

No.
-----

Third Party Evaluation  
entrusted by JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)  
in JFY 2001 - 2002

# **COUNTRY PROGRAM EVALUATION OF SRI LANKA**

## **Main Report**

October 2002

KRI International Corp.

PVE
JR
03-9(1/2)

Third Party Evaluation  
entrusted by JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)  
in JFY 2001 - 2002

**COUNTRY PROGRAM EVALUATION**  
**OF**  
**SRI LANKA**

Main Report

October 2002

KRI International Corp.

This report is made up based on data/information in April-May 2002 when the field survey was conducted.

The opinions represented on this report is belong to evaluation study team, which do not represent the JICA's ones.

## PREFACE

In the context of reviewing Japan's official development assistance (ODA) with respect to the recent financial constraints, it has demanded the improvement of project evaluation, in terms of reviewing the contribution of ODA to national and human development in developing countries.

Japan International Cooperation Agency (JICA), Japan's major ODA implementation agency, has commissioned experienced experts and consultants, who have broad outlook and remain neutral in project evaluation, to conduct evaluation survey. Since new budget allocated for "Third-Party Evaluation" in 1999, we have also commissioned third parties, who have expertise in various fields of development assistance, to make suggestions on evaluation method and conduct evaluation based on the method.

We conduct country program evaluation for the purpose of comprehensively evaluating the degree to which JICA cooperation has contributed to development in certain developing countries and extracting recommendations and lessons learned for improving JICA Country Program Action Plan (identify the priority sectors and set up cooperation programs) and formulating and implementing cooperation programs or projects from the evaluation results.

In FY 2001, we determined to carry out country program evaluation of Sri Lanka by applying "Third-Party Evaluation," as a consequence of comprehensively analyzing requests from JICA Overseas Offices, needs of revising country program action plan, and the results of previous country program evaluation (region and under-progress).

In this survey, we dispatched a survey mission (team leader: Nobuhiro Mori, KRI International Corp.) to Sri Lanka twice during the period November 2001 to October 2002.

The mission conducted site survey in consultation with Sri Lank Government officials. Through analyzing and compiling data and information collected in the survey, the final report was completed at last.

We hope that this report will contribute toward improving effectiveness and efficiency of Japan's ODA to Sri Lanka, and toward promoting friendship between Japan and Sri Lanka.

In the end, we would like to extend our sincere gratitude and appreciation to all these people who cooperate in this survey.

October 2002

Haruo Matsui, Director  
Japan International Cooperation Agency

October 2002

Mr. Haruo Matsui, Director  
Japan International Cooperation Agency

## **LETTER OF TRASMITTAL**

Dear Sir:

We are pleased to formally submit herewith the final report of “Country Program Evaluation of Sri Lanka (2001-2002)”.

The purpose of the study is to evaluate the degree to which JICA cooperation (2001-2002) has contributed to development in Sri Lanka from a comprehensive standpoint, and based on the result, to formulate recommendations for improvements in JICA’s Country Programs for Sri Lanka. The evaluation was also aimed at acquiring useful lessons in and recommendations for formulating and implementing future cooperation programs and projects.

The Study Team employs two kinds of approach, which are program evaluation and sectoral evaluation. For program evaluation, we select representative projects in order to analyze and evaluate JICA’s contribution to the progress of sectoral development. When the individual project evaluations were carried out, if the target projects constituted a group of related projects with the same goals and objectives (for instance, when grant assistance was implemented following a development study), the evaluation was conducted with the related projects bundled as a single program. For sectoral evaluation, a development objectives tree is created, and the contribution made by JICA cooperation in the various areas and the various development objectives are analyzed and evaluated. Then, the factors that either encourage or are detrimental to that contribution are identified. Based on those evaluation results, lessons and recommendation are identified.

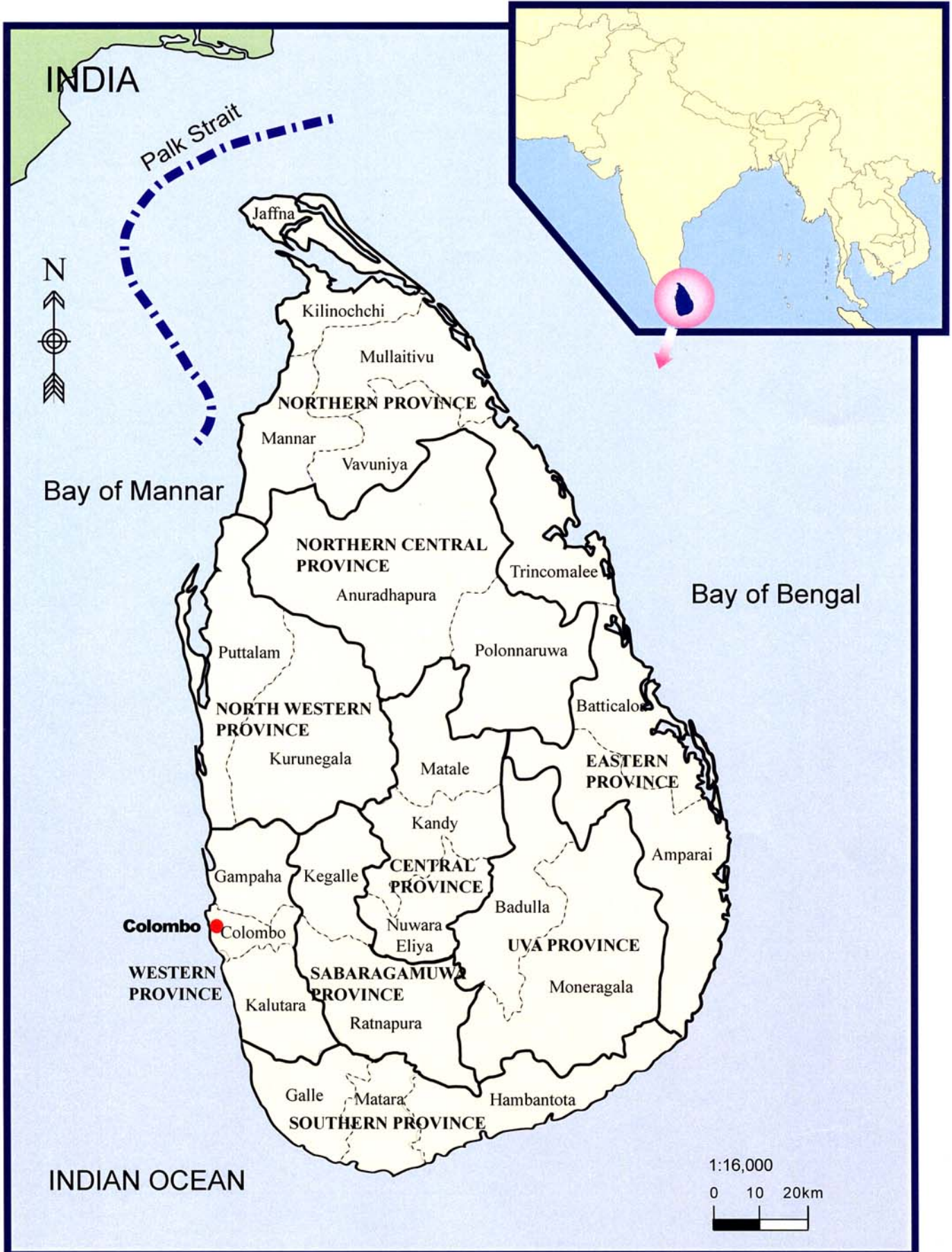
In the end, we would like to express our deep appreciation and sincere gratitude to all those extended their cooperation to the Study Team, in particular, officials concerned of Department of External Resources, Ministry of Policy Development & Implementation and Implementation Agencies. It is entirely due to all people concerned of this study that the final report was made up.

Sincerely yours,

Nobuhiro Mori  
Team Leader  
The Study Team for  
Country Program Evaluation of  
Sri Lanka

# - SRI LANKA -

## Location Map



## Abbreviations

<b>AIDA</b>	:	Accessible Information on Development Activities
<b>AsDB (ADB)</b>	:	Asian Development Bank
<b>BOO</b>	:	Build-Own-Operate
<b>BOT</b>	:	Build-Operate-Transfer
<b>C/P</b>	:	Counterpart
<b>CEB</b>	:	Ceylon Electricity Board
<b>CITI</b>	:	Clothing Industry Training Institute
<b>D/D</b>	:	Detailed Design
<b>DAC</b>	:	Development Assistance Committee
<b>DfID</b>	:	Department for International Development
<b>EDCF</b>	:	Economic Development Cooperation Fund
<b>ERD</b>	:	External Resources Department
<b>F/S</b>	:	Feasibility Study
<b>FAO</b>	:	Food and Agriculture Organization of the United Nations
<b>G.C.E</b>	:	General Certification Examination
<b>GDP</b>	:	Gross Domestic Product
<b>GOSL</b>	:	Government of Sri Lanka
<b>GTZ</b>	:	Gesellschaft für Technische Zusammenarbeit
<b>HIV</b>	:	Human Immunodeficiency Virus
<b>ICT</b>	:	Institute on Computer Technology
<b>IDA</b>	:	International Development Association
<b>IPP</b>	:	Independent Power Producers
<b>IT</b>	:	Information Technology
<b>JBIC</b>	:	Japan Bank for International Cooperation
<b>JCT</b>	:	Jaya Container Terminal
<b>JICA</b>	:	Japan International Cooperation Agency
<b>JOCV</b>	:	Japan Overseas Cooperation Volunteers
<b>LECO</b>	:	Lanka Electricity Company
<b>LTTE</b>	:	Liberation Tigers of Tamil Eelam
<b>M/P</b>	:	Master Plan
<b>MRI</b>	:	Medical Research Institute
<b>NORAD</b>	:	Norwegian Agency for Development Cooperation
<b>NTT</b>	:	Nippon Telegraph and Telephone Corporation
<b>NWSDB</b>	:	National Water Supply and Drainage Board
<b>ODA</b>	:	Official Development Assistance
<b>OECD</b>	:	Overseas Economic Cooperation Fund
<b>PDM</b>	:	Project Design Matrix
<b>PPP</b>	:	Public Private Partnership
<b>PRS(P)</b>	:	Poverty Reduction Strategy (Paper)
<b>QEY</b>	:	Queen Elizabeth Quay
<b>SDR</b>	:	Special Drawing Rights
<b>SIDA</b>	:	Swedish International Development Cooperation Agency
<b>SLPA</b>	:	Sri Lanka Port Authority
<b>SLR</b>	:	Sri Lanka Railway

<b>SLRC</b>	:	Sri Lanka Rupavahini Corporation
<b>SLT</b>	:	Sri Lanka Telecom
<b>TT&amp;SC</b>	:	Textile Training and Services Centre
<b>UN</b>	:	United Nations
<b>UNDP</b>	:	United Nations Development Programme
<b>UNFPA</b>	:	United Nations Population Fund
<b>UNICEF</b>	:	United Nations Children's Fund
<b>UNIDO</b>	:	United Nations Industrial Development Organization
<b>USAID</b>	:	The United States Agency for International Development
<b>WB</b>	:	World Bank
<b>WEP</b>	:	World Education Program
<b>WHO</b>	:	World Health Organization



# Contents

PREFASE

LETTER OF TRANSMITTA

SRI LANKA Location Map

Abbreviations

<b>Chapter 1 Overview of Country Program Evaluation of Sri Lanka .....</b>	<b>1-1</b>
1.1 Background, Purpose and Objective of the Study.....	1-1
1.1.1 Background and Detail of the Study .....	1-1
1.1.2 The Purpose of the Evaluation.....	1-1
1.1.3 Target of the Evaluation.....	1-2
1.2 Plan for the Evaluation Study.....	1-10
1.2.1 Framework for the Evaluation Study.....	1-10
1.2.2 Individual Project/Program Evaluations.....	1-11
1.2.3 Sectoral Evaluations.....	1-11
1.2.4 Overall Evaluation and Lessons Learned/Recommendations.....	1-12
1.3 Organizational Structure and Processes of Studies.....	1-13
1.3.1 Organizational Structure of Studies .....	1-13
1.3.2 Field Work Process and Places Visited .....	1-13
<b>Chapter 2 Present Situation of Socio-Economic Development in Sri Lanka .....</b>	<b>2-1</b>
2.1 Overview .....	2-1
2.2 Economic Conditions.....	2-2
2.3 Social Conditions.....	2-6
2.4 Poverty Reduction Strategy .....	2-7
2.5 General Conditions by Province.....	2-10
2.6 Conclusion: Present Situation of the Socio-economic Development.....	2-12
<b>Chapter 3 International Cooperation by International Organizations and Donor Countries.....</b>	<b>3-1</b>
3.1 Aid Disbursement by Sri Lanka.....	3-1
3.1.1 Aid disbursement by type.....	3-1
3.1.2 Aid disbursement by sector.....	3-3
3.2 Aid Policies and Aid Provided by Japan for Sri Lanka.....	3-4
3.2.1 Aid Policies.....	3-4
3.2.2 Trends in Types of Aid Provided by the Japanese Government.....	3-5
3.2.3 Aid Provided by the Japanese Government by Sector .....	3-6
3.2.4 Trends in aid to the Southwest Asian Region.....	3-6

3.3	Trends in Aid by International Organizations and Other Donors.....	3-10
3.3.1	Aid by International Financial Institutions .....	3-10
3.3.2	Aid by Other Donors .....	3-10
3.3.3	Aid Characteristics by Donor.....	3-11
3.4	Conclusion: Trends in Aid for Sri Lanka.....	3-14
<b>Chapter 4</b>	<b>Individual Project/Program Evaluation .....</b>	<b>4-1</b>
4.1	Procedures for Individual Project/Program Evaluation.....	4-1
4.2	Results of Individual Project/Program Evaluation .....	4-8
4.2.1	Building and Improving Economic and Social Infrastructure .....	4-8
4.2.2	Development of Mining and Manufacturing Industries.....	4-17
4.2.3	Development of Agriculture, Forestry and Fisheries .....	4-21
4.2.4	Education and Human Resources Development .....	4-26
4.2.5	Improving Health / Medical Services .....	4-29
4.2.6	Evaluation as Regards the Poverty, Gender and Environmental Issues .....	4-35
<b>Chapter 5</b>	<b>Sectoral Evaluation .....</b>	<b>5-1</b>
5.1	Framework of Sectoral Evaluation .....	5-1
5.2	Results of Sectoral Evaluation.....	5-4
5.2.1	Evaluation of Building and Improving Economic and Social Infrastructure Sector.....	5-4
5.2.2	Evaluation of Development of Mining and Manufacturing Industries Sector.....	5-68
5.2.3	Evaluation of Development of Agriculture, Forestry and Fisheries Sector .....	5-85
5.2.4	Evaluation of Education and Human Resources Development Sector .....	5-101
5.2.5	Evaluation of Improving Health / Medical Services Sector.....	5-117
<b>Chapter 6</b>	<b>conclusion AND Lessons learned / Recommendations .....</b>	<b>6-1</b>
6.1	Summary .....	6-1
6.2	Lessons Learned and Recommendations Concerning the Formation and Implementation of Cooperation Programs and Projects.....	6-5
6.3	Recommendations Concerning Future Direction of Aid.....	6-14

**Appendix :** Sheet of Aid Projects by Sector

## List of Charts

Chart 1-1-1	Purpose of the Study.....	1-2
Chart 1-1-2	Number of Projects to be Evaluated by Sector and by Form of Assistance.....	1-2
Chart 1-2-1	Flows of Project/Program Evaluation and Sectoral Evaluation.....	1-10
Chart 1-3-1	List of Study Members.....	1-13
Chart 1-3-2	Study Process .....	1-15
Chart 1-3-3	Visiting Agency in Site.....	1-16
Chart 2-2-1	Key Economic Indicators.....	2-3
Chart 2-2-2	Contribution to Growth.....	2-3
Chart 2-2-3	I-S Gap.....	2-5
Chart 2-2-4	Budget Allocation (90s on ave.).....	2-5
Chart 2-2-5	Country Risks.....	2-6
Chart 2-3-1	Percentage of ethnic groups per province (census of 1981: %) .....	2-6
Chart 2-3-2	Key Social Indicators.....	2-7
Chart 2-4-1	Poverty reduction framework in Sri Lanka.....	2-9
Chart 2-5-1	Socio-economic Condition by Province .....	2-10
Chart 2-5-2	Poverty Condition by Province .....	2-11
Chart 2-5-3	Trend of Production of Principal Crops.....	2-11
Chart 2-5-4	Composition of Employment by Sector .....	2-12
Chart 2-6-1	Key Economic and Social Indicators by Country .....	2-23
Chart 2-6-2	Millennium Development Goals (MDG) .....	2-24
Chart 3-1-1	Aid Disbursements by Type .....	3-1
Chart 3-1-2	Key Donors by Type .....	3-2
Chart 3-1-3	Trend of Grant Aid by Key Donor.....	3-2
Chart 3-1-4	Trend of Loan Aid by Key Donor.....	3-3
Chart 3-1-5	Aid Disbursements by Sector .....	3-3
Chart 3-2-1	Japan's ODA to Sri Lanka by Type (from FY 1990-99).....	3-5
Chart 3-2-2	Trends of Japan's ODA by Type .....	3-6
Chart 3-2-3	Japan's ODA by Sector (from 1990-2000) .....	3-6
Chart 3-2-4	Japan's ODA to South West Asian Countries .....	3-7
Chart 3-2-5	Japan's ODA per capita.....	3-7
Chart 3-2-6	Japan's ODA to South West Asian Countries by Type.....	3-8
Chart 3-2-7	Japan's Technical Cooperation for South West Asian.....	3-9
Chart 3-3-1	Sectoral Loan Aid by Key Donor (from 1990-2000) .....	3-10
Chart 3-3-2	Sectoral Grant Aid by Key Donor (from 1990-2000) .....	3-11
Chart 3-3-3	Priority Sector and Disbursements by Key Donor .....	3-12
Chart 4-1-1	Key Points in Individual.....	4-1
Chart 4-1-2	Relationship of the Five Evaluation Criteria and PDM Components .....	4-2
Chart 4-1-3	Format of the Evaluation Grid.....	4-3
Chart 4-1-4	Projects Covered by Individual Evaluation (Category A).....	4-7
Chart 5-1-1	An example of a development policy objectives tree.....	5-1
Chart 5-1-2	An example of combining the past JICA assistance with the development policy objectives tree.....	5-2
Chart 5-2-1	Sub-sectors in the Field of Building and Improving Economic and Social Infrastructure .....	5-4

Chart 5-2-2	Budget Allocation by the Sri Lanka Government.....	5-4
Chart 5-2-3	Aid Distribution by the Donor .....	5-4
Chart 5-2-4	Japan’ s Assistance Distribution.....	5-5
Chart 5-2-5	Assistance Distribution by international organizations .....	5-5
Chart 5-2-6	Road Elongation by Road Class .....	5-6
Chart 5-2-7	Class A and B National Roads.....	5-7
Chart 5-2-8	Road Elongation by Province and Road Class (2000) .....	5-8
Chart 5-2-9	International Comparison of Road Pavement Rate (Data for 1997).....	5-8
Chart 5-2-10	Number of Vehicles by Type .....	5-9
Chart 5-2-11	International Comparison of Vehicle Ownership Density.....	5-10
Chart 5-2-12	Records of Bus Operation.....	5-10
Chart 5-2-13	Private Bus Services and Regional Bus Companies .....	5-11
Chart 5-2-14	Development policy objectives tree for the road sub-sector.....	5-12
Chart 5-2-15	Planned Road Projects .....	5-14
Chart 5-2-16	National Railway Network of Sri Lanka.....	5-17
Chart 5-2-17	Trends in the Number of Railway Carriages .....	5-17
Chart 5-2-18	Records of Railway Operation.....	5-18
Chart 5-2-19	Operating Balance of SLR.....	5-18
Chart 5-2-20	Development policy objectives tree for the railway sub-sector.....	5-19
Chart 5-2-21	Distribution of Ports (SLPA).....	5-22
Chart 5-2-22	Port Performance.....	5-23
Chart 5-2-23	Container Throughput at Various Ports in the World (1998).....	5-24
Chart 5-2-24	Development policy objectives tree for port sub-sector .....	5-25
Chart 5-2-25	Planned Port Projects.....	5-28
Chart 5-2-26	Passenger Transport by Sri Lanka Airlines .....	5-30
Chart 5-2-27	Annual Number of Aircraft Departures (data for 1996).....	5-31
Chart 5-2-28	Passenger and Freight Load Factors.....	5-31
Chart 5-2-29	Development policy objectives tree for airport sub-sector.....	5-32
Chart 5-2-30	Power Generation Capacity of Sri Lanka.....	5-34
Chart 5-2-31	CEB’s Installed Capacity of Hydro, Thermal, and Wind Power Generation .....	5-35
Chart 5-2-32	International Comparison of Power Generation Sources.....	5-35
Chart 5-2-33	Power Generation Capacity and Power Consumption (CEB) .....	5-36
Chart 5-2-34	Electric Power Consumption by Sector.....	5-36
Chart 5-2-35	International Comparison (by Power Source).....	5-37
Chart 5-2-36	Development of Major Power Transmission and Transformation Facilities.....	5-37
Chart 5-2-37	Power Transmission Network.....	5-38
Chart 5-2-38	Transmission/distribution Losses and System Interruption.....	5-38
Chart 5-2-39	International Comparison of Transmission/distribution Losses.....	5-38
Chart 5-2-40	Trends in Household Electrification Rate.....	5-39
Chart 5-2-41	Development policy objectives tree for the electric power sub-sector .....	5-40
Chart 5-2-42	Planned Power Generation Projects .....	5-42
Chart 5-2-43	Planned Power Transmission and Transformation Projects.....	5-43
Chart 5-2-44	Trends in the Number of Telephone Lines.....	5-45
Chart 5-2-45	Trends in Telephone Density.....	5-45
Chart 5-2-46	Comparison of Telephone Density .....	5-46

Chart 5-2-47	Waiting Time for Telephone Installation.....	5-46
Chart 5-2-48	Number of Lines per Personnel.....	5-46
Chart 5-2-49	Domestic Communication Charge (US\$/3 minutes).....	5-46
Chart 5-2-50	International Communication Charge (3-minute call to the U.S. (US\$)).....	5-46
Chart 5-2-51	Cellular Phone Density.....	5-47
Chart 5-2-52	Development policy objectives tree for the telecommunication sub-sector.....	5-48
Chart 5-2-53	TV Channels Available in Colombo (Including Cable TV Channels).....	5-51
Chart 5-2-54	Penetration of TV Sets.....	5-52
Chart 5-2-55	Development policy objectives tree for the broadcasting sub-sector.....	5-52
Chart 5-2-56	Access to Safe Water.....	5-54
Chart 5-2-57	Accessibility to Sanitation Facilities.....	5-55
Chart 5-2-58	Development policy objectives tree for the water supply, sewage, and sanitation sub-sector.....	5-56
Chart 5-2-59	Ongoing and Planned Projects (Water Supply Infrastructure).....	5-59
Chart 5-2-60	Development policy objectives tree for the housing sub-sector.....	5-62
Chart 5-2-61	Budget Allocation of the Sri Lanka Government.....	5-68
Chart 5-2-62	Aid Distribution by Donors.....	5-68
Chart 5-2-63	Aid Fund Distribution of the Japanese Government.....	5-68
Chart 5-2-64	Aid Fund Distribution of international organizations.....	5-69
Chart 5-2-65	GDP Share by Industry.....	5-70
Chart 5-2-66	Industrial Structure in Selected Asian Countries.....	5-70
Chart 5-2-67	Export Structure.....	5-71
Chart 5-2-68	Employment Structure.....	5-71
Chart 5-2-69	Structure of Manufacturing Value Added.....	5-72
Chart 5-2-70	Structure of Manufacturing Exports.....	5-72
Chart 5-2-71	Development Policy Objectives Tree for the Mining and Manufacturing Industry Development Sector.....	5-76
Chart 5-2-72	Labor-productivity Index of Manufacturing (1995 as 100).....	5-79
Chart 5-2-73	Unemployment Rate.....	5-80
Chart 5-2-74	Manufacturing Value Added by District.....	5-81
Chart 5-2-75	Overview of JICA Project in Mining and Industry.....	5-82
Chart 5-2-76	Development Budget Allocation of the Sri Lanka Government.....	5-85
Chart 5-2-77	Aid Distribution by Donors.....	5-85
Chart 5-2-78	Aid Fund Distribution of the Japanese Government.....	5-85
Chart 5-2-79	Aid Fund Distribution of International Organizations.....	5-86
Chart 5-2-80	Planting Extent and Production of Rice (Paddy).....	5-87
Chart 5-2-81	Per Ha Yield of Tea.....	5-87
Chart 5-2-82	GDP of Major Sectors.....	5-89
Chart 5-2-83	Export of Major Sectors.....	5-89
Chart 5-2-84	Labor Population of Major Sectors.....	5-90
Chart 5-2-85	Household Income.....	5-90
Chart 5-2-86	Development Policy Objectives Tree for the Agriculture, Forestry and Fisheries Development Sector.....	5-92
Chart 5-2-87	Growth Rate of GDP.....	5-94
Chart 5-2-88	Farmers' Income in Mahaweli Area.....	5-94
Chart 5-2-89	Household below Poverty Line.....	5-95

Chart 5-2-90	Self-sufficiency Rate of Major Foodstuff.....	5-95
Chart 5-2-91	Increase Rate of Export.....	5-96
Chart 5-2-92	Development Budget Allocation by the Sri Lanka Government.....	5-101
Chart 5-2-93	Aid Distribution by Donors.....	5-101
Chart 5-2-94	Aid Fund Distribution of the Japanese Government.....	5-101
Chart 5-2-95	Aid Fund Distribution of International Organizations.....	5-102
Chart 5-2-96	School Programs, School Ages, and Types of Public Schools.....	5-103
Chart 5-2-97	Dropout, Fail, and Promotion Rates at Each Grade of Junior Schools (1996).....	5-104
Chart 5-2-98	Data Related to Junior School Education.....	5-105
Chart 5-2-99	Chronological Comparison of the Improvement of Junior School Education.....	5-105
Chart 5-2-100	Enrollment Rate at Primary Schools (1980, 1998).....	5-106
Chart 5-2-101	Enrollment Rate at Secondary Schools and High Schools (1980, 1998).....	5-106
Chart 5-2-102	Data Related to University Education.....	5-107
Chart 5-2-103	Number of Public Schools, Students, Teachers, and Students per Teacher by Area and School Type (1998).....	5-108
Chart 5-2-104	Number of Public Schools by Language (1994).....	5-108
Chart 5-2-105	Dropout Rate (Average over Grades 1 to 9) and Fail Rate (Average over Grades 1 to 13) by Province and Sex in 1990/91.....	5-109
Chart 5-2-106	Measures of Educational Reform.....	5-110
Chart 5-2-107	Development policy objectives tree for the education and human resource development area.....	5-111
Chart 5-2-108	Development Budget Allocation by the Sri Lanka Government.....	5-117
Chart 5-2-109	Aid Distribution by Donors.....	5-117
Chart 5-2-110	Aid Fund Distribution of the Japanese Government.....	5-117
Chart 5-2-111	Aid Fund Distribution of International Organizations.....	5-118
Chart 5-2-112	Health Development Targets to be achieved by Year 2002 for.....	5-119
Chart 5-2-113	Development policy objectives tree for the area of improvement of Health / Medical Care Systems.....	5-121
Chart 5-2-114	Indicators of the Inhabitants' Health Standard by District.....	5-125
Chart 5-2-115	Indicators of the Standard of Medical Care Services by District.....	5-126
Chart 5-2-116	Deployment of Specialist Physicians.....	5-127
Chart 6-1-1	Structure of Sri Lanka's Five-Year Programs during the 1990s.....	6-2
Chart 6-1-2	Operations of Major Donors in Sri Lanka.....	6-4
Chart 6-2-1	Lesson Learned from individual project/program evaluations.....	6-6
Chart 6-2-2	Recommendations gained from individual project/program evaluations.....	6-13
Chart 6-3-1	Directionality of future support derived from sectoral evaluations.....	6-15
Chart 6-3-2	Comparison between JICA planning of project evaluation for Sri Lanka and the actual recommendation resulting from the sectoral evaluation of this evaluation study.....	6-18
Chart 6-3-3	Correspondence between Poverty Reduction Strategy of Sri Lanka and Suggestions of Study Team.....	6-27