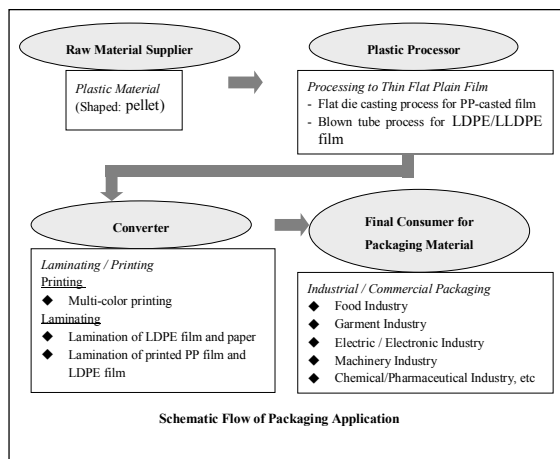
Source: JICA Study Team

Growth of Production and GVA

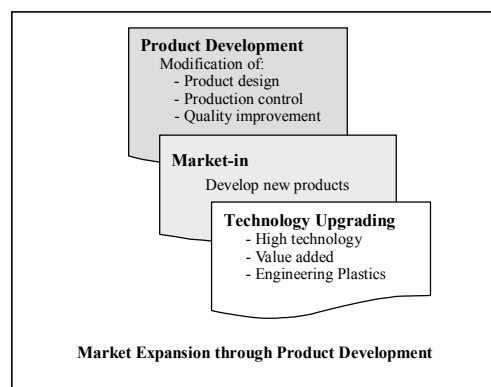
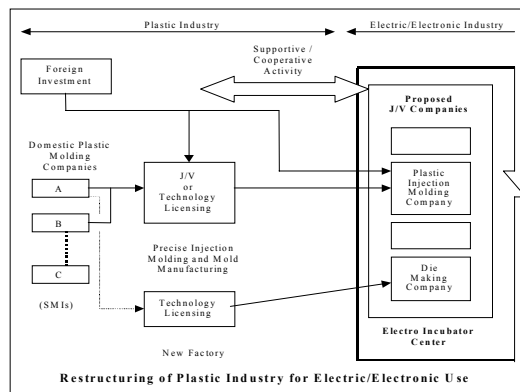


To attain these targets, The Rainbow Plan proposes various programs. They include:

- ① Expansion of domestic markets is to be promoted through product development. A technological base of plastic film production is to be established.
- ② Plastic packaging enterprises are developed to meet the demand for packaging materials.

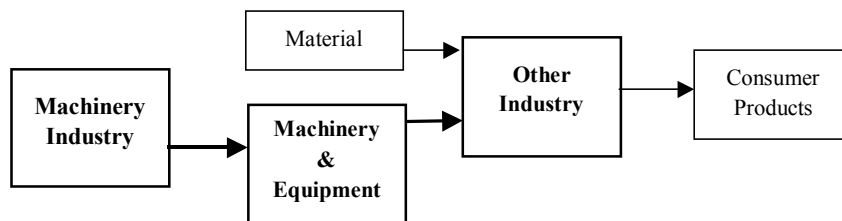


- ③ FDIs in the plastic industry are to be promoted, including investment in packaging film. (Designation of the plastic industry as a thrust industry is requested.)
- ④ Plastic products for electric/electronic use are to be promoted through formation of JV companies or mergers of SMIs.
- ⑤ “Market-in” is to be introduced for product development and market expansion.



- ⑥ Composite technology and co-extrusion technology are developed at public institutes and academia.
- ⑦ Recycle/re-use of inferior plastics is to be promoted, and a collection/recycling system of PET bottles is to be introduced.

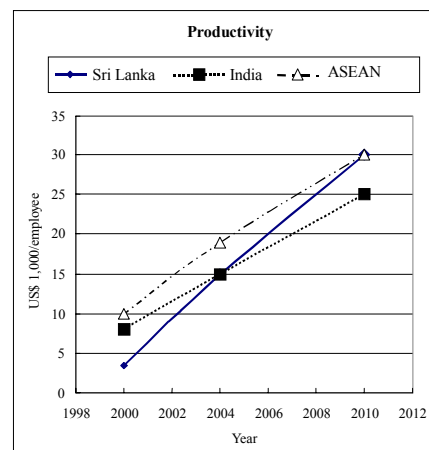
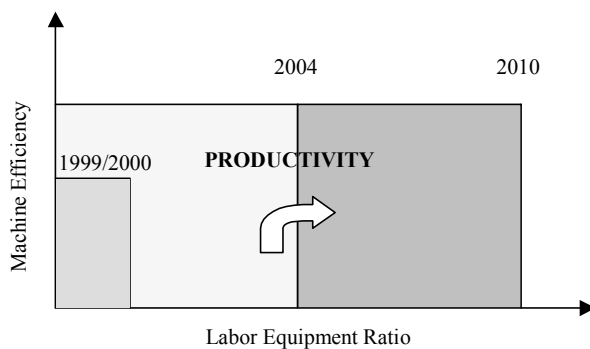
The machinery industry is currently in a critical situation defeated by import at marginal prices under the open market policy promoted with less attention to the industrialization policy. The machinery industry is not only a consumer good producer but also a supplier of production machinery and equipment. The machinery industry provides its products to every industry and improves their productivity. That is why the machinery industry is called a “Mother Industry”.



An argument may be brought forth for or against designation of the machinery industry as a target industry and/or revitalization of the industry under the open market economy. The Rainbow Plan calls for challenge to reactivate the machinery industry in Sri Lanka as the Mother Industry. Such efforts should be summoned up at least during the period of consolidation of industrial foundation in Sri Lanka up to the year 2004.

The targets for reactivation of the machinery industry are planned to be set as follows:

- (i) To start with development of new agricultural machinery and equipment for domestic markets (Input-Output table indicates many potential areas in agriculture).
- (ii) To introduce advanced design and technology and to modernize facilities to manufacture new products.
- (iii) To quadruplicate the productivity by 2004 by elevating the machinery efficiency ratio and the labor-equipment ratio.



To attain these targets, The Rainbow Plan proposes various programs. They include:

- ① Production of agricultural machinery is to be revitalized by making use of the skilled workers remained at enterprises. Possible areas to be looked into are:
 - (i) Leaf picking machine
 - (ii) Lightweight compact tractor
 - (iii) Can and bottle making plant
 - (iv) Press for coir
 - (v) Automation of tea industry
 - (vi) Agricultural tools
 - (vii) Welding fabricated products
 - (viii) Conveyer/belt drive equipment
 - (ix) Vacuum evaporation plating
 - (x) Packing and labeling machine
- ② Enterprises are to be restructured so as to concentrate on a small number of specific products in accordance with the products portfolio.
- ③ New advanced machines are to be designed. At the same time, foreign advanced technology should be actively introduced by licensing.
- ④ Additional investment is to be made for manufacturing of new products. The new products should be different from the currently imported products, as an import substitution policy is not desirable nor intended.
- ⑤ The subcontract system is to be actively introduced, as machinery enterprises are mostly SMIs and the labor equipment ratio should be elevated.
- ⑥ Revitalization in agricultural machinery production is to be expanded to other industries, looking for clustering through provision of the required machinery.
- ⑦ Efforts for reactivation of the machinery industry should be united among machinery enterprises, as well as by public support.

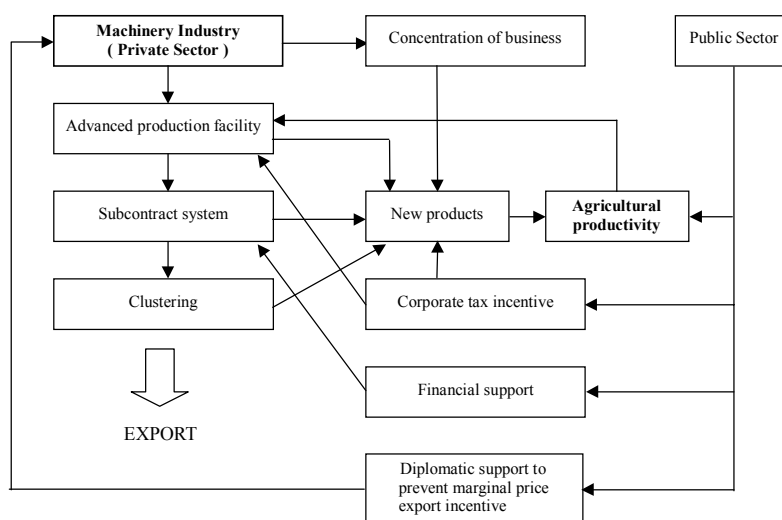


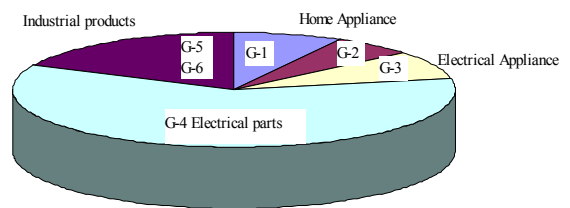
Image of Collaboration for Development

The electric/electronic industry is a relatively new industry in Sri Lanka. About 80% of enterprises are SMIs, but a dozen enterprises are J/V with or operated by foreign capital, mainly for electrical parts. Enterprises are classified into six groups as follows:

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

Turnover of Electric/Electronic Industry



Most home appliance and industrial product manufacturers are assemblers of SKD and CKD. How to enhance productivity and competitiveness of these manufacturers is the main focus of The Rainbow Plan. The targets for development of the electric/electronic industry are planned to be set as follows:

- (i) To selectively promote investment and production of “focal products” by elevating their technology levels.
- (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 Manufacturing) and export of focal products at the later stage.

Selected Focal Products

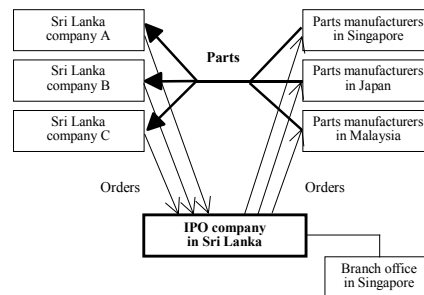
No	Group	Focal Products
1	Home appliance/Electronic	Color television, Radio cassette recorder
2	Home appliance/Electric	Washing machine, Refrigerator
3	Electrical appliance	Switch, Socket, Breaker, etc.
4	Electrical parts	Coil, Transformer, PCB*
5	Industrial products/Electronic	Accessories of Information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

* PCB: Printed Circuit Board & its assembly

To attain these targets, The Rainbow Plan proposes various programs for development of the electric/electronic industry. Among these programs are:

- ① Technology level is to be elevated from the SKD and CKD levels to the level of “domestic design and buy parts” and further to the level of “own design” (Refer to page 13).
- ② Technological level-up is to start with “reverse engineering” which calls for study on products of advanced technology (both technological study and cost reduction study).
- ③ Product design is to be promoted to create and produce “differentiated” products.

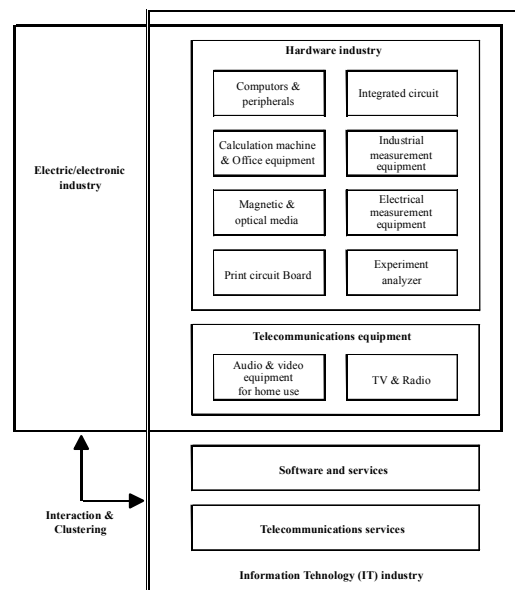
- ④ A system of International Procurement Operation (IPO) is to be introduced to enable purchase of parts and components in a larger lot of orders and economize the procurement cost. This system is applied through collaboration of a number of assemblers in Sri Lanka.



Proposed IPO in Sri Lanka

- ⑤ An Electro Technology Center is proposed to strengthen the function of testing of locally manufactured and imported products, calibration, and design development.
- ⑥ A center for design and manufacturing of PCB (printed circuit board) is planned in the medium/long term, to meet the increasing demand for PCB.

- ⑦ Clustering with the IT service industry is to be promoted as the electronic industry is closely related to hardware of the IT industry. Possible areas of clustering will be (i) computers and peripherals, (ii) office equipment, (iii) magnetic and optical media, (iv) integrated circuit, (v) industrial measurement equipment, and (vi) experiment analyzer.



Clustering between Electronic Industry and IT Industry

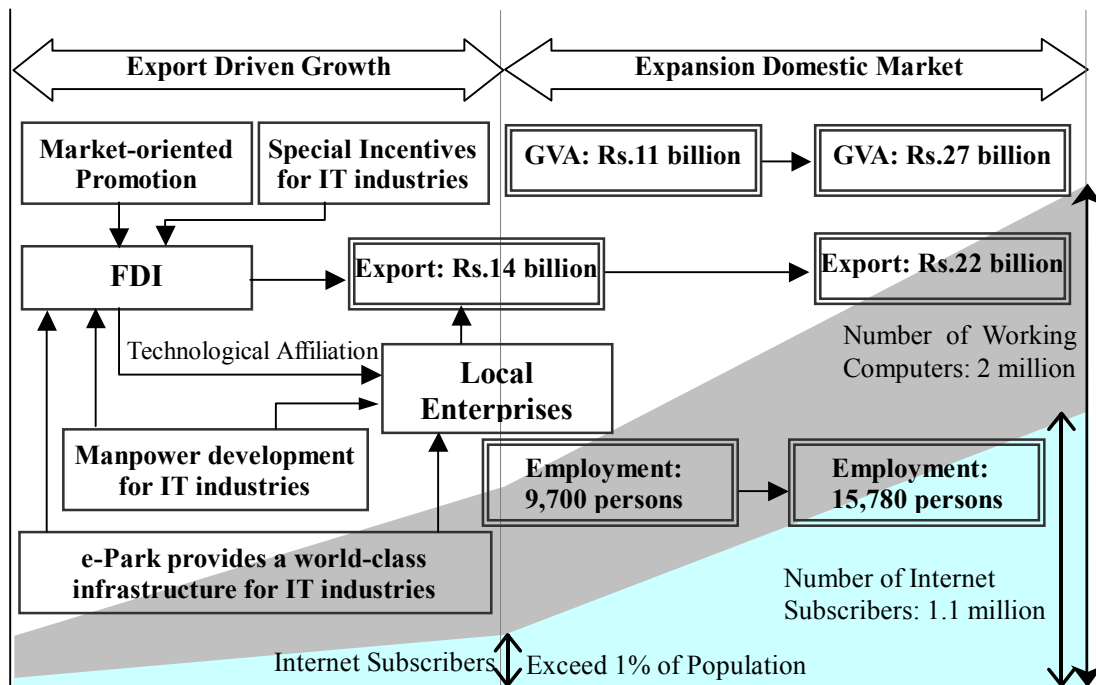
The information technology (IT) service industry is a new industry developed in the 1990s. Application for investment under BOI has been increasing, and 59 projects were approved by the end of 1999. Although the turnover and export values are still relatively small (Rs. 5.4 billion and Rs. 1.0 billion in 1999, respectively), the expected export value would exceed Rs. 7.7 billion when all BOI approved projects are in operation.

Bottlenecks for development of the IT industry in Sri Lanka are: (i) limited manpower resource, (ii) limited infrastructure, (iii) markets, and (iv) organizations to promote the IT industry. However, it is projected that computerization will be accelerated to the level of 800,000 units in 2004 and the internet subscription rate will be elevated to 1% of population by that time. With this projection in view, the targets for development of the IT service industry in 2004 and 2010 are set as tabulated herein.

Target 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

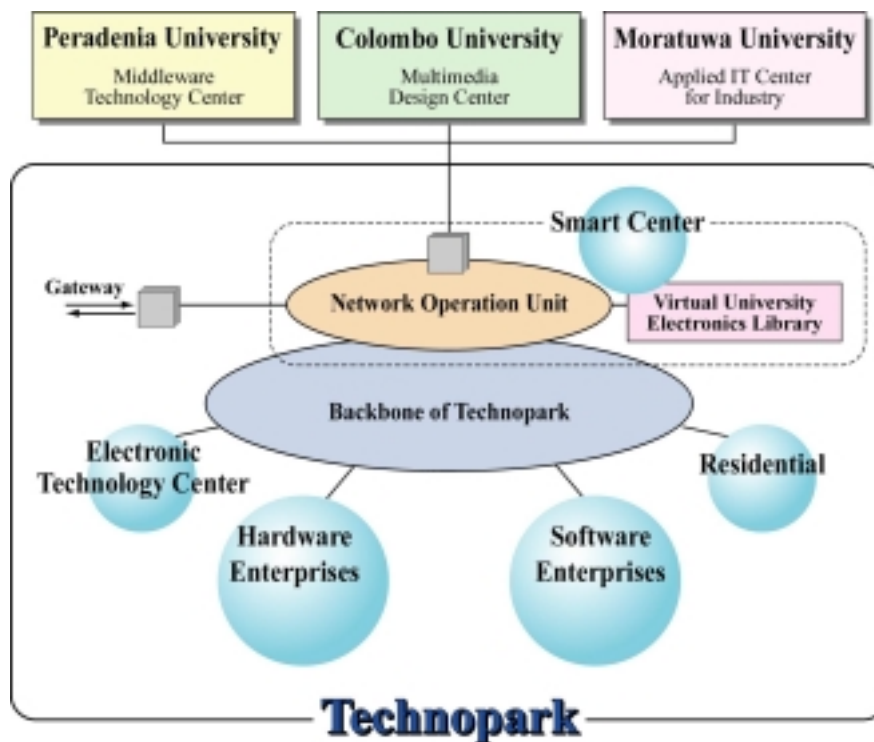
Source: JICA Study Team estimates.



Scenario for Development of IT Service Industry

To attain these targets, The Rainbow Plan proposes various programs. Among these programs are:

- ① Expansion of domestic markets is to be realized in combination with computerization in the private and public sectors.
- ② Export markets are to be developed at the same time, through promotion of FDIs and market research in several selected countries.
- ③ Some flagship projects are to be implemented. As a spearheaded project, an e-park or Technopark is proposed to be set up where software services and hardware industries are located.



Concept of Technopark

- ④ A Smart Center is planned in the e-park or Technopark to function as a virtual university, re-training center and instructors' training center.
- ⑤ IT professionals are to be increased in number through (i) establishment of IT faculty at universities, (ii) expansion of public and private institutions, (iii) training of instructors, and (iv) establishment of re-training systems.
- ⑥ Clustering with other industries is to be promoted, particularly with the electric/electronic industry.
- ⑦ A software business incubator scheme is to be introduced to create new business in the IT industry.

21 ACTION PROGRAM (2000-2004)

The Rainbow Plan proposes a number of plans and programs to be implemented for industrial development in Sri Lanka. Major plans and programs proposed for implementation in 2000-2004 are summarized below as Action Programs.

Responsible Agency	Action Program
	<p>Private Sector Action Program</p> <ul style="list-style-type: none"> <li data-bbox="405 667 1326 734">➤ Establishment of a common premise where the private sector can discuss the relevant issues <li data-bbox="405 763 1267 792">➤ Participation in industrial policy-making through IPC and its Committees <li data-bbox="405 822 1267 851">➤ Collaboration in a paradigm shift towards technology-intensive industries <li data-bbox="405 880 1267 947">➤ Promotion of collaboration and cooperation among enterprise in the same subsector or in associations <li data-bbox="405 976 1251 1043">➤ Establishment of ground to discuss and implement division of labor and subcontract system <li data-bbox="405 1072 1259 1102">➤ Promotion of mergers among SMIs to consolidate basis for development <li data-bbox="405 1131 1310 1198">➤ Improvement of accounting and financial skills to maintain sound accounting practices <li data-bbox="405 1227 1059 1256">➤ Promotion of licensing of foreign advanced technology <li data-bbox="405 1285 1214 1314">➤ Promotion of JV with foreign investors to manufacture new products <li data-bbox="405 1344 1358 1411">➤ Establishment of a common procurement system regarding parts and components (e.g., IPO) <li data-bbox="405 1440 1362 1469">➤ Formation of new associations/cooperatives to set up new factories for processing <li data-bbox="405 1498 1182 1527">➤ Strengthening international marketing focusing on target products <li data-bbox="405 1556 1251 1585">➤ Promotion of clustering among industries and with the related industries <li data-bbox="405 1615 1082 1644">➤ Environmental protection inside and outside the factories <li data-bbox="405 1673 858 1702">➤ Enhancement of quality control (QC)
	<p>Academic Sector Action Program</p> <ul style="list-style-type: none"> <li data-bbox="405 1794 1267 1861">➤ Participation in industrial policy-making through IPC and its Committees (including nomination of IPC Chairman) <li data-bbox="405 1890 1046 1919">➤ Strengthening linkage between academia and industry <li data-bbox="405 1948 1362 2016">➤ Collaboration in promoting paradigm shift towards technology-oriented industrial development

Responsible Agency	Action Program
a.s.	➤ Enhancement of practical engineering for HRD by reorganizing curricula to cope with changing needs of manufacturing enterprises
a.s.	➤ Collaboration in R&D
a.s.	➤ Collaboration in operating technology centers in respective subsectors
Public Sector Action Program	
MID	➤ Foundation of Industrial Policy Council (IPC) for rationalization of industrial policy-making mechanism
MID	➤ Legislative reform related to rationalization of policy-making mechanism
MID	➤ Adjustment of regional industry development policy
MID	➤ Institutional rationalization of MID
IDB	➤ Institutional rationalization of IDB
MOST	➤ Adjustment of applied technology management system, including management of ITI and SLSI
MID	➤ Discussion on rationalization of industrial estate management
MID	➤ Preventive measures to be taken for export at marginal price and enactment of anti-dumping regulation and diplomatic negotiation
MVTRI	➤ Provision of vocational training in target industries
MID	➤ Establishment of information sharing system and computerization as a model for public computerization
IDB	
MID	➤ Compilation of industrial statistics and preparation of database
MID	➤ Provision of concessional loans for development of target industries and SMIs
MID	➤ 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
MOPF	➤ Introduction of tax incentives for promotion of advanced technology, R&D, training, and marketing
MID	➤ Establishment of SMI Development Corporation (SMIDEC)
MOPF	➤ Incorporation of industrial policy into financial and fiscal policies
BOI	➤ Acceleration of FDIs in target industries, particularly in focal products
BOI	➤ Acceleration of JV and technology transfer in target industries
MID	➤ Promotion of local investment in industrial development, including mitigation of deference between BOI and non-BOI status enterprises
MID	➤ Upgrading of local industries and enhancement of local contents in manufacturing

Responsible Agency	Action Program
DOC	➤ Maintenance of tariff structure at the current level at least during the period of consolidation of industrial foundation
MID	➤ Reinforcement of Rubber Research Institute (RRI) through establishment of Inspection and Testing Department
MOP	➤ Increased production of natural rubber through improvement in productivity
MID	➤ Product development and market expansion of plastic product, including establishment of technological base of plastic film production
BOI	➤ Designation of plastic industry as a thrust industry for BOI incentives
BOI	➤ Promotion of FDIs, particularly in production of packaging film
IDB	➤ Promotion of plastic packaging products and formation of Packaging Technology Association
MOI	➤ Establishment of Plastic Technology Center in IDB or ITI
MID	➤ Adoption of policy to develop agricultural machinery industry
MID	➤ Establishment of Electro Technology Center for calibration and testing of local, imported and export products
MID	➤ Study on establishment of PCB Design and Sample Complex
MID	➤ Support to bringing up specialists in engineering procurement and product marketing in electric/electronic industry
MID	➤ Establishment of a common premise where development of IT industry can be discussed
BOI	➤ Revision of BOI incentive criteria to allow smaller IT enterprises
MID	➤ Promotion of e-Park or Technopark project to promote software industry and hardware/electronic industry
MID	➤ Establishment of Smart Center for IT in the e-Park or Technopark
MVTRI	➤ Establishment of trainers' training and re-training system
MID	➤ Creation of new business through Software Business Incubator scheme

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

Some conclusions of the master plan study and some recommendations for implementation of The Rainbow Plan are summarized below.

- (1) In the event that the plans and programs proposed in The Rainbow Plan are implemented by the private, academic and public sectors, the targets set 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.
- (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. 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.
- (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.
- (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 and the External Resources Department of MOPF requesting such assistance and cooperation.
- (6) Implementation of The Rainbow Plan should be monitored by MID every year. As there might be some changes in the environment surrounding industrial development of 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 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.