

TRANSFORMING SCHOOL EDUCATION IN SRI LANKA



From Cut Stones to Polished Jewels



THE WORLD BANK

TRANSFORMING SCHOOL EDUCATION IN SRI LANKA

From Cut Stones to Polished Jewels



The World Bank
Human Development Unit
South Asia Region

2011 The International Bank for Reconstruction and Development/The World Bank
1818 H Street, Washington DC 20433
Telephone: 202-473-1000
Internet: www.worldbank.org
E-Mail: feedback@worldbank.lk

Published by

The World Bank Colombo Office
73/5, Galle Road, Colombo 03, Sri Lanka
Internet: www.worldbank.org/lk

This volume is a product of the staff of the International Bank for Reconstruction and Development/The World Bank. The findings, interpretations, and conclusions expressed in this paper do not necessarily reflect the views of the Executive Directors of The World Bank or the governments they represent. The World Bank does not guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgement on the part of The World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

Rights and Permissions

The material in this publication is copyrighted. Copying and/or transmitting portions or all of this work without permission may be a violation of applicable law. The International Bank for Reconstruction/The World Bank encourage dissemination of this work and will normally grant permission to reproduce portions of the work.

For permission to photocopy or reprint any part of this work, please send a request with complete information to the Copyright Clearance Center, Inc., 222 Rosewood Drive, Danvers, MA 01923, USA. Telephone 978-750-8400, Fax 978-750-4470, www.copyright.com

All other queries on rights and licenses, including subsidiary rights, should be addressed to the Office of the Publisher,

The World Bank, 1818 H Street NW, Washington DC 20433, USA,
Fax: 202-522-2422, E-mail: pubrights@worldbank.org

Cover photographs by

Deshan Tennekoon/WB Education Sector Development Project Trinco Sri Lanka

ISBN : 978-955-8908-41-9

Produced by

Ari Investments Limited,
19, St. Joseph Road, Nugegoda, Sri Lanka.
E-mail: ariyaw@sltnet.lk

TABLE OF CONTENTS

Abbreviations and Acronyms	ix
Acknowledgements	xi
Executive Summary	E1
Chapter One: The General Education Sector: Outcomes and Policies	1
Introduction	1
General Education in Sri Lanka in International Perspective	2
The General Education System	2
National Assessments of Learning Outcomes	15
The Contribution of the World Bank Education Sector Report	16
Chapter Two: Investment in Human Capital: Benefits, Challenges and Opportunities	19
Introduction	19
Economic and Social Benefits of Investment in Education	19
Public Investment in Education	28
Private Investment in Education	34
Education and the Global Labor Market	36
Avenues and Pathways for the Future	37
Chapter Three: Governance and Delivery of Education Services	41
Introduction	41
The Organizational Framework of the General Education Sector	41
Teacher Management and Development in a Decentralized System	45
Avenues and Pathways for the Future	47
The Program for School Improvement: An Innovation	48
Avenues and Pathways for the Future	54
Chapter Four: The Social Benefits of Education: Promoting Social Cohesion through the School System	57
Introduction	57
Education and Social Cohesion: The Conceptual Framework	57
Education and Social Cohesion in Sri Lanka	58
Initiatives to Promote Social Cohesion	59
Avenues and Pathways for the Future	64

Chapter Five:	Language as Human Capital: Enhancing English Language Learning	67
	Introduction	67
	Performance in the English Language	69
	The Policy Framework: Challenges and Options for the Future	71
	Avenues and Pathways for the Future	75
	The Bilingual Education Program: An Innovation	78
	Avenues and Pathways for the Future	80
Chapter Six:	Dimensions of Quality: Mathematics Education	83
	Introduction	83
	Performance in Mathematics	83
	The National Education Policy and Curriculum Reforms	88
	Mathematics Standards	89
	Mathematics Teaching Strategy	90
	Avenues and Pathways for the Future	95
Chapter Seven:	Dimensions of Quality: Science Education	97
	Introduction	97
	Learning Achievements in Science	97
	The Policy Framework for Science Education, Science Curriculum and Teaching Strategies in Schools	101
	Avenues and Pathways for the Future	107
Chapter Eight:	Inter-Sectoral Dimensions of Education Outcomes: School Health and Nutrition	111
	Introduction	111
	School Health and Nutrition in Sri Lanka	112
	Institutional School Health Responses in Sri Lanka	118
	Avenues and Pathways for the Future	121
References		125

FIGURES

Figure 1.1.	Adult Literacy in Relation to GDP Per Capita of Middle Income and Low Income Countries	3
Figure 1.2.	The Survival Rate from Grade 1-9 by Gender	6
Figure 1.3.	Net Enrollment Rates in Senior Secondary Education, 1990-2007	7
Figure 1.4.	General Certificate of Education Ordinary Level Pass Rates 2005-2009	13
Figure 1.5.	General Certificate of Education Advanced Level Pass Rates 2005-2009	13
Figure 2.1.	Impact of Education on Earnings, Male and Female Workers, 2008	21
Figure 2.2.	Private Rates of Return to Education, Male and Female Workers, 2008	22
Figure 2.3.	Average Years of Completed Schooling for Persons Aged Over 20 Years, by Sex and Year of Birth	23
Figure 2.4.	Lorenz Curves of the Benefits of Public Education Expenditure by Consumption Quintiles 2007	24
Figure 2.5.	Poverty Incidence by Education Level of Household Head	25
Figure 2.6.	Economic Welfare by Education Level of the Principal Income Earner of a Household	26
Figure 2.7.	Public Investment in Education as a Percentage of National Income, 2010 or Nearest Year	30
Figure 2.8.	Public Investment in Education as a Proportion of the Government Budget, 2010 or Nearest Year	30
Figure 2.9.	Association between Public Investment in Education per Student and Learning Outcomes 2007	31
Figure 2.10.	Composition of Household Education Expenditure, 2006/7	34
Figure 2.11.	Private Education Expenditure per Student 2006/7 (Rupees)	35
Figure 2.12.	The Changing Composition of Skills Needed in Economies in the 21 st Century	36
Figure 3.1.	Organizational System of the Central Ministry of Education and Agencies	43
Figure 3.2.	The Organizational Framework of the Provincial Education System	44
Figure 3.3.	The Program for School Improvement: Network of Relationships	50
Figure 5.1.	Trends in Achievement of Skills in English Language at Grade 4, 2003-2009	69
Figure 5.2.	The GCE O/L Performance, 2005-2009	70
Figure 5.3.	The GCE A/L General English Performance, 2005-2009	70
Figure 6.1.	National Achievement at Grade 8, Sub-Skills in Mathematics	84
Figure 6.2.	The GCE O/L Mathematics Examination Pass Rates, between 2005 and 2009	85
Figure 6.3.	GCE O/L Mathematics Examination Pass Rates by Province, 2009	87
Figure 6.4.	Performance of the GCE O/L Mathematics Teachers	94
Figure 7.1.	National Achievement at Grade 8, Sub-Skills in Science	98
Figure 7.2.	The GCE O/L Examination Pass Rates in Science between 2005 and 2009	99
Figure 7.3.	The GCE O/L Science Examination Pass Rates by Province, 2009	100
Figure 7.4.	Pass Rates of the Main Subjects of the GCE A/L Science Stream in 2009	101

Figure 8.1.	(a) Decreasing Communicable Diseases and (b) Decreasing Communicable Diseases and Increasing Obesity	113
Figure 8.2.	Nutrition Problems among School Children in Sri Lanka	115
Figure 8.3.	Common Health Problems among School Children in Sri Lanka	115
Figure 8.4.	Summary of Sanitation in Schools by Province	117
Figure 8.5.	Summary of Water in Schools by Province	118

TABLES

Table 1.1.	Government Schools, Student Enrollment and Teachers, by Province, 2009	4
Table 1.2.	Enrollment and Survival Rates in Primary Education by Gender	5
Table 1.3.	Net Enrollment Rates Across Economic Quintiles	8
Table 1.4.	Performance of Primary School Students in the National Assessments of Learning Outcomes at Grade 4, 2003 -2009	10
Table 1.5.	Performance of Junior Secondary School Students in the National Assessments of Learning Outcomes at Grade 8, 2005 -2008	11
Table 1.6.	Differences between National Assessments and Public Examinations	17
Table 2.1.	Education and Earnings by Gender, 2008, Least Squares Estimates of Augmented Mincerian Earnings Functions	20
Table 2.2.	Gini Coefficients of Public Education Expenditure by Level of Education	25
Table 2.3.	The Time Trend of the Incremental Impact of Education on Economic Welfare, 1990-2007	27
Table 2.4.	Education Expenditure as a Percentage of GDP and Total Government Expenditure, Sri Lanka and Selected Other Countries, 2010 or Nearest Year	29
Table 2.5.	Average per Pupil and per School Expenditure, National and Provincial Schools, 2007	33
Table 2.6.	Provincial and Central Government Shares of General Education Expenditure, 2007-2009	33
Table 3.1.	Grade 4 Test Scores and Household Educational Expenditures (School-level Fixed Effects Estimation with Clustered Standard Errors)	52
Table 4.1.	Number of Schools, Teachers and Students by District for Second National Language, 2009	63
Table 5.1.	Performance of Bilingual Education Student at the GCE O/L Examination 2009	79
Table 6.1.	Mean Scores and Standard Errors of Mean scores in Mathematics by Gender and by Location, 2005 and 2008	83
Table 6.2.	Performance in Mathematics at the GCE O/L Examination	86
Table 6.3.	Comparison of the NCTM Standards and Sri Lankan Standards	89
Table 6.4.	Comparison between Primary Mathematics Content Standards of Sri Lanka and Singapore	90

Table 6.5.	Performance of School Candidates in Combined Mathematics at the GCE A/L	95
Table 7.1.	Mean Scores and Standard Errors of Means Scores in Science by Gender and by Location, 2005 and 2008	98
Table 7.2.	Themes in the Secondary Science Programs in the USA, Singapore and Sri Lanka	104

BOXES

Box 2.1.	Investment in ICT and Education	38
Box 3.1.	Incentive Payments for Teachers in OECD Countries	46
Box 3.2.	School-Based Teacher Development in Mexico and Madagascar	47
Box 3.3.	Teacher Performance and Pay in Andhra Pradesh, India	48
Box 3.4.	Merit and Needs-Based Teacher Recruitment in Sindh Province, Pakistan	49
Box 3.5.	Impact of School-Based Management: Cross-Country Experience	51
Box 3.6.	School-Family-Household Interactions to Promote Learning	56
Box 4.1.	Curriculum Changes and Social Cohesion in South Africa and Guatemala	60
Box 4.2.	Singapore's Language Policy	62
Box 5.1.	English Language Teaching and Learning in China	68
Box 5.2.	Common Constraints in the Teaching of English as a Second Language	74
Box 5.3.	A Range of Initiatives to Improve English Language Learning	75
Box 5.4.	An Innovation in English as a Second Language Teaching in South Australia	77
Box 5.5.	The Bilingual Education Program in Turkey	78
Box 5.6.	Content and Language Integrated Learning (CLIL) in the Netherlands	81
Box 6.1.	Factors Associated with Higher Performance in TIMSS	91
Box 6.2.	Shortcomings in the Mathematics TIMs for Junior Secondary Education	92
Box 7.1.	Aims of the Singapore Lower Secondary Science Syllabus (2008)	103
Box 7.2.	Scottish Schools Digital Network (Glow)	108

Vice President

Isabel Guerrero

Country Director

Diaretou Gaye

Sector Director

Michael Rutkowski

Sector Manager

Amit Dar

Team Leader

Harsha Aturupane

TEAM MEMBERS

This report was written by a team consisting of Team Leader Harsha Aturupane (Lead Education Specialist, SASED) and team members Deepa Sankar (Senior Economist, SASED), Hiroshi Saeki (Operations Analyst, SASED), Mari Shojo (Education Specialist, SASED), and consultants Anil Deolalikar (University of California), Visaka Dissanayake, Ruth Dixon (Imperial University, London), Lesley Drake (Imperial University, London), Roshini Ebenezer (Imperial University, London), Paul Glewwe (University of Minnesota), Rozana Himaz (Oxford University), Romaine Jayewardene (Colombo University), Thomas Kellaghan (Education Research Center, Ireland), R.S. Medagama (Imperial University, London), Benoit Millot, Marie Perera (Colombo University), Renato Ravina (University of Minnesota), Upul Sonnadara (Colombo University), Ruvan Weerasinghe (Colombo University), Suzanne Wisnieskwi (University of St. Thomas) and Damaris Wikremanayake. The peer reviewers were Kin Bing Wu (Lead Education Specialist, EASHE), Lianqin Wang (Senior Education Specialist, MNSHD) and Dileni Gunewardena (University of Peradeniya).

ABBREVIATIONS AND ACRONYMS

ABOE	Activity Based Oral English
CCRE	Consultative Commission for Education reform
CEEE	Centre of Excellence for English Education
CLIL	Content and Language Integrated Learning
COTE	College of Teacher Education
CSR	Corporate Social Responsibility
DECS	Department of Education and Children's Services
DOE	Department of Examinations
EPD	Education Publication Department
ERA	Environment Related Activities
FRESH	Focusing Resources on Effective School Health
ESDFP	Education Sector Development Framework and Program
ESL	English as a Second Language
GCE A/L	General Certificate of Education Advanced Level
GCE O/L	General Certificate of Education Ordinary Level
GDP	Gross Domestic Product
GOSL	Government of Sri Lanka
IBO	International Baccalaureate Organization
ICT	Information and Communication Technology
IELTS	International English Language Testing System
ISA	In-Service Advisors
IT	Information Technology
MOE	Ministry of Education
MRI	Medical Research Institute
NBUCRAM	Norm-Based Unit Cost Resource Allocation Mechanism
NCOE	National College of Education
NCTM	National Council of Teachers of Mathematics
NEC	National Education Commission
NEREC	National Education Research and Evaluation Center
NIE	National Institute of Education
NSF	National Science Foundation
OECD	Organisation for Economic Co-operation and Development
PISA	Programme of International Student Assessment
PSI	Program for School Improvement
RESC	Regional English Support Center
S&T	Science and Technology
SBM	School-based Management

SBTD	School-based Teacher Development
SCPEU	Social Cohesion and Peace Education Unit
SDC	School Development Committee
SHPP	School Health Promotion Program
SLAAED	Sri Lanka Association for the Advancement of Education
SLAAS	Sri Lanka Association for the Advancement of Science
SMC	School Management Committee
SMI	School Medical Inspection
TC	Teacher Center
TESL	Teaching of English as a Second Language
TIM	Teacher's Instructional Manual
TIMSS	Trends in International Mathematics and Science Study
TOEFL	Test of English as a Foreign Language
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UNTAET	United Nations Transitional Administration in East Timor
WFP	United Nations World Food Programme
WHO	World Health Organization

ACKNOWLEDGEMENTS

The team acknowledges with sincere gratitude the assistance of several World Bank colleagues and Sri Lankan counterparts in the preparation of this education sector report. In particular, Diaretou Gaye (Country Director for Sri Lanka and the Maldives), Naoko Ishii (former Country Director for Sri Lanka and the Maldives), Michal Rutkowski (Sector Director, Human Development), and Amit Dar (Education Sector Manager); a number of government officials, particularly Mr. H.M. Gunasekera (Secretary, Ministry of Education), Mr. S.U. Wijeratne (Additional Secretary, Planning and Performance Review), Mr. Hemantha Premathilaka (Additional Secretary, Education Quality Development), Mr. Mohamed Thamby (Additional Secretary, Human Resource Development), Ms. Madura Wehella (Director, Policy and Planning), Dr. Jayantha Balasuriya (Deputy Director, Policy and Planning), Mr. Anura Edirisinghe, (Commissioner-General, Examinations), Mr. W. Pushpakumara (Commissioner-General, Education Publications), Dr. Jayanthi Gunasekera, (Assistant Director-General, NIE), Ms. Priyanthi Samaraweera, (Assistant Commissioner, EPD), Mr. Niel Gunadasa (Director, ICT, MOE), Ms. Priyatha Nanayakkara, (Director, Bilingual Education, MOE), Mr. H.W. Wijedasa (Director, Mathematics, MOE), Mr. M.P. Wipulasena (Director, Science, MOE), Mr. Lionel Premachandra (Director, English and Foreign Languages, MOE), Ms. Kamani Perera (Director, Commerce and Business Studies, MOE), Ms. Gayathri Abeygunesekera (Commissioner, DOE), Mr. Rienzie Subasinghe (Deputy Commissioner, DOE), Mr. Ariyaratane Hewage (Chairman, Finance Commission), Mr. Asoka Gunewardena (former Chairman, Finance Commission), Mr. W.H. Munasinghe (Secretary, Finance Commission) and several present and former officials of the Finance Commission including Mr. M.L.A. Chandradasa, Mr. Mahinda Gammampila, Mr. Sisira Liyanage, Mr. Phillip Senaratne, Mr. Wilfred Perera, Mr. Prasanna Weerasinghe, Mr. Ananda Lecamwasam, Mr. K.W.K. Premadasa, Mr. S. Thillanadarajah, Mr. Ranga Perera, and provincial education authorities who were extremely helpful at various stages of the study. We also would like to thank the National Education Research and Evaluation Centre (NEREC) of the University of Colombo, various branches of the Ministry of Education (MOE) and the National Institute of Education (NIE), Education Publications Department (EPD), Department of Examinations (DOE) and Department of Census and Statistics (DCS). The peer reviewers were Dileni Gunewardena (Senior Lecturer, University of Peradeniya), Kin Bing Wu (Lead Education Specialist, EASHE), and Lianqin Wang (Senior Education Specialist, MNSHD). The report was financed by the World Bank and the Education Program Development Fund (EPDF) of the Education for All: Fast Track Initiative.

EXECUTIVE SUMMARY

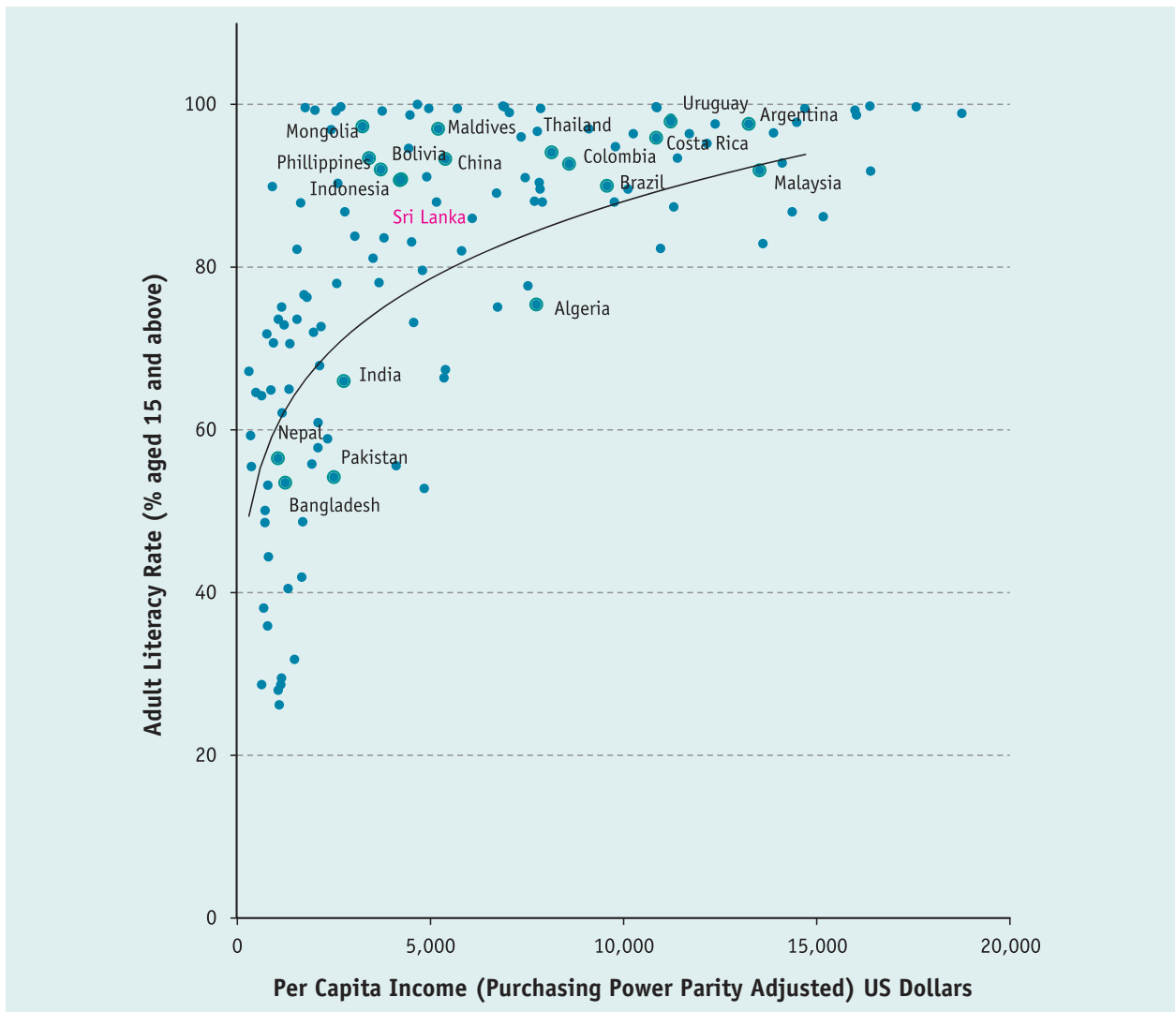
1. **Sri Lanka stands upon the threshold of two great transformations.** The first transformation is the advancement and progress of the nation from a low-income country to a middle-income country. The second transformation is the transition of the nation from a country in conflict to a country in lasting peace.
2. **The general education sector is at the heart of these two great transformations.** The school system makes a unique and foundational contribution to the economic development of a country. The school system also makes a unique and foundational contribution to the social development of a nation. As such, the general education sector, which covers primary and secondary education, can and should play a prominent role in the economic and social transformation of the country.
3. **Sri Lanka has been well-known in development policy circles as a country with good education attainment levels in basic indicators such as primary school enrolment and completion, and adult literacy** [World Bank (2005a), Aturupane (2009), Little (2010)]. The literacy level of countries is of vital importance for development, as the education attainment of people generates a variety of economic and social benefits. Sri Lanka's performance on adult literacy is illustrated in Figure 1 below.^a According to the information in Figure 1 Sri Lanka is one of the better performers among developing countries, with an adult literacy rate above the expected value for its level of *per capita* income. However, there are a number of countries in other regions of the world, at similar or lower levels of *per capita* income, that enjoy literacy rates above the predicted values for their levels of *per capita* income, and which display a performance on literacy superior to that of Sri Lanka. These include countries such as Bolivia, Indonesia, Mongolia and the Philippines. There are also countries that have higher *per capita* incomes than Sri Lanka and perform better on adult literacy, such as Argentina, Brazil, Costa Rica, Colombia, China, Thailand and Uruguay. Overall, Sri Lanka performs well, but not exceptionally so. This is different to the position enjoyed by Sri Lanka in earlier decades, when it was considered one of the best performers among developing countries [Aturupane (1993), Kakwani (1993), Aturupane *et al* (1994), UNDP (1998)]. Sri Lanka has now been overtaken by a number of middle-income countries that have successfully accelerated the development of their education systems and economies.

Education is Central for Economic Development

4. **The human capital foundations of a modern knowledge economy are established at the stage of general education.** The quality of general education determines the capabilities of students

a Points above the regression line are countries whose adult literacy rate is above the expected value, given their level of national income *per capita*. Points on the regression line are countries whose adult literacy rate is at the expected value, given their level of national income *per capita*. Points below the regression line are countries whose adult literacy rate is below the expected value, given their level of *per capita* income.

Figure 1. Adult Literacy in Relation to GDP Per Capita of Middle Income and Low Income Countries



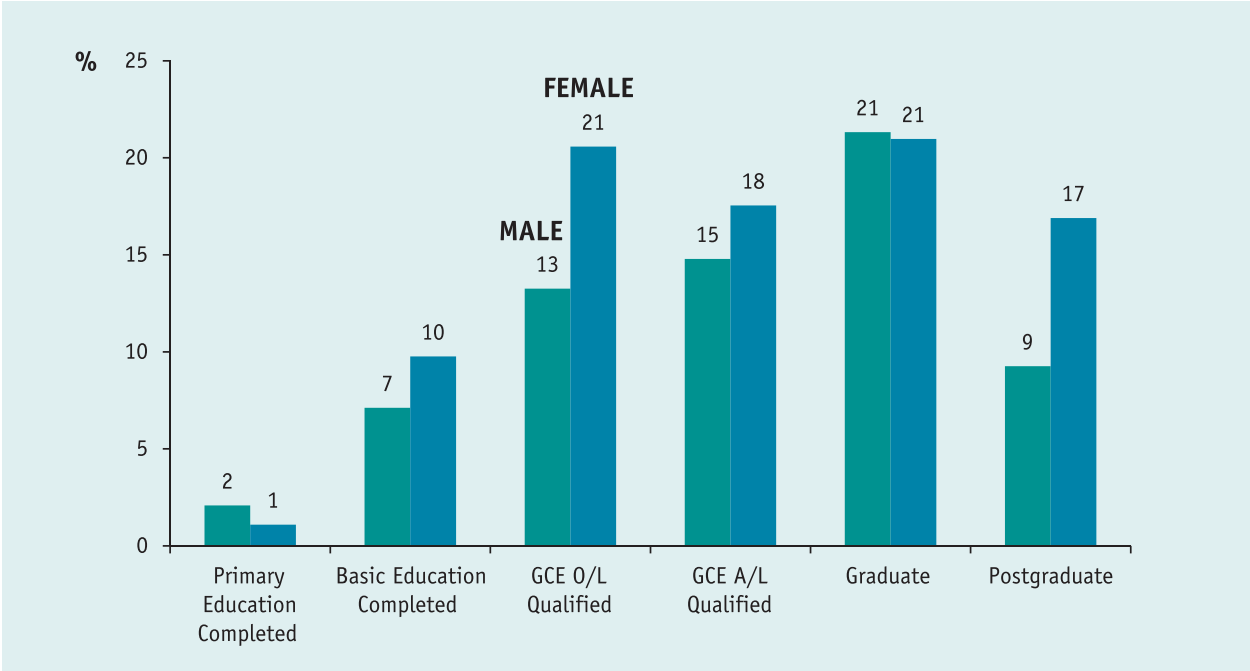
entering the higher education sector, which in turn is a key determinant of the quality of university graduates. The quality of general education also determines the competencies of entrants into the vocational and technical training sector, which is a key factor influencing the quality of skilled personnel emerging from training institutions. Also, many individuals at various stages of the general education system directly enter the labor market. The quality of general education determines the productivity of these employees and workers. In consequence, the general education sector plays a central role in determining the productivity of the labor force and the performance of the economy. Moreover, the importance of the economic role of the education sector has been expanding and rising rapidly in recent years, as global production processes have become increasingly knowledge intensive.

5. **Education has a powerful impact on earnings and economic welfare in Sri Lanka.** The rates of return to education are positive, and substantial at the secondary and higher education levels [Figure 2]. This pattern of returns to education reflects the fact that the supply of primary and basic educated human capital is relatively high in the country, so that returns to education at this level are small. At secondary education level and higher education level, however, the supply of educated labor is lower, and returns to education are high. In addition, workers may be using their educational certificates at secondary education and higher education levels to signal their quality, while employers may be using these certificates to screen potential employees for quality. Education attainment is also positively related to the economic prosperity of households and individuals [Figure 3]. As the education levels of the principal income earners of households rise the impact on economic welfare increases. The greater welfare of more educated households results from several channels. More educated individuals normally work in better quality jobs, with higher earnings streams. In addition, educated individuals are generally better at making rational consumption and investment decisions.

Human Capital is Increasingly Important for the Global Labor Market

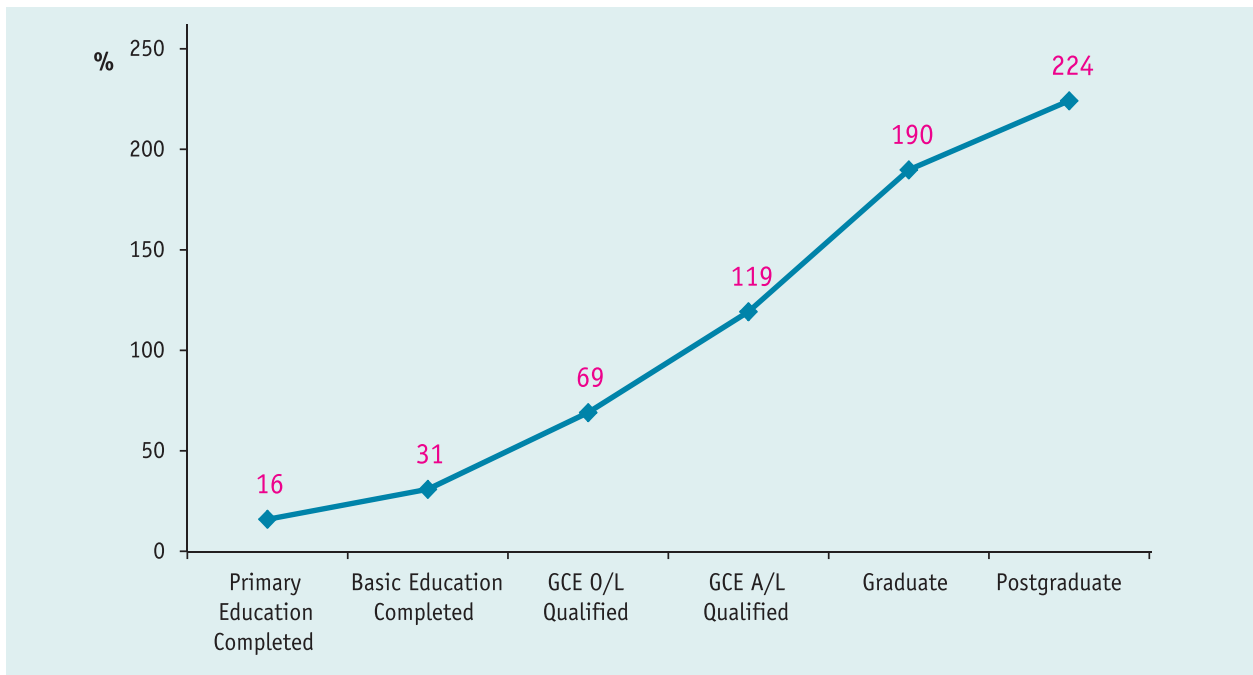
6. **The skills required for economic development are undergoing a world-wide transformation.** Up to the 1970s routine cognitive tasks, which are mental tasks with well-defined logical rules (e.g. maintaining expense reports) and routine manual tasks, which are well-defined using such rules (e.g. installing standard equipment) were important in economic production

Figure 2. Private Rates of Return to Education, Male and Female Workers



Source: World Bank staff computations, derived from econometric estimates of earnings functions.

Figure 3. Economic Welfare by Education Level of the Principal Income Earner of a Household

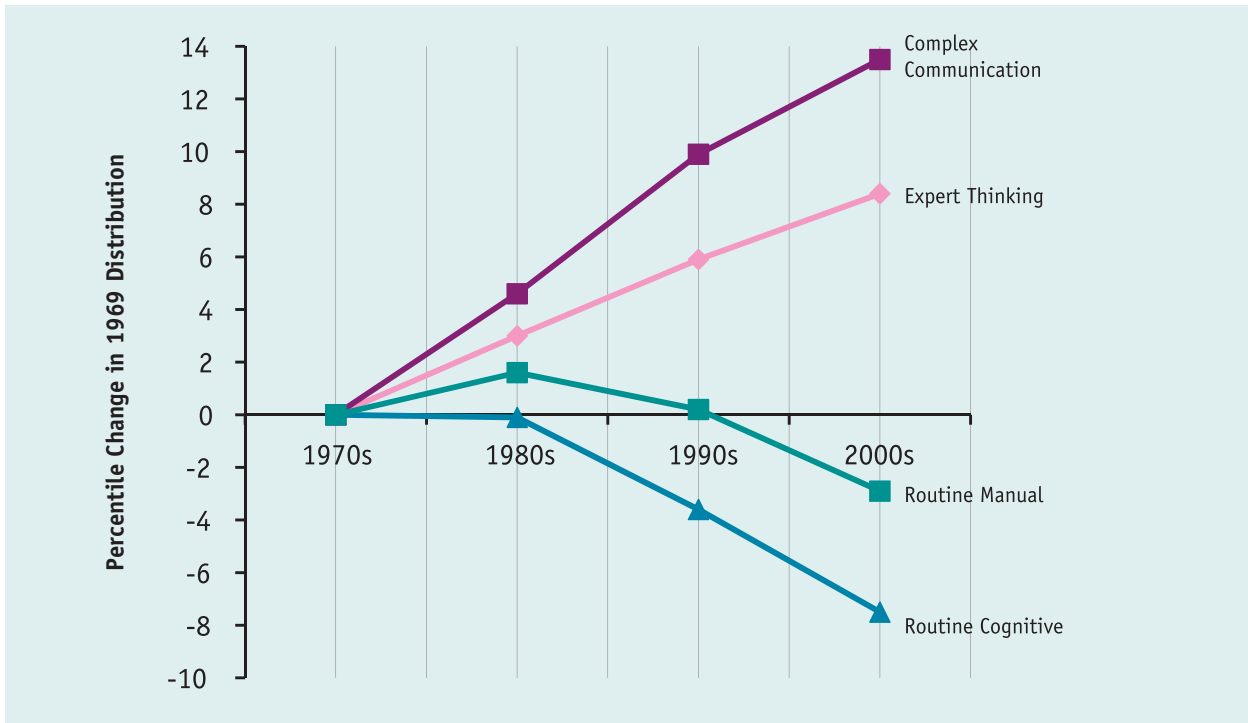


Source: Himaz and Aturupane (2011).

processes. However, since the 1970s the relative importance of these skills has been declining in sophisticated economies, especially with increasingly complex automation and technology-intensive machines available to perform many of these tasks. Instead, skills such as expert thinking, which requires creative solutions to problems for which there are no simple rule based solutions (e.g. diagnosing the illness of a patient with puzzling symptoms), and complex communication, which involves inter-personal interactions to acquire and explain information, and if necessary use this information persuasively (e.g. a manager motivating her work force) are becomingly increasingly important in advanced and upper-middle income economies [World Bank (2008b) based on Levy and Murnane (2004)]. This transformation in skills required for economic advancement is illustrated in Figure 4.

7. **Employers are demanding high levels of “soft skills”.** Employers list skills such as habits of discipline and industry, creativity, good communication, collaborating in teams, problem solving, decision making, initiative, punctuality and the ability to work to deadlines, and adaptability and trainability as key skills needed for the work place. In addition, formal private sector organizations, especially those involved in international trade and finance, stress the importance of fluency in international languages, particularly English language skills. Scientific and industrial occupations require individuals with good mathematics and science knowledge and skills. The ability to use information technology is a basic requirement in the modern world. The higher education system

Figure 4. The Changing Composition of Skills Needed in Economies in the 21'st Century



Source: Adapted from World Bank (2008b) and Levy and Mundane (2004).

also requires the soft skills, English language fluency and basic IT literacy in the graduates of the school system who are the entrants into higher education institutions.

Key Dimensions of Human Capital

English Language Skills

8. **English has become the principal language of the global knowledge economy.** It is the most widely used language in international finance, trade and commerce. It is the main language in which research findings and conclusions, especially scientific discoveries, are published and disseminated within the community of academics and scholars. It is also the chief language in which new scientific knowledge is communicated to the organizations that transform these discoveries into technological advancements that are of practical benefit to people. There are several strategic policy initiatives that can assist the government to develop and improve the teaching and learning of English in the future. In particular, a multi-pronged strategy, containing a variety of initiatives and covering the school environment, curriculum related activities, and co-curricular activities, would be both optimal. Creating an immersion English environment in the school, where feasible, is like to be the single most effective initiative to promote the English language skills of students.

Bilingual Education

9. **Bilingual education is a recent innovation.** Under the Bilingual education policy, students are offered the option of learning some subjects in the English medium from grades 6-13. Bilingual education is available in a wide range of countries, especially in Europe and Asia. The principal objective of the Bilingual Education policy is to improve the economic opportunities of students when they complete their education, as individuals fluent in English are in strong demand in the national and international labor markets. A second objective is to enable students from different ethnic communities to study in the same school, in order to promote social cohesion. There is widespread demand for Bilingual Education, and over 55,000 students from 601 schools are now participating in the Bilingual Education Program.

10. **The government needs to develop a suitable Content and Language Integrated Learning (CLIL) Framework to develop the Bilingual Education Program.** The CLIL could be integrated within the Common Framework of Reference, such as the Common European Framework of Reference. The Bilingual education program would then fit into a clear, logical and internally consistent education framework. This would facilitate the development of the Bilingual education program as an integrated education development strategy.

Mathematics Education

11. **A high quality mathematics education is essential for everyday life and for the workplace in the modern world.** Practical mathematical skills are needed for everyday living. In addition, many jobs require expert thinking and non-routine analytical skills in order to identify and solve problems. Mathematics education focuses on developing a person's analytical and problem solving skills. Mathematics is also an exciting subject which challenges the mind and offers opportunities for students to enhance their creative abilities.

12. **The key reform needed to strengthen mathematics education in Sri Lanka is for the secondary school curriculum to be sufficiently differentiated to take into account heterogeneity among students.** The practice in countries such as the U.K. and Singapore, in consequence, is to have two mathematics subjects at the GCE O/L, one an advanced or higher mathematics subject for students intending to pursue mathematics-intensive subjects such as physics, engineering, economics (and of course mathematics itself) at higher levels of education, and a second practical mathematics subject for other students who will mainly require mathematics for day-to-day living later in life. The Ministry of Education could consider adopting the practice of countries such as the U.K. and Singapore and have two mathematics subjects, an advanced or higher mathematics subject and a practical mathematics subject, at the GCE O/L, to take into account student heterogeneity and cater to the needs of the different groups of students.

Science Education

13. **The importance of science education has been recognized in Sri Lanka's science and technology policy.** The National Science and Technology Policy acknowledges that Science and Technology (S&T) plays a key role in economic development and that education is central to achieving this goal [NASTEC (2009)]. The policy recognizes that investment in research and development as well as in a strong S&T resource base is essential to compete successfully in the rapidly growing technology-intensive global market. This is necessary given that high technology exports form only one percent of Sri Lanka's manufactured exports compared with 27 percent in Thailand, 55 percent in Malaysia and 57 percent in Singapore. The S&T policy strongly advocates a quality science education which encourages an inquiring mind in students and fosters a culture of innovation and entrepreneurship.

14. **The study of science in the school system needs to develop away from learning of large volumes of scientific information to one of student directed inquiry.** A fundamental change in the organizational structure of the science syllabus is needed to reflect the manner in which the essential components of content, skills/processes and attitudes are to be balanced to achieve learning outcomes within a scientific theme [Dissanayake and Sonnadara (2011)]. An organizational structure for guiding teachers on how to weave content, skills/processes and attitudes needs also to be included in the Teacher's Instructional Manual (TIM). The activities relating to the competency levels must be directed to student directed inquiry and not towards learning content. It is essential to make this change to develop students' higher order thinking skills and sharpen their skills in open ended problem solving and decision making. New knowledge creation and innovation will not be possible without this fundamental change.

Education Plays a Vital Role in Shaping a Country's Social, Cultural and Political Life

15. **The social dimensions and benefits of education are being increasingly appreciated in developed and middle-income countries.** The social and cultural foundations of an enlightened modern democracy are established at the stage of general education. The school system inspires and shapes a country's values, ethics, and social institutions. This includes the attitudes of citizens towards social and cultural diversity, and ethnic and religious pluralism. In addition, the school system has a vital influence on the values, ethics, codes of conduct and patterns of behavior that are needed for democratic institutions to flourish. Hence, the school system has a central role to play in the future development of Sri Lanka as a modern, liberal political democracy.

16. **Among the many social benefits of education, promoting social cohesion in countries has become extremely important in the modern world,** as global mobility of culturally diverse populations has posed challenges to the shared values, ethics and identities of societies. The instantaneous transfer of diverse and varied information through modern communications technologies has further increased the importance of social cohesion. Cohesive societies are

more effective in achieving collective economic and social goals, since such societies are better at including and uniting diverse groups and forging synergy [Greaney (2006)]. Five dimensions of social cohesion, belonging, inclusion, participation, recognition and legitimacy, are especially important for multi-ethnic, multi-cultural and multi-religious societies such as Sri Lanka.

17. **In Sri Lanka education can play a prominent role in building mutual understanding and trust amongst the country's diverse ethnic, cultural and religious groups.** Since the 1990s, policymakers have been aware of the need to restructure the education system so that it would help inculcate values of peace and social integration in the future generations. The Ministry of Education has taken the vital step of preparing a national policy on promoting social cohesion through education. The national policy identifies seven strategic areas through which social cohesion can be developed. These are: (a) curriculum; (b) teacher education; (c) second national language (2NL); (d) whole school culture; (e) integrated schools; (e) co-curricular activities; and (g) research.

18. **The curriculum introduced for Life Competencies and Civics Education (grades 6-9) and Citizenship Education and Governance (grades 10-11) that successfully integrates peace education concepts and values of cooperation and respect for others is an excellent foundation to promote democracy and social cohesion through education.** The curriculum includes the role of citizens, their rights and responsibilities, good governance and participation in a democracy. It also deals with international norms and human rights and the role of international organizations. Further the curriculum seeks to help promote the need for sensitivity to difference and respect for diversity of cultures in a multi-ethnic, multi-religious and multi-cultural society. In this sense the curriculum for the GCE O/L examination presents an excellent opportunity. However, at present Life Competencies and Civics Education is a compulsory subject only in grades 6-9, Citizenship Education and Governance is only an optional subject for grades 10-11 and barely 20 percent (approximately 75,000) of students offer the subject for the GCE O/L. The government should consider including this subject among the list of compulsory subjects for the GCE O/L, so that all students would follow it.

Governance and Delivery of Education Services

19. **The general education sector has a complex governance framework, combining elements of de-concentration, delegation and devolution of functions and powers between the central government and the nine provincial councils.** The central government is responsible for the formulation of national education policies, norms and standards. Provincial councils play an important role in the management and delivery of education services. General education is the most decentralized sector in the country, with education budgets typically accounting for over half of all provincial expenditures.

20. **The division of roles and functions between the center and provinces attempts to combine the advantages of centralized academic systems with the benefits of *delegated management systems*.** Centralized academic systems, especially covering curriculum and examinations, facilitate goals such as nation-building, increased social cohesion, and uniform quality standards. Delegated management systems enjoy greater proximity of service delivery to beneficiaries such as students, parents and guardians, school principals and teachers.

Teacher Management and Development in a Decentralized System

21. **The quality and quantity of teachers are a crucial determinant of education performance and student learning outcomes.** At the aggregate level, the country has an adequate number of teachers, with approximately 214,000 teachers and a student-teacher ratio of 18:1. If anything, this is a low student-teacher ratio which is expensive to maintain. However, teacher deployment is a problem, especially for teachers of subjects such as English, science, mathematics and IT. Certain schools, particularly those rural schools in difficult areas find it extremely hard to attract and retain teachers in these subjects. The Ministry of Education and Provincial Councils are in the process of trying out several initiatives to improve teacher deployment, including faster promotions for teachers serving in disadvantaged schools, providing living accommodation for teachers in such schools, and giving preference to individuals in the districts which experience the worst teacher shortages when selecting candidates for teacher trainee positions. Three further policy measures that could be promising are: (a) the payment of a substantial monthly financial incentive for teachers to locate in schools in difficult areas, as is the practice in many OECD countries; (b) identifying a geographical area within which teachers transfers are relatively uncontroversial, and improving teacher deployment within these areas through appropriate teacher transfers and appointments; and (c) changing teacher recruitment from the present centralized system to a fully decentralized system of school-based teacher recruitment.

22. **A new initiative, School-based Teacher Development (SBTD), is a promising initiative to improve the quality of teaching.** Under this concept teacher development takes place directly at the school level. This model has been noted globally for its effectiveness [Allemano *et al* (2011)]. SBTD involves the active participation and direct control by school teachers, school principals, and officials in the school support network, such as in-service advisors. The activities under SBTD typically include school-based mentoring, peer learning, peer coaching, individual consultation, and visits to other classroom. As the pilot program developed it became popular in schools. The international experience supports SBTD as a promising reform to be scaled up in the future.

The Program for School Improvement: A Successful Innovation that Can be Scaled-Up

23. **The Government of Sri Lanka embarked on an innovative pilot initiative called the Programme for School Improvement (PSI) to empower schools and local school communities** in 2006. This initiative was influenced by reforms in developed countries, such as the U.S.A., the

U.K., Australia and Canada, as well as developing countries in East Asia and South Asia, to devolve managerial power to schools. The objective was to enable schools to become increasingly self-managing, with strong community involvement, and improve the delivery of education services.

24. **The PSI has been highly popular with school communities, including principals, teachers, parents and local community members.** Among school community members support for the PSI has been nearly universal. Schools principals and teachers state that they feel more empowered and motivated. This echoes findings in countries such as Hong Kong, China [Dimmock and Walker (1998)] and Israel [Gaziel (1998)] where principals and teachers expressed perceptions of greater empowerment, commitment and achievement orientation. Local community members also felt that they had more voice and influence in the management of schools after the introduction of the PSI. This is similar to findings in countries such as El Salvador [Sawada and Ragatz (2005)] where local community members expressed a sense of greater efficacy and commitment towards the school.

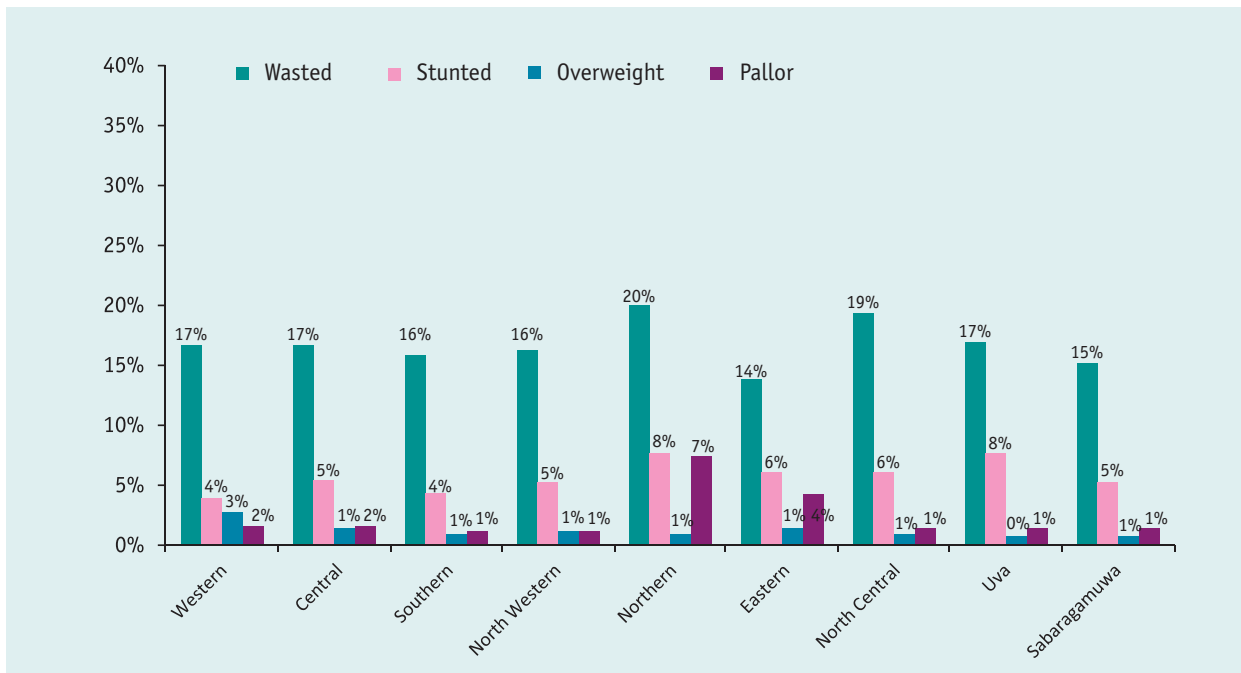
25. **The PSI has shown positive impact on learning outcomes in Sri Lanka.** A rigorous impact assessment, based on a randomized design and carried out over the period 2006 to 2008, found that participation in PSI was associated with an increase in the mathematics and English language test scores of grade 4 pupils. This is a significant finding, as improvements in learning outcomes through school-based management reforms are not universal. Countries that have demonstrated positive results include El Salvador, Kenya, Mexico and Nicaragua.

26. **A number of factors were found to have contributed to this favorable outcome** in Sri Lanka [World Bank and EFA-FTI Secretariat (2011)]. The leadership provided by dynamic and well-motivated schools principals was of central importance. In addition, increased teacher and parental involvement in the education process, at school and at home, contributed to this outcome. School development committees directed their efforts at increasing resources, both cash and in-kind, for their local schools. These resources were used for co-curricular and extra-curricular activities such as drama and literary events, and athletics, games and sports. Also, the resources were used for curriculum-related activities such as the purchase of children's story books for the library, and trips by school children to places of cultural or historical interest.

27. **Principals and teachers stated that the active involvement of parents, past pupils and other local community representatives invigorated and stimulated their schools.** This was particularly important in small and remote rural communities. Parents were delighted to be involved in school affairs, and felt it gave them greater ownership and commitment to the education of their children. Past pupils of schools saw their support as "giving something back" to the schools from which they had benefited when they were themselves children.

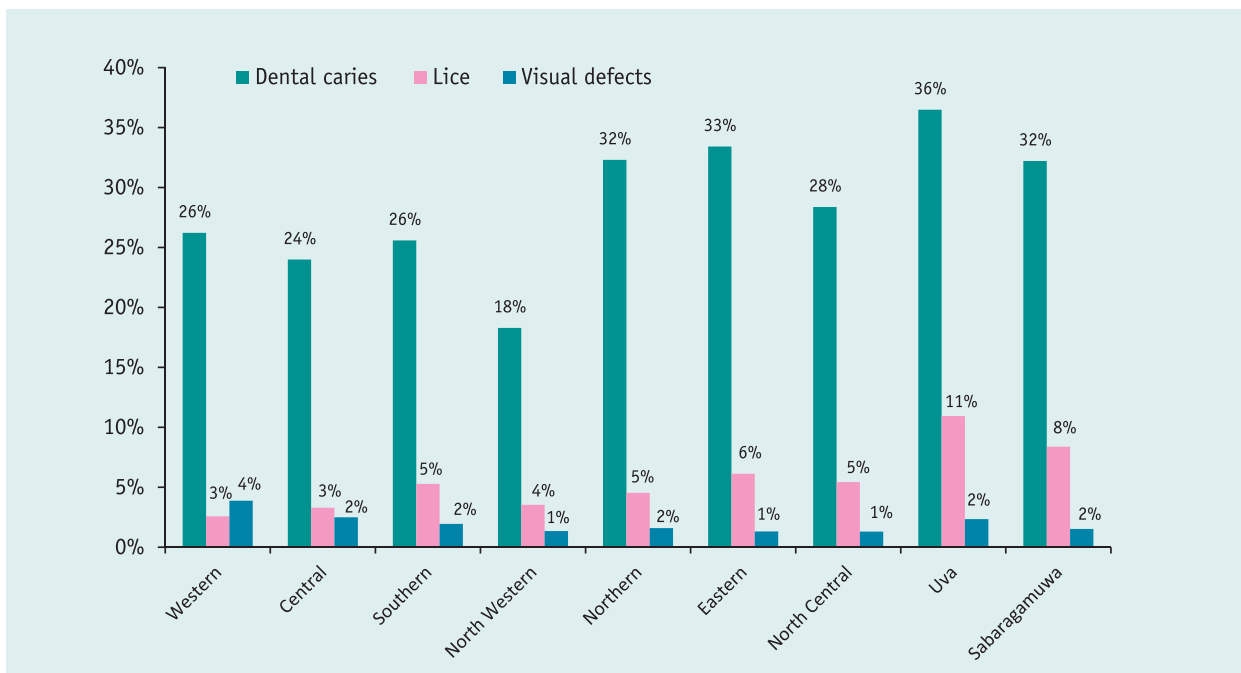
28. **The Program for School Improvement should be elevated to a higher level, rising from mainly distal activities to proximal activities.** Supporting schools to develop a parental involvement program has to date been largely restricted to distal activities (attending meetings, involvement in

Figure 5. Nutrition Problems among School Children in Sri Lanka



Source: Data provided by the Family Health Bureau (2010) and represents the first three quarters of 2010.

Figure 6. Common Health Problems among School Children in Sri Lanka



Source: Data provided by the Family Health Bureau (2010) and represents the first three quarters of 2010.

school committees, engagement in voluntary work or making financial contributions to maintain or improve physical conditions, resources, and services). This can now be elevated to a program in which attention is paid to proximal activities, such as: (a) developing parents' understanding that the home environment has a profound impact on the school learning of children and that they have the power to change it; and (b) developing parents' self-confidence and sense of efficacy in establishing a home environment that will provide rich learning experiences for children.

29. **The PSI should also be extended to make communities contribute to the development of “competencies for life”, so-called “soft skills” or generic skills which are necessary for effective functioning in personal life, interpersonal relationships, and employment/ economic activities** (e.g. critical and divergent thinking, problem solving, creativity, initiative, leadership, responsibility, team work). Experience in community activities is often more relevant and appropriate in developing these skills than school-based experience which is often preoccupied with covering syllabuses and preparing students for examinations. Community activities also provide opportunities to develop social cohesion through learning to live with others in harmony, respecting the diversity of a multi-ethnic, multi-religious and multi-cultural society.

Inter-Sectoral Linkages: School Health and Nutrition and Education Outcomes

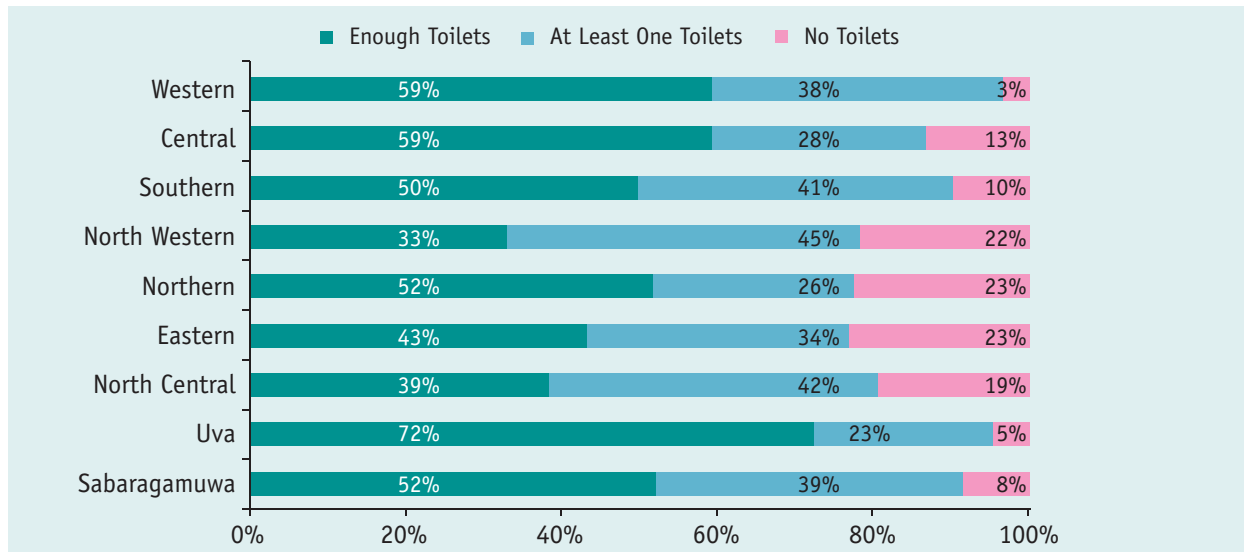
30. **School health and nutrition programs are increasingly recognized as important policy initiatives to improve education outcomes.** School health and nutrition programs have gained higher priority on the modern global development agenda especially due to recent evidence on the positive impact of children's health and nutrition levels on educational outcomes. This recognition has driven the formation of health and education partnerships to utilize the resources, technical capacity and infrastructure of both sectors so that their interaction can contribute to improved access and maximized education outcomes. Schools provide a platform for the delivery of child health and nutrition services, where they can strengthen the effectiveness of global health interventions and deliver gains in education participation and learning.

31. **School children in Sri Lanka experience complex health and nutrition needs.** Figures 5 and 6 provide data from the 2010 school inspections covering about 682,800 children across all provinces. The data displays, as described above, that obesity (overweight) is a problem, especially in the Western province and is seen alongside under-nutrition (wasted/stunted) and pallor (used in the SMI as a proxy for anemia), which are both particular problems in the Northern province. Both lice infestation and dental caries are also displayed as pervasive issues affecting large numbers of school-age children in Sri Lanka.

32. **Adequate water and sanitation which protects children's right to health and facilitates good hygiene practices are lacking in almost 50 percent of schools.** This is despite their being basic needs for an environment conducive to learning. According to the School Census data, about 49 percent of schools did not have adequate toilet facilities and 18 percent were without adequate water supply [Figure 7 and Figure 8].

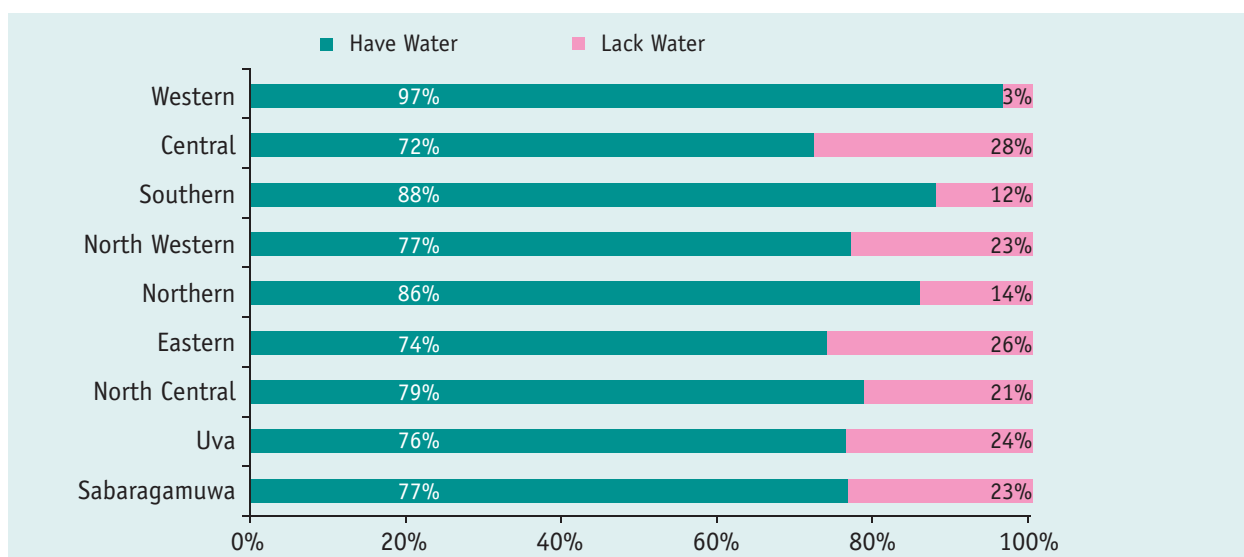
33. **School health and nutrition should be expanded and mainstreamed into secondary schools in the future.** This is an important next step for the school health program in Sri Lanka. Many of the current intervention priorities - malnutrition, hunger, de-worming are targeted toward the poorer sections of the populations, though many emerging issues such as reproductive health, mental health and life skills are also related to older children in secondary school. While some secondary schools have aspects of school health, as Sri Lanka looks to extend the network

Figure 7. Summary of Sanitation in Schools by Province



Source: MOE, Census Branch (2008), Finance Commission (2011).

Figure 8. Summary of Water Availability in Schools by Province



Source: MOE, Census Branch (2008), Finance Commission (2011).

of high quality secondary schools, basic health and nutrition should be clearly mainstreamed and integrated into what represents the gold standard of secondary education as well as their designated primary feeder schools. While this of course encompasses the provision of water and sanitation, and environmental safety to minimum government standards, it should also include interventions which are pertinent to the health of adolescents and young adults and the support they require in maximizing their educational achievement. This may include the provision for targeted iron supplementation for girls, trained school counselors, the establishment of peer support networks for students and teachers, ensuring increased awareness of issues such as reproductive health, appropriate referral pathways and facilities for adolescent health needs and specific life skills teaching for age-appropriate issues.

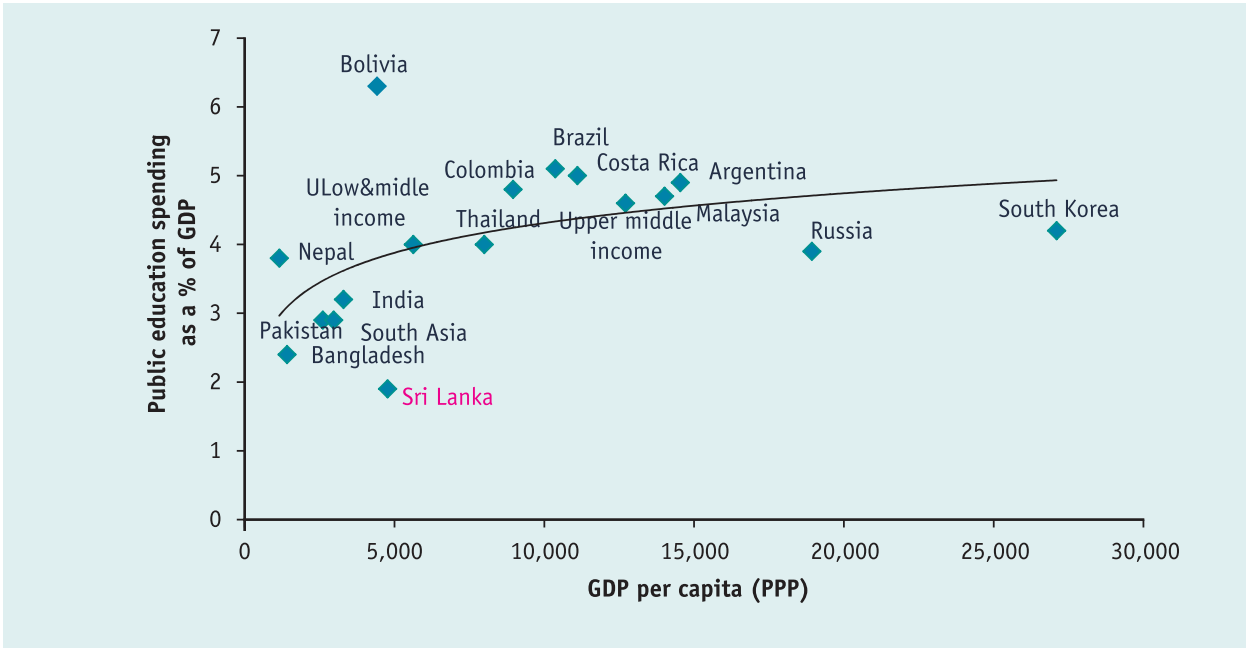
Investment in Education Needs to be Increased and Expanded

34. **Public expenditures on education in Sri Lanka are modest when compared to middle income countries and other comparable nations.** Education expenditure as a percentage of GDP is 1.9 percent and as a proportion of the government budget is 7.3 percent. This is the smallest share of public investment in education among a cluster of countries that share common features with Sri Lanka [Figure 9 and Figure 10]. Public investment in education in Sri Lanka falls below the level of East Asian countries such as South Korea, Malaysia, Thailand and Singapore; Latin American countries such as Argentina, Brazil, Bolivia, Colombia and Costa Rica; and of other South Asian nations such as India, Bangladesh, Pakistan and Nepal. It is also well below the share of investment for middle income countries as a whole. In fact, advanced middle-income countries normally invest about 4.6 percent of national income in education, which is more than double the share of national income devoted to education by Sri Lanka.

35. **The low public investment in education, especially relative to other countries, hurts the Sri Lankan general education system.** This is illustrated in Figure 11. The diagram shows the various countries that participated in the Trends in International Mathematics and Science Study (TIMSS). Sri Lanka was not a participant, but did conduct a National Assessment in which TIMSS items from an earlier round were included as a special module. The scores from this module are used to insert Sri Lanka into the diagram. The information in Figure 11 shows, first, that learning levels are positively associated to per student investment in education. Second, it shows that Sri Lanka, which invests very little on education, also performs poorly in TIMSS. Overall, countries that under-invest in education also under-perform on education outcomes.

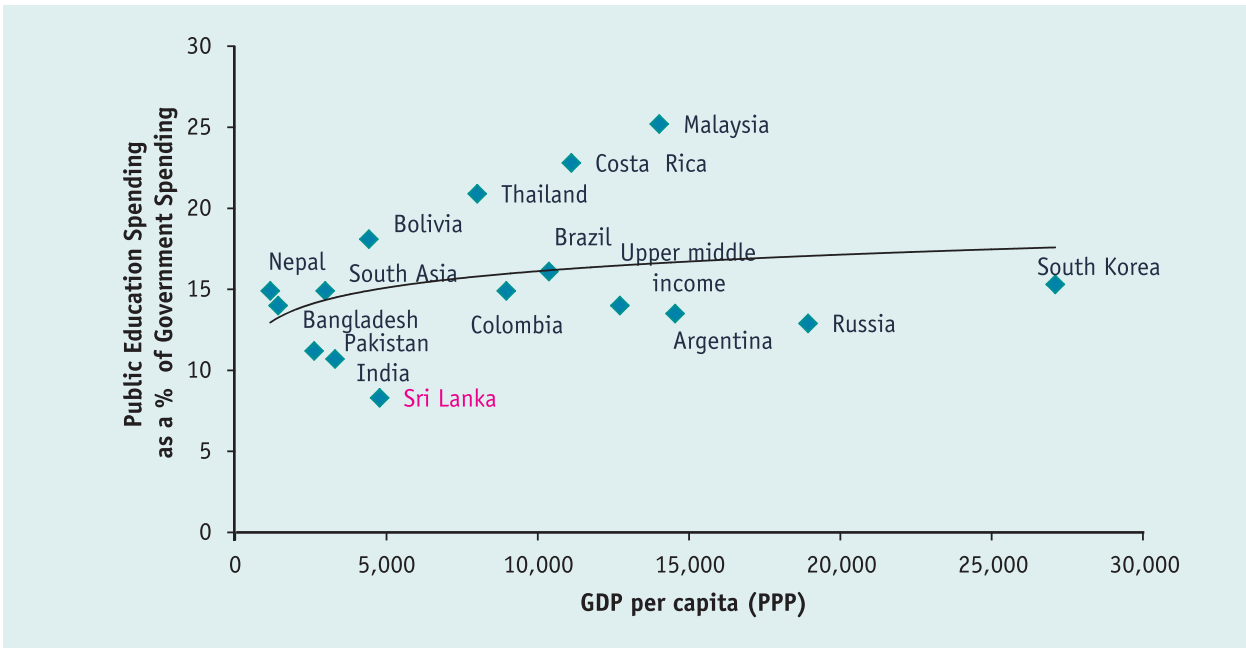
36. **Low investment in education can have several negative consequences for the performance of the education system.** Under-investment in the capital education budget means that the ability of the country to develop a stock of modern education assets and spaces, such as classrooms adapted to the use of technology, IT laboratories, libraries, science laboratories, language laboratories, activity rooms, multi-purpose rooms, IT equipment, science equipment, and teaching-learning material, is severely constrained. In addition, there are about 1,700 schools (around 18 percent of

Figure 9. Public Investment in Education as a Percentage of National Income, 2010 or Nearest Year



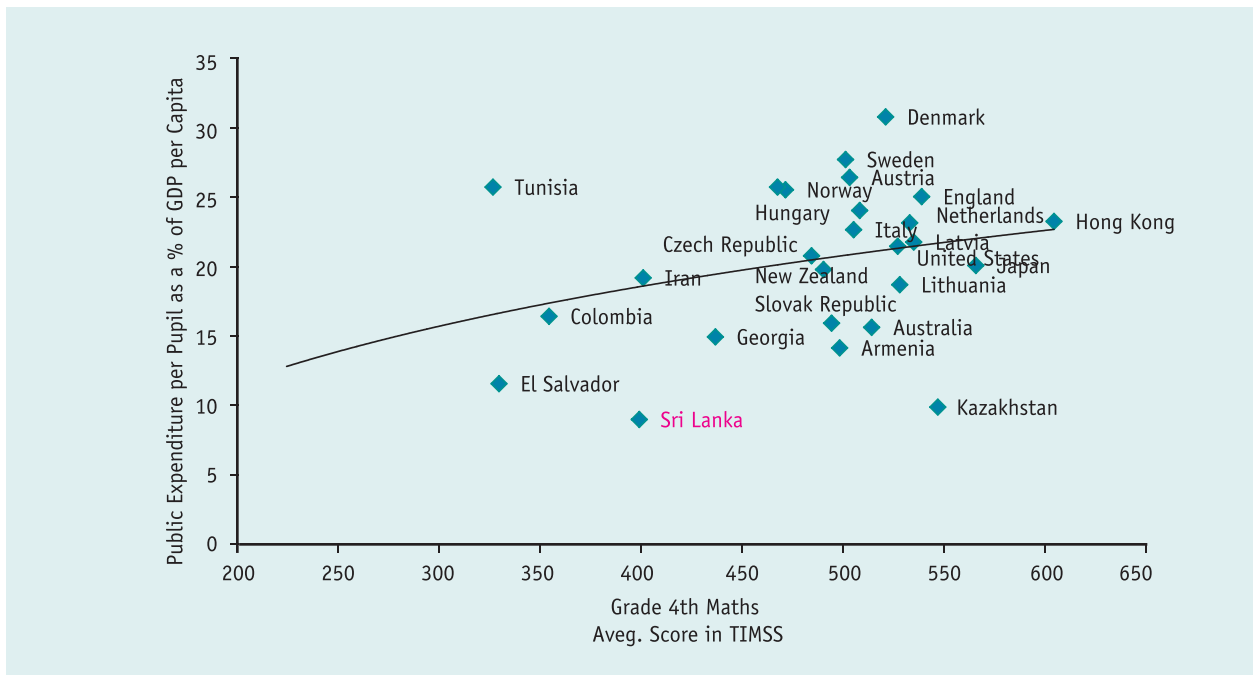
Sources: Central Bank of Sri Lanka Annual Report 2010, Education Statistics and World Development Indicators (World Bank).

Figure 10. Public Investment in Education as a Proportion of the Government Budget, 2010 or Nearest Year



Sources: Central Bank of Sri Lanka Annual Report 2010, Education Statistics and World Development Indicators (World Bank).

Figure 11. Association between Public Investment in Education per Student and Learning Outcomes in TIMSS 2007



Sources: Mullis *et al* (2008). Sri Lanka has been inserted from NEREC 2008.

schools) without drinking water facilities, and approximately 1,200 schools (around 12 percent of schools) without any sanitation facilities. The ability of the country to supply these basic facilities is restricted by the shortage of funds. Low investment in the recurrent education budget means that the country’s ability to spend on quality processes, such as the professional development of teachers and teacher educators, the management and leadership development of school principals and education administrators, the delivery of on-site academic and administrative support to schools, and to provide incentives for teachers to locate in disadvantaged areas, as well as to meet the operating and maintenance cost of capital education investment, is limited. Overall, the ability of the education system to deliver a high quality education experience for school children is tightly constrained by the relatively low level of public investment in education.

37. **Sri Lanka needs to expand the flow of resources into the education sector to transform the general education system into the foundation of a knowledge hub.** Middle-income countries with economies more advanced than Sri Lanka in East Asia, Latin America, and Eastern Europe, invest considerably more in education. In order to invest adequate resources in modern equipment and technology and enable Sri Lankan students to acquire the skills and competencies needed for modern knowledge-intensive economic processes, the country will need to increase investment in education. There are multiple options to increase the resources available for the general education sector.

38. **The government needs, over time, to increase public investment in education.** This would enable the government school system to acquire the stock of modern education assets and spaces, such as classrooms wired for the use of technology, IT laboratories, libraries, science laboratories, language laboratories, activity rooms, multi-purpose rooms, IT equipment, science equipment, and teaching-learning material, that are needed. Basic needs such as clean drinking water and safe sanitation can also be met. In addition, investment in quality processes such as the professional development of teachers and teacher educators, the management and leadership development of school principals and education administrators, and the delivery of on-site academic and administrative support to schools, can be expanded. Greater public investment will also make it feasible to provide fiscal incentives for teachers to serve in schools in disadvantaged areas. Adequate resources for the operating and maintenance cost of capital investment in education is also an important priority.

39. **The government can also encourage public-private partnerships in education.** Sri Lanka already has a model of private-public partnerships through the “assisted schools” model, where the government agrees to fund the salaries of teachers according to certain guidelines, and the school finds resources to meet the other capital and operating expenses. Such a model can be encouraged for schools located in wealthy urban neighborhoods, with affluent parents. Sharing the costs of operating such schools with families would free up public funds and enable the government to increase resources for schools attended by poorer children. An alternative model is for schools to tap into funds available from private firms, perhaps under Corporate Social Responsibility (CSR) schemes to increase the resources available to them, over and above the amounts that the government is able to provide.

Transforming the School System

40. **The transformation and development of the general education sector will be of enormous benefit and value to Sri Lanka.** It will also be a challenging and complex endeavor which will need visionary leadership from political authorities, policy makers and technocrats, and long-term commitment and ownership from the stakeholders in the education system.

41. **The general education system has served Sri Lanka well in the past, but needs a new vision and strategy for the future.** On the positive side, the general education system has underpinned the higher education system, the technical education and vocational training system, the labor market, and the social, cultural and political life of the country. The human and social capital produced through the general education system served Sri Lanka (or something missing here) well when it was a low-income country. There have also been successful reforms introduced in the past, such as the increase in the compulsory education age range to 14 years, the empowerment of schools through the Program for School Improvement, the Bilingual Education Program, School-Based Teacher Development, and the Primary Education reforms. The proportion of students completing

grade 9 has risen to 90 percent, which compares well with countries around the world. Learning outcomes have begun to show a rising trend in key subjects such as mathematics, English and the first language (Sinhala and Tamil). The general education reform and development program of the country should be encouraged by these positive achievements of the past, and rise to address the next set of challenges ambitiously and boldly.

42. **The country now faces a set of major challenges as it seeks to ascend the ladder of middle-income countries.** A secondary education development program which sharply expands the availability of good quality secondary schools is urgently needed. The quality of primary education in remote rural and estate areas needs further improvement. The English language fluency of the school aged population has to rise swiftly, especially after nearly half-a-century of neglect and even antagonism. The pace of technological progress, especially in ICT, is rapid and accelerating. School children need to be able to master and utilize technology and ICT, in ways that are appropriate for their age and stage of neural development. Learning outcomes in a variety of subjects, including mathematics and science, have to improve. The soft skills needed for modern economic processes, such as team work, habits of industry and hard work, meeting deadlines, good communication, problem solving, leadership, initiative and creativity, need to be instilled through the general education sector. The values and ethics needed for a harmonious multi-ethnic, multi-religious society, and for a well-functioning liberal democracy, have to be built through the school system.

43. **The development strategy for school education needs to be communicated widely among the education community, and broad ownership generated.** The local school communities, especially principals, teachers and parents, are of central importance to the improvement of education outcomes. Therefore, the ownership and commitment of school communities is a necessary condition for a successful general education development strategy. The central Ministry of Education and the Provincial Education Agencies need to communicate the scope, objective and rationale for the general education development program to the school communities. The choice of strategies for implementation, and their ordering and sequencing, will need to be accomplished with the participation, ownership and commitment of the school communities.

44. **The school education development strategy can build on past successes and target interventions that directly benefit schools and students.** In particular, the future education development strategy could focus on initiatives that empower schools through managerial authority and resources, streamline and strengthen incentives, and provide more information to local school communities. Such measures have been successful in the past, including when introduced at a pilot level. The future program can broaden and deepen the engagement with school communities, and also scale up the various successful pilot initiatives.

45. **Change and development in the school education sector can have many opponents.** These can include stakeholders who feel that their interests are not represented in the development initiatives proposed, individuals and agencies that are ideologically opposed to the changes

proposed, and groups with vested interests. The leaders of change need to build bridges with all stakeholders who may have concerns about the strategy, and ensure that these concerns are heard and genuine issues addressed. The leaders will also need to manage competing ideologies in a way that enables the best options selected for the strategy to be implemented for the overall benefit of the country.

46. **The development of school education requires sustained, long-term commitment from political authorities.** In particular, innovative initiatives in education governance can be difficult, as these often involve devolving power and authority from administrative tiers to individual institutions such as schools. In addition, innovations in school financing, such as school-based learning improvement grants, can be controversial as they push traditional-minded individuals out of their comfort zones. Further, the promotion of a multi-ethnic and multi-religious democracy can be controversial with groups that prefer social and cultural homogeneity. Therefore, such policy initiatives need visionary and sustained leadership from the highest levels of government.

47. **The schools in lagging regions need special attention.** The general education development strategy needs to be differentiated according to the level of development of the various provinces, zones and divisions. The older, well-established schools in the neighborhood of cities are at a more advanced stage of development. As a result, they can undertake more ambitious development initiatives. In contrast, the schools located in rural and estate regions, are relatively under-developed, with less qualified staff, poorer facilities, and academic and managerial systems and processes that are still being established. As a result, these schools need greater policy attention and financial assistance.

48. **The media needs to be allies in the process of implementation of the school education development strategy.** The popular media plays a prominent role in providing information and shaping the perceptions of the general public. It is of vital importance that the past and present achievements of the general education system, its future challenges, and the development initiatives proposed to address these challenges, are communicated to and understood by the media. This, in turn, will enable the leaders of change and development to communicate to the general public their vision of the future of the general education system, and their strategy to achieve that vision. The support and understanding of the public will be of central importance to generate long-term political interest and commitment to the general education development strategy.

49. **The school education system will uniquely determine the future of Sri Lanka's economic, human and social development.** The population of the country needs to participate in and support the process of education development. This process of development will have to be at multiple levels, including at the level of the national Ministry of Education, the provincial Education Agencies, and the individual schools. The education community operates at each of these levels, and can and should generate and sustain development in each sphere, and of course, over all spheres.

Strategic Initiatives for the Development of the General Education Sector

General Education Development Needs	Key Potential Development Initiatives	Benefits of these Initiatives	Challenges to Implementation
Expansion of access to quality secondary and basic education.	Establish a geographically balanced network of good quality secondary schools.	Provides regional equity of access to secondary education.	The resource requirement will be high. The program needs to be phased in over a period of time.
	Map the network of primary schools so that all children have convenient access to good quality primary education and the opportunity to move on to secondary education.	Links the primary and secondary school network and promotes regional equity.	
	Activate school attendance committees to ensure completion of basic education and transition to secondary education of children at risk of non-enrollment or early drop out.	Completion of basic education and transition to secondary education provides many economic and social benefits to individuals.	Good quality leadership is needed for school attendance committees to perform well.
Improve the quality of general education.	Establish a technically rigorous National Assessment System for policy formulation and program development.	Education policy formulation will become evidence-based. Also, international comparisons between Sri Lanka and comparator countries will become feasible. This could be useful for program development.	Good quality education researchers will need to be developed.

	Promote school-based teacher development as the primary means of continuing teacher development.	School-based teacher development has been more effective than other forms of teacher training in Sri Lanka. International evidence also favors school-based teacher development.	Schools will need resources and information to implement this program well.
	Provide incentives and reform teacher management to improve teacher deployment.	Better teacher deployment will benefit schools in geographically disadvantaged locations.	Measures to improve teacher deployment runs into many vested interests.
Greater managerial empowerment schools.	Expand the functions and activities of school development committees and school management teams.	The empowerment of schools has benefited education outcomes in Sri Lanka. It is also very popular with local school stakeholders.	Social groups committed to central control oppose the empowerment of schools.
	Provide direct grants to schools to improve education outcomes.	Resources will be used more punctually and sensitively to meet school needs.	
Enhance English Language learning.	Establish a Content and Language Integrated Learning Framework for Bilingual Education.	Bilingual education will operate within an international framework.	Social groups opposed to globalization and international integration oppose the promotion of English.
	Create immersion English environments in schools, where feasible.	English language learning outcomes will develop best in such an environment.	

Strengthen mathematics and science education.	Diversify the mathematics curriculum to cater for student heterogeneity.	Students with different mathematical abilities will be able to select options according to their interests and abilities, and improve overall performance in secondary education.	The NIE may be find it difficult to diversify the secondary school curriculum.
	Modernize the science curriculum to blend theory and practical learning.	This will provide students with a better understanding of science, especially for practical living.	
School health and nutrition needs of children from more disadvantaged households need to be met.	Strengthen the school health and nutrition program.	Better health and nutrition levels contribute strongly to the education performance of children.	Good coordination is required between the education and health systems.
	Ensure that all schools meet national water and sanitation norms.	This will enable all schools to provide for the basic needs of children.	The maintenance of water and especially sanitation facilities needs to be improved.
Increase investment in education.	Gradually increase the share of the budget allocated for education.	Higher investment in human capital will yield multiple economic and social benefits to the country.	The government budget has many competing needs.
	Facilitate public private partnerships in education.	The resources available for education will increase.	Social groups opposed to private sector participation in education may resist such measures.

Balance the allocation of resources between higher-order assets spaces and processes, and basic learning needs.	The availability of computer centers, science laboratories, activity rooms, multi-purpose rooms, language laboratories, and their associated equipment, as well as resources for quality processes, needs to be increased while also meeting basic needs such as classrooms and water and sanitation.	The improved capital stock in schools will enable more advanced and modern methods of teaching and learning.	Considerable resources will be needed.
---	---	--	--

CHAPTER ONE

THE GENERAL EDUCATION SECTOR: OUTCOMES AND POLICIES

INTRODUCTION

1.1. **Sri Lanka stands upon the threshold of two great transformations.** The first transformation is the advancement and progress of the nation from a low-income country to a middle-income country. The second transformation is the transition of the nation from a country in conflict to a country in lasting peace.

1.2. **The general education sector is at the heart of these two great transformations.** The school system makes a unique and foundational contribution to the economic development of a country. The school system also makes a unique and foundational contribution to the social development of a nation. As such, the general education sector, which covers primary and secondary education, can and should play a prominent role in the economic and social transformation of the country.

1.3. **The human capital foundations of a modern knowledge economy are established at the stage of general education.** The quality of general education determines the capabilities of students entering the higher education sector, which in turn is a key determinant of the quality of university graduates. The quality of general education also determines the competencies of entrants into the vocational and technical training sector, which is a key factor influencing the quality of skilled personnel emerging from training institutions. Also, many individuals at various stages of the general education system directly enter the labor market. The quality of general education determines the productivity of these employees and workers. In consequence, the general education sector plays a central role in determining the productivity of the labor force and the performance of the economy. Moreover, the importance of the economic role of the education sector has been expanding and rising rapidly in recent years, as global production processes have become increasingly knowledge intensive.

1.4. **The social and cultural foundations of an enlightened modern democracy are also established at the stage of general education.** The school system inspires and shapes a country's values, ethics, and social institutions. This includes the attitudes of citizens towards social and cultural diversity, and ethnic and religious pluralism. In addition, the school system has a vital influence on the values, ethics, codes of conduct and patterns of behavior that are needed for democratic institutions to flourish. Hence, the school system has a central role to play in the future development of Sri Lanka as a modern, multi-ethnic and multi-cultural democracy.

GENERAL EDUCATION IN SRI LANKA IN INTERNATIONAL PERSPECTIVE

1.5. **Sri Lanka has been well-known in development policy circles as a country with good education attainment levels in basic indicators such as primary school enrolment and completion, and adult literacy** [World Bank (2005a), Aturupane (2009), Little (2010)]. The literacy level of countries is of vital importance for development, as the education attainment of people generates a variety of economic and social benefits. Sri Lanka's performance on adult literacy is illustrated in Figure 1.1 below.¹ According to the information in Figure 1.1, Sri Lanka is one of the better performers among developing countries, with an adult literacy rate above the expected value for its level of per capita income. Adult literacy rates in many of Sri Lanka's South Asian neighbors, such as India, Bangladesh, Pakistan and Nepal, all fall below the predicted values for their levels of per capita income. Only the Maldives, with a higher per capita income, has a literacy level above that of Sri Lanka in South Asia.

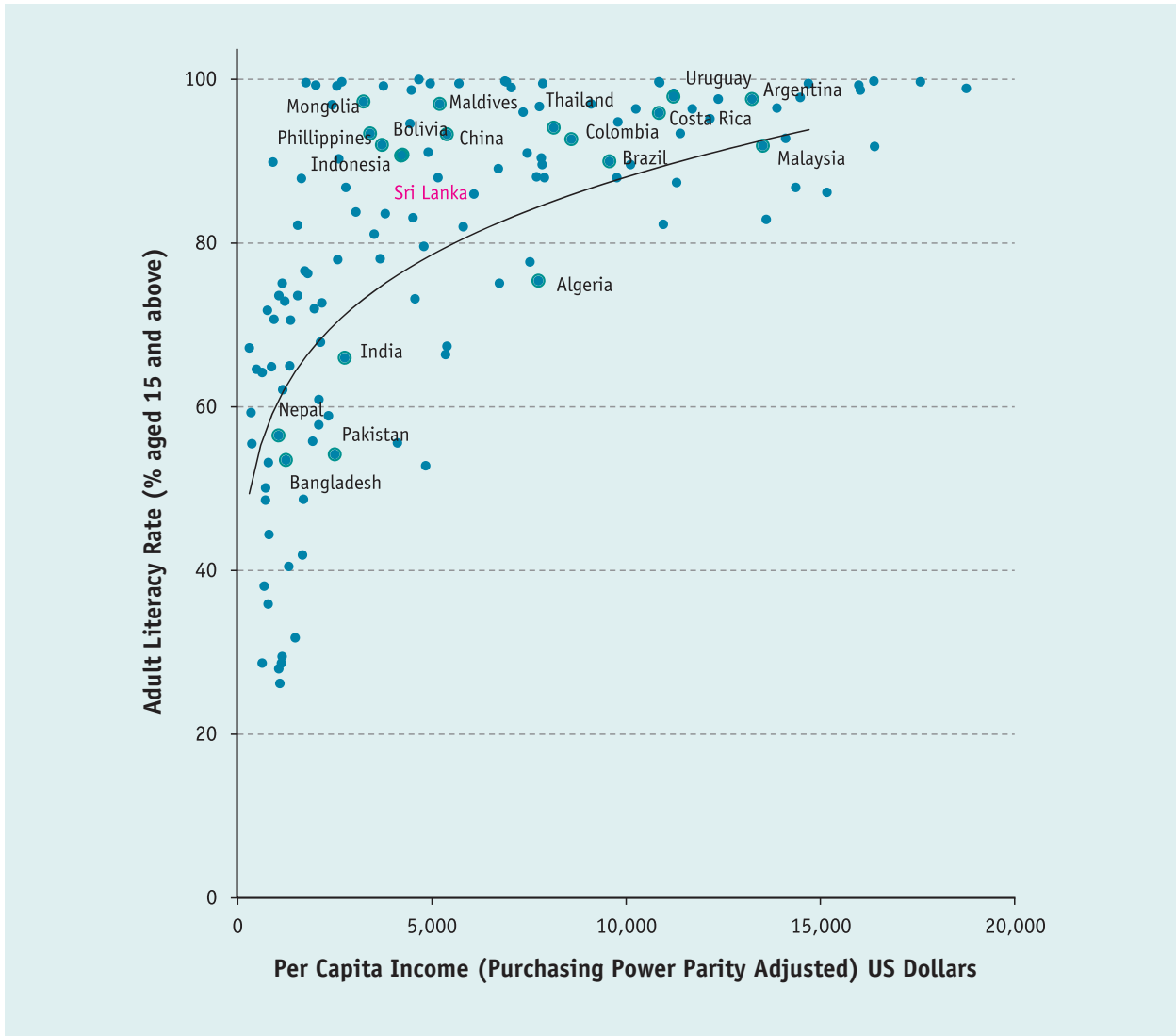
1.6. There are a number of countries in other regions of the world, at similar or lower levels of per capita income, that enjoy literacy rates above the predicted values for their levels of per capita income, and which display a performance on literacy superior to that of Sri Lanka. These include countries such as the Philippines, Indonesia, Bolivia and Mongolia. There are also countries that have higher per capita incomes than Sri Lanka and perform better on adult literacy, such as Argentina, Brazil, Costa Rica, Colombia, China, Thailand and Uruguay. Overall, Sri Lanka performs well, but not exceptionally so. This is different to the position enjoyed by Sri Lanka in earlier decades, when it was considered one of the best performers among developing countries [Aturupane (1993), Kakwani (1993), Aturupane et al (1994), UNDP (1998)]. Sri Lanka has now been overtaken by a number of middle-income countries that have successfully accelerated the development of their education systems and economies.

THE GENERAL EDUCATION SYSTEM

1.7. **The government plays a prominent role in the delivery of general education services.** There are approximately 10,400 schools, of which 9,410 (91 percent) are government schools. The balance consists of around 70 private schools, 700 pirivena (temple) schools, and about 200-250 international schools. Total school enrollment consists of approximately 4.1 million students, of whom around 3.9 million students (92 percent) attend government schools, and the balance attend private, pirivena and international schools. The government, private and pirivena schools offer the national curriculum and their students sit the national public examinations. International schools offer foreign curricula and prepare students for overseas examinations.

1 Points above the regression line are countries whose adult literacy rate is above the expected value, given their level of national income *per capita*. Points on the regression line are countries whose adult literacy rate is at the expected value, given their level of national income *per capita*. Points below the regression line are countries whose adult literacy rate is below the expected value, given their level of *per capita* income.

Figure 1.1 Adult Literacy in Relation to GDP Per Capita of Middle Income and Low Income Countries



1.8. **The network of government schools has been established to provide universal access to primary and secondary education.** This policy objective has been achieved to a great extent, with a comparatively even distribution of schools and teachers in relation to student enrollment, across the country [Table 1.1]. The average school size is 406 students per school. The relatively sparsely populated Northern, North-Central, Uva and Sabaragamuwa Provinces have less than 350 students per school, on average, while the densely populated Western Province has an average of 685 students per school. The overall student-teacher ratio for the country, at 18: 1, is low. Among the provinces, the student-teacher ratio ranges from 15:1 in the Uva Province to 23:1 in the Western Province.

1.9. The school system is organized into three cycles: primary education (grades 1-5), junior secondary education (grades 6-9), and senior secondary education (grades 10-13). Primary schooling commences at age 5 or 6 years. The combination of primary and junior secondary

Table 1.1. Government Schools, Student Enrollment and Teachers, by Province, 2009

Province	Number of Schools	Number of Students	Number of Teachers	Average School Size	Student Teacher Ratio
Western	1,338	915,872	40,460	685	23
Central	1,465	522,061	30,613	356	17
Southern	1,099	504,171	29,340	459	17
Northern	840	239,633	13,402	285	18
Eastern	1,002	385,115	20,217	384	19
North Western	1,218	472,836	27,214	388	17
North Central	772	247,737	14,428	321	17
Uva	839	277,116	18,240	330	15
Sabaragamuwa	1,102	368,181	21,724	334	17
Sri Lanka	9,675	3,932,722	215,638	406	18

Source: World Bank estimates, based on Ministry of Education, School Census, 2009

education (grades 1-9) comprises the basic education cycle. Basic education is compulsory and all children aged 6-14 years are expected to complete nine years of education. The first national public examination, the General Certificate of Education Ordinary Level (GCE O/L), is conducted at the end of grade 11, when children are 15 or 16 years of age. Students successfully completing the GCE O/L can continue onto the next stage of general education, or enter the vocational training and technical education system. The General Certificate of Education Advanced Level (GCE A/L) is conducted at the end of grade 13. The GCE A/L is a pre-requisite for entrance into degree programs in the public university system.

1.10. The country has four types of schools, as follows:

- Type 1AB schools. These schools have classes from Grade 1 to 13 or Grade 6 to 13, and GCE A/L courses are offered in all three streams; Science, Commerce and Arts. These can be described as full curriculum schools. There are around 690 schools in this category.
- Type 1C schools. These schools have classes from Grade 1 to 13 or Grade 6 to 13 where GCE A/L courses are offered in one or two streams: Arts and /or Commerce. There are about 1,950 schools in this category.

- Type 2 schools. These schools have classes from Grade 1 to 11 or Grades 6 to 11. There are slightly over 4,000 schools in this category.
- Type 3 schools. These are primary schools with classes from Grade 1 to Grade 5. There are approximately 2,720 primary schools.

Access and Participation in Education

1.11. **Primary education is universal, and there is gender parity.** The net primary enrollment rate among both boys and girls is 99 percent [Table 1.2]. The gross primary enrollment rate among boys is 101 percent and among girls 102 percent. The proximity of the net and gross primary enrollment rates suggests that there is little repetition in the primary education cycle. Nearly all students are enrolled, and are moving through the primary education system efficiently. Survival rates in primary education, too, are high. Approximately 99 percent of boys and nearly 100 percent of girls complete primary education.

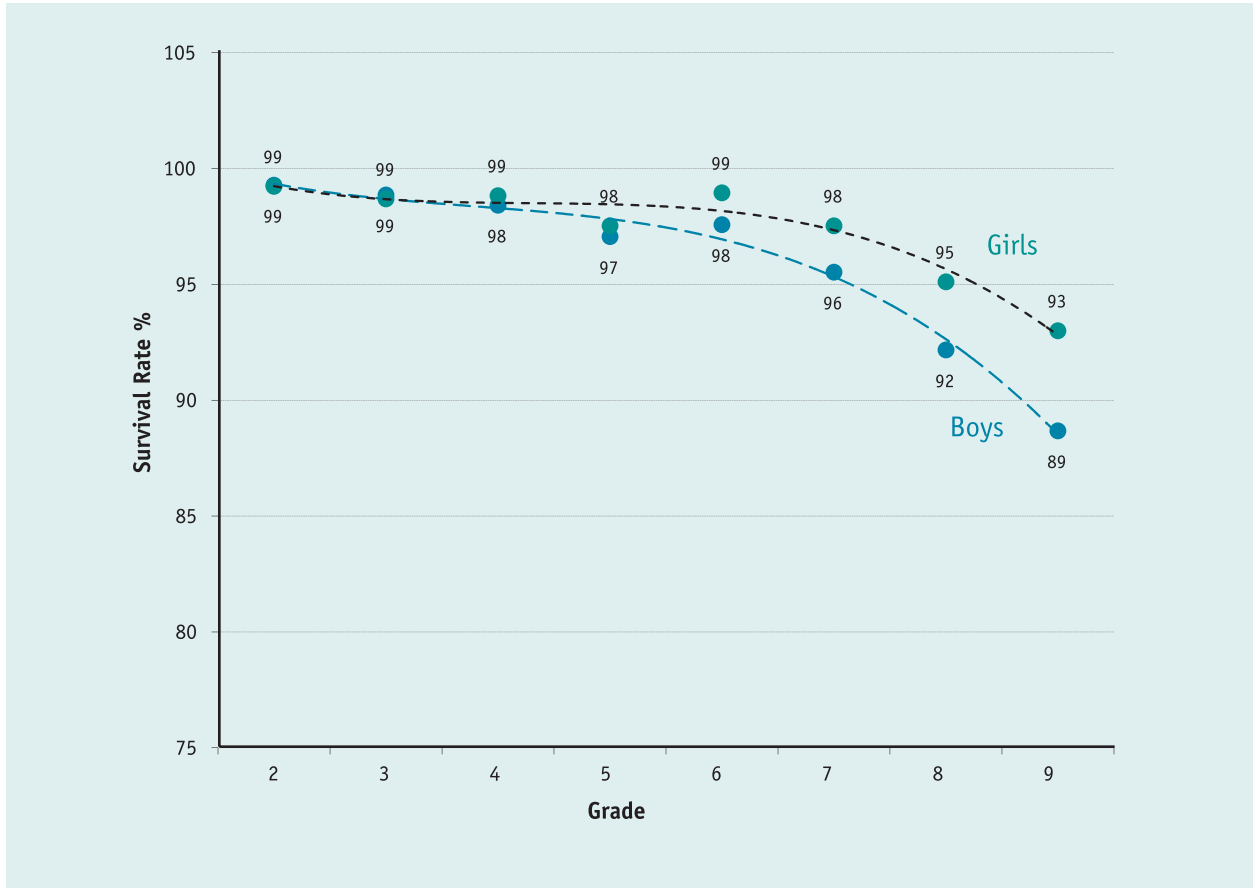
Table 1.2. Enrollment and Survival Rates in Primary Education by Gender

	Male (percent)	Female (percent)	Sri Lanka (percent)
Net Primary Enrollment	99	99	99
Gross Primary Enrollment	101	102	102
Survival Rate	99	100	99

Source: Ministry of Education School Census 2008, and Department of Census and Statistics, Household Income and Expenditure Survey 2006/7.

1.12. **The survival rate of students through the compulsory basic education cycle is high.** The survival rate to the end of grade 9 among girls is 93 percent, and among boys 89 percent [Figure 1.2]. The survival rate through grade 9 among students has risen steeply in recent years. In 2005 only 78 percent of all students (boys and girls combined) completed grade 9. By 2009, the survival rate for boys and girls combined had increased to 91 percent. The increase in the survival rate has been caused by a combination of factors, including the activation of school attendance committees to promote school attendance among children up to age 14, school feeding programs to attract children from poor communities to attend school, and the strengthening of special education and non-formal education programs for children with special learning needs. One reason for the lower survival rate among boys is that teen-aged boys have employment opportunities in various types of occupations requiring physical labor. As a result, some boys from poorer homes drop out of school and take up these job opportunities. A second reason could be that households in Sri Lanka appear to invest additional resources in girl's education [Himaz (2010)].

Figure 1.2 The Survival Rate from Grade 1-9 by Gender



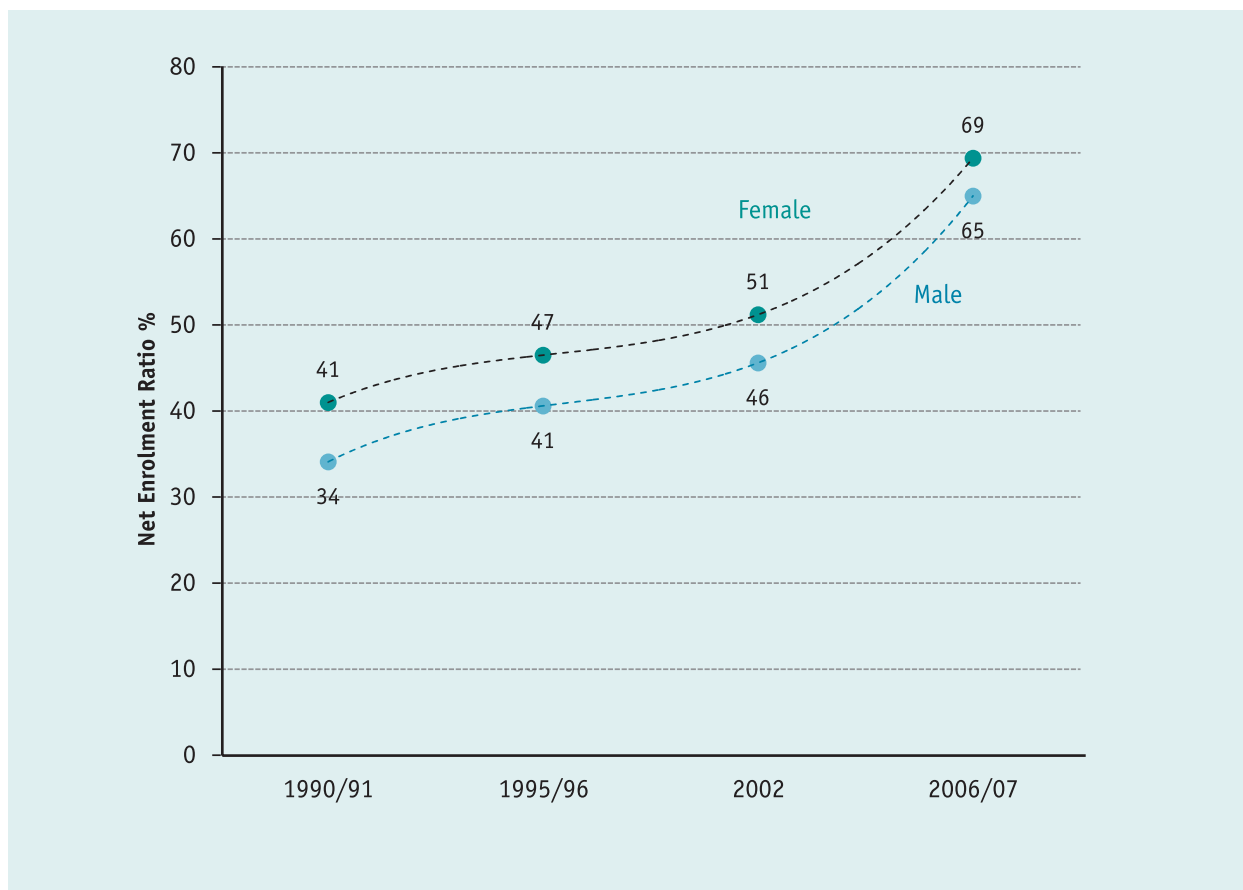
Source: Himaz and Aturupane (2011).

1.13. Participation in senior secondary education has been rising over time. The net enrollment rate in secondary education among girls has increased from 41 percent in 1990/91 to 69 percent in 2006/7 [Figure 1.3]. The net enrollment rate in secondary education among boys has risen from 34 percent in 1990/91 to 65 percent in 2006/7. The expansion of secondary education enrollment has accelerated in recent years, with exponential increases during the period 2002-2006/7. Enrollment among boys has risen faster during this period than among girls, enabling the wide gender gap of previous periods to be reduced.

The Policy Framework for Improving Access and Participation in General Education

1.14. The favorable participation outcomes in general education can be attributed to a combination of effective government policies and strong household demand [Aturupane (2009), Medagama and Sonnadara (2011)]. The Government of Sri Lanka (GOSL) policy framework for the general education sector is the Education Sector Development Framework and Program (ESDFP) [MOE (2007a)]. The first theme of the ESDFP is the promotion of equitable access to basic and secondary education. Under this theme, there are a wide range of demand and supply side policies

Figure 1.3 Net Enrollment Rates in Senior Secondary Education, 1990-2007



Source: World Bank staff estimates based on household income and expenditure survey data.

to enroll and retain all children in the age group 6-14 years in the education system, as well as provide access to senior secondary education for children between 15-18 years. As seen in Table 1.3 below, there is a high degree of equity in net enrollment rates at the level of primary education and, to a considerable extent, at the junior secondary education level. In primary education, the net enrollment rate is 98 percent among the poorest economic quintile, and 99 percent for all other quintiles. At junior secondary education, the net enrollment rate ranges between 89 percent for the poorest quintile to 97 percent for the wealthiest quintile. At senior secondary education, however, the variation in enrollment is considerably greater, ranging from 52 percent for the poorest quintile to 77 percent for the wealthiest quintile.

Demand-Side Policies to Promote Equitable Access to Education

1.15. Sri Lanka has a wide array of demand-side policies to attract and retain children in school.

- Education is provided free of tuition costs in all government schools from grades 1-13. This initiative effectively decreases the direct costs of schooling significantly. It is

Table 1.3. Net Enrollment Rates Across Economic Quintiles

Consumption Quintiles	Primary Education (%)	Junior Secondary Education (%)	Senior Secondary Education (%)
Quintile One (Poorest)	98	89	52
Quintile Two	99	93	59
Quintile Three	99	95	65
Quintile Four	99	96	71
Quintile Five (Richest)	99	97	77
Total	99	94	65

Source: Bank staff estimates based on household survey data.

particularly important for children from poor households. The provision of tuition free education is considered by policy makers to be the single most important demand-side initiative to promote school enrollment and attendance.

- The government provides all children from grades 1-11 with a set of free school uniforms and a set of free textbooks each year. Also, students are entitled to subsidized transport in public buses and trains. This package of incentives helps ensure that poor children have the minimum level of support required to attend school, and learn (textbooks) during their school years.
- Primary school children in poor and disadvantaged areas also receive free school meals. The meals are prepared and served on the school premises, with often the participation of community representatives such as parents and past pupils. The meals constitute a strong incentive for primary school enrollment and attendance. In addition, it acts as a nutritional supplement that can improve learning outcomes by enhancing the cognitive capacity of children.
- The GOSL has enacted compulsory education legislation. It is a legal requirement that all children aged 6-14 years complete nine years of education [Jayaweera (1998)]. The legislation defines the compulsory basic education cycle as grades 1-9, consisting of primary education (grades 1-5) and junior secondary education (grades 6-9). Parents and guardians are responsible for complying with the legislation and ensuring that their children and wards aged 6-14 years participate in the education system.
- School attendance committees, under the leadership of school principals, exist in school communities. The school attendance committees are expected to follow up out-of-school children, if necessary into their homes, and discuss measures to bring the children into

the education system with their parents or guardians. Out-of-school children can be children who have never attended school, or children who have attended for a while and then dropped out.

Supply-Side Policies to Promote Equitable Access to Education

1.16. **Sri Lanka has a wide array of supply-side policies to complement and supplement the demand-side policies and promote participation in the education system.** The government has established a comprehensive, country-wide network of primary and secondary schools. Primary schools are available within two kilometers of the homes of all primary school-aged children. There is a primary school in every village. Secondary schools are available within five kilometers of the homes of all children in the secondary schooling age range. All children aged 6-18 years, therefore, are able to attend a school within reasonable traveling distance of their homes. The establishment of this comprehensive network of primary and secondary schools is the most important supply-side policy initiative. Any child has physical access to a school, for his / her age group, within easy traveling distance from home. It also constitutes a necessary condition for the demand-side policy measures to be effective, as it makes certain that a school is available for all children who seek education. There is automatic progression through the education system from grades 1-11. This policy initiative is designed to enable children to proceed through the education system in alignment with their age group. In particular, less talented children are not discouraged by failing grades and falling behind. The measure also decreases the cost of providing education, as it reduces grade repetition. Special education programs are available for children with special learning needs. This includes children with cognitive learning disabilities, physical handicaps, behavioral problems, visual impairments, and hearing difficulties. The government has a small number of schools set aside for children with severe learning disabilities. Other children, wherever possible, are accommodated in standard schools. Special education teachers are trained to work with these children. This policy measure seeks to address the needs of one of the most vulnerable social groups, children with special learning requirements. Non-formal education programs are available for adolescents who either never attended school or dropped out of school at a young age, and now require skills to enter the labor market. Non-formal education is offered through functional activity learning centers for children who lack basic literacy skills, and through a network of community learning centers for children over 16 years of age.

1.17. **Overall, the combination of demand and supply side policies constitutes a strong framework to promote school enrollment, the completion of basic education and the transition to senior secondary education.** The two most important policies are tuition free education in government schools and the country-wide network of primary and secondary schools. Other policies complement and supplement these two central policies, focusing on special groups of needy and vulnerable children.

Education Quality and Performance

Performance in Basic Education

1.18. **Learning outcomes in primary education have been improving over time.** National assessments of cognitive skills in Grade 4 show that learning outcomes in mathematics, English, and First Language (Sinhala and Tamil) have been rising in recent years [Table 1.4]. The mean score in mathematics has increased from 62 percent in 2003 to 73 percent in 2009. The proportion of students scoring over 50 percent in mathematics increased from 65 percent in 2003 to 79 percent in 2009. The mean score in English has increased from 44 percent in 2003 to 56 percent in 2009. The proportion of students scoring more than 50 percent in the English language rose from 31 percent to 56 percent over the same period. The mean score in the First Language (Sinhala and Tamil) increased from 44 percent in 2003 to 56 percent in 2009. In the First Language the proportion of students scoring more than 50 percent between 2003 and 2009 improved from 67 percent to 80 percent.²

Table 1.4. Performance of Primary School Students in the National Assessments of Learning Outcomes at Grade 4, 2003 -2009

	2003			2009		
	Mean and Standard Error	Proportion of students scoring between 0-50 percent	Proportion of students scoring between 51-100 percent	Mean and Standard Error	Proportion of students scoring between 0-50 percent	Proportion of students scoring between 51-100 percent
Mathematics	62.31±0.05	35	65	73.18±0.05	21	79
English	43.67±0.04	69	31	55.92±0.04	44	56
First Language	63.88±0.05	33	67	72.34±0.04	20	80

Source: National Education Research and Evaluation Center, University of Colombo.

1.19. There are several studies examining the national assessments at the primary education level in depth [NEREC (2007), (2008), (2009), Aturupane (2008), Medagama and Sonnadara (2011)]. These studies yield the following general conclusions.

² These are very large increases by international standards. The national assessments were undertaken in such a way as to make the 2003 and 2009 assessments comparable as far as possible. However, some factors, such as teaching to the test, and dropping the weaker students from sitting the tests, may also have contributed to these unusually large scores.

- Cognitive achievement scores have improved in all provinces between 2003 and 2009.
- When school type is considered, the best performance is seen among students from Type 1AB schools while the poorest performance is seen among students from Type 2 schools. Type 1C and Type 3 show approximately equal performance.
- Students from urban schools perform better than students from rural schools. However, there has been a reduction in the disparity between urban and rural schools between 2003 and 2009.
- Female students outperform male students in all three subjects.

1.20. Learning outcomes in junior secondary education have also been rising over time.

National assessments of cognitive skills in Grade 8 demonstrate that learning outcomes in mathematics and science have been rising over time [Table 1.5]. The mean score in mathematics has increased from 45 percent in 2005 to 50 percent in 2008. The proportion of students scoring over 50 percent in mathematics increased from 33 percent in 2005 to 45 percent in 2008. The mean score in science has risen from 53 percent in 2005 to 56 percent in 2008. The proportion of students scoring more than 50 percent in science rose from 53 percent to 59 percent over the same duration.

Table 1.5. Performance of Junior Secondary School Students in the National Assessments of Learning Outcomes at Grade 8, 2005 -2008

	2005			2008		
	Mean and Standard Error	Proportion of students scoring between 0-50 percent	Proportion of students scoring between 51-100 percent	Mean and Standard Error	Proportion of students scoring between 0-50 percent	Proportion of students scoring between 51-100 percent
Mathematics	45.2 ± 0.03	67	33	50.4 ± 0.19	55	45
Science	53.2 ± 0.04	47	53	55.9 ± 0.04	41	59

Source: National Education Research and Evaluation Center, University of Colombo.

The analysis of the results of the Grade 8 national assessments yield similar conclusions to the analysis of the Grade 5 national assessment [NEREC (2008), Medagama and Sonnadara (2011)].

- The cognitive achievement levels have increased in all provinces between 2003 and 2009.
- Students from Type 1AB schools perform best, and students from Type 2 schools perform worst.
- Students attending urban schools perform better than students attending rural schools.
- Girls perform better than boys.

1.21. **The findings from the national assessments of learning outcomes in basic education are intuitively plausible and consistent with findings from other countries.** For instance, the finding that students from Type 1AB schools perform better than others is plausible, as Type 1AB schools are the most developed schools in the country, and children from wealthy homes with educated parents typically attend these schools. Type 2 schools, in contrast, are often the least developed schools, and children from poorer and more disadvantaged homes attend these schools. Type 1AB schools are usually found in cities and towns, so that the finding that urban children perform better than rural children is correlated with the types of schools and the social, economic and education backgrounds and environments of the children. The finding that girls outperform boys in Sri Lanka is well-known [NEREC (2008), (2009), Aturupane, Glewwe and Wisniewski (forthcoming 2011)]. This finding is also consistent with results from other countries with advanced education systems.

Performance in Senior Secondary Education

1.22. **The quality of education at the senior secondary grades does not display strong trend improvements as in the case of basic education.** The information normally used in Sri Lanka at the senior secondary grades to assess education quality is drawn from the two public examinations, the GCE O/L and GCE A/L. Examination data are not as robust and reliable a source of evidence on education quality as national assessments of learning outcomes [Greaney and Kellaghan (2008)]. In particular, examination papers vary over years, and changes in performance may partly reflect differences in the level of difficulty of the questions in the test papers of those years, rather than changes in education quality. Also, the authorities in charge of public examinations may plot the marks of students in a statistical curve and readjust the curve so that there are no large changes in the final results over the years. These caveats should be borne in mind in the section below discussing the recent trend in examination performance.

1.23. **Examination pass rates at senior secondary education have remained constant in recent years.** The proportion of students passing the GCE O/L examination has risen from 48 percent in 2005 only to 49 percent in 2009 [Figure 1.4]. This is an insignificant change. The pass rates in GCE O/L subjects exhibit considerable variation among subjects. The lowest performance is in English language, where only 37 percent of students passed in 2009. This is a major weakness, as English language fluency is critically important for the country to perform well in the global knowledge economy. Other key subjects where performance needs to be strengthened considerably are mathematics and science [Dissanayake and Sonnadara (2011), Jayewardene and Sonnadara (2011)]

1.24. **At the GCE A/L examination, too, the proportion of students passing the examination has remained the same, 60 percent, between 2005 and 2009** [Figure 1.5]. Among subject streams, the GCE A/L pass rates in the Arts and Commerce streams are much higher than in the Science stream. For instance, in 2009 the pass rate in arts subjects was 65 percent, and in commerce subjects 60 percent, but in science subjects only 36 percent. Performance in mathematics shows a declining trend in recent years, with the proportion of students passing falling from 51 percent in 2005 to

Figure 1.4 General Certificate of Education Ordinary Level Pass Rates 2005-2009

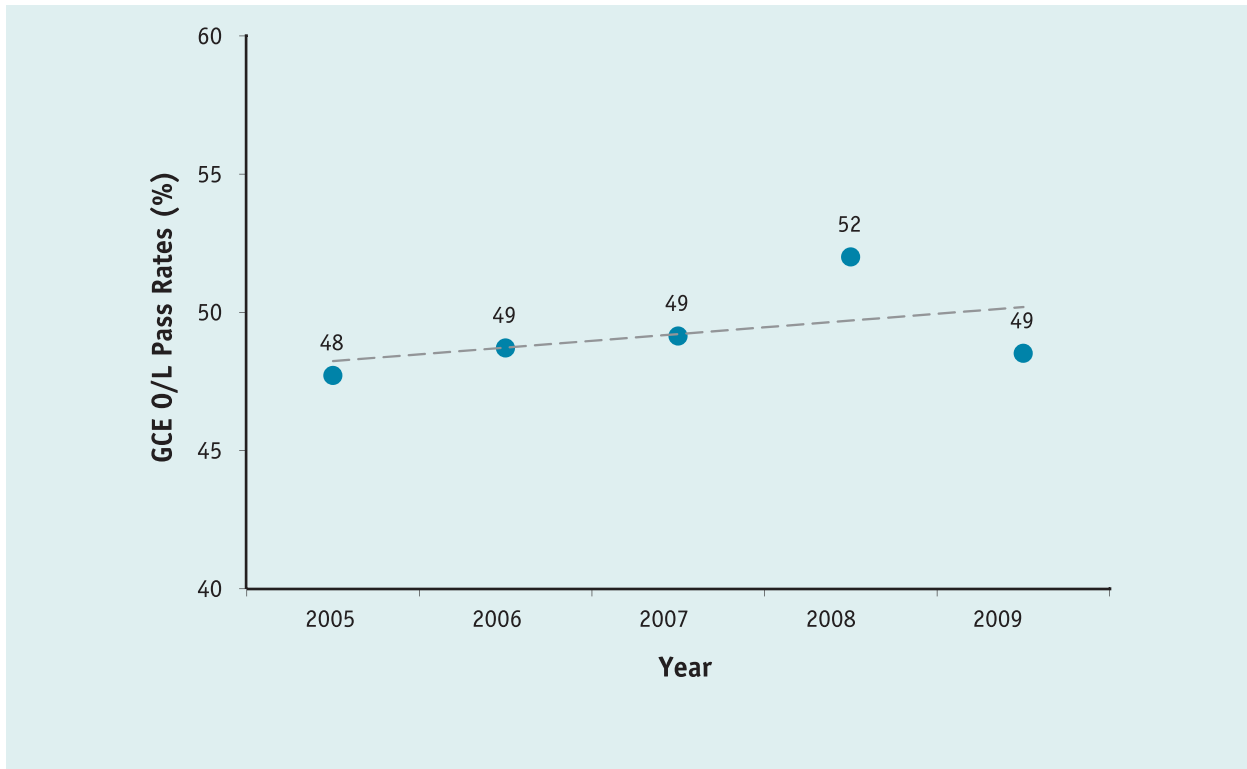
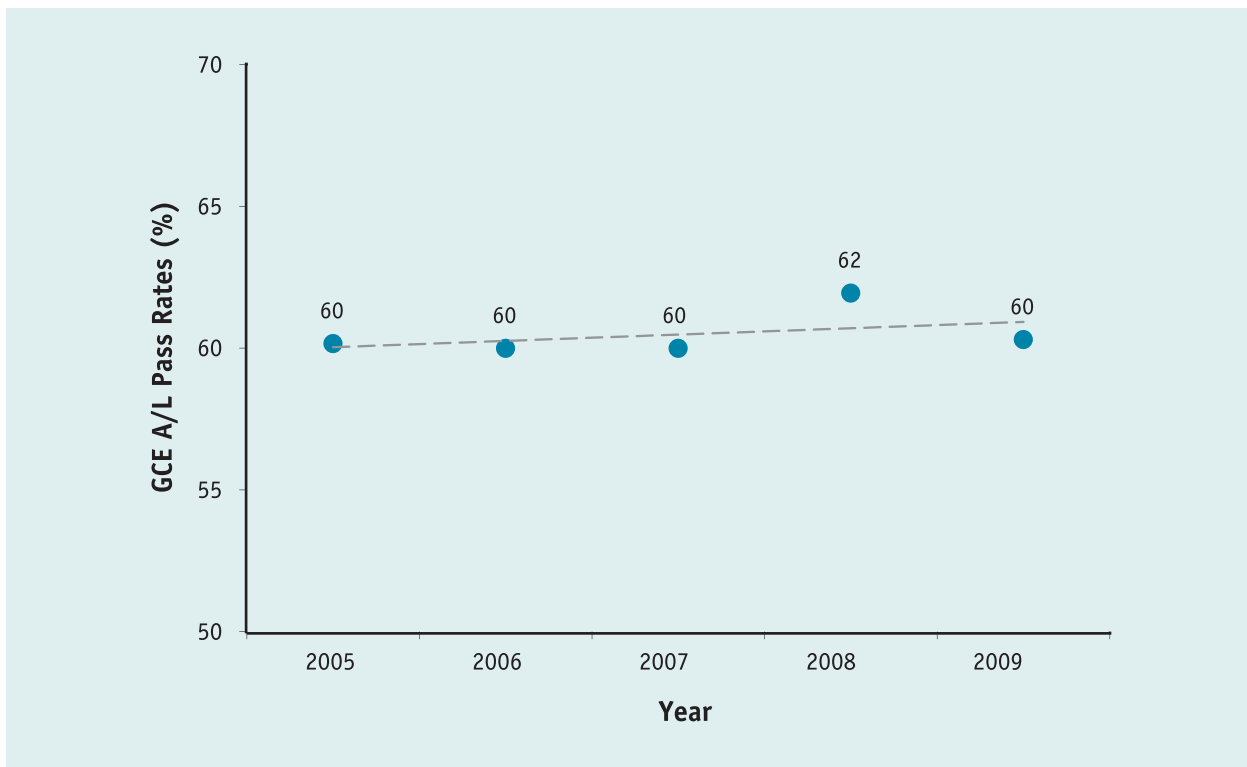


Figure 1.5 General Certificate of Education Advanced Level Pass Rates 2005-2009



45 percent in 2009. Even some students who achieve A grades at the GCE O/L in mathematics fail the GCE A/L mathematics paper. High quality scientific and technical skills are important for the economic growth of a country, and the weakness in science subjects needs to be addressed urgently.

The Policy Framework to Improve Education Quality

1.25. **The differences in performance between basic and secondary education can be attributed, at least in part, to the varying levels of policy attention provided to these education cycles.** The government has awarded considerable emphasis to the improvement of learning outcomes in recent years. The second theme of the ESDFP is the promotion of education quality [MOE (2007a)]. The main focus of these quality enhancing activities, however, has been at the primary and basic education levels [Medagama and Sonnadara (2011)].

1.26. **The central thrust of the policy measures to improve education quality is a primary education reform program.** Under this reform, the first five years of schooling comprising the primary stage of education are divided into three key stages. These are:

- Key Stage One (Grades 1 - 2) the main learning mode is guided play with secondary emphasis on active learning and a minimum of desk work.
- Key Stage Two (Grades 3 - 4) equal importance is given to all three modes of learning, play, activity- based learning and desk work.
- Key Stage Three (Grade 5) the emphasis is on deskwork as pupils are prepared for the early years of secondary education supplemented by active learning and play.

At the end of each stage all children are expected to achieve a list of essential learning competencies. Besides, there are also a set of desirable learning competencies for gifted children.

1.27. **The primary education reform program has been supported by a variety of development initiatives.** This includes focused teacher education and training; good quality textbooks; and the supply of educational materials, especially for primary mathematics. Classrooms have also been re-arranged to facilitate guided play and active learning, and school families have been arranged so that teachers from different schools within the same school family can exchange ideas and learn from each other. Parent-teacher interaction to facilitate discussion of students' performance has also been promoted. These initiatives have contributed positively and helped improve student learning at primary level [Aturupane et al (forthcoming 2011)]. In addition, the school feeding and nutrition improvement intervention has helped to improve learning [Wisnieskwi (2010), Dixon et al (2011)]. And a policy initiative to promote school-based management, the Program for School Improvement (PSI), has also had a favorable impact on learning at primary level [Kellaghan (2011), World Bank and EFA-FTI Initiative (2011)].

1.28. **Quality improvement at the senior secondary education level has not received adequate policy attention.** Unlike in basic education, there has not been a focused program to improve the quality of education at the senior secondary level. There have been some initiatives to revise the secondary school curriculum. However, this revision has certain weaknesses which have hampered the promotion of learning. For instance, the science curriculum is overloaded and cannot be covered adequately during a school year [McCaul (2007), Dissanayake and Sonnadara (2011)]. The mathematics curriculum is not properly integrated vertically between the primary and secondary cycle and, within secondary education, between the GCE O/L and GCE A/L cycles. Further, the mathematics curriculum at the GCE O/L stage is not fully suited for children at the age range 14-16 years [Jayewardena and Sonnadara (2011)]. Nor has there been a concerted teacher education and training program for senior secondary school teachers, as there has been for primary and basic education teachers. It has been observed that the teachers have not fully understood the competencies and the competency levels in the secondary school curriculum [Setunga et al (2007)] especially in subjects such as science and mathematics [SLAAED (2010)] and English [Perera, M. (2011)]. The Teacher Instructional Manuals do not provide adequate guidance on the evaluation of competencies [SLAAED (2010)]. Textbooks in many subjects have contained errors: especially the English language and English medium books [Perera, M. (2011)].

1.29. **There are wide disparities in the pattern of access to good quality senior secondary education.** While the 2,640 senior secondary schools offer universal access to senior secondary education, the quality of a major proportion of these schools has to be improved. In particular, only about 800 senior secondary schools (30 percent) offer the Bilingual Education program, where students can study subjects in the English medium. Only 690 schools (29 percent) offer the GCE A/L science stream. And among these 690 schools, only about 200 schools are able to prepare students for engineering and medical programs at university level. These good quality schools are all located in or near a few large cities and towns.

NATIONAL ASSESSMENTS OF LEARNING OUTCOMES

1.30. **Sri Lanka has a latent system for the measurement of cognitive achievement.** The National Education Research and Evaluation Center (NEREC) of the University of Colombo has conducted national assessments of learning outcomes in Grades 4, 8 and 10. In addition, the Open University has conducted one national assessment in English language skills. The focus of these national assessments have been mainly on the measurement of cognitive outcomes, in subjects such as First Language (Sinhala and Tamil), English, science and mathematics, differentiated by province. The results have been useful to rank provinces, and to monitor the evolution of learning outcomes in the various provinces over time. These national assessments have been useful. However, they have also been limited in their technical rigor and analysis. Their impact on policy, too, has scope for improvement.

1.31. **The national assessments now need to be developed to reflect international good practice and become an integral part of the Sri Lankan education system.** In this context, there are a number of areas in which the national assessments require further improvement and development.

- The technical rigor of the national assessments, including test design, sampling, survey management, analysis of results, and dissemination and publication, needs to be strengthened. This requires the development of capacity to design and implement national assessments in the NEREC.
- The understanding of the purpose and uses of national assessments among policy makers and technocrats and education stakeholders needs to be developed. In particular, there is still confusion between national assessments and public examinations. The two are very distinct in purpose and use [Table 1.6 below]. This distinction needs to be clarified and communicated to all relevant policy makers and education stakeholders.
- The utilization of national assessments of learning outcomes for policy purposes needs to be considerably strengthened. There are a variety of uses of a national assessment, including reviewing the education system, curriculum design and revision, improving textbooks and learning material, strengthening teacher education and training, and guiding resource allocation [Greaney et al (2009)].
- Sri Lanka can also consider participating in international assessments of learning outcomes. The benefits could include reviewing the performance of the education in relation to other middle-income and developing countries, and the stimulus for the development of the system that could arise from the results of such assessments. The cost, of course, is that participation in such studies can be very expensive. National policy makers would need to measure the benefits and costs of such participation and choose the best options for Sri Lanka.

THE CONTRIBUTION OF THE WORLD BANK EDUCATION SECTOR REPORT

1.32. This report, which has been prepared with the participation of senior education policy makers and administrators, academics, researchers, employers, education providers, principals, teachers and students, serves several purposes. First, the report contains rigorous technical analyses and provides an understanding of the general education sector based on factual evidence. Second, the report presents and discusses a wide variety of education systems, policies and reforms observed in the modern world. The discussion has a special focus on those areas where Sri Lanka faces its most important policy challenges in general education. Third, based on global and international experience, the report presents several policy and program options for the consideration of the policy makers, stakeholders and beneficiaries of the education sector. Finally, the information and analysis in the report can contribute to the preparation and implementation of a long-term education sector development strategy in Sri Lanka.

Table 1.6. Differences between National Assessments and Public Examinations

	National assessments	Public examinations
Purpose	To provide feedback to policy makers.	To certify and select students.
Frequency	For individual subjects offered on a regular basis (such as every four years).	Annually and more often where the system allows for repeats.
Duration	One or two days.	Can extend over a few weeks.
Who is tested?	Usually a sample of students at a particular grade or age level.	All students who wish to take this examination at the examination grade level.
Format	Usually multiple choice and short answer.	Usually multiple choices.
Stakes: importance for students, teachers, and others	Low importance.	Great importance.
Coverage of curriculum	Generally confined to one or two subjects.	Covers main subject areas.
Effect on teaching	Very little direct effect.	Major effect: teacher tendency to teach what is expected on the examination.
Additional tuition sought for students	Very unlikely.	Frequently.
Do students get results?	Seldom.	Yes.
Is additional information collected from students?	Frequently, in student questionnaires.	Seldom.
Scoring	Usually involves statistically sophisticated techniques.	Usually a simple process that is based on a predetermined marking scheme.
Effect on level of student attainment	Unlikely to have an effect.	Poor results or the prospect of failure, which can lead to early dropout.
Usefulness for monitoring trends in achievements levels over time	Appropriate if tests are designed with monitoring in mind.	Not appropriate because examination questions and candidate populations change from year to year.

Source: Greaney and Kellaghan (2008).

CHAPTER TWO

INVESTMENT IN HUMAN CAPITAL: BENEFITS, CHALLENGES AND OPPORTUNITIES

INTRODUCTION

2.1. **Human capital has become the most important determinant of economic performance and social well-being in the modern world.** This is true at the level of the global economy, and also at the level of countries and regions. The key distinguishing characteristic between advanced economies, middle-income economies and low-income economies, is the knowledge content of their production activities and outputs. Economic processes and products have become increasingly knowledge and skill intensive in recent times. Further, the importance of knowledge and skills is growing at an accelerating pace. Among advanced economies, for instance, the single most important determinant of economic performance is the education attainment of their populations [Hanushek and Welch (2006)]. Among middle-income and low-income economies, too, countries that perform well in education enjoy considerable welfare gains [Patrinos and Psacharopoulos (2011)].

2.2. **Investment in education yields a variety of social benefits.** These include enhancing economic equity; promoting inter-generational social mobility; instilling the values and attitudes and patterns of behavior needed for a cohesive society; creating the enlightened citizenry needed for a well-functioning liberal democracy; and contributing to the production of healthy families and children. Several of these benefits have been identified and documented in the case of Sri Lanka, too [World Bank (2005a)]. The achievement of social goals through investment in education also constitutes an important element of the overall national education policy framework [MOE (2007a), (2008a)].

ECONOMIC AND SOCIAL BENEFITS OF INVESTMENT IN EDUCATION

2.3. **Investment in human capital has a positive and significant impact on earnings, at all levels of education from primary schooling upwards, for both men and women.** All the education coefficients in the econometric analysis presented in Table 2.1 are positively signed and statistically significant, from primary education to postgraduate education. As the education levels of individuals rise their earnings increase. The earnings functions for both men and women display this monotonically rising pattern in relation to education. The impact of education on earnings is stronger among female workers than among male workers. This is likely to be due to self-selection

effects, as there is a greater probability of the more able women entering the labor market, while among men nearly all working aged individuals would participate in the labor market. These findings support the notion that investment in human capital is an important determinant of the labor market performance of individuals. The experience variables display the familiar pattern of earnings functions, rising up to a maximum in late middle-age and then declining thereafter. The earnings functions also show that urban men and women earn more than their counterparts in the rural sector, while male and female workers in estate areas earn less than workers in rural areas.

Table 2.1. Education and Earnings by Gender, 2008, Least Squares Estimates of Augmented Mincerian Earnings Functions

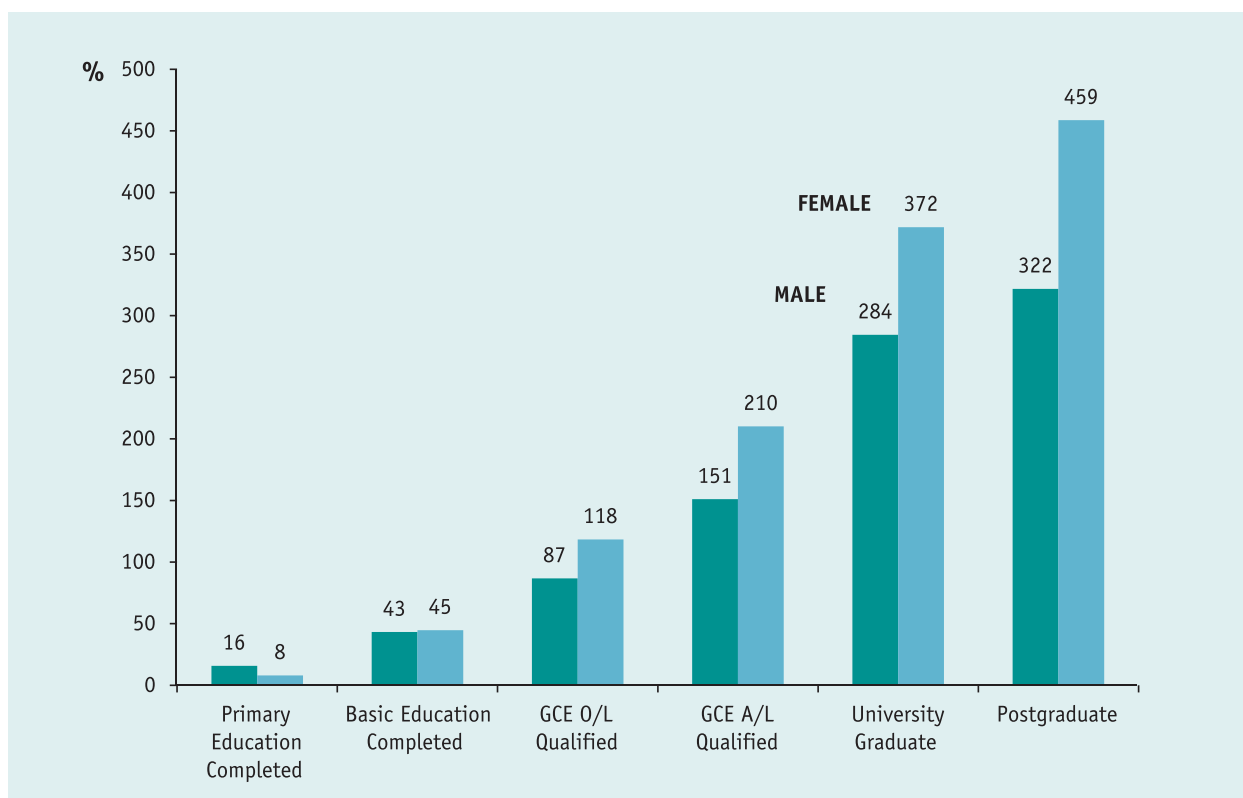
Variable	Male		Female	
	Coefficient	T Statistic	Coefficient	T Statistic
Constant	8.443	225.640	8.050	173.240
Primary incomplete	0.013	0.370	0.021	0.520
Primary education	0.146	4.340	0.077	1.930
Basic education	0.359	10.490	0.370	8.670
GCE_OL	0.624	17.600	0.781	17.450
GCE_AL	0.920	25.160	1.132	26.070
Graduate	1.347	29.050	1.551	29.990
Postgraduate	1.439	21.230	1.720	23.790
Experience	0.034	24.020	0.029	14.530
Experience squared	-0.001	-22.380	-0.001	-13.760
Urban sector	0.127	8.090	0.199	8.350
Estate sector	-0.310	-15.500	0.036	1.400
Adjusted R squared	0.319		0.453	
Sample size	10,940		5,339	

Source: World Bank staff estimates, based on labor force survey data.

Note: The base category for education levels is no education. The base category for sectors is the rural sector.

2.4. **Education attainment and earnings are positively related in Sri Lanka.** Earnings rise continually as the education levels of individuals increase [Figure 2.1]. A male worker with primary education earns 16 percent more per month than a man with no schooling, and a female worker with primary education earns 8 percent per month more than a woman with no schooling. Among men and women who have completed basic education, a male worker earns 43 percent more than a man with no education, and a female worker earns 45 percent more than a woman who is not educated. Among men and women who have completed the GCE O/L, male workers earn 87 percent more than uneducated men, and female workers earn 118 percent more than uneducated women. The earnings of both men and women rise further at each stage of education. Among men and women who have completed the GCE A/L, male workers earn 151 percent more than uneducated men, and female workers earn 210 percent more than uneducated women. The highest gains are recorded among men and women who have completed higher education. Male university graduates earn 284 percent more per month than uneducated men, while female university graduates earn 372 percent more per month than uneducated women. Postgraduate educated men earn 322 percent more per month than uneducated men, while postgraduate educated women earn 459 percent more per month than uneducated women. Overall, these findings clearly support the notion that men and women benefit from their investments in education.

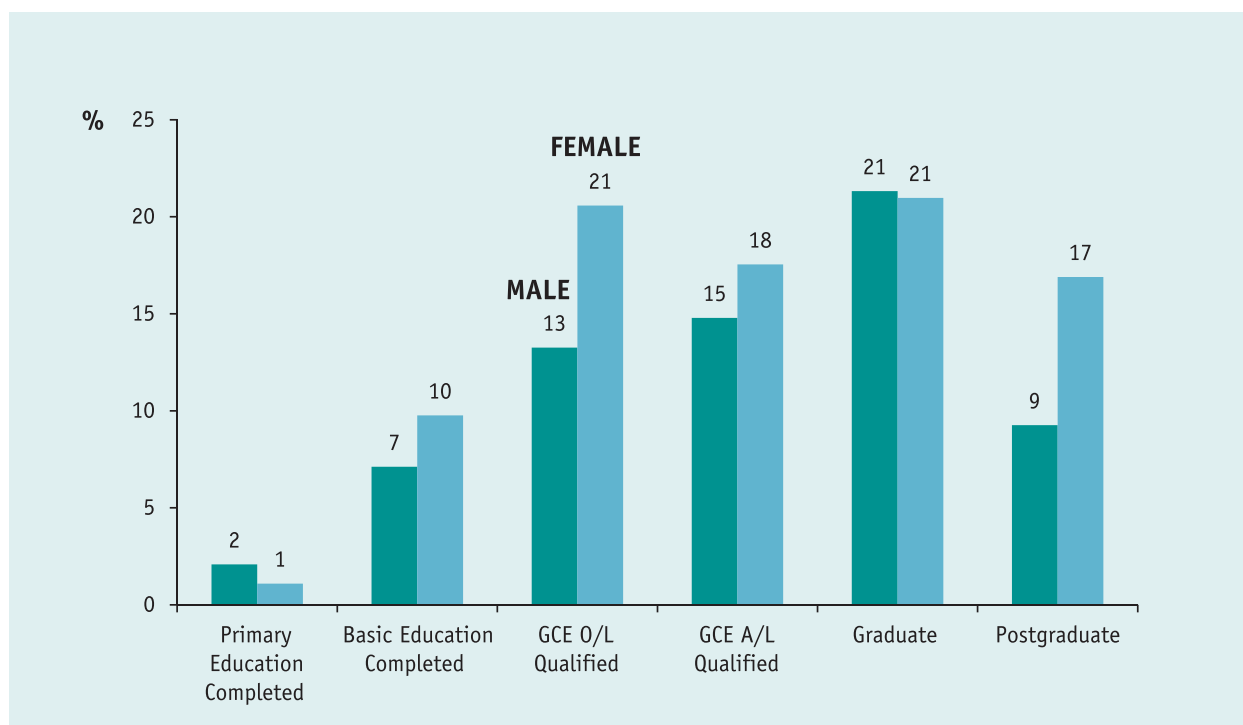
Figure 2.1 Impact of Education on Earnings, Male and Female Workers, 2008



Source: World Bank staff computations, derived from econometric estimates of earnings functions.

2.5. **The rates of return to education are positive, and substantial at the secondary and higher education levels.** Among primary educated workers the returns to education are positive but relatively low, at 2 percent for men and 1 percent for women, respectively [Figure 2.2]. Workers who have completed basic education receive slightly better returns: 7 percent for men and 10 percent for women. However, among workers who are secondary educated or higher, returns to education are considerably greater. GCE O/L qualified men earn returns of 13 percent, while women enjoy even higher returns at 21 percent. Among GCE A/L qualified workers, men receive a return of 15 percent, while women receive a return of 18 percent. Among university graduates the returns to education for both men and women are 21 percent. At postgraduate level, the returns to education for men are 9 percent and for women 17 percent, respectively.

Figure 2.2 Private Rates of Return to Education, Male and Female Workers



Source: World Bank staff computations, derived from econometric estimates of earnings functions.

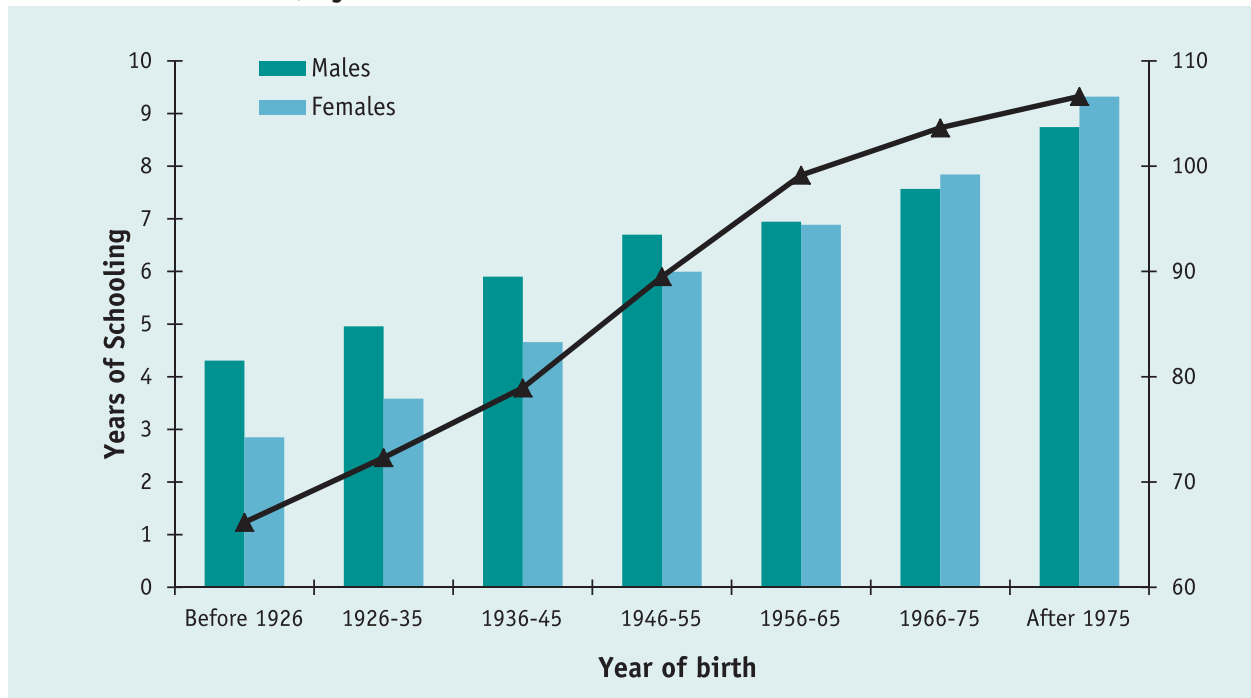
2.6. This pattern of returns to education is consistent with the fact that the supply of primary and basic educated human capital is relatively high, so that returns to education at this level are small. At secondary education level and higher education level, however, the supply of educated labor is lower, and returns to education are high. In addition, workers may be using their educational certificates at secondary education and higher education levels to signal their quality, while employers may be using these certificates to screen potential employees for quality. Overall, the pattern of returns to education is consistent with economic theories of human capital and of signaling–screening in labor markets with asymmetric information. The higher returns enjoyed by women in comparison

to men is likely to be due to selection effects, as fewer women participate in the labor market. Therefore, the women who do work are likely to be more capable than average, resulting in better productivity and greater returns to human capital.

Gender Equity and Inter-Generational Benefits of Investment in Education

2.7. **The inter-generational benefits of investment in education attainment and on gender equity are clear and strong.** As can be seen in Figure 2.3, in early years education attainment was relatively low with an average of four years among men and three years among women. Over time, as the education system expanded, the education levels of both boys and girls increased. Also, the pace of improvement was higher among girls. Among individuals born in the mid-1960s and onwards, the education attainment of women has exceeded the attainment levels of men. There are many complex reasons for the increase in education attainment among both men and women over time, including greater awareness of the importance of human capital among policy makers and, in the case of girls, changing views on the rights and roles of women. However, one important reason has also been the inter-generational benefit of education, with educated parents increasing the demand for education for their children. Hence, investment in education in earlier generations has helped in the expansion of education attainment in subsequent generations, as well as the increase in the education level of girls and women.

Figure 2.3 Average Years of Completed Schooling for Persons Aged Over 20 Years, by Sex and Year of Birth



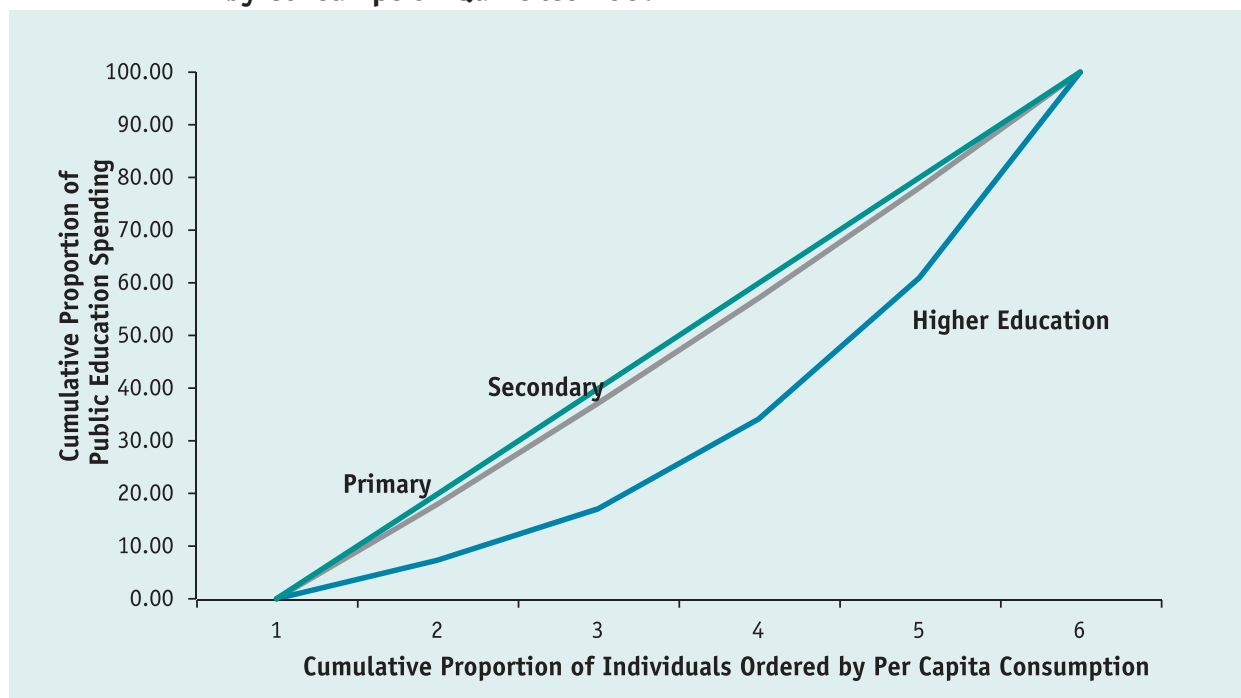
Source: Aturupane and Deolalikar (2011)

Education, Inequality and Poverty

2.8. The equity dimension of public expenditure on education can be analyzed using Lorenz curves [Figure 2.4] and Gini coefficients for public education investment by level of education and consumption quintile [Table 2.2]. The pattern of Lorenz curves and Gini coefficients over the different levels of education in Sri Lanka show a high degree of equity in primary and secondary education expenditure. Public investment is the most equitable at the primary education level, with the Lorenz curve falling almost completely onto the 45 degree line of perfect equality, and the Gini coefficient just 0.2 percent. This high level of equality at the primary school level reflects the fact that enrollments across economic groups are highest and most equal at this level of education. Public spending on secondary education, too, is highly equitable. The Lorenz curve for secondary education is close to the 45 degree line, and the Gini coefficient is low, just under 5 percent. Higher education spending is less equitable. The main reason for this is that only a relatively small proportion of students make it through to higher education, and these students are drawn mainly from the upper-income quintiles. This is a typical finding across countries, and is not specific to Sri Lanka.

2.9 **Education has also been closely related to poverty reduction.** The poverty levels of households show a continuous decline as the education level of the household head increases [Figure 2.5]. The prevalence of poverty among households with uneducated heads is 46 percent. In

Figure 2.4 Lorenz Curves of the Benefits of Public Education Expenditure by Consumption Quintiles 2007



Source: Bank staff estimates, based on household survey data.

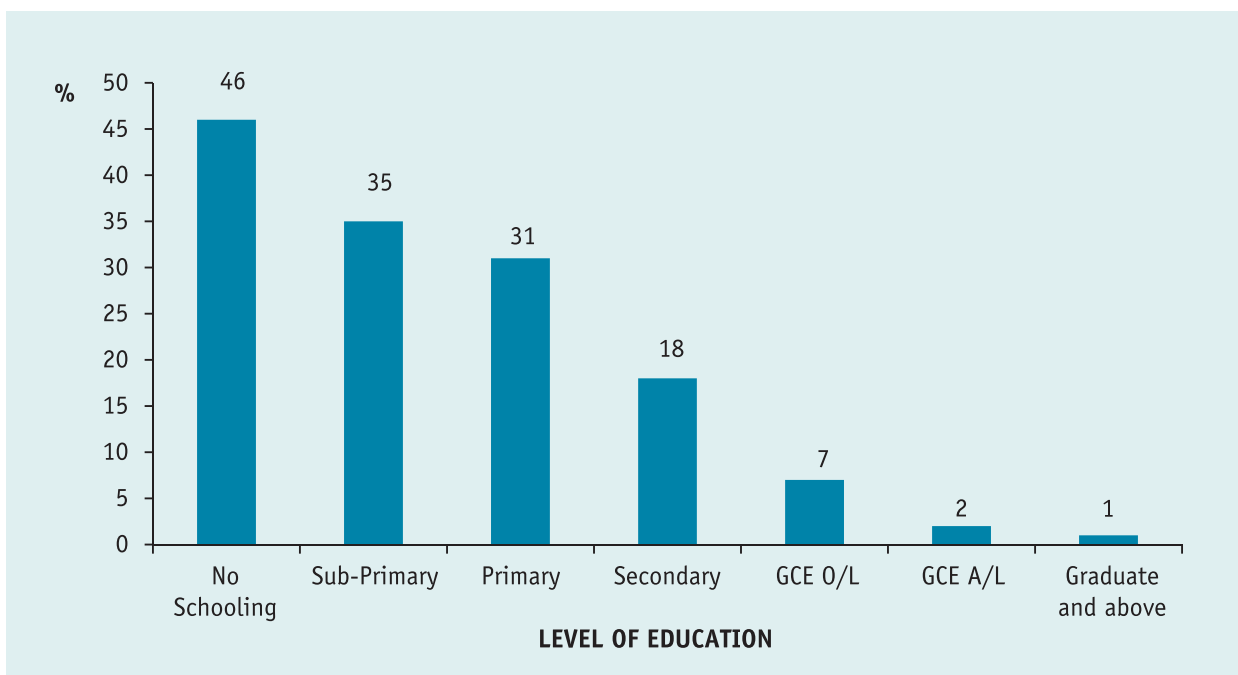
Table 2.2. Gini Coefficients of Public Education Expenditure by Level of Education

Level of Education	Gini Coefficient (percent)
Primary Education	0.2
Secondary Education	4.92
Higher Education	40.24

Source: Bank staff estimates, based on household survey data.

households where the head had completed primary education, the incidence of poverty declines to 31 percent. Among households with heads who have a moderate level of secondary education, the incidence of poverty is 18 percent. In households with heads who have completed the GCE O/L, the poverty rate falls to 7 percent. Among households with heads who have GCE A/L education, the prevalence of poverty is a mere 2 percent. In households where the head has either a university degree or higher qualification, the incidence of poverty is only 1 percent. This positive association between the education level of household heads and the level of poverty operates through a number of channels. Households with more educated heads generally have more regular employment and higher earnings. They also typically have lower fertility and family sizes, which contribute to lower poverty levels.

Figure 2.5 Poverty Incidence by Education Level of Household Head



Source: Gunewardena (2007).

Education and Economic Welfare

2.10. **Education has a powerful impact on economic welfare in Sri Lanka.** Education attainment is positively related to the economic prosperity of households and individuals [Figure 2.6]. As the education levels of the principal income earners of households rise the impact on economic welfare increases. Households where the principal income earner is primary educated have 16 percent better consumption levels than households where the principal income earner is uneducated. Households where the principal income earner has completed basic education have 31 percent higher consumption levels than households where the principal income earner is uneducated. Households in which the principal income earner has completed GCE O/L education have 69 percent higher consumption levels than households where the principal income earner is uneducated. Households where the principal income earner is GCE A/L educated enjoy 119 percent better consumption levels than households where the main income earner is uneducated.

Figure 2.6 Economic Welfare by Education Level of the Principal Income Earner of a Household



Source: Himaz and Aturupane (2011).

Households in which the principal income earner is a graduate enjoy 190 percent higher consumption levels than households in which the principal income earner is uneducated. Finally, households in which the principal income earner has postgraduate qualifications enjoy 224 percent higher consumption levels than households in which the principal income earner is uneducated. The greater welfare of more educated households results from several channels. More educated

individuals normally work in better quality jobs, with higher earnings streams. In addition, educated individuals are generally better at making rational consumption and investment decisions. Overall, these findings support the notion that investment in human capital is an important determinant of the economic welfare of households.

2.11. **Quantile regression analysis also shows that individuals in the upper welfare quantiles systematically enjoy greater incremental welfare gains, for the same level of education from middle school to the end of senior secondary education, than individuals in lower welfare quantiles** [Himaz and Aturupane (2011)]. Several countries in Europe and Latin America have similar findings in the context of studies of returns to education, with individuals at higher income quantiles better able to benefit from investment in human capital than individuals at the lower income quantiles [World Bank (2008b)]. There could be a variety of reasons for this type of finding. Individuals from the upper welfare quantiles are likely to have attended better quality schools, so that they embody a higher quality of human capital. They also may be more able and motivated, and therefore better able to utilize their human capital in the labor market. To the extent that the greater incremental welfare gains to the higher welfare quantiles are the result of better quality education institutions, public investment in education needs to focus on improving the quality of schools attended by the children of the lower welfare quantiles to promote equality of opportunity.

2.12. **The impact of education on economic welfare has been rising over time** [Table 2.3]. Between 1990/91 and 2006/7 the additional effect of education on economic welfare has risen for all categories of education except primary completed. At grades 1-4 the incremental effect of education has increased from 2.9 percent in 1990 to 3.6 percent in 2006/7. In grades 5-7 the incremental effect of education has fallen marginally from 1.7 percent in 1990 to 1.6 percent in

Table 2.3. The Time Trend of the Incremental Impact of Education on Economic Welfare, 1990-2007

Years of Education	1990/91 (%)	2006/7 (%)
Grades 1-4	2.9	3.6
Grades 5-7	1.7	1.6
Grades 8-10	3.3	4.0
Completed GCE O/L	11.5	12.8
Completed GCE A/L	10.5	13.0
Graduate	10.8	14.0

Source: Himaz and Aturupane (2011).

2006/7. At grades 8-10 the incremental effect of education has grown from 3.3 percent in 1990 to 4.0 percent in 2006/7. At the level of GCE O/L completed the incremental effect of education has risen from 11.5 percent in 1990 to 12.8 percent in 2006/7. At the level of GCE A/L completed the incremental effect of education has risen from 10.5 percent in 1990 to 13.0 percent in 2006/7. Among university graduates the incremental effect of education has increased from 10.8 percent in 1990 to 14.0 percent in 2006/7. This suggests that education has become of increasing importance over time, especially at the levels of GCE O/L, GCE A/L and university, in the economic welfare of households. The pattern, with higher levels of education more important than the lower levels of education, is consistent with the notion that economic activities have become more knowledge intensive, so that the return to knowledge-based skills has been rising.

PUBLIC INVESTMENT IN EDUCATION

2.13. The government spent approximately LKR 93 billion (USD 806 million) on general education in 2009. Recurrent expenditure was about LKR 86 billion (USD 744 million) and capital expenditure was around LKR 7 billion (USD 62 million). The share of recurrent expenditures, at 92 percent, is high; while the share of capital expenditures, 8 percent, is low. This pattern of a large share of the public education budget, over 90 percent, being devoted to recurrent education expenditure was also seen in 2007 and 2008. One important reason for this pattern is the low student teacher ratio, and the consequent heavy expenditure on maintaining a large teaching force.

Investment in Education in International Perspective

2.14. **Public expenditures on education in Sri Lanka are modest when compared to middle income countries and other comparable nations.** Education expenditure as a percentage of GDP is 1.9 percent and as a proportion of the government budget is 7.3 percent [Table 2.4]. This is the smallest share of public investment in education among a cluster of countries that share common features with Sri Lanka [Figure 2.7. and Figure 2.8.]. Public investment in education in Sri Lanka falls below the level of East Asian countries such as South Korea, Malaysia, Thailand and Singapore; Latin American countries such as Argentina, Brazil, Bolivia, Colombia and Costa Rica; and of other South Asian nations such as India, Bangladesh, Pakistan and Nepal. It is also well below the share of investment for middle income countries as a whole. In fact, advanced middle-income countries normally invest about 4.6 percent of national income in education, which is more than double the share of national income devoted to education by Sri Lanka. The low share of national income and government expenditure invested in education results also in low recurrent expenditures per student. Sri Lanka spends well below the comparator countries shown in Table 2.4. per student, particularly in relation to middle-income countries such as South Korea, Malaysia, Thailand, Brazil, Argentina, Russia, Colombia and Costa Rica.

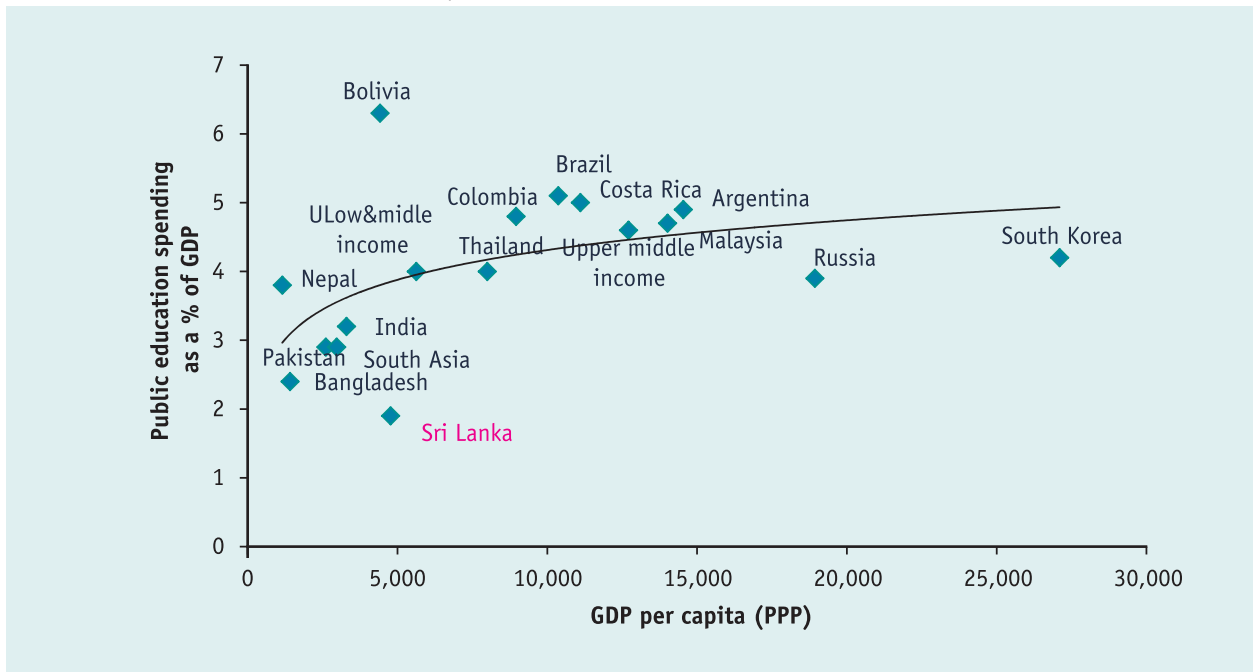
Table 2.4. Education Expenditure as a Percentage of GDP and Total Government Expenditure, Sri Lanka and Selected Other Countries, 2010 or Nearest Year

Country	Public Education Spending as a percentage of GDP	Public Education Spending as a percentage of Government Spending	Education Recurrent Expenditure per student as a share of GDP per capita
Sri Lanka	1.9	7.3	9.1
Malaysia	4.7	25.2	15.0
Thailand	4.0	20.9	18.3
South Korea	4.2	15.3	17.8
Singapore	3.3	10.3	na
Argentina	4.9	13.5	16.5
Brazil	5.1	16.1	18.1
Bolivia	6.3	18.1	na
Costa Rica	5.0	22.8	18.8
Colombia	4.8	14.9	16.6
Russia	3.9	12.9	18.0
India	3.2	10.7	12.3
Bangladesh	2.4	14.0	13.6
Pakistan	2.9	11.2	11.4
Nepal	3.8	14.9	na
South Asia	2.9	14.9	na
Low and middle income	4.0	na	na
Upper middle income	4.6	14.0	na

Sources: Central Bank of Sri Lanka Annual Report 2010, Education Statistics and World Development Indicators (World Bank).

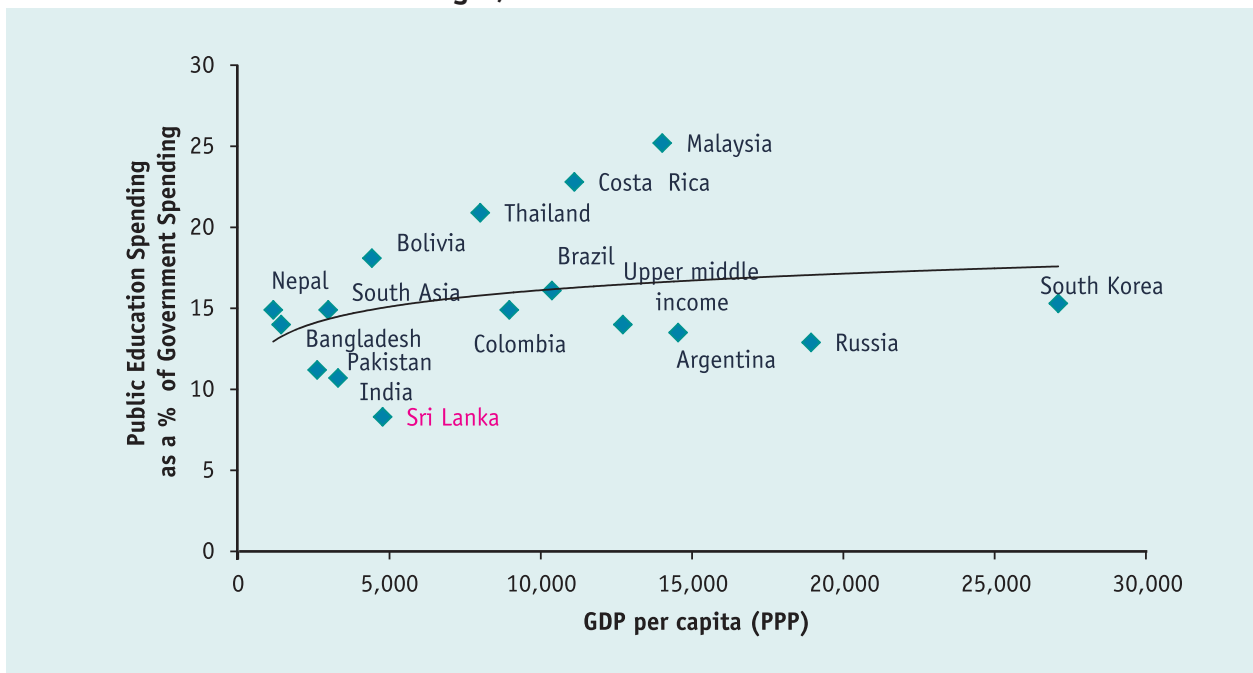
Note: Data for Sri Lanka are for 2010. Data for other countries and regions are from the closest available year to 2010.

Figure 2.7 Public Investment in Education as a Percentage of National Income, 2010 or Nearest Year



Sources: Central Bank of Sri Lanka Annual Report 2010, Education Statistics and World Development Indicators (World Bank).

Figure 2.8 Public Investment in Education as a Proportion of the Government Budget, 2010 or Nearest Year

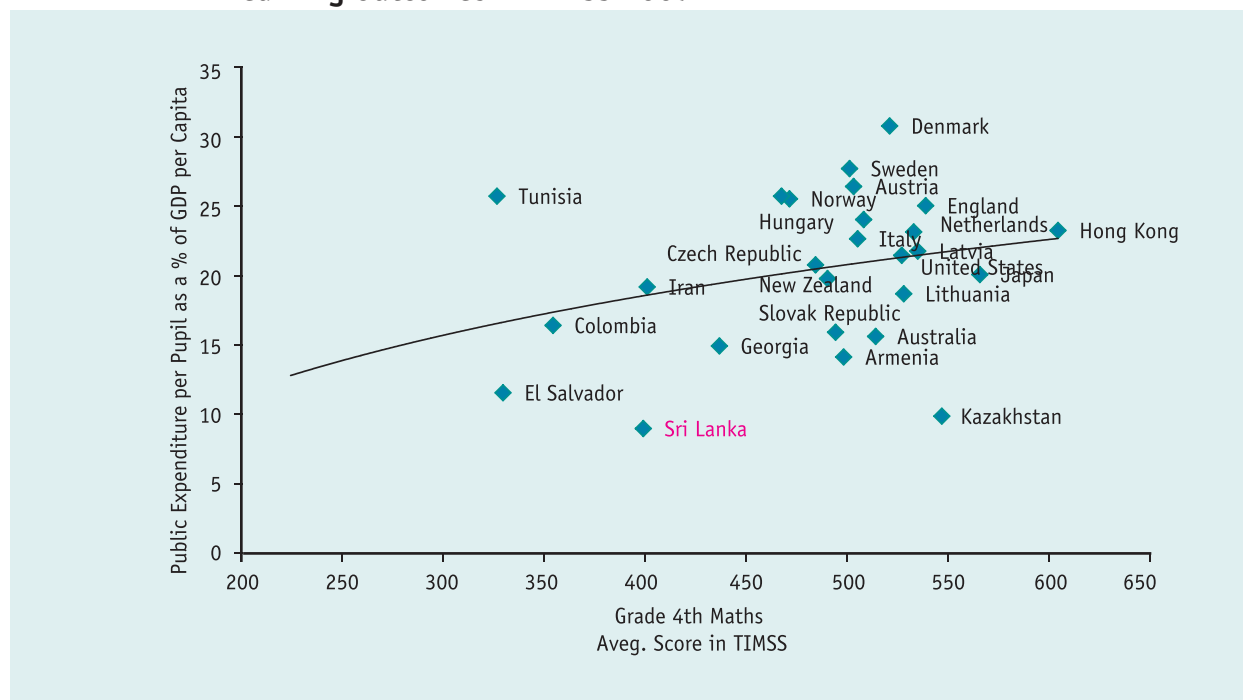


Sources: Central Bank of Sri Lanka Annual Report 2010, Education Statistics and World Development Indicators (World Bank).

2.15. There are several reasons for the low level of public education investment in Sri Lanka: (a) relatively low teacher salaries, with Sri Lankan teachers receiving salaries considerably less, as a proportion of national income *per capita*, than teachers in other Asian countries such as South Korea, Malaysia, Thailand, India, Pakistan and Bangladesh, and also less than the comparator countries in Latin America; (b) the expansion of the capital stock of schools during the 1950s-1970s, which reduced the need for major investment in the construction of new schools and new classroom blocks; (c) the competition for resources from a wide range of investments in public infrastructure and social services including universal free health care and large-scale access to safety nets; and (d) large defense and public order expenditures. The latter is likely to reduce, over time, as the military conflict in the Northern and Eastern Provinces has ended. Such a reduction would offer scope for the government to increase investment in human capital, along with any other priority sectors.

2.16. **The low public investment in education, especially relative to other countries, hurts the Sri Lankan general education system.** This is illustrated in Figure 2.9 below. The diagram shows the various countries that participated in the Trends in International Mathematics and Science Study (TIMSS). Sri Lanka was not a participant, but did conduct a National Assessment in which TIMSS items from an earlier round were included as a special module. The scores from this module are used to insert Sri Lanka into the diagram. The information in Figure 2.9 shows, first, that learning levels are positively associated to per student investment in education. Second, it shows that Sri Lanka, which invests very little on education, also performs poorly in TIMSS. Overall, countries that under-invest in education also under-perform on education outcomes.

Figure 2.9 Association between Public Investment in Education per Student and Learning Outcomes in TIMSS 2007



Sources: Mullis *et al* (2008). Sri Lanka has been inserted from NEREC 2008.

2.17. Low investment in education can have several negative consequences for the performance of an education system. Under-investment in the capital education budget means that the ability of the country to develop a stock of modern education assets and spaces, such as classrooms adapted to the use of technology, IT laboratories, libraries, science laboratories, language laboratories, activity rooms, multi-purpose rooms, IT equipment, science equipment, and teaching-learning material, is severely constrained. In addition, there are about 1,700 schools (around 18 percent of schools) without basic facilities such as drinking water and approximately 1,200 schools (around 12 percent of schools) without sanitation, and the ability of the country to supply adequate basic facilities is restricted. Low investment in the recurrent education budget means that the country's ability to spend on quality processes, such as the professional development of teachers and teacher educators, the management and leadership development of school principals and education administrators, the delivery of on-site academic and administrative support to schools, and to provide incentives for teachers to locate in disadvantaged areas, as well as to meet the operating and maintenance cost of capital education investment, is limited. Overall, the ability of the education system to deliver a high quality education experience for school children is tightly constrained by the relatively low level of public investment in education.

2.18. Public expenditures on education are weighted towards the central government although the majority of schools belong to the provinces. According to Table 2.5, the variation in public education spending between the national schools and provincial schools ranges from about 40 million rupees per national school to around 4.3 million rupees per provincial school in the Eastern Province per annum. Even the wealthiest province, the Western Province, only spends about 7.5 million rupees per school, which is more than 500 percent less than the expenditure on national schools. National schools are usually larger than provincial schools, so that the disparity in expenditures appears less per student. Nonetheless, national schools with about 19,000 rupees per student on average receive more funds than provincial schools, where the highest is about 17,900 rupees per student in the Southern Province. However, there is a self-sustaining loop here, as the increased resources allocated to national schools leads to more students seeking admission to such schools, which in turn makes these schools grow in size at the expense of provincial schools, which then leads to greater allocation of resources for teachers and capital assets to national schools, in a continuing cycle. This cycle has also led to the polarization of the schools by student size, with a small number of mainly national schools growing increasingly larger and a large number of mainly provincial schools growing increasingly smaller [Medagama and Sonnadara (2011)].

2.19. Establishing equity in the allocations between national and provincial schools is a key future challenge for the general education system. The government has begun to address this issue, with the provincial share of general education spending rising from about 68 percent of general education spending in 2007 to 71 percent in 2009 [Table 2.6]. National schools are normally located in big urban centers, such as Colombo, Kandy, Galle and Kurunegala. The students who attend national schools are typically from more affluent households than the students who attend provincial schools, the majority of which are in rural locations. Hence, expanding the provincial

Table 2.5. Average per Pupil and per School Expenditure, National and Provincial Schools, 2007

Province	No. of students	No. of schools	Per student total exp. Rs	Per school total exp. Rs
Western	681,617	1,288	14,153	7,489,948
Central	419,314	1,413	16,195	4,805,857
Southern	354,714	1,032	17,931	6,163,073
Northern	244,888	881	16,341	4,542,359
Eastern	325,040	944	12,562	4,325,524
North Western	385,617	1,187	17,239	5,600,248
North Central	224,680	772	15,576	4,533,276
Uva	223,919	795	17,434	4,910,398
Sabaragamuwa	300,598	1,076	16,129	4,506,000
National Schools	676,127	326	19,313	40,056,743
Sri Lanka	3,836,514	9,714	16,380	6,469,121

Source: Balasuriya (2007).

Table 2.6. Provincial and Central Government Shares of General Education Expenditure, 2007-2009

Provincial and Central Share of Education Spending	2007	2008	2009
Provincial Share of Public Education Spending (%)	68.2	70.6	71.1
Central Share of Public Education Spending (%)	31.8	29.4	28.9
Total	100	100	100

Source: Estimated from Ministry of Finance Planning Budget Books (various years) and Provincial Education Expenditure Reports (various years).

share of general education spending would have favorable equity implications. The government needs to consider speeding up the pace at which resources are increased for provincial schools in future years.

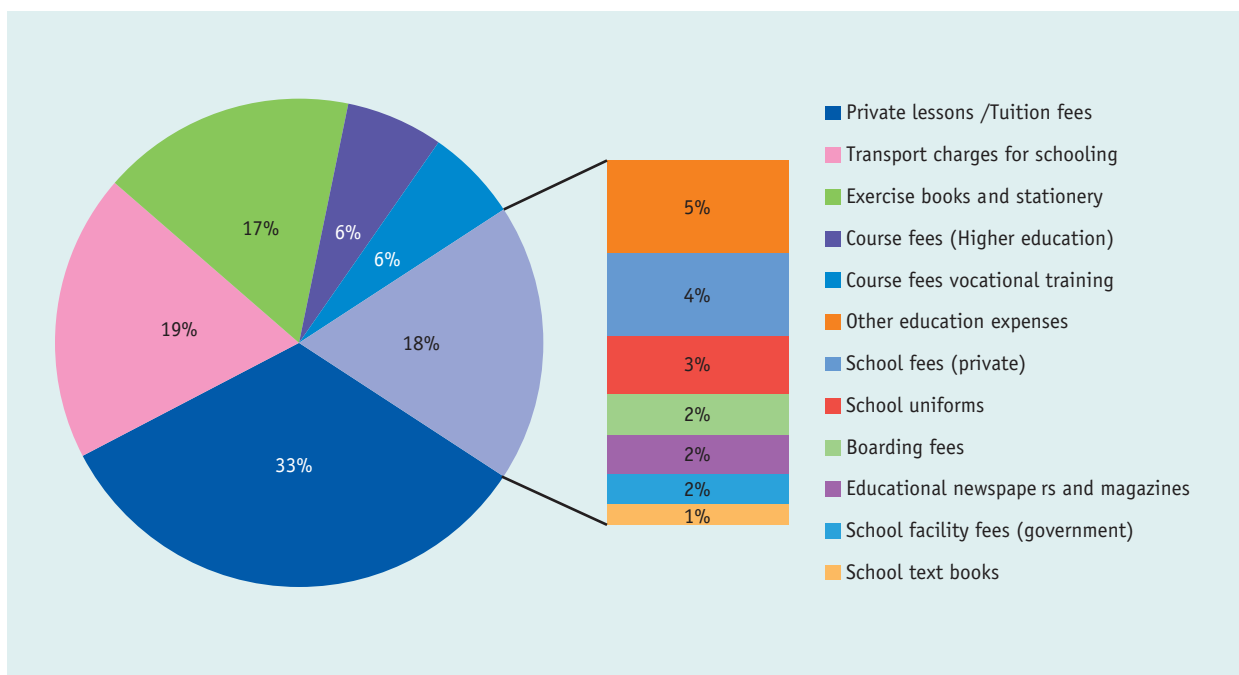
The Norm-Based Unit Cost Resource Allocation Mechanism

2.20. Sri Lanka introduced a new resource allocation mechanism called the Norm-Based Unit Cost Resource Allocation Mechanism (NBUCRAM) in the early 2000s. The objective of the NBUCRAM was to provide an equitable and rational basis for the allocation of resources to schools. According to the NBUCRAM the recurrent budget is allocated based on norms which include student-teacher ratios, estimated learning costs of different subjects and grades, the number of students in the schools, and the grade levels covered by the various types of schools [See Aturupane and Abeygunewardena (2002)]. The capital budget is allocated according to a stock-adjustment principle, where over time the capital stock of schools are improved from their current levels to desired levels, given norms for capital works, equipment and technology. A quality input grant which would flow directly to schools was included in the reform program to speed up resource utilization and to enable greater sensitivity to local school needs. This system increased the equity of resource allocation and utilization in primary and secondary education. In particular, children from low-income households benefited from this initiative [Arunatilake and Jayawardena (2010), Balasuriya (2011)].

PRIVATE INVESTMENT IN EDUCATION

2.21. **Parents and students display a strong preference for investment in human capital.** The investments made by Sri Lanka's households on education were about LKR 9,368 million (USD 85 million) in 2006/7. This was approximately 17 percent of the amount invested by the government.

Figure 2.10 Composition of Household Education Expenditure, 2006/7

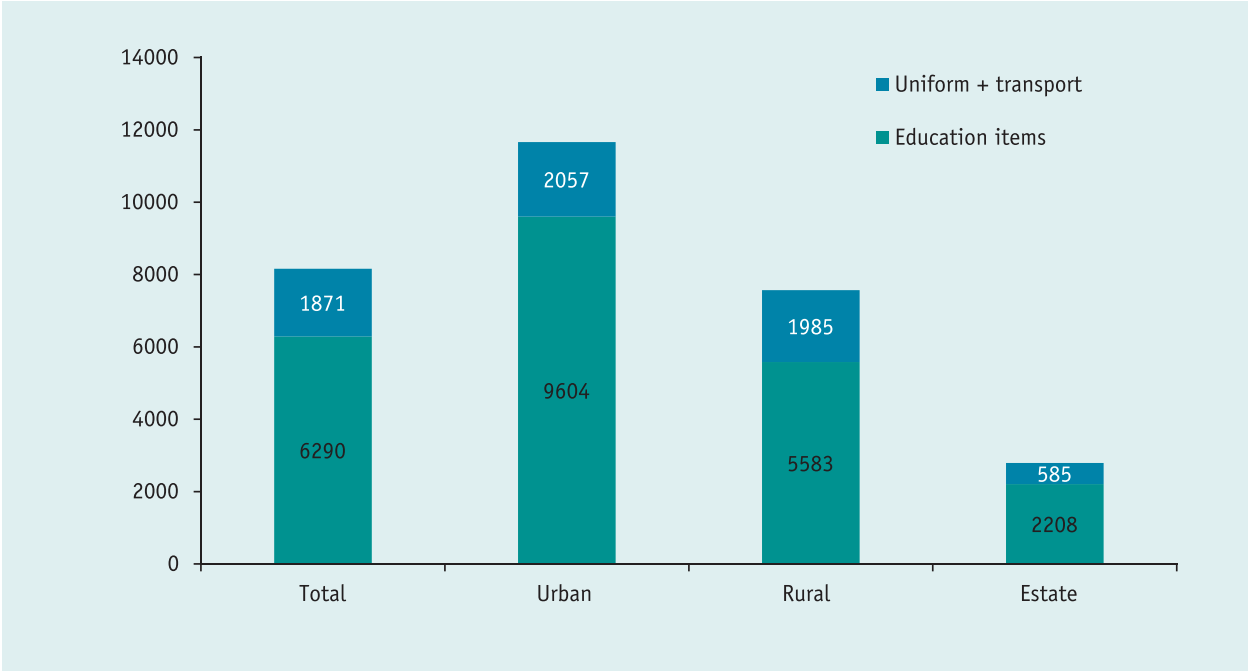


Source: Bank staff estimates, based on household survey data.

The main items of expenditure are private tuition/coaching expenses, transport costs, and exercise books and stationery [Figure 2.10]. Other items of expenditure include school books, education related magazines and newspapers, school facility fees and other fees, and boarding fees. The expenditure on tuition can be interpreted in several ways. First, it can be a reflection of the intense competitiveness of families and individuals, with parents and children seeking to gain an advantage by supplementing their formal schooling with additional instruction through private tuition. The widespread prevalence of private tuition/coaching in middle-income and even advanced economies, including in countries as diverse as Japan, Canada, Brazil, South Korea and Hong Kong [Bray (2006)] lend credence to this notion. Second, tuition teachers typically provide instruction aimed directly at examination papers, while schools seek to provide a broader education with wider social and cultural goals. Some parents and students would seek to focus more closely on examination outcomes than on wider educational goals, and devote time and resources to private tuition. Third, parents and students may not be satisfied with the quality of education provided in schools, and seek to supplement their learning through tuition. Private tuition does contribute to higher scores in cognitive achievement tests in Sri Lanka [Aturupane *et al* (forthcoming 2011)]. Hence, it is a rational decision by parents and children to invest in tuition, if they are seeking to raise their test scores.

2.22. **Household expenditures on education vary between the urban, rural and estate sectors** [Figure 2.11]. Households in urban areas spend around 11,660 rupees per student, while households in rural areas spend about 7,600 rupees per student, and households in estate areas approximately

Figure 2.11 Private Education Expenditure per Student 2006/7 (Rupees)



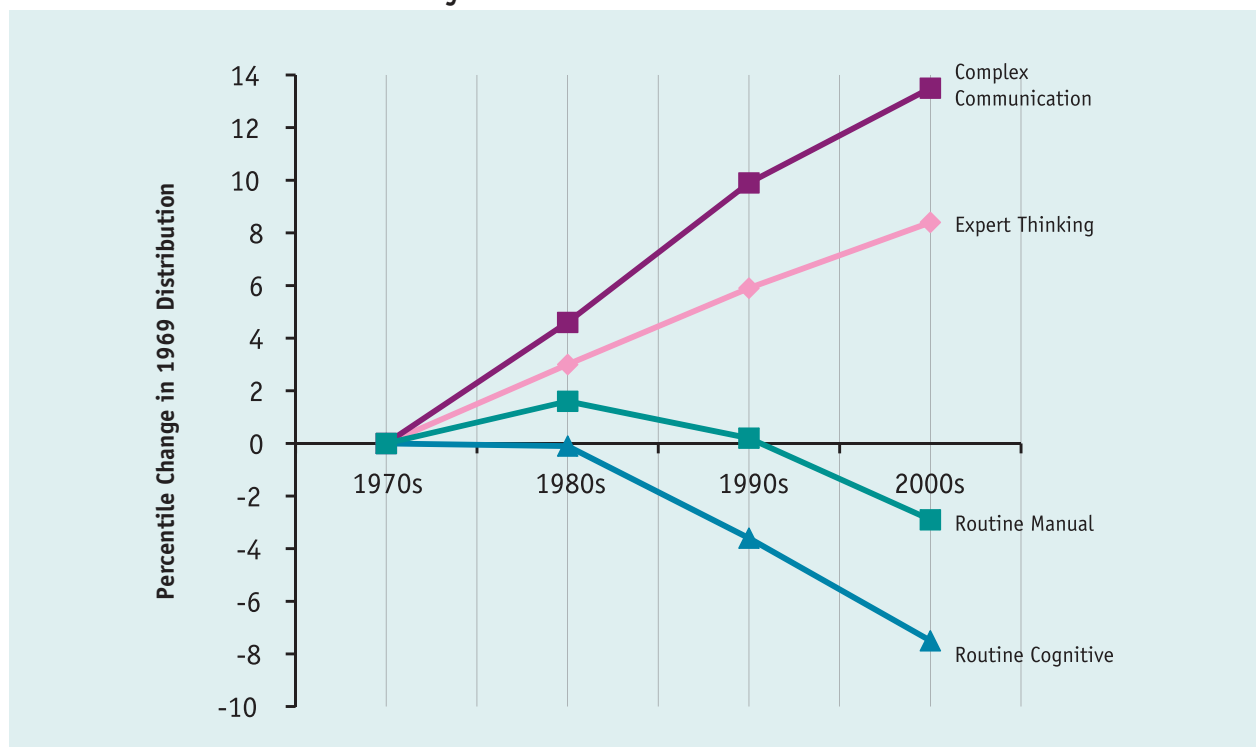
Source: Bank staff estimates based on household survey data.

2,800 rupees per student. Household spending in urban areas is about 55 percent more than among rural households and 420 percent more than among households in estate areas. Urban households are typically more affluent and educated than rural and estate households. Parents and students from these urban households are likely to have higher educational ambitions and aims, and invest more in human capital accumulation.

EDUCATION AND THE GLOBAL LABOR MARKET

2.23. **The skills required for economic development are undergoing a world-wide transformation.** Up to the 1970s routine cognitive tasks, which are mental tasks with well-defined logical rules (e.g. maintaining expense reports) and routine manual tasks, which are well-defined using such rules (e.g. installing standard equipment) were important in economic production processes. However, since the 1970s the relative importance of these skills has been declining in sophisticated economies, especially with increasingly complex automation and technology-intensive machines available to perform many of these tasks. Instead, skills such as expert thinking, which requires creative solutions to problems for which there are no simple rule based solutions (e.g. diagnosing the illness of a patient with puzzling symptoms), and complex communication, which involves inter-personal interactions to acquire and explain information, and if necessary use this

Figure 2.12 The Changing Composition of Skills Needed in Economies in the 21st Century



Source: Adapted from World Bank (2008b) and Levy and Murnane (2004).

information persuasively (e.g. a manager motivating her work force) are becoming increasingly important in advanced and upper-middle income economies [World Bank (2008b) based on Levy and Murnane (2004)]. This transformation in skills required for economic advancement is illustrated in Figure 2.12.

2.24. **Employers are demanding high levels of “soft skills”.** Employers list skills such as habits of discipline and industry, creativity, good communication, collaborating in teams, problem solving, decision making, initiative, punctuality and the ability to work to deadlines, and adaptability and trainability as key skills needed for the work place. In addition, formal private sector organizations, especially those involved in international trade and finance, stress the importance of fluency in international languages, particularly English language skills. Scientific and industrial occupations require individuals with good mathematics and science knowledge and skills. The ability to use information technology is a basic requirement in the modern world. The higher education system also requires the soft skills, English language fluency and basic IT literacy in the graduates of the school system who are the entrants into higher education institutions.

2.25. **The general education system needs to sharply increase the output and supply of school completers with the skills needed in the work place and by the higher education system.** This will require a variety of initiatives in the diversification, modernization and delivery of the curriculum. Special emphasis will need to be placed on the production of soft skills, the promotion of English language fluency and IT literacy, and improvement of the quality of science and mathematics education. Modern ICT-intensive pedagogical methods are likely to increase world-wide in the years to come [Box 2.1], and Sri Lanka will need to invest substantial resources in this area.

AVENUES AND PATHWAYS INTO THE FUTURE

2.26. **Sri Lanka will need to expand the flow of resources into the education sector to transform the general education system into the foundation of a knowledge hub.** Middle-income countries with economies more advanced than Sri Lanka in East Asia, Latin America, and Eastern Europe, invest considerably more in education. In order to invest adequate resources in modern equipment and technology and enable Sri Lankan students to acquire the skills and competencies needed for modern knowledge-intensive economic processes, the country will need to increase investment in education. There are multiple options to increase the resources available for the general education sector.

2.27. **The government needs, over time, to increase public investment in education.** This would enable the government school system to acquire the stock of modern education assets and spaces, such as classrooms wired for the use of technology, IT laboratories, libraries, science laboratories, language laboratories, activity rooms, multi-purpose rooms, IT equipment, science equipment, and teaching-learning material, that are needed. Basic needs such as clean drinking water and safe

Box 2.1. Investment in ICT and Education

Sri Lanka has commenced a number of initiatives related to the use of ICT (Information and Communications Technology) in education. The impetus for the use of ICT in education arises from a variety of sources. A key source is the ability of ICT to generate a plethora of multi-modal learning opportunities for pupils with different learning styles, including auditory, visual, kinesthetic aspects. These ICT based initiatives include setting up computer laboratories in secondary schools, pilot-testing the one-laptop-per-child idea in a small number of primary schools, and commencing the development of local language content for ICT based learning. These initiatives are at an embryonic stage. With the cost of ICT equipment declining and a variety of solutions becoming available in the global market, the Ministry of Education is seeking to expand the use of ICT in education. A number of areas need be considered as the government moves in this direction, including: (a) strengthening leadership and management capacity, which is essential for success in such initiatives [Tondeur et al (2008)]; (b) professional development of teachers; (c) curriculum modernization and content development; and (d) strengthening IT infrastructure, connectivity and accessibility. This development initiative is likely to require substantial resources. The introduction of cost effective learning platforms and portable energy efficient devices, such as cloud-based, thin-client end user devices can help [Vota (2010)].

Source: Weerasinghe (2011).

sanitation can also be met. In addition, investment in quality processes such as the professional development of teachers and teacher educators, the management and leadership development of school principals and education administrators, and the delivery of on-site academic and administrative support to schools, can be expanded. Greater public investment will also make it feasible to provide fiscal incentives for teachers to serve in schools in disadvantaged areas. Adequate resources for the operating and maintenance cost of capital investment in education is also an important priority.

2.28. **The government can also encourage public-private partnerships in education.** Sri Lanka already has a model of private-public partnerships through the “assisted schools” model, where the government agrees to fund the salaries of teachers according to certain guidelines, and the school finds resources to meet the other capital and operating expenses. Such a model can be encouraged for schools located in wealthy urban neighborhoods, with affluent parents. Sharing the costs of operating such schools with families would free up public funds and enable the government to increase resources for schools attended by poorer children. An alternative model is for schools to tap into funds available from private firms, perhaps under Corporate Social Responsibility (CSR) schemes to increase the resources available to them, over and above the amounts that the government is able to provide.

2.29. **Sri Lanka has been successful in initiatives involving school level spending, and can build on these successes further in the future. The system of school-based funding of education, the Norm-Based Unit Cost Resource Allocation Mechanism (NBUCRAM), was successful in improving the equity of resource allocation and utilization in primary and secondary education, especially for children from low-income households [Arunatilake and Jayawardena (2010)]. Policy makers can consider building on this past success and expand the quality input grant to a school-based learning enhancement grant which covers quality processes as well as quality inputs, and includes the acquisition of educational equipment and technology.**

CHAPTER THREE

GOVERNANCE AND DELIVERY OF EDUCATION SERVICES

INTRODUCTION

3.1. **The general education sector has a complex governance framework, combining elements of de-concentration, delegation and devolution of functions and powers between the central government and the nine provincial councils.** The central government is responsible for the formulation of national education policies, norms and standards. Provincial councils play an important role in the management and delivery of education services. General education is the most decentralized sector in the country, with education budgets typically accounting for over half of all provincial expenditures.

THE ORGANIZATIONAL FRAMEWORK OF THE GENERAL EDUCATION SECTOR

3.2. **The division of roles and functions between the center and provinces attempts to combine the advantages of centralized academic systems with the benefits of *delegated management systems*.** Centralized academic systems, especially covering curriculum and examinations, facilitate goals such as nation-building, increased social cohesion, and uniform quality standards. Delegated management systems enjoy greater proximity of service delivery to beneficiaries such as students, parents and guardians, school principals and teachers.

Central Government functions

- 3.3. The central government is responsible for the following functions:
- formulating national education policy;
 - establishing the school curriculum;
 - setting the curricula of teacher education institutions;
 - establishing service conditions for the four education services: the teachers service, the principals service, the education administrators service, and the teacher educators service;
 - human resource management of education administrators, school principals and school teachers at the national level;
 - publishing and distributing textbooks, and accrediting any textbooks produced by the private sector;
 - providing national level incentives, such as school uniforms and transport subsidies, to

- increase school attendance;
- administering professional development programs and courses for principals, section heads and teachers;
- public examinations;
- quality assurance;
- administering national schools; and
- national level planning, monitoring and research.

The organizational structure of the central education agencies is presented in Figure 3.1 below.

Provincial Council functions

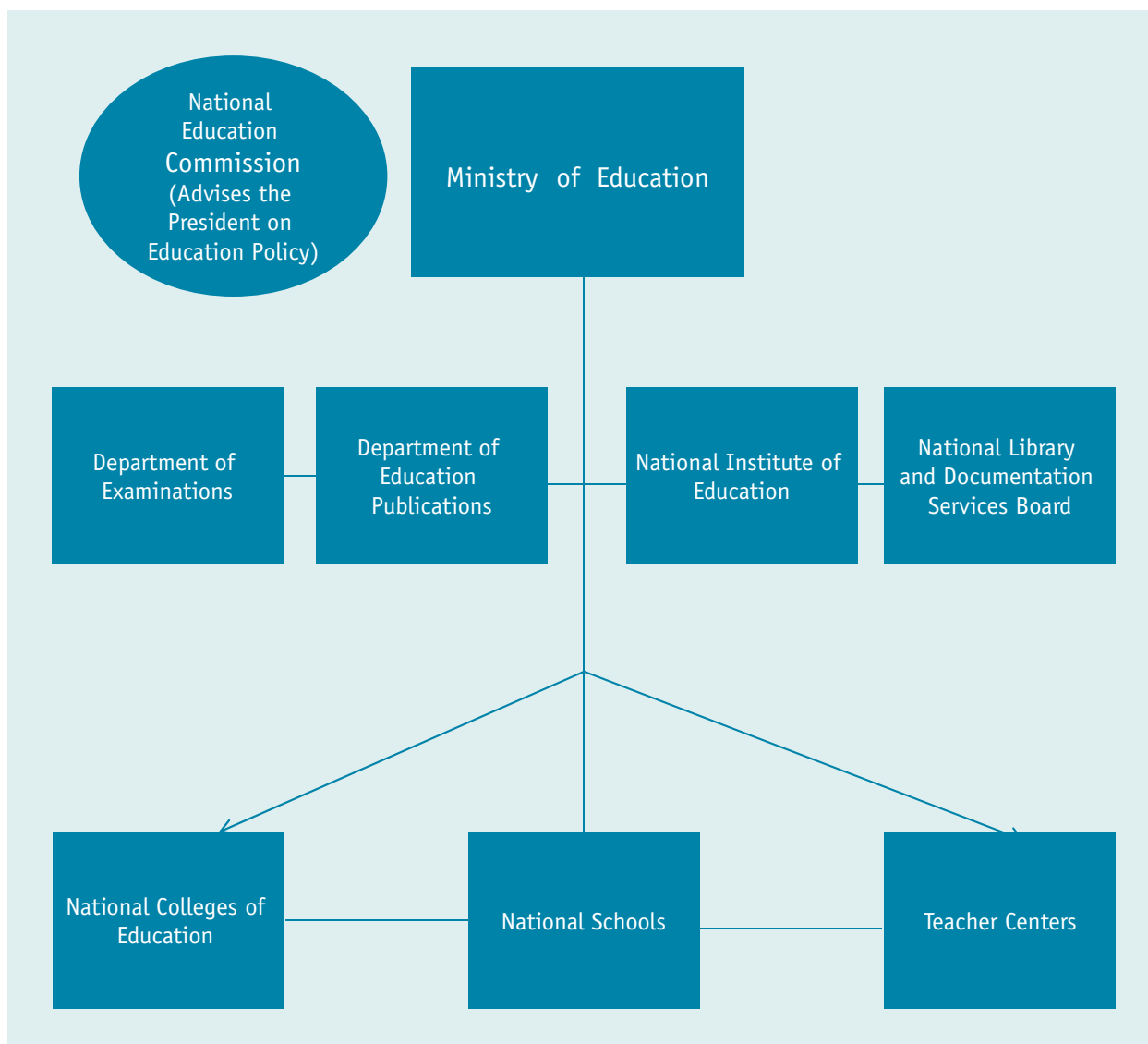
3.4. **The Provincial Councils play a vitally important role in the delivery of services in the general education sector.** About 9,070 schools (96 percent of government schools) are administered by the nine provincial councils and their intermediary education agencies, the zonal education offices and divisional education offices. The functions of Provincial Councils include:

- formulating provincial education policy, within the overarching framework of national education policy;
- preparing and implementing provincial education sector development plans;
- human resource management and development of education administrators, school principals and school teachers at the provincial level;
- administration of provincial schools; and
- provincial level monitoring.

The organizational structure of the provincial education agencies is presented in Figure 3.2 below.

3.5. **The sub-provincial level contains two sets of administrative tiers: education zones and education divisions.** There are 97 education zones, with each zone covering on average 100 schools. There are 309 divisions, with each division covering on average 30 schools. The education zonal offices mainly engage in human resource management of education administrators, school principals and school teachers, and the provision of facilities and equipment for schools within their zones. Zonal officials also assist in the preparation and implementation of education development plans at the zonal level. Divisional education offices chiefly assist schools through technical support activities, such as on-site advisory activities and monitoring. The division of labor between the education zones and divisions is not entirely clear, however, and the roles and responsibilities of these two levels of sub-provincial educational administration need to be more clearly defined and developed.

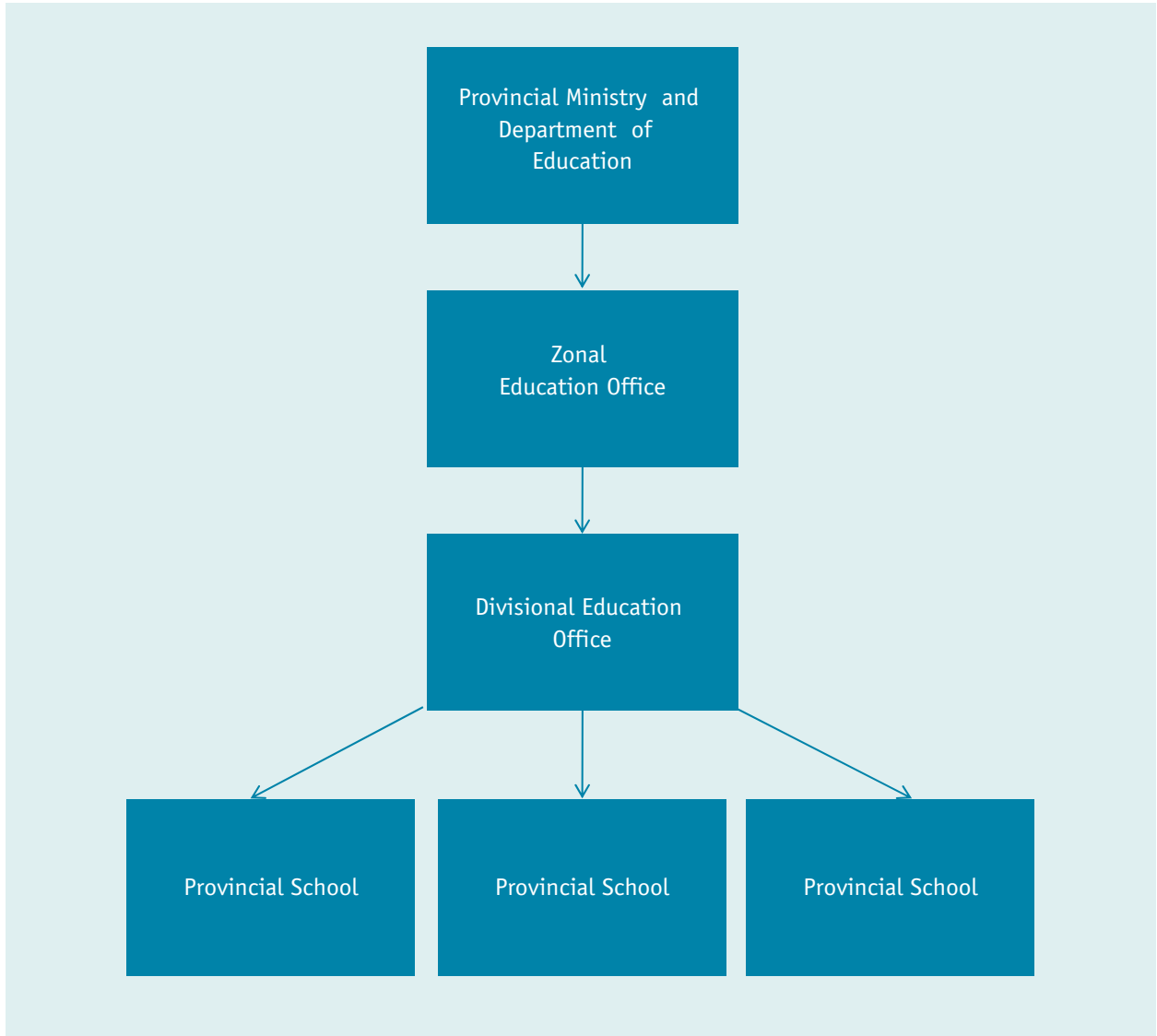
Figure 3.1 Organizational System of the Central Ministry of Education and Agencies



The Institutional Foundation for the Delivery of Education Services

3.6. **The basic institutional foundation for the delivery of education services exists between the central government agencies and the Provincial Councils.** Several characteristics of good first stage public service institutions are present. These include: (a) input-oriented line-item budgeting; (b) legal cadres of government education officials, such as principals, teachers, education administrators, and teacher educators; (c) opportunities for the professional development and career progress of managerial, teaching and technical staff; and (d) cash accounting systems. In addition, characteristics of good second stage public service institutions, such as an institutionalized performance auditing system within a supreme audit institution, the Auditor General’s Department, and an internal audit within the education sector, also exist.

Figure 3.2 The Organizational Framework of the Provincial Education System



Performance Incentives within the General Education Sector

3.7. **The incentive system for the key agents within the institutional framework is a vital factor influencing the performance of the education system.** This includes central education officials; provincial, zonal and divisional education staff; education administrators; curriculum developers; teacher educators; school principals; and school teachers. Within government organizations both explicit and implicit performance incentives exist through a reward system, such as appointments to positions of high status, promotions up the career ladder of the service, higher levels of responsibility, greater job security, more stimulating and interesting work, and reduced supervision. Such performance incentives exist, in principle, at all levels of the general education system. For instance, high performing teachers can become principals, teacher educators, curriculum developers or education administrators. Good school principals can be promoted to

assume responsible positions in divisional, zonal or provincial education offices. Capable provincial and zonal education officials can seek positions in the central Ministry of Education.

3.8. **The actual operation of this incentive system, however, has been limited by several key factors.** Financial incentives for performance are slight within the public service. The government wage and salary structure is tightly compressed, with small annual increments. Hence, the opportunity cost of non-performance is low. Also, promotions are chiefly seniority based, which further weakens performance incentives. These are system-wide problems within the public service as a whole, and not confined to the education sector.

TEACHER MANAGEMENT AND DEVELOPMENT IN A DECENTRALIZED SYSTEM

3.9. **The quality and quantity of teachers are a crucial determinant of education performance and student learning outcomes.** At the aggregate level, the country has an adequate number of teachers, with approximately 214,000 teachers and a student-teacher ratio of 18:1. If anything, this is a low student-teacher ratio which is expensive to maintain. The responsibility for teacher employment and deployment is divided between the central Ministry of Education and the Provincial Councils. The recruitment of trainee teachers, post GCE A/L, is the responsibility of the central Ministry of Education. The assignment of these trained teachers to national schools or to provinces, after they qualify as teachers, is also the responsibility of the Ministry of Education. However, the responsibility for recruiting university graduates to provincial schools as teachers lies with the Provincial Councils. Teacher transfers across provinces require the intervention of the Ministry of Education. But teacher transfers within provinces are the responsibility of Provincial Councils.

3.10. **Teacher deployment is a problem, especially for teachers of subjects such as English, science, mathematics and IT.** Certain schools, particularly those rural schools in difficult areas find it extremely hard to attract and retain teachers in these subjects. The Ministry of Education and Provincial Councils are in the process of trying out several initiatives to improve teacher deployment, including faster promotions for teachers serving in disadvantaged schools, providing living accommodation for teachers in such schools, and giving preference to individuals in the districts which experience the worst teacher shortages when selecting candidates for teacher trainee positions. Three further policy measures that could be promising are: (a) the payment of a substantial monthly financial incentive for teachers to locate in schools in difficult areas, as is the practice in many OECD countries [see Box 3.1]; (b) identifying a geographical area within which teachers transfers are relatively uncontroversial, and improving teacher deployment within these areas through appropriate teacher transfers and appointments; and (c) changing teacher recruitment from the present centralized system to a fully decentralized system of school-based teacher recruitment.

3.11. Pre-service teacher education is carried out by University Faculties of Education, the National Institute of Education (NIE), the National Colleges of Education (NCOEs) and the Colleges of Teacher Education (COTEs). There are four universities having faculties/ departments of education which provide post-graduate diplomas in education courses. One university has a pre-service Bachelor of Education (B.Ed) course. The NIE conducts distance mode courses leading to a Bachelor of Education degree for trained teachers in service and a distance program for untrained teachers in the system as well. The NCOEs, 17 in number conduct a pre-service Diploma in Teaching of three years duration. The annual intake is around 3,000 trainees. The nine COTEs cater to the untrained teachers in the system by offering a two year Teacher Training Certificate Course.

3.12. Continuing and in-service training programs for teachers are carried out by the NIE with the assistance of In-Service Advisors (ISA) based in the education zones and in the Teacher Centers (TCs) located in the zones. The Education Faculties of the universities, the NCOEs and COTEs also conduct special in-service education programs, depending on needs and availability of funds. There are also certain subject based centers such as Provincial ICT (Information and Communications Technology) Centers for ICT teachers ICT and Regional English Support Centers (RESC) for English language teachers.

3.13. There have been concerns regarding the impact of continuing and in-service education delivered through the cascade model of teacher training in off-site institutions. [NEC (2003),

Box 3.1. Incentive Payments for Teachers in OECD Countries

Many countries have developed schemes that offer extra payments for teachers as incentives to serve in less developed areas or in disadvantaged schools. These schools often have difficulty in attracting teachers. Additional payments are provided yearly in about two-thirds of OECD countries including Australia, Denmark, England, Finland, France, Greece, Ireland, Italy, Japan, Mexico, Netherlands, New Zealand, Norway, Poland, Scotland, Spain and the United States [OECD (2010)]. In Japan, for instance teachers are paid an allowance for working in hard-to-staff locations. This is called an “isolated area allowance”. This allowance can add up to 25 percent of the basic scheduled salary of a teacher.

In Scotland, teachers are awarded the remote school allowance as stipulated by the Scottish Negotiating Committee for Teachers (SNCT). In the Northern Territory Government, Australia, significant benefits are provided for teachers working in remote areas. They include a remote incentive allowance, remote retention payments, special study leave, free housing for teachers recruited to remote communities, family travel assistance, leave to attend to business outside the remote community, and special teaching allowances. Additionally, there are a range of professional and personal support services for teachers working and living in very remote indigenous communities.

Lekamge *et al* (2007)]. While teachers obtain useful information on topics such as classroom management, student discipline, and interactions with parents, these rarely have much effect on central areas of professional development such as content knowledge, pedagogical knowledge and the unique cognitive needs of children in the age-group being taught.

AVENUES AND PATHWAYS FOR THE FUTURE

3.14. **A new initiative, School-Based Teacher Development (SBTD), has been introduced on a pilot basis.** Under this concept teacher development takes place directly at the school level. This model has been noted globally for its effectiveness [Allemano *et al* (2011)]. SBTD involves the active participation and direct control by school teachers, school principals, and officials in the school support network, such as in-service advisors. The activities under SBTD typically include school-based mentoring, peer learning, peer coaching, individual consultation, and visits to other classrooms. The model of SBTD initially experienced teething problems, as it was new [Setunge *et al* (2007)]. However, as the pilot program developed it became popular in schools. The international experience supports SBTD as a promising reform to be scaled up in the future [Box 3.2].

Box 3.2. School-Based Teacher Development in Mexico and Madagascar

In some countries, schools are given responsibilities for teacher training and development. One reform, which was implemented in Mexico, provided schools five-year grants to improve education quality. In the first four years, about 80 percent of the grant must be spent on school materials and facilities. In the fifth year, only part of the money must be spent on such goods, with a large proportion of the grant going to fund teacher training and development. In a reform in Madagascar, the government gives a direct grant to schools, the amount of which is calculated on a per-student basis. School councils can use these capitation grants to fund teacher costs (salary and bonus) and training, as well as to purchase school materials and improve school facilities.

Source: Bruns *et al* (2011).

3.15. There are a number of novel initiatives underway in Latin America and South Asia to improve teacher attendance and performance. In El Salvador, a reform was implemented under which schools received funds directly from the Ministry of Education for hiring, firing, and monitoring teachers. Similar projects have been implemented in other Latin American countries such as Honduras, Guatemala and Nicaragua. These models of school-based teacher recruitment generally improved teacher attendance and deployment. The Indian State of Andhra Pradesh has initiated a pilot program which links the payments of teachers to their performance [Box 3.3]. The Sindh Province of Pakistan has initiated a merit and need based model of teacher recruitment [Box 3.4]. Sri Lankan policy makers need to consider innovative methods of improving teacher employment and deployment that are appropriate for the education system of the country.

Box 3.3. Teacher Performance and Pay in Andhra Pradesh, India

Andhra Pradesh is the 5th most populous state in India, with a population of over 80 million, 73 percent of whom live in rural areas. A research project was conducted in five districts in Andhra Pradesh to understand the impact on learning outcomes of providing various inputs and incentives to schools. Teachers in incentive schools were offered bonus payments on the basis of the average improvement in test scores (in mathematics and language) of students taught by them subject to a minimum improvement of 5 percent. All teachers in group incentive schools received the same bonus based on average school-level improvement in test scores, while the bonus for teachers in individual incentive schools was based on the average test score improvement of students taught by the specific teacher.

According to Muralidharan and Sundararaman (2009), the evaluation of the interventions in the first two years reveals that providing incentives to teachers increased student learning. School level group incentives and teacher level individual incentives perform equally well in the first year of the program, however the individual incentive schools significantly outperformed the group incentive schools in the second year. The additional inputs (para teachers and school grants for spending on student level inputs) were also effective in raising test scores and appear to be substantially more cost effective than the status quo. However, the incentive program spent the same amount of money on bonus payments and achieved significantly better outcomes. However, the authors of the study also noted the possible limitations in their study to do with the long term effect of incentives, the potential for teachers and schools to game the system, uncertainty about the optimal ratio of base to bonus pay and further work required to account for other determinants of student performance such as class size, school infrastructure, household inputs and peer effects.

Source: Muralidharan and Sundararaman (2009).

THE PROGRAM FOR SCHOOL IMPROVEMENT: AN INNOVATION

3.16. **The Government of Sri Lanka embarked on an innovative pilot initiative called the Program for School Improvement (PSI) to empower schools and local school communities** in 2006. This initiative was influenced by reforms in developed countries, such as the U.S.A., the U.K., Australia and Canada, as well as developing countries in South Asia and East Asia, to devolve managerial power to schools. Theme four of the GOSL Education Sector Development Framework and Program seeks to enable schools to become increasingly self-managing, with strong community involvement, and improve the delivery of education services [MOE (2007b), (2008b)].

3.17. **The PSI was designed to bring about change in the culture of schools through the establishment of management structures and the provision of training and support services in**

Box 3.4. Merit and Needs-Based Teacher Recruitment in Sindh Province, Pakistan

Sindh is the second-largest province in Pakistan with a population of 50 million. The Government of Sindh launched Education Sector Reform Program in 2006. Merit and needs-based teacher recruitment is a central reform as part of the Program. The Program ensures teachers in the province are recruited according to merit. The recruitment begins with candidates applying for positions, and district governments pre-screening applicants for minimum qualifications. Candidates take an entrance examination. Passing candidates (those scoring above 60 percent) are eligible for appointments. These eligible candidates receive a merit score, composed of their test score plus additional points for professional and academic qualifications, domicile (residing in close proximity to the appointment school) and bonus points for female candidates. The highest scoring candidates for a given locality are then locally appointed to positions. The appointments are on a contract basis, for a period of three years, and are school specific. As a result, more than 13,000 teachers have been hired under merit-based, school-specific teacher recruitment policy. A new teacher certification system was launched.

Source: World Bank (2010).

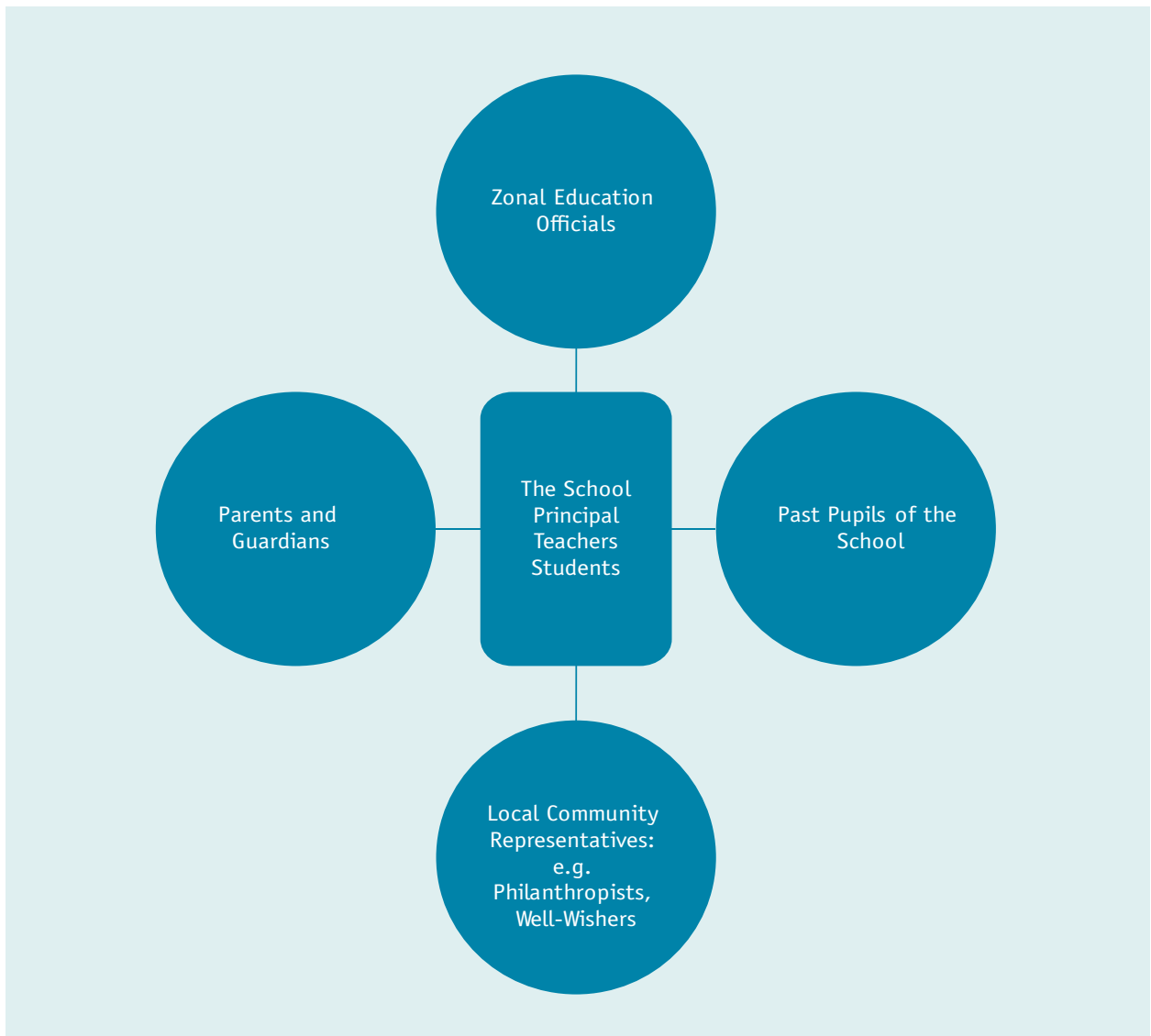
which: (a) decisions for a range of activities were devolved to the school level; (b) the participation of parents and community in the work of the school was increased; and (c) the quality of student learning became a major focus. More specifically, PSI was planned to achieve:

- active involvement of the school community (parents, teachers, past pupils and local community members) in the running of the school (Figure 3.3 below);
- planned development of the school;
- effective utilization of resources;
- improved performance in curricular and co-curricular activities through co-operation between school and community;
- establishment of congruence between staff training and school needs;
- strengthening school-community relationships; and
- entrusting responsibility for the school to the School Development Committee, thus ensuring accountability [MOE (2005)].

3.18. Each PSI school has a School Development Committee (SDC) and a School Management Committee (SMC). The SDC consists of the Principal (as Chairperson), a Deputy Principal, and representatives of teachers, parents, past pupils, and the zone. The SDC should meet at least once a month during its three-year term of office. The SDC is expected to prepare a five-year school development plan based on the Manual of Instruction for School Level Planning [MOE (2004a)] and an annual implementation plan. These plans should address: (a) student access and participation; (b) student achievement; and (c) school plant and physical resources [MOE (2004b)]. Grants are provided for the activities of the plan. The SDC is required to prepare an annual budget and

statements of financial accounts; operate a bank account; be responsible for the development of the school plan; and be accountable to the relevant authorities and to the school community. The School Management Committee (SMC), which is established within the school, consists of all the school staff members of the SDC and members selected from among Deputy Principals, Assistant Principals and Heads of Divisions. Its main function is to implement decisions taken by the SDC.

Figure 3.3 The Program for School Improvement: Network of Relationships



3.19. The PSI was launched in one zone in each of the provinces in 2006. The PSI proved highly popular with schools and community stakeholders. As a result, in each succeeding year, additional zones were added. By 2011, all zones and schools were participating in the scheme. Information on the interpretation and implementation of PSI is available from some recent studies [Lekamge *et al* (2007), Dias (2008), Kularatne (2008), and Gunasekara *et al* (2010)].

3.20. **The PSI has shown a positive impact on learning outcomes in Sri Lanka.** A rigorous impact assessment, based on a randomized design and carried out over the period 2006 to 2008, found that participation in PSI was associated with an increase in the mathematics and English language test scores of grade 4 pupils [Table 3.1]. This is a significant finding, as improvements in learning outcomes through school-based management reforms are not universal. Countries that have demonstrated positive results include El Salvador, Kenya, Mexico and Nicaragua [Box 3.5].

Box 3.5. Impact of School-Based Management: Cross-Country Experience

The impact of school-based management (SBM) varies among countries. In some countries SBM has had a favorable impact on cognitive tests scores. In other countries SBM has had a positive impact on promoting access and participation in school. In yet other countries SBM has influenced the culture and learning environment of the school.

Countries such as El Salvador, Kenya, Mexico, and Nicaragua showed a positive relationship between SBM and student learning outcomes. There are several factors associated with this result, including greater parental oversight, better motivation of principals and increased teacher accountability.

SBM policies actually changed the dynamics of schools, either because parents got more involved or because teachers' actions changed, in countries such as El Salvador, Nicaragua and Kenya.

SBM had a positive impact on reducing repetition, failure rates and dropout rates in countries such as Brazil, El Salvador, Honduras and Mexico.

Source: Barrera-Osorio *et al* (2009).

3.21. The successful implementation of PSI has been associated with a number of factors. These include:

- a strong commitment of the principal and other teachers to the values of PSI;
- a school plan prepared and its implementation monitored;
- a wide range of extra-curricular activities provided for pupils (e.g., dance, music, sport, gardening);
- increased community involvement in the school;
- regular (monthly) meetings between teachers and parents to monitor and discuss the progress of individual pupils;
- regular visits to the schools by zonal and divisional officers to participate in committees, to advise on teaching methods, and to assist in development and implementation of the school plan; and
- a shift in teachers' minds from inputs to the quality of student learning.

Table 3.1. Grade 4 Test Scores and Household Educational Expenditures (School-level Fixed Effects Estimation with Clustered Standard Errors)

Variables	(1) Math	(2) English	(3) Maths	(4) English
Year = 2008	-0.0684	-0.0584	-0.0385	-0.0469
	(0.0482)	(0.0458)	(0.0525)	(0.0495)
2008×PSI	0.199***	0.177***	0.220***	0.226***
	(0.0720)	(0.0662)	(0.0767)	(0.0712)
	(0.102)	(0.0921)	(0.110)	(0.101)
Male			-0.238***	-0.344***
			(0.0289)	(0.0266)
Sinhala			0.349***	0.0286
			(0.103)	(0.0841)
Tamil			0.0400	-0.0644
			(0.0975)	(0.0828)
Income			0.0313***	0.0421***
			(0.0119)	(0.0116)
Mother's Educ.			0.0281***	0.0269***
			(0.00635)	(0.00545)
Father's Educ.			0.0101	0.00962*
			(0.00625)	(0.00540)
Constant	-0.114***	-0.0756***	-0.668***	-0.337***
	(0.0173)	(0.0163)	(0.104)	(0.0880)
Observations	5709	5688	4746	4727
R-squared	0.003	0.004	0.038	0.058
Number of schools	196	196	196	196

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
Source: World Bank and EFA-FTI Secretariat (2011).

3.22. These findings are consistent with results from school-based management programs in other countries. For instance, school-based management reforms in Brazil have influenced activities such as planning, participation in parent-teacher associations, and working conditions of teachers [Carnoy *et al* (2008)]. School-based management reforms in Guatemala have helped improve community participation and parental involvement [di Gropello (2006)].

3.23. **In weaker schools, a variety of measures are in place to address problems associated with low or marginal levels of implementation.** These include:

- PSI committees have been established in all zones.
- Technical Assistants have been appointed in all provinces to support schools.
- Meetings have been held between Ministry officials, Zonal officers, and Technical Assistants to review progress.
- Training of SDC personnel has been carried out at provincial level.
- Schools serving pupils from disadvantaged areas that need additional support or assistance in implementing PSI have been identified.
- “Seed grants” have been given to “difficult” and “very difficult” schools [MOE (2008b)].

3.24. **The PSI has been highly popular with school communities, including principals, teachers, parents and local community members.** Among school community members support for the PSI has been nearly universal. Schools principals and teachers state that they feel more empowered and motivated. This echoes findings in countries such as Hong Kong, China [Dimmock and Walker (1998)] and Israel [Gaziel (1998)] where principals and teachers expressed perceptions of greater empowerment, commitment and achievement orientation. Local community members also felt that they had more voice and influence in the management of schools after the introduction of the PSI. This is similar to findings in countries such as El Salvador [Sawada and Ragatz (2005)] where local community members expressed a sense of greater efficacy and commitment towards the school. The PSI has been supported by government authorities and representatives from the main political parties in Sri Lanka. However, it has been controversial among some parties committed to authoritarian central control.

3.25. **A number of factors were found to have contributed to this favorable outcome** [World Bank and EFA-FTI Secretariat (2011)]. The leadership provided by dynamic and well-motivated schools principals was of central importance. In addition, increased teacher and parental involvement in the education process, at school and at home, contributed to this outcome. School Development Committees directed their efforts at increasing resources, both cash and in-kind, for their local schools. These resources were used for co-curricular and extra-curricular activities such as drama and literary events, and athletics, games and sports. Also, the resources were used for curriculum-related activities such as the purchase of children’s story books for the library, and trips by school children to places of cultural or historical interest.

3.26. **Principals and teachers stated that the active involvement of parents, past pupils and other local community representatives invigorated and stimulated their schools.** This was particularly important in small and remote rural communities. Parents were delighted to be involved in school affairs, and felt it gave them greater ownership and commitment to the education of their children. Past pupils of schools saw their support as “giving something back” to the schools from which they had benefited when they were themselves children.

AVENUES AND PATHWAYS FOR THE FUTURE

3.27. **The PSI is a successful pilot innovation in terms of popularity among, and demand from, schools and local communities.** The popularity of the program has been so great that the initial pilot in 8 zones in 2006 has now been scaled up and extended to all the 97 zones in the country. The demand for this expansion of the program came “bottom up” from the school communities themselves.

3.28. **The PSI has also been successful in assisting schools to improve learning outcomes of primary school students in two important subjects: English and mathematics.** This outcome is particularly important as English and mathematics are two subjects which students find the most difficult, and which have the highest failure rates at the GCE O/L examination.

3.29. **There are a number of initiatives available for the government to build upon the success of the PSI, and broaden and deepen the relationship between schools and local school communities.** These include:

- Consolidating the PSI in schools where structures have been established, but activity is low. This would require greater clarity in specification of roles, capacity building, and continuing technical and financial support for schools.
- Reviewing and fine tuning regulations regarding School Development Committees (SDCs) and School Management Teams to establish their appropriateness for all types and sizes of school.
- Empowering lower levels of governance with clearly defined functions that do not overlap with higher levels. This will involve strengthening zonal and divisional capacity for advisory services and networking of principals.
- Paying particular attention to schools serving children in socio-economically disadvantaged areas, as effective governance is particularly important for the marginalized and disadvantaged. Additional funding may be required which takes account of school size, level of schooling, special education needs, location and type of school.

3.30. **The Program for School Improvement can be elevated to a higher level, rising from mainly distal activities to proximal activities.** Supporting schools to develop a parental involvement program has to date been largely restricted to distal activities (attending meetings, involvement in

school committees, engagement in voluntary work or making financial contributions to maintain or improve physical conditions, resources, and services). This can now be elevated to a program in which attention is paid to proximal activities. The program would then focus on: (a) developing parents' understanding that the home environment has a profound impact on the school learning of children and that they have the power to change it; and (b) developing parents' self-confidence and sense of efficacy in establishing a home environment that will provide rich learning experiences for children.

3.31. The PSI can also be extended to make communities contribute to the development of “competencies for life”, so-called “soft skills” or generic skills which are necessary for effective functioning in personal life, interpersonal relationships, and employment/economic activities (e.g. critical and divergent thinking, problem solving, creativity, initiative, leadership, responsibility, team work). Experience in community activities is often more relevant and appropriate in developing these skills than school-based experience which is often preoccupied with covering syllabuses and preparing students for examinations. Community activities also provide opportunities to develop social cohesion through learning to live with others in harmony, respecting the diversity of a multi-ethnic, multi-religious and multi-cultural society.

3.32. The PSI can be developed to demonstrate specific behaviors that parents can use (e.g., how to interact with pupils regarding homework, having pupils read to them) to improve learning outcomes. Research going back to the beginning of the 20th century has consistently established that families have an important role to play in their children's scholastic development. While much early research focused on status variables (parental education, income, or occupation), more recent research has shown that variables that describe the ethos, atmosphere, or teaching style of families are better predictors than status variables of students' scholastic achievements [Kellaghan (2001), (2011)]. Appreciation of this fact has led to efforts, based on a variety of models and approaches, to develop home-school relationships and, in particular, to improve the developmental capacity and educational options available to families. While a school cannot change the income or occupation of adults in the home, it can impact on its “atmosphere” or ethos. In this context, families in socioeconomically disadvantaged areas have received special support, as they are likely to differ from schools in their aspirations, activities, values, and the competencies they foster, putting children at risk of educational failure, school dropout, and intergenerational poverty.

3.33. Enlisting the support of parents in the education tasks of the school is one aspect of a two-way process in the development of school-parent/community relationships. The other aspect is that schools will provide a mechanism for parents to assert their preferences over a school's operational decisions and policies, becoming more responsive to the needs of the parents and communities they serve, working not just to meet students' needs but also helping to build communities by serving their social and cultural needs and interests. A variety of more specific reasons proposed in support of engaging in partnership includes:

- broadening the range of experiences and expertise available to the school;
- providing mutual support to persist in efforts to achieve goals;
- allowing partners to concentrate on tasks that they do best;
- increasing resources (human and material);
- increasing the sense of involvement and ownership. When parents and community members contribute to schools in cash or in kind (e.g., material, labor, expertise), they are more likely to ensure that their children are enrolled in those schools and attend regularly;
- increasing effectiveness as a variety of perspectives, interests, and expectations are brought to bear on problems; and
- broadening the range of advocacy (e.g., to focus attention and increase societal commitment to educational issues).

Box 3.6. School-Family-Household Interactions to Promote Learning

Apart from the vast literature that established relationships between home/community characteristics and students' learning, a number of studies have focused on one or more dimensions of parent and community engagement, variously operationalized as helping children with homework [Patall *et al* (2008)], participation in a training program [Gertler *et al* (2006)], discussing school activities in the home [Ho Sui-Chu and Williams (1996)], organizing and monitoring children's time, helping with homework, discussing school matters with the child, reading to the child, and being read to by the child [Finn (1998)].

Although it is not always possible to isolate the effects of community/parent engagement in these studies, findings indicate that such engagement, sometimes in conjunction with other factors, is associated with a significant effect on a variety of achievement variables. In the United States, parental involvement was found to be significant for a variety of achievement variables at both elementary and secondary school levels [Jeynes (2005), (2007), Patall *et al* (2008)]. In research in developing countries, parental engagement was associated with: (a) improvement in the recruitment, retention, and attendance of pupils; (b) reduced grade failure and repetition (Mexico); (c) improvement in teacher efforts (El Salvador, Nicaragua); and (d) higher pupil achievement on national primary school examinations (Kenya), on tests of language and mathematics (Colombia), and on measures of life skills and writing (Bangladesh) [Bray (2001), Gertler *et al* (2006)]

Source: Kellaghan (2011).

CHAPTER FOUR

THE SOCIAL BENEFITS OF EDUCATION: PROMOTING SOCIAL COHESION THROUGH THE SCHOOL SYSTEM

INTRODUCTION

4.1. **The social dimensions and benefits of education are being increasingly appreciated in developed and middle-income countries.** Among the many social benefits of education, promoting social cohesion in countries has become extremely important in the modern world, as global mobility of culturally diverse populations has posed challenges to the shared values, ethics and identities of societies. The instantaneous transfer of diverse and varied information through modern communications technologies has further increased the importance of social cohesion. Cohesive societies are more effective in achieving collective economic and social goals, since such societies are better at including and uniting diverse groups and forging synergy [Greaney (2006)]. Five dimensions of social cohesion, belonging, inclusion, participation, recognition and legitimacy, are especially important for multi-ethnic, multi-cultural and multi-religious societies such as Sri Lanka.

4.2. **The education system is of central importance in promoting national unity and solidarity among the different social groups in a country.** Sri Lanka has initiated measures to promote social cohesion through the school curriculum, textbooks, teacher development, co-curricular and extra-curricular activities, the organization of schools, and language policy. The present chapter discusses these measures, and future policy options for Sri Lanka as a middle-income society.

EDUCATION AND SOCIAL COHESION: THE CONCEPTUAL FRAMEWORK

4.3. **Education is a key instrument in the promotion of social cohesion through the transmission of knowledge and the shaping of attitudes of individuals towards diversity and change.** Education is responsible for the cultivation of a civilized society and helps to inculcate the moral and ethical values that create a democratic, equitable and united society. Education can contribute towards social cohesion in four ways: (a) by teaching students the basic principles of good citizenship and the consequences of not adhering to those principles; (b) by providing students with an experience consistent with these principles in the context of ethnic and cultural diversity; (3) by providing equal opportunities to all students; and (d) by providing a common understanding of citizenship, while incorporating the interests of diverse communities [Heyneman (2010)].

4.4. **An education system has the potential to either promote or reduce the conditions needed for a cohesive society.** While education can play a vital part in building social cohesion among diverse groups in a community, education can also play a negative role in countries where there is war or civil strife [Buckland (2006), Davies (2006), Cardozo (2008)]. Education, if used positively, forges a national identity which unites diverse communities. But if used negatively, education can be used to promote a particular idea of national identity that does not incorporate all cultural communities, and hurts the excluded groups. Education may either promote harmony and cooperation or cause conflict and disharmony, depending on the policy framework and contents of the system [Baig (2010)].

EDUCATION AND SOCIAL COHESION IN SRI LANKA

4.5. **In Sri Lanka education can play a prominent role in building mutual understanding and trust amongst the country's diverse ethnic, cultural and religious groups.** Since the 1990s, policymakers have been aware of the need to restructure the education system so that it would help inculcate values of peace and social integration in the future generations. The 1997 Education Reforms contained a special component on Value education and national integration with the idea that the teaching and learning environment “will inculcate justice and fair play in pupils regardless of caste, creed or social class” [Presidential Task Force (1997), p26]. Life Competencies was introduced as a subject at the junior secondary level. The Ministry of Education has taken the vital step of preparing a national policy on promoting social cohesion through education [MOE (2008b)].

4.6. **The national policy identifies seven strategic areas through which social cohesion can be developed.** These are: (a) curriculum; (b) teacher education; (c) second national language (2NL); (d) whole school culture; (e) integrated schools; (e) co-curricular activities; and (g) research [MOE (2008a)]. The creation of a specific unit, the Social Cohesion and Peace Education Unit (SCPEU) in the Ministry of Education is an indication of the importance placed on social cohesion in education.

4.7. **Policy makers and personnel in education organizations and institutions have displayed a strong commitment towards these national goals in recent years.** The concept of Amity Schools, where students from different ethnic and religious backgrounds can study in the same school, has been introduced. English is promoted as a link language between Sinhalese and Tamil speaking students. Changes in curriculum have included the introduction of Civics Education, and the learning of Sinhala or Tamil as a second national language. The teaching of the second national language is intended to help remove the barriers and divisions of language. National, provincial and zonal education authorities have been motivated to organize extra-curricular activities with the purpose of boosting inter-ethnic tolerance and understanding. Principals and teachers have been involved in organizing cultural events and co-curricular activities which help students learn about diversity and tolerance. Development partners also have sponsored programs at school, zonal and

provincial level to ensure the future generation is equipped with an understanding of the value of social cohesion [Wikramanayake (2011)].

INITIATIVES TO PROMOTE SOCIAL COHESION

4.8. **Children tend to accept diversity more easily than adults and can be encouraged to mix and share ideas with children of other ethnic and religious groups at an early stage.** The National Education Research and Evaluation Center (NEREC) of the University of Colombo, based on their research, proposed that mutual understanding and social cohesion would improve if children from the different ethnic and religious groups learned together in classrooms [NEREC (2004)]. The NEREC study also found that children who demonstrated less tolerance for other ethnic and religious groups were more cynical and less secure than children who were more accepting of diversity.

4.9. **The promotion of ethnically integrated schools has been a specific strategy of the national policy for social cohesion.** In Sri Lanka, still a large percentage of the schools tend to be segregated by medium of instruction. Less than 500 schools offer mixed medium education. This is barely 5 percent of the total number of schools in the national education system. This is partly due to the fact that in many areas of the country there are inadequate Sinhalese and Tamil students for a mixed medium school. However, there are opportunities, especially in multi-ethnic urban communities, to expand the number of mixed-medium schools. These opportunities are likely to grow as the population urbanizes and a greater proportion of the people come to live in cities and towns.

4.10. **Extra-curricular and co-curricular activities in which students of different ethnic and religious backgrounds participate together can promote trust and acceptance of diversity.** These activities include literary events, cultural shows, activity camps, debates and dramas, English competitions, art exhibitions, music, singing and dancing, oratorical competitions, spelling bees, essay competitions, sports and athletics events. The MOE has focused on different types of programs to build trust and comradeship between students of different backgrounds. Several student-exchange programs have been organized between Tamil, Sinhala and Muslim students from different areas. The programs are expected to be a start in the building of a relationship between schools and students of different social groups. It is hoped that these students and schools would maintain the links they have formed and implement their own activities in the future. Several student exchange programs between Sinhala and Tamil schools have been organized and these have created opportunities for students to live with other students of different ethnic backgrounds. Participants in these programs have displayed great enthusiasm and appreciation for the program and its objectives.

4.11. **Realizing the importance of the role of education in building social cohesion, the Ministry of Education established a national education policy for social cohesion and peace.** A new curriculum was introduced for Life Competencies and Civics Education (grades 6-9) and Citizenship Education and Governance (grades 10-11) that successfully integrated peace education concepts and values of cooperation and respect for others. The curriculum has been produced after much research and a study of civics education in several countries [see Box 4.1 for some examples]. The curriculum includes the role of citizens, their rights and responsibilities, good governance and participation in a democracy. It also deals with international norms and human rights and the role of international organizations. Further the curriculum seeks to help promote the need for sensitivity to difference and respect for diversity of cultures in a multi-ethnic, multi-religious and multi-cultural society. In this sense the curriculum for the GCE O/L examination presents an excellent opportunity. However, at present Life Competencies and Civics Education is a compulsory subject only in grades 6-9, Citizenship Education and Governance is only an optional subject for grades 10-11 and barely 20 percent (approximately 75,000) of students offer the subject for the GCE O/L.

Box 4.1. Curriculum Changes and Social Cohesion in South Africa and Guatemala

Curriculum Transformation in South Africa

After an evaluation of their current curriculum that presented their “learners as divided and different; inferior and superior”, the South African Ministry of Education decided to develop and implement a new curriculum. Since 1994, this transformation has taken place through the national Qualifications Framework, and has integrated education and training, academic and vocational in order to create an outcomes based education aimed at providing learners with the skills needed to ensure economic prosperity and to contribute to the development of a common citizenship. A specific subcommittee was established with the goal of integrating human rights education into each of the eight learning areas defined by curricula developers. The social sciences learning area statement, for example, aims at “contributing to the development of informed, critical and responsible citizens who are able to participate constructively in a culturally diverse and changing society.”

Inclusive Curriculum Revision Processes in Guatemala

Following the settlement of Guatemala’s civil war, a Consultative Commission for Education reform (CCRE) was established in 1997 to help design educational reforms for the country. The CCRE is a decision-making body with broad representation ... including Mayan organizations, women’s organizations, teachers’ unions and associations, students, journalists, churches, universities, private education centers and private enterprise.

Source: IIEP (2006).

4.12. **A key issue in the promotion of social cohesion in education concerns the manner in which minority cultures are represented in textbooks.** The transfer of knowledge from one generation to the next through textbooks is often controlled not only by scholarly and pedagogical criteria, but also by the interests of social groups. In this sense it is vitally important that textbooks are examined for sensitivity to different cultures and religions and for the imparting of inappropriate values. Greaney (2006) mentions eight ways in which textbooks can undermine respect for diversity and tolerance: (a) narrow nationalism; (b) religious bias; (c) omission; (d) imbalance; (e) historical inaccuracy; (f) treatment of physical force and militarism; (g) use of persuasive techniques; and (h) artworks. The Sri Lankan history textbooks have been criticized on some of the criteria above, especially by well-known Sri Lankan academics and scholars [Obeysekera (2003), de Silva, K.M. (2005), Indrapala (2007), Wikramanayake (2011)]. Some of these scholars point out that the history textbooks contain historical inaccuracies, omissions and imbalances even in relation to the original source books of the country's history such as the Deepavamsa and the Mahavamsa. It would be very useful for Sri Lanka, as it advances from a low-income society to a culturally sophisticated middle-income society, to examine the textbooks, especially history textbooks, against the criteria (a) - (h) above; and where necessary and relevant, improve the textbooks to complement the initiatives in other parts of the education system to promote social cohesion.

4.13. **How countries choose to deal with the issue of building national solidarity and social cohesion depends largely on each individual nation.** Revising the curriculum and textbooks is not an easy task. However, it is especially important for countries which are in post-conflict situations and moving towards a culture of peace like Sri Lanka. Many countries in these situations have revised their curricula and textbooks in a manner conducive to the promotion of social cohesion.

4.14. **Teachers are the most valuable resource for the promotion of concepts of social cohesion, and the acceptance of diversity.** Therefore teacher education and training, and the transferring of these ideas to the students, is vital. There are 17 National Colleges of Education (NCOEs) located all over the country offering pre-service teacher education. NCOE teacher educators are trained through the NIE on how to integrate peace concepts into the different subjects they teach. According to the MOE, 60 percent of teacher educators have received training in social cohesion and peace concepts. However, it is not clear how many teachers have been trained in aspects of social cohesion to date, nor how successfully teachers transmit these ideas to students. A baseline survey conducted in 2010 by the Ministry of Education and the NIE indicated that a significant number of trained teachers were unable to use what they had learnt and to apply their skills in the classroom. The survey also shows that although 80 percent of teachers said they understood the concepts of peace and value education, only 24 percent of these were able to give an appropriate example [MOE and NIE (2010)].

4.15. **Language has always been an important issue in Sri Lanka because of the multi-ethnic mix of the population. Language has served to identify each ethnic group's cultural heritage.** While language can often be an issue of contention between diverse ethnic and religious groups,

linguistic issues can also contribute to the building of peaceful relations between different ethnic communities if handled in a sensitive manner. In 1978, Articles 18 and 19, Chapter IV of the Constitution of the Democratic Socialist Republic of Sri Lanka designated Sinhala and Tamil as national languages and English as a link language, realizing the importance of English both as a communication link between the two major communities and as an international language. Learning English as a second language and using it as a medium of instruction in bilingual education, and learning the second national language are important policy reforms that would help the future generation communicate with all ethnic and religious groups as well as promote social tolerance and understanding of diversity. Countries with multi ethnic communities have made similar language policies. An example is provided in Box 4.2.

Box 4.2. Singapore's Language Policy

Widely hailed as an educational success story, Singapore, a multilingual island nation in Southeast Asia, embraces an officially bilingual education policy. English is the medium of all content-area education from the start of schooling, with students' official "mother tongue" required as a single subject. Although called the student's "mother tongue," these languages may not be the student's home language, resulting in many students studying two non-native languages in school. Singapore is comprised of three major ethnic groups in the following proportions: Chinese 77%, Malays 14% and Indians 8%. In 1959 when Singapore gained self-rule from Britain, Singapore chose to become an officially multilingual state, selecting four official languages: English, Mandarin Chinese, Malay and Tamil. English is promoted as the "working language" of Singapore for inter-ethnic communication, while the other official languages are considered "mother tongues" of the major ethnic groups.

Source: Dixon (2005).

4.16. Sri Lanka has introduced the learning of the second national language, i.e. Tamil among Sinhala medium students and Sinhala among Tamil medium students, as a subject from grades 6 to 9. In 2001 the Second National Language became an additional subject for the GCE O/L. In 2007 it was introduced as an oral subject from grade 1 and was put in one of the selection baskets for the O/L. Therefore the two languages are to be taught to all children in all government schools as part of the curriculum. However, the implementation of this policy has been difficult due to the shortage of teachers able to teach the second national language. While about 16,000 students offer Sinhala as a second national language at the GCE O/L cycle, only 3,000 offer Tamil. The pass rate in 2009 at the GCE O/L was 51 percent in Tamil as a second national language and 49 percent in Sinhala as a second national language. There is a shortage of teachers to teach both Sinhala and Tamil as second languages, and this is the main constraint to the expansion of the program. Table 4.1 below provides information on the current status of implementation of the second national language (both Sinhala and Tamil) policy.

Table 4.1. Number of Schools, Teachers and Students by District for Second National Language, 2009

District	No. of Schools	No. of Students studying Tamil as Second National Language	No. of Students Studying Sinhala as Second National Language	No. of Teachers of 2nd National Language (both Sinhala and Tamil)
Colombo	94	25,406	5,173	64
Gampaha	75	9,534	7,082	27
Kalutara	79	8,780	5,811	32
Kandy	186	17,015	11,212	99
Matale	74	4,729	3,192	30
Nuwara Eliya	105	5,707	6,556	37
Galle	66	10,842	2,783	34
Matara	74	7,887	2,918	34
Hambantota	60	6,439	1,969	31
Jaffna	17	0	1,718	0
Mannar	13	506	1,205	0
Vavuniya	32	770	4,815	8
Batticaloa	62	791	9,870	12
Ampara	91	4,776	7,395	41
Trincomalee	48	1,302	5,259	13
Kurunegala	253	21,943	11,530	122
Puttalam	89	10,867	3,361	21
Anuradhapura	110	9,041	3,365	49
Polonnaruwa	37	2,618	2,855	7
Badulla	205	14,942	10,091	96
Monaragala	56	4,008	1,353	11
Ratnapura	115	10,092	4,019	39
Kegalle	105	5,667	9,590	39
Sri Lanka	2,046	183,662	123,122	846

Source: Department of Statistics 2009, Ministry of Education.

Note: Teachers who were recruited to teach another subject but were also teaching a second national language are not included in the figures.

AVENUES AND PATHWAYS FOR THE FUTURE

4.17. **Sri Lanka can select from a menu of policies to build on the current set of measures to promote social cohesion and strengthen social tolerance and the acceptance of diversity.** This menu of policy options covers the organization of schools, curriculum reforms, teacher education and training, education materials (especially textbooks), and extra-curricular and co-curricular activities among students from different cultural, ethnic and religious backgrounds.

4.18. **The number of ethnically integrated schools can be increased over time, as in these schools children can learn to mix and relate naturally to other children of different cultures and backgrounds.** Promoting integrated schools can continue to be one of the key strategies to promote social cohesion in schools. As the economy grows an increasing proportion of population will move into urban centers. This will increase the quantity of students from different ethnic and religious backgrounds in one location, making it feasible to expand the number of ethnically integrated schools. The presence of children from a diversity of cultural, ethnic and religious backgrounds will provide a richer education experience than a culturally and ethnically homogenous classroom. Mutual understanding and mutual exchanges facilitative of social cohesion will be strengthened when children from different ethnic and religious backgrounds learn together in the classroom.

4.19. **A policy option for the government to consider is to make the subject of Citizenship Education and Governance compulsory for the GCE O/L cycle.** The contents of the Citizenship Education and Governance syllabus is very good, especially from the perspective of inculcating values and ethics conducive to a modern, liberal, multi-ethnic and multi-religious democracy. If Citizenship Education and Governance were to become a compulsory subject at the GCE O/L, it would enable all students in the country to study this very important subject at a very important stage in their formative years. The awareness and understanding of the younger generation of the values and concepts of good citizenship, democracy, social tolerance and the appreciation of cultural, ethnic and religious diversity would be promoted.

4.20. **The history textbooks could be reviewed by panels of scholars and researchers from all the different ethnic and religious groups in the country.** The accuracy of contents of books, in relation to the source material and historical records, needs to be verified. In addition, the presentation of history needs to promote a favorable picture of a multi-ethnic, multi-religious and multi-cultural country. This will be especially important in the future, as globalization proceeds and population flows into and out of Sri Lanka increases, expanding the ethnic and cultural heterogeneity of the population.

4.21. **Teacher education and training programs need to strengthen the capacity of teachers to deliver concepts conducive to social cohesion.** Since teachers play a central role in delivering concepts of social tolerance and respect for diversity in the classroom, their education and training

in this regard is of paramount importance. It is vital that teachers promote a favorable environment for a multi-ethnic and multi-religious society in the future generations. The shortage of teachers for the second national languages also needs to be addressed over time.

4.22. **Co-curricular and extra-curricular activities among students from different ethnic and religious groups can continue to play a major role in promoting interaction between students of the various communities in the country.** This is especially useful for students from relatively homogenous regions, as such activities will provide opportunities for these students to interact with other students from a variety of ethnic and religious backgrounds. Co-curricular and extra-curricular activities also promote “soft skills”, such as team work, habits of industry and hard work, the ability to work to deadlines, leadership, good communication and discipline. Living harmoniously in a multi-ethnic and multi-religious society is also a key soft skill in modern times. Co-curricular and extra-curricular activities promote this soft skill, too.

4.23. **The role of English as a link language can be further developed.** The demand for good English language skills is very strong, from both students and parents. This is mainly driven by the economic and educational opportunities that open when a student is fluent in English. But it is also partly driven by an understanding that fluency in English is important for social interaction in culturally and linguistically diverse societies. Improved English language skills in the population will facilitate the interactions between the different ethnic and linguistic groups in the country.

CHAPTER FIVE

LANGUAGE AS HUMAN CAPITAL: ENHANCING ENGLISH LANGUAGE LEARNING

INTRODUCTION

5.1. **English has become the principal language of the global knowledge economy.** It is the most widely used language in international finance, trade and commerce. It is the main language in which research findings and conclusions, especially scientific discoveries, are published and disseminated within the community of academics and scholars. It is also the chief language in which new scientific knowledge is communicated to the organizations that transform these discoveries into technological advancements that are of practical benefit to people.

5.2. **English language skills and competence are considered one of the most important economic assets of a population in the modern world.** India, Sri Lanka's large and rapidly growing neighbor, has become an economic powerhouse and the "back-office" of the world due, to a significant extent, to the presence of a substantial number of entrepreneurs, employees and workers who are fluent in English. China, the fast growing economic giant and manufacturing powerhouse of the world, has become aware of the vital importance of English. In consequence, China has launched an enormous drive to expand and improve English language teaching and learning, with an estimated 325 million individuals studying English [see Box 5.1].

5.3. **There is strong and rapidly growing demand for English language skills and competence in modern Sri Lanka.** Individuals fluent in English have access to jobs in international labor markets. They also have access to a wider range of jobs in the domestic economy. These typically include better quality jobs, with higher salaries and benefits. English is also vitally important in education. Students fluent in English have access to global knowledge and information. They also have access to a broader and more varied set of educational opportunities, especially higher education opportunities, as they can study in overseas universities and colleges as well as in higher education institutions within the country.

5.4. **Policy makers are aware of the cardinal importance of English.** The promotion of English language skills and fluency occupies a prominent position in government policy documents such as the Mahinda Chintana, the Budget Speech (2010), and the Education Sector Development Framework and Program [MOE (2007a)]. Policy makers are aware that, in addition to the economic and educational benefits of English, it also has a key role to play, as the link language between the different ethno-linguistic groups in the country, to facilitate and promote inter-ethnic

communication and understanding. The President of Sri Lanka has appointed a Special Task Force to expand and strengthen English language skills.

Box 5.1. English Language Teaching and Learning in China

It has been claimed that English language learning has become a national obsession in China, with an estimated 325 million people (one-fifth the population) studying English at any given time, with an expenditure of over \$60 billion per year on English language learning materials [Frank (2006)]. English language books for children represent the fastest growing segment of English language learning materials in China, comprising between two to three thousand titles and approximately 5 percent of the overall publishing market for children's books in China [Zhang (2009)].

However it was not until the early 1980s that the English language became a compulsory subject in the Gao Kao examination, China's college entrance examination, and the Ministry of Education promulgated its "exposure to a native speaker" requirement at all public schools and universities [Zuo (2008)].

All these forces came together to produce an ever-growing market of English language education in China that has resulted in a massive recruitment drive of foreign teachers and foreign experts, primarily from Australia, Canada, England, New Zealand and the United States.

Measures to promote successful English Teaching and Learning

A new standard English course has replaced the former grammar based teaching outline. The new standard adopts the international system for Modern Languages: Learning, Teaching, Assessment. A Common European Framework of Reference [Council of Europe (1996)]. The pupils start learning English from grade 3 in primary schools. The basic phase is divided into 9 levels. After grade 6, they should reach level 2, and after grade 9, level 5. Students graduating from high school should have reached level 8, while those from foreign language high schools or schools with foreign language specialties should have reached level 9. This has changed the old style of teaching, which attached importance to grammar and vocabulary.

The use of satellite TV for both English teachers and school children is a new innovation. A separate channel on satellite TV is used to broadcast primary school English teacher training sessions and actual English lessons for use in classrooms, where needed.

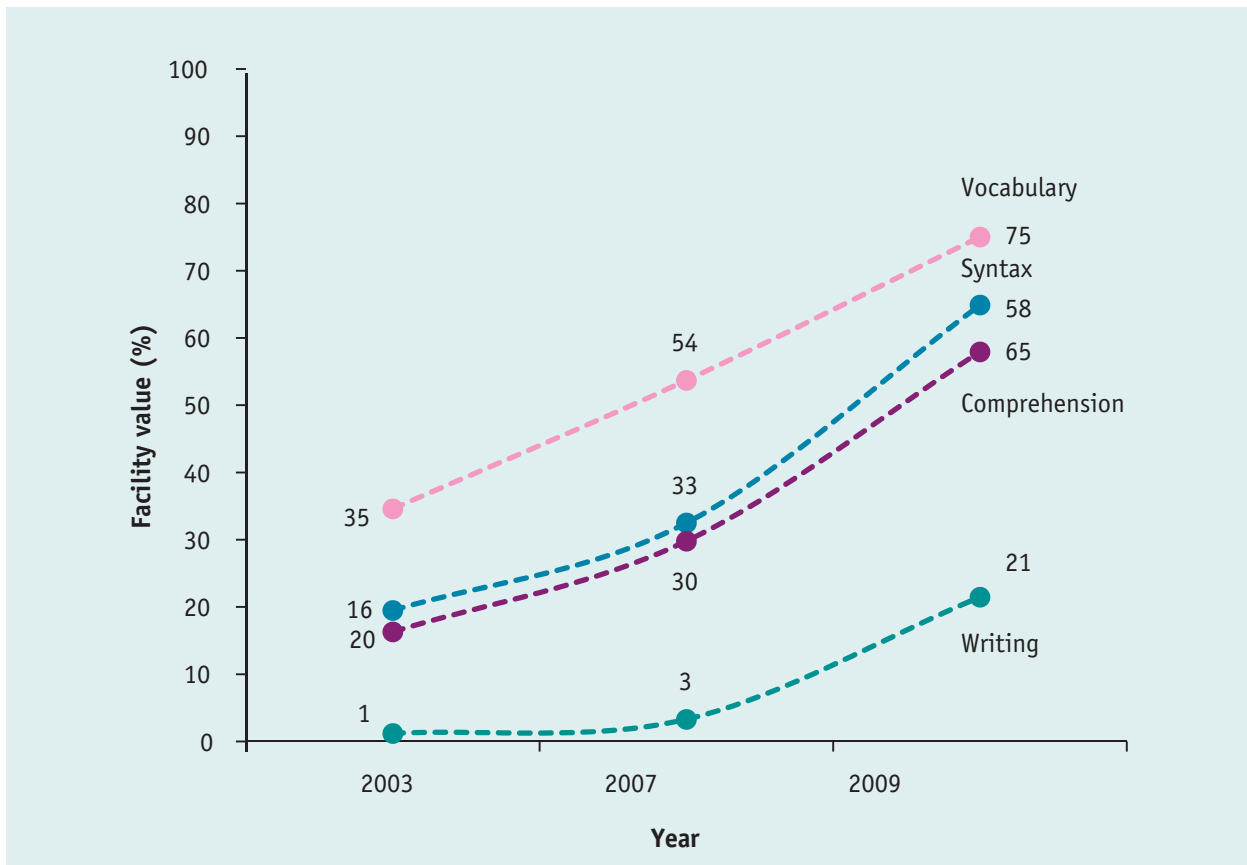
Textbooks for use in the primary and middle school have been reviewed by the national textbook review committee under the Ministry of Education and they are prepared according to the new standard. Most of the textbooks are joint-venture productions between a Chinese publisher and a foreign publisher, catering to the requirements of the curriculum and examinations, and the need of Chinese children for learning based on their national context.

The Ministry of Education requires each province to work out their strategic plans for implementing English teaching in schools in terms of time frame, scale and content of teaching, and teacher training requirements and programs.

PERFORMANCE IN THE ENGLISH LANGUAGE

5.5. **English language learning outcomes in primary education have been improving in recent years.** English language achievement levels of primary school students have risen over the period 2003-2009 [NEREC (2009)]. Further, not only has the overall performance improved, there has also been a positive trend over time in the achievement of key skills: vocabulary, syntax, comprehension and writing [Figure 5.1].

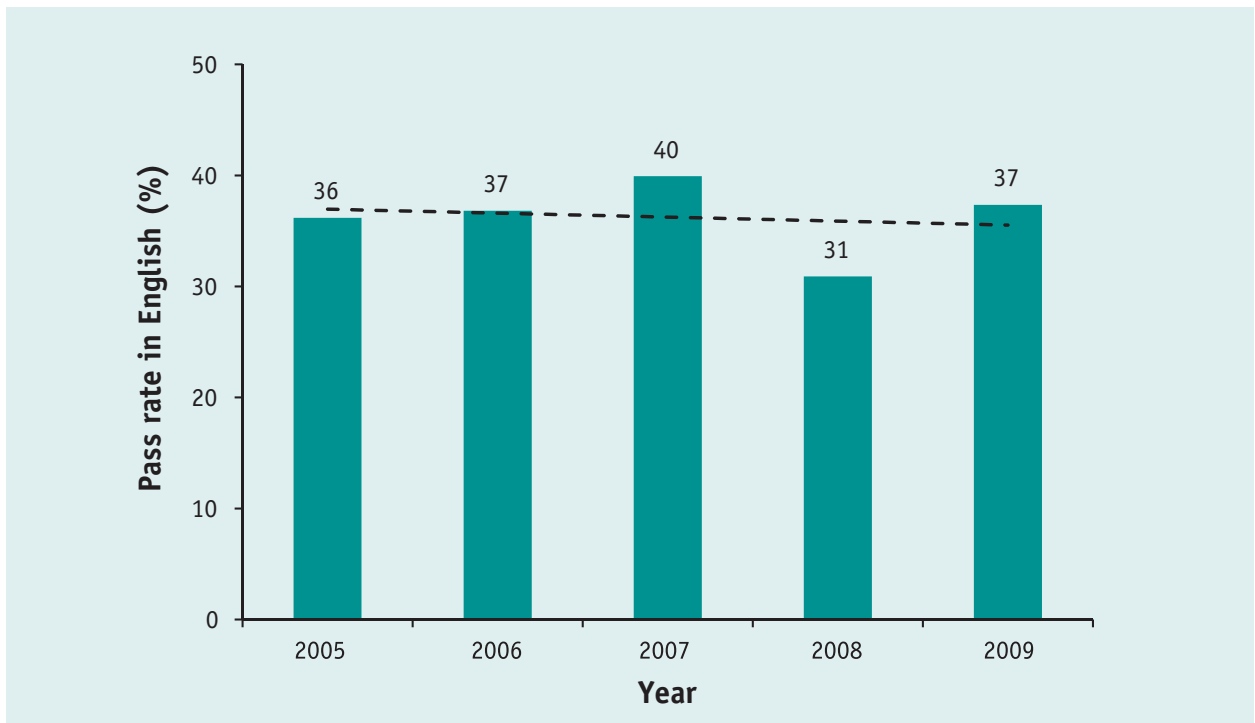
Figure 5.1 Trends in Achievement of Skills in English Language at Grade 4, 2003-2009



Source: National Education Research and Evaluation Center, 2003, 2007 and 2009.

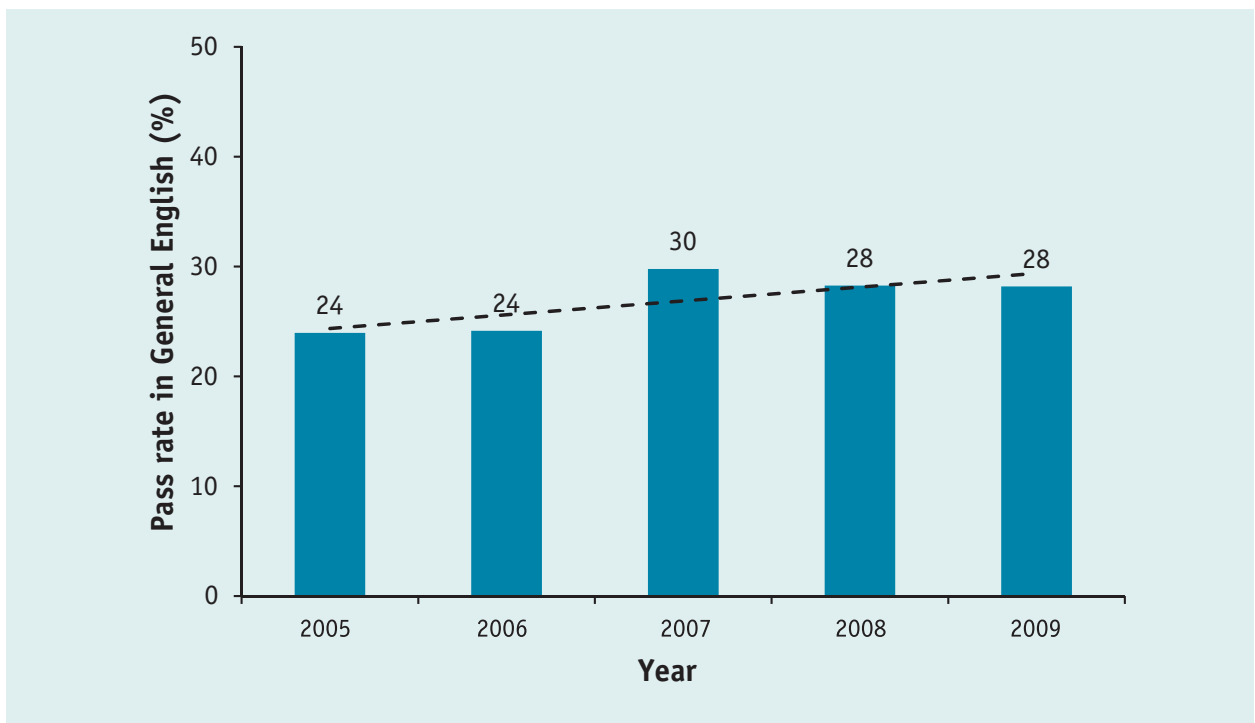
As can be seen in Figure 5.1, the magnitude of the increase in performance from 2003 -2009 is substantial in all four skill areas. However, even though there is an improvement in the writing skills, compared to other skills writing skills are still weak. Teaching of English commences only at grade three in most schools. In grades three and four more emphasis is on acquiring listening and speaking skills. This could be one reason for the low performance in writing skills. A second reason could be that writing is a higher-order skill than vocabulary and writing, and hence more difficult. Nevertheless, as only basic competencies in writing were assessed, the relatively low performance suggests that writing skills need to be considerably improved in the future.

Figure 5.2 The GCE O/L Performance, 2005-2009



Source: Department of Examinations, 2005-2009.

Figure 5.3 The GCE A/L General English Performance, 2005-2009



Source: Department of Examinations, 2005-2009.

5.6. English is normally the subject in which students experience the greatest difficulty at the public examinations, with only 35-40 percent of students passing at the GCE O/L examination and 25-30 percent of students passing at the GCE A/L examination [see Figure 5.2. and Figure 5.3]. A recent national assessment of learning outcomes in English at grade 10 found that 47 percent of students scored between 10-39 percent in the tests [Open University (2010)].

5.7. **Sri Lanka has unnecessarily low levels of English language skills in the general population and among students.** As a former British colony, and with good education attainment at primary and basic education levels for many years, the English language achievement levels among the population should have been considerably higher. However, the country deliberately discouraged the teaching and learning of English for nearly fifty years, from 1956 onwards. There were two reasons for this policy stance. First, English was seen as the language of the “Colonial Master“, and nationalist groups antagonistic to the British actively opposed the teaching and use of English in the country. Second, English at the time of political Independence in 1948 was the language of a small elite among Sri Lankan society. The positive policy response, in such a context, would have been for policy makers to allow the teaching and learning of English to expand so that knowledge of the language would spread more widely and deeply among the population and the labor force. This was the policy pursued by India, as well as another economically successful former British colony, Singapore. Unfortunately, Sri Lanka adopted a negative policy response: the use of English in schools (and in public life) was discouraged.

THE POLICY FRAMEWORK: CHALLENGES AND OPTIONS FOR THE FUTURE

5.8. **The importance of promoting English language learning outcomes had become clear, by the dawn of the twenty-first century, to the general public and policy makers.** There was in particular strong demand from parents and students. The government introduced two reforms, in the late 1990s and early 2000s, to improve English language outcomes. First, the primary education reform program introduced Activity Based Oral English (ABOE) from Grade 1 and the teaching of English as a second language from Grade 3 as an integral component of the primary school curriculum. Second, the government introduced a Bilingual Education option, under which selected subjects in the secondary education curriculum can be taught in the English medium. Currently, these include mathematics, science subjects such as physics, chemistry and biology, and several arts subjects (with the exception of history and of course the national languages Sinhala and Tamil).

5.9. **The policy reforms and initiatives to improve the teaching and learning of English have been fairly successful, especially at primary education level.** As seen earlier English language learning outcomes among primary school students have been improving over time. In addition, there has been an improvement in the proportion of students passing the GCE O/L examination in

English (albeit a slower improvement than at primary education level). These favorable trends can be attributed to the policy initiatives of the recent past [Cumaranatunga (2011), Perera, M. (2011)].

5.10. **The Activity Based Oral English (ABOE) Program was introduced to expose students to the English language as early as possible.** ABOE was intended, inter alia, to reduce anxiety and shyness in speaking English as a second language, and to enable students to gain confidence and use English without fear or nervousness. ABOE is an informal way of learning English through ERA (Environment Related Activities). As the name suggests, the emphasis is on the use of English in conversation while engaged in guided play and activity, and the students are not expected to read and write. They are introduced to words, phrases and simple sentences such as greetings and classroom language.

5.11. **The primary curriculum is based on a multi-layered syllabus.** The contents are delineated in terms of rationale, approach, topics, structures and vocabulary. While the grade 3 curriculum formalizes and consolidates the English introduced informally in grades 1 and 2, the grade 5 curriculum links up with the grade 6 textbook by gradually increasing the depth and complexity of language content. The primary curriculum also provides opportunities for the balanced development of all four language skills.

5.12. **The current set of educational materials used in the primary grades contain a comprehensive learning package** [Cumaranatunge (2011)]. The package comprises of a Pupil's Book, Workbook, Teacher's Guide, a set of supplementary readers and a Training Manual with video for teachers. It forms a part of the total activity based primary curriculum. The materials are also attractively presented and the textbooks are durable. There is also a network of Regional English Support Centres (RESCs) aimed at improving the quality of English Language teaching in primary classes. The set of teacher training modules at primary stage are appreciated by teachers [Perera, M. (2011)].

5.13. **The policy framework to improve English language learning in the secondary education cycle has positive features, but is less well-developed than at the primary education stage.** On the positive side, the secondary school textbooks are prepared according to a multi-layered syllabus where the contents delineated in terms of rationale, approach, topics, structures and vocabulary. The materials are colorfully and attractively presented. All units are under themes which are relevant to the local as well as the global context. There is vertical and horizontal integration in the presentation of themes and language structures in the textbooks, although this is not exploited in the Teacher Instructional Manuals. Some of the themes also relate to the National Goals and are covered in other subjects such as Science, Health Science, and Information Technology [SLAAED (2010)].

5.14. On the negative side, there is only one English language textbook at each grade level. As a result, the textbook is unable to cater to student heterogeneity in the second language classroom.

There is also a mismatch between the competencies identified in the Teacher Instructional Manuals and the textbooks [Perera, M. (2009), (2011)]. All the competencies identified in the Teacher Instructional Manuals are not catered to through the activities given in the textbook. Further issues include an imbalance in the teaching of language skills, with greater focus on reading and writing skills and inadequate focus on vocabulary [SLAAED (2010)]. The learning materials fail to cater to different language levels of students [Perera, M. (2009)], and textbooks contain language as well as factual errors [Perera, M. (2011)].

5.15. General English in the GCE A/L cycle, grades 12-13, has not been particularly successful.

The main objectives of General English at this level are for students to develop skills to function in English in an office, to encourage students to use English in daily life, to enjoy using English in everyday conversation, to prepare for the examination in General English, and to practice both spoken and written English. However, there are a number of issues relating to the teaching of English at the GCE A/L cycle. These include:

- Heavy emphasis on other subjects due to the competition to enter the Universities, result in taking the periods allocated for General English to teach those subjects.
- As General English marks are not counted for university entrance students do not take the subject seriously.
- As a result of the two papers at the GCE A/L examination being held on the same day, some students do not wait for the second paper.
- Lack of teachers to teach English in grades 12 and 13. According to the school census 2009, only 13% of the schools that had the GCE A/L classes possess sufficient teachers to teach General English in the grades 12 and 13 classes.
- There is a big gap between the difficulty level of the GCE O/L paper and the GCE A/L General English paper.

5.16. Teachers are the most important resource in the promotion of English language skills among students at all grade levels.

However, teachers are also a key constraint. In principle, Sri Lanka has an adequate number of English teachers. There were 21,476 English as a Second Language (ESL) teachers, as against a required cadre of 21,425, in 2010. But there is serious problem of teacher deployment. Some schools, especially in urban centers, have an excess of ESL teachers. Other schools, especially in rural areas, have a deficit of ESL teachers. About 35 percent of schools are considered to have a deficit of ESL teachers while around 12 percent of schools have an excess [Perera, M. (2011)].

5.17. The quality of ESL teachers is highly variable. At the upper end of the distribution, there are good, competent and dedicated teachers. However, at the lower end of the distribution, there are serious issues of teacher quality [Perera, M. (2011)]. These issues arise due to a variety of factors. Direct recruits to the English Language Teaching profession differ considerably in quality and performance. The minimum requirement is three passes at the GCE A/L and a credit pass in

English at the GCE O/L. However, there is also a district quota system, with only 30 percent of students selected from the National list and the balance 70 percent selected according to the district quotas. These marks of the teacher trainees selected from the National List are usually much higher than the marks of the teacher trainees who are chosen according to the district quota system.³ The teacher trainees who come from the districts with low marks find it difficult to cope with the language problems [Perera, M. (2011)]. The failure rate in the final teacher training examination at the end of two years is 10 percent, which is quite high.

5.18. There is a shortage of teacher educators and teacher trainers qualified in the Teaching of English as a Second Language (TESL) to provide pre-service teacher education and continuing teacher development for school teachers [Perera, M. (2011)]. There is also a shortage of English Subject Directors with English teaching/training experience, and of English In-Service Advisors (ISAs) in many locations. The “Cascade method” is typically used to train teachers at Zonal level. However, the Cascade Model has major limitations. In particular, the message tends to get diluted and distorted in transmission [Cumaranatunge (2011)].

5.19. The problems identified above are not uncommon for the teaching of English as a second language in countries [see Box 5.2].

Box 5.2. Common Constraints in the Teaching of English as a Second Language

English Language teaching across 8 countries, Vietnam, Thailand, Indonesia, Japan, Taiwan, South Korea, Singapore and the Philippines, reveal the following common issues [Grassick (2007)].

- Large class size. This ranged from 30 pupils in Singapore to over 60 in the Philippines.
- Mixed ability classes which teachers find difficult to teach.
- Lack of teacher training in learner-centered approaches.
- Low levels of English language proficiency among English teachers.
- Teacher supply- lack of suitably qualified teachers.
- Little opportunity to use English outside the classroom.
- Lack of creative and stimulating education materials.

³ The objective of recruiting teacher educators on the basis of district quotas is the hope that it will improve teacher deployment. Teachers recruited from less developed districts, it is thought, will then be more willing to work in the same districts than teachers recruited from other more developed districts. However, it is not clear that this policy actually works. Many teachers in the less developed districts try either to work in the more prosperous areas of those districts or transfer to more developed districts, resulting in a shortage of teachers in the poorer and more disadvantaged areas within districts.

AVENUES AND PATHWAYS FOR THE FUTURE

5.20. **There are several strategic policy initiatives that can assist the government to develop and improve the teaching and learning of English in the future.** In particular, a multi-pronged strategy, containing a variety of initiatives and covering the school environment, curriculum related activities, and co-curricular activities, would be both optimal. Creating an immersion English environment in the school, where feasible, is like to be the single most effective initiative to promote the English language skills of students. At the level of the primary school curriculum, it would be useful to introduce the alphabet in grade one and word charts from grade 2 onwards, to enable students to become familiar with the letters from early on. Students should also be encouraged to read English language books, especially story books and material that naturally arouse the interest of children. Students and parents can also be encouraged to enhance the use of English in their home environments, including watching and listening to English language TV and radio programs. Music could be another medium through which language skills can be learnt, with students reading lyrics while listening to songs. At the level of co-curricular activities schools could introduce events such as English literary festivals, debating and oratory, and drama. A set of possible initiatives is outlined in Box 5.3 below.

Box 5.3. A Range of Initiatives to Improve English Language Learning

- Total immersion in English. Total immersion language learning is usually the best method for learning a language within a short period of time. It is a method by which the student is exposed to a culture/situation where only the relevant language is spoken. By this method the student internalizes the language very fast and becomes fluent and confident in using it. This method could be used in a school in particular classes or on set days, or on weekends or holidays when total immersion programs in English can be conducted.
- Conduct popular co-curricular activities and societies and clubs only in English. Encourage the setting up of English Literary, Drama and Debating Societies. This way interest in the subject would ensure a mastery of the language.
- Encourage conversation in English from early years either in the classroom or outside.
- Conduct assemblies in English. Include topics of common interest and discuss these in schools in English.
- Encourage reading of English books. Start with children's books. Make sure the student has understood what he/she has read and reward efforts with praise and affirmation.
- Advise students to surround themselves with English at home. Listen to radio/TV in English. Have a discussion time in class for the previous night's news items.
- Use music as a media through which to learn English. Students can read the lyrics while listening to songs.

5.21. **There is a need for the development of a well-articulated curriculum framework that motivates and guides the implementation of an effective system of English language education at all levels.** Many European countries have adapted their foreign language teaching at the national level to the frameworks and standards articulated by the Council of Europe's language policy and activities. *Modern Languages: Learning, Teaching, Assessment. A Common European Framework of Reference* (Council of Europe, 1996), developed and revised over the past decade, has had high and positive impact in countries such as Denmark, Finland, France, Germany, Netherlands, Norway, Sweden and Spain [Goullier (2007)]. It is now being used not only among European countries but also outside Europe such as in Malaysia, Indonesia and India. It is used in Sri Lanka by the English Language teachers in international schools as these schools prepare students for international, including European, examinations. The government could consider the development of a similar framework for schools teaching the national curriculum.

5.22. **Learning materials need to be developed to cater to the different levels in the Framework.** Ability grouping could be done in the classroom, and the proficiency levels of students can be matched with a relevant level in the framework. This would facilitate the teaching of English in classrooms where there is considerable heterogeneity among students. Ability grouping and differential tasks have already been used effectively in Sri Lankan ESL classrooms [Perera, N. (2007), Perera, M. (2009)]. Assessment of learning outcomes could also be aligned to the levels in the Framework. And national textbook review committees, with representation from experts in English language, pedagogy, and publishing, could be set up to review and improve the quality of textbooks and related material, including the Teacher Instructional Manual.

5.23. **The government could consider diversifying the General English curriculum at the GCE A/L stage to cater to both academic needs as well as the needs of the world of work.** Senior secondary school students who wish to enter university can be encouraged to sit the Academic English paper which would correspond to the highest level in the framework. The General English paper would be more relevant to the "world of work" and the expected level could be one level lower. A good quality pass in the GCE A/L General English paper could be given greater weight than the GCE O/L credit pass when recruiting trainee English teachers. Also, a good pass in the GCE A/L General English paper could be taken as a pre-requisite for entrance to public universities. These last two measures would ensure that students have an incentive and a reward for learning English to a high level of competence.

5.24. **The professional quality of academic staff needs to be strengthened.** This is of vital importance, both among school teachers and among teacher educators. Strengthening content knowledge, pedagogical knowledge and the unique cognitive needs of children in the relevant age-groups being taught is of particular importance. School-Based Teacher Development (SBTD) could be used for on-site professional support and strengthening of teacher skills and performance.

Box 5.4. An Innovation in English as a Second Language Teaching in South Australia

ESL Innovative Schools

The ESL Innovative Schools initiative supports schools to develop quality ideas and practices for ESL learners' language development and ESL pedagogy. This initiative is intended to assist an ESL focus teacher in leading innovation, with an identified group of teachers of ESL learners. The initiative is designed to connect with the Department of Education and Children's Services (DECS). Strategic directions to:

- ensure higher achievement for ESL learners across the curriculum
- improve literacy
- improve relevance, responsiveness and effectiveness of the curriculum
- improve retention and attendance
- improve student wellbeing
- build community capacity
- enhance workforce capability for teachers of ESL learners

There are 2 phases in this innovation:

- Phase 1: This is designed to support 10 schools that demonstrate commitment and appropriate structures for improving learning outcomes for ESL learners.
- Phase 2: The second phase of the initiative supports 10 schools previously in Phase 1 to continue their ESL Innovative schools initiative. These schools will have demonstrated commitment, set up appropriate structures and show improved ESL student learning outcomes in the previous year. The ESL focus teacher and group of teachers as identified will continue to expand and develop their work.

For schools in Phase 2 the recommended strategy is to build onto the existing ESL Innovative Schools' initiative to build ESL teacher capacity and support improved practice in ESL teaching, language development and cultural inclusion. The particular focus is on schooling data on ESL learners' achievements, monitoring improvements over time. Consistency of teacher judgments is a focus and the link between ESL Scales judgments, SACSA Outcomes and Standards achieved, with links to state LaN data.

Phase 2 may see an expansion of the group of teachers in the school who have undergone professional development and who can mentor other teachers, to support whole school innovation and change, mentoring processes enable close work with teachers that leads to professional reflection, data collection and improvement of pedagogy.

Source: Perera, M. (2011).

Box 5.4 above describes an example of a school based innovation of a collaborative staff development program in Australia. In addition, the network of Regional English Support Centers (RESCs) and Teacher Centers (TCs) can be employed for off-site continuing teacher development activities. The Peradeniya Teachers' College, which is meant to be the Centre of Excellence for English Education (CEEE), could act as the central body for Continuous Professional Development of English teachers. The three National Colleges of Education (NCOEs) which provide pre-service teacher education for English language teachers can strengthen their courses to better integrate pedagogy and subject content instruction.

THE BILINGUAL EDUCATION PROGRAM: AN INNOVATION

5.25. **Bilingual education is a recent innovation introduced by the government.** Under the Bilingual education policy, students are offered the option of learning some subjects in the English medium from grades 6-13. Bilingual education is available in a wide range of countries, especially in Europe and Asia [see Box 5.5 for a description of a Bilingual education program in Turkey]. The principal objective of the Bilingual Education policy is to improve the economic opportunities of students when they complete their education, as individuals fluent in English are in strong demand in the national and international labor markets. A second objective is to enable students from different ethnic communities to study in the same school, in order to promote social cohesion. There is a widespread demand for Bilingual Education, and over 55,000 students from 601 schools are now participating in the Bilingual Education Program.

Box 5.5. The Bilingual Education Program in Turkey

There are a wide range of bilingual education programs currently in use in Turkey. The model discussed here is used in a large number of private schools throughout Turkey, and with some minor contextual variations, the same structure is used in the majority of these schools. The program is used for English immersion, though a few schools have immersion programs in Russian, French, German, and other European languages, too. The Turkish program begins at elementary level and continues through to the end of secondary education. Students have second language classes (but no content teaching) in elementary school and a special year of intensive language training, known as the prep year, between elementary school and junior high school. Immersion begins in junior high school and is expanded in senior high school. A third language is added in junior high school and continues throughout high school. No content teaching is done through the third language. Some optional continuity into tertiary education is also present. Students are encouraged to attend an English medium university in Turkey, or to study abroad. Supplementary TOEFL (Test of English as a Foreign Language) and IELTS (International English Language Testing System) preparation classes are available to senior high school students.

5.26. **Students offering Bilingual Education have been observed to perform better than other students at the public examinations in a range of subjects** [Table 5.1]. This negates the concern expressed by some opponents of Bilingual Education that students studying some subjects in the English medium would not be able to perform well. The issue, obviously, is addressed by the fact that the majority of students would be electing to study in the Sinhalese, Tamil or English medium depending on the extent of their language fluency.

Table 5.1. Performance of Bilingual Education Student at the GCE O/L Examination 2009 (Key Subjects)

Subject	Number Sitting the Examination	Number Passing the Examination	Percentage of Passes
Mathematics	904	810	90
Science	904	763	84
Health and Physical Education	232	231	99
History	855	756	88
Geography	101	85	84

Source: Bilingual Unit, Ministry of Education.

5.27. **The Bilingual education program faces several key challenges.** There is a shortage of teachers in the government schools who are sufficiently fluent in English to teach other subjects in the English medium. In addition, there is a shortage of teacher educators competent to develop Bilingual education teachers. This is a major constraint to the expansion of the program.

5.28 The Bilingual Education program currently being implemented is not entirely consistent with the model generally used in other countries: Content and Language Integrated Learning (CLIL). The optimal method of teaching and preparing material for Bilingual education is for the English as a Second Language (ESL) teacher and subject (content) teacher to work together in Content and Language Integrated Learning (CLIL) programs. In Sri Lanka, the Bilingual education program is conducted jointly by the Bilingual Education Unit of the MOE and the Unit of Language coordination at the NIE. Both these units advocate the CLIL model. However the collaboration between the English Department and the subject departments, and the Unit and Cell appear to need further development. For instance, there is no acknowledgement of the contribution of the English Department and Bilingual Education unit in the Teacher Development Manuals prepared by the Cell of Language coordination implying that there were no such contribution. The professional development programs and the textbooks are not consistent with the CLIL model. The Sri Lankan

bilingual program does not appear to follow any of the internationally accepted CLIL models [Wickramagamage *et al* (2009)].

5.29. **The educational material for the Bilingual education program is relatively under-developed.** The English medium textbooks, in particular, have been heavily criticized for their weak quality, including English language errors. A further weakness is that the textbooks are translations of Sinhala medium textbooks, and are not specifically prepared for Bilingual education. The textbooks are also not aligned within an overall Content and Language Integrated Learning framework.

AVENUES AND PATHWAYS FOR THE FUTURE

5.30. **The government can select from among several strategic initiatives to develop the Bilingual education program.** First, the MOE needs to identify a suitable CLIL model and adapt it to the Sri Lankan context. The CLIL could be integrated within the Common Framework of Reference, such as the Common European Framework of Reference [Box 5.6 describes such a Bilingual education CLIL in the Netherlands]. The Bilingual education program would then fit into a clear, logical and internally consistent education framework. This would facilitate the development of the Bilingual education program as an integrated education development strategy.

5.31. **The quality of education material, especially textbooks, needs to be strengthened.** The textbooks need to be written rather than translated, and by teams of textbook writers with the relevant skills, including the ability to write well in English. The textbooks and other educational material (e.g. teacher instructional manuals) need to be mutually consistent and complementary.

5.32. **The teaching force available for the Bilingual Education program needs to be increased over time.** This can be done in two ways. First, the in-take of Bilingual education teachers can be increased. Second, existing teachers who have the potential to teach in the English medium can be trained, through suitable professional development programs, as teachers for the Bilingual education program. The government will need to develop a suitable incentive package to attract and retain good quality Bilingual education teachers.

5.33. **Bilingual education schools could also be used to promote English language learning by creating an immersion English environment in these schools.** The schools could operate in English for at least a part of the school week. This would enable students studying in the Sinhala and / or Tamil medium in the Bilingual schools to expand and improve their usage of the English language.

Box 5.6. Content and Language Integrated Learning (CLIL) in the Netherlands

Content and Language Integrated Learning (CLIL) in the Netherlands has developed from international education. It has grown rapidly from one CLIL school in 1989 to a network of 100 secondary schools in the 2010/11 school year. In the past decade, CLIL has developed into a special school type in secondary education. English is the foreign language used in CLIL. In principle, any school can start a CLIL stream, but if it wants to join the official network of CLIL schools or use the name 'tto school' or 'tto junior school' it has to adopt the CLIL standard described under the next heading.

In the Netherlands, CLIL has developed within schools. This means that provision is somewhat heterogeneous. The Dutch model for CLIL as a prescribed invariable model does not exist, or at least not in terms of precise Ministry of Education guidelines regarding the content of CLIL, its subjects or timeframe, etc. The official position of the Inspectorate for Education and the Ministry of Education, Culture and Science is that up to half of the total number of lessons may be taught in English, that the Dutch curriculum must be followed, and that CLIL must not be costly to introduce or adversely affect language proficiency in Dutch. However schools themselves, supervised and coordinated by the *Europees Platform voor het Nederlandse Onderwijs* (European Platform for Dutch Education), have developed a form of self-regulation by devising a standard for CLIL.

The CLIL Standard

In 1998 the European Platform, in cooperation with the CLIL schools network, laid down a standard for bilingual VWO. In 2003, a quality project was launched to monitor the development of CLIL in individual schools. This standard is considered to be the guideline for new schools and underlies school efforts to secure a CLIL quality guarantee.

The standard recognizes four components, namely 'results', 'educational process', 'quality' and 'pre-conditions'. The first component, 'results', describes the final aims of the CLIL streams for students: their English should be at level B2 of the Council of Europe Common European Framework of Reference for Languages by the end of year 3, and at the level of the International Baccalaureate Organization (IBO) A2 certificate by the end of year 6. The results for both Dutch and subjects taught in the CLIL stream should not differ significantly from the results of comparable non-CLIL students. Last but not least, the results of European and international orientation (EIO) are also defined. CLIL presupposes that students have contacts with other students, not only for language purposes, but also with a view to preparing themselves for an international future. Knowledge of the EU and the ability to live and work in an international environment are considered to be important aspects of CLIL. The second component, 'educational process', defines quantitative and qualitative requirements. Quantitative equipment

include the number of hours taught (50 % for years 1-3 and some 1,150 study hours for years 4-6) and the subjects to be taught using CLIL (see the 'subjects' heading below). Dutch is specifically mentioned as having a similar status to that of English. The 'quality' component includes the teaching skills and human resources required (language proficiency to a least B2 Common European Framework level, native speakers to support the CLIL stream, etc.). In addition, teachers are informed about the work expected of them and how they are meant to carry it out, i.e. a didactical profile of teachers is given. CLIL makes demands on teachers that differ somewhat from those experienced in mainstream education. They are meant to encourage their students to actively use the target language as often as possible. In this way knowledge of specialist jargon in each subject is acquired. Naturally, a lot of attention is paid to communication skills. A wide range of English educational and information resources is available in classrooms and multimedia centers. The second component also includes internationalization, which is meant to play a central role in the school's policy and curriculum.

The third and fourth components include measures to ensure that the school pays attention to the quality of its CLIL stream and the preconditions for setting it up. In this respect, it is important that students in the CLIL stream who take courses in other foreign languages should be offered them in the target language. In Dutch language teaching, this is not normally the case. Finally, the CLIL standard states in which way the bilingual English curriculum differs from the mainstream curriculum, for example, through extra attention paid to French or German, the offer of an extra foreign language, greater attention paid to information and communication technology and a varied program of extra-curricular activities.

CLIL begins from the outset of basic secondary education (years 1 to 3 of lower secondary education). In order to ensure that students learn a variety of registers and styles, the types of subject offered need to vary. Subjects should include at least one social science, one natural science and one creative subject (including Physical Education). Extra lessons are sometimes given in English and, in a few schools, CLIL is combined with the mainstream *gymnasium* (pre-university school). In years 1-3, 50 % of the total number of hours is taught in the target language (English). In the *tweede fase* (upper secondary education, years 4 to 5 of HAVO and years 4 to 6 of VWO) all pupils choose a subject combination. The number of CLIL pupils is not generally sufficient for all four subject combinations to be offered. Schools have therefore chosen mainly to offer subjects from the compulsory part in English, such as general science, culture and arts (*Algemene Natuurwetenschappen*, or ANW, and *Culturele en Kunstzinnige Vorming*, or CKV), history and social studies. In addition, a specialised subject project paper can be written in English, internationalization activities can be undertaken during unspecified teaching time, and extra hours of English are often offered. The study load for the second stage of VWO is 4,800 hours (spread over three years), 1,150 hours of which are in English. Not all CLIL secondary schools offer CLIL in upper secondary education.

Source: Perera, M. (2011).

CHAPTER SIX

DIMENSIONS OF QUALITY: MATHEMATICS EDUCATION

INTRODUCTION

6.1. **A high quality mathematics education is essential for everyday life and for the workplace in the modern world.** Practical mathematical skills are needed for everyday living. In addition, many jobs require expert thinking and non-routine analytical skills in order to identify and solve problems. Mathematics education focuses on developing a person's analytical and problem solving skills. Mathematics is also an exciting subject which challenges the mind and offers opportunities for students to enhance their creative abilities.

PERFORMANCE IN MATHEMATICS

6.2. This section examines the achievement of students in mathematics, using information from national assessments of learning outcomes of grade 8 students; the GCE O/L examination at the end of grade 11; and the GCE A/L examination at the end of grade 13.

National Assessment at Grade 8

6.3. **The learning outcomes for mathematics in middle school (Grades 6-8) have improved in recent years.** Table 6.1 presents the mean scores and standard errors of mean scores of the NEREC national achievement tests. Among girls, the mean score increased from about 46 percent

Table 6.1. Mean Scores and Standard Errors of Mean scores in Mathematics by Gender and by Location, 2005 and 2008

Gender	Mathematics		Location	Mathematics	
	2005	2008		2005	2008
Male	44.4 ± 0.05	49.2 ± 0.30	Urban	52.3 ± 0.13	53.2 ± 0.42
Female	45.9 ± 0.04	51.6 ± 0.27	Rural	44.4 ± 0.03	48.9 ± 0.20
Total	45.2 ± 0.03	50.4 ± 0.19	Total	45.2 ± 0.03	50.4 ± 0.19

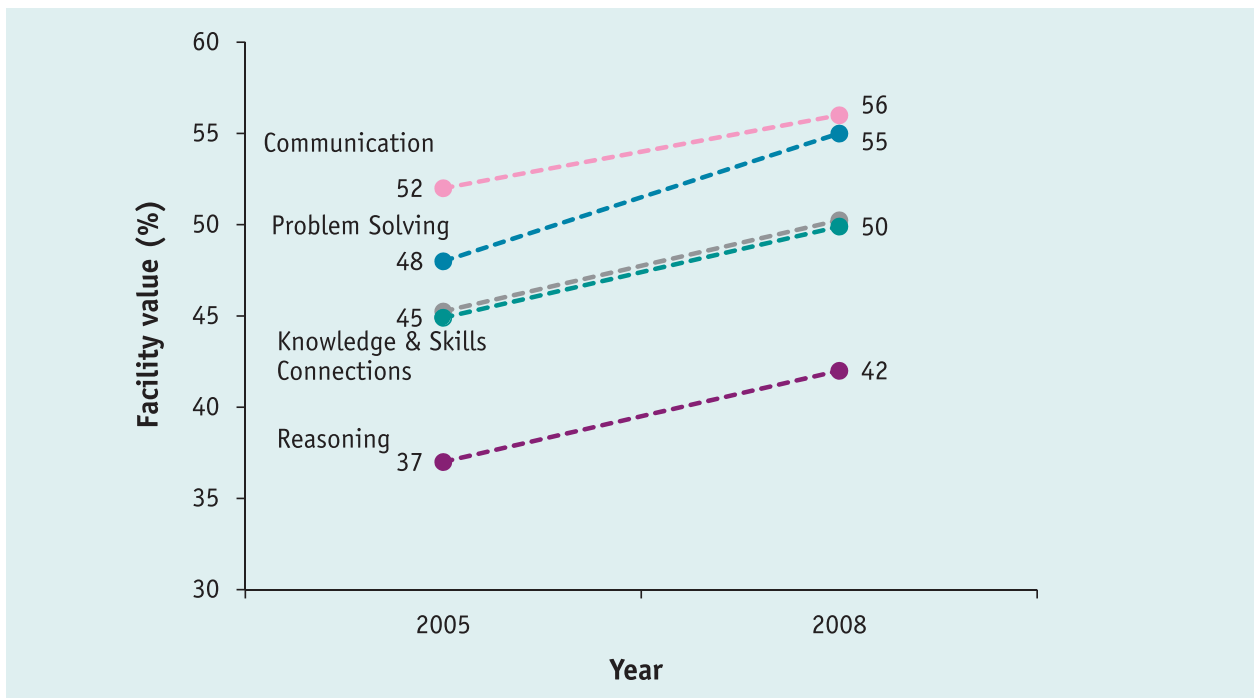
Source: National Education Research and Evaluation Center, 2005 and 2008.

in 2005 to around 52 percent in 2008. Among boys, the mean score rose from about 44 percent in 2005 to approximately 49 percent in 2008. The difference between the 2005 and 2008 mean scores are statistically significant at 99 percent for both girls and boys.

6.4. **An improvement is seen in the performance in mathematics at both urban and rural schools.** Students from urban schools perform better than students from rural schools. However, the students from rural schools showed greater improvement in mathematics learning outcomes between 2005 and 2008 than students from urban schools. In the urban areas, the mean score increased from about 52 percent in 2005 to around 53 percent in 2008. The difference between the results of 2005 and 2008 is statistically significant at 99 percent and 90 percent for the rural and urban areas respectively.

6.5. **There is an improvement in all five sub-skills in Mathematics between 2005 and 2008** [Figure 6.1]. The test items of the grade 8 national assessments have been designed to test the learning outcomes specified for each subject by curriculum developers [NEREC (2009)]. For mathematics, knowledge and skills, communication, recognizing connections, reasoning and problem solving abilities are tested. The achievement levels of students under each of these sub-skills can be analyzed using the facility values (discrimination index) of the test items. In calculating the facility value, the National Education Research and Evaluation Center (NEREC) has used the percentage of students who have been able to answer the given item correctly.

Figure 6.1 National Achievement at Grade 8, Sub-Skills in Mathematics



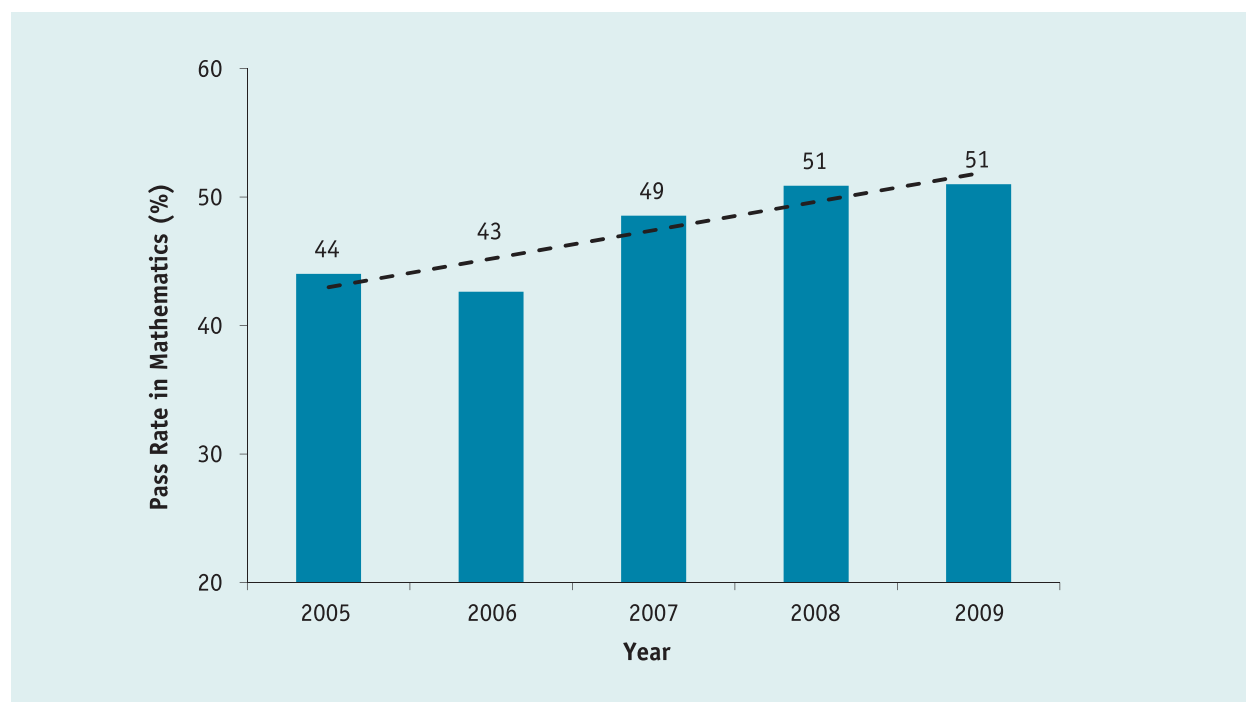
Source: Bank staff estimates, based on household survey data.

6.6. **Communication is the best mathematics sub-skill among students** [Figure 6.1]. This has improved from a facility index of 52 percent in 2005 to 56 percent in 2008. The greatest improvement is seen in the sub-skill problem solving for which the facility index has increased from 48 percent in 2005 to 55 percent in 2008. Both the sub-skill ‘knowledge and skills’ and the sub-skill ‘making connections’ have increased from a facility index of 45 percent to a facility index of 50 percent from 2005 to 2008. The weakest sub-skill in mathematics is reasoning. This is also reflected in the comparison made with a limited study related to the TIMSS (Trends in International Mathematics and Science Study) carried out by NEREC. This is consistent with the performance of students at the GCE O/L examination where the poorest performance is seen in geometry which tests the skills of reasoning to a high degree. Since there are only a few test items related to some of the sub-skills, further national assessments with a proper balance between the curriculum areas may be necessary to study any link between the NEREC results and the performance of students in mathematics at the GCE O/L.

Performance at the GCE O/L Examination

6.7. **There is an improvement in the GCE O/L pass rates in mathematics from 2005 to 2009** [Figure 6.2]. Approximately 270,000 students from 6,600 schools sit the GCE O/L annually. Since a simple pass grade in mathematics is required to qualify for the GCE A/L, an increase in mathematics pass rates positively affects the number who qualify for the GCE A/L. Between the years 2005 and 2009, GCE O/L mathematics pass rates increased from 44 percent

Figure 6.2 The GCE O/L Mathematics Examination Pass Rates, between 2005 and 2009



Source: Department of Examinations, 2005-2009.

to 51 percent. In the year 2009, 49 percent of the students who sat the GCE O/L qualified for the GCE A/L.⁴

6.8. **The mean score for mathematics between 2005 and 2009 has been at a relatively low value.** Although there has been an improvement in the GCE O/L mathematics pass rates, the mean scores have consistently been low up to 2009 (32±2). The increasing trend observed in the achievement levels of grade 8 students is not reflected in the GCE O/L examination marks, and may be due to standardization of results.

6.9. **A large percentage of students obtain a low mark for mathematics at the GCE O/L examination.** During the years 2007 to 2009, approximately 70 percent, 63 percent⁵ and 71 percent respectively of students obtained a mark below 40 percent in mathematics [Table 6.2].

Table 6.2. Performance in Mathematics at the GCE O/L Examination

Class Interval (Marks)	Percentage		
	2007	2008	2009
90-100	0.29	1.68	0.77
80-89	2.22	4.17	2.67
70-79	5.70	5.75	4.25
60-69	5.36	6.84	5.14
50-59	5.37	10.91	6.98
40-49	10.75	7.64	8.08
30-39	21.30	13.84	13.15
20-29	10.83	12.80	16.08
10-19	16.12	17.48	19.12
0-9	22.05	18.90	23.02

Source: Department of Examinations, 2008-2010.

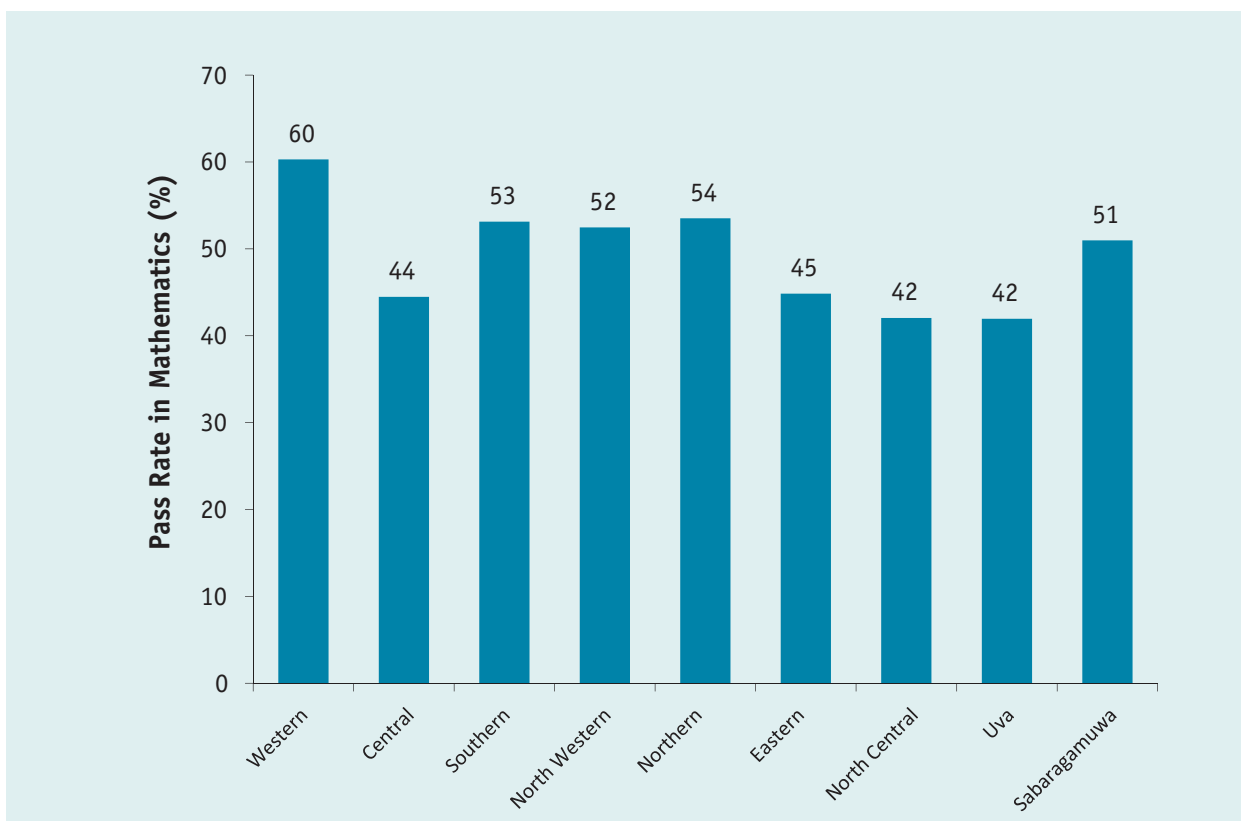
4 Since the time period given for answering the Mathematics paper was increased by 30 minutes in 2010, a direct comparison with past data cannot be carried out.

5 In 2008, the initial mathematics paper was cancelled and a repeat paper, similar to the cancelled paper was given. This may be the reason why the number that scored below 40 is significantly less in 2008, than in 2007 and 2009.

There are various factors contributing to the poor performance in mathematics at the GCE O/L examination. The subject knowledge of teachers is one of the major factors. The fact that students are allowed to pass from one grade to another without gaining the knowledge and skills essential to be able to cope with the work in the higher grade, is another contributing factor. However, the most important factor is that there is only one mathematics subject for all students, which fails to take into account heterogeneity in neural development and cognitive capacity among children and youth.

6.10. **In Sri Lanka, mathematics education is compulsory up to grade 11 and is commonly termed “mathematics for all”.** Mathematics education up to grade 9 focuses on developing basic skills required to function effectively in daily life, and on enhancing the analytical skills of students. However, in grade 10 and 11, more emphasis is given to the basics of higher mathematics including algebra and geometry; i.e., all students in this age group are compelled to learn mathematics as a ‘subject’ distorting the concept of “mathematics for all” to a concept of “same mathematics for all”. This could be one of the main reasons for the high failure rate in mathematics at the GCE O/L examination [NIE (2006)].

Figure 6.3 GCE O/L Mathematics Examination Pass Rates by Province, 2009



Source: Department of Examinations, 2009.

6.11. **There is a large disparity in pass rates between provinces.** Figure 6.3 presents the GCE O/L mathematics pass rates in 2009 across all nine provinces. The highest pass rate is seen in the Western province with 60 percent, while the Uva and North Central provinces show the lowest pass rate with 42 percent. The Eastern and Central provinces also perform relatively poorly, with pass rates of 45 percent and 44 percent respectively. The other four provinces, Northern, Southern, North-Western and Sabaragamuwa perform approximately equally, with pass rates between 51 percent to 54 percent.

As such, the provinces fall into three categories, with one group of four provinces at the bottom, a second group of four provinces clustered in the middle, and the Western Province an outlier at the top. The Western Province is the most economically advanced region of the country. The Southern, North-Western and Sabaragamuwa provinces also have traditionally been relatively educationally developed.

Performance at the GCE A/L Examination

6.12. **Over the past five years, there has been high variation in the GCE A/L examination pass rates with respect to the main subjects.** Annually, about 20,000 students sit as school candidates for the GCE A/L combined mathematics paper. The GCE A/L pass rate in combined mathematics in 2009 was 44.9 percent. This is low, compared for instance to the pass rate in Biology (75 percent). Although a credit pass in mathematics at the GCE O/L examination is required to follow the physical science stream at the GCE A/L, the prescribed competency in mathematics may be insufficient to cope with the standard of mathematics expected at the GCE A/L. The present system where all students follow the same mathematics syllabus at the GCE O/L prevents curriculum developers and teachers from catering to the requirements of students who wish to follow mathematics at the GCE A/L and beyond.

THE NATIONAL EDUCATION POLICY AND CURRICULUM REFORMS

6.13. **Curriculum revisions were carried out in 2007 and Sri Lanka adopted a competency based learning teaching assessment model.** The purpose of the reform was to address the issue that students were not able to demonstrate acceptable levels of achievement in applying their learning to everyday situations. Their skills in open ended problem solving and decision making were weak and few were able to demonstrate their ability to use higher order skills. The main aim of the mathematics curriculum under these reforms is to develop individuals who are able to think mathematically, and apply mathematical knowledge effectively and responsibly in problem solving and decision making.

6.14. The early experience of curriculum implementation in grades 6 and 10, and in grades 7 and 11, is that there are shortcomings related to the design, planning, development and implementation

of the curricula [Perera, G. (2009)]. These consist of: (a) no proper pre-testing was carried out with regard to appropriateness; (b) there is no horizontal integration of different subjects; (c) only the 5E model is used as a learning methodology; (d) dissemination and publicizing of ideas relevant to the new curriculum were not adequate; (e) the understanding of the implementation of the curriculum among teachers was inadequate; and (f) there is no systematic monitoring to identify shortcomings in the curriculum [Perera, G. (2009)]. Focus group discussions with teachers suggested that the training they had received on implementing the curriculum was inadequate. The teachers interviewed also felt that there was insufficient time allocated for all the activities proposed in the Teacher’s Instructional Manuals (TIMs) and that the 5E method was not the most appropriate teaching strategy in all situations.

MATHEMATICS STANDARDS

6.15. **Sri Lankan content standards and process standards are aligned with international trends** [Table 6.3]. International trends in mathematics education focus on developing individuals with the reasoning abilities and communication skills required to solve everyday problems, by integrating the traditional content of mathematics to make meaning of the real world. Many leading international educational jurisdictions regard the Standards for School Mathematics as a global benchmark [McCaul (2007)]. The National Council of Teachers of Mathematics (NCTM) defines standards as the mathematical content and processes that students should know and be able to use

Table 6.3. Comparison of the NCTM Standards and Sri Lankan Standards

NCTM Content Standards	Sri Lankan Content Standards
Number and Operations Measurement Geometry Algebra Data Analysis and Probability	Numbers Measurement Geometry Algebra Statistics Sets and Probability
NCTM Process Standards	Sri Lankan Process Standards
Communication Representation Connections Reasoning and Proof Problem Solving	Communication (Knowledge and) Skills Relationships Reasoning Problem Solving

Source: National Council of Teachers of Mathematics (www.nctm.org) and National Institute of Education (2010).

as they progress through school. NCTM sets out five Content Standards which describe explicitly the five strands of content that students should learn, and five Process Standards highlighting the ways of acquiring and applying content knowledge. As shown in Table 6.3, Sri Lankan content standards and process standards are aligned with that of Singapore.

MATHEMATICS TEACHING STRATEGY

Primary Education (Grades 1 to 5)

6.16. **The Mathematics Teacher’s Instructional Manuals (TIMs) for the primary education cycle contain 10 common competencies to be developed in key stage 1 (grades 1 and 2), key stage 2 (grades 3 and 4) and key stage 3 (grade 5).** Each TIM also specifies entry level competencies and essential learning competencies for each grade, the subject content and the learning teaching methodology. An assessment report card is also provided at the back of the TIM. The syllabus has a spiral approach, and concepts are introduced at each grade with increasing depth. Textbooks which are aligned with the TIMs are provided for students in grades 3 to 5. Table 6.4 compares the primary mathematics content standards of Sri Lanka with those of Singapore, which has scored well on recent international assessment studies such as TIMSS (Trends in International Mathematics and Science Study) [Box 6.1] and PISA (Programme of International Student Assessment). As can be

Table 6.4. Comparison between Primary Mathematics Content Standards of Sri Lanka and Singapore

Sri Lanka		Singapore	
Grades 1 and 2	Numbers, Measurements, Money, Shapes and Space	Grade 1	Whole Numbers Measurements Geometry Data Analysis
		Grade 2	Grade 1 Standards & Fractions
Grades 3, 4 and 5	Numbers, Operations, Measurements, Money, Shapes and Space Manipulation of Data	Grade 3	Same as Grade 2
		Grade 4	Grade 3 Standards & Decimals
		Grade 5	Grade 4 Standards & Percentages, Ratios

Source: Ministry of Education, Singapore (2007a) and National Institute of Education (2010).

seen, the content standards of the Sri Lankan syllabus and the Singapore syllabus are almost similar. One of the differences is that Sri Lanka introduces data analysis only in grade 3, whereas Singapore introduces this topic in grade 1. Singapore also introduces ratios and percentages in grade 5, while Sri Lanka introduces these concepts only in grades 6 and 7 respectively.

6.17. Three hours and thirty minutes are allocated per week for mathematics in key stage 1, and five hours per week is allocated for mathematics in key stages 2 and 3. The learning teaching process in the primary education cycle involves guided play, activity and desk work. In key stage 1, greater emphasis is placed on guided play. Equal emphasis is given to the three processes in key stage 2, and in key stage 3, greater emphasis is placed on activity and desk work. Teachers are encouraged to use mathematics activity rooms, competitions, projects, and exhibitions to kindle the interest of students in mathematics and to develop their knowledge and skills.

Box 6.1. Factors Associated with Higher Performance in TIMSS

Trends in International Mathematics and Science Study (TIMSS) is a continuing cycle of international mathematics and science assessments conducted every four years for fourth and eighth grade students. It assesses achievement in countries around the world and collects information on the educational contexts for learning mathematics and science. TIMSS data have been collected in 1995, 1999, 2003, and 2007.

In the years 1999, 2003 and 2007, the Asian Pacific countries, Singapore, the Republic of Korea, Chinese Taipei, Hong Kong and Japan have consistently had the highest average performance in mathematics among grade 8 students. In 2003, Singapore was the top performing country at both the fourth and eighth grades, having a significantly higher average achievement in mathematics than the rest of the participating countries. In 2007, there was a significant gap between the average achievement in mathematics at grade 8 of the above five Asian Pacific countries and the rest of the participating countries. In the same year, the achievement of 40 to 45 percent of grade 8 students in Chinese Taipei, Korea and Singapore were at or above the Advanced International Benchmark, which represents fluency on items involving the most complex topics and reasoning skills. The median percentage of students reaching this Benchmark was 2 percent.

Factors associated with higher achievement in mathematics include: (i) speaking the language of the test at home; (ii) higher levels of parents' education; (iii) positive attitude towards learning mathematics; (iv) higher educational expectations; (v) more educational resources and books in the home; and (vi) attending a school where satisfactory working conditions and adequate resources are provided, and principals and teachers have a positive view of the school climate.

Source: Mullis et al (2004) and (2008).

Junior Secondary Education and the GCE O/L Cycle (Grades 6 to 11)

6.18. A description of the aims of learning mathematics, the learning teaching process, the subject content, competencies, competency levels, the activity continuum and assessment criteria is provided in the TIMs of grades 6 to 11. There are a common set of aims of learning mathematics and 31 common competencies specified for grades 6 to 11. Under the competencies, competency levels as well as subject content and learning outcomes are specified for each grade.

6.19. A study on the implementation of the mathematics and science curricula in Grades 6 and 10 revealed that the curriculum strands and general aims correspond to international standards [McCaul (2007)]. However, the study also identified several shortcomings in the TIMs [see Box 6.2]. These are common to the TIMS of grades 7 to 9 and grade 11 as well.

Box 6.2. Shortcomings in the Mathematics TIMs for Junior Secondary Education

- Learning outcomes are not included for the process strands of communication, relationships, reasoning and problem solving.
- The TIM activities are limited to focusing on basic concepts and mathematical skills and do not engage students in applying their learning to everyday problems and situations.
- Instructions for activities provide only general and not specific criteria for assessing students during each activity.
- The collective total of the areas identified for assessment and evaluation in the activities do not provide a balanced range of assessing the competencies set out for the course.
- The use of technologies such as hand calculators is limited.
- The TIMs provide activities to fill the allocated number of periods, but little guidance is given for adjustments to be made to accommodate student needs or time constraints.

Source: McCaul (2007).

6.20. Teachers use only the activities specified in the TIM in their lessons and lack sufficient flexibility to develop their own lessons or to use different teaching strategies. Mathematics is taught in the classroom through a series of activities. All activities are described in step-by-step detail, follow the same format, and prescribe the same teaching strategy. The activities are designed in a sequence according to the 5E learning cycle of engagement, explanation, exploration, elaboration and evaluation. Focus group discussions with teachers which were conducted for our study revealed that teachers thought that the syllabus cannot be covered if every lesson is taught according to the 5E model. The term papers set by the provinces however have a compulsory question based on an activity in the TIM and therefore teachers felt compelled to use only the activities specified in the TIM in their lessons.

6.21. **The mathematics curriculum specifies skills, communication, relationships, reasoning and problem solving as process standards.** However, little emphasis is paid to developing the full spectrum of process skills that are specified, in particular, relationships, reasoning and problem solving. McCaul (2007) points out that the TIMs do not provide an organizing structure of how content and process learning outcomes are to be balanced. Concepts and mathematical skills are emphasized over other process standards. The activities require students to engage in problem solving, classifying data and communicating results. Nevertheless, specific expectations for process skills on which teachers can base assessment of learning in these areas are not provided. In short, little emphasis is placed on the development of skills in the relationships, reasoning and problem solving standards. McCaul (2007) also states that the TIMs do not provide opportunities for open ended and creative problem solving.

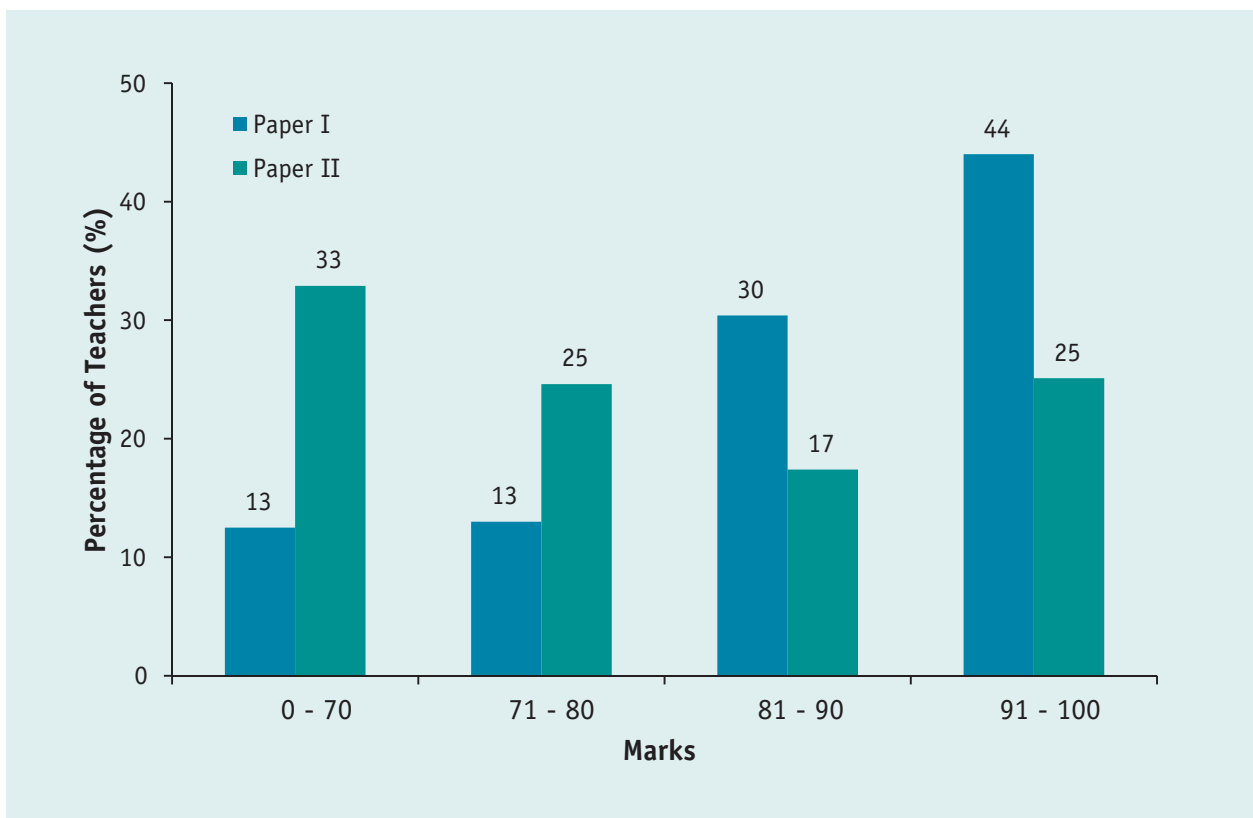
6.22. To the contrary, the Singapore mathematics syllabus emphasizes mathematics problem solving as the critical focus of its mathematics courses. The development of this ability is dependent on concepts, mathematical skills, processes, attitudes and meta-cognition. The syllabus provides clear direction on how these components should be integrated into the teaching of mathematics [Jayewardena and Sonnadara (2011)]. Sri Lanka could also adopt similar strategies to enhance the problem solving skills of students.

6.23. **It is imperative that the country provides high quality education materials and textbooks to support students in their learning.** The Education Publication Department (EPD) is responsible for the production and distribution of textbooks. The government provides mathematics textbooks for students in grades 6 to 11. The textbooks are based on the syllabi provided by the NIE and are written by a panel whose names are listed in the textbooks. Final evaluation is done by a university lecturer. Although the textbooks provided under the new program have gone through several cycles of revision, they still contain many factual, conceptual, grammatical and typographical errors. There are also errors in the exercises in the textbooks. It should be noted however that during 2010 the EPD has taken several steps to improve the quality of textbooks.

6.24. **Teachers with sound mathematical knowledge and effective teaching practices are essential for imparting excellent mathematics education.** There are approximately 1,600 Sinhala medium and 800 Tamil medium teachers with appointments for other subjects who teach mathematics in the secondary education cycle. Two studies conducted by the NIE and the Department of Examinations (DOE) show that there is an urgent need for a comprehensive teacher development program to enhance the knowledge and skills of mathematics teachers. In 2008 the NIE conducted a study to assess the mathematics knowledge of teachers in schools where students scored less than 30 percent for the GCE O/L mathematics paper. In total, 172 teachers participated in the study in which a 'question paper' on the themes of measurement and algebra was used. The marks obtained by the teachers revealed that 36 percent of teachers from the Western Province and 51 percent of the teachers from the other provinces scored less than or equal to five marks out of 10

[NIE (2008b)]. The other study was conducted in 2010 by the DOE to examine the causes for the poor performance in mathematics at the GCE O/L examination. For this study, 207 teachers who had applied for paper marking were selected and given a question paper which is similar to the GCE O/L mathematics paper. Figure 6.4 gives a summary of the marks. Most teachers performed well in paper I. However, this was not the case for paper II. Paper II tested higher order skills and 50 percent of the paper contained problems on algebra and geometry. Only 42.5 percent of the teachers were able to score over 80 out of 100 on paper II. A detailed analysis revealed that teachers' performance was poorest on geometry questions. The same weakness is reflected in students' performance at the GCE O/L examination. The study also found that mathematics teachers with distance training performed the poorest, while teachers trained at National Colleges of Education (NCOE) performed the best.

Figure 6.4 Performance of the GCE O/L Mathematics Teachers



Source: Department of Examinations, 2010.

GCE A/L Cycle (Grades 12 and 13)

6.25. There are three mathematics courses offered by GCE A/L students. All Physical Science students offer combined mathematics. Higher mathematics is offered on average by less than 10 Physical Science students. Mathematics is offered on average by less than 75 Arts students.

6.26. **Mathematics and science at the senior secondary education level are available at only 600 schools which account for about 25 percent of the schools with GCE A/L classes.** Recognizing the need to expand science and mathematics education, the National Education Commission (NEC) proposed that the GCE A/L science and mathematics streams be introduced in 1,745 Type 1C schools across the country in a phased program [NEC (2003)]. However, there has been little success in following up on these recommendations. The data given in Table 6.5 show that the number of school candidates offering combined mathematics as a subject at the GCE A/L has not increased during the past six years. It also reveals the decreasing trend in mathematics pass rates.

Table 6.5. Performance of School Candidates in Combined Mathematics at the GCE A/L

	2004	2005	2006	2007	2008	2009
Number sat	21,209	20,737	21,399	20,160	21,273	21,297
Pass Rate	53.3%	51.2%	51.8%	48.3%	46.4%	44.9%

Source: Department of Examinations, 2004-2009.

6.27. **Although the syllabi are competency based, and the 5E model of teaching is advocated, most teachers adopt lecture style teaching due to lack of time.** The syllabi and TIMs for the senior secondary education cycle are prepared by the NIE in consultation with university academic staff. A competency based curriculum was introduced in 2009. The 5E learning teaching model is advocated in the TIMs. Focus group discussions with teachers revealed that the training provided by the NIE is irrelevant and confusing. Teachers stated that the NIE used the services of university academic staff who are not involved in curriculum development or paper setting/marking to provide the training. This resulted in the training consisting of a series of lectures on mathematical content. No specific teaching strategies or instructions on the implementation of the curriculum are provided in these training sessions. The government does not provide mathematics text books for A/L students. The EPD has translated several English medium mathematics textbooks of international standard which have assisted students greatly and this practice should be continued.

AVENUES AND PATHWAYS FOR THE FUTURE

6.28. **Research on brain development and cognitive capacity among children and youth suggests that the secondary school curriculum needs to be sufficiently differentiated to take into account heterogeneity among students.** The practice in countries such as the U.K. and Singapore, in consequence, is to have two mathematics subjects at the GCE O/L, one an advanced or higher mathematics subject for students intending to pursue mathematics-intensive subjects such as physics, engineering, economics (and of course mathematics itself) at higher levels of education, and a second practical mathematics subject for other students who will mainly require

mathematics for day-to-day living later in life. The Ministry of Education could consider adopting the practice of countries such as the U.K. and Singapore and have two mathematics subjects, an advanced or higher mathematics subject and a practical mathematics subject, at the GCE O/L, to take into account student heterogeneity and cater to the needs of the different groups of students.

6.29. Teacher education and training programs need to incorporate the objectives of the mathematics curriculum so that all teachers will have a better understanding of the expectations of the curriculum. Since there is no systematic monitoring to identify shortcomings in the curriculum, an on-going monitoring program needs to be designed and implemented to ascertain whether the objectives of the curriculum are met. Training on different teaching strategies needs to be provided and teachers need be encouraged to use their experience and judgment to select the most appropriate methods to motivate students and impart knowledge. Teacher training also needs to make teachers aware of the cognitive needs and capacities of students in the age groups in their classrooms.

6.30. To overcome shortcomings in the TIMs, learning outcomes need to be provided not only for the content standards but for the process standards as well. The process standards reasoning and problem solving need to be included in the activities. Clear guidelines need to be provided on how the process standards are to be assessed. Attention needs also to be paid to the horizontal integration of subjects and the use of technology. Teachers need to be encouraged to develop their own lesson plans and to use different teaching strategies.

6.31. To ensure that students are provided with quality textbooks, the EPD needs to invest in hiring a team of competent and qualified writers. Writers need to be made aware of the aims of the competency based curriculum so that the textbooks will be aligned with these aims. Final evaluation of the textbooks needs to be undertaken by at least two subject experts.

6.32. Teachers play an especially important role in providing students with a high quality mathematics education. In consequence, it is essential to ensure that all mathematics teachers are subject-competent and have sound teaching practices. Since there are many teachers in the system without the required mathematics training, it is of vital importance to initiate a comprehensive teacher development program that will provide teachers with both the required subject knowledge and training in good teaching practices. The advice and support of university academics and mathematics educators should be obtained in this regard.

CHAPTER SEVEN

DIMENSIONS OF QUALITY: SCIENCE EDUCATION

INTRODUCTION

7.1. **The future of Sri Lanka lies in developing human capital that can deliver rapid growth in a knowledge-driven global economy.** To generate new knowledge and use it innovatively a country requires a scientifically literate population. A quality science education is vital for scientific literacy. If students understand the basic concepts, appreciate important ideas and know how science is applied to everyday situations, high scientific literacy can be achieved.

7.2. **The importance of science education has been recognized in Sri Lanka's science and technology policy.** The National Science and Technology Policy acknowledges that Science and Technology (S&T) plays a key role in economic development and that education is central to achieving this goal [NASTEC (2010)]. The policy recognizes that investment in research and development as well as in a strong S&T resource base is essential to compete successfully in the rapidly growing technology-intensive global market. This is necessary given that high technology exports form only one percent of Sri Lanka's manufactured exports compared with 27 percent in Thailand, 55 percent in Malaysia and 57 percent in Singapore. The S&T policy strongly advocates a quality science education which encourages an inquiring mind in students and fosters a culture of innovation and entrepreneurship.

7.3. **Access to science education has grown steadily in response to the need to widen scientific literacy.** The study of science up to the GCE O/L was available to a selected minority pre-independence but grew as the social demand for science education increased. Presently students in all secondary schools offer the subject at GCE O/L. Curriculum reforms through the years have also sought to improve the quality of science education and important strides have been made. Despite this progress there is concern about the outcomes of science education. Students are not able to demonstrate acceptable levels of achievement in applying their knowledge to everyday situations and to the workplace.

LEARNING ACHIEVEMENTS IN SCIENCE

National Assessment at Grade 8

7.4. **The science learning outcomes in middle school have improved between 2005 and 2008** [Table 7.1]. Test scores of both boys and girls have increased and, as in the case of mathematics

scores, girls perform better than boys. The difference between the mean scores in 2005 and 2008 is statistically significant at 99 percent for both boys and girls.

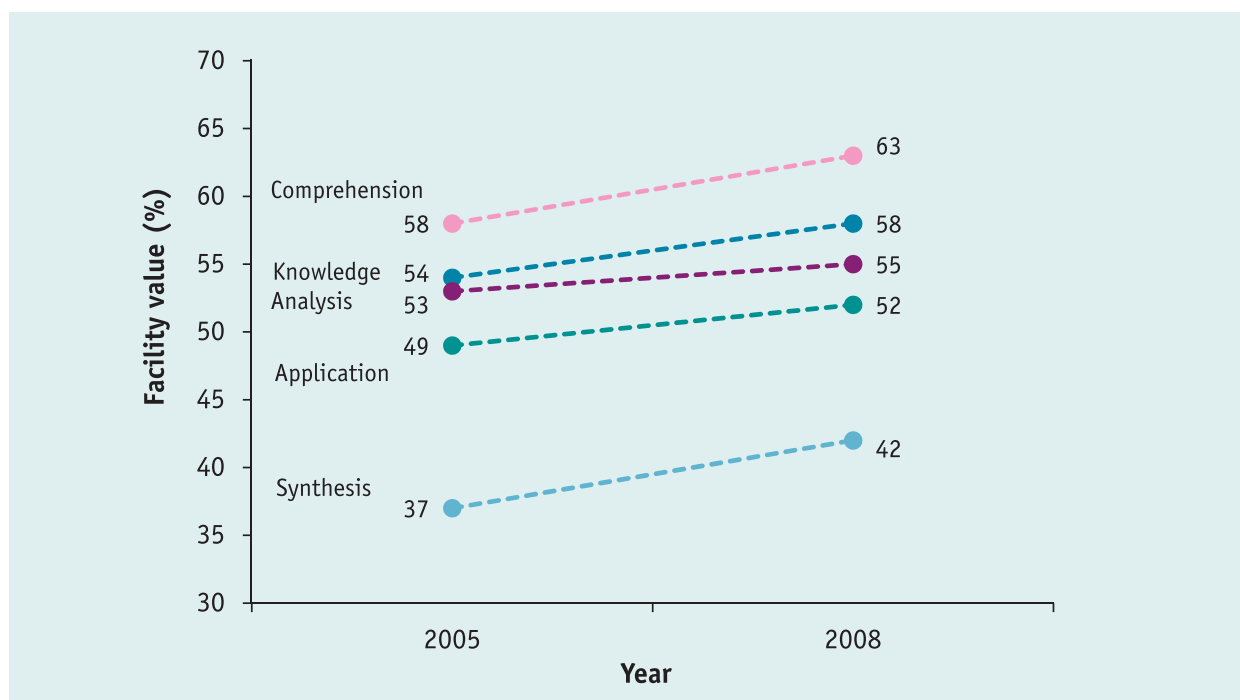
Table 7.1. Mean Scores and Standard Errors of Means Scores in Science by Gender and by Location, 2005 and 2008

Gender	Science		Location	Science	
	2005	2008		2005	2008
Male	52.7 ± 0.05	56.0 ± 0.38	Urban	57.5 ± 0.12	58.4 ± 0.44
Female	53.2 ± 0.05	56.6 ± 0.28	Rural	52.4 ± 0.04	55.1 ± 0.22
Total	53.2 ± 0.04	56.3 ± 0.20	Total	53.2 ± 0.04	56.3 ± 0.20

Source: National Education Research and Evaluation Center, 2005 and 2008

7.5. **Achievement levels of students in urban schools are higher than those of rural students** [Table 7.1]. However, students in rural schools show a greater improvement in mean scores in the three year period. The difference between the scores in 2005 and 2008 is statistically significant at 99 percent and 90 percent for the rural and urban schools respectively.

Figure 7.1 National Achievement at Grade 8, Sub-Skills in Science



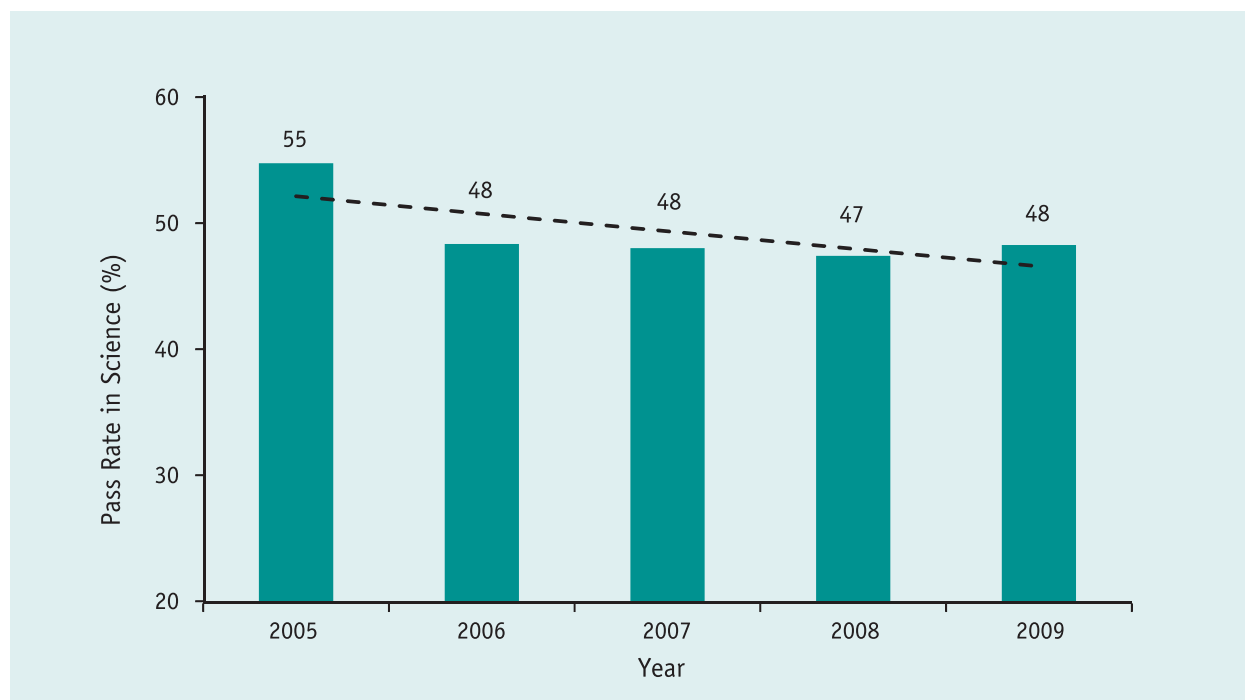
Source: National Education Research and Evaluation Center, 2005 and 2008.

7.6. **On average, there is an improvement in all five sub-skills in science between 2005 and 2008** [Figure 7.1]. The national assessments in science test students' knowledge and the abilities of comprehension, application, analysis and synthesis. Comprehension is the strongest science sub-skill while synthesis is the weakest, showing a low mean score. It is significant that the ranking of the mean scores of all five sub-skills has remained unchanged after 3 years. The strengths of students are still in comprehension, assimilating knowledge and analysis. They are weaker in application and synthesis. These findings may be attributed to weakness in the application of concepts to real life situations and to insufficient use of experiments at class room level [NEREC (2005), (2008)].

Performance at the GCE O/L Examination

7.7. **Science results of school candidates have declined by about 6 percent between 2005 and 2009** [Figure 7.2]. The drop is mainly due to the reduction between 2005 and 2006. Nevertheless, the pass rates are inadequate considering that more than half of those who sit the science paper fail to pass. The mean scores for science are also low (34 ± 2). The latest data indicate a pass rate of 60% in 2010.⁶

Figure 7.2 The GCE O/L Examination Pass Rates in Science between 2005 and 2009

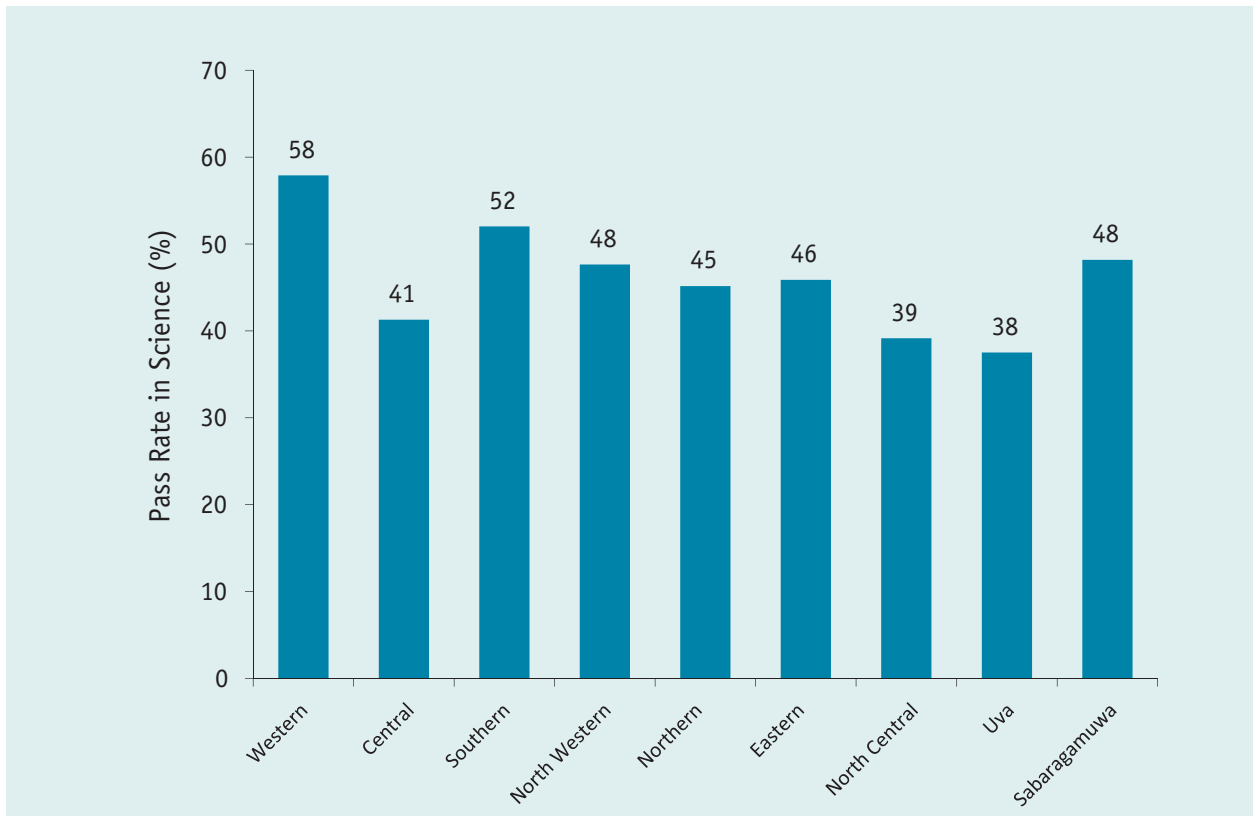


Source: Department of Examinations, 2005-2009.

⁶ The pass rate has increased from 48% in 2009 to 60% in 2010. Since this is a substantial change, further studies are required to assess these findings. Pass rates in national examinations may vary due to possible standardization of examination marks, year on year variation in the level of examination questions etc.

7.8. Substantial regional disparities exist between provinces with respect to GCE O/L science pass rates. Figure 7.3 presents the 2009 GCE O/L science pass rates across all nine provinces. Provinces such as the Western, Southern, North-Western and Sabaragamuwa show higher pass rates than the other provinces. The highest pass rate for science is seen in the Western province (58 percent) while North-Central and Uva Provinces have the lowest pass rates (39 percent and 38 percent respectively).

Figure 7.3 The GCE O/L Science Examination Pass Rates by Province, 2009

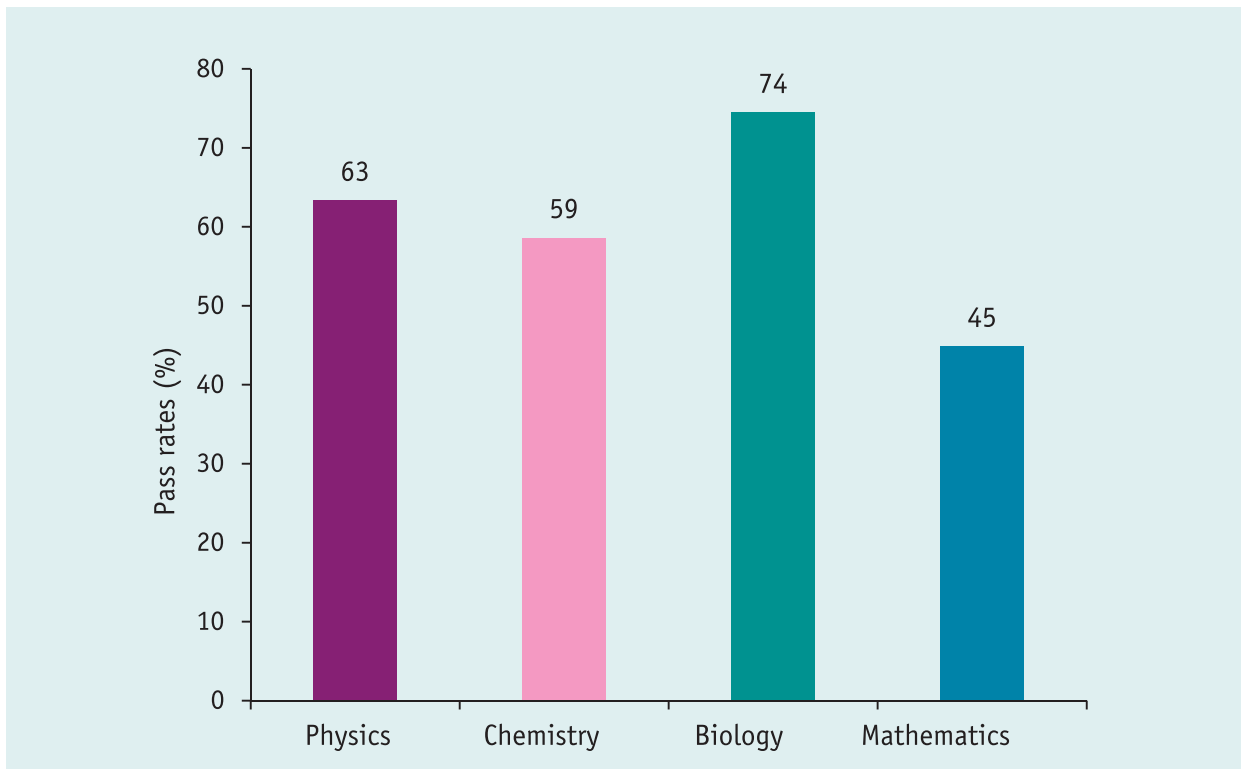


Source: Department of Examinations, 2009.

Performance at the GCE A/L Examination

7.9. There is a variation in performance at the GCE A/L with respect to the main science subjects. Figure 7.4 presents performance of school candidates at the 2009 GCE A/L examination, in the four main subjects in the science stream. While 74 percent of the students pass biology at the GCE A/L, only 45 percent pass mathematics. The pass rates in physics and chemistry, subjects common to both physical and biological science students, are 63 percent and 59 percent respectively. Thus, there is a distinct difference in the attainment of students in the physical and biological science streams.

Figure 7.4 Pass Rates of the Main Subjects of the GCE A/L Science Stream in 2009



Source: Department of Examinations, 2009.

THE POLICY FRAMEWORK FOR SCIENCE EDUCATION, SCIENCE CURRICULUM AND TEACHING STRATEGIES IN SCHOOLS

7.10. **Key reforms in curriculum and teaching learning methodology have been introduced to improve the learning of science.** This is in response to findings that students were not able to apply their learning to everyday situations and to findings that their skills in open-ended problem solving and decision making relating to innovation and creativity were weak. Few were able to demonstrate the ability to use higher order thinking skills [McCaul (2007)].

7.11. **Competency-based teaching, learning and assessment practices were therefore introduced.** A competency-based curriculum sets expectations for learning of content as well as of skills/processes and attitudes that students should acquire, in an activity-based learning environment. The skills and processes enable students to apply knowledge concepts within the subject discipline itself or to real situations using higher-order thinking skills. New teaching methodologies to increase teacher effectiveness and to improve student-teacher interaction were adopted [Ginige (2008)]. The reforms were introduced at all three levels of school education.

7.12. **An activity-based curriculum has been developed for primary students.** At primary level, basic science is taught in grades 1 and 2 (key stage 1), grades 3 and 4 (key stage 2) and grade 5 (key stage 3) as a component part of an integrated ‘Environment Related Activities (ERA)’ curriculum. Six hours a week are devoted to ERA. All primary subjects including science are taught in the mother tongue. The ERA syllabus is based on 16 themes into which science topics relevant to the local and global context are cleverly woven.

7.13. **Activity-based teaching is employed to a fair extent and science is successfully taught in primary school.** Students are able to get hands on experience and have the opportunity to learn in collaboration with peers. Teachers are guided by a Teachers Instruction Manual (TIM) prepared by the National Institute of Education (NIE). Text books are not issued to students. Competencies that must be acquired and content learnt under each theme are described in the TIM together with activities necessary to understand the concepts. However, the balance of knowledge, skills/ processes and attitudes necessary to acquire a specific competency is not explicitly stated in the syllabus or TIM although some skills and processes are encouraged in the activities. The bias is still towards teaching content. The lack of material and equipment for activities hampers teaching but teachers do adapt, whenever possible, using local materials.

7.14. In the junior secondary and GCE O/L cycle of education (grades 6 to 11) science is offered as a stand-alone subject in an integrated curriculum. Physics, Chemistry and Biology are taught as separate units within the integrated curriculum in grades 10 and 11. At the end of grade 11, the first national examination, the GCE O/L is held. The medium of instruction of science is the mother tongue or English (bilingual schools). Text books are issued at each grade and are available in all three languages.

7.15. The objectives of the science program in grades 6-11 are described in the TIM and refer to the application of scientific knowledge and concepts to everyday living and to the nation’s well-being using inquiry skills, problem solving and scientific reasoning. In this respect they are valuable outcomes of science education. Narrowing the focus of the aims to clearly define the skills students should hope to acquire through the study of science may be considered. Such precise aims are described in the syllabus of Singapore [Box 7.1 below] a country known to have a strong school science program.

7.16. **The syllabus is structured on broad themes (or standards) to help students appreciate the big ideas in science.** The syllabus has a spiral approach where the concepts are revisited at each grade with increasing depth. Table 7.2 compares the themes in the secondary science program of three countries including Sri Lanka. When account is taken of the competencies as well as themes, the Sri Lanka syllabus shows broad agreement with those of USA and Singapore. The main areas the Sri Lanka syllabus does not address are “Science as a Human Endeavour” and “History and Nature of Science”.

Box 7.1. Aims of the Singapore Lower Secondary Science Syllabus (2008)

- a) Enable students to acquire understanding and knowledge so as:
 - to become confident citizens in a technological world, able to take or develop an interest in matters relating to science and technology;
 - to recognize and appreciate the usefulness and limitations of the scientific method in investigating and solving problems;
 - to be prepared for science studies at upper secondary level and beyond.
- b) Develop abilities and skills that
 - are relevant to the study and practice of science;
 - are useful in everyday life;
 - encourage effective communication;
 - encourage safety consciousness and safe practice.
- c) Develop attributes relevant to the study and/or practice of science such as:
 - concern for accuracy,
 - objectivity,
 - inquisitiveness,
 - initiative,
 - innovativeness,
 - integrity,
 - perseverance,
 - critical analysis.
- d) Stimulate
 - curiosity, interest and enjoyment in science and its methods of inquiry;
 - interest in, and care for, the environment.
- e) Promote an awareness:
 - that the study and practice of science is cooperative and cumulative and are subject to social, economic, technological, ethical and cultural influences and limitations;
 - that the applications of science are generally beneficial; but the abuse of scientific knowledge can be detrimental,
 - of the importance of the use of IT for communications and as a tool for data collection and analysis.

It is hoped that teachers will incorporate the social, environmental, economic and technological aspects of science whenever possible throughout the syllabus [see Aims (d) and (e)]. Where appropriate, students should also have opportunities to discuss the ethical implications of science and technology.

Source: Ministry of Education, Singapore. (2008).

7.17. The five themes selected are not used to structure the Sri Lanka syllabus. Instead a set of eight competencies is used to organize the teaching sequence in grades 6-11. The competencies provide a general description of expected learning. Each competency is further specified as a number of competency levels. The statements under each competency level describe the content.

7.18. **The content described under the large number of competency levels specified in a grade (35-50) is excessive resulting in an overburdened curriculum.** The time allocated to complete the topics is unrealistic and arbitrary. Syllabi are impossible to cover in the given three terms.

Table 7.2. Themes in the Secondary Science Programs in the USA, Singapore and Sri Lanka

USA (National Standards for The Education of Science)	Singapore	Sri Lanka
(Grades 5-8) Unifying Concepts and Processes Science as Inquiry Physical Sciences Life Science Earth and Space Science Science and Technology Science in Personal and Social Perspectives Science Perspectives Science as Human Endeavour History and Nature of Science	(Lower Secondary) Science and Technology Measurement Diversity Models and Systems Energy Interactions	(Grades 6-11) Observing the Environment Organisms and Life Processes Matter, their Properties and Interactions Earth and Space Energy, Force and Work

7.19. **Although the content is described under each competency level in the syllabus, the remaining core components of skills/processes and attitudes are absent.** To clarify this point, the syllabi of four countries, Sri Lanka, Malaysia, Singapore, and the USA in relation to the topic 'Animal Diversity' are compared [see Dissanayake and Sonnadara (2011)]. The Malaysian and Singapore⁷ syllabi have an organizational structure and detail of expected learning outcomes that are measurable within the framework of the three core components. An organizational structure for guiding teachers on how to weave content, skills/processes and attitudes is also lacking in the TIM. The activities relating to the competency levels also are directed towards learning content and not so much to promote student directed inquiry [see also McCaul (2007)].

⁷ Malaysia and Singapore achieve high rankings in international assessment examinations such as Trends in Mathematics and Science Study (TIMSS) and the Program of International Student Assessment (PISA).

7.20. **Practical work, a distinct feature of science education receives little attention in the science curriculum for several reasons.** The lack of laboratory resources in schools appears to be the main reason but the absence of an examination system to test practical skills also contributes to this neglect. Practical work is necessary for a real understanding of how science works and for developing student aptitude particularly if they take up advanced science courses. The S&T policy document recognizes the need for field and laboratory exercises in school science programs as they help to promote a science, technology and innovation culture in the country [NASTEC (2010)].

7.21. Other initiatives encouraged are the establishment of science centers and science exploration. Progress has been made by establishing 36 on-site environmental education centers island-wide by the Ministry of Education (MOE). The MOE and the Science Education Committees of the Sri Lanka Association for the Advancement for Science (SLAAS) and the National Science Foundation (NSF) have also undertaken a series of successful programs to enhance the appeal of science in schools e.g. science days, exhibitions, national science competitions etc. which are contributing to increased interest in the practical aspect of science.

7.22. **The 5E learning cycle was introduced to classrooms in 2007 in order to make teaching more effective, but there are still challenges.** According to several studies, there is difficulty in implementing the 5E teaching methodology of engagement, explanation, exploration, elaboration and evaluation due to time constraints. Teachers are reverting to lecture-based teaching in order to complete the vast syllabi in time. Lack of awareness about the new teaching strategies among teachers and inadequate training given on 5E methodology are also reasons for failure in implementation [McCaul (2007), NIE (2008), (2009)].

7.23. Continuing teacher development was previously done using the ‘cascade model’ but the method was found to have limitations due to dilution of the message in transmission. In 2010 the NIE commenced ‘direct training’. NIE staff and teacher trainers in the province engage in direct training but they encounter hardship due to lack of resources and deficient training facilities in the provinces.

7.24. **The GCE O/L examination papers need to test competencies and learning outcomes delineated in the new syllabi.** A study carried out in 2009 found that the GCE O/L examination had not adjusted to testing competencies and learning outcomes but was placing more emphasis on measuring cognitive abilities as in the past [Perera, G. (2009)]. This may partly be due to the absence of clearly spelt out learning outcomes for the full spectrum of content and skills/process strands in the curriculum documents. Teachers were also found to not have significantly changed their assessment practices in term tests [McCaul (2007)].

7.25. **The Education Publication Department (EPD) has taken several steps to improve the quality of textbooks in recent times.** The material is attractive and colorful and presented

reasonably well. However, there are still some issues including factual errors, lack of clarity of subject matter, change in context of subject material after translation, variation and inconsistencies in materials across the three languages, grammatical errors and typographical errors.

7.26. In the GCE A/L cycle of education (grades 12 and 13) students undertake 3 subjects of study. The options available for science stream students are physics, chemistry, biology, combined mathematics, higher mathematics, IT and agriculture. The number of schools providing GCE A/L science subjects (type 1AB schools) is low and accounts for only 26 percent of the total number of schools teaching GCE A/L subjects. Students in several rural areas are deprived of the opportunity to study GCE A/L science owing to the absence of type 1AB schools in their locality. Some are forced to move a long distance away from home to enroll in one.

7.27. **Many issues relating to the junior secondary and the GCE O/L science curriculum are also common to the GCE A/L.** Discussions with school teachers and provincial education authorities revealed that issues such as content overload, lack of emphasis on student-directed enquiry, teacher shortages and variable quality of teachers, the lack of focus on practical work and poor laboratory facilities were equally applicable to science education at the GCE A/L [Dissanayake and Sonnadara (2011)].

7.28. **The GCE A/L teacher has been given greater freedom to follow the teaching learning method of their choice to achieve the relevant learning outcome.** Use of practical components, supplementary reading materials and teaching learning aids such as computer-assisted material, co-curricular activities, for example science clubs, field trips, exhibitions and competitions, publications, debates and science days are encouraged in the syllabus. Although the 5E-model of activities has been advocated, most teachers adopt lecture-based teaching due to time constraints resulting from overloaded syllabi.

Challenges Identified

7.29. In order to better grasp the issues relating to science education, focus group discussions were conducted with curriculum developers of the NIE, a wide range of education authorities of the MOE, the provinces, zones and divisions, and with school teachers and principals in several provinces.

7.30. **Teachers pointed out an overburdened curriculum from grades 6 to 13.** They stated that students are simply unable to cope with the volume of scientific knowledge they have to learn and that the time assigned to complete the syllabus was insufficient. Many schools arrange classes after school and during the holiday period to complete the syllabus. Cooperative activity-based learning was being abandoned in favor of lecture-based teaching due to time constraints. Some teachers stated that they are compelled to follow the activities prescribed in TIMs and hence lose the freedom to innovate.

7.31. **Teachers stated that laboratory work was not being given sufficient importance in grades 6-13.** Due to lack of time, certain schools hold practical classes after school as class time is taken up for teaching theory. Students in some schools complete the GCE O/L without any practical knowledge and experience. They stated that part of the reason for neglect of practical work is the absence of a public examination. The majority of schools visited lack adequate laboratory resources particularly lab chemicals.

7.32. **The shortage of good quality science teachers was regarded as a serious problem.** Furthermore, some zonal staff mentioned that teachers were not appropriately trained and lacked practical skills and therefore were reluctant to teach laboratory work. Teachers stated that in-service training was inadequate. Awareness seminars about new reforms were insufficient and unclear. The lack of clear direction given in the training sessions left them confused and less confident. Principals and staff in some schools mentioned that they employ methods of school-based teacher development through the formation of 'quality circles'. Teachers are able to help one another to strengthen weak areas in teaching and obtain needs-based training.

7.33. Teachers mention several problems relating to term tests set by the school or the zone. [Dissanayake and Sonnadara (2011)]. English medium questions are translated incorrectly (bilingual schools). In term examinations set by zones, marks assigned on question papers are at times different to that in the marking scheme. Teachers in one of the provinces stated that some questions try to ascertain the manner in which students performed activities in the classroom and not the learning outcome.

AVENUES AND PATHWAYS FOR THE FUTURE

7.34. **There is a need to formulate a clear policy framework that sets goals of school science education of the country and pathways to reach the goals.** The preparation of a Science Education Policy by the MOE is presently under consideration and its development would be beneficial to curriculum developers, planners and implementers.

7.35. **The study of science needs to move away from learning of large volumes of scientific information to one of student directed inquiry.** This would be helped by a change in the organizational structure of the science syllabus to reflect the manner in which the essential components of content, skills/processes and attitudes are to be balanced to achieve learning outcomes within a scientific theme [Dissanayake and Sonnadara (2011)]. An organizational structure for guiding teachers on how to weave content, skills/processes and attitudes needs also to be included in the TIM. The activities relating to the competency levels must be directed to student directed inquiry and not towards learning content. It is essential to make this change to develop students' higher order thinking skills and to improve their skills in open ended problem solving and decision making - raw materials for innovation.

7.36. **A careful review of and reduction in content of the overburdened science syllabus in grades 6-13 is needed.** In addition, review and refinement in the sequence plan of grades 6 to 11 and 12 to 13 is necessary to ensure that an appropriate amount of content is distributed through the grades to ensure that students are properly prepared for the two national examinations. For a seamless transition from primary to secondary science, teaching science as a stand-alone course at primary level may be considered sometime in the future.

7.37. **Practical work could be promoted as a compulsory part of the curriculum and assessed as part of the examination system.** School-based testing of practical work could be introduced and included as part-requirement for the GCE A/L. Improvement of laboratory facilities and a proper and efficient system of distribution of lab chemicals is essential within the framework of practical examinations.

Box 7.2. Scottish Schools Digital Network (Glow)

Scottish Schools Digital Network (Glow) is a model in the use of modern technology in education. It is the Scottish Schools Digital Network and is the world's first national intranet for education.

Glow is transforming the way education is being delivered. Its aim is to break geographical and social barriers and allow collaboration along the length and breadth of Scotland.

Glow has been designed to work alongside the school curriculum to build capacity and underpin new approaches to delivering a first-class education to Scotland's children and young people. This innovative intranet is a "digital blackboard" which every student and teacher in Scotland can share, for regular lessons as well as extra-curricular activities. For example, it enables smaller schools to work with larger schools on science projects, exchanging ideas and accessing central resources. This offers considerable opportunities especially for schools in remote areas. As well as facilitating discussion boards, forums and webcasts, Glow can create a "virtual classroom" experience.

Data gathered or research done by a teacher can be placed on Glow so that it can be easily accessed by all other teachers and students, instead of being locked up in a single location. If anyone needs specialist knowledge, they can contact other members or ask advice from academic "experts" and then share their experience with the rest of the network.

New findings and information can be broadcast live in a webcast so that schools throughout Scotland could interact in real time with each other as well as with specialists in the field. This enables pupils to ask and have answered live questions. It has also the potential of supporting teachers and making science relevant and exciting for young people.

7.38. The use of ICT in education enables learning by making it dynamic, lively and interactive.

ICT is now increasingly being integrated to international school science programs. The Sri Lanka syllabus or TIM has not yet included direction on how to use whatever ICT is available in schools. Schoolnet a digital network set up for Sri Lankan schools, presently connects over 300 schools in Sri Lanka and may be effectively used to work alongside the school curriculum and support science education. The network is expected to increase its coverage and could be used in a manner described for Glow in Scotland (Box 7.2).

7.39. Teachers need the freedom to use the teaching strategy best suited for a learning outcome by mixing and matching teaching strategies.

All activities that are to take place in the class room described in the TIM follow the same format and prescribe the same teaching strategy. However, teachers need to be given the freedom to use the teaching strategy best suited for a learning outcome by mixing and matching teaching strategies. They should be encouraged to innovate.

7.40. Examinations need to be adapted to the competency-based curriculum by close collaboration between curriculum writers and the Department of Examinations.

It is necessary for the two groups to reach a consensus on the learning outcomes that has to be included in testing for the full spectrum of content and process strands in the curriculum documents once they are revised. The change in the testing system also needs to be applied to term tests in all grades in school.

7.41. The training and quality of teachers need to be improved.

The quality of learning is largely dependent on the teacher. Deployment of high quality teachers in all schools will result in improvement of standards throughout the country and in the disappearance of wide regional disparities in performance seen at present. In order to improve teacher quality, greater subject specific training in theory and practical work, both in pre-service and continuing teacher training programs could be offered. Teachers could be incentivized to undertake a broad range of recognized continuing teacher training activities which include for example their participation in scientific research in universities and industry. The practice of school-based teacher development presently being successfully implemented in some schools could be considered for all schools. Facilities for pre-service training may be improved by upgrading one of the six NCOEs designated for science, to a National Centre for Excellence in Science Teaching.

CHAPTER EIGHT

INTER-SECTORAL DIMENSIONS OF EDUCATION OUTCOMES: SCHOOL HEALTH AND NUTRITION

INTRODUCTION

8.1. **School health and nutrition programs are increasingly recognized as important policy initiatives to improve education outcomes.** School health and nutrition programs have gained increased priority on the modern global development agenda due to recent evidence on the impact of children's health and nutrition levels on educational outcomes. This recognition has driven the formation of health and education partnerships to utilize the resources, technical capacity and infrastructure of both sectors so that their interaction can contribute to improved access and maximized education outcomes. Schools provide a platform for the delivery of child health and nutrition services, where they can strengthen the effectiveness of global health interventions and deliver gains in education participation and learning.

8.2. **International frameworks exist for school health planning, and for programs based around supportive partnerships between the education and health sectors.** The 'FRESH (Focusing Resources on Effective School Health)' framework was launched at the Education for All Dakar meeting in 2000. The FRESH framework is frequently used as the basis for planning school health and nutrition programs by many countries and by the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations World Food Programme (WFP), the United Nations Children's Fund (UNICEF), the World Health Organization (WHO), the World Bank and civil society. The four pillars of the FRESH framework are detailed below.

- a) Policy: health and nutrition-related school policies that provide a non-discriminatory, safe, and secure environment.
- b) School environment: access to safe water and the provision of separate sanitation facilities for girls and boys.
- c) Education: skills-based education that addresses health, nutrition, and hygiene issues and promotes positive behaviors.
- d) Services: simple, safe, and familiar health and nutrition services that can be delivered cost-effectively in schools such as deworming, micronutrient supplements, and food (to avoid hunger), together with increased access to youth-friendly clinics.

8.3. **Health issues which commonly affect school-age children often impact their attendance, concentration and achievement at school.** There is often a high prevalence of diseases such as

malaria, diarrheal disease, worm infections and iron deficiency anemia among schoolchildren around the world. Worm infections for instance, affect up to a third of all school-age children and an estimated quarter of all school-age children across the world suffer from iron deficiency anemia [Jukes et al (2008)]. Such diseases and their negative effects on children's attendance, concentration or cognition decrease their ability to maximize education [Jukes et al (2008)]. Children with persistent hookworm infection for example are shown to be 13 percent less likely to be literate and earn up to 43 percent less as adults [Bleakley (2007)]. There is clear evidence that school health interventions, including feeding, deworming, iron supplementation and malaria treatment increase attendance, concentration and achievement thereby reducing the effects of ill health on educational outcomes [Bundy (2011)].

8.4. School health and nutrition programs directly confer the most benefit on the poorest and neediest children. The double jeopardy of being more susceptible to diseases and poor health, and then suffering greater negative health and educational outcomes from these diseases, affects poorer children specifically and often contributes to greater inequality in communities. School health and nutrition programs can conversely be seen as interventions to expand capabilities, rather than to increase resources, where improved health increases children's capabilities to benefit from education.

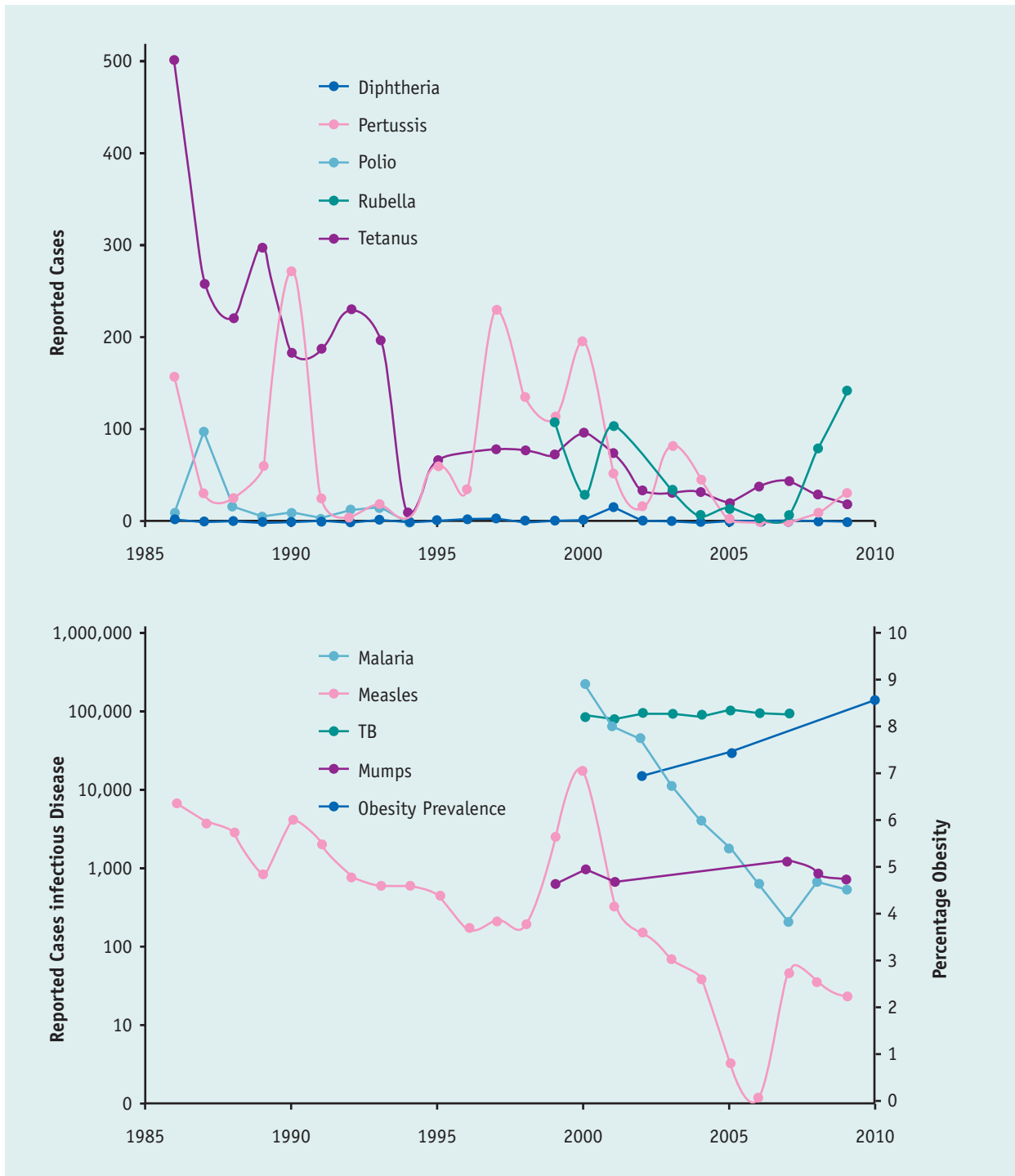
8.5. School health and nutrition programs are often an efficient and cost-effective method of achieving educational gains. By utilizing the existing educational infrastructure, which provides a strong mechanism, and many teaching personnel who can reach large numbers of school-age children, school-based programs are a cost-effective way to deliver health interventions. They are also often cheaper than many other education interventions that produce similar impacts on children's learning, enrolment and attendance. School health and nutrition programs generate economic benefits, resulting from improved education outcomes, which usually exceed their costs several times over [Bundy (2011)]. Indeed school-based deworming is one of the most cost-effective interventions for increasing school attendance ever rigorously evaluated [J-PAL (2007)].

SCHOOL HEALTH AND NUTRITION IN SRI LANKA

8.6. Sri Lanka has established a wide-ranging school health and nutrition program. The nutritional and health priorities of Sri Lanka today have been shaped by an evolving socio-economic environment as well as long running community and school health interventions. The school health and nutrition program is a function of both the Ministries of Education and Health, is increasingly integrated into education policy and planning and is one of the most advanced programs among developing countries in Asia [Dixon et al (2011)].

8.7. Complex health and nutrition needs are evident in Sri Lanka. The recently concluded civil war, population dispersal patterns, and the existence of different subpopulations have created a diverse

Figure 8.1 (a) Decreasing Communicable Diseases and (b) Decreasing Communicable Diseases and Increasing Obesity



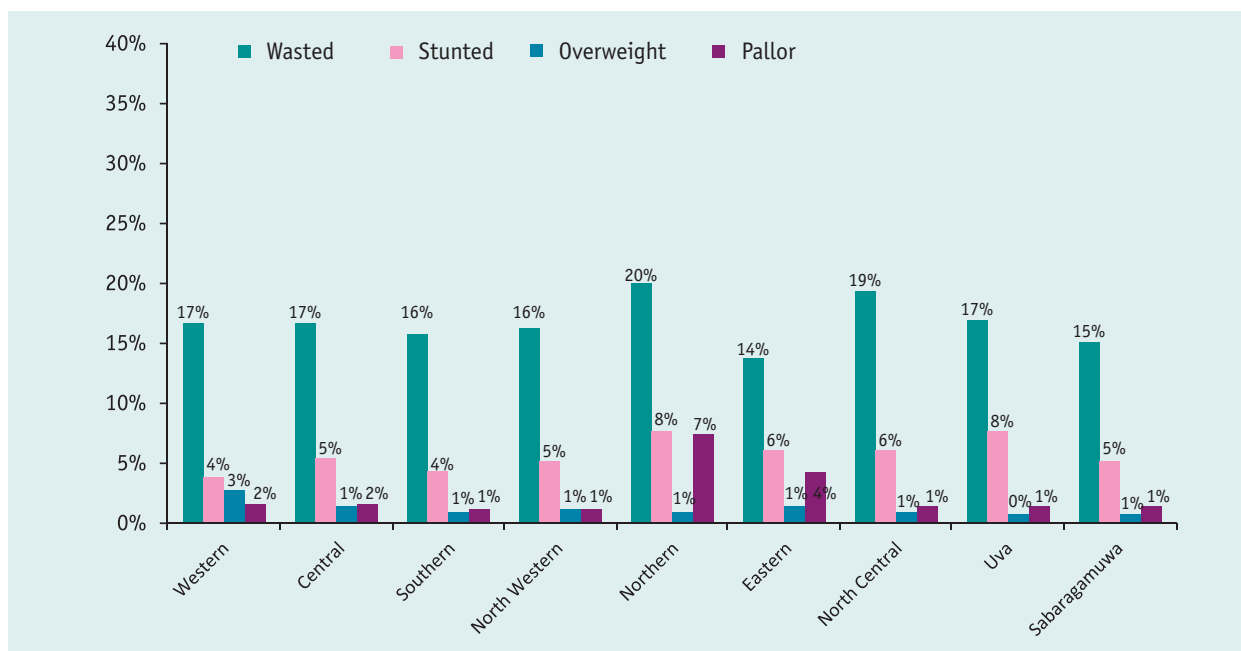
Source: Diphtheria, measles, mumps, pertussis, polio, rubella, tetanus reported cases from WHO (2010c). Tuberculosis (TB) cases from WHO (2010a), estimated incidence per year per 100,000 population (new and relapse cases) taken to cases and extrapolated using the population growth figures for Sri Lanka. Malaria cases are total indigenous cases of malaria from WHO (2010b). Obesity is from WHO (2010a).

and dynamic health and nutrition picture. Overall, although significant progress has been made in controlling communicable diseases [Figure 8.1a and Figure 8.1b], these diseases have not yet been eliminated and sustained reduction relies on the maintenance of good practice. Further, associated with increasingly sedentary lifestyles, poor eating habits and stress, the risk of communicable diseases is being replaced by so called diseases of affluence – non-communicable diseases such as obesity and diabetes, coronary heart disease and cancer [Figure 8.1b] [Engelgau et al (2010)].

8.8. School health and nutrition reflects this complexity, with the commonly termed ‘nutrition transition’ strongly evident in Sri Lanka. The ‘nutrition transition’ is a common trend in middle income countries where some parts of the country are facing a rise in non-communicable diseases mostly evident in the developed world such as obesity and diabetes, while other areas are challenged by infectious diseases such as worms and malaria as well as malnutrition. In Sri Lanka, a Medical Research Institute (MRI) survey across 9 to 10 year olds in all provinces of the country reported obesity levels of 5 percent and 3 percent in the North Western and Western provinces respectively, while in the Northern and Eastern provinces stunting was recorded at 18 percent and 20 percent [Pathmeswaran et al (2005)]. Though compared to levels of under-nutrition, obesity still affects relatively few children, levels of overweight and obese children are growing particularly in more affluent areas such as Colombo. Occurrence of concurrent excess and deficiency within the country can also be seen in the distribution of iodine nutrition status. In 2005, 44 percent of children in the Northern province were observed to be taking in excessive iodine with a few children (5 percent) having a lower intake than that recommended. Conversely in Uva 45 percent of children were either mildly or moderately iodine deficient with only 7 percent having an excessive intake. [MRI, Department of Healthcare and Nutrition (2006)]. Worm prevalence is thought to be low across much of Sri Lanka where ecological conditions are not favorable and broad scale anthelmintics are in use [de Silva et al (2003)]. Recent surveys between 2003 and 2006 in the Western province also indicate relatively stable low worm prevalence. Higher worm prevalence has been seen in the plantation areas where favourable environmental conditions combine with poverty and poor sanitation [Gunawardena et al (2008), de Silva et al (2010)]. The Northern and Eastern provinces have seen some recent nutritional assessments of those children very affected and/or displaced by the conflict [MRI (2009)]. In 2009, there were high levels of stunting amongst internally displaced persons (over 34 percent in all 3 districts surveyed) and some severe stunting (up to 9 percent) with similar levels of wasting and severe wasting; no children were found to be overweight in this context.

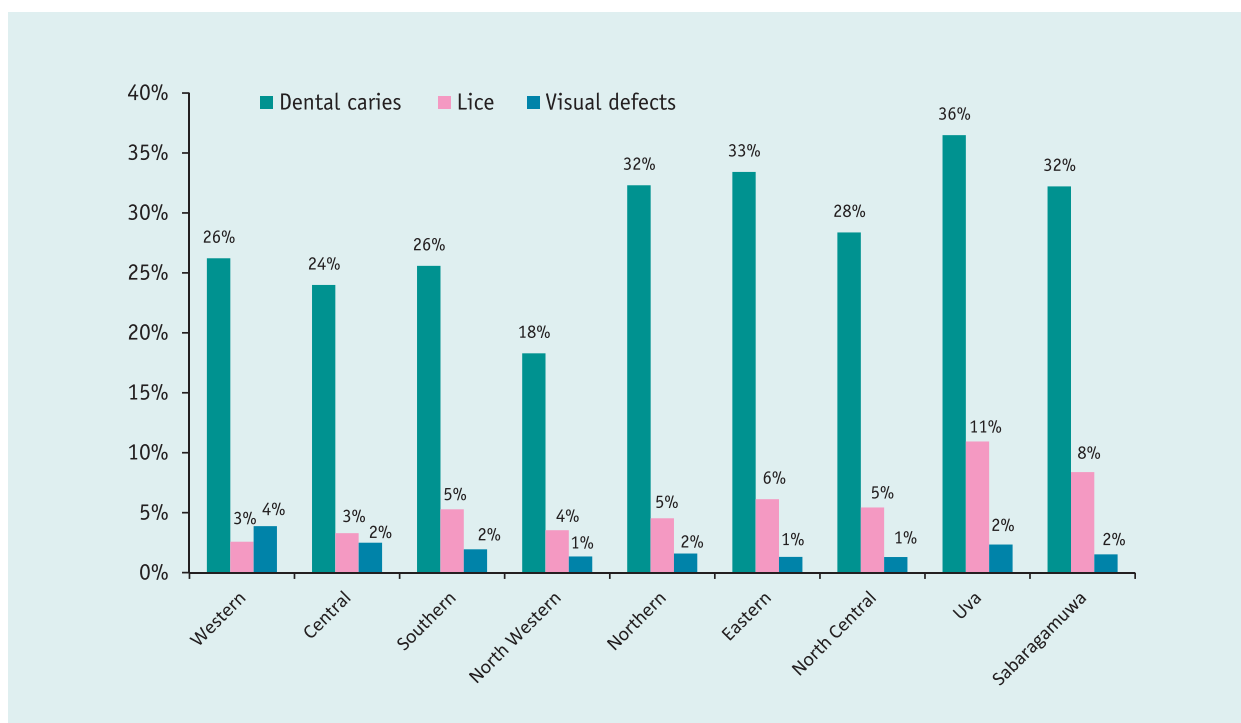
8.9. A broad picture of school health across all ages can be gleaned from the School Medical Inspection (SMI) data. Figures 8.2 and 8.3 provide data from the 2010 inspections covering some 682,801 children across all provinces. The data displays, as described above, that obesity (overweight) is a present problem, especially in the Western province and is seen alongside under-nutrition (wasted/stunted) and pallor (used in the SMI as a proxy for anemia), which are both particular problems in the Northern province. Both lice infestation and dental caries are also displayed as pervasive issues affecting large numbers of school-age children in Sri Lanka.

Figure 8.2 Nutrition Problems among School Children in Sri Lanka



Source: Data provided by the Family Health Bureau (2010) and represents the first three quarters of 2010.
 Note: In the SMI, pallor is taken as a proxy for anemia. This is not a quantitative or diagnostic test and as such is only indicative.

Figure 8.3 Common Health Problems among School Children in Sri Lanka



Source: Data provided by the Family Health Bureau (2010) and represents the first three quarters of 2010.

8.10. Mental health needs are an emerging issue which is increasingly recognized alongside basic physical needs. A growing syllabus, changing socio-cultural pressures, high expectations from parents, and scholarship assessments are cited to be contributing to increased stress, and deliberate self harm [Senadheera et al (2010)] in schoolchildren, all associated with poor coping skills. In 2004, a national survey of mental health in adolescents reported almost 1 in 5 adolescents in schools to have clinically relevant mental health problems with an extremely high proportion of these reporting symptoms classified as definite or severe [Perera, H. (2004)]. This was supported in 2008 by the Global School-Based Health Survey [WHO (2008a)], where about 10 percent of adolescents admitted to seriously contemplating suicide and around 33 percent reported symptoms of clinical depression⁸. Following this in 2010, a further study⁹ demonstrated similar rates of depression (36 percent) and severe anxiety (28 percent), with examinations being the most commonly cited problem [Rodrigo et al (2010)]. Parents, the public and the education sector demonstrated concern about the effect this is having, including generating considerable media coverage. The impact of the conflict on children's mental wellbeing in the Northern and Eastern provinces and the effects of the 2004 tsunami in affected communities has yet to be comprehensively assessed, though small-scale studies described below suggest that this is a significant problem. Among children surveyed in Sri Lanka's Northern and Eastern provinces 82 percent had experienced at least one war-related event while 96 percent reported at least one aversive experience out of the family violence spectrum. Prevalence rates of 30 percent for post-traumatic stress and 19 percent for major depression were reported [Catani et al (2008)]. Following the tsunami in 2004 post-traumatic stress reportedly ranged from 14 percent to 39 percent in 3 affected coastal communities indicating high mental health needs related to this event [Neuner et al (2006)].

8.11. Reproductive health is an increasing priority area. In the national survey of emerging issues among adolescents in Sri Lanka [UNICEF (2004)] knowledge of reproductive health issues, HIV and AIDS and sexually transmitted diseases was reported as poor, and 70 percent of early adolescents (aged 10 to 14 years) were unaware of the physiological changes and processes which were taking place in their own bodies. Sexuality and sexual health are both still relatively 'taboo' subjects in Sri Lanka, which has led to a poor flow of information in education reflected in the low knowledge of Sri Lankan adolescents about sex, sexual abuse, pregnancy, puberty, HIV and reproductive health. However, with risk behaviors such as multiple sexual partners and unprotected sex increasing, along with the age of first sexual intercourse decreasing, sexual health has become a priority in Sri Lanka [de Silva (2008)]. Prevalence of HIV does currently remain low though there are increasing numbers of people living with HIV and AIDS in Sri Lanka, and reported HIV-related deaths are also rising [UNAIDS (2008)]. As only 8 percent of 15 to 24 year olds who took part in the 2007 Demographic and Health Survey could correctly identify two methods of preventing sexual

⁸ Percentage of students who felt so sad or hopeless almost every day for 2 weeks or more in a row that they stopped their usual activities during the past 12 months.

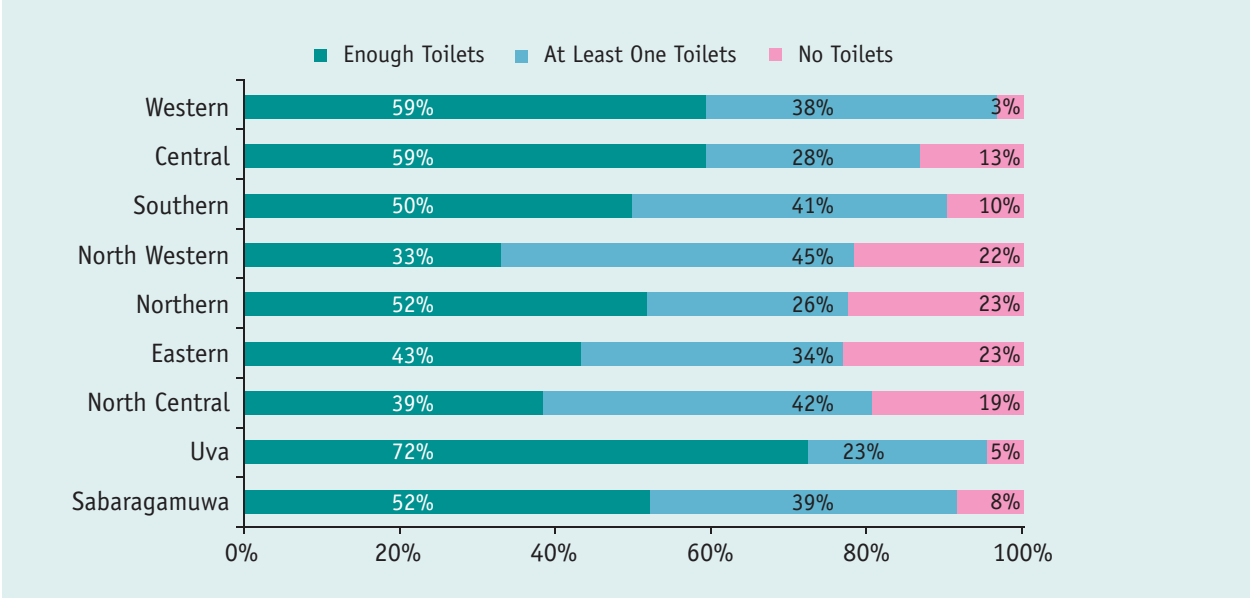
⁹ Using the Centre for Epidemiologic Studies Depression Scale (CES-D), anxiety screening test of suicide and Mental Health Association international with translated questionnaires.

transmission of HIV and correctly reject two myths, ensuring excellent life skills and accurate related information should clearly be high on the agenda. Recent literature has highlighted that parents are concerned about reproductive health issues, but are reluctant to discuss these issues with their children. Overwhelmingly, parents suggest that schools and teachers would be their preferred method of ensuring that correct information on reproductive health issues was transferred to their children [Godamunne, (forthcoming 2011)].

8.12. **Adequate water and sanitation which protects children’s right to health and facilitates good hygiene practices are lacking in almost 50 percent of schools.** This is despite their being basic needs for an environment conducive to learning. According to the 2006 School Census it was identified that 3,893 schools (41 percent) did not have adequate toilet facilities and 607 (6 percent) did not have a toilet at all. There were also serious issues regarding the supply of safe water which was not available in 2,563 (27 percent) of schools. In 2008, according to the Census data, the situation was worsening with 4,707 schools (49 percent) not having adequate toilet facilities and 1,825 (19 percent) without water supply [Figure 8.4 and Figure 8.5].

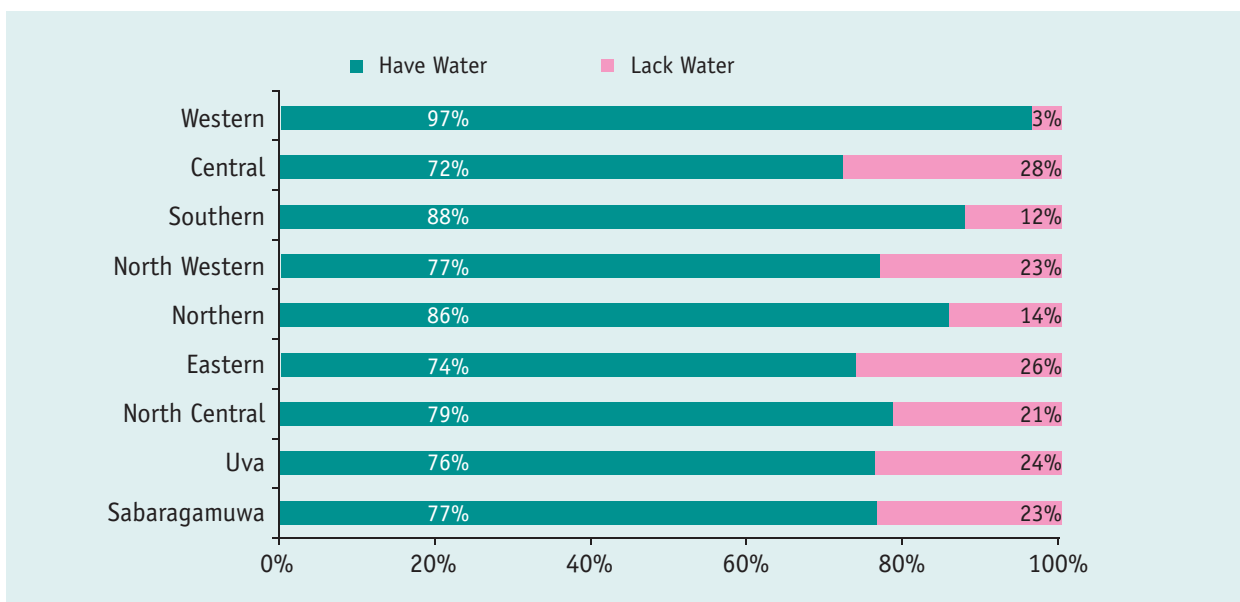
8.13. **The health and nutrition status of children exerts a strong and significant effect on their learning outcomes in Sri Lanka.** Poor early childhood nutrition as indicated by stunting, hearing deficiencies, and persistent illnesses that reduce school attendance, directly results in Sri Lankan primary school children performing worse in cognitive tests [Wisniewski (2010)]. In addition, there are indirect effects of poor health and nutrition on the education performance of children. Parents of children with helminth infections, myopia and iodine deficiencies were found to reduce

Figure 8.4 Summary of Sanitation in Schools by Province



Source: MOE, Census Branch (2008), Finance Commission (2011).

Figure 8.5 Summary of Water Availability in Schools by Province



Source: MOE, Census Branch (2008), Finance Commission (2011).

their investment in children’s education [Wisniewski (2010)]. This, in turn, would lead to poorer education outcomes for these children.

INSTITUTIONAL SCHOOL HEALTH RESPONSES IN SRI LANKA

8.14. **Sri Lanka’s school health program has been designed within the internationally agreed frameworks for school health programming as well as in the broader Sri Lankan education framework.** Beginning with a series of uncoordinated but targeted initiatives as far back as 1918, school health in Sri Lanka has developed into a cohesive and strategic program [Medagama (2008)]. In 2007, the Ministries of Education and Health developed and released a joint policy circular, formally recognizing their cooperation in the current School Health Promotion Program (SHPP). Designed in the structure of the WHO Health Promoting School initiative, the SHPP has been guided by the unifying FRESH framework [MOE (2007b)]. The SHPP also fits well with Education Ministry projects such as ‘Program for School Improvement (PSI)’, ‘School-Based Management (SBM)’ and the proposed ‘Thousand Schools Projects’ for secondary education. This mainstreaming of school health and nutrition within larger policy objectives is also increasingly reflected in its integration into national planning and monitoring structures such as the Finance Commission Checklist.

8.15. **The Ministries of Education and Health coordinate to provide a comprehensive and targeted program.** This kind of multi-stakeholder coordination provides a much needed foundation for the SHPP in pursuit of its objectives (listed below) which covers all the core elements outlined in the FRESH framework in its program [Family Health Bureau (2007)]:

- To develop policy legal structure and partnerships among all stakeholders to promote the health of the school community;
- To ensure a safe, healthy environment, both physical and psychosocial, that facilitates learning;
- To provide skills-based health education for schoolchildren;
- To ensure access to health services for schoolchildren; and
- Develop and implement plans at all levels for school health promotion empowering schoolchildren to be change agents to improve the health of their families and communities.

As the needs of each province are varied, as described above, planning and implementation is largely devolved to the provincial level to enable programs to be targeted. In brief, deworming takes place in plantations, school feeding prioritizes smaller, rural, and poorer schools, psychosocial interventions focus in the Northern and Eastern provinces and water and sanitation is targeted to schools currently reporting zero facilities.

8.16. The monitoring framework is designed to evaluate both health and educational outcomes. This includes indicators of nutritional status, academic achievement and attendance at school. Program coverage data is currently maintained either via the Finance Commission at provincial level and/or in the relevant ministry nationally. It must be noted that the integration of the SHPP indicators into the School Census and the monitoring by the Finance Commission of provincial performance represent significant steps in the mainstreaming of school health and nutrition and its positioning in other large education sector projects.

8.17. SMIs systematically assess the health status and nutritional needs of school going children and respond with healthcare referrals and interventions. The goal is to ensure that every school is annually visited by a Public Health Inspector and a medical doctor and children are medically examined. All health problems detected are recorded with the head teacher for referrals to medical services, a school health card is maintained for each child, and the referrals are followed up in a subsequent visit to the school.

8.18. SMI includes deworming, vitamin supplementation and vaccinations. As part of the SMI an annual Vitamin A mega dose is given to all children in Grades 1, 4, 7 and 10, along with vaccinations according to the national schedule and treatments for minor problems such as skin infections and suspected worms, according to need. Deworming is provided once to all children in the first year. This single ‘school entry treatment’ reflects the low prevalence of soil-transmitted helminths in Sri Lanka, except in plantation areas where deworming takes place every year for all children. Coverage of the SMI as well as the health data is collected and disseminated by the Ministry of Health and reportedly incorporated 84 percent of schools in 2009. Immunizations have traditionally been provided by SMIs with excellent results and in 2008 it was written up as a case study to advocate for school-based vaccines in other countries [WHO (2008b)].

8.19. School meal programs are targeted towards the poorest areas to combat serious malnutrition and have been shown to maximize school attendance and increase educational outcomes. Another key component of health and nutritional service delivery in schools is the school meal program. The Morning Meal Program, run by the Ministry of Education, has been providing food in schools as a morning meal between 7.30 a.m. and 8.30 a.m. to maximize both attendance for the morning meal and learning outcomes in the following day's curriculum. Meals are prescribed for each day, though menu changes are permitted according to the supply of local food stuffs. The Midday Meal Program provided by WFP in co-ordination with the Ministry of Education is targeted towards areas of severe malnourishment [MOE (2009)]. Under ongoing evaluation, in 2007 schools in both programs showed increased attendance, improved eating habits, and better educational achievement in the years following the implementation of school feeding [MOE (2007c), (2007d)].

8.20. Psychosocial care is also a growing component of the program. Both the Ministries of Education and Health, with technical assistance by development partners, have put in place strategic psychosocial interventions targeted particularly to conflict areas. These include providing "small activities for small spaces" where many of the school buildings are now being re-built and space is minimal for many children, indoor and outdoor games, providing teacher training and support networks and creating mechanisms for counseling and support to be offered within the existing political infrastructure. Country-wide specific counselors are being trained to a high level, one per district (two where dual language is required) to instigate training cascades and to support existing befriending and Saturday counseling facilities that are already available country-wide.

8.21. Health education and life skills are increasingly integrated into the general education curriculum. Health as a subject has been expanded to include life skills, reproductive health, healthy living and health promotion. Health and Physical Education is now a compulsory subject until Grade 9 and health is also incorporated into Environment Studies and Home Economics throughout all primary and secondary grades. The core life skills identified by WHO (i.e., self awareness, empathy, effective communication, social skills, ability to cope with emotions, creativity, critical thinking, problem solving, and decision making) are all integrated into the syllabus which commenced in 2007 at Grade 6 with a 3 year roll out plan. A teacher's instruction manual for the teaching of the syllabus has also been developed to assist with teaching methodology which will build health and life skills, rather than just impart knowledge. In-service training for teachers to teach difficult and culturally sensitive topics is being enhanced by enlisting the support of the Ministry of Health divisional personnel. Such medical personnel are also utilized to conduct reproductive health lessons and seminars to older adolescents whom some teachers are reluctant to teach.

8.22. Sanitation norms are developed and the percentage of schools with adequate water and sanitation are increasing. Among the key initiatives to improve the school environment are the

efforts to ensure sufficient clean water and sanitation facilities. The Ministry of Education conducted a situation analysis of the water and sanitation facilities in schools in 2008 and developed a plan to ensure that all schools are provided with these facilities within 3 years. Under the Education Sector Development Framework and Program (ESDFP), progress has been made to increase this coverage and in 2011 recent figures from the Family Health Bureau showed that services had been provided to 54 percent of schools previously identified without water supply, and the number of schools without a toilet had decreased by 50 percent. Minimum standards have been developed, known as national norms, for the provision of water and sanitation for schoolchildren [MOE (2007b)], schools have been assessed, and provisions are being made to meet these requirements. Between 2008 and 2010, of the 4,707 schools identified with inadequate number of toilets, 1,756 were improved in line with the national norms.

8.23. **Schools can be accredited as ‘health promoting schools’.** The SHPP has the accreditation of the school scheme according to what constitutes a health promoting school. Evaluations are carried out at zonal level and schools reaching specified standards are given bronze, silver or gold awards. The system is then utilized to advise schools on how they can progress up the rankings. It is thought that this will raise the profile of the ‘health promoting schools’ concept and will encourage schools to try and participate to obtain accreditation.

AVENUES AND PATHWAYS FOR THE FUTURE

8.24. **The Sri Lankan school health program is well targeted and responsive to a complex health and demographic situation.** The policy framework is comprehensive with operationally effective coordination between health and education. Some issues of sustaining targeting and coverage do exist as functions of broader and more systematic issues including comprehensive monitoring, funding dispersal and capacity at all levels. By taking steps to address these wider issues, which have all been identified by both Ministries as crucial next steps for the school health program in Sri Lanka, the program can be increasingly mainstreamed into ongoing educational policy, maintaining its leading status in school-based delivery of health interventions.

8.25. **Building on and extending the platform of excellent collaboration between education and health, specifically improving data flows and integrating monitoring activities would be useful.** This will increase the utility of monitoring for both parties, in terms of both health and educational outcomes related to the program and identifying points for program improvement. The recommendation of extending coordination, links and mainstreaming also stretches out to related activities such as psychosocial interventions and ensuring all implementing and planning parties are networked and sharing information. This will help prevent any duplication, allow each program to coordinate better with the other and contribute to the ongoing mainstreaming of school health and nutrition.

8.26. Capacity building at all levels, in particular with regard to information management and monitoring and evaluation. This should be targeted at a number of levels to enable maintenance of the targeting in an increasingly complex and devolved program. It will maximize the cost-effective and successful systems which have been developed thus far and increase health and educational collaboration.

- a) At national level – improved capacity to monitor the national program as a whole in terms of management as well as data collection, storage, and evaluation will be critical in utilizing information and program data to effectively guide the program, advocate for change and report effectively to all levels.
- b) At provincial level – increased planning and financial management capacity will allow fuller devolving of the system to provincial level so targeting can be developed and managed accordingly, and increased planning will reduce issues of funding delays and distribution.
- c) At zonal level – strengthened information technology and program monitoring capacity will be integral to the success of any monitoring and evaluation system as this will be the primary level of data collection from schools.
- d) At school level – strengthened capacity of teachers to monitor and report on the health of students in their schools. This would support the Public Health Inspector in the SMI and would help to derive maximum referral utility, as well as health and educational gains in a system with exceptionally high school coverage.

8.27. A systematic and comprehensive data collection and information management system reporting to and by all administrative levels. This has been flagged as an area of concern where much data is collected but there is a lack of capacity for this to occur systematically, with useful evaluation and dissemination for planning purposes. The creation of such a system and its administration at national level with constructive use of results would enhance empowerment of provinces for fully devolved implementation. At the same time, the national ministry level would also be empowered for improved program guidance, policy, and monitoring and evaluation. This would also contribute to ensuring that both geographical and demographic targeting of interventions continues to be needs-driven and responsive.

8.28. Complete establishment and maintenance of devolved implementation and management roles for the provincial and national ministries respectively. This would be supported by strengthened finance distribution systems. This should be considered in light of school-based management initiatives with assessments of which aspects of school-based health and nutrition could be successfully mainstreamed to the school level financing. This is particularly pertinent for aspects of the program such as the feeding element where continuity is vulnerable to short-term funding delays.

8.29. **Expanding and mainstreaming; incorporating secondary schools.** This is an important next step for the school health program in Sri Lanka. Many of the current intervention priorities - malnutrition, hunger, deworming are targeted toward the poorer sections of the populations, though many of the emerging issues such as reproductive health, mental health and life skills are also related to older children in secondary school. While some secondary schools have some aspects of school health, as Sri Lanka looks to extend the network of high quality secondary schools, basic health and nutrition should be clearly mainstreamed and integrated into what represents the gold standard of secondary education as well as their designated primary feeder schools. While this of course encompasses the provision of water and sanitation, and environmental safety to minimum government standards, it should also include interventions which are pertinent to the health of adolescents and young adults and the support they require in maximizing their educational achievement. This may include the provision of trained school counselors, the establishment of peer support networks for students and teachers, ensuring increased awareness of issues such as reproductive health, appropriate referral pathways and facilities for adolescent health needs and specific life skills teaching for age-appropriate issues.

REFERENCES

Allemano, E., N. Baumgart, D. Chapman, H. Craig, R. Kraft, R. Rawlinson, and H. Thornton. (2011). *Teacher Development and Management*. The World Bank, Washington D.C., U.S.A. Processed.

Arunatilake, N. and P. Jayawardena. (2010). "Formula Funding and Decentralized Management of Schools: Has It Improved Resource Allocation in Schools in Sri Lanka?" *International Journal of Educational Development*, 30 (1): 44-53.

Aturupane, H. (1993). *Is Education Beneficial? A Microeconomic Analysis of the Impact of Education on Economic Welfare in a Developing Country*. Ph.D. Thesis, Cambridge University, U.K.

Aturupane, H., P. Glewwe., and P. Isenman. (1994). "Poverty, Human Development and Growth: An Emerging Consensus?" *American Economic Review*, May 1994 (Papers and Proceedings), 84 (2): 244-249.

Aturupane, H., and B. Abeygunewardene. (2002). "The Cost and Financing of Primary Education". In A.W. Little (Ed.) *Primary Education Reforms in Sri Lanka*, EPD, MEHE, Colombo, Sri Lanka.

Aturupane, H. (2008). "Education in Sri Lanka: Learning Outcomes, Equity and Household Preferences." In Senanayake, S.M.P., W. Wimalaratne, and A. de Silva. (Eds). *Development Perspectives, Growth and Equity in Sri Lanka: A Festschrift in Honour of Prof. W.D. Lakshman*. Department of Economics, University of Colombo.

Aturupane, H. (2009). *The Pearl of Great Price: Achieving Equitable Access to Primary and Secondary Education and Enhancing Learning in Sri Lanka*. Create Pathways to Access Research Monograph 29, London, U.K.

Aturupane, H., A. Deolalikar, and D. Gunewardena. (2010). "Determinants of Child Weight and Height in Sri Lanka: A Quantile Regression Approach." In McGillivray M., I. Dutta, and D. Lawson. (Eds.) *Health Inequality and Development*. Studies in Development Economics and Policy, Palgrave Macmillan.

Aturupane, H., P. Glewwe, and S. Wisniewski. (Forthcoming 2011). "The Impact of School Quality, Socio-Economic Factors and Child Health on Students: Academic Performance: Evidence from Sri Lankan Primary Schools." *Education Economics*.

Aturupane, H. and A. Deolalikar. (2011). *Evolving Inequality of Schooling Attainment in Sri Lanka*. University of California Working Paper No: 11-26, University of California, Riverside.

Baig, K. (2010). "The Real Purpose of Education." *Yearbook of the National Society for the Study of Education*, 107: 221-222.

Balasuriya, J. (2007). *Do Public Funds Matter for Education Attainment? Public Expenditure and Quality of Education Tracking System (PEQETS) in Sri Lanka*. Ministry of Education, Colombo, Sri Lanka.

- Balasuriya, J. (2011). "Can Equity in Education be Achieved through Resource Allocation via Formula Funding of Schools ? Sri Lankan Case". *Journal of Comparative Education*, May 2011. Vol: 70, pp 57-107.
- Barrera-Osorio, F., T. Fasih, and H. Patrinos. (2009). *Decentralized Decision-Making in Schools: The Theory and Evidence on School-Based Management*. The World Bank, Washington D.C., U.S.A.
- Bleakley, H. (2007). "Disease and Development: Evidence from Hookworm Eradication in the American South." *The Quarterly Journal of Economics*, 122 (1): 73–117.
- Bray, M. (2001). *Community Partnerships in Education: Dimensions, Variations and Implications*. UNESCO, Paris.
- Bray, M. (2006). "Private Supplementary Tutoring: Comparative Perspectives on Patterns and Implications." *Compare*, 36 (4): 515-530.
- Bruns, B., D. Filmer, and H. Patrinos. (2011). *Making Schools Work: New Evidence on Accountability Reforms*. The World Bank, Washington D.C., U.S.A.
- Buckland, P. (2006). "Post-conflict Education: Time for a Reality Check?" *Forced Migration Review Supplement: Education and Conflict: Research, Policy and Practice*. Oxford: Refugees Studies Centre, UNICEF, Department of Educational Studies, University of Oxford. <http://www.fmreview.org/FMRpdfs/EducationSupplement/full.pdf>
- Bundy, D.A.P. (2011). *Rethinking School Health*. The World Bank, Washington D.C.
- Cardozo, M. L. (2008). "Sri Lanka: In Peace or in Pieces? A Critical Approach to Peace Education in Sri Lanka." *Research in Comparative and International Education*, 3 (1).
- Carnoy, M., M. Gove, S. Loeb, J. Marshall, and M. Socias. (2008). "How Schools and Students Respond to School Improvement Programs: The Case of Brazil's PDE." *Economics of Education Review*, 27 (1): 22-38.
- Catani, C., N. Jacob, E. Schauer, M. Kohila, and F. Neuner. (2008). "Family Violence, War, and Natural Disasters: A Study of the Effect of Extreme Stress on Children's Mental Health in Sri Lanka." *BMC Psychiatry*, 8 (33).
- Council of Europe. (1996). *Modern Languages, Learning, Teaching, Assessment: A common European Framework of Reference*. Strasbourg, France.
- Cumaranatunge, L.K. (2011). "Swings of the pendulum: A survey of ESL Textbook Writing in Sri Lanka" Paper presented at the 6th International SLELTA Conference, October, Sri Lanka.
- Davies, L. (2006). "Understanding the Education: War Interface." *Forced Migration Review Supplement: Education and Conflict: Research, Policy and Practice*. Oxford: Refugees Studies Centre, UNICEF, Department of Educational Studies, University of Oxford.

- Department of Examinations (DOE). (2010). *Report on the Research Related to G.C.E. O/L Mathematics*. Colombo, Sri Lanka. Unpublished.
- De Silva, K. M. (2005). *A History of Sri Lanka*. Vijitha Yapa Publications, Sri Lanka.
- De Silva, N., Abhayaratne, A. Fernando, S.D. Fernando, D. Gunawardena, R. Jayatissa, A. Pathmeswaran, C. Piyasena, N. Rajaratne and R. Wickramasinghe. (2003). *Intersectoral Study on Education and Health, Impact of Health and Nutrition on Learning Achievement in Primary School*. National Education Commission, Colombo, Sri Lanka.
- De Silva, N. (2008). *Understanding Adolescent Sexual and Reproductive Health*. Colombo: Plan.
- De Silva, N., A. Pathmeswaran, N. Gunawardana, B. Kumarendran, R. Ebenezer, R. Peiris, and M.C.H. Jukes. (2010). *The Impact of School-Based Deworming and Iron Supplementation on the Cognitive Abilities of Schoolchildren in the Plantation Sector of Sri Lanka*. Interim Report, Colombo, Sri Lanka. February 2010.
- Dias, M.A.A.S. (2008). *Case Studies on Schools Exposed to the Programme on School Improvement*. National Institute of Education (NIE). Colombo, Sri Lanka.
- di Gropello, E. (2006). *A Comparative Analysis of School-Based Management in Central America*. Working Paper 72. The World Bank, Washington D.C., U.S.A.
- Dimmock, C. and A. Walker. (1998). "Comparative Educational Administration: Developing a Cross-Cultural Conceptual Framework." *Educational Administration Quarterly*, 34 (4): 558-95.
- Dissanayake V. and U. Sonnadara. (2011). *Strengthening Science Education in Sri Lanka*. Colombo, Sri Lanka. Processed.
- Dixon, L. Q. (2005) "The Bilingual Education Policy in Singapore: An Analysis of its Sociohistorical Roots and Current Academic Outcomes." *International Journal of Bilingual Education and Bilingualism*, 8 (1): 25-47.
- Dixon, R., R. Ebenezer, N. de Silva, R. Peiris, A. Nelly, D. Bundy, L. Drake, R.S. Medagama and H. Aturupane. (2011). *Improving School Health and Nutrition*. Colombo, Sri Lanka. Processed.
- Engelgau, M., K. Okamoto, K.V. Navaratne, and S. Gopalan. (2010). *Prevention and Control of Selected Chronic NCDs in Sri Lanka: Policy Options and Action*. HNP Discussion Paper, Human Development Network, The World Bank, Washington D.C., U.S.A.
- Family Health Bureau. (2007). *School Health Unit, School Health Promotion Policy, Budget and Plan*. Sri Lanka, Family Health Bureau.
- Finn, J.D. (1998). "Parental Engagement that Makes a Difference." *Educational Leadership*, 55 (8): 20-24.
- Frank, B. (2006) Selling English Language Books in China. <http://www.selling-books.com/selling-english-language-books-in-china>

- Gaziel, H. (1998). "School-Based Management as a Factor in School Effectiveness." *International Review of Education*, 44 (4): 319-33.
- Gertler, P., H. Patrinos, and M. Rubio-Codina. (2006). *Empowering Parents to Improve Education: Evidence from Rural Mexico*. World Bank Policy Research Working Paper 3955. The World Bank, Washington D.C., U.S.A.
- Ginige, I.L. (2008). *The Vision of the New Curriculum and the Expected Paradigm Shift in School Education*. Vocational Skills Development Centre. Sri Lanka.
- Godamunne, P. (forthcoming 2011). *Sri Lankan Parents' Attitudes towards Adolescent Reproductive and Sexual Health Education Needs: A Qualitative Study*.
- Goullier, F. (2007). *The Common European Framework of Reference for Languages (CEFR) and the Development of Language Policies: Challenges and Responsibilities*. Report on the Intergovernmental Language Policy Forum, February.
- Grassick, L. (2007). *Primary Innovations: All Country Research Summary Report*. British Council, Vietnam.
- Greaney, V. (2006). "Textbooks, Respect for Diversity and Social Cohesion." In Roberts-Schweitzer, E., V. Greaney, and K. Duer (Eds.), *Promoting Social Cohesion through Education: Case Studies and Tools for Using Textbooks and Curricula*. The World Bank, Washington D.C., U.S.A.
- Greaney, V. and T. Kellaghan. (2008). *Assessing National Achievement Levels in Education*. Vol. 1. The World Bank, Washington D.C., U.S.A.
- Greaney, V., T. Kellaghan, and T.S. Murray. (2009). *Using the Results of a National Assessment of Educational Achievement*. Vol. 5. The World Bank, Washington D.C., U.S.A.
- Gunasekara, T.A.R.J., M.A.A.S. Dias, D.A.S.D. Ratnayaka, N.D. Dissanayake, G.H.R.T. De Silva, and R.B.N. Chinthani. (2010). *Impact Evaluation of the Programme for School Improvement in Sri Lanka 2006-2009*. Faculty of Research Planning and Development, National Institute of Education. Sri Lanka.
- Gunawardena, N.K., N.D.D.M. Amarasekera, A. Pathmeswaran, and N.R. de Silva. (2008). "Effect of Repeated Mass Chemotherapy for Filariasis Control on Soil-Transmitted Helminth Infections in Sri Lanka." *Ceylon Medical Journal*, 53 (1) 13–16.
- Gunewardena, D. (2007). *Consumption Poverty in Sri Lanka: 1985-2002: An Updated Analysis of Household Survey Data*. Center for Poverty Analysis, Colombo, Sri Lanka.
- Gunewardena, D., D. Abeyrathna, A. Ellagala, K. Rajakaruna, and S. Rajendran. (2008). *Glass Ceilings, Sticky Floors or Sticky Doors? A Quantile Regression Approach to Exploring Gender Wage Gaps in Sri Lanka*. PEP-PMMA Working Paper.
- Hanushek, E., and F. Welch. (2006). *Handbook of the Economics of Education*. Vol. 1. Elsevier Science and Technology Books.

- Heyneman, S.P. (2010). *Social Cohesion and Education-Background: Social Cohesion and Development*. Social Functions of Education. <http://education.stateuniversity.com/pages/2428/Social-Cohesion-Education.html>
- Himaz, R. (2010). "Intra-household Allocation of Education Expenditure: The Case of Sri Lanka." *Economic Development and Cultural Change*, 58: 231-258.
- Himaz, R. and H. Aturupane. (2011). *Education and Household Welfare in Sri Lanka from 1985 to 2007*. Economics Series Working Papers 527. University of Oxford, Department of Economics.
- Ho Sui-Chu, E., and J.D. Williams. (1996). "Effects of Parental Involvement on Eighth Grade Achievement." *Sociology of Education*, 69: 126-141.
- IIEP (International Institute for Educational Planning). (2006). *Guidebook for Planning Education in Emergencies and Reconstruction*. International Institute for Educational Planning-UNESCO, Paris.
- Indrapala, K. (2007). *The Evolution of An Ethnic Identity: The Tamils in Sri Lanka C.300 BCE to C.1200 CE*. Vijitha Yapa Publications, Sri Lanka.
- Jayaweera, S. (1998). "Education in Sri Lanka - Fifty Years Since Independence." In A.D.V. de S. Indraratne (Ed.). *Fifty Years of Sri Lanka's Independence: a Socio Economic Review*. Sri Lanka Institute of Social and Economic Studies, Colombo, Sri Lanka.
- Jayewardene D.R. and U. Sonnadara. (2011). *Strengthening Mathematics Education*. Colombo, Sri Lanka. Processed.
- Jeynes, W.H. (2005). "A Meta-analysis of the Relation of Parent Involvement to Urban Elementary School Student Academic Achievement." *Urban Education*, 40: 237-269.
- Jeynes, W.H. (2007). "The Relationship between Parental Involvement and Urban Secondary School Student Academic Achievement." *Urban Education*, 42: 82-110.
- J-PAL (Abdul Latif Jameel Poverty Action Lab). (2007). *Policy Briefcase No.4. Mass Deworming a Best Buy for Education and Health*. October 2007. Cambridge, MA: J-PAL.
- Jukes, M.C.H., L.J. Drake, and D.A.P. Bundy. (2008). *School Health, Nutrition and Education for All*. The World Bank, Washington D.C., U.S.A.
- Kakwani, N. (1993). "Performance in Living Standards: an International Comparison." *Journal of Development Economics*, 41 (2): 287-319.
- Kellaghan, T. (2001). "Family and schooling." In Smelser, N.J. and P.B. Baltes (Eds.), *International Encyclopedia of the Social and Behavioral Sciences*. Pergamon, Oxford.
- Kellaghan, T. (2011). *School-based and Home- and Community-based Learning Improvement Initiatives*. Education Research Center. Dublin, Ireland. Processed.
- Kularatne, W.G. (2008). *Handbook for School Improvement Partners*. Ministry of Education. Sri Lanka.

Lekamge, D., P. Jaufer, R. George, and L. Gonsalkorale. (2007). *Principal's School Management and Leadership Capacity*. Open University, Sri Lanka.

Levy, F. and R. Murnane. (2004). "Key Competencies Critical to Economic Success." In Rychen, D.S., and L.H. Slaganik. (Eds.), *Defining and Selecting Key Competencies*. Cambridge, Mass: Hogrefe and Huber.

Little, A. (2010). *The Politics, Policies and Progress of Basic Education in Sri Lanka*. Create Pathways to Access Research Monograph 38, London, U.K.

Medagama, R.S. (2008). *A Study of the School Health Promotion Programme in Sri Lanka*. Colombo, Sri Lanka. Processed.

Medagama R.S. and U. Sonnadara. (2011). *Overview of the General Education System in Sri Lanka*. Colombo, Sri Lanka. Processed.

McCaul, T. (2007). *Study of the Implementation of Mathematics and Science Curriculum in Grade 6 and 10*. National Institute of Education (NIE). Colombo, Sri Lanka.

MRI (Medical Research Institute), Department of Healthcare and Nutrition. (2006). *Iodine Nutrition Status in Sri Lanka 2005*. Sri Lanka, MRI.

MRI (Medical Research Institute), Sri Lanka. (2009). *Rapid Assessment of Children 5-14 Years Displaced in Post Conflict*. Sri Lanka: MRI.

Ministry of Education (MOE). (2004a). *Manual of Instructions for School Level Planning*. Colombo, Sri Lanka.

Ministry of Education (MOE). (2004b). *The Development of Education: National Report*. Colombo, Sri Lanka.

Ministry of Education (MOE). (2005). *Programme on School Improvement*. Colombo, Sri Lanka.

Ministry of Education (MOE). (2007a). *Education Sector Development Framework and Programme*. Colombo, Sri Lanka.

Ministry of Education (MOE). (2007b). *Circular 2007/21 School Health Promotion Programme*. ED1/21/1/2/2 (08/10/2007). Colombo, Sri Lanka.

Ministry of Education (MOE). (2007c). *School Health Promotion Programme. Impact Study Results*. Colombo, Sri Lanka. Processed.

Ministry of Education (MOE). (2007d). *Study on the Impact of the Food for Education Programme of the World Food Programme*. School Health and Nutrition Unit, MOE, Sri Lanka.

Ministry of Education (MOE). (2008a). *National Policy and a Comprehensive Framework of Actions on Education for Social Cohesion and Peace (ESCP)*. Social Cohesion and Peace Education Unit. Colombo, Sri Lanka.

- Ministry of Education (MOE). (2008b). *Review of PSI*. World Bank mission. Colombo, Sri Lanka.
- Ministry of Education (MOE). (2009). *School Census 2009*. Colombo, Sri Lanka.
- Ministry of Education and National Institute of Education. (2010). *Education for Social Cohesion: School Baseline Survey Report*. Colombo, Sri Lanka.
- Ministry of Education (MOE). (2011). *Education Sector Development Framework and Programme II, 2012-2016*. Colombo, Sri Lanka.
- Ministry of Education, Singapore. (2007a). Mathematics (Primary) Syllabus. <http://www.MOE.gov.sg/education/syllabuses/maths-primary>
- Ministry of Education, Singapore. (2007b). Mathematics (Secondary) Syllabus. <http://www.MOE.gov.sg/education/syllabuses/maths-secondary>
- Ministry of Education, Singapore (2008). Science (Lower Secondary) Syllabus 2008. <http://www.MOE.gov.sg/education/syllabuses/sciences/>
- Mullis, I. V. S., M. O. Martin, E. J. Gonzalez, K. M. O'Connor, S. J. Chrostowski, K. D. Gregory, R. A. Garden, and T. A. Smith. (2000). *TIMSS 1999 International Mathematics Report: Findings from IEA's Repeat of the Third International Mathematics and Science Study at the Eighth Grade*. TIMSS & PIRLS International Study Center, Boston College, Chestnut Hill, MA.
- Mullis, I. V. S., M. O. Martin, E. J. Gonzales, and S. J. Chrostowski. (2004). *TIMSS 2003 International Mathematics Report: Findings from IEA's Trends in International Mathematics and Science Study at the Fourth and Eighth Grades*. TIMSS & PIRLS International Study Center, Boston College, Chestnut Hill, MA.
- Mullis, I. V. S., M. O. Martin, P. Foy. (with J. F. Olson, C. Preuschoff, E. Erberber, A. Arora, and J. Galia.) (2008). *TIMSS 2007 International Mathematics Report: Findings from IEA's Trends in International Mathematics and Science Study at the Fourth and Eighth Grades*. TIMSS & PIRLS International Study Center, Boston College, Chestnut Hill, MA.
- Muralidharan, K. and V. Sundararaman. (2009). *Teacher Performance Pay: Experimental Evidence from India*. National Bureau of Economic Research Working Paper 15323.
- National Education Commission (NEC). (2003). *Envisioning Education for Human Development. Proposals for a National Policy Framework on General Education in Sri Lanka*. Colombo, Sri Lanka.
- National Education Research and Evaluation Centre (NEREC). (2004). *A qualitative study of civic competencies of children in Sri Lanka*. Colombo, Sri Lanka.
- National Education Research and Evaluation Centre (NEREC). (2005). *National Assessment of Achievement of Grade 8 & 10 Students in Sri Lanka*. Colombo, Sri Lanka.
- National Education Research and Evaluation Centre (NEREC). (2007). *National Assessment of Achievement of Grade 4 Students in Sri Lanka*. Colombo, Sri Lanka.

- National Education Research and Evaluation Centre (NEREC). (2008). *National Assessment of Achievement of Grade 8 Students in Sri Lanka*. Colombo, Sri Lanka.
- National Education Research and Evaluation Centre (NEREC). (2009). *National Assessment of Achievement of Grade 4 Students in Sri Lanka*. Colombo, Sri Lanka.
- National Institute of Education (NIE). (2006). *Report Submitted to the Director General of the NIE by the Committee for the Subject of Mathematics*. Colombo, Sri Lanka.
- National Institute of Education (NIE). (2008a). *An Evaluation of the Process of Development and Implementation of the New Curriculum in Grades 6 and 10*. Colombo, Sri Lanka.
- National Institute of Education (NIE). (2008b). *A study on the Subject Knowledge of Mathematics Teachers in Schools that Perform Poorly in O/L Mathematics*. Colombo, Sri Lanka.
- National Institute of Education (NIE). (2009). *An Evaluation of the Process of Development and Implementation of the New Curriculum in Grades 7 and 11*. Colombo, Sri Lanka.
- National Institute of Education (NIE). (2010). *Primary and Junior Secondary Syllabus (Grades 1-11)*. Colombo, Sri Lanka.
- National Science and Technology Commission (NASTEC). (2008). *National Science and Technology Policy*. Ministry of Science and Technology, Sri Lanka.
- National Science and Technology Commission (NASTEC). (2009). *National Science and Technology Policy*. Ministry of Science and Technology, Sri Lanka.
- National Science and Technology Commission (NASTEC). (2010). *National Science and Technology Policy*. Ministry of Science and Technology, Sri Lanka.
- Neuner, F., E. Schauer, C. Atani, M. Ruf, and T. Elbert. (2006). "Post-Tsunami Stress: A Study of Posttraumatic Stress Disorder in Children Living in Three Severely Affected Regions in Sri Lanka." *Journal of Traumatic Stress*, 19 (3): 339–347.
- Obeyssekera, G. (2003). "Buddhism, Ethnicity and Identity: A Problem of Buddhist History." *Journal of Buddhist Ethics*, 10.
- OECD (Organisation for Economic Co-operation and Development). (2010). *Education at a Glance 2010: OECD Indicators*. OECD, Paris, France.
- Open University. (2010). *A National Study on Student Achievement in English at Grade 10*. Colombo, Sri Lanka.
- Patall, E.A., H. Cooper, and J.C. Robinson. (2008). "Parent Involvement in Homework: A Research Synthesis." *Review of Educational Research*, 78: 1039-1101.
- Pathmeswaran, A., R. Jayatissa, S. Samarasinghe, A. Fernando, R.P. de Silva, R.O. Thattil, and N.R. de Silva. (2005). "Health Status of Primary Schoolchildren in Sri Lanka." *Ceylon Medical Journal*, 50 (2): 46-50.

- Patrinos, H. and G. Psacharopoulos. (2011). *Education: Past, Present and Future Global Challenges*. Policy Research Working Paper 5616. The World Bank, Human Development Network, Education Team, Washington D.C., U.S.A.
- Perera, G. (2008). *An Evaluation of the Process of Development and Implementation of the New Curriculum in Grades 7 and 11*. National Institute of Education (NIE), Colombo, Sri Lanka.
- Perera, G. (2009). *An Evaluation of the Process of Development and Implementation of the New Curriculum in Grades 6 and 10*. National Institute of Education (NIE), Colombo, Sri Lanka.
- Perera, H. (2004). "Mental Health of Adolescent School Children in Sri Lanka: A National Survey." *Sri Lanka Journal of Child Health*, 33: 78-81.
- Perera, M. (2009). *Coping with Student Heterogeneity in the English Language Classrooms. A Collaborative Action Research*. A Study Conducted for the National Education Commission. Colombo, Sri Lanka.
- Perera, M. (2011). *Status of English Language Teaching in Sri Lanka*. Colombo, Sri Lanka. Processed.
- Perera, N. (2007). *Use of Same Ability Grouping to Minimize the Problems of Student Heterogeneity*. Unpublished M.A. Thesis, University of Colombo, Sri Lanka.
- Presidential Task Force on General Education. (1997). *General Education Reforms*. Colombo, Sri Lanka.
- Rodrigo, C., S. Welgama, J. Gurusinghe, T. Wijeratne, G. Jayananda, and S. Rajapakse. (2010). "Symptoms of Anxiety and Depression in Adolescent Students: A Perspective from Sri Lanka." *Child and Adolescent Psychiatry and Mental Health*, 4 (10).
- Sawada, Y. and A. Ragatz. (2005). "Decentralization of Education, Teacher Behavior and Outcomes: The Case of El Salvador's EDUCO Program." In Vegas, E. (Ed.) *Incentives to Improve Teaching: Lessons from Latin America*. The World Bank, Washington D.C., U.S.A.
- Senadheera, C., J. Marecek, C. Hewage, and W.A.A. Wijayasiri. (2010). "Research Letter: A Hospital-Based Study on Trends in Deliberate Self Harm in Children and Adolescents." *Ceylon Medical Journal*, 55 (2): 67-68.
- Setunga, Prasad, R.D. Sugathapala, and J. Jayasuriya. (2007). *The Study of School-Based Teacher Development Programmes*. Research Report. University of Peradeniya, Kandy, Sri Lanka
- Sri Lanka Association for the Advancement of Education (SLAAED). (2000). *Education Reforms in Sri Lanka*, Sri Lanka Association for the Advancement of Education. Colombo, Sri Lanka.
- Sri Lanka Association for the Advancement of Education (SLAAED). (2010). *A Study to Examine the Degree of Horizontal and Vertical Integration of the Modernized Curriculum introduced at Secondary Level in 2007*. Colombo, Sri Lanka.
- Tondeur, J., H. van Keer, J. van Braak, and M. Valcke. (2008). "ICT Integration in the Classroom: Challenging the Potential of a School Policy." *Computers and Education*, 51. Elsevier Press.

- UNDP. (1998). *Sri Lanka: National Human Development Report*. UNDP, Colombo, Sri Lanka.
- UNICEF. (2004). *National Survey on Emerging Issues among Adolescents in Sri-Lanka*. UNICEF, Colombo, Sri Lanka.
- UNAIDS (Joint United Nations Programme on HIV/AIDS). (2008). 2008 Report on the Global AIDS Epidemic. *Annex HIV and AIDS Estimates and Data 2007 and 2001*. UNAIDS, Geneva.
- Van der Werf, G., B. Creemers, H. Guldemon. (2001). "Improving Parental Involvement in Primary Education in Indonesia: Implementation, Effects and Costs." *School Effectiveness and School Improvement*, 12 (4): 447-466.
- Vota, W. (2010). *Updated Quick Guide to Low-Cost ICT Devices for Educational Systems in the Developing World*. InfoDev Technical Report.
- Weerasinghe, R. (2011). *ICT and Education: Sifting through Hype to Preserve the Hope*. Colombo, Sri Lanka. (Processed).
- WHO (World Health Organization). (2008a). *Global School-Based Student Health Survey*. <http://www.who.int/chp/gshs/srilankadataset/en/index.html> .
- WHO (World Health Organization). (2008b). *School Immunization Programme in Sri Lanka*, May 26 - June 2. http://www.who.int/immunization_delivery/systems_policy/SriLanka-schoolimmunization.pdf
- WHO (World Health Organization). (2010a). *Global Health Observatory Database, Incidence of Tuberculosis*. <http://apps.who.int/ghodata/?vid=510>
- WHO (World Health Organization). (2010b). *Malaria Country Profile: Sri Lanka*. http://www.who.int/malaria/publications/country-profiles/profile_lka_en.pdf
- WHO (World Health Organization). (2010c). *Vaccine-Preventable Diseases: Monitoring System 2010 Global Summary, Immunization Profile, Sri Lanka*. http://apps.who.int/immunization_monitoring/en/globalsummary/countryprofileresult.cfm
- Wickramagamage, C., P. Sethunga, and M. Kalugampitiya. (2009). *The Pursuit of Equity and Excellence in English through English Medium/Bilingual Education in the Sri Lankan Education System: Effective Strategy to Meet Desired End?* Colombo, Sri Lanka. Processed.
- Wikramanayake, D. (2011). *The Promotion of Social Cohesion in Education*. Colombo, Sri Lanka. Processed.
- Wisnieskwi, S. (2010). "Child Nutrition, Health Problems and School Achievements in Sri Lanka." *World Development*, 38 (3): 315-332.
- World Bank. (2005a). *Treasures of the Education System in Sri Lanka: Restoring Performance, Expanding Opportunities and Enhancing Prospects*. The World Bank, Washington D.C., U.S.A.
- World Bank. (2005b). *Expanding Opportunities and Building Competencies for Young People: A New Agenda for Secondary Education*. The World Bank, Washington D.C., U.S.A.

World Bank. (2008a). *Linking Education Policy to Labor Market Outcomes*. The World Bank, Washington D.C., U.S.A.

World Bank. (2008b). *School and Work in the Eastern Caribbean: Does the Education System Adequately Prepare Youth for the Global Economy?* The World Bank, Washington D.C., U.S.A.

World Bank. (2008c). *What Do We Know about School-based Management?* The World Bank, Washington D.C., U.S.A.

World Bank. (2010). Internal Analysis Report: Merit and Needs-based Teacher Recruitment Round II. The World Bank, Washington D.C., U.S.A. Processed.

World Bank and EFA-FTI Secretariat. (2011). *An Impact Evaluation of Sri Lanka's Policies to Improve the Performance of Schools and Primary School Students through its School Improvement and School Report Card Programs*. World Bank. Washington D.C. and Colombo, Sri Lanka.

Zhang , L. (2009). *The Potential of English Children's Books in China*. China Publishing Today. <http://www.cptoday.com.cn/En/news>

Zuo, L. (2008). "A Recent History of Teaching EFL in China TESOL (Teachers of English to Speakers of Other Languages." *Essential Teacher*, 5 (2): 1-6.



The World Bank
73/5, Galle Road
Colombo 3, Sri Lanka
Telephone: +94 11 556 1329
Facsimile: +94 11 244 0357
www.worldbank.org/lk



The World Bank
1818 H Street, NW
Washington, DC 20433 USA
Telephone: 202-473-1000
feedback@worldbank.lk
www.worldbank.org

ISBN : 978-955-8908-41-9