DIRECTIONS IN DEVELOPMENT
Infrastructure

Investing in Infrastructure

Harnessing Its Potential for Growth in Sri Lanka

Dan Biller and Ijaz Nabi

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In memory of
Gajanand Pathmanathan,
a Sri Lankan economist whose knowledge, insights, and support
facilitated this endeavor greatly.
His wisdom and good judgment are sorely missed.

Contents

Figures

Maps

Tables

Foreword

In 2010, Sri Lanka transitioned into a middle-income country. The question now is how can Sri Lanka best maintain a steady economic growth rate, particularly through infrastructure development, to achieve both the Mahinda Chintana (Government Development Plan) and the Millennium Development Goals. Currently, Sri Lanka is 2 years into the second 10-year Mahinda Chintana. Thus, this report comes at a crucial time, when assessing the progress made toward achieving these goals is as important as figuring out the amount of financial resources that are needed and are feasible.

Understanding the rural-urban transformation is also crucial, because it impacts the use of the country's productive resources, the ability to deliver services, and their costs. Thus, this report provides a snapshot of these investment gaps and their significance for each infrastructure subsector in the context of the current development plan.

This report is organized as follows. Chapter 1 establishes the role of infrastructure in Sri Lanka's economic growth. Chapter 2 explores the significance of urbanization, hubs, competitive exports, and dynamic cities as drivers of economic growth and what this could mean for Sri Lanka's development. Chapter 3 establishes the infrastructure constraints of the transport, energy, water and sanitation, solid waste, and telecommunications sectors. This chapter also establishes the investment needs, that is, "investment gaps" of these sectors. Chapter 4 explores the possibilities through which Sri Lanka can finance its infrastructure investment needs by enabling private sector involvement and strengthening government institutions and offers policy recommendations on how to close these infrastructure gaps. Chapter 5 concludes the analysis, summarizing major highlights.

As Sri Lanka transitions to an upper-middle-income country, infrastructure is likely to significantly contribute to the country's economy. We hope this report stimulates dialogue on the role of infrastructure in trade, rural-urban transition, and medium-term economic growth in Sri Lanka.

John Henry Stein
Sector Director
South Asia Sustainable Development
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The table below presents the background papers and their authors. Background papers were used in the preparation of this report, which was written by Dan Biller (Lead Economist and Project Manager, SASSD) and Ijaz Nabi (Consultant).

Throughout this book, the background papers will be referenced by their authors listed in the table below.

Background Papers

Title	*Authors*
1. "Macroeconomic Analysis and Challenges Relating to the Sri Lanka Infrastructure Framework for the Future"	Indrajit Coomaraswamy (Consultant)
2. "Planning, Regulation and Coordination"	Indrajit Coomaraswamy (Consultant) and Rohan Samarajiva (Consultant)
3. "Assessment of the Enabling Framework for Public-Private Partnerships in Sri Lanka"	Dan Biller (Lead Economist, SASSD), Jose Luis Guasch, and Roshan Madawela (Consultants)
4. "Trade and Logistics Assessment"	Rosanna Chan (Economist, SASFP) and Stefanie Sieber (Environmental Economist, EASER)
5. "Urbanization"	Celine Ferre (Economist)
6. "Transport"	Amali Rajapaksa (Senior Infrastructure Specialist, SASDT) and Fernanda Ruiz-Nuñez (Senior Economist, SASDT)
7. "Energy"	Stefanie Sieber (Environmental Economist, EASER)
8. "Water and Sanitation"	Kirsten Hommann (Senior Economist, TWISI)
9. "Solid Waste Management"	Stefanie Sieber (Environmental Economist, EASER)
10. "Telecommunications"	Chaitri Hapugalle (Consultant), Siddhartha Raja (ICT Policy Specialist, TWICT), and Cecilia Maria Paradi-Guilford (Consultant)
11. "From Low-Middle Income to High-Middle Income in 15 years: Can Malaysia Provide Insights?"	Dan Biller (Lead Economist, SASSD) and Ijaz Nabi (Consultant)

About the Authors

Dan Biller is the Sustainable Development Lead Economist for the World Bank's South Asia Region. Prior to his appointment, he was Lead Economist in the East Asia and the Pacific Region, where he focused on environment and natural resource, urban-rural links, infrastructure, climate change, and social development issues; and the Environment and Natural Resources Program Leader in the World Bank Institute, where he managed and delivered training on the economic aspects of environment, natural resources, and sustainable development in Latin America, Africa, Europe, and the Middle East.

From 1999 to 2002, he was a senior economist at the Organisation for Economic Co-operation and Development (OECD) in Paris, where he worked on natural resource management, the economic aspects of biodiversity, agriculture and the environment, and sustainable consumption. Prior to this appointment, Mr. Biller worked at the Fundação Getúlio Vargas (Getulio Vargas Foundation) in Brazil, the Universidade Santa Úrsula (Santa Ursula University) in Brazil, and the World Bank. He managed projects in natural resource management and environment, infrastructure (water and sanitation, urban, and energy), mining, hydrocarbons, and macroeconomics. He has extensive field experience in Latin America, East Asia, South Asia, Angola, and Burundi.

As a professor, Mr. Biller taught Natural Resource Economics, Financial Derivatives, and International Economics. In 1996, he was appointed to the technical committee of the Summit Conference on Sustainable Development in the Americas, where he focused on energy and forestry. Mr. Biller received his PhD and MS in economics from the University of Illinois at Urbana-Champaign, and his BS in economics with a minor in geophysics from the University of Kansas. His doctorate fields include Natural Resources and Environmental Economics, Econometrics, Industrial Organization, and Economic Development. He has published extensively on several of the above topics.

Ijaz Nabi joined the World Bank in 1986 and worked in the Republic of Korea, the Lao People's Democratic Republic, Malaysia, Mexico, Myanmar, and Thailand (where he led the World Bank team during the East Asian financial crisis). During 2002–08, he was Manager, Economic Policy, for the South Asia region. He took early retirement from the Bank in 2008 to serve as Dean of the School of Humanities and Social Sciences and Professor of Economics at the

Lahore University of Management Sciences in Pakistan. He is a member of the Economic Advisory Councils of the prime minister of Pakistan, and of the chief minister of the province of Punjab in Pakistan. He was also a member of the Monetary Policy Committee of the State Bank of Pakistan (2009–11).

Since 2009, he has served as Country Director, Pakistan Program, International Growth Center, a policy research consortium of the London School of Economics and Oxford University. Mr. Nabi studied at the London School of Economics and Warwick University. He has published extensively on economic growth, investment and finance, industrialization, international trade, agriculture, and labor markets in developing countries.

Abbreviations

AES Corporation	Applied Energy Services Corporation
BBC	British Broadcasting Corporation
BIA	Bandaranaike International Airport
BOI	Board of Investment
BPO	business process outsourcing
CEB	Ceylon Electricity Board
CNG	compressed natural gas
COSCO	China Ocean Shipping Company
CPA	Consumer Protection Authority
CPC	Ceylon Petroleum Corporation
DESA	Division of the Department of Economic and Social Affairs
GATS	General Agreement on Trade in Services
GDP	gross domestic product
GNI	gross national income
GoSL	Government of Sri Lanka
ICT	information and communication technology
IFIs	international financial institutions
IRI	International Roughness Index
IT	information technology
KPO	knowledge process outsourcing
LIOC	Lanka Indian Oil Corporation
LNG	liquefied natural gas
LPG	liquefied petroleum gas
LPI	Logistics Performance Index
LTTE	Liberation Tigers of Tamil Eelam
MDGs	Millennium Development Goals
MRs	metro regions
NCRE	nonconventional renewable energies
NRW	nonrevenue water

NWSDB	National Water Supply and Drainage Board
PPI	private participation in infrastructure
PPP	public-private partnership
PUCSL	Public Utilities Commission of Sri Lanka
SAGT	South Asia Gateway Terminal
SLR	Sri Lanka Railway
SL Rs	Sri Lankan Rupees
SLT	Sri Lanka Telecom
SLTB	Sri Lanka Transport Board
SOEs	state-owned enterprises
SWM	solid waste management
T&D	transmission and distribution
TRCSL	Telecommunications Regulatory Commission of Sri Lanka
VAT	value-added tax
WITS	World Integrated Trade Solution

Overview

Sri Lanka achieved middle-income country status in January 2010, through steady, long-term gross domestic product (GDP) growth of about 5 percent per year. This growth was fueled by the adoption of a liberalization policy that was implemented in the late 1970s and has continued—albeit, sporadically. One consequence of the reform was the change in the role the government played, from being a major contributor to the production of goods and services to being a regulator, creating space for the private sector and monitoring the outcomes for further reform.

The government also began to pay attention to the much neglected infrastructure. An ambitious public investment program was launched to overcome the infrastructural backlog, focusing on the Mahaweli power and irrigation program, urban development, and investment in Katunayaka Free Trade Zone. The Public Utilities Commission of Sri Lanka (PUCSL) was established as a multisector regulatory authority to expedite privatization of public utilities. This helped "crowd in" private investment in productive sectors of the economy. Returns to these investments in terms of GDP growth and employment generation would have increased in the absence of the draining conflict. This report argues that a continued push for regulatory fine-tuning to enhance the efficiency of infrastructure investments would increase returns to investment. Importantly, the higher returns could have mitigated the need for large public investment in infrastructure and thus help avert the adverse fiscal consequences (including high indebtedness) at a time of competing expenditure demands and low revenue generation.

As a consequence of three decades of civil conflict, infrastructure reconstruction in the northern and eastern regions is likely to take center stage. The conflict has come to an end. The infrastructure needs in the northern and eastern regions are higher than in the rest of the country, as a consequence of the conflict itself and the diminished access to the region. A "principle of inclusion" could be applied to bring those regions to the level of infrastructure services available in most of Sri Lanka.

Sri Lanka's social achievements (high literacy and good health indicators) are on par with or even better than its middle-income peers such as the Dominican Republic, Indonesia, and the Philippines. The Sri Lankan labor force is thus ready to work with investments that generate high-productivity employment. Sri Lanka could aim at becoming an upper-middle-income country in the next 15 years, as indicated in its vision document—the Mahinda Chintana (Government Development Plan). It could become a new Malaysia. However, unlike its peers and Malaysia, Sri Lanka has not succeeded in attracting investment to create the demand for its labor force with high-productivity potential. The central theme of this report, in concert with the Mahinda Chintana, is that with the conflict out of the way, infrastructure will be critical in attracting investment for sustained high growth in the future. This is in line with the Mahinda Chintana's "hub" concept, since agglomeration dividends become part of the "economics energy" that fuels the dynamism of infrastructure, commercial, and knowledge hubs. A "principle of connectivity" would thus enable the country to take advantage of agglomeration dividends, steering the economy toward sustained high economic growth.

The two principal drivers of investment for sustained high economic growth and productive employment are (a) international competitiveness for export-led growth and (b) urbanization, which facilitates productive economic activity. These two drivers of investment and economic growth, in turn, depend crucially on efficient infrastructure that shortens the international supply chain on the one hand and brings about agglomeration dividends on the other.

Sri Lanka's exports (identified in revealed comparative advantage and government's own priorities) are apparel (mainly underwear, knitted goods, and swimwear), coconut oil, fish, information technology services, precious and semiprecious stones, natural rubber and rubber-based goods (surgical gloves and tires), port and port-related services, and tea. The supply chain analysis of priority exports pinpoints the importance of modernizing infrastructure (air cargo, Colombo Port, rail and road connectivity to the ports, and telecommunications) to shorten the chain, lower the costs, and increase international competitiveness.

Despite reasonable GDP growth, urbanization in Sri Lanka, at 15 percent,[1] is well below that of its middle-income peers and the rest of South Asia. It is easy to conclude that the vast majority of the educated labor force of Sri Lanka has either left the country or lives in rural areas and small rural towns engaging in relatively low-productivity agriculture and service jobs. Urbanization of around 40 percent is needed to move this workforce to higher productivity employment. Well-managed urbanization with proper infrastructure services will result in agglomeration economies in the urban centers leading to higher returns of investment in manufacturing and modern services.

The Mahinda Chintana's vision for Sri Lanka's "Cities of the Future" is to create a system of interconnected regional growth poles. With the ending of civil unrest, there is a strong potential for developing regional growth centers to complement and reinforce the positive growth contribution of the Colombo

metropolitan region. To this end, the government plans to develop a systematic network of cities linked with each other and with the rest of the world—a vision that requires the formation of four metro regions (MRs):

- Colombo MR (Colombo metro city, Gampaha, and Kalutara)
- north central MR (Anuradhapura, Dambulla, Trincomalee, and Polonnaruwa)
- southern MR (Hambantota)
- eastern MR (Ampara and Batticoloa).

Each metro region will consist of principal cities and secondary cities. Principal cities will be endowed with high-quality urban services, and all cities will be interconnected, enabling each region to grow and evolve as an integrated system.

Modernizing the urban infrastructure will be the key to realizing the Mahinda Chintana vision for Sri Lankan cities. Much remains to be done to improve public transportation, the road network, and its maintenance and traffic management in the main cities. Furthermore, as an aspiring middle-income country that also wants to significantly improve its tourism sector, Sri Lanka needs to improve its solid waste management, sewerage, and drainage systems.

Redressing infrastructure constraints, however, cannot be piecemeal and product specific. Instead, a sectorwide approach is needed. The Mahinda Chintana provides clear policy guidelines for the entire transport sector for shortening the supply chain, thus making Sri Lankan exports more competitive, improving urban quality of life, and enjoying agglomeration benefits. For instance, to develop Sri Lanka into a dynamic maritime and aviation hub, it recommends expansion of the Port of Colombo, development of the Port of Hambantota, modernization of Bandaranaike International Airport (BIA), construction of a second international airport at Mattala, and modernization of 14 domestic airports. It reaffirms the importance of public transport and formulates an ambitious road rehabilitation and development program. Based on assessments using the best available analytical tools and policy objectives of the government (the primary one being 8 percent GDP growth), this report estimates that the annual investment needs for the transport sector (roads, railways, seaports, airports, and public transport) range from 2.49 percent (lower bound) to 4.16 percent (upper bound) of GDP.

The efficiency of transport sector investments will be enhanced further by addressing priorities at the provincial level. In the Western Province, the priorities are electrification of railways in the Colombo metropolitan region, a rapid transit system in the Colombo metropolitan region, and multimodal transport access to BIA. The priority in the Southern and the Northern Provinces is to carry out multimodal transport and logistics operations studies to identify the required infrastructure services. For the Eastern Province, the development of aviation for tourism is the immediate priority; and for Uva Province, the focus is the development of an appropriate road network to promote tourism.

Affordable and clean energy is essential for ensuring the competitiveness of Sri Lanka's economy. However, the energy sector in Sri Lanka is increasingly

dependent on expensive and volatile petroleum imports. Thus, Sri Lanka needs to diversify the generation mix for more coal-fired power plants and renewable energy sources. With realistic targets, the energy sector will require annual investment of 1.18 to 2.17 percent of GDP. Efficiency improvements via a cost-effective mix of power generation (avoiding the temptation of investing in a new refinery), passing the Petroleum Industry Act, and making the PUCSL fully operational to monitor and regulate pricing in the partially privatized distribution of petrol will help lower the total volume of investment in the sector.

Improved access to water and sanitation is essential to enhance the living conditions in Sri Lankan cities. Although well ranked compared to other South Asian cities, in 2011, the Economist Intelligence Unit ranked Colombo among the 10 least-livable cities in the world. One reason is its 90-year-old sewerage system that could collapse at any time. Annualized rehabilitation and replacement costs and greenfield investments are estimated to be between 0.13 percent and 0.26 percent of GDP for Sri Lanka as a whole. The cost could be lower with greater efficiency in the delivery of services in rural areas and enhanced capacity of local authorities, improvement in collections, and better-targeted subsidies.

Urbanization and income growth significantly increase solid waste generation. On average, only 31 percent of the solid waste generated in Sri Lanka is collected by the local authorities; the rest is dumped haphazardly along streets and on vacant land, affecting local drainage systems and the environment. This statistic masks considerable variation, since collection efficiency is typically much higher in urban centers and rich provinces. Annual investment needed to improve solid waste management ranges from 0.04 percent (lower bound) to 0.31 percent (upper bound) of GDP.

The telecommunications sector is one of the pillars of the Sri Lankan economy and a key partner in a knowledge hub. It has the potential to benefit from the growth of the services sector and the untapped global information and communication technology market. Deregulation and private investment have improved affordability and increased coverage (World Bank 2010). However, tariff wars and increased cost pressures have eroded profits—hence, the inability to reinvest in new technology and expand the network. By March 2012, close to 90 percent of the population had mobile phones, but large differences remained between rural and urban areas and across provinces. Roughly 18 percent of Sri Lanka's territory is uncovered.[2] Going forward, addressing telecommunication gaps requires reforms rather than public investment. It is also critical to identify and address gaps in the policy and regulatory framework that might constrain private investment, by focusing on (a) clarifying the telecommunications policy, (b) completing the liberalization process, (c) simplifying the tax and licensing regimes, (d) strengthening the regulatory framework, and (e) rethinking the approach to universal service.

This report estimates that annual investments of 3.84 to 6.90 percent of GDP would be required to modernize infrastructure to sustain high GDP growth in this decade. Investing 6.9 percent of GDP annually in infrastructure will allow Sri Lanka to have, for example, a high level of connectivity comparable to that

of developed countries and access to water and sanitation comparable to those in upper-middle-income countries. The alternative of investing only 3.84 percent of GDP annually will yield more modest standards in terms of access and quality of service. The level of investment requirements will pose a fiscal sustainability challenge, given the high level of public debt and low revenue generation. The regulatory and institutional reform for specific infrastructure sectors discussed in this report will help to increase returns to investment in terms of the quantity and quality of services and will lower the need for total investment. This needs to be complemented by efforts to (a) reduce the losses of state-owned enterprises delivering infrastructure services to release resources for investment, (b) promote public-private partnerships (PPPs), (c) improve coordination among different tiers of government, and (d) take advantage of sectoral synergies to increase returns to investment.

The elimination of losses of major infrastructure state-owned enterprises (Sri Lanka Transport Board, Sri Lanka Railways, Ceylon Petroleum Corporation, Ceylon Electricity Board, and National Supply and Drainage Board) is critical. This was estimated at 1.74 percent of 2011 GDP and could release as much as 23 percent of the resources that could be used to finance needed infrastructure investments. Cost-reflective pricing and efficiency measures such as improved targeting of subsidies, appropriate fuel mix, and human resource policies are needed to stem the state-owned enterprise losses. In addition, fine-tuning in some sectors would bring a much needed increase in efficiency via newer technologies, better pricing mechanisms, and incentive signals to promote innovation.

Sri Lanka is accumulating valuable experience in executing PPPs in telecommunications, power generation, seaport terminals, housing, and real estate development. There have been difficulties, of course, but none that have been insurmountable. By the standards of middle-income countries such as Indonesia, Malaysia, and the Philippines, however, Sri Lanka is underserved (each country has about three times as many PPP projects as Sri Lanka) by this important source of infrastructure financing. Apart from political and macroeconomic stability, what matters the most for attracting PPPs is a strong framework that clearly lays out the policy, legal, and institutional aspects of contracting PPPs. The main elements of the framework that need to be addressed include PPP institutional anchor and jurisdictional clarity, needs and typologies of government support, eligibility criteria, and awarding and accounting for guarantees.

A recent constitutional amendment granting greater power to lower tiers of government makes it all the more important to improve intragovernmental coordination for improved execution of infrastructure projects. For example, solid waste and water and sanitation require coordination among all three tiers of government (that is, central, provincial, and local authorities) to benefit from economies of scale in engineering works. Similarly, roads, passenger bus transport, and electricity require coordination between the central and the provincial governments. Coordination will also need to improve across infrastructure sectors to enjoy the synergies that will result. Examples are coordination among

electricity, roads, sewerage, and telecommunication providers to lay shared conduits for delivering the services.

There is remarkable evidence that infrastructure service access in Sri Lanka for key infrastructure like power and water and sanitation is quite inclusive. District analysis where data are available indicates very low Gini coefficients—adjusted by household spatial distribution—for power, water, and sanitation services (0.04, 0.01, and 0.01, respectively). Access is widespread, and the quality of these services in the country is generally good. Moreover, if one discounts infrastructure services such as cooking gas and telephone landlines, the picture that emerges is a country where infrastructure services are generally not regressive in income.[3] This "principle of inclusion" in the country's infrastructure services planning could guide the rehabilitation and possible expansion of infrastructure services provision in the postconflict areas. A "principle of connectivity" could be used to assist in fostering economic growth in the country.

In conclusion, this report argues that better infrastructure is essential for more competitive exports and more livable cities that together will help achieve the Mahinda Chintana objective of sustained high economic growth. The required infrastructure investment will be substantial but can be contained to minimize the fiscal burden by reducing losses of state-owned enterprises, increasing PPPs, improving coordination across tiers of government, and taking advantage of potential synergies.

Notes

1. Sri Lanka has several characteristics, such as education levels, which indicate that it is more urbanized. In effect, the official definition of urban population changed prior to the 2001 census. If the official 2001 definition is expanded to include growing urban areas and emerging urban centers, then the urban population would account for 40 percent of total population (Lall and Astrup 2009).
2. See Hapugalle, Raja, and Paradi-Guilford for details.
3. The adjusted Gini coefficient for cooking gas is 0.33 and for landlines and mobile 0.03. The former reflects the wide use of firewood for cooking in the country, which may have severe health consequences in terms of indoor air pollution (not analyzed in this study but a possible topic for future work).

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Hapugalle, Chaitri, Siddhartha Raja, and Cecilia Maria Paradi-Guilford. "Telecommunications." Background paper for Biller, Dan, and Ijaz Nabi. *Investing in Infrastructure: Harnessing Its Potential for Growth in Sri Lanka*. Washington, DC: World Bank.

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Introduction

Sri Lanka achieved middle-income country status in January 2010. Growth was fueled by the adoption of a liberalization policy that was implemented in the late 1970s, which has continued, albeit sporadically. To continue to grow, however, Sri Lanka needs to pay attention to its much neglected infrastructure. Accordingly, *Investing in Infrastructure: Harnessing Its Potential for Growth in Sri Lanka*, has two objectives:

- To improve the understanding of the infrastructure sectors in Sri Lanka, including their current state and performance, future development needs, investment requirements and financing gaps, and bottlenecks to infrastructure development.
- To provide policy makers in Sri Lanka with a sound analytical basis for prioritizing investments and designing policy interventions that result in the mobilization of funds and their effective use for future development of infrastructure.

Detailed and specific information can be found in the background papers listed in the acknowledgments and cross-referenced throughout this volume.

To achieve its objectives, this report assesses the country's infrastructure endowment and performance, analyzes the contribution of infrastructure to economic and spatial development, and outlines investment needs and strategic priorities within those established by the Mahinda Chintana.[1] It provides a cross-sectoral analysis of the major infrastructure crosscutting themes including the link between infrastructure and poverty reduction and economic growth; the institutional and regulatory framework; the main issues regarding planning, coordination, and financing; and the role and constraints of private sector participation in infrastructure financing and service provision. It identifies bottlenecks to economic growth and considers policy issues to address them.

The report also provides a menu of policy instruments, targeting those that generate incentives for better maintenance, mitigate infrastructure-related market failures, create appropriate institutional arrangements, and, where

feasible, promote market-based pricing. The report indicates the major gaps in infrastructure and hence promotes Mahinda Chintana's overall objective of promoting economic growth, increasing efficiency, and improving logistics. It also references international experience that is relevant to the country. The central theme of this report, in concert with the Mahinda Chintana, is that infrastructure is fundamental to Sri Lanka, attracting investment for sustained high economic growth in the future. This is because with proper economic management, investment will flow into economic activity that strengthens Sri Lanka's international competitiveness.

As a consequence of 30 years of civil conflict, there are impending infrastructure issues in the northern and eastern regions. The civil conflict has ended. The infrastructure needs in the northern and eastern regions are higher than in the rest of the country as a consequence of the conflict itself and diminished access to the region. It is reasonable to expect that reconstruction of infrastructure in the northern and eastern regions will take center stage, since it is already happening in certain areas in the eastern region.

The report starts with an overview and introduces the main findings. It addresses major constraints, instruments, and outcomes important to unleash the potential of infrastructure investments and policy fine-tuning. Chapter 1 discusses the infrastructure and growth nexus, given the country's macroeconomic scenario. It examines the long-term sustainability, particularly considering the Mahinda Chintana's high infrastructure investment targets, and how the country can achieve its high economic growth targets, given its historical and current investment levels. It outlines what it will take for Sri Lanka to generate high-productivity jobs and thus sustain high economic growth for several decades, discussing trade and logistics, agglomeration economies, and the process of urbanization. This provides the foundation for a more detailed discussion in subsequent chapters on the role of infrastructure in the strategy for sustained high growth and employment generation.

Chapter 2 argues that the two principal drivers of sustained high economic growth and productive employment are (a) international competitiveness that results in export-led growth and (b) urbanization that facilitates productive economic activity. These two drivers of economic growth, in turn, depend crucially on efficient infrastructure that shortens the international supply chain on the one hand and brings about agglomeration dividends on the other. In order to make the case for the need to target infrastructure investment appropriately, Sri Lanka's international competitiveness and urbanization are assessed in more detail in this chapter. This focus is closely linked with the "hub" concept presented in the Mahinda Chintana.

Chapter 3 reviews key infrastructure sectors to identify the regulatory issues that need to be addressed and estimate the needed investment. Redressing infrastructure constraints, however, cannot be piecemeal and product specific. Instead, a sectorwide approach is needed. Chapter 3 then analyzes key growth-promoting components of Sri Lanka's infrastructure, including government vision and targets as expressed in the Mahinda Chintana and other official documents.

This allows infrastructure gaps to be identified and investment needs to be estimated to achieve higher growth, greater international competitiveness, more livable cities, and more productive employment. It also presents infrastructure services in a spatial context, with respect to access and relative poverty.[2]

In light of the large investment requirement and high public debt and deficit, Chapter 4 discusses the potential of public-private partnership in infrastructure delivery and supportive regulatory reform. The sizable infrastructure gap in the context of lack of fiscal space potentially poses a challenge for fiscal sustainability. The regulatory and institutional reform discussed in the context of specific sectors in Chapter 3 helps to increase returns to infrastructure investment in terms of the quantity and quality of services. Not only should this increase efficiency in service delivery, but it should also help lower the need for total investment in infrastructure and thus help mitigate the impact of the Mahinda Chintana's targets on the budget. This needs to be complemented by efforts to reduce the losses of state-owned enterprises delivering infrastructure services, promote public-private partnerships, improve coordination among different tiers of government, and take advantage of sectoral synergies to increase returns to investment.

Notes

1. The Mahinda Chintana is the government of Sri Lanka's medium-term development strategy. See http://www.treasury.gov.lk/publications/mahindaChintanaVision-2010full-eng.pdf. This report does not cover the environmental implications of investments that are being addressed in the Sri Lanka Country Environmental Analysis (Department of National Planning 2010).
2. Relative poverty is the rate of poverty in each district calculated by dividing the number of poor households in each district by the number of total households in each district.

Reference

Department of National Planning. 2010. "Mahinda Chintana: Vision for the Future, Development Policy Framework." Ministry of Finance and Planning, Colombo. http://www.treasury.gov.lk/publications/mahindaChintanaVision-2010full-eng.pdf.

CHAPTER 1

Economic Growth and Structural Change: The Role of Infrastructure

Background

Historically, Sri Lanka, like other countries in the South Asia region, has concentrated on developing rural areas by bringing economic growth and social infrastructure services to them. Yet, differently from other countries in the region, Sri Lanka has, at least in part, succeeded in this endeavor. As a consequence, Sri Lanka is often considered a highly densely populated rural country, with only 15 percent (World Bank 2012) of the population in cities and 33 percent (Department of Census and Statistics 2011) of the labor force in agriculture. Sri Lanka's population is highly educated, however; and it is difficult to imagine that most high school and college graduates will return to the countryside to work as farmers. As indicated by British Broadcasting Corporation (BBC 2008) news, even among the poorest of the poor, the expectations are rapidly changing.

If, indeed, the country were rural, one would expect a greater proportion of gross domestic product (GDP) allotted to agriculture. Rather, Sri Lanka's economy relies on services (58.5 percent) and manufacturing (27.8 percent; World Bank 2012). Spatially, the Western Province accounts for 45.1 percent (Central Bank of Sri Lanka 2011) of GDP and 65 percent (Department of Census and Statistics 2010) of industrial value added but only 28 percent of the population. Less than a third of Sri Lankans produce almost 60 percent of the country's production; but as is apparent in this report, a large part of the country enjoys relatively good infrastructure and social services for its per capita income level. Sri Lanka seems more like a low-density urban country than a high-density rural one, with a per capita nominal GDP of a little over US$2,800 per year (World Bank 2012).

Sri Lanka has long been considered a low-income country; but when compared to similar countries, it is apparent that Sri Lanka is middle income. Table 1.1 compares Sri Lanka to other middle-income country island nations. While these countries are spread around the globe, selective indicators illustrate

Table 1.1 Sri Lanka Compared to Other Middle-Income Island Nations

Country	*Average GDP growth (2004–09) (GNI per capital) (2009 PPP)*	*Urbanization (2009)*	*Forecasted urbanization (2030)*[a]	*Telecom access (per 100 people)*[b,c]	*Electricity access (% of population) (2009)*	*Access to improved sanitation (%) (2010)*[d]	*Access to improved water (%) (2010)*[e]	*Total road network (km)*[f]	*Vehicles per km of road*[g]	*Paved roads (%) (2008)*[h]
Dominican Republic	6.4 (8,110)	69.5	80.0	97	95.9	83	86	12,600	NA	49.4
Indonesia	5.5 (3,720)	52.6	68.9	114	64.5	54	82	476,337	38	56.9
Philippines	4.8 (4,060)	65.7	76.7	99	89.7	74	92	200,037	14	9.9
Sri Lanka	5.9 (4,720)	15.1[i]	21.4	104	76.6	92	91	97,286	41	81.0

Source: World Bank 2012, unless otherwise noted.

Notes: GDP = gross domestic product; GNI = gross national income; NA = not available; PPP = public-private partnership.

a. UN World Urbanization Prospects: The 2007 Revision Population Database. http://esa.un.org/unup/unup/index_panel1.html.

b. International Telecommunication Union World Telecommunications ICT Indicators 2012 Database. http://www.itu.int/ITU-D/ict/publications/world/world.html.

c. Telecom access is defined as the number of fixed and mobile lines.

d. Improved sanitation = connection to a public sewer, a septic system, pour-flush latrine, simple pit latrine, or ventilated improved pit latrine.

e. Improved water = household connection, public standpipe, borehole, protected dug well, protected spring, rainwater collection.

f. Data from varying years: Dominican Republic: 2001, Indonesia: 2009, Philippines: 2003, Sri Lanka: 2003.

g. Data from various years: Indonesia: 2009, Philippines: 2005, Sri Lanka: 2007.

h. Data from various years: Dominican Republic: 2001, Indonesia: 2009, Philippines: 2003, Sri Lanka: 2003.

i. Recalculated at 40 percent (according to Lall and Atrup 2009).

how Sri Lanka is remarkably similar to them. An important difference is the low level of urbanization in Sri Lanka. While urbanization levels are subject to debate,[1] a country with the general indicators of Sri Lanka tends to be more urbanized, especially since it is largely dependent on manufacturing and services. Urbanization and economic growth tend to go hand in hand in most countries, except in Sri Lanka.

Sri Lanka has been steadily improving its service provision, regardless of which political party is in power. This shows continuity in its development path. It is difficult to find a parallel in other nations. Even more remarkable is the fact that this has been achieved during frequent severe internal strife. Yet, the country is changing. The 30-year civil war is over, and most of Sri Lanka's neighbors have been enjoying rapid economic growth for many years. Import trade partners may soon become export trade partners, because the country has the potential to diversify from exporting mainly to developed countries. The need to increase economic growth is taking center stage in the country.

Achieving Short- to Medium-Term Economic Growth: The Role of Infrastructure

Since the 1970s, Sri Lanka has established a tradition of wide-ranging liberalization that the government may wish to continue, especially with the prospects of lasting peace and persistent vulnerability due to a constricted budget and fluctuating prices. The waves of liberalization have established a record of effective reform, leading to more impressive investment, growth, and employment performance than during the more government-regulated era. Despite these recent achievements, Sri Lanka has not been able to match the successes of other South Asian countries, such as India, even though it was ahead of them at the time of independence. However, Sri Lanka has outperformed these same countries in health, education, and infrastructure, especially in terms of access. These accomplishments have come at a steep price; they have strained the budget and failed to translate into productive employment opportunities, sparking two youth insurrections in the south and separatism in the north. The resulting 30-year civil conflict is now at an end, and domestic optimism is at its peak. However, Sri Lanka still remains vulnerable. This is because fluctuating prices of a few key commodities, particularly oil, continued low productivity, and poor public sector management collectively stretch the budget, causing the economy to overheat at a growth rate of 6 percent per year.

The Mahinda Chintana is a medium-term development plan of the government of Sri Lanka (GoSL) to promote national development, growth, and investments. It prioritizes infrastructure development in its calls for a growth rate of 8 percent, and international evidence of the positive impacts of infrastructure investments on medium-term economic growth is strong. Yet, this does not mean that investing in physical infrastructure alone yields such positive results. Adequate planning that takes into account trade-offs, adjustments aimed at improved efficiency, and ways of enabling private sector participation that share risks and

alleviate public budgets are equally or more important to Sri Lanka. For this to materialize, adequate institutional and regulatory frameworks need to be in place both to ensure service delivery and to avoid rent-seeking behavior. There is a need to improve the constitutional and legislative coherence of institutional arrangements pertaining to infrastructure sectors in light of the ongoing transition to a decentralized form of government as a result of the 13th Amendment to the Constitution. National policies developed through broad consultation are necessary for infrastructure sectors where the gestation periods of investments are longer than the terms of individual legislatures and administrations. They are absent for the majority of infrastructure sectors in Sri Lanka. The recommended regulatory reforms place greater weight on contracts than on oversight by discretion-wielding regulatory agencies. However, even in the case of contracts, there is a need for interpretation and conflict resolution, a need that can, for the most part, be met by strengthening the existing quasi-autonomous regulator, the Public Utilities Commission of Sri Lanka (PUCSL). The structure of the PUCSL is sound, but it has been in operation for a relatively short period; therefore, much more needs to be done with regard to its capacity enhancement.

Investment in infrastructure has traditionally contributed to Sri Lanka's growth. In the early period of 1948–77, there was insufficient investment in infrastructure. During 1956–77, it was the public sector that undertook most of the investment. A number of state-owned enterprises (SOEs) were established to produce manufactured goods, including steel, mining, and chemicals. The incentives for private investment were limited, and public investment was restricted by resource constraints. The overall investment rate was only 15.7 percent (Central Bank of Sri Lanka 2011) of GDP during this period. At the time, the East Asian Tiger economies were recording more than double this figure. Following the liberalization of the economy in 1977, investment rose from 14.4 percent of GDP in 1977 to 33.8 percent in 1980, with an average of 27.6 percent during 1978–84. This was due to the ambitious public investment program accompanying reform, which paved the way to a liberalized economy.

By leveraging the current macroeconomic conditions and its position in a fast-growing region, Sri Lanka can achieve the Mahinda Chintana goals. Yet, at the same time, the GoSL needs to properly manage the risks involved in moving ahead. As of 2009, Sri Lanka finds itself in a rare macroeconomic window of opportunity: its gross official external reserves have jumped to 6 months of import cover (Central Bank of Sri Lanka 2009), terms of trade have spiked to almost 25, and external debt and debt servicing have remained at comfortable levels. This performance is complemented by Sri Lanka's proximity to a fast-growing India and the interested eyes of investors and tourists since the civil conflict ended. There exist certain risks in this positive outlook, mainly slippage in fiscal consolidation, delays in the implementation of structural changes, an unexpected increase in prices of key imports, and weather-related shocks. Nonetheless, if these internal and external conditions are coupled with the necessary reforms, then the annual growth of 8 percent should be within reach.

The key to unlocking this 8 percent growth is raising national savings by 12 percent to 35 percent of GDP. National savings have increased markedly due to a sharp rise in private transfers (remittances); savings grew from an average of 16.7 percent of GDP during 1985–96 to 22 and 23 percent during 1997–2004 and 2005–10, respectively (Central Bank of Sri Lanka 2011). This has been achieved despite the fact that the public sector has been dissaving continuously since 1988. Sri Lanka has been able to avert economic crises, thanks to exogenous factors, such as the increase in remittances with the oil-price-led boom in the Middle East, the International Monetary Fund standby agreement, and generous support received as an early reformer. With its lower-middle-income country status, this concessional assistance will no longer be as forthcoming; and with fast-growing neighbors, its early reforms will no longer garner as much traction. The Sri Lankan economy must find its own balance and a new competitive edge by increasing the productivity of its workforce through investments in infrastructure and other reforms.

The increase in national savings can be shouldered by the public sector through reformed SOEs and by the private sector through enabling environments for public-private partnerships (PPPs). To avoid the economy overheating again, the government could foster an environment in which public expenditure does not crowd out private investment. To remedy this, the government could follow two parallel tracks. First, SOEs that act as key infrastructure providers, such as the Ceylon Electricity Board, Ceylon Petroleum Company, and National Water Supply and Drainage Board, should record a positive return on investment. At present, the government should aim to achieve this goal mainly through better management and expanding key parts of the physical infrastructure. Second, the government should pursue the option of PPPs more openly and comprehensively. This is because in the context of a constrained fiscal environment, with high deficits and debt levels, PPPs can play a fundamental role in attracting capital and entrepreneurship. Given the tight fiscal space, one of the main challenges is how to prioritize and target investment needs effectively.

An estimation of the total investments necessary in infrastructure sectors related to the Mahinda Chintana goals is important to assess Sri Lanka's continuous transformation into a manufacturing and service-oriented economy. The investments are substantial and will have to be met by both the public and private sectors. To optimize alignment with the vision of the Mahinda Chintana, the sectors included in the analysis are energy, solid waste management (SWM), telecommunications, transportation, and water and sanitation. In all sectors, except telecommunications, the estimated investment needs always represent total investment, including not only the initial capital injection but also subsequent maintenance. Table 1.2 shows the level of investment each sector requires. For example, energy investment needs for 2010–20 should be US$698 million to US$1.285 billion per year. In the telecommunications sector, public spending should be minimal, since around the world, the sector is largely driven and operated by the private sector. Calculations suggest that while all five sectors have made significant progress, access to quality infrastructure is still

Table 1.2 Investment Needs, Including Operation and Maintenance Costs per Year by Sector, 2010–20

Annual investment needs	*In US$ million*	*As an average share of GDP, percent*
Transport	1,471–2,463	2.49–4.16
Energy	698–1,285	1.18–2.17
Water and sanitation	75.5–154	0.13–0.26
Solid waste	25–182	0.04–0.31
Telecommunications	Not applicable	Not applicable
Total	2,269.5–4,084	3.84–6.90

Note: GDP = gross domestic product. 2011 GDP was used to calculate the average share of GDP.

uneven across rural, urban, and estate areas and may be particularly low in the war-affected provinces.

Based on the findings of this report, total annual investment needs for the four sectors range from US$2.27 billion to US$4.08 billion per year up to 2020, or 3.84 to 6.90 percent of GDP. The calculations were based on government targets and baselines. Where these were not available, international relevant comparators were used. Going forward, a combination of investment in infrastructure stock and the implementation of supportive reforms will allow Sri Lanka to achieve the goals of the Mahinda Chintana. Using the most recent data, calculations combining conditions of physical infrastructure and investment patterns show that the transport sector (that is, connectivity) makes up almost two-thirds of this investment gap (table 1.2). The second-largest investment requirements are for the energy sector, followed by the water and sanitation and SWM sectors. The telecommunications sector does not require any investment in a public-private sense, since it can be developed by the private sector. The estimates present a range of lower and upper boundaries that include essential investments and investments to place Sri Lanka close to high-middle-income countries in terms of infrastructure.

The impact of different infrastructure subsectors on economic growth is harder to quantify and, thus, to prioritize on an economic growth basis. Not only is this a function of the subsector itself, with direct and indirect consequences, but it may also vary from country to country. For example, in a country where manufacturing is highly dependent on water-intensive industries, access to adequate water supply may have a direct impact on economic growth. Alternatively, access to adequate water supply also has an indirect impact via morbidity and mortality of the country's population and thus labor force. Even within a subsector there may be variants, as in the case of rural roads versus national road networks. In the case of Sri Lanka, while transport takes the larger share of investment needs, SWM is highly inadequate in the country. As international experience points out, if Sri Lanka is aiming to be an important tourist destination, it may be worth addressing SWM soon, together with priorities in transport.

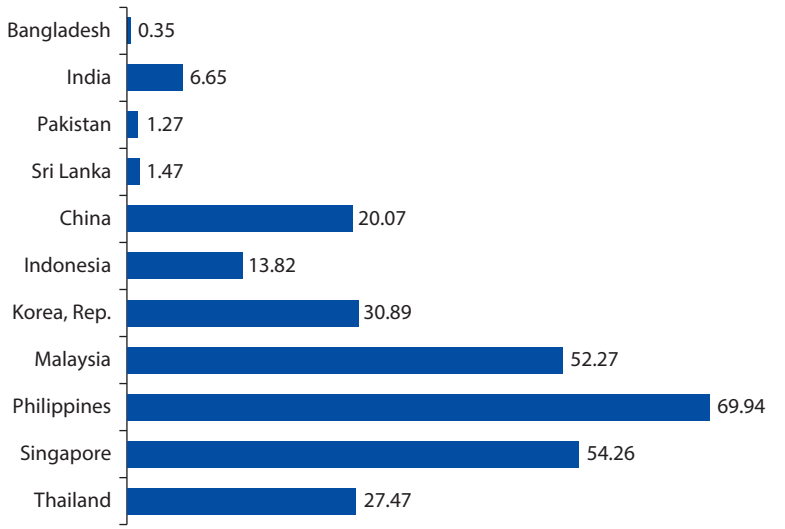
Sri Lanka should move up the value chain in its exports by focusing on the most dynamic and high-performing exports and improving the logistical framework around them. Part of this strategy is to aggressively pursue increased

exports of key commodities, namely underwear for women and girls, fish (chilled and frozen), surgical gloves, and insulated wires. These commodities were chosen based on the analysis of Sri Lanka's export dynamics, government priorities and incentives, industry performance, and revealed comparative advantage. To counter competitive pressure from other low-cost producers such as China and India in international markets, Sri Lanka needs to diversify and move up the value chain for its exports. However, the key hindrance is Sri Lanka's poor logistical performance; the country ranks 81st out of 155 in the 2012 Logistics Performance Index (LPI), markedly below the rankings of other comparable middle-income countries such as Indonesia and the Philippines, as well as regional competitors such as China and India, but close to the Dominican Republic, which is ranked 85th.

The failure to achieve dynamic competitiveness in Sri Lanka, unlike in the rest of South Asia, is embedded in the failure to move up the technology ladder in production systems. Figure 1.1 shows that unlike other factors, such as the ones described previously, and the quality of its labor supply, in which Sri Lanka compares well with more dynamic East Asian and Latin American economies, on this indicator of international competitiveness, Sri Lanka behaves like a South Asian economy.

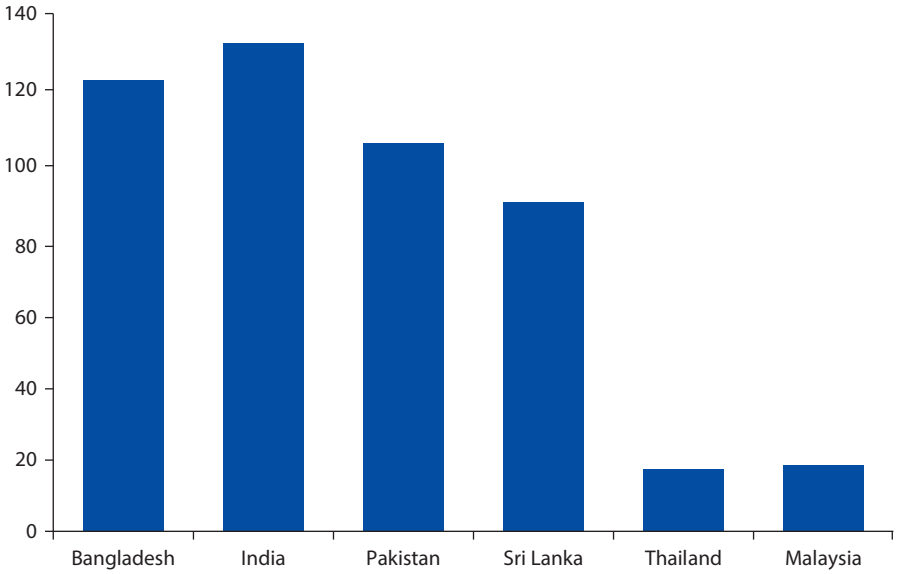
Many factors account for the weak demand for workers in export-competitive, high-productivity jobs. Some are clearly embedded in a regulatory environment that is still perceived to be difficult for doing business (figure 1.2), suggestive of

Figure 1.1 High-Technology Exports as a Share of Manufactured Exports, 2001–10[a]
percent



Source: World Bank 2012.
a. Data for Bangladesh are available for up to 2007. Thus, the percentage rate shown for Bangladesh is from 2001 to 2007. Data for the Republic of Korea are up to 2009. Thus, the percentage rate shown for Korea is from 2001 to 2009.

Figure 1.2 Ease of Doing Business, 2011 (by rank)



Source: World Bank 2012.

the need to complete the reform agenda. While recognizing the importance of labor regulations on labor productivity, detailed analysis of this issue is being addressed elsewhere (World Bank 2011; World Bank forthcoming).

The analysis of the logistics sector highlights that the bottlenecks lie more in the services associated with logistics than in the physical infrastructure, as discussed in detail in chapter 2. This lagging in terms of quality is evident through an inefficient integration into international supply chains, an increasingly pressured port, problematic roads and railways, and time-consuming customs systems. The country needs to ensure efficient integration of the international supply chains with the often simpler domestic component, so as to curb the increasing cost or delivery time. In this regard, greater use of air freight—especially for higher-value goods—should only be the beginning of offering options such as inventory management and freight forwarding. The Colombo port has also been able to attract significant container transshipment traffic but should now maintain its competitive position through the capability to provide quick turnaround times for vessels and containers.

In addition, Sri Lanka should move quickly to improve trucking and other services that remain unusually underdeveloped, given the short distances and limited effects of congestion. The government should also consider improving its extensive railway network, because the travel times are too long despite the short distances, thus failing to provide any efficient transfer between the railhead and the factory. Finally, while Sri Lankan customs authorities have partially updated their document processing systems with electronic filing, this and other options remain limited because they are mainly offered to Board of Investment affiliates,

producing overall slow adoption. To further facilitate trade, the government could also establish a free trade zone and logistics hub to complement the container port, taking the next step in modern port development. In this manner, Sri Lanka can target key areas of its logistical and transportation network while also evolving its systems and processes for more efficient operation. This would be much in line with the Mahinda Chintana's goal of creating a transport hub in the country.

Tourism also suffers from road congestion and low travel speeds. Though the distances between tourist sites are relatively short, the travel times are comparable to India. This may not be a major problem for the development of tourism for now, but it will become one as Sri Lanka gears up to realize the full potential of tourism in tourism destinations farther from Colombo. As the eastern and northern provinces open up to foreign visitors, the ability of tourism to contribute to Sri Lanka's economic growth should greatly increase. The country already has the natural capital, the human capital, and the social capital through culture and traditions, which act as a magnet for tourists from around the world. Improvements in infrastructure services will only facilitate this process.

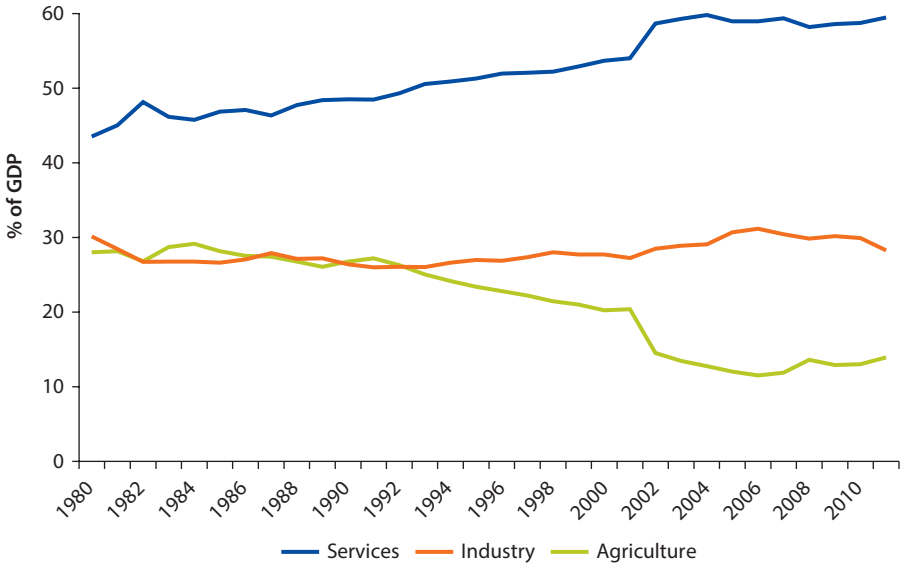
A historically overvalued exchange rate has also undermined Sri Lanka's competitiveness. The exchange rate has been under constant pressure because of persistent inflation differentials between Sri Lanka and its major competitors and trading partners. Much of the pressure may be traced back to the impact of the budget deficit on aggregate demand. The rupee has often been overvalued, because the authorities have tended to use the exchange rate as an inflation anchor, thereby undermining competitiveness. Sri Lanka has not been able to offset this with an industrial policy offering subsidies due to a lack of fiscal space. More recently, an overvalued exchange rate has also been favored to facilitate debt repayment, which has become a major burden on the budget.

Achieving Medium- to Long-Term Economic Growth: The Role of Infrastructure

In terms of composition of GDP, Sri Lanka stopped behaving like a South Asian economy in the mid-1990s. As illustrated in figure 1.3, there has been a structural transformation of the economy, particularly during the postliberalization years. The share of the agricultural sector declined from 30.7 percent of GDP in 1977 to 12.1 percent in 2011 (Central Bank of Sri Lanka 2011). The services sector increased from 40.6 to 58.5 percent during the same period. While the share of the industrial sector remained broadly similar, there has been a shift from inefficient production of import substitutes to globally competitive exports. This is reflected in the sharp increase in the share of manufacturing exports in industrial production.

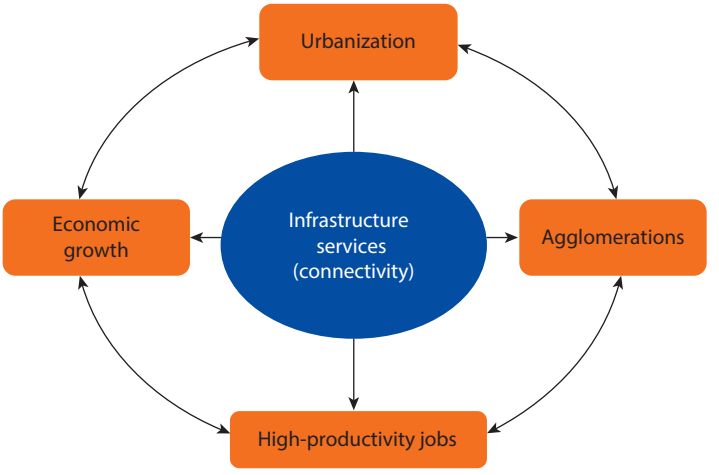
Rising shares of services and manufacturing in an economy generally accompany urbanization. Figure 1.4 presents a simple conceptual framework

Figure 1.3 Sectoral Shares in GDP, 1980–2011



Source: World Bank 2012.
Note: GDP = gross domestic product.

Figure 1.4 Infrastructure, Agglomerations, and Urbanization



that links urbanization, agglomerations, high-productivity jobs, and economic growth to infrastructure services. All factors influence one another in a virtuous cycle, and infrastructure services are inputs to the different quadrants and to the virtuous cycle, as a whole. A few things should be noted. Urbanization and agglomerations are not the same. In effect, urbanization is a physical concept, while agglomeration is an economic one. People may take advantage of agglomerations even if they do not live in cities per se if different ways to connect and exchange information are available (for example, telecommunications, information technology [IT]). This is already seen in the countryside of Sri Lanka, given its highly educated population and connectivity via mobile phones and Internet. Nonetheless, the face-to-face exchange of information is also important because it allows labor and production to learn from each other and apply technological advances. In this sense, urbanization facilitates agglomerations that enable highly productive jobs and economic growth. Agglomeration economies also help create internationally connected cities, concentrating on production and facilitating economic growth. As elsewhere in the world, agglomeration economies are present in Sri Lanka, even if the country is underurbanized.[2] Yet, if the Mahinda Chintana's hub concept is to reach its full potential, agglomeration economies need to be further stimulated.

Agglomeration economies attract migrants to urban areas. Yet, it cannot be oversold. Migration itself can be seen as a market force/flow that, left to its own devices, will be largely dependent on individual choices. The combination of both flows (agglomeration and migration) can have a profound influence on the pattern of use of natural resources and the environment, and of infrastructure services, which in turn may influence migration and agglomeration and ultimately the prospects for high-productivity jobs and economic growth. All these flows are linked to the four forms of capitals that compose the foundation for sustainable development: (a) man-made capital, (b) natural capital, (c) social capital, and (d) human capital. For instance, migration from rural areas and the resulting urbanization can directly or indirectly impact the stocks of man-made capital (for example, factories, urban infrastructure), natural capital (for example, watersheds, airsheds, and land), social capital (for example, firms and communities), and human capital (for example, the qualification of the labor force), which in turn may impact the degrees of substitutability among the different forms of capital through factors such as technological change.

While Sri Lanka is a low-density urban country, or "underurbanized," it should manage its urbanization process in such a way that maximizes the public benefits of agglomerations while mitigating its public costs, primarily congestion, pollution, and crime. Taking advantage of the underurbanization and of its well-prepared labor force would allow the country to sustain high rates of economic growth in the long term. Fine-tuning economic management and public investment to create high-productivity jobs in the modern manufacturing and services sectors would allow the country to take full

advantage of its existing endowments. This is discussed in detail in the next chapter. Manufacturing's share in GDP has been constant for the last three decades; and while the sector has high potential for generating plentiful high-productivity jobs, it has yet to deliver on its potential. This would mean moving up in the value chain, as discussed. On services, the prospects seem to continue on the growth path of its share of GDP, as the sector is beginning to splinter into modern high-productivity services and will require infrastructure investment to allow them to grow and create more high-productivity jobs.

Concluding Remarks

Sri Lanka has invested heavily in strengthening the supply side of the labor market via exceptional achievements in education, health, and, to a certain extent, access to some infrastructure services. These types of policies are referred to as "spatially blind" (World Bank 2009). Over the years, they have produced a capable labor force that has not been fully utilized in the country. Its qualifications, coupled with the conflict that plagued the country for decades, led part of this labor supply to look for employment elsewhere. This, in turn, increased Sri Lanka's reliance on remittances, which fueled final consumption.

The challenge for achieving high-middle-income status in the next generation lies in how to use its human, natural, man-made, and social forms of capital in a sustainable manner. Spatially blind policies have created quality human capital. Sri Lanka is also endowed with pristine beaches and landscapes, wildlife and national parks, cities that are still not severely degraded by pollution and overpopulation, and cultural wealth and diversity. These form the primary basis of its wealth. Using its human, natural, and social capital efficiently and sustainably and improving its man-made capital are an important part of the equation to achieving high-middle-income status in the next decade.

Policy fine-tuning to increase private sector participation in the Sri Lankan economy and encourage investments and export orientation is a powerful policy tool for strengthening the demand side. Such change has been sporadic, but there is strong evidence that the economy has responded well to economic reform complemented by investment in infrastructure. The end of civil war presents an opportunity to refocus on policy fine-tuning but also to facilitate investing in infrastructure to strengthen the impact of the change in terms of high-productivity employment generation, agglomerations, and economic growth. Given the high public debt and deficit and low revenue generation, innovative approaches will be needed to accelerate infrastructure investment. Table 1.3 provides a summary of the challenges and suggested solutions proposed in each of the background papers that form the basis of this report.

Table 1.3 Summary of Challenges and Suggested Solutions by Sector or Issue

Sector or issue	*Challenges*	*Solutions*
Macroeconomics (SM)	• Vulnerability to fluctuations of key commodity prices, for example, oil • Low levels of productivity in the public sector • Private investment crowded out by public expenditure • Dependence on exogenous factors to address fiscal imbalances.	• Leverage the benefits of being located in a fast-growing region • Reform SOEs to increase profitability • Attract private investment to fund the 10% national savings increase • Raise national savings to 35% to achieve 8% growth rate.
Planning and governance (SM)	• Capping of public investment at its current level (6–7 percent of GDP) • Improved sector policies, regulation, institutional development, and capacity building and coordination, and better targeted or elimination of fiscal subsidies • Institutional arrangements in infrastructure sectors lack clarity.	• Prioritization based on economic returns, MDG and Mahinda Chintana targets, more private participation, reduction in the losses of SOEs, export/trade and logistics, and demand/urbanization • Broad-based consultation on national policies • Improve coherence of constitutional and legislative arrangements for the 13th constitutional amendment • PUCSL should assume contract interpretation and conflict resolution role • Increase independence of regulatory authorities, especially for bus and telecommunications sector.
Public-private partnerships (SM)	• PPP framework lacks coherence, clarity, and transparency • There is limited coordination and unclear jurisdiction • The processes and procedures are complicated.	• Clear regulatory environment, policy statement, and guidelines • Better interagency coordination • Human and institutional capacity requires improvement.
Trade and logistics (SM)	• Competitive pressure from international low-cost producers • Poor integration of international and domestic supply chains • Cumbersome document processing and customs procedures • Poor logistical performance.	• Diversify into higher-value-added manufacturing • Move up the value chain in key exports • Fully computerize document processing and other customs procedures • Improve logistical services, focusing on air freight, trucking, and port services.
Urbanization (ML)	• Low and stagnant urbanization • Urbanization is concentrated around Colombo • Low quality of services in small towns.	• Adopt a demand-driven strategy, recognizing agglomeration potential • Provide universal access to essential services through "spatially blind" policies • Improve tax collection and regulation schemes.
Transport (SML)	• No multimodal transport system • Bandaranaike International Airport lacks a domestic terminal • Road network is in poor condition • Roads are highly congested.	• Establish agency for intermodal concerns • Establish lead transport ministry • Improve traffic management and control.
Energy (SML)	• High dependence on oil • Difficult to obtain future coal financing • Hydropower largely exploited • High levels of indoor pollution, especially in poor areas • PUCSL operational in power but not in petroleum.	• Diversification of power generation mix • Unbundle functions of Ceylon Electricity Board and restructure its long-term debt • Enhance efficiency on the supply and demand side • Render PUCSL fully operational • Establish energy planning and policy analysis function of Sri Lanka Sustainable Energy Authority.

table continues next page

Table 1.3 Summary of Challenges and Suggested Solutions by Sector or Issue *(continued)*

Sector or issue	*Challenges*	*Solutions*
Water and sanitation (SM)	• Inadequate institutional and technical support in rural areas • Large financial losses due to nonrevenue water, uncollected revenue, and tariffs below cost • Block tariffs and subsidies fail to reach the poor.	• PUCSL needs a clear mandate for the sector • Revision of institutional arrangements for the sector is needed • Revision of tariff structure and better targeting of subsidies is needed.
Solid waste management (SML)	• Poor fiscal health of local authorities • High waste collection inefficiency • Inadequate disposal due to lack of sanitary landfills • Limited public and political support.	• Create local SWM departments with heads and budgetary line items • Improve management of existing resources • Establish committees to develop regional landfills • Introduce cost-recovery mechanisms and cross subsidies.
Telecommunications (SM)	• Mobile phone penetration lags behind other middle-income countries • Access to Internet services is limited • Large digital divide (urban-rural; Western Province-rest of country).	• Simplify taxation and licensing regimes • Create a transparent mechanism for the regular review of interconnection regimes • Develop Internet access in rural areas and improve domestic backbone connectivity.

Note: S = short run; M = medium run; L = long run; GDP = gross domestic product; MDG = Millennium Development Goal; PPP = public-private partnership; PUCSL = the Public Utilities Commission of Sri Lanka; SOEs = state-owned enterprises; SWM = solid waste management.

Notes

1. Urbanization was recalculated at 40 percent when the definition of urban areas was expanded to include growing urban areas and emerging urban centers (Lall and Astrup 2009). Yet, the Western Province has about 28 percent of the country's population, and not all of it is located in urban areas. It is unlikely that other urban areas can explain the difference between the official and recalculated figure of urbanization. More important, however, is that given the country's indicators (for example, education level), one would expect urbanization comparable to the countries listed in table 1.1.
2. The literature on economic geography is vast and novel, including Fujita and Thisse (2002) and World Bank (2009).

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CHAPTER 2

The Hub Concept, Competitive Export, and Dynamic Cities as Drivers of High Economic Growth

The challenge for achieving high-middle-income status in the next generation as implied by the Mahinda Chintana's hub concept lies in how to efficiently and sustainably use Sri Lanka's existing assets—its human, man-made, natural, and social capital. Spatially blind policies (including infrastructure) have created quality human capital; yet, domestic markets are unable to fully absorb it. Sri Lanka is also endowed with pristine beaches and landscapes, wildlife and national parks, cities that are still not severely degraded by pollution and overpopulation, and cultural wealth and diversity; yet, the country is still to take off as a major tourist destination. This diverse capital foundation forms the core of the country's wealth. Using its human, natural, and social capital efficiently and sustainably and improving its man-made capital are an important part of the equation to achieving high-middle-income status in the next decade.

Achieving the Mahinda Chintana's goals depends on improving the infrastructure (Department of National Planning 2010). This is well recognized by the Mahinda Chintana's hub concept that focuses on naval, aviation, energy, commercial, and knowledge hubs. The Mahinda Chintana has a chapter devoted to the transportation hub. As indicated in figure 1.4 in chapter 1, infrastructure services, particularly those that improve connectivity through better transport, power, and communications (typical network infrastructures), play center stage in the nexus of urbanization, agglomeration, high-productivity jobs, and economic growth. This includes local, regional, and international connectivity. Sri Lanka needs greater emphasis on operating, maintaining, integrating, and planning infrastructure assets to support high-value-added exports and facilitate urbanization. Investments should reflect consideration for their role in integrated service delivery. This is discussed in more detail in the next two chapters, which cover infrastructure cross-sectoral issues, specific infrastructure subsectors, planning, and regulations.

The two principal drivers of sustained high economic growth and productive employment are (a) international competitiveness that results in export-led growth and (b) urbanization that facilitates productive economic activity. It is argued that these two drivers of economic growth, in turn, depend crucially on efficient infrastructure that shortens the international supply chain, on the one hand, and brings about agglomeration dividends, on the other. Supporting export-led growth means enabling private enterprises to compete at higher levels of the product value chain. This requires significant improvements in the provision of infrastructure services, not simply investments in new infrastructure assets. Moreover, to realize the Mahinda Chintana's vision of capitalizing on regional economic opportunities and developing cities as commercial and regional hubs for growth, the country will likely experience rapid urbanization. While agglomeration economies do not necessarily depend on physical proximity, Sri Lanka needs better infrastructure to support urbanization and agglomeration economies. Urbanization near 40 percent can facilitate a shift toward higher productivity employment but only with supporting infrastructure services. This chapter focuses specifically on these medium- and long-term drivers that are likely to facilitate long-term sustained economic growth.

Trade and Logistics

Trade Competitiveness, Services, and Logistics

Sri Lanka's exports face a crucial challenge. Increasingly, countries trade in stages of production or along supply chains that compel movement up the supply chain toward higher-value-added activities in order to stave off competition from labor-abundant economies such as China and India. This report argues that retaining a fluid comparative advantage requires modern and efficient logistics including trade-facilitating infrastructure. The discussion in this section is organized to identify the emerging export priorities in Sri Lanka and the logistics and infrastructure improvements needed to realize the growth potential of the priority activities.

Several methods were used to assess the trade and logistics in Sri Lanka. The methodology employed to identify export priorities and infrastructure needs takes into consideration several factors such as Sri Lanka's export dynamics, the government of Sri Lanka's (GoSL's) export priorities and the incentives regime supporting these priorities, and a review of Sri Lanka's industry performance and priorities indicated by revealed comparative advantage of the country's exports. The approaches are then combined into a simple ranking of export activities. Another filter used in identifying priority activities is the likely threat from competing economies. Sri Lanka's trade logistics and infrastructure are then evaluated in the light of export potential of priority sectors.

Assessment of Competiveness

A ranking of dynamic exports is done employing the International Trade Centre's Trade Map framework.[1] The analysis allows categorization of Sri Lankan manufacture as champions (dynamic exports whose share is rising in an expanding

world market), niche products (whose share is growing in a stable world market), underachievers (whose share is declining in a growing world market), and losers (whose world market for these products is declining). The two right-hand-side quadrants of figure 2.1 provide the champion and niche exports of Sri Lanka: underwear, gloves and mittens, tea, several rubber-based products (natural rubber, tires and inner tubes, surgical gloves), and diamond cutting; and there has been rapid recent growth in modern services (shipping, telecommunications, and computer and information).

Government priorities and incentives yield results different from those discussed previously. The GoSL emphasizes export diversification to reduce overreliance on a few products and the move toward high-value-added products through branding and segmenting (Central Bank of Sri Lanka 2008, 2009). The priority sectors presented in the 2011–15 Exports Development Board Strategic Plan are listed in table 2.1 and described in more detail subsequently. This selection reflects the views and objectives of the core institutions, most notably the Export Development Board and the Board of Investment (BOI)[2] (see Chan and Sieber for a discussion of the incentives offered to the government priority sectors).

An industry review yields yet another result. Another list of priorities has been compiled based on output and productivity measures of both tradable and nontradable sectors.[3] These products constitute 90 percent of the total industrial output and include several commodity groups already discussed in the previous sections.

Figure 2.1 International Trade Centre's Trade Map Framework Applied to Sri Lanka Manufacturing

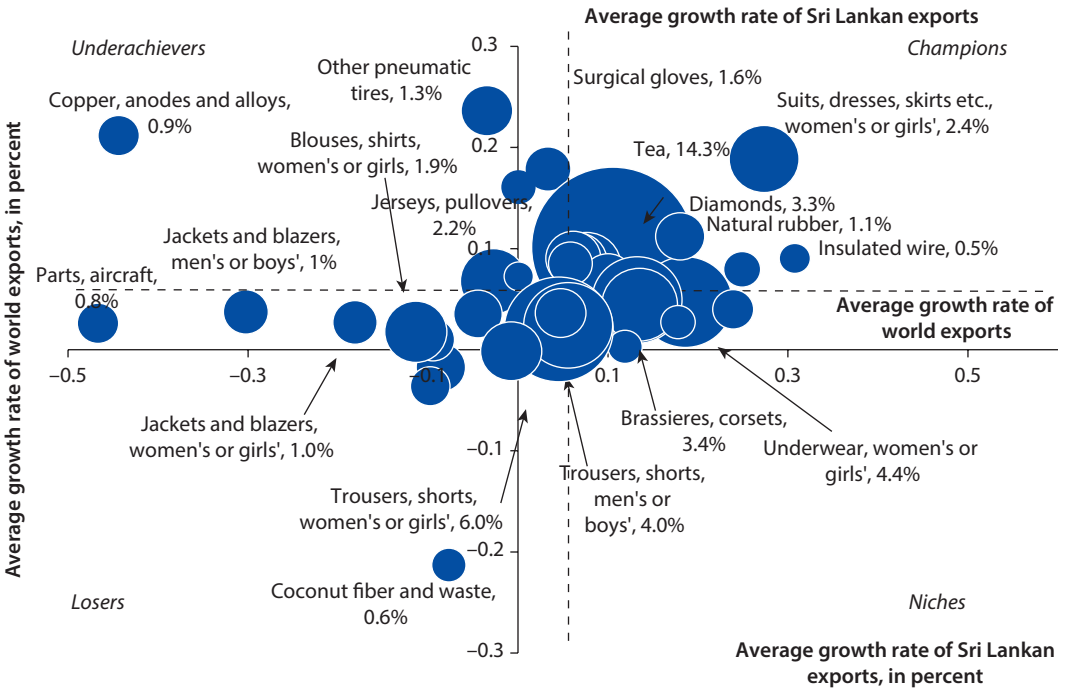


Table 2.1 Priority Sectors Based on Government Priorities

Rank	*Sector*
1	Apparel
2	Tea
3	Rubber and rubber-based products
4	Diamonds, gems, and jewelry
5	ICT/BPO/KPO
6	Food and other beverages
7	Spices and allied products

Source: Sri Lanka Exports Development Board October 2010.
Note: BPO = business process outsourcing; ICT = information and communication technology; KPO = knowledge process outsourcing.

Finally, revealed comparative advantage is another methodology used by the World Bank to identify priority exports. It uses the World Bank's World Integrated Trade Solution (WITS) software and measures how large the share of tea, for example, is in Sri Lanka's exports relative to the share of tea exports in total world trade. If this ratio is bigger than 1, it means that Sri Lanka is exporting a larger share of tea than the rest of the world and, thus, has a revealed comparative advantage in the production of tea.

Unsurprisingly, Sri Lanka has the largest revealed comparative advantage in the production of coconut fibers and waste, tea, and copra. Tea has moved from third place in 2004 to first in 2009. The export potential in the tire subsector is also as substantial as the production of precious and semiprecious stones and apparel. Knitted and crocheted underwear and brassieres have been able to considerably increase their competitiveness, whereas shirts and blouses for both men and women have lost out, almost halving their revealed comparative advantage. Despite their small average export share, spices and animal feed are also included in the priority list.[4]

Summary of Sector Priorities

The four rankings can be combined to get an overall ranking of export priorities. The index for the overall ranking simply adds up to the highest ranking of each approach. The priority export activities are deemed to be those that have an aggregate score of 4 or 3. Table 2.2 summarizes the results. Apparel (mainly underwear, knitted goods, and swimwear), coconut oil, fish, information technology (IT) and IT-enabled services, precious and semiprecious stones, natural rubber, and rubber-based goods (surgical gloves and tires), port and port-related services, and tea reveal themselves to be the priority export activities.

Sri Lankan producers should move away from low-value-added activities that put them in direct competition with other low-cost producers, such as China, Bangladesh, the Lao People's Democratic Republic, and Vietnam. The data show that Sri Lanka has been losing its competitive advantage in low-value apparel products. It is thus crucial that manufacturing diversify into higher-value-added

Table 2.2 Sector Prioritization Screening

	Export dynamics	*Govt. priorities*	*Industry review*	*Revealed comparative advantage*	*Count*
Brassieres, corsets, and so on	1	1	1	1	4
Gloves, mittens, and mitts (knitted or crocheted)	1	1	1	1	4
Swimwear	1	1	1	1	4
Tea	1	1	1	1	4
Tires and inner tubes	1	1	1	1	4
Underwear and nightwear, women's or girls'	1	1	1	1	4
Animal fat, vegetable oils, partly processed, including coconut oil	1	1	1		3
Fish (frozen, excluding fillets)	1	1	1		3
Hard rubber, and so on	1	1	1		3
IT and IT-enabled services	1	1	1		3
Natural rubber, excluding latex	1	1	1		3
Other pneumatic tires		1	1	1	3
Port-related services	1	1	1		3
Precious or semiprecious stones	1	1		1	3
Suits, dresses, skirts, and so on, women's or girls' (knit)	1	1	1		3
Surgical gloves		1	1	1	3
Trousers, shorts, women's or girls' (textiles)		1	1	1	3
T-shirts, singlets, and other vests (knit)	1	1	1		3
Underwear, nightwear, and so on, men's or boys' (knit)	1	1	1		3
Animal feed (bran, sharps, other residuals)			1	1	2
Coconut fiber or waste		1		1	2
Copra		1		1	2
Diamonds, excluding industrial	1	1			2
Fruits and nuts		1	1		2
Industrial diamonds	1	1			2
Manufacture of ceramics		1	1		2
Spices (except pepper and pimento)	1			1	2
Vegetables		1	1		2
Casting of metals			1		1
Domestic transport	1				1
Floriculture		1			1
Flour of wheat or of meslin	1				1
Insulated wire, and so on	1				1
Manufacture of tobacco products			1		1
Manufacture of basic iron and steel			1		1
Manufacture of beverages			1		1
Manufacture of dairy products			1		1
Manufacture of electronic motors, generators, and so on			1		1
Manufacture of other chemical products, mainly fertilizer			1		1

table continues next page

Table 2.2 Sector Prioritization Screening *(continued)*

	Export dynamics	*Govt. priorities*	*Industry review*	*Revealed comparative advantage*	*Count*
Manufacture of plastic products			1		1
Manufacture of structural metal products, tanks, and so on			1		1
Parts, electric panels, and so on	1				1
Printed matter			1		1
Sawmilling and planning of wood			1		1
Tourism			1		1
Wholesale and retail			1		1

Source: Chan and Sieber.
Note: IT = information technology.

products such as insulated wires and electrical parts and that the GoSL also support service sectors, such as transportation-related services (port and airport) and tourism. In particular, the last two subsectors (in conjunction with IT and IT-enabled services) have the potential to transform Sri Lanka into an export-led, service-based economy. Any investments in the infrastructure and logistic services needed to develop these sectors should be prioritized in any medium-term development program.[5]

Rising Share of Services and Sustained High Growth

Services are splitting into traditional and modern. The case for services as the new engine of growth rests on the view that services are splintering into two types. Traditional services are characterized by low technology and low productivity. High-technology, "information age" services have high productivity and still do not fully tap international demand (Bhagwati 1984a, 1984b, 1987). Modern services thus are tradable and enjoy the agglomeration effects previously associated with tradable goods only. This requires a better understanding of what constitutes modern services and their role in the economies of South Asia.

Recently, Sri Lanka outperformed other South Asian countries in the provision of modern services (World Bank 2009a, 2009b). Modern services comprise banking, insurance, financial, and communication-related services (Ghani 2010). Traditional services comprise trade, hotels and restaurants, personal, cultural and recreational, community and social, transportation, storage, real-estate dwelling, and government and public administration services. Using this composition of traditional and modern services, during 2000–06, Sri Lanka outperformed the rest of South Asia, as illustrated in table 2.3. It experienced a much higher growth rate in modern services compared to traditional services.

Exporting Services and Some Challenges[6]

Services have an important role in raising the overall productivity level and wages in the economy and, thus, contribute to sustained high growth. Yet, impediments

Table 2.3 Difference in the Growth Rates of Modern and Traditional Services

Bangladesh	3 Percentage points higher
India	5.5 Percentage points higher
Nepal	No difference
Pakistan	4 Percentage points higher
Sri Lanka	13 Percentage points higher

Source: Adapted from Ghani 2010.

to the growth of modern services will have to be removed and their capacity to generate jobs will need to be enhanced. For example, the likely determinants of success in computer and business services are the quality of infrastructure (electrification, availability of the Internet and its bandwidth, telephony), education (secondary and tertiary workers), and facility with the English language.[7] With a large number of broadband and telephone subscribers, a high rate of electrification, and a large number of English speakers, Sri Lanka is comfortably positioned to do well in export of computer and business services. Table 2.4 shows that Sri Lanka outperforms the rest of South Asia on Internet bandwidth and comes second to Pakistan in international call traffic; however, when compared to Malaysia and Thailand, Sri Lanka lags behind when it comes to Internet bandwidth and the information and communication technology price basket. The literature[8] also identifies better integration of areas with low productivity and traditional skills with those that have higher productivity and modern skills as key for change. This will require removing impediments in the mobility of labor and capital among regions. To take advantage of global trade in services, Sri Lanka should take a more proactive, forward-looking stance in international negotiations on traded services. This will require some domestic liberalization of the services regime to ensure better access to international markets for the regions' traded services.

Logistics and Infrastructure

Sri Lanka's overall Logistics Performance Index (LPI) has improved from being ranked 137 out of 154 in 2009 to 81 out of 155 in 2012. This ranking is composed of six subcomponents: customs, infrastructure, international shipments, logistics competence, tracking and tracing, and timeliness. Ranking is low because of the poor perception regarding clearance by border control agencies, most notably customs. The logistics services are also rated poorly because of limited capacity to track and trace consignments, as illustrated in table 2.5. Most notably, Sri Lanka's ranking for all six categories is well below that of other comparable middle-income countries, such as Indonesia or the Philippines. It also has a significantly lower LPI than its regional competitors Bangladesh,[9] China, and India but is close to the Dominican Republic, which is ranked 85th.

A comprehensive analysis of the relationship between competitiveness and logistics and infrastructure requirements is presented in Chan and Sieber.

Table 2.4 Comparison of Telecommunications Infrastructure

	Internet bandwidth (bits per person) 2011[a]	*Voice (international calls traffic in minutes per person)*[b]	*ICT price basket 2011*
Bangladesh	146.2	6.4 (2006)	6.5
India	546.1	27.64 (2009)	3.8
Nepal	137.8	17.62 (2006)	27.2
Pakistan	427.7	37.89 (2010)	8.2
Sri Lanka	783.5	34.21 (2006)	1.8
Thailand	2,517.3	13.46 (2006)	3.4
Malaysia	6,497.2	110.7 (2008)	1.8

Source: International Telecommunications Union 2012a, 2012b.
Note: ICT = information and communication technology. The ICT price basket is composed of the prices for fixed telephone, mobile cellular, and fixed broadband services and is computed as a percentage of countries' average gross national income per capita.
a. ITU 2012a.
b. ITU 2012b.

Table 2.5 Components of Logistics Performance Index, 2010 and 2012

	Customs	*Infrastructure*	*International shipments*	*Logistics competence*	*Tracking tracing*	*Timelines*
Panel A: score						
Bangladesh	2.33	2.49	2.99	2.44	2.64	3.46
China	3.16 (3.25)	3.54 (3.61)	3.31 (3.46)	3.49 (3.47)	3.55 (3.52)	3.91 (3.8)
Dominican Republic	2.51 (2.53)	2.34 (2.61)	2.59 (2.83)	2.42 (2.74)	3.17 (2.49)	3.85 (2.97)
India	2.70 (2.77)	2.91 (2.87)	3.13 (2.98)	3.16 (3.14)	3.14 (3.09)	3.61 (3.58)
Indonesia	2.43 (2.53)	2.54 (2.54)	2.82 (2.97)	2.47 (2.85)	2.77 (3.12)	3.46 (3.61)
Philippines	2.67 (2.63)	2.57 (2.8)	3.4 (2.97)	2.95 (3.14)	3.29 (3.3)	3.83 (3.3)
Singapore	4.02 (4.10)	4.22 (4.15)	3.86 (3.99)	4.12 (4.07)	4.15 (4.07)	4.23 (4.39)
Sri Lanka	1.96 (2.58)	1.88 (2.5)	2.48 (3)	2.09 (2.8)	2.23 (2.65)	2.98 (2.9)
Panel B: ranking						
Bangladesh	88	71	60	95	91	69
China	31 (30)	25 (26)	26 (23)	28 (28)	28 (31)	35 (30)
Dominican Republic	62 (76)	89 (77)	106 (73)	98 (76)	47 (110)	38 (100)
India	51 (52)	46 (56)	45 (54)	38 (38)	52 (54)	55 (44)
Indonesia	71 (75)	68 (85)	79 (57)	91 (62)	80 (52)	70 (42)
Philippines	53 (67)	63 (62)	19 (56)	46 (39)	43 (39)	41 (69)
Singapore	2 (1)	4 (2)	1 (2)	6 (6)	6 (6)	14 (1)
Sri Lanka	142 (71)	137 (89)	117 (50)	141 (68)	141 (68)	124 (110)

Sources: International Finance Corporation and World Bank Group 2010, 2012.
Note: 2012 data are represented in parentheses. Bangladesh data for 2012 are not available.

The work uses published information and data to analyze the key features and performance of logistics systems and important characteristics of export industries of Sri Lanka. The study follows the guidelines promulgated in the World Bank's Trade and Transport Facilitation Assessment toolkit (World Bank 2010b), adjusting the application to fit the resources available to conduct this study.

It thus goes beyond the LPI, which at times can be biased against certain countries, given its reliance on perceptions.

To illustrate the role of infrastructure in strengthening export competitiveness, the study focused on four commodities and one service—underwear for women and girls, surgical gloves, fish (chilled and frozen), insulated wires or cables, and tourism—selected from the list of priority sectors discussed above. A second round of more detailed interviews was conducted to provide an in-depth analysis of the supply chains identified during the initial interviews. An assessment of the supply chains of the four products and tourism reveals the following regarding the drivers of competitiveness:

- The evaluation of the supply chains for the selected commodities provides a broad overview of the logistics capabilities of Sri Lanka. The logistics services used in the domestic component of supply chains for imports and exports are relatively basic. In the case of garments, they are limited to a transfer through the port or airport, a relatively short movement by road to and from the factory and storage of inputs at the factory, and exports at the nominated forwarder's warehouse. The latter may include consolidation. The major cost incurred for inputs is the transfer through the port. For exports, the buyer assumes the cost for the port.

- The trade in women's underwear represents a move up the garment sector's value pyramid, but the products are not very time sensitive due to infrequent changes in styles. Given the high-value density of the product, a reduction in delivery time through the use of airfreight offers significant savings in terms of inventory-related costs. Sri Lanka's airfreight connectivity is reasonable, given the size of its economy and the limited amount of tourism recently. Sri Lanka has also been able to remain competitive in the traditional export of low-value garments owing to favorable freight rates and delivery times to Europe and the United States.

- The success of the garment trade has been largely due to improvements in the logistics of the garment trade facilitated through the BOI. As the order cycles in the global garment trade have decreased, it has been incumbent on exporting nations to reduce the time for clearance of both inputs and products and to transport these in containers to and from the garment factory. This has been particularly important for underwear, which uses a large number of imported inputs often shipped as loose container load cargo, and for traditional low-value garments with their tighter deadlines.

- The trade in surgical gloves is not sensitive to order cycles. However, a tightening of the inbound supply chain was necessary owing to the growing product diversity and the increasing proportion of imported inputs required for the new categories of gloves. These supply chains are largely managed by suppliers who also benefit from the connectivity between the Port of Colombo and ports elsewhere in Asia.

- The trade in insulated wire between Sri Lanka and India is dependent on favorable trade agreements and lower manufacturing costs that offset the additional transport costs. The improvement in India's port performance and improvements in the quality and availability of regional shipping services has allowed this trade to continue even as Sri Lanka's advantage in terms of production costs has decreased. If this trade is to continue, it will require further improvements in customs procedures and in the efficiency of the port and handling of local shipping.

- The ability to increase trade in frozen seafood exports is highly dependent on the ability to control the quality of the product from the time it is caught to the time it is loaded in the container for export. Beyond this point, the international logistics are well managed, and there are no significant problems with quality control. The critical component of the supply chain is the cold chain between the fishing boat and the processing plant. At present, this is not well managed and prevents the trade from growing significantly.

- With regard to tourism, the main bottleneck involves the movement of tourists by road. However, despite the congestion and low travel speeds, the distances between tourist sites are relatively short and travel times are comparable to those in India. This may, thus, not be a major problem for the development of tourism for now but will become one as Sri Lanka gears up to realize the full potential of tourism in tourism destinations farther from Colombo.

Future Export Competitiveness and Infrastructure

Sri Lanka's major exporters have been successful in moving to higher-value exports. They have focused on niche markets of products with relatively long order cycles, so that there is enough time for procuring imported inputs. In the future, it will be necessary to expand the product line and, at the same time, to shorten the order cycles. For instance, underwear manufacturers and exporters are already increasing their use of airfreight to reduce delivery times. They have also been able to maintain their competitive advantage in the production of lower-value exports through the use of available raw materials and the fast delivery of finished products. It will be necessary to change the mix of local and imported inputs to diversify the products more so as to maintain a competitive edge. This will require more sophisticated supply networks.

Manufacturers will have to significantly improve their logistics. The challenge lies primarily in the international component of their supply chains, since the domestic component is relatively simple and does not add much to the cost or delivery time. The international component needs to be restructured to increase the value of the delivered product. This includes capturing value-added logistics services that can be provided locally and improving the quality of the imported inputs to production.

Going forward, greater export competitiveness will require improving all components of trade logistics, including trade facilitation (for example, improving

performance of customs and border agencies). On infrastructure, the following was found:

- *Air cargo:* Air freight is an increasingly important mode for Sri Lankan exports, especially for higher-value goods and more time-sensitive exports. The high air cargo costs need to be reduced by promoting greater competition that, in turn, requires attracting more scheduled cargo carriers (currently, there are five: China Airlines, Etihad Airways, Malaysia Airlines, Qatar Airways, and Sri Lankan Airlines, down from eight in 2000). Sri Lankan Airlines is the largest cargo operator, accounting for 60 percent of the cargo movement, and is the sole ground handling agent at Bandaranaike International Airport.

- *Ports:* The success of Colombo Port in attracting container transshipment traffic has been an important source of competitive advantage for low- to medium-value exports. That is, it is important not only for generating employment and return on the infrastructure investment but also for improving market access for Sri Lanka's exports. Transshipment attracts larger vessels and increases the frequency of shipping services to the markets in which Sri Lankan exporters compete. So far, the port has been successful in maintaining its market share of South Asian traffic. However, the port faces growing competition not only from the major hubs, for example, Dubai, Kelang (Malaysia), Salalah, Singapore, and Tanjung Pelepas (Malaysia), but also from increasingly efficient Indian ports, such as Chennai and Nhava Sheva.

  Colombo's ability to maintain its competitive position depends on the capability to provide quick turnaround for vessels and containers. In this regard, it has only been partially successful. The privately operated terminal, the South Asia Gateway Terminal, has demonstrated the gains in efficiency and quality of service that can be achieved through private terminal operations. However, the Sri Lanka Port Authority has been slow to take advantage of this. As a result, the total capacity of the port has not been able to keep up with demand. Because investment in new facilities has been delayed, congestion has become a problem. This drives away transshipment business to Nhava Sheva, which will then be difficult to recover. The new facilities being constructed in South Harbor will provide needed capacity and increase competition among terminal operators. It is important that these facilities provide the same level of service as the South Asia Gateway Terminal. This will allow the port to compete effectively for transshipment business, despite growing traffic levels and more direct vessel calls at India's major ports.

- *Road and rail transport:* There is significant competiveness eroding the current state of both the road and rail infrastructure. This includes the congested road access to the Port of Colombo, which delays the movement of trucks to and from the port and turnaround in port. There is also a problem related to the quality of the trucking services, since the industry is dominated by independent

operators of older trucks. Their impact on trade competitiveness will increase as Sri Lanka diversifies the export mix and accelerates the rate of export growth.

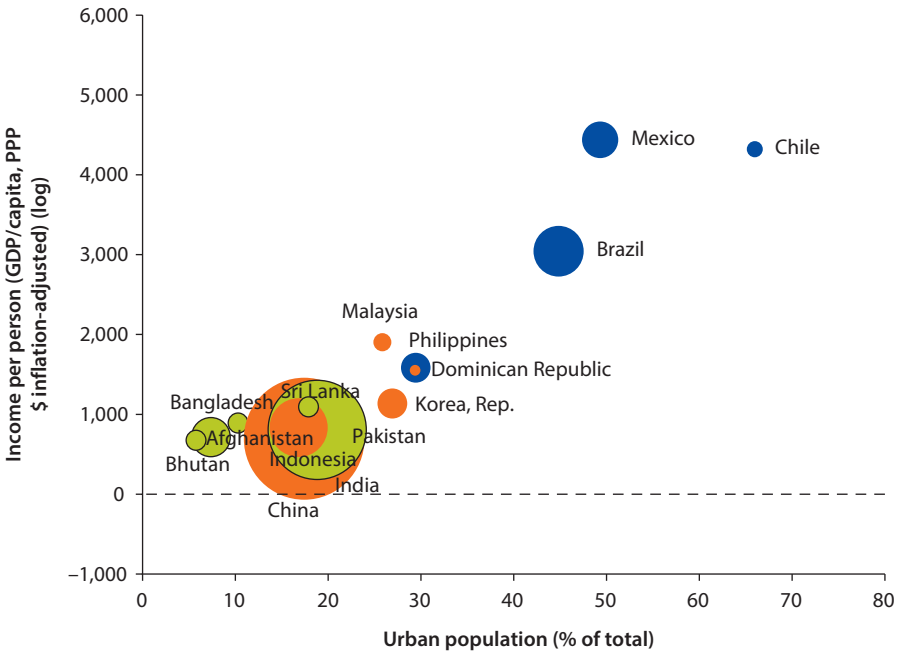
- *Telecommunications:* Export of computer and business services depends crucially on how well the telecommunications sector performs. In Sri Lanka's case, the main telecommunications sector issues concern regulation and policy rather than large new investment.

Urbanization

Dynamic Cities

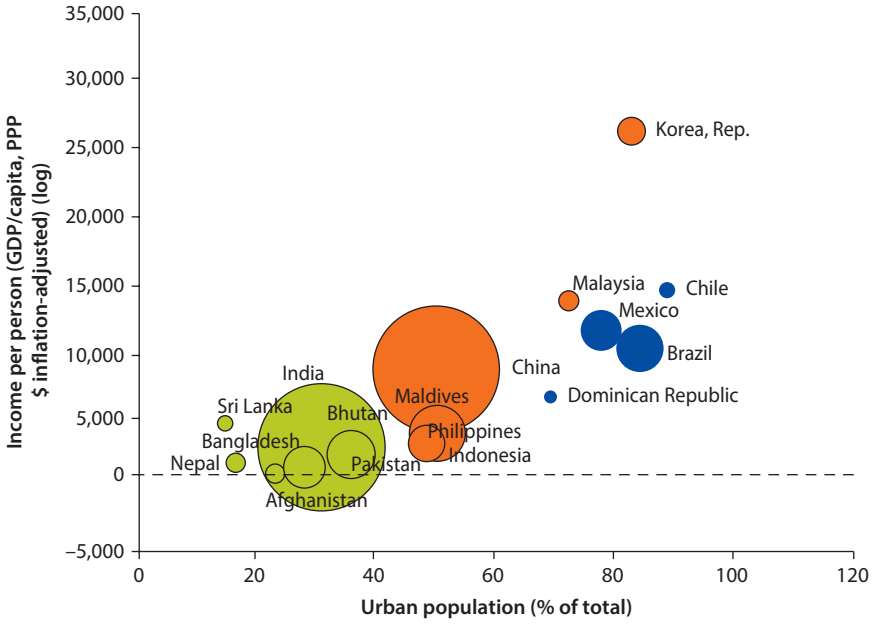
Different from most economies, between 1960 and 2011, income per capita in Sri Lanka quintupled without a commensurate expansion of its urban population. Figures 2.2 and 2.3 provide snapshots of the relationship between urbanization and economic progress in selected developing countries. The sizes of the bubbles represent country population. Thus, China and India are represented by the largest bubbles. As cities catalyze agglomerations, they are important engines for economic growth. In 1960, the selected Latin American countries were fairly distant from South Asian and East Asian economies not only in terms of urban population as a percentage of the total population of a given country but also in terms of gross domestic product (GDP) per capita.

Figure 2.2 Snapshot of the State of Urbanization, Selected Countries, 1960



Sources: gapminder.org 2012; World Bank 2012a.
Note: GDP = gross domestic product; PPP = public-private partnership.

Figure 2.3 Snapshot of the State of Urbanization, Selected Countries, 2011



Sources: gapminder.org 2012; World Bank 2012a.
Note: GDP = gross domestic product; PPP = public-private partnership.

Half a century later, the situation is significantly different. The Republic of Korea and Malaysia are not only as urbanized as Latin American countries but are also richer. The remaining East Asian economies are not significantly far from Latin American countries. Yet, South Asian countries lag behind on both variables. In the case of Sri Lanka, this may have been exacerbated by a definitional change in the early 1990s (Central Bank of Sri Lanka 2011). Even if we recalculate the 2011 urban population to be 40 percent of the total (Lall and Astrup 2009), Sri Lanka would still remain clustered with other South Asian countries instead of closely following its middle-income country competitors.

Even though Sri Lanka has recently experienced reasonable economic growth, urbanization at 15 percent has remained low compared to 40 percent in countries with similar income per capita and long-term economic growth. This leads to the conclusion that the vast majority of the educated labor force of Sri Lanka live in rural areas and small rural towns and are engaged in relatively low-productivity agricultural and service jobs. Urbanization of about 40 percent is needed to move this workforce to higher productivity employment. Well-managed urbanization with proper infrastructure services results in agglomeration economies in the urban centers. This results in higher returns to investment in manufacturing and modern services, making them more attractive to private investment. This, then, helps to balance both sides of the labor market equation, that is, a well-educated labor force employed in well-paying

modern service and manufacturing sector jobs, which in turn will result in sustained high economic growth to double the GDP per capita to more than US$4,000, as envisaged in the Mahinda Chintana.

The Current Situation[10]

Urbanization in Sri Lanka is predominantly a coastal phenomenon. More than 25 percent of the Sri Lanka population live within 1 kilometer of the coast, a strip of land that constitutes only 5 percent of the country's area. As many as 41 cities, out of the 51 cities having a population of over 50,000, are located in proximity to the coast (Asian Development Bank 2010). The highest concentration of urban population is along the west coast, where a contiguous urban belt encircles Colombo as the major urban agglomeration in the country and spreads north and south (National Physical Planning Department 2006). The size distribution of Sri Lanka's cities is skewed toward small cities—there are only 16 cities with a population of more than 100,000; three cities with a population between 100,000 and 500,000; and one, the capital city Colombo, with a population of more than 650,000. Based on the 2001 Census definition of urban areas, only 15 percent of Sri Lanka's population live in urban areas, suggesting that Sri Lanka is underurbanized relative to its level of income (US$2,800 in 2012).[11]

While the Western Province, where Colombo Metropolitan Region is located, covers only about 6 percent of the total land area of the country and has 28 percent of its population, it now accounts for about 45 percent of national GDP and 65 percent of industrial value added. Mainly due to the Colombo Metropolitan region, industrial value added per worker and wages in the Western Province are on an average twice that in all other provinces of the country (World Bank 2010a). However, Sri Lanka's unbalanced pattern of growth is not uncommon in the Asia region, and that economic density is expected to rise further as the country transitions to upper-middle-income status.[12]

The pattern of urbanization described above is about to change. With the end of civil unrest, the government estimates that urbanization will accelerate to 3 to 4 percent per year, and by 2020, about 60 percent of the Sri Lankan population will be living in cities (Ministry of Finance and Planning 2010).[13] As Sri Lanka urbanizes, it will amplify the transformation from a rural-based economy to one based on manufacturing and services. While rapid urbanization can bring about significant benefits and economic development, the expected increase in urbanization calls for effective urban management practices to be adopted across the whole country. Sri Lanka needs to ensure that the benefits of agglomeration economies are maximized while the country mitigates the problems associated with urbanization elsewhere in South Asia and other regions.

Sri Lankan cities are better served compared to other South Asian cities. They are endowed with world-class cultural and environmental assets of strategic importance and, therefore, can act as magnets to tourism. Yet, a significant part of the urban population lives in underserved settlements. Sri Lanka's underserved settlements tend to be relatively small in size and scattered within cities. In Colombo city alone, about half the population is estimated to live in

underserved settlements with limited access to services. The urban poor suffer from social exclusion, high vulnerability to environmental hazards, and limited access to basic services. Only 21 percent of households within Colombo's low-income settlements have individual sanitary facilities, while the remaining households depend on communal latrines (World Bank 2012a). During the heavy rains and floods of the monsoon season, health problems due to water-borne diseases such as dengue affect the urban poor, mostly in the form of income loss due to illness and medical costs. In addition, firewood is widely used for cooking among the poor, indicating a potential indoor air-pollution problem. Urban poverty is particularly widespread in the Province of Sabaragamuwa in the Southwest, where the mean per capita monthly consumption expenditure is only 70 percent of that in the Western Province, compared to over 90 percent for other provinces. These are all early warning signs that Sri Lankan cities may not be prepared to deal with a high influx of migrants.[14]

The Mahinda Chintana Vision for Sri Lanka Urban Development

Sri Lanka needs competitive and dynamic cities to reach its aspiration of becoming an upper-middle-income economy and a global hub by 2016. Accelerating growth to meet the aspirations of US$4,000 per capita GDP envisioned in the Mahinda Chintana will require a major shift in the structure of the economy, and a diversification of the economy into higher-value-added products. Such a profound economic transformation calls for a massive leap forward in the productivity and competitiveness of Sri Lankan cities. As noted, the service sector has started diversifying into modern, export-oriented activities, such as IT and business services, which highly benefit from the agglomeration economies characterizing urban areas. Other service sectors with large growth potential—port-related services and tourism—are also highly dependent on the competitiveness of urban areas for growth, and the country's most dynamic manufacturing exports—value-added apparel, rubber-based products (tires and surgical gloves), and agro-processing (teas and spices)—are either urban based or benefit from proximity to urban areas (World Bank 2012a).

The Mahinda Chintana's vision for Sri Lanka's "Cities of the Future" is to create a system of interconnected regional growth poles. While the government's expectation on the achievement of balanced regional development has not yet been realized, with the ending of civil unrest there is a strong potential for developing regional growth centers to complement and reinforce the positive growth contribution of the Colombo metropolitan region. To this end, the government plans to develop a systematic network of cities linked with each other and with the rest of the world—a vision that will be materialized by the formation of four metro regions (MRs):

1. Colombo MR (Colombo metro city, Gampaha, and Kalutara)
2. North-central MR (Anuradhapura, Dambulla, Trincomalee, and Polonnaruwa)
3. Southern MR (Hambantota)
4. Eastern MR (Ampara and Batticoloa).

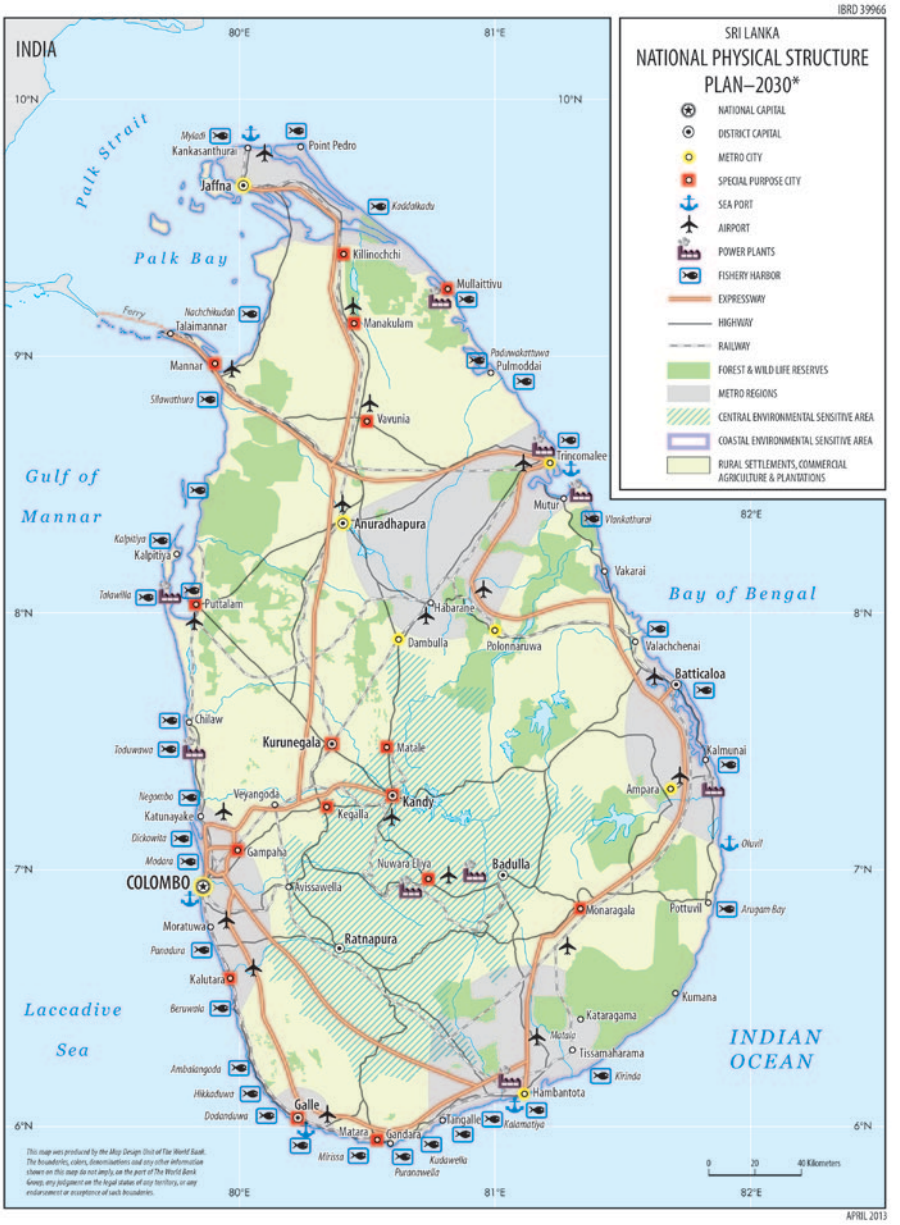
Each metro region will consist of principal cities and secondary cities. Principal cities will be endowed with high-quality urban services, and all cities will be interconnected, enabling each region to grow and evolve as an integrated system. Cities located within the north and east will be given priority to develop under the Reawakening of North and East programs, which are now being implemented, with a total planned investment expenditure of SL Rs 500 billion until 2012 (European Institute for Asian Studies 2011). Map 2.1 illustrates the Mahinda Chintana's cities of the future vision.

The GoSL recently launched an ambitious program of economic and physical regeneration for metro Colombo and has taken steps to establish a metropolitan coordination agency (the Colombo Metropolitan City Corporation) to address the complex challenges of metropolitan management. With the end of the conflict, the GoSL has given priority to the revitalization of regional economies outside the Western Province by launching a number of regional development programs aimed at strengthening local comparative advantages and supporting productivity-driven industrialization. Among the most important regional programs that are under way are the Greater Dambulla and Greater Hambantota programs, and the Greater Matara, Trincomalee, and Greater Galle programs.

Infrastructure Bottlenecks That Need To Be Addressed

The infrastructure of Sri Lankan cities is not adequate to meet the needs of its growing urban economies. Poor solid waste management and underdeveloped sewerage and drainage systems are bottlenecks to areas, such as tourism development, which have great growth and employment-generation potential. On average, only 31 percent of the solid waste generated is collected, although the percentage varies significantly across regions.[15] There are no environmentally and socially acceptable waste disposal facilities in Sri Lanka; therefore, inadequate dumping frequently blocks the natural drainage, increasing the risk of flooding. The country has only a few small-scale landfills constructed on a pilot basis. A solution has yet to be found to the looming solid waste crisis in the Colombo metropolitan area. While access to piped water supply is high overall in urban areas, sewerage facilities are severely underdeveloped. Inadequate sewerage services result in uncontrolled discharge of sewage into waterways and marshes, and the discharge of pollutants by factories is poorly controlled. Sewerage network facilities were limited to the City of Colombo until recently, when the southern city of Hikkaduwa also introduced a sewerage network system. In Colombo city, the sewerage access rate is estimated at 80 percent, and part of the system is in need of urgent repair. Adequate sewage treatment facilities and adequate means of disposal are not available, causing major degradation of urban beaches. Moreover, the Colombo metropolitan area and other cities located on the coast are particularly vulnerable to the effects of flooding. Improved flood and drainage management is a high priority to reduce the economic costs of repeated flooding in Sri Lankan cities.

Map 2.1 National Physical Structure Plan for 2020



Source: Based on National Physical Planning Department 2006.

Urban transport promotes exchange and connectivity; it enlarges the labor market and promotes consistency in the polycentric structure of most of the large cities. Urban transport thus is a key contributor to city competitiveness. Much remains to be done to improve public transportation, road network maintenance, and traffic management in the main cities. Since the per capita

income is expected to continue to increase in Sri Lanka, most families will be able to afford a private vehicle. This will put enormous pressure on the transport infrastructure, especially the road network in urban and suburban areas, where economic growth is concentrated. Although the share of public transportation among the different vehicle modes remains very high in Sri Lankan cities compared to other South Asian countries, it has been decreasing over time owing to inadequate quality and reliability. While congestion and pollution are still not eminent problems, they could be in the future. Adequate regulation of buses and three wheelers, which are the main public transport modes, and improvement of traffic management, could help reduce congestion and pollution, at low costs. A comprehensive approach is required to improve road safety that has been deteriorating over time for want of pedestrian facilities, road safety awareness, and enforcement of traffic signs. Accident costs in the Western Province are estimated to be high (Kumarage 2008). Most investments in urban roads should be used to improve and rehabilitate the existing road network.

Notes

1. The analysis is based on the four-digit International Standard Trade Classification that covers 1,004 product groups. The framework involves calculating the average annual growth rate of both Sri Lankan and world exports over the last 5 years, and the average share of a given commodity in total exports. The means are calculated for 2004–09 to capture the most recent export dynamics, while smoothing out any short-term fluctuations. The average annual growth rates are then used to single out (a) the fastest-growing exports in Sri Lanka, which have an average annual growth rate that is higher than that of total Sri Lankan exports and (b) the fastest-growing industries in the world market using a definition analogous to (a).
2. The Export Development Board is the premier government entity in charge of export promotion, product development, and provision of policy guidelines. Its export development efforts are carried out in consultation with the private sector and other relevant agencies of the government of Sri Lanka (GoSL), including the Board of Investment (BOI). In fact, given the importance of foreign direct investment for national and export growth, BOI exercises substantial leverage in the formulation of export strategies. The Export Development Board's efforts are thus often in line with the foreign direct investment promotion efforts.
3. See Chan and Sieber for details.
4. Authors' calculations presented in Chan and Sieber.
5. Most of the data available cover manufacturing. An analysis based solely on the numbers available would thus penalize services. Yet, services are a major share of Sri Lankan gross domestic product (GDP) responsible for a large part of the country's economic growth. This is likely to remain in the future.
6. This subsection is based on Maarten and Garretsen (2010).
7. See Hapugalle, Raja, and Paradi-Guilford for details.
8. See, among others, World Bank (2003).

9. Bangladesh data for 2012 are not available.
10. This subsection draws on World Bank (2012b).
11. The classification of Sri Lanka's urban areas is based on their administrative definition of local government institutions and their functions, rather than on urban characteristics/indicators such as population size and density, access to services, or employment structure. Areas that were originally considered urban included municipal councils, urban councils, and town councils. The 13th Amendment of 1987, which created the Pradeshiya Sabhas (lowest level of government) by amalgamating rural and town councils, led to the reclassification of 87 town councils from urban to rural, with the consequent reduction in the country's urbanization.
12. The economic density of Colombo is US$15 million per square kilometer compared to US$73 million per square kilometer in Ho Chi Minh city, US$88 million per square kilometer in Bangkok, and US$269 million per square kilometer in Singapore (World Bank 2010a).
13. The forecasts are twice as high as the estimates published by the Division of the Department of Economic and Social Affairs (DESA) of the United Nations Secretariat. DESA estimates that Sri Lanka's urbanization will increase to about 17 percent in 2020 and 21 percent in 2030.
14. When considering urban areas only, Sabaragamuwa is the province with the lowest average levels of urban income and urban consumption (World Bank 2007).
15. The Western Province had the highest collection efficiency, at 63.7 percent in 1998; in contrast, the North Western and North Central Provinces both collect less than 10 percent of their waste. See Sieber for details.

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CHAPTER 3

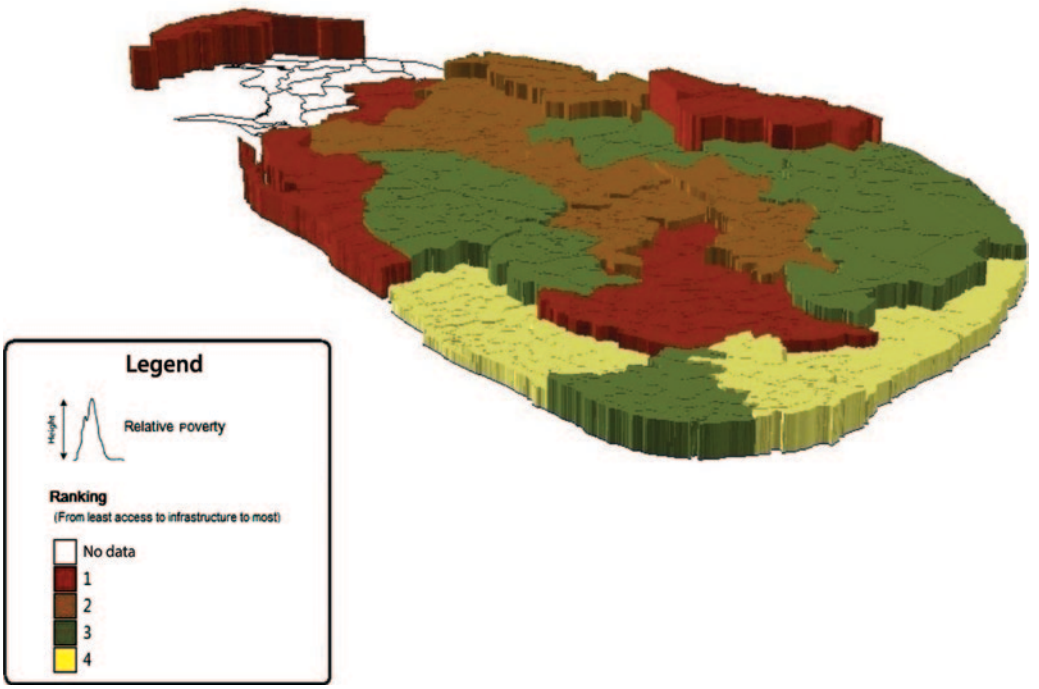
Infrastructure Constraints and Investment Needs

The growth-retarding impact of infrastructure constraints, shown in the specific context of high-potential exports and urban development in chapter 2, would need to be addressed to enable Sri Lanka to move to a higher sustained growth trajectory. Redressing infrastructure constraints, however, cannot be piecemeal and product specific. Rather, a sectorwide approach is needed. Drawing on the detailed analysis presented in background papers #6 through #10, this chapter analyzes key growth-promoting components of Sri Lanka's infrastructure, including government vision and targets as expressed in the Mahinda Chintana and other official documents. This allows infrastructure gaps to be identified and investment needs to be estimated to achieve higher growth, greater international competitiveness, more livable cities, and more productive employment.

While connectivity infrastructure policies may need adjusting, there is remarkable evidence that infrastructure service access in Sri Lanka for key infrastructure like power and water and sanitation is quite inclusive. Different governments in Sri Lanka have emphasized the provision of spatially blind infrastructure, that is, direct benefits to households that have high welfare impact. District analysis where data are available indicates very low Gini coefficients—adjusted by household spatial distribution—for power, water, and sanitation services (0.04, 0.01, and 0.01, respectively).[1] Access is widespread, and the quality of these services throughout the country is generally good. Discounting infrastructure services such as cooking gas and telephone landlines, the picture that emerges is of a country with inclusive infrastructure service provision.[2]

In Sri Lanka, key infrastructure services are generally not regressive. Three scoring methods[3] were used for an initial analysis of the correlation between infrastructure service provision and poverty in the country. All methods yield similar results. Map 3.1 presents a spatial representation of the results corresponding to scoring method III. Sri Lanka is one of the few countries where key infrastructure services (power and water and

Map 3.1 Relative Poverty and Access to Selected Infrastructure Services in Sri Lanka



Source: Based on Ministry of Finance and Planning Household Income and Expenditure Survey 2009–10.
Note: Selected infrastructure services include water, sanitation, and power.

sanitation) do not appear to be regressive. For example, different from India, Sri Lanka's lagging regions (outside the Western Province) are shown with green and gold even where the relative poverty "mountains" are high.[4] This implies the presence of the "principle of inclusion" regarding basic infrastructure service provision since early in the economic development of the country.

The "principle of inclusion" in the country's infrastructure services planning could guide the rehabilitation and possible expansion of infrastructure services provision in the postconflict areas. As discussed, however, the "principle of connectivity" could be used to assist in fostering economic growth in the country as a whole. These guiding principles clearly need to be adjusted to specific regions in the country according to needs assessments, since choices of infrastructure investments and reform policies are made in the planning process. The remaining sections in this chapter discuss specific infrastructure subsectors, their investment gaps, their relation to economic growth, and specific sector policies that may be needed to address existing constraints.

Transport

Transport plays a crucial role in helping Sri Lanka achieve the Mahinda Chintana's targeted 8 percent annual growth rate. As an intermediate service to a wide range of production activities in almost all sectors, transport is widely recognized as central to economic growth.[5] It facilitates the movement of inputs and goods from different locations to markets and consumers. In addition, reduction in transport costs stimulates trade, makes specialization and economies of scale possible, and helps widen markets. Sri Lanka's success depends on having not only efficient ports and airports to connect globally but also an integrated inland multimodal transport system. Sri Lanka is strategically located on the main international ship routes with great potential to consolidate its position as a maritime and aviation hub, and a world-renowned tourist destination. However, Colombo Port and Bandaranaike International Airport (BIA), which are central for international connectivity, are reaching their capacity. Moreover, the inland transport system is poorly integrated across transport modes and is under increasing pressure because of the fast-growing transport demand. Investment in transport infrastructure will also enhance the livability of cities, which will be the centers of economic growth. Reducing congestion and pollution in urban areas will require an increase in the share of public transportation. Furthermore, the capacity of the road system must be enhanced through improved traffic management, better control of intersections in urban areas, and making high-occupancy vehicles a priority. All of these measures are integral to the control of public "bads" that obstruct the benefits of agglomeration economies.

Government Vision and Targets

The Mahinda Chintana provides clear policy guidelines for the entire transport sector (Department of National Planning 2010). For instance, to develop Sri Lanka into a dynamic maritime and aviation hub, it recommends expansion of the Port of Colombo, development of the Port of Hambantota, modernization of BIA, construction of a second international airport at Mattala, and development and modernization of 14 domestic airports. It reaffirms the importance of public transport and formulates an ambitious road rehabilitation and development program. The Mahinda Chintana Randora (National Infrastructure Development Program) and the 10-year horizon development framework set out the vision of a high-quality mobility road network with universal accessibility. This framework recognizes that access to the road network and its quality will improve if the following issues are addressed: (a) increasing road user costs, (b) insufficient coordination among sector institutions, and (c) low capacity of provincial-level authorities.

The Public Investment Plan for 2012–16 further indicates that the transport sector will receive a total investment of SL Rs 218.5 billion (US$1.66 billion)[6] or 3.3 percent of gross domestic product (GDP)[7] over the 5-year period. Out of the total planned investment on infrastructure, 32.7 percent will be spent on

roads, 8.9 percent is allocated for railways and public transport, and 5.4 percent is allocated for seaports and airports.

Growth-Retarding Gaps

Roads

Sri Lanka has one of the densest road networks in the world, but as shown in table 3.1, this was achieved at the cost of inadequate maintenance. Historically, funding for maintenance has been given low priority compared to new projects. As a consequence, most of the roads are still awaiting rehabilitation. It will thus be necessary to increase maintenance funds substantially to ensure a high-quality road network. Moreover, difficulties in acquiring land affect design standards and inhibit road rehabilitation. The design of existing roads could be improved, particularly with respect to vertical and horizontal alignment. Correcting these in rehabilitation projects has been problematic because of the high cost of land acquisition and the difficulties associated with resettlement procedures. As a consequence, some rehabilitation projects have not considered any realignment, which lowers the safety of improved roads at bends and intersections. Most road construction work is carried out through contractors who often have low capacity. In particular, the small- and medium-size enterprises contracted for local authority and provincial roads lack technical and contract management skills. In addition, the industry is not large enough to meet the growing demand for road rehabilitation following the government of Sri Lanka's (GoSL's) ambitious program.

Railways

The sector is in need of investment for rehabilitating the existing assets and expanding new rail lines. The delivery of quality service for both passengers and freight is severely constrained by the depleted assets base, obsolete signal and communication system, and aging rolling stock of the railway sector. Table 3.2 summarizes the operational performance of the sector. As a result, freight transport is continually being lost to road transport, which reduces avenues for profitability. There is also a need to restore the railway lines in the war-affected north and east and to build new railroads to emerging growth centers, free-trade zones, and the port of Colombo. Furthermore, the railway sector is a large landowner. Adequate use of this land may help in the sector's rehabilitation.

Table 3.1 Condition of the Core National Road Network According to the International Roughness Index (IRI), 2011

Roughness (IRI m/km)	*Condition category*	*Percentage of national roads*
Less than 3	Excellent	16
2 to 5.5	Good	27
5.5 to 7	Fair	13
7 to 10	Poor	33
More than 10	Very poor	11

Source: Ministry of Ports and Highways 2012.
Note: The IRI is an international standard and comparable measure to assess the quality of roads.

Table 3.2 Summary of Annual Railway Operational Details, 2004–09

Annual operations	*2004*	*2005*	*2006*	*2007*
Total number of trains scheduled	116,051	116,024	115,281	122,132
Total number of trains operated	107,216	106,074	107,055	112,956
Cancellations	8%	9%	7%	8%
On-time arrivals ± 5 minutes at destination	41%	38%	37%	31%

Source: Sri Lanka Railway (SLR), Planning Division.
Note: Data include both passenger and freight trains.

Table 3.3 Railways Operational Expenditure, Income, and Subsidies, 2005–11
in million US$

	2005	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*[a]
Operational expenditure	48	57	64	72	77	54	62
Total income	17	22	26	32	35	30	32
Percent cost recovery	35	39	41	44	45	55	52
Total subsidy/loss	31	35	38	40	42	24	31

Source: Central Bank of Sri Lanka 2011.
a. Provisional.

In addition, Sri Lanka Railway (SLR) has been unable to recover operational costs (table 3.3). A management and business plan for SLR is needed along with adoption of good commercial practices in house. Private sector participation is limited, because the Railway Ordinance does not allow outsourcing of operational activities. SLR recovers less than half of its operational costs and requires significant government subsidies. Overstaffing is also a problem that needs to be addressed. Safety is a major concern; there have been many fatalities due to derailments because of speeding, overcrowded trains, elephants crossing, and malfunctioning of the braking system. In addition, unsecured crossings have been a significant source of accidents in the country; of the 1,000 railroad crossings in the network, only 200 are secured.

Aviation

The sector needs to be better integrated with other modes of transport (road network, railways, and buses) in order to benefit from economies of scales and improve domestic connectivity. For instance, BIA is not well connected with the road network, railways, or buses. This low level of integration inhibits the flow of people and goods, and thus the growth of the industry and tourism sectors. BIA requires more investment to realize its potential as an aviation hub. One possibility to increase BIA's attraction is to promote it as a stopover airport by marketing shopping, sightseeing, and getaway holidays in and around Colombo. BIA also needs a domestic terminal that facilitates speedy transition of passenger and cargo between international flights and domestic flights. An expansion of the airport should accommodate domestic civil flights, including helicopters and floatplanes. Passenger demand for domestic aviation services is low due to small coverage and low-quality domestic airports. More investment is needed to meet

the renewed demand from tourism. New market entrants could further enhance the attractiveness of domestic aviation by lowering prices. However, private operators are at a competitive disadvantage, because they do not enjoy the same tax exemptions and concessions as state-owned airlines and face severe restrictions for getting government approvals.

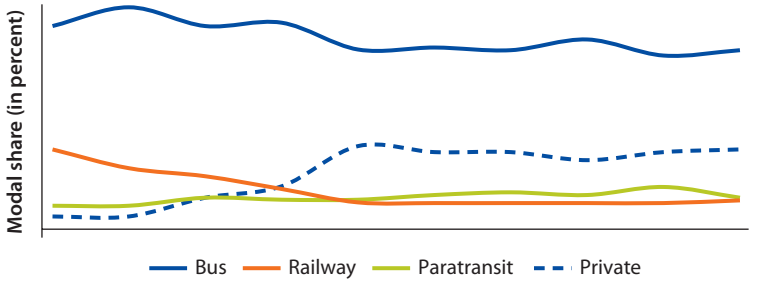
Ports

The main challenge in the ports sector is to increase the productivity and thus competitiveness of the Colombo Port. This primarily implies lowering the overall transaction costs relative to the competition. This is not a simple matter of price—all factors that might affect cost need to be carefully monitored and controlled, including vessel delays, port charges, and handling efficiency, as well as workers' pay and labor productivity. The latter may be difficult to achieve because of extensive unionization. The Colombo Port also has to provide cost-effective solutions for Indian exporters to retain its position as a transshipment hub. Owing to the limited capacity of the domestic market, transshipment alone remains the future of the Colombo Port. The Indian market is particularly important since almost 39 percent of the containers are transshipped to the subcontinent.[8] Just-in-time delivery is becoming increasingly important, which is why the Colombo Port should develop efficient and cost-effective transport solutions for Indian ports and shipping lines. Finally, to realize its full potential, port access and intermodal connectivity must be improved. The Colombo Port is located at the end node of the main commercial city center in the country and, thus, has major access problems. The port operations are not well integrated with other modes of transportation, particularly railways. Truck access to the port is inefficient, causing major congestion. City planning, railway access, and integrated logistics centers are required to ensure efficient port operations.

Transport Services

The quality and frequency of bus service need to be improved, including the quality of vehicles, driver's conduct, value-added services, reliability, and comfort. Insufficient adherence to timetables has contributed to poor service quality and a deterioration of road safety. Integrated network planning would facilitate easier transfers and hubbing operations of buses at different locations. Facilities for the disabled also need to be improved. Transport services would be modernized through the use of information and communication technology (ICT). For instance, the introduction of intelligent transport systems could help (a) manage buses, passenger loads, and routes; (b) reduce vehicle wear; and (c) improve safety, transportation times, and fuel consumption. Finally, unregulated paratransit, such as three wheelers, creates significant congestion, pollution, and safety problems. A significant proportion of three-wheeler drivers are unlicensed, and are frequently involved in traffic violations, accidents, and even crime. In addition, three wheelers create parking problems and increase prices through their collusive behavior. Regulation will be essential to manage the paratransit system and ensure clean, safe, and affordable transportation.

Figure 3.1 Share of Passenger-Kilometers, by Mode, 1958–2007
percent



Source: TransPlan database, University of Moratuwa, Sri Lanka 2010.

Road Safety, Congestion, and Pollution

A comprehensive approach is needed to address road safety problems requiring better institutional coordination, including better enforcement of rules by the road police, greater safety awareness of both drivers and the public, and better road safety standards and norms. In addition, road projects do not always practice minimum safety standards, and rehabilitated roads tend to lead to higher and more serious accidents. The deregulation of the bus sector has led to a sharp rise in accidents because of weak regulation and enforcement. Congestion and pollution are increasing problems in urban areas owing to higher use of private vehicles. Dissatisfaction with public transport sector buses and trains, coupled with rising incomes, has driven more people to use private vehicles (figure 3.1). As a consequence, congestion and pollution have increased rapidly in urban areas. Mass transit systems should be studied in depth to see how using public transport could be encouraged.

Estimating Transport Sector Investment Needs

The transport infrastructure needs for Sri Lanka are estimated using a benchmarking approach.[9] The benchmarking approach consists of identifying the physical infrastructure needed to meet specific connectivity targets.[10] It allows the estimation of total investment by levels of connectivity (regional, national, rural, or urban), by mode of transportation (roads, railways, ports, or airports), and by expenditure category (improvement, upgrading, expansion, or maintenance). The investment gap can be determined by applying a matrix of unit costs to the physical investment needs. To determine the unit cost of each type of investment, the World Bank's road database was used. The data were fine-tuned with information from recent projects carried out in Sri Lanka and validated by transport experts. Since the unit cost depends on how the connectivity targets are defined, the results are presented for two scenarios: an upper- and lower-bound scenario. The upper-bound scenario aims for a high level of connectivity comparable to that of developed countries, with all infrastructures maintained in good condition. A lower-bound scenario is also computed using more modest standards. While this methodology has drawbacks, it is the most appropriate,

considering the limited data available. An important caveat is that while the estimates can be disaggregated, the methodology is not designed to be precise at the subsector level.

For each subsector, targets are defined for regional, national, rural, and urban connectivity. Regional connectivity is concerned with internationally traded goods and international passenger movements. Since Sri Lanka is an island, targets are only set for air and maritime connections. National connectivity targets encompass the entire inland transport network, that is, roads, railways, and domestic airports. The urban connectivity targets largely focus on road density and railways, whereas rural connectivity is mainly concerned with access to roads.

Using this benchmarking model, an annual average share of 2.49 to 4.16 percent of GDP should be invested in the transport sector (table 3.4). This is in line with the government plan for 2010–15, where 2.5 percent of the GDP per year is expected to be invested in these sectors.[11] Approximately 31 percent of the investments in the sector should be allocated to the maintenance of assets. These allocations are substantially different from the government's plans, where new construction and expansion take up the largest shares.

Table 3.4 Estimated Transport Investment Needs under Lower-Bound Scenario, 2011–20
in million US$

	New/Expand	*Improve*	*Upgrade*	*Maintenance*	*Total*
Lower-bound scenario					
National roads	0	2,265	477	772	3,514
Provincial roads	0	2,714	0	565	3,279
Rural/other local roads	0	3,935	0	700	4,635
Urban roads	0	512	540	198	1,250
Ports	128	336	0	450	914
Airports	251	8	18	159	436
Railways	0	231	48	399	678
Total investment	379	10,001	1,083	3,243	14,706
Annual investment	38	1,000	108	324	1,471
Percentage of total	3%	68%	7%	22%	100%
Percentage of GDP	—	—	—	—	2.49%
Upper-bound scenario					
National roads	0	2,718	1,350	2,185	6,253
Provincial roads	0	3,257	0	1,598	4,855
Rural/other local roads	0	4,722	0	1,982	6,704
Urban roads	0	667	1,191	333	2,191
Ports	1860	40	0	810	2,710
Airports	424	10	22	207	663
Railways	0	528	153	577	1,258
Total investment	2,284	11,942	2,716	7,692	24,634
Annual investment	228	1,194	272	769	2,463
Percentage of total	9%	48%	11%	31%	100%
Percentage of GDP	—	—	—	—	4.16%

Note: GDP = gross domestic product; — = not applicable.

Issues Concerning the Provinces

To help prioritize investments, a multicriteria analysis is used to identify transport interventions at the provincial level. The multicriteria analysis has identified the following:

- Three priorities for the Western Province range from improvements in public transportation to multimodal transport access for BIA. The first priority is the electrification of railways in the Colombo metropolitan region, which would enhance the share of public transport and, in turn, lower congestion and pollution. Second, the introduction of a rapid transit system in Colombo metropolitan region is recommended, which would have a similar effect. Third, multimodal transport access to BIA is essential for enhancing Sri Lanka's competitiveness. Integrating BIA with landside transportation is thus a top priority.

- The key priority for the Southern Province is a "Multimodal Transport and Logistics Operations Study." This study should aim to (a) identify the different infrastructure and services required; (b) identify the required points of intermodalism and interchange; (c) identify the functions of the degree of complementarities required; (d) design the required functionality and capacity for the future based on potential transport and traffic forecast; and (e) construct the required intermodal facilities.

- A similar study should be undertaken for the Northern Province to identify the transport systems and infrastructure needs for its new economic development strategy. This analysis would (a) undertake a capacity assessment study; (b) design missing infrastructure for intermodal integration; (c) construct selected infrastructure facilities required as priority; and (d) provide institutional capacity building for transport agencies in the Northern Province including human resources development.

- For the Eastern Province, the multicriteria analysis has identified the development of aviation for tourism as a key priority. To develop the aviation sector for tourism, it would be necessary to (a) study whether the airports in the Eastern Province could be integrated with tourism development and commercial centers; (b) determine the landside integration; (c) design one or two selected airports as regional airports; and (d) implement projects along with development of infrastructure for access modes and infrastructure.

- For the Uva Province, two priorities are needed to support its wider economic development strategy. First, the development of the road network is essential for tourism promotion. The aim is to (a) identify tourist locations and constraints for access, including scenic routes and connectivity between holiday resorts; (b) design and construct the key links with viewpoints and turnouts for vehicles; and (c) formulate a maintenance program for such facilities with tourist agencies and operators. Second, integrated supply chain development

should be promoted within the province for logistics processing and for value-adding services. Such a project would increase employment and trade within the province.

To conclude, the efficiency of the transport system could be further enhanced by focusing on multimodal integration. The sectoral development plans have been crafted independently for each subsector, resulting in a lack of multimodal integration. The whole transport system would become more efficient, if the existing interface problems were addressed. These include rail-to-port and road-to-port links, feeder bus-to-rail services, a single ticketing system for road and rail transport, and thorough documentation for road and rail freight services. Observers have also pointed out that the largest obstacle to improving integration and transport efficiency is the absence of a lead transport ministry.

Quality public transportation services will also increase efficiency and, at the same time, the livability of Sri Lanka's cities. Congestion and pollution are increasing problems in urban areas. These problems can be addressed by improving the quality and frequency of public transportation services that have been neglected for three decades. In addition, it would reverse the trend of increased private vehicle and unregulated three-wheeler use. However, it is recommended that these issues be addressed after analytical assessments. Sri Lanka's cities will also become safer and, thus, more livable if the Road Safety Action Plan is implemented. There is a need to address the road safety problems with a comprehensive approach, clear commitment of funds, and active involvement of all stakeholders. While it is appreciated that an action plan agreed to by all the relevant government agencies has been launched, the challenge would lie in the efficient implementation of this plan.

Energy

An efficient, affordable, and clean energy supply is essential for ensuring the competitiveness of Sri Lanka's economy. On the one hand, cheap and clean energy for households can increase labor productivity through multiple channels. These include better health due to reduced indoor pollution as well as improved education and employment outcomes. On the other hand, an affordable uninterrupted energy supply will enable firms to improve their production processes and delivery times. This will, in turn, enhance their international competitiveness. The energy sector in Sri Lanka is high cost and increasingly dependent on expensive and volatile petroleum imports. Until the mid-1990s, most of the new electricity demand in Sri Lanka was met by hydropower, but most of the economically viable sites have now been exploited. The bulk of new energy has to be oil based. This has driven up consumer tariffs due to the high international price of petroleum products. Most of the price volatility has been absorbed by the Ceylon Electricity Board (CEB), which has incurred considerable financial losses during the last decade.

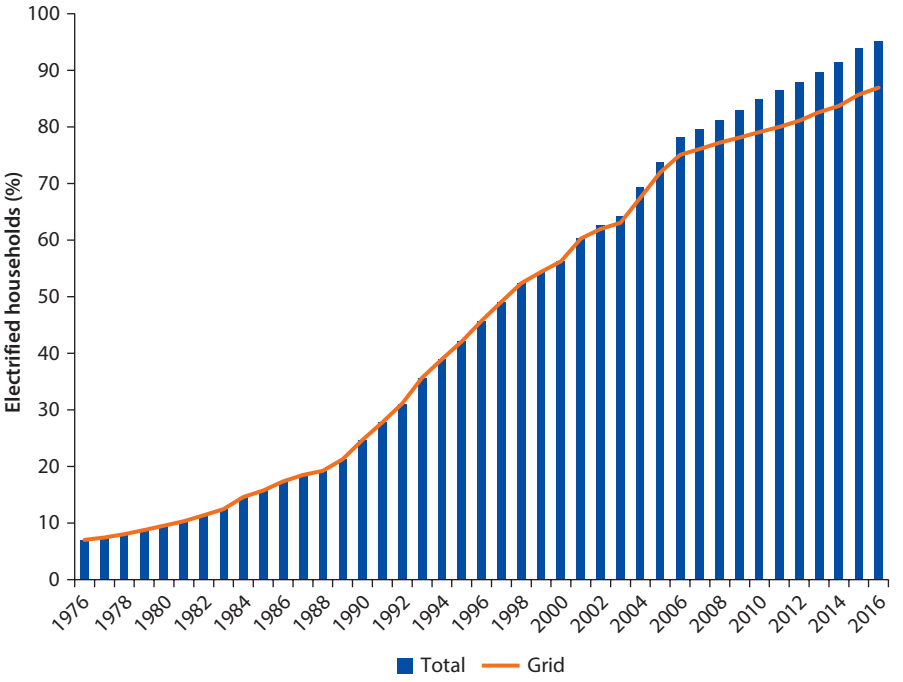
Going forward, it is crucial that Sri Lanka raise sufficient funds to diversify its generation mix toward coal-fired power plants and renewable energies. While

funding has already been secured for the Puttalam Project (a 300-megawatt coal-fired power plant), it is generally difficult to obtain financing for new projects. This is largely due to the high level of indebtedness of the CEB. In addition, the coal-fired power plants suitable for Sri Lanka are not attractive for investors, because they are less efficient and have higher greenhouse gas emissions than the alternatives used in bigger developing countries. Financing the supply from nonconventional renewable energies (NCRE)[12] is equally difficult; large-scale generation from solar energy is not feasible, and wind power is too expensive.

Government Vision and Targets

The GoSL's strategy for the sector was formulated in the 2006 National Energy Policy and Strategies and the Mahinda Chintana. It set several targets, most notably for household electrification and the diversification of the generation mix. In particular, the share of electrified households was to rise to 86 percent by 2010 and 95 percent by 2016 (Ministry of Finance and Planning 2007). The current target of 100 percent electrification is within reach if sizable investments in grid-extension and the transmission and distribution (T&D) network are made (figure 3.2). For the generation mix, the GoSL envisaged a four-fuel mix with an expansion in coal-fired power and NCRE. Goals were also set for tariffs and petroleum prices as well as demand- and supply-side efficiency programs. The initial targets for household electrification were achieved as the level of

Figure 3.2 Share of Electrified Households, 1996–2006



Source: Based on Ministry of Finance and Planning 2007.

Table 3.5 Gross Generation to the Grid, 1980–2010
gigawatt hours; percent

Gross generation	*1980*	*1990*	*2000*	*2010*
Large hydropower	1,480; 88.7	3,145; 99.8	3,154; 47.0	4,989; 46.18
Oil-fired thermal energy	189; 11.3	5; 0.2	3,512; 52.3	5,064; 46.87
Small renewables, largely hydropower			55; 0.81	750; 6.94
Total	1,669; 100	3,150; 100	6,721; 100	10,803; 100

Source: Sri Lanka Sustainable Energy Authority 2012.

electrification increased to 88 percent in 2010 (CEB 2010). By 2010, 88 percent already had electricity, with the majority being connected to the grid. Therefore, with the necessary investments in grid extension and off-grid service provision, the targets are within reach. Improvements of the T&D network are also necessary, because losses are still high in the war-affected north and east.

The NCRE's targets for the diversification of the generation mix are less likely to be met. The NCRE's targets of 7 percent for 2010 and 10 percent for 2015 have been determined without rigorous analysis. As a consequence, it is not surprising that the current achievements fall short of this benchmark, with only 6.94 percent on grid (table 3.5; Sri Lanka Sustainable Energy Authority 2012) and 6.9 percent off grid in 2009. Furthermore, it is unlikely that they will provide considerable capacity in the future, for the following reasons: (a) the large-scale hydropower potential is already exploited, with only a few medium-size sites remaining unused; (b) large-scale power generation from solar energy is not possible; and (c) wind power is too expensive and unsustainable, because the current feed-in tariffs are too generous. Alternatively, the targets for coal-fired power generation will be achieved with only a year's delay if the required financial resources can be raised. The GoSL's targets for coal-fired power generation are 20 percent by 2010 and 54 percent by 2015. As Puttalam I became operational in 2011, the target for 2010 was achieved with only a year's delay. The target for 2015 is also within reach, if the second phase can be completed by 2013 and financing is secured for the Trincomalee coal-fired plant. However, the latter has been difficult, because GoSL guarantees are needed to convince the National Thermal Power Corporation to sign the joint venture agreement with the CEB.

The targets for reforming tariffs have been achieved only for electricity but not for the petroleum sector. The National Energy Policy and Strategies stated that electricity customer tariffs and petroleum prices should be made more cost-reflective. The new tariffs for 2011–15 set by the Public Utilities Commission of Sri Lanka (PUCSL) make a first step in this direction. They gradually restructure tariffs toward cost-effectiveness, while subsidizing low-income households. However, this restructuring process did not continue beyond its initial exercise in January 2011. Instead, the government had to impose a fuel-adjustment charge—25 to 40 percent for domestic consumers and 15 to 25 percent for industrial and other consumers—to cover the losses incurred due to revised oil prices in February 2012.[13] Similarly, the GoSL reintroduced direct price controls in the petroleum sector in 2004 and resumed full control over the liquefied

petroleum gas subsector in late 2010. Yet, a decision was taken in September 2012 to place the Petroleum Corporation under the PUCSL, which will regulate pricing and quality of petroleum products.

Finally, supply- and demand-side efficiency programs have been partially implemented to meet the GoSL's targets. On the supply side, the aim was to reduce T&D losses to 13.5 percent by 2009 and to 12.1 percent by 2015. This target has almost been achieved owing to the extensive rehabilitation of the Lanka Electricity Corporation's network (Sri Lanka Sustainable Energy Authority 2007). On the demand side, appliance-labeling targets for 2007 have not been met, but some achievements had been reported by the end of 2010. These include the mandatory energy-efficient building code and labeling regulations for compact fluorescent light bulbs.

Growth-Retarding Gaps

Updating the Mahinda Chintana's data, table 3.6 illustrates that, on average, US$683.86 million to US$1.285 billion, or 1.16 to 2.17 percent of GDP per year, will have to be invested in the energy sector. This is slightly higher than the investments earmarked under the Mahinda Chintana, largely owing to higher-than-expected NCRE and T&D network development costs for 2011–15. In contrast, the investment requirements for diversifying the generation mix are slightly lower for 2011–15 but higher for 2016–20. The diversification of the generation mix makes up a third of the total investment figures followed by expenditures for NCRE and T&D development.

Table 3.6 Investment Requirements with 10 Percent NCRE Target, 2011–20
in million US$

	2011–15		
	Low	*High*	*2016–20*
Electrification of households—grid	80.5	80.5	22.8
Electrification of households—off grid	26	26	10.2
Tariff rationalization, debt restructuring, and targeted subsidies	70	209	
Fuel diversity, energy security, and reliability in bulk power generation	1,296.6	1,296.6	3,906.1
Renewable energy for power generation	849.5	849.5	1,615.5
Transmission and distribution network development	859.7	859.7	862.3
Supply-side efficiency	38	38	9
Demand-side efficiency	9	9	
Energy sector knowledge management, planning, and funding	190	190	
Total	3,419.3	3,558.3	6,425.9
Annual investment	683.86	711.66	1,285.18
Annual investment as a share of GDP	1.16%	1.2%	2.17%

Sources: Compilation based on Ceylon Electricity Board (CEB 2008), Ministry of Finance and Planning (2007), World Bank (2010), and authors' calculations using average incremental cost and load growth estimates.
Note: GDP = gross domestic product; NCRE = nonconventional renewable energies; T&D = transmission and distribution. The transmission costs include the costs for the T&D network, transmission, and grid substations development; the connection of new power plants; and other costs associated with the transmission systems.

The main challenge in the energy sector is the mobilization of the investment for electricity generation, which falls into three categories: medium hydropower, NCRE, and coal. In the case of rural electrification and the development of the T&D network, securing finance from the existing sources should not be problematic. Bilateral donors are willing to assist the CEB in rural electrification programs, whereas international financial institutions (IFIs) often finance T&D projects, since they do not raise contentious climate change issues. Electricity generation projects fall into three categories: medium hydropower, NCRE, and coal. Each poses different challenges for mobilizing investment, whether through equity or debt:

- ***Medium hydropower projects:*** These face the lowest hurdles. The remaining hydropower projects are relatively small and demonstrably additional under Clean Development Mechanism rules. They should thus be able to secure at least some carbon finance. Most of the hydropower projects have so far benefited from bilateral assistance under concessionary terms. Even if Sri Lanka is no longer eligible for concessional finance, IFIs and bilateral sources (especially Japan) should be available for medium-size renewable energy projects.

- ***Coal projects:*** Completing the coal projects will be difficult. Since financing for the Puttalam II has now been secured, it is crucial to avoid further delays; oil-based generation will already need to fill the gap in 2012 and 2013 even under the present schedule (World Bank 2010). The problems facing the next coal project at Trincomalee are more serious. Negotiations of the joint venture agreement have proven difficult and time consuming. Whether these new arrangements (with the PUCSL as regulator) will provide a more sustainable system remains to be seen.

- ***Generation mix:*** It will be crucial to balance public expectations about tariff decreases against the financial realities of the CEB. The assumption that the fuel cost component of the tariff will decline rapidly once the system moves from oil to coal is correct (World Bank 2010). However, it should be the first priority of the CEB to rebuild its finances and ensure a sound and transparent tariff footing, including automatic fuel cost adjustments. In fact, the CEB will need many years of solid earnings before it will be considered creditworthy enough for commercial financing of its proposed joint ventures. Therefore, the PUCSL must avoid the temptation to reduce tariffs with the coming of the first coal projects. The revised set of tariffs is a first step in this direction, since they introduce cost recovery by 2014.

- ***PUCSL:*** The PUCSL should be made fully operational. The Petroleum Industry Act has not yet been enacted, so the PUCSL cannot assume its regulatory jurisdiction over all aspects of the petroleum industry. More specifically, it cannot assume responsibility for pricing in the partially privatized distribution sector. In the meantime, the energy and petroleum ministries act as regulators

without any predetermined performance or safety standards. The PUCSL should thus continue to focus on tariff rationalization, the effective targeting of subsidies, and the development of planning guidelines and regulations.

- ***Petroleum sector:*** The challenge in the petroleum sector is to avoid the temptation of investing in a new refinery. A new refinery seems attractive from an energy security perspective. However, it is unclear whether a heavy dependence on Iranian crude oil will provide greater security than the reliance on petroleum products, whose sources are more diverse. Any investment decision should be based on an objective evaluation of all the options, with a clarity of assumptions and technology alternatives that currently does not exist. The investment requirements for the distribution infrastructure and storage tank farms are also modest and easily financed by domestic banks. The same is true for the needs of the liquefied petroleum gas subsector.

Water and Sanitation

"Improved" access to water and sanitation is crucial for enhancing the livability of Sri Lanka's cities. International rankings of livability usually consider a range of factors, including the city's stability, health care, infrastructure, education, culture, and environment. According to the 2011 Economist Intelligence Unit report, Colombo ranked among the 10 least-livable cities. One reason for this poor performance is its 90-year-old sewage system, which is close to collapse. To enhance the livability of urban areas and, in particular, of Sri Lanka's economic center, investment in "improved" access to water and sanitation will be essential. Average measurements of improved access to water and sanitation are encouraging, yet vary greatly. By 2009, Sri Lanka achieved the 2015 Millennium Development Goals (MDGs) for improved access to water, with an estimated average of 87.66 percent, while sanitation still lags at 89.45 percent (table 3.7). The MDG targets are 86 percent and 93 percent, respectively. These statistics mask the uneven development across the urban, rural, and estate areas. In addition, access is often inadequate, since water and sanitation services can be too far away or insufficient to meet the household's needs. Sizable investments in both rehabilitation and greenfields will be necessary to ensure livable cities. The largest costs will be associated with the rehabilitation or replacement of the water and sanitation network. Significant greenfield investments will also be necessary in the water sector to meet rural water coverage targets, especially if the access

Table 3.7 Population Access to Water and Sanitation Services, 2009–10
percent

	Urban	*Rural*	*Estates*	*Total*
Improved water	97.42	87.6	60.33	87.66
Improved sanitation	86.4	90.89	74.02	89.45
Adequate water	87.33	65.9	34.17	67.37

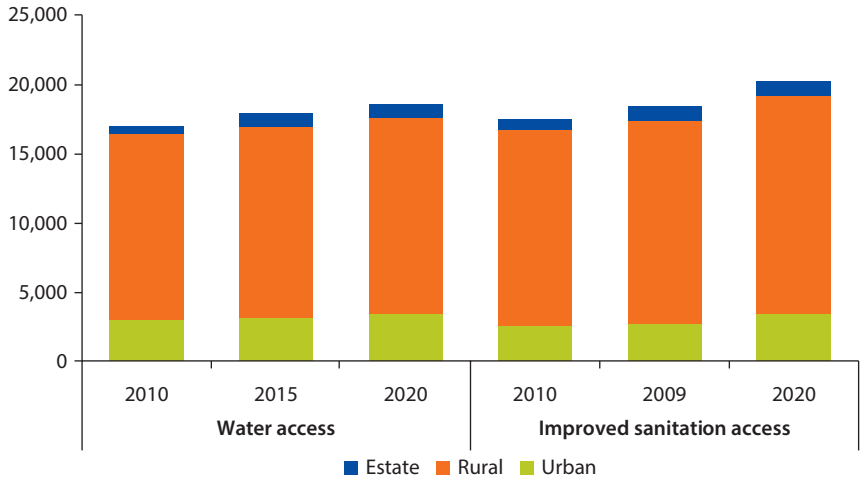
Source: Based on the Household Income and Expenditure Survey 2009–10 (Department of Census and Statistics 2008).

definition includes sufficiency of water and distance to water sources. However, depending on future urbanization trends, more investments may be required in urban areas than in rural areas.

Government Vision and Targets

The GoSL ratified a national policy for rural water supply and sanitation in 2001, in which "adequate" as opposed to "improved" access to water was defined. According to the definition of the World Health Organization and of United Nations Children's Fund's (UNICEF's) Joint Monitoring Program for Water Supply and Sanitation, improved water and sanitation sources are essentially protected from outside contamination. "Improved water" sources are defined as sources that are protected from the exterior (that is, piped water into dwelling, to yard/plot, to public tap or standpipe, tube well or bore hole, protected dug well, protected spring and rainwater). The GoSL's new sector policy further restricts this definition by stating that a water source is "adequate" if it is within 200 meters of the household's premises and yields at least 40 liters per person per day (Rural Water Supply and Sanitation Division 2001).[14] About 87.66 percent of the population has access to improved water supply and 67.37 percent has access to adequate water. Improved sanitation facilities separate people from contact with excreta and are exclusive for each household. The facilities that are included in this category are flush toilets, piped sewer system, septic tank, flush or pour flush pit latrine, ventilated improved pit latrine, pit latrine with slab, and composting toilet. As far as improved sanitation is concerned, Sri Lanka has yet to achieve its goals. However, if the more stringent access definitions are applied, Sri Lanka needs to invest significantly in the water and sanitation sector (figure 3.3).

Figure 3.3 Current Improved Water and Sanitation Access and Future Population Targets
in '000s



Source: Based on the Household Income and Expenditure Survey, 2006–07 (Department of Census and Statistics 2008).

Growth-Retarding Gaps

The estimation of the infrastructure gap and associated investment needs is based on international data and information from World Bank projects. For instance, the estimates for greenfield investments in rural areas drew on the monitoring database of the ongoing World Bank–supported Second Community Water Supply and Sanitation Project. In contrast, the cost of extending urban water and sanitation infrastructure was based on international benchmarks. Similar approaches were used to determine the connection, rehabilitation, replacement, and maintenance costs. Preliminary estimates shown in table 3.8 suggest that US$75.5 million to US$154 million, or 0.13 to 0.26 percent of GDP, need to be spent annually on sector improvements. Infrastructure investments were calculated for Sri Lanka to meet its 2015 MDG targets evenly across its urban, rural, and estate populations. Additional goals were formulated for 2020—90 percent coverage for water and universal coverage for sanitation—and corresponding investment needs were computed. Investment requirements were estimated for both the "improved" and "adequate" access definitions, amounting to US$56.4 million to US$139.8 million annually for the 2015 MDGs and US$94.5 million to US$168.2 million annually for the 2020 targets.

Rehabilitation or replacement costs make up the largest share of the cost estimates, closely followed by greenfield investments and maintenance costs. Rehabilitation or replacement costs range from 40 to 60 percent, depending on the access definition and time period. In contrast, maintenance costs always subsume about a third of all expenditure irrespective of the scenario considered. The share of greenfield investments rises over time to keep pace with the population growth and increased coverage targets, especially in the rural areas for water. Connection costs, on the other hand, are negligible. The estimated costs could, however, be lowered considerably if services were delivered more efficiently.

Table 3.8 Cost of the Service Gap, 2011–20
in million US$ and percent of GDP

	Improved water		*Improved sanitation*		*Total*	
	Lower bound	*Upper bound*	*Lower bound*	*Upper bound*	*Lower bound*	*Upper bound*
Total cost (in million US$)						
2010–15	163.4	378.1	118.7	321.0	282.1	699.1
2015–20	144.3	347.3	209.1	493.6	353.4	841.0
2010–20	307.7	725.4	327.8	814.6	635.5	1,540.1
Annualized cost (in million US$)						
2010–15	32.7	75.6	23.7	64.2	56.4	139.8
2015–20	28.9	69.5	41.8	98.7	94.5	168.2
2010–20	30.8	72.5	32.8	81.5	75.5	154.0
Share of GDP (percent)						
2010–15	0.06	0.13	0.04	0.11	0.1	0.24
2015–20	0.05	0.12	0.07	0.17	0.16	0.28
2010–20	0.05	0.12	0.06	0.14	0.13	0.26

Note: GDP = gross domestic product.

There are two potential efficiency gains that could bring about savings and an improved allocation of scarce resources. First, already-created assets can only be sustained if service delivery is streamlined in rural areas and capacity is built in local institutions to maintain these services. Second, hidden costs or implicit subsidies associated with nonrevenue water (NRW), bill collection efficiency, and tariffs below cost could save the National Water Supply and Drainage Board (NWSDB) up to US$41.6 million annually.

The key challenge ahead is to maintain the achievements of the past, while extending services to a growing population and to people not yet serviced. Despite many years of conflict, Sri Lanka's water and sanitation infrastructure has continuously improved, as demonstrated by the high access rates. However, sizable investments will be necessary to maintain the existing assets, which make up a third of the total investment cost. In addition, service needs to be delivered and extended for the growing population and to people not yet serviced. In fact, access is lower in districts with a higher estate population or a drier climate. With respect to investment priorities, the war-affected provinces in the north and east should be brought at par with the rest of Sri Lanka, requiring a consolidated effort. Nonetheless, less investment will be needed, because access rates are already similar to the national average.

The performance of the NWSDB has improved remarkably in recent decades, but there are still areas for improvement. A key challenge for the NWSDB will be to address the high NRW, especially in Colombo, which was assessed at US$12 million annually. However, the NWSDB reported operating revenue of US$14.2 million (SL Rs 1.9 billion; Central Bank of Sri Lanka 2011) in the financial year 2011, mainly due to the increased number of connections and significant reduction of NRW. The NWSDB incurs an even higher annual revenue loss of US$24 million, because the average tariff is below cost. As in most countries, nondomestic users cross-subsidize domestic consumption; yet, among the domestic users, not all need a subsidy. Revising the tariff structure to ensure only lifeline consumption is subsidized would target the subsidy better and promote water conservation. The PUCSL also needs to play a role here.

The costs associated with the duplication of service delivery, though they could not be quantified, are likely to be sizable. Service delivery is often duplicated in rural areas but cannot be quantified for lack of data. However, these costs are likely to be sizable, given the number of deconcentrated and decentralized government entities in the country. Another cost of duplication, also not assessed in this report, relates to the lost economies of scale and scope in delivering local services. There has been a missed opportunity to create a professional cadre in local institutions that are effective in delivering local services. More comprehensive reviews, beyond the scope of this chapter, are needed to sharpen Sri Lanka's strategy on the institutional service delivery front. This includes not only clarifying the roles of the different government institutions in rural areas but also the definition of a regulatory framework that encourages private investments in the water and sanitation sector. Moreover, if Sri Lanka wishes to move

toward upper-middle-income standards and extend its sewerage network to other urban centers, the institutional arrangements for operation and maintenance of the sewerage systems need to be revisited as well as the way costs are recovered.

Solid Waste

Urbanization and income growth significantly increase solid waste generation, which is a great challenge to local authorities in developing countries. Several empirical studies have shown that solid waste generation increases with income growth (for example, Cole, Rayner, and Bates 1997; Johnstone and Labonne 2004; Karousakis 2006).[15] In addition, more solid waste is generated in cities, because urban households consume more store-bought items and reuse and recycle less solid waste. Managing these growing volumes is challenging for local authorities in developing countries, which typically only collect 30 to 60 percent of the solid waste generated (World Resources Institute 1996). The rest is dumped haphazardly along the streets and on vacant lands, which leads to environmental and health damage (UNEP-IETC-HIID 1996). The solid waste management (SWM) sector in Sri Lanka is no exception, since it is characterized by ineffective collection and inadequate solid waste disposal. On average, only 31 percent of the solid waste generated in Sri Lanka is collected by the local authorities. However, this statistic masks considerable variation, since collection efficiency is typically much higher in urban centers and rich provinces. In addition, the collected solid waste is usually not disposed of in an environmentally sound manner because of a lack of sanitary landfills. The solid waste is instead disposed of in open dumping sites or burned, buried, or used as fertilizer. In addition to the negative health and environmental impacts, poor SWM is damaging Sri Lanka's growth prospects; poor SWM has also been identified as one of the main constraints to the sustainable development of the tourism sector (World Bank 2010). This could be damaging to Sri Lanka's growth prospects, because the tourism sector has great growth and employment-generation potential, especially since the end of the 30-year civil war.

Government Vision and Targets

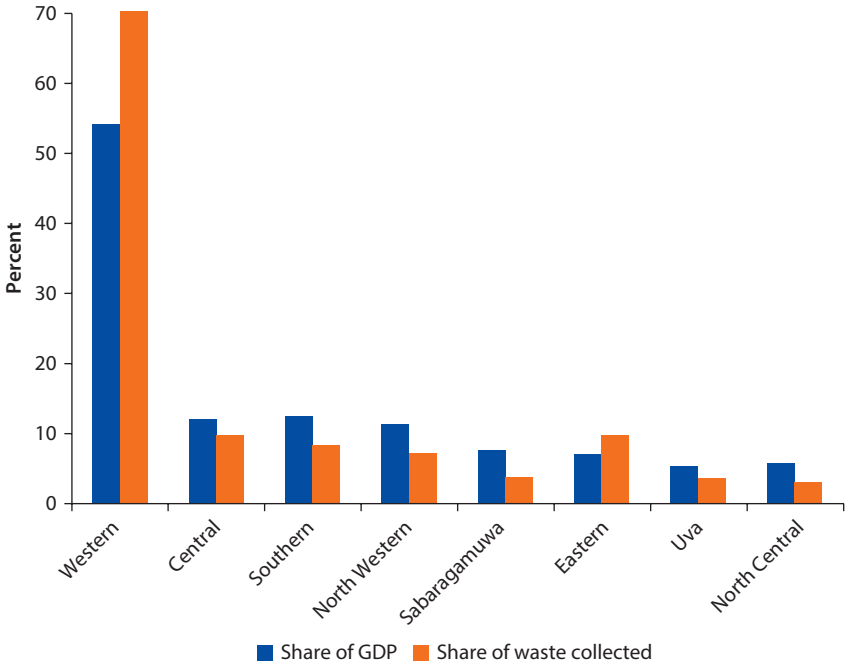
The National Strategy for SWM has promulgated key operational guidelines for achieving collection efficiency. These involve solid waste reduction, reuse, and recycling activities (the so-called 3Rs); source separation; and the provisions of technical guidelines for structuring public and private partnerships in solid waste collection and disposal. It further emphasizes the importance of integrating SWM with urban planning and economic development strategies. One of the main operational issues in implementing the national strategy is poor interagency coordination. In particular, vertical integration of SWM functions across local authorities and provincial and national governments is inadequate. This is discussed in detail in chapter 4.

Growth-Retarding Gaps

The average solid waste collection efficiency of 31 percent is low compared to other comparable lower-middle-income countries, which on average collect about 68 percent of the generated solid waste (Ministry of Environment and Natural Resources 2005; Sieber, background paper #9). However, this national average masks large geographic variation, since collection efficiency is generally higher in urban areas and richer provinces, reaching 65 percent. The inefficiency of solid waste collection can be explained by the low levels of both physical and human capital. There were only 2,300 collection vehicles for the 311 local authorities in 2004 (Ministry of Environment and Natural Resources 2005). More than half of the transport vehicles were handcarts and merely 8 percent were compactor trucks. Efficiency is further reduced by poor operation and maintenance, narrow roads, wrong placement of collection bins, lack of transfer stations for storing and disposing of solid waste, and use of garbage vehicles for other activities. In addition, the solid waste collection and transportation sector is characterized by high absenteeism and an unwillingness of staff to work nights. Figure 3.4 provides a snapshot of solid waste collection in Sri Lanka.

There are no significant environmentally and socially acceptable solid waste disposal facilities in Sri Lanka. Some small-scale sanitary landfills were constructed on a pilot basis, but they absorb only a small fraction of the collected

Figure 3.4 Share of Municipal Solid Waste Collected 2007 and GDP 2011
percent



Sources: Central Bank of Sri Lanka 2011; National Solid Waste Management Support Center 2008.
Note: GDP = gross domestic product. Solid waste management data are for 2007; GDP data are for 2010.

solid waste. Solid waste processing is also negligible.[16] The vast majority is, hence, tipped haphazardly in open dump sites without any environmental controls or in open spaces (Abeysundra and Babel 2005). Many of the open dumping sites are in low-lying areas, such as marshes or abandoned paddy fields, and none of them has been engineered to control the pollutants that are released as the solid waste decomposes (United Nations Environment Programme 2001). This also has consequences for local drainage systems. The construction of new sites is hindered by the lack of public lands and considerable public debate surrounding the location of new solid waste dumping sites. For instance, locations close to residential areas, sensitive natural resource basins, historical and cultural monuments, national parks, and other ecosensitive areas are always contentious. Recourse to legal and political pressures to relocate designated disposal sites away from private lands owned by "politically connected people" add to the institutional challenges experienced by most local authorities. Disputes between local authorities on the location of dumping sites and landfills are also common.

The estimation of the SWM service gap is based on forecasts of solid waste generation and two scenarios of collection efficiency. First, the analysis forecasts the amount of solid waste generated by households, tourists, industries, and hospitals. A further distinction is made between rural and urban areas. Second, the amount of solid waste collected is forecast for business-as-usual and service improvement scenarios. The latter assumes that Sri Lanka would achieve the collection efficiency of the average upper-middle-income country by 2020. The SWM service gap is then captured by the difference between the two scenarios. The infrastructure gap and associated investment needs are calculated based on the estimated SWM service gap. First, the SWM service gap is used to determine the infrastructure gap, that is, the number of transport vehicles (and workers) and sanitary landfills needed to meet the additional demand. Second, the investment needs are calculated based on the annual operating and capital cost for collecting, transporting, and disposing of the solid waste. The capital investments for the appropriate disposal facilities and vehicles were also computed.

Sizable investments in infrastructure are necessary to meet the SWM service gap by 2020. Using the predictions of the amount of waste collected in the business-as-usual and service improvement scenarios, the SWM service gap in 2020 is estimated to be 5,170 tons per day. To meet this gap, infrastructure and manpower requirements are necessary, including the construction of more than 100 sanitary landfills (table 3.9). Moreover, the workforce has to double by 2020, and more than 1,700 vehicles have to be purchased. These investments will on average cost US$25 million to US$182 million per year, or 0.04 to 0.31 percent of GDP, with disposal costs making up to 30 to 40 percent.

A national SWM policy framework needs to be developed. One of the main issues of the national SWM strategy is the difficulty implementing it at the local level without significant modifications. Since the institutional, technical, and financial capacities of rural Pradeshiya Sabhas are very different from those of local authorities in urban areas, the country needs to formulate a national SWM policy framework. This would enable local authorities to prepare strategies based

Table 3.9 Cost of the Service Gap, 2015 and 2020
in million US$/year

	2011–15		2015–20	
	Low	*High*	*Low*	*High*
Waste collection and transportation cost				
Rural Pradeshiya Sabhas	2.29	13.17	3.28	23.09
Urban councils + urban Pradeshiya Sabhas	9.53	54.76	14.59	102.71
Municipal councils	2.36	13.59	3.57	25.15
Total	14.19	81.52	21.44	150.95
Sanitary landfill cost				
Rural Pradeshiya Sabhas	0.93	8.71	1.26	11.82
Urban councils + urban Pradeshiya Sabhas	3.86	36.22	5.60	52.57
Municipal councils	0.96	8.99	1.37	12.87
Total	5.75	53.92	8.24	77.26
Total cost	19.93	135.44	29.68	228.21
Total cost as an average share of GDP	0.03%	0.23%	0.05%	0.39%

Source: Based on Environmental Resources Management 1997, Ministry of Environment and Natural Resources 2005, United Nations Environment Programme 2001, and stakeholder consultations.
Note: GDP = gross domestic product.

on their solid waste profiles and technical and fiscal capacities. Fiscal and management improvements at the local level will also be essential. Some of the recommended operational improvements suggested at the local authority level are (a) the creation of a separate SWM section or department, (b) the revision of the budget format to include a separate SWM head, (c) scaling up the solid waste reduction and recycling practices and increases in service coverage, (d) the creation of community groups for social mobilization and awareness creation, (e) the provision of incentives for the 3Rs, and (f) improved solid waste data management.

In the long term, there should be fundamental improvements in the SWM budget and expenditure management processes. Possible fiscal initiatives include (a) revising the property tax and trade license rates and (b) introducing cross-subsidies or differential solid waste collection charges. In addition, local authorities should manage their manpower, machineries, and equipment more efficiently to raise more revenue. One way to incentivize a more efficient use of the budgetary support would be to decouple the subsidy from the amount spent on wages and link it to operational efficiency parameters instead. To help finance effective SWM at the local level, a two-window funding mechanism should be introduced: a technical capacity-building grant and a capital-financing window. Local authorities not eligible at present for capital loan financing should receive technical assistance to build capacity, improve their fiscal and solid waste data management, and reform their SWM operations. Local authorities with the necessary fiscal and technical capacities should instead be supported via the capital financing window. SWM issues pertaining to public-private delivery of services and improvement in coordination of different tiers of government are discussed in chapter 4.

Telecommunications

The telecommunications sector is one of the backbones of the Sri Lankan economy and shows potential to benefit from the growth of the services sector and the untapped global ICT market. In Sri Lanka, international connectivity and access to high-speed and inexpensive Internet services are sine qua non in the development of a vibrant innovation system. The impact goes beyond the ICT market, expanding into more traditional sectors such as agriculture and manufacturing. The growth and development of the telecommunications sector led by the private sector is an impetus for the national economy. As discussed in chapter 2, Sri Lanka has great potential to benefit from strengthening economic fundamentals and tapping into the global ICT market.

Liberalization, competition, and private investment spurred development in the sector, but the agenda is not over. Regulatory reform, deregulation, and private investment have improved affordability, increased coverage, and widened adoption of telephone services (World Bank 2010). However, tariff wars, slow economic growth, increased inflationary cost pressures, and interest rates have led to the erosion of profits and the inability to reinvest in new technology and expand the network capacity. Over 80 percent of the population now has mobile telephone subscriptions. However, large differences remain between rural and urban areas and across provinces, leaving roughly 18 percent of Sri Lanka's territory uncovered. Low penetration levels are a result of acute supply constraints due to a weak policy and regulatory framework and little competition.

Sri Lanka should address the remaining infrastructure gaps through reforms rather than fiscal means, with the government merely assuming a regulatory role. The growth strategy for the telecommunications sector depends on sustained private investments, with little to no public financing. It is critical to identify and address any gaps in the policy and regulatory framework that might constrain private investment. Sufficient private investment could be facilitated by (a) clarifying the telecommunications policy, (b) completing the liberalization process, (c) simplifying the tax and licensing regimes, (d) strengthening the regulatory framework, and (e) rethinking the approach to universal service. The preeminent role of the private sector in telecommunications precluded the need to estimate an investment gap. Rather, the analysis focused on policy issues.

Government Vision and Targets

The GoSL's strategic objective, as stated in the Mahinda Chintana, is to turn the country into a technology hub for which a modern telecommunications infrastructure is essential. In the Mahinda Chintana, the GoSL identifies a "modern telecommunications infrastructure" as "an essential requirement for rapid economic and social development of the country" (Ministry of Finance and Planning 2007). Therefore, the government's objective is to promote the development of an affordable, high-quality telecommunications network, with equal access in both rural and urban areas, and across provinces. The targets for Sri Lanka's telecommunications sector are realistic but require updating and specification.

Table 3.10 The Telecommunications Regulatory Commission of Sri Lanka's Targets for 2016 and Status as of December 2011

Indicator	*Target for 2016*	*2011 Status*	*2010–11 Growth rates, %*
Fixed telephone subscriptions	18.2 per 100	17.5 per 100	3
Cellular telephone subscriptions	32.5 million	18.3 million	5
Data connections (Internet and e-mail)	252,000 connections	359,000 connections	28

Source: Telecommunications Regulatory Commission of Sri Lanka 2011.

The policy targets for the telecommunications sector were outlined in the Mahinda Chintana and 2006–16 development plan of the Telecommunications Regulatory Commission of Sri Lanka (TRCSL). The current indicators for fixed telephone subscription and the number of data communications are steadily approaching or have exceeded their respective 2016 targets, while cellular telephone subscriptions have yet to near the 2016 target (table 3.10). Furthermore, targets need be updated to new technological realities; for example, new targets need to be specified for broadband penetration.

Growth-Retarding Gaps

There is a need to update the telecommunications policy to lay the foundation for the next generation of network developments. The current policy dates from 1998 and focuses on the principles of competition, high-quality service, and universal service. However, it was developed to address the concerns of the telephony era, not the Internet and broadband age. A key constraint has been the lack of a strategic approach to universal telecommunications services. In the current context, such a strategy would define goals for universal telephone service, expanded broadband services, and universal access to Internet services, with a specific focus on rural areas. In addition, the regulatory agency is weak, because it lacks independence and faces internal capacity constraints. First, steps need to be taken to minimize the opportunities for regulatory capture and strengthen the independence of the TRCSL. The risk for regulatory capture is primarily due to political appointments and the absence of conflict-of-interest rules. Second, the initial practice of hiring TRCSL staff from the state-owned enterprises has lowered its technical capacity, constraining its ability to manage this fast-evolving sector. Stricter service guidelines and streamlined internal processes are also necessary to ensure a high standard for the regulator's activities and interactions with stakeholders.

The existing tax regime also places a high burden on the telecommunications sector. First, the government has imposed sector-specific taxes that impose a relatively high burden on telecommunications service providers. Second, the GoSL taxes multiple stages in the value chain of telecommunications services, thereby inhibiting the growth of the sector through limiting both the demand and the supply side for connectivity. Third, telecommunications companies face problems in the administration of the tax regime, which involve fines for minor

disputes and uncoordinated levy setting. The government has begun reforming the tax regime for the telecommunications sector, a process that should engage all stakeholders.

Sri Lanka Telecom (SLT) still dominates the international connectivity markets, which has significant potential for further liberalization. Owing to the partial liberalization of international connectivity—SLT still holds a monopoly on the international gateway facility—high fees have been sustained. As a consequence, improving the competition at the service level and licensing 32 external gateway operators had only a limited effect. It is thus critical that the gateway be managed as an essential facility with open-access regulation and nondiscriminatory pricing. Moreover, a regulatory framework should be created that brings the prices of international connectivity closer to costs through pricing international leased lines. Sri Lanka lacks a stable interconnection regime that specifies that calls are carried and paid for between different networks. In fact, there is no framework within which specific rates could be defined. This creates uncertainties, because it is not clear how revenue for calls between networks should be shared. TRCSL has made some progress in imposing new guidelines. Continuing consultations with stakeholders—including the private sector and consumers—will be necessary.

The existing licensing regime for telecommunications is overly complex and not aligned with the latest technological developments. There are currently at least 10 markets in Sri Lanka's telecommunications sector, each with its own licensing regime. Such a setup does not ease the introduction of new technologies and business models. In addition, the licensing regime is not aligned with the latest technological developments. First, it distinguishes between the fixed wireless and mobile telephone, which is problematic since both technologies are inherently mobile. Second, there are different licenses for data communications and telephone services. However, the introduction of Internet-protocol-based networking has eliminated technical constraints in providing Internet services. Both distinctions create opportunities for arbitrage. There is a lack of service-level competition, since SLT dominates the broadband market. SLT accounts for 85 percent of broadband subscribers, because it controls the wireline telephone network that is a key channel for broadband delivery. It would be possible to mandate the opening of the subscriber lines through a process commonly known as "unbundling." This would allow alternative service providers to get access to subscribers at mandated cost-plus pricing and would increase service-level competition.

The existing funding mechanism for universal service is inefficient and has created distortions in the market. The universal service fund is created through a per-minute levy on incoming international calls. Not only is this based on an outdated notion of international telephone services as a luxury service, but it also distorts international trade in telecommunications services and creates a gray market for international call services. Funding problems are exacerbated by a slow disbursement of collected funds. To promote service coverage, public funds should help connect the remotest and least-served regions. The spectrum policy

should also be reviewed to accommodate recent evolutions in the market. There have been three important evolutions in the spectrum market. First, the rise of wireless broadband requires the identification of new ranges of spectrum that can support high-speed and mobile data services. Second, advances in technology mean that older assumptions about the need to divide and tightly regulate spectrum are being overturned. Third, the convergence of technologies means that spectrum policy and licenses should be technology and service neutral. There is, thus, an opportunity for Sri Lanka to clarify its spectrum policy, with a focus on the availability of spectrum for advanced services.

Sri Lanka lacks a widespread domestic backbone network. Backbone connectivity in Sri Lanka is currently expensive, limiting the access of businesses and individuals to affordable broadband services in less "Colombo-centric" locations. In addition, there is no clear regulatory framework for leased-lines pricing or for nondiscriminatory access to existing backbone infrastructure. Extending the current network is also difficult because of the high cost of civil works. These problems could be resolved if the telecommunications network used already existing passive infrastructures (for example, railways) as is planned under e-Sri Lanka. A more direct engagement of TRCSL is now required to create a simple mechanism for coordinating such activities in the future. The important demand-side problems in growing the broadband market are affordability and unclear attractiveness of Internet services. First, Sri Lanka's broadband Internet plans are among the most expensive in the region (World Bank 2008). Second, the attractiveness of Internet services, especially in rural areas, is not clear. While mobile telephone services are nearly ubiquitous and have a clear value proposition, the same is not the case for Internet services. Even in media-rich and developed markets such as the United States, half of those who do not have broadband say it is because they do not find it relevant (Home Broadband 2010).

International experience has shown that visionary yet actionable strategies are necessary for strong telecommunications growth, which Sri Lanka currently lacks. These strategies often address both supply- and demand-side concerns and lay out long-term objectives backed up with specific action plans. They are also developed through consultative approaches to both ensure high quality and generate support and visibility (Kim, Kelly, and Raja 2010). Such consultation may be enhanced through the creation of an industry association that serves as a balanced representative of various service providers' viewpoints. As a first step, the GoSL should encourage the creation of such an association and update its sector strategy. The government will also need to focus on creating the appropriate incentives to make telephone services ubiquitous and to accelerate the expansion of broadband networks. The dual objectives of the reform agenda are universalizing telephony and expanding broadband Internet services. The reform agenda should thus focus on (a) clarifying the telecommunications policy; (b) completing the process of liberalization; (c) simplifying the tax and licensing regimes; (d) strengthening the regulatory framework, especially in interconnection and spectrum management; and (e) rethinking the approach to universal service.[17]

Concluding Remarks

The total estimated investment needs of the major infrastructure sectors in Sri Lanka are summarized in table 1.2. Excluding the telecommunications sector, for which estimates are not available, the needed investment ranges from about 0.04 percent of GDP (solid waste sector) to as high as 4.16 percent of GDP (transport sector). The total needed investment (excluding telecommunications) ranges from 3.84 to 6.9 percent of GDP. As previously discussed, investment levels as high as roughly 7 percent of GDP (more if telecommunications is included), if carried out entirely by the public sector, will pose serious fiscal challenges, given the country's low revenue generation, chronic fiscal deficit, and high debt. Thus, prudent management of the infrastructure program will require measures that produce higher returns from any given level of investment. Improving the regulatory and institutional enabling environment discussed in the context of specific sectors in this chapter will help mitigate the need for higher investment, keeping the needs closer to the lower bound. Other important cross-sectoral complementary measures to achieve this goal are discussed in chapter 4.

Notes

1. Authors' calculations.
2. The adjusted Gini coefficient for cooking gas is 0.33 and for landlines and mobile 0.03. The Gini coefficient for gas reflects the widespread use of firewood for cooking in the country, which may have severe health consequences in terms of indoor air pollution (not analyzed in this study but a possible topic for future work).
3. Score I: simple average (sum of the points for each indicator divided by the number of indicators); score II: weighted average using predetermined weights to capture that water and sanitation and power are important direct benefits to households; score III: weighted average using weights obtained from a principal component analysis—a statistical procedure.
4. Height represents relative poverty (number of poor individuals in each district/total headcount of each district). Each district is then ranked between 1 and 4. This ranking is dependent on the quartile the aggregate scores fall into. If a district falls in the bottom quartile, it ranks 1 (red in the map), which indicates poor accessibility to infrastructure, while a district that scores in the top quartile ranks 4 (gold in the map) and indicates highest accessibility.
5. Liu (2001) presents a literature review of the links between transport and economic growth.
6. Exchange rate on September 26, 2012, was SL Rs 130.9657 (Central Bank of Sri Lanka 2012).
7. 2011 Gross domestic product (GDP) of SL Rs 6,543 billion at market prices (Central Bank of Sri Lanka 2011).
8. According to the chief executive officer of the Sri Lanka Shippers' Academy and the secretary general of the Asian Shippers' Council, 4.3 million 20-foot equivalent container units are currently handled by Sri Lanka. Seventy-five percent of this is transshipment, of which 39 percent goes to India.

9. See Rajapaksa and Ruiz-Nuñez for details.
10. A detailed discussion on the estimation of the transport investment needs in Sri Lanka (including methodology selection and the assumptions behind the model) can be found in Carruthers and Krisnamani (2010). Other relevant literature includes Bogetic (2006), Bogetic and Fedderke (2006), Euijune (2002), and World Bank (2006).
11. This comparison does not include investment needs in transport services (that is, railways and buses for public transportation), since the government of Sri Lanka (GoSL) accounting system does not disaggregate investment in infrastructure from investment in rolling stock and buses.
12. Nonconventional renewable energies (NCRE) is defined as small hydro (less than 10 megawatts), wind, biomass, and other energy sources (for example, agricultural solid waste, landfill gas, and municipal solid waste).
13. See PUCSL 2012 for further details.
14. The Rural Water Supply and Sanitation Division also prepared a rural sanitation policy in 2006, which has not yet been ratified (Rural Water Supply and Sanitation Division 2006).
15. A relative delinking of income and solid waste generation was found only at high income levels in developed economies (Mazzanti, Montini, and Zoboli 2006).
16. The main solid waste processing practices followed in the country are composting, recycling, and biogas generation. Composting is a popular practice in estate and urban areas, while commercial composting has become popular in some local authorities in recent years. In fact, the number of compost plants has grown from one plant in 1997 to 56 plants in 2009. Some small-scale solid-waste-to-energy projects were also initiated on an experimental basis, but they had only mixed success.
17. See Hapugalle, Raja, and Paradi-Guilford for details.

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CHAPTER 4

Financing Infrastructure Investment

In chapter 3, it was estimated that an additional 3.84 to 6.9 percent of gross domestic product (GDP) would be required to modernize infrastructure to sustain high GDP growth in the future in Sri Lanka. This will pose a challenge for fiscal sustainability, given the high level of public debt. The regulatory and institutional reform discussed in the context of specific sectors in chapter 3 will help to increase returns to infrastructure investment in terms of the quantity and quality of services. This will help lower the need for total investment in infrastructure and thus help mitigate the impact of the Mahinda Chintana targets on the budget. This needs to be complemented by efforts to reduce the losses of state-owned enterprises (SOEs), delivering infrastructure services to release resources for investment, promoting public-private partnerships (PPPs), improving coordination among different tiers of government, and taking advantage of sectoral synergies to increase returns to investment.

Reducing Losses of SOEs

Reducing the losses incurred when SOEs provide infrastructure services can make a significant contribution to freeing the resources required to achieve the Mahinda Chintana infrastructure and growth targets. The losses incurred by SOEs providing major infrastructure in 2011 are shown in table 4.1.[1] The net losses amount to 1.74 percent of 2011 GDP, and their elimination would release as much as 23 percent of the resources required to meet the lower bound of the financing for infrastructure investment. To eliminate SOE losses, the authorities would need to streamline tariffs and make them more transparent and responsive to costs in the energy and water and sanitation sectors. Electricity tariffs have not passed on the fluctuations in international petroleum prices to customers since the government reintroduced price controls in 2004. However, the recent electricity tariff restructuring by the Public Utilities Commission of Sri Lanka (PUCSL) is intended to make them fully cost reflective by 2015, while subsidizing low-income households. Nonetheless, tariffs are still below cost in the water and sanitation sector, and the subsidies are poorly targeted, with the bottom quintile receiving only 14 percent.

Table 4.1 Losses and Gains of Infrastructure-Providing SOEs, 2011
in billion SL Rs and million US$

SOEs	Losses/gains in billion SL Rs	Losses/gains in million US$
Sri Lanka Transport Board	−2.03	−15.5
Sri Lanka Railway	−4.10	−31.30
Ceylon Petroleum Corporation	−94.51	−721.64
Ceylon Electricity Board	−19.27	−147.14
National Water Supply and Drainage Board	6.23	48.57
Total	−113.68	−867.01

Source: Central Bank of Sri Lanka 2011; Ministry of Finance and Planning 2011.
Note: SL Rs = Sri Lankan rupees; SOE = state-owned enterprise. Exchange rate on September 26, 2012, was SL Rs 130.9657 (Central Bank of Sri Lanka 2012).

The Sri Lanka Transport Board (SLTB) and Sri Lanka Railway (SLR), for their part, need to address extremely high-cost structures. Cost-reflective pricing and efficiency measures can make a major contribution to sustainable mobilization of the financing required to meet Sri Lanka's infrastructure target. Rationalizing poorly targeted fiscal subsidies would need to be an important aspect of reforms to improve the operational efficiency of SOEs to release resources for new investments in infrastructure. In addition, reforms in some sectors would bring much-needed increases in efficiency via newer technologies, better pricing mechanisms, and incentive signals to promote innovation. The associated increase in productivity would not only promote economic growth but also facilitate mitigating the infrastructure gap. Financial assessments of key infrastructure SOEs listed in table 4.1, and also Sri Lanka Telecom and Sri Lanka Ports Authority, are presented in Coomaraswamy and Samarajiva, along with a discussion of the steps needed to improve financial performance.

Encouraging PPP in Infrastructure Provision

PPP Advantages

PPPs for infrastructure financing have the overarching objectives of allowing the public sector to share risks with the private sector in the provision of public services, and alleviating pressures on public budgets. PPPs have the added advantage of tapping into new technologies and increased efficiencies that the private sector may provide. More than 20 years of PPP experience indicates that efficiency/productivity gains from PPP-executed projects over purely publicly delivered projects can range from 10 percent to over 70 percent, and there have also been significant improvements in the quality of service. Under optimal risk-sharing contracts, PPPs can also contribute to significant reduction in costs and delays in construction. A review of construction projects by the UK National Audit Office has shown that, on average, PPP arrangements were responsible for only 22 percent of cost overruns for the public sector compared to 73 percent under traditional procurement arrangements. PPPs also increase the capacity of local industry and bring more innovation to a specific sector. This is advantageous

because by bringing in international construction companies, investors, and advisors, Sri Lanka can quickly adopt international best practices. For example, when applied to road construction and management, this could mean improving the technical quality of not only the road assets but also the expertise of local staff, institutions, and companies involved. Yet, it should be noted that PPPs are not a guarantee of knowledge transfer. Knowledge transfer comes if international companies are willing to bid and have the incentive to build capacity in the local contracting industry.

PPP Experience in Sri Lanka and Future Potential

The government of Sri Lanka (GoSL) has implemented a policy framework (Procurement Guidelines for Development of Infrastructure Projects on a PPP Basis, 2010, and Procurement Guidelines on Goods and Works, 2006) that is currently under review. The legal framework provides specific guidelines on solicitation, drafting, short listing, procurement, litigation, conformity, and unsolicited proposals to ensure transparency. A formal institutional framework for PPPs such as in Chile, Korea, Peru, or South Africa does not yet exist but can be created by integrating the functions of several government departments involved in the PPP process. Guided by the PPP framework, Sri Lanka is beginning to accumulate valuable experience in executing PPPs. The leading sectors that have adopted PPPs so far include the telecommunications sector (five mobile and four fixed line), power (hydro and thermal), seaport terminals (South Asia Gateway Terminal [SAGT] with John Keells Holdings and Asian Development Bank support), housing (Millennium City, Nivasi), real estate development (World Trade Center), and the services sector. The full list of PPP projects is discussed in Biller, Guasch, and Madawela.

The experience with PPPs so far has been good. There have, of course, been difficulties, but none that were not eventually surmounted. The performance of recent important PPP projects is as follows:

- SAGT is one of the largest foreign investments in Sri Lanka, and all reports indicate that it is also an extremely successful one. Data up to May 2010 indicate that cargo volumes handled by the port terminal have risen by 22.3 percent year-on-year up to 175,514, 20-foot equivalent container units. This number increased by 24.4 percent in December 2011 year-on-year. Volumes handled by all terminals have been rising, thanks to improved global trade.

- Asia Power Sapugaskanda, funded jointly by an international consortium of funders and technology partners, has proceeded without any major problems, and appears to have secured effective cooperation from all stakeholders, including the Board of Investment (BOI), Ceylon Electricity Board (CEB), and Ceylon Petroleum Corporation (CPC) in implementing the agreements.

- In the case of Ace Power's proposed plant for Anuradhapura, a protest and mass opposition based on environmental concerns surrounding the project led

to its abandonment in 2001. Following negotiations with the CEB, the Ministry of Power and Energy, and the BOI, it was agreed to relocate the power plant at Horana. Despite the loss of 11 months, the project was successfully completed in December 2002 on a revised schedule. The experience represents a good example of the need to pay attention to different regulations, including environmental ones, and the power of civil society in defense of public goods.

- The Applied Energy Services Corporation (AES Corporation) Kelanitissa plant that operates under a build-own-transfer agreement with the government, CEB, and CPC reports that a number of factors slowed the completion of the project, and the consortium management was of the view that future participation in similar PPP infrastructure projects will depend on the government's ability to spell out a clear policy on its position with regard to private sector participation.

The PPP experience thus far suggests that Sri Lanka remains underserved by this important source of financing investment in infrastructure. The Mahinda Chintana guidance on sector-specific potential PPPs and those given in other documents allow a sectorwide listing of ongoing and potential PPPs.[2] Table 4.2 compares Sri Lanka with similar middle-income countries with respect to their ability to attract PPP projects. Indonesia, Malaysia, and the Philippines are larger economies than Sri Lanka and, as expected, other things being equal, have more PPP projects. The Philippine economy is not as large as that of Indonesia or Malaysia but still has more projects. This may be due to a friendlier environment for attracting private sector involvement, caused by fiscal constraints, search for efficiency, risk sharing, greater infrastructure needs, and other factors. Given Sri Lanka's infrastructure needs and fiscal constraints, it is reasonable to expect that Sri Lanka would need to attract more PPP projects in the coming years. Yet, figure 4.1 also illustrates how PPPs remained stagnant throughout the last decade in Sri Lanka. If the GoSL wants to achieve the goals of the Mahinda Chintana, addressing this imbalance is sorely needed.

Realizing the PPP Potential in Infrastructure

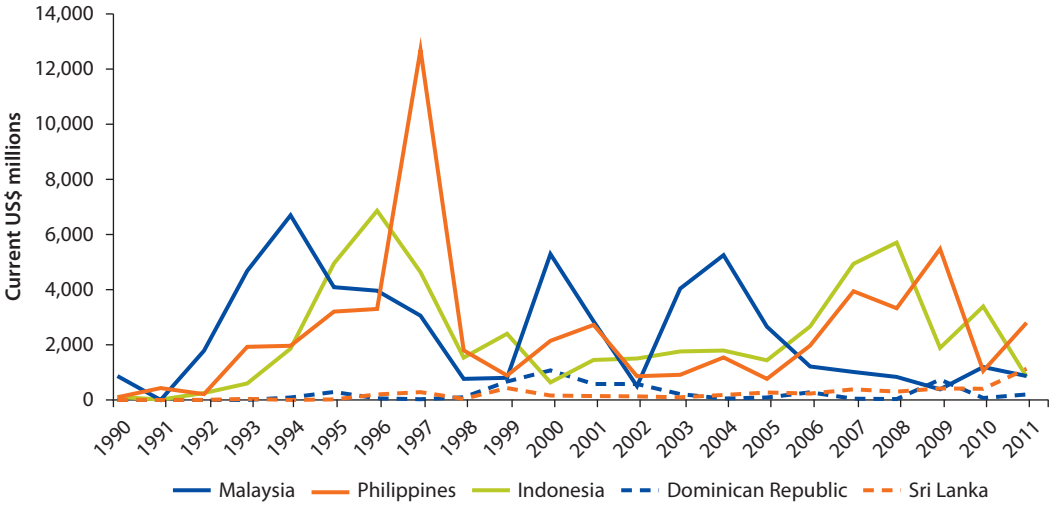
Several countries, including Brazil, Chile, Peru, South Africa, and the United Kingdom, have developed comprehensive frameworks for encouraging PPP in

Table 4.2 Ratios of Level of Population, GDP (PPP), and Number of Private Participation in Infrastructure (PPI) Projects in Sri Lanka

Country	*Population*	*GDP (PPP)*	*Number of PPI projects*
Dominican Republic	0.48	0.85	0.83
Indonesia	11.61	9.64	3.07
Malaysia	1.38	3.84	3.27
Philippines	4.55	3.35	3.70
Sri Lanka	1.00	1.00	1.00

Note: GDP = gross domestic product; PPP = public-private partnership.

Figure 4.1 Private Participation in Infrastructure Total Investment Commitments, Selected Countries, 1990–2011
in million current US$



Source: Public-Private Infrastructure Advisory Facility database. http://ppi.worldbank.org.

infrastructure provision. Experience shows that a strong PPP framework that clearly states the policy, legal, and institutional aspects of contracting PPPs goes a long way in creating the enabling environment for attracting PPPs. Based on lessons learned from 20 years' experience with PPPs around the world, suggestions are offered on salient features to strengthen the PPP process in Sri Lanka (for the full discussion see Biller, Guasch, and Madawela).

PPP Policy Framework and Execution Modalities

Institutional Anchor and Jurisdiction. Leadership of PPP/Infrastructure Initiative: Best practices recommend the establishment of a lean delivery unit with high convening power by virtue of being linked to the highest levels of government, like the Office of the Prime Minister. The major roles of the delivery unit are solving problems in implementation and ensuring effective coordination among the various relevant institutions (line ministries, agencies, subnational governments, and so forth). Backed by skilled professionals, the delivery unit also should monitor progress of salient PPP projects and anticipate problems and find solutions before they become too expensive to set right. Other important agencies include:

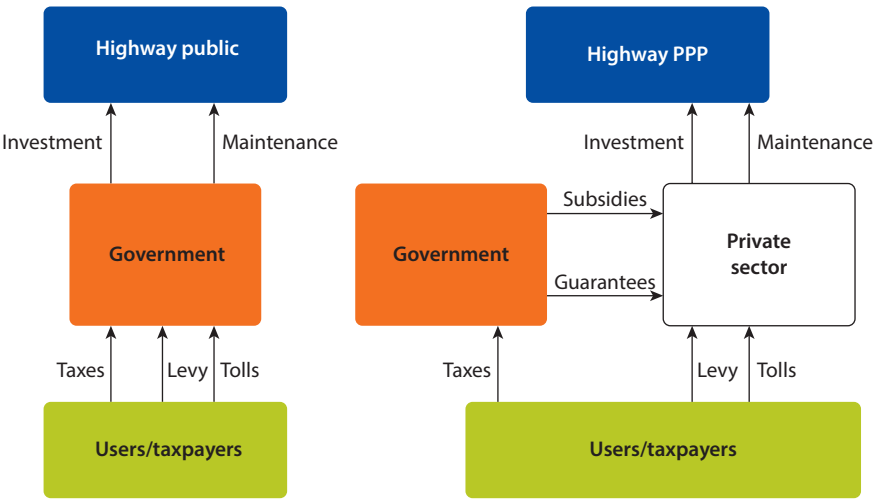
- Line ministries (infrastructure/others) should be in charge of the planning, priorities, and identification of PPP projects (technical analysis/design) and submitting the projects for approval to interministerial committees.
- Interministerial committees (led by finance/treasury) review PPP projects submitted by line ministries, decide on and select and prioritize projects,

validate key objectives/indicators of projects, filter for quality and impact of project, and approve projects for government support.

- PPP unit receives the projects and designs the contract and executes the transaction (and also provides advice); it supports and advises other relevant entities and the state and municipal governments on PPP design and disseminates PPP best practice.
- Treasury/finance ministry leads the discussion in the Inter-Ministerial Cabinet on PPP projects, validates economic impact analysis, assesses fiscal impact and contingent liabilities, and authorizes PPP transactions.
- Superintendence/regulatory agency oversees execution of project and compliance with contract.
- Observatory (linked to the delivery unit) does ex-post impact evaluation and derives lessons for future PPPs.

Needs and Typology of Government Support. Not all projects are viable as PPPs, and they are likely to require support from the government (financial or guarantees). Government support could be financial and nonfinancial, and understanding their links and overlaps is important to minimize the fiscal burden of financial support. PPPs cannot be considered as an additional source of revenue, because the private sector is ultimately paid from the same sources, that is, by users and taxpayers. Nonetheless, it is often considered as such for fiscally constrained countries and where the alternative is no project at all. PPPs allow for the acceleration of the infrastructure program and, at least in the short term, help release the fiscal constraints. As shown in figure 4.2, the private sector will still need to recover its investment and make a profit (but through the life of the project) and expects to be funded through

Figure 4.2 Financing Sources for Highways Through Public Funds or PPPs



Note: PPP = public-private partnership.

the same sources, as budgets often are tolls, fuel taxes, or government contribution (general taxes). Sri Lanka would like to consider a strategy and procedures to (financially) support worthwhile projects that are not fully financially viable. Biller, Guasch, and Madawela present various options for doing this depending on the specific nature of the project.

Eligibility Criteria. Countries with successful PPP experience have established eligibility criteria particularly for government support.[3] Concerns about long-term fiscal impacts of PPP projects prompted governments such as South Africa to establish rules to ensure that projects demonstrate (a) value for money, (b) optimum risk transfer to the private sector, and (c) affordability for government/users (cost recovery). The remaining key risk is that countries cannot afford basic services or undertake future investments if payment levels become unsustainable. Brazil, for example, has established limits on future payments for PPP projects to protect future investments.

Awarding and Accounting for Government Guarantees. Guarantees can be triggered, but it is important to establish rules to ensure that the staff in charge of PPP projects has the right incentives, information, and capacity to evaluate and account for the costs and risks of contingent liabilities. Below are some rules to achieve those objectives:

- Use cost-benefit analysis to select projects and use value-for-money analysis to choose between PPPs and public finance.
- Quantify costs and risks of contingent liabilities.
- PPP approval should occur at the level of the cabinet, or Ministry of Finance, or a government body with an interest in future spending. The Ministry of Finance should review proposed PPPs.
- Governments should bear only those risks that they can manage through control or influence.
- Modern accrual-accounting standards should be adopted for financial reporting to reduce the temptation to use PPPs to hide fiscal obligations.
- PPP contracts and cost/risk information on financial obligations imposed on government should be disclosed.
- Budgetary systems should be modified to capture the costs of contingent liabilities.
- A guarantee fund should be used so the cost of guarantees is recognized when they are granted and to help with payments if guarantees are triggered.
- Government should charge fees for guarantees (this may not be possible at the early stages of a PPP program), which are passed on to the users by the operator.
- Coherent and longer-term sectorwide strategies and policies are needed to support the strategies.
- The government should have the capacity to implement PPPs and to anticipate and address problems well before they become costly delays.

- A conflict resolution process, especially a legal framework for resolving conflicts quickly, is needed.

Strengthening Coordination among Different Tiers of Government

Sectors That Involve Three Levels of Government

Solid Waste

In the solid waste "value chain," processing facilities/landfills require most investment. They may be fully outsourced to private companies, but based on experience, it appears that PPPs would be a better solution. This is the case for two reasons. First, the contracts to manage the relationships with solid waste suppliers may be excessively complex. Second, public resistance to the location and operation of solid waste facilities may be easier to manage if the government is involved. In Sri Lanka, each provincial government, through its Commissioner of Local Government (and in the case of the Western Province, through the Waste Management Authority), should assign local authorities to one or more solid waste processing facilities in a manner compliant with the national policy. Ideally, the institutional design should not lock in local authorities to specific solid waste processing facilities, allowing for competition at the margin among facilities. For example, there should be an obligation to deliver, say, 60 percent of a local authority's solid waste to the assigned facility, but not 100 percent. The minimum commitment will reduce uncertainty in the design of the facility. However, the possibility that 40 percent may go to another approved solid waste facility within or outside the province will create incentives for efficiency and responsiveness to the local authority and/or their agents among the operators of solid waste processing facilities.

Local authorities may choose to collect solid waste using their own personnel and equipment or to outsource these functions, in the same way that street cleaning and similar functions have been successfully outsourced for a long time. Indeed, the Sri Jayewardenepura Kotte Municipal Council is currently using its own personnel and equipment to collect solid waste in one part of its territory and has outsourced these functions in the remainder to a private entity. The efficacy of these arrangements depends on a number of factors, including (a) the capacity of the local authorities to draft and monitor outsourcing contracts that adequately address problems of commitment, (b) the transparency of the grant of the contract, and (c) the number of existing employees and existing investment in equipment. Outsourcing may be applied to collection of solid waste from households and commercial establishments; it can be applied to the operation of depots and the hauling of sorted solid waste from depots to the solid waste processing facility; or it can be applied to both. Ideally, outsourcing contracts will be structured so that benchmarking can be done, for example, by giving multiple haulage contracts instead of one covering the entire local authority.

Benchmarking can be embedded in the contracts, creating incentives for good performance and penalties for poor performance. There are 330 local authorities in Sri Lanka. Given the lack of capacity to draft and enforce outsourcing contracts

within even the largest of these, an outsourcing support cell within an existing organization would appear a useful investment. Model contracts that include incentives for efficiency and gradually higher standards for separation can be provided. Moreover, assistance in modifying them to the circumstances of different local authorities can be offered for a fee or on a subsidized basis. Well-crafted contracts that minimize ambiguity and rest on objective indicators are essential to smooth operation and minimization of conflicts. Currently, a cloud of suspicion about rent seeking hangs over outsourcing contracts and their enforcement. The main reason for this is that the contract has to be enforced by the local authorities, which is one of the interested parties. One alternative would be to resort to the courts. However, their remedies are time consuming and all-encompassing.

A solution would be to apply the natural justice principle that is an integral part of Sri Lankan administrative law and states that a party cannot judge its own case. Since the local authority is one of the parties, an entity other than the local authority must be responsible for settling disputes. The PUCSL has extensive mediation powers (PUCSL 2002) and will hopefully accumulate experience and expertise over time. It may serve as the first stop when conflicts arise with respect to solid waste contracts. Binding arbitration could be the last resort. The regulatory manuals of the PUCSL include detailed procedures for conflict resolution, such as Med-Arb (mediation with arbitration as a last resort) and Arb-Med (arbitration with the decision in a sealed envelope, to be followed by mediation, with the envelope being opened only when mediation fails).[4]

Water and Sanitation

The greatest investment in water and sanitation is required for the pipe networks that distribute water and carry away sewage. Sewerage treatment plants also require significant investment. The major investments that are required for building new pipelines, the refurbishment of the existing deteriorated pipelines, and modern sewerage treatment plants are beyond the resources of the local authorities. The funds cannot be raised from development partners or through PPPs, unless there are viable sources of revenue. A possible solution could be a concession contract that would lock in revenue streams from users of water and sanitation services. However, in a rapidly urbanizing country like Sri Lanka, this is not necessarily a feasible short-term option, but a long-term one. The contract should be between the provincial governments or a multilocal authority entity such as the proposed Metro Colombo Corporation on one side and the PPP operating the system on the other. The contract can include whatever grant elements exist in the financing arrangement and any subsidy or concessional elements that are built in to benefit designated classes of users. Contractual safeguards are possible to address these uncertainties. However well crafted, concession contracts can be interpreted differently by parties over time and may require a conflict-resolving body. The conflict-resolution and interpretation function cannot be given to either party of the concession contract, because that would violate the principles of natural justice. The natural candidate, again,

is the PUCSL. If foreign investors are involved, there may be a need for an international-arbitration clause.[5] However, it is in the interest of all to have a lower-cost, local solution as the first screen.

Sectors That Involve Two Levels of Government

Authority over roads, road passenger transport, and electricity are divided between the central government and the provincial governments.[6] The minor roads that fall under the authority of local authorities are excluded from the present discussion.

Roads

Currently, all main roads are built, owned, and maintained by the central government. Therefore, there is no obvious need for regulation in that government supply can be directly controlled. However, regulation will be required if the national policy on roads, which is assigned to the central government by the Constitution, is changed (either at the national or provincial level) to allow or encourage private investment. Such regulation should create an environment conducive to investment and ensure that suppliers with significant monopoly power do not abuse such powers. The Constitution gives the central government undivided authority over national roads, including limited-entry, limited-exit highways such as the Southern Expressway. It is advisable that the national policy permit private investment through PPPs to build and operate the national roads as toll roads, thereby creating incentives for adequate maintenance. Toll roads generate revenues from users that can be directly applied to maintenance, avoiding the perennial problems of underexpenditure on maintenance. Concession contracts can specify minimum standards such as the International Roughness Index[7] and build in penalties if they are not met. Sri Lankan conditions may not be conducive for toll roads that are fully private except in a few cases, for example, the Katunayake (Airport) Expressway, where demand characteristics are such that tolls are likely to yield adequate returns (Yatanwala and Jayasena n.d.). Therefore, PPPs with significant public investment are likely to be the norm. This would enable the setting of affordable tolls that would attract adequate volumes of traffic to justify the investments.

Concession contracts with significant built-in subsidies would be a solution to increasing investment in road infrastructure. Public investment would be reduced and used to leverage additional private investment. Nonetheless, the interpretation and conflict resolution problems discussed above in relation to water and sanitation services will apply to toll concession contracts, as well. The PUCSL, backed up by international arbitration in the case of foreign investment, complements the solution. In the case of major roads that fall within the complete or partial jurisdiction of provincial governments, the PPP and concession contracts can be applied with modifications if tolling can be justified. The current approach has as its centerpiece the Road Maintenance Trust Fund. The Road Maintenance Trust Fund is expected to come on stream in 2011. It can be focused on the roads that involve no private investment.

Road Passenger (Bus) Transport

There is private investment in bus transport at present but adequate regulation and institutional clarity are lacking. The sector is rife with problems: ownership is highly fragmented, timetables are not respected, oversupply at peak times coexists with undersupply at off-peak times, and there is inadequate articulation between public and private bus services. The private operators on interprovincial routes are subject to regulation by the National Transport Commission that is not independent of the central government and lacks capacity to resolve problems. Intraprovincial operators are instead subject to the authority of provincial road transport ministries and agencies. Further, the constitutional changes effected in 1989 (the 13th amendment) have not been properly integrated into the overall regulatory system, and an unclear division of labor between the National Transport Commission and provincial regulatory authorities remains.

The most critical issues that must be addressed by policy are (a) the overfragmentation of the industry on the private side and (b) the hemorrhaging of losses exceeding total revenues by the public supplier. Excessive fragmentation of the industry makes regulation quite difficult. A majority of private suppliers operate one or two buses and very few of their own fleets. These structural problems can be addressed only by an overall policy that clearly demarcates authority between the national and provincial authorities, provides incentives for private operators to coalesce into companies or cooperatives, and introduces organizational reform of the public supplier. Without these structural reforms, simply improving the capacity or powers of the National Transport Commission will do little to improve sector performance. A draft National Transport Policy has been subject to public discussion[8] but has yet to be formally adopted. It does not address the above concerns adequately.

Bus fares are highly politicized. The best efforts to introduce formula-based tariff regulation that would depoliticize the process by automatically adjusting for increases or decreases in fuel costs have failed to transcend the political pressures. A policy decision to adopt formula-based tariff regulation under the authority of the central and provincial bus transport ministries or to create independent regulatory authorities with clear jurisdiction over tariff regulation must be taken. If the latter option is chosen, the GoSL may consider new legislation on interprovincial bus transportation that would pass authority to the PUCSL. The modular design of the PUCSL is capable of accommodating interprovincial bus transportation; however, this subject was not addressed in the PUCSL Act. A center-province coordinating committee that would ensure articulation of regulatory procedures and decisions would be a necessary element of such legislation.

Electricity

Electricity reforms have been discussed in depth in Sri Lanka, since the late 1990s. In 2002, legislation reflecting the stakeholder discussions was adopted by Parliament but not gazetted. Electricity reform was also ruled on by the Supreme Court. The 2002 legislation was replaced in 2009 by an act that finally gave

regulatory authority over the sector to the PUCSL. The earlier planned unbundling of the CEB was abandoned, though the process led to a functional unbundling within the monolithic organization. In these deliberations, scant attention was paid to Article 32 of the Concurrent List of the 13th amendment, giving both levels of government concurrent jurisdiction over, "extension of electrification within the Province and the promotion and regulation of the use of electricity within the Province."[9] Read in conjunction with the provisions that reserve for the central government subjects not specifically included in Lists I and III,[10] this indicates that electricity generation and transmission are central subjects, while distribution, supply, and extension of services are provincial subjects. The central government has authority to set national policy and is active in this area.[11] Nevertheless, such policy cannot override constitutional provisions that assign the regulation of distribution to the provinces.

The de facto reality, however, is that the PUCSL is in charge of electricity regulation, and another central government agency, the Sri Lanka Sustainable Energy Authority, is in charge of renewable energy, with its powers defined by the Sri Lanka Sustainable Energy Authority Act, No. 35 of 2007.[12] It would appear that actions at the constitutional/legislative level are required to unravel the confusion and restore coherence, especially with regard to distribution and supply, perhaps the politically most sensitive components of the electricity value chain. The central government has clear authority over generation and transmission. In the implicit single-buyer model that has been implemented under the 2009 Act, the most critical relationships are those between the CEB, which controls transmission and is the de facto single buyer, on one side, and the operators of generators, on the other. The 2009 Act requires all generation licensees above 25 megawatts to have some shareholding from an entity controlled by the government, though the shareholding is not specified. The most effective instrument for ensuring investment under these conditions is a power-purchase contract with the single buyer, which is subject to interpretation and conflict resolution by the PUCSL. The 2009 Act requires only accounting separation among the generation, transmission, and distribution units within the CEB. The hope, implicit in the original reform plans, of creating different incentives among the managers of different functional units, is unlikely to be realized. However, the potential for extracting reliable information, which is crucial for effective regulation and management, does exist. This can be realized only by judicious action on the part of the PUCSL backed up by the owner of the CEB, the government.

Sectors That Involve the Central Government Only

Major ports and all airports are solely within the jurisdiction of the central government, according to the 13th amendment to the Constitution.[13] Railways, petroleum (and possibly also compressed natural gas [CNG], liquefied natural gas [LNG], and liquefied petroleum gas [LPG]) and telecommunications are also under the central government jurisdiction.[14] Ports that are not declared as major ports by Parliament may fall under the provincial jurisdiction. They are not

discussed, because they do not exist at present and are unlikely to be of significance in the foreseeable future.

International Ports and Airports

International ports and airports have monopolistic elements, but with regard to transit traffic they compete with ports and airports in the wider region. Policy and regulation should balance these two aspects. The monopoly power derives from the fact that shipping lines and airlines terminating and originating local traffic have no economically feasible alternatives, especially in a small island lacking land links to nearby territories. Ports and airports require high capital investment and are economically difficult to replicate, thereby constituting essential facilities. Networking effects that reward the more connected with more connections reinforce these characteristics, though they are also present in the competing regional hub of ports and airports. As recent European Commission actions against Maersk and other major shipping lines demonstrate (Hansegard 2011), shipping lines are also powerful players capable of collusive behavior.

The current arrangements in the port sector, where shipping lines have integrated downward to port terminals (*World Cargo News Online* 2003), create an environment in which a small number of powerful liner operators are arrayed against the geography-derived power of governments. The terminal in the South Colombo Port has been concessioned out to a consortium that includes China Merchants Holdings, a Chinese government company that has shipping interests and from which China Ocean Shipping Company (COSCO) was spun off. Therefore, shipping line–port terminal integration exists in the Colombo Port, too. The optimal structure would involve the government acting as landlord and terminals that are operated as PPPs, preferably with different terminals operated by different entities. Competition among the terminals would then create incentives for efficiency and good performance in terms of price and quality. An independent, resourced agency that can maintain oversight in terms of mergers and acquisitions and anticompetitive behavior in the port sector is all that is required. Tariff regulation has been tried with little success in India and is being discontinued (Pillay 2011). The present practice at the Colombo Port of the landlord operating two terminals and mandating that the prices offered at the third (private) terminal are identical to its prices is suboptimal.

The airport should similarly be subject to oversight in competition terms, without direct regulation of tariffs. However, the government's present policies appear to be going counter to this principle. In May 2011, the government extended the Sri Lankan Airlines' monopoly on ground handling and catering services at the Bandaranaike International Airport (BIA) by another 10 years (Lanka Business Online 2011e). This is despite the evidence that BIA's ground handling charges are higher than those of its peers (Civil Aviation Authority 2005). Prior to any actions on the regulatory side, a policy change conducive to efficient operation of the airport appears in order. There does not appear to be any interest at the present time on the part of the GoSL in operating airports as PPPs, as is done in India.[15]

At present, noneconomic considerations appear to govern the civil aviation sector, comprising the government-owned existing international airport, the second international airport under construction, and the two airlines on the government side and around 30 foreign airlines. The government operates two airlines, both running at considerable loss for several years (Lanka Business Online 2011c, 2011e). If there is interest in reducing losses and improving performances, PPPs may be considered. As long as the airlines are government owned and operated at a loss, it is unlikely that conditions will be created for the entry of Sri Lanka–based privately owned airlines, because they will only exacerbate the losses of the government airlines. Private investment and management even in the form of PPPs do not appear to be desired. In this light, the creation of conditions conducive to investment through the unbundling of elements amenable to forms of competition (in the market or for the market) and regulation of the remaining elements in ways that allow a level playing field for private entrants to compete in requires a sea change in policy. It is, of course, highly desirable that this take place, if the logistics requirements of Sri Lanka's highly trade-dependent economy are to be met at low cost and adequate quality.

As chapter 2 suggests, and especially as the Logistics Performance Index results reported therein indicate, high port and airport charges are beginning to act as drags on Sri Lanka's export industries, because they face both increasing competition abroad and higher input costs. If the GoSL wishes to enhance the competitiveness of Sri Lanka's goods and services sectors, it should consider adopting the landlord-port model for the container ports at least, along with PPPs for the operation of the terminals. In addition, a disarticulation of airport operation from the loss-making government airlines would be necessary, preferably converting the current fully government-owned airport management company, Airport Aviation Services Sri Lanka Ltd. (AASSL), to a PPP to enable greater investment and efficiency. The government may wish to continue the operation of Sri Lankan Airlines and Mihin Lanka as fully government-owned entities. The historical record indicates that government-run airlines have not done well and that during the brief period in which Sri Lankan Airlines was operated as a PPP, its performance was better even under the extraordinarily adverse circumstances due to the destruction of half the fleet by the Liberation Tigers of Tamil Eelam (LTTE) in 2001. But the most important issue is to free the airport from the yoke of subsidizing the airlines (which was the case even during the time Sri Lankan Airlines was operated as a PPP). The open-skies agreements being pursued by the government will not only open foreign airports to Sri Lanka–based airlines but will also increase the number of flights by foreign airlines to Sri Lanka, thus improving competition not only for passengers but also for air freight.

If the above policy changes are made, the PUCSL can play a significant role in competition regulation and in the smooth operation of the concession agreements. For example, it may be necessary to have competition for the market (periodic concessioning out) in some or all ground handling services, given the relatively small size of the airport. The PUCSL should have oversight of these

agreements to ensure that they do not contain anticompetitive provisions. In addition, it can serve as the mediator of conflicts among the parties, even if more rigorous international arbitration options exist. It can also ensure that port terminal and airport operators treat all shipping lines and airlines without undue discrimination. It is unlikely that there will be many international airports with passenger and freight volumes large enough to be of interest to investors in PPPs. The exception might be Jaffna, which serves an area with extremely high outmigration and may become a source of high-value exports that require air transportation. Since it is the major city that is most distant from Colombo, there has always been demand for domestic air service in Jaffna. This airport, and possibly others, may require regulatory oversight by the PUCSL.

Railways

The railway system is a fully government-owned and operated integrated monopoly, except for marginal private involvement in cement transport and a tourist train. It began to operate as a government department after the repeal of legislation to convert it into a fully government-owned corporation. It is among the government organizations that are racking up large losses, year after year (Central Bank of Sri Lanka 2010). It operates fewer route kilometers than at independence, and its share of passenger and goods transport is miniscule (5 percent and 1 percent, respectively; Central Bank of Sri Lanka 2011) and declining every year. It has enormously valuable assets in the form of large amounts of land in urban centers and rights-of-way linking almost all the major population centers. The "main line" up to Jaffna was the most profitable route prior to the conflict and could well be restored to profitability if institutional reforms accompany the rebuilding of the track destroyed by the LTTE (Samarajiva 2009).

Restoring the railway system as an integral part of the national transport system will require major policy changes and reforms. The double-tracked routes that extend in multiple directions out of Colombo will have to be carved out and developed as a metropolitan rail transport system, possibly with electrification. This could include an airport express service. Dedicated rail tracks can link container yards and dry ports in the interior to the currently highly congested Colombo Port. The main line from Ragama to Jaffna can be carved out and developed separately under a PPP. It could also include spurs to the port and to the planned export-processing zone in Trincomalee (Lanka Business Online 2011a) and Talaimannar, the closest point to India, the terminus of a ferry service in the short term and potentially of an international bridge in the long term (Samarajiva 2010). The carve-outs may be operated as integrated track-and-train operations or with the operation of trains separated from the building and maintenance of track. In the former instance, there is little need for regulation, except possibly in terms of price and quality regulation.

Given the current weakened state of railway transport, intermodal competition will, for the most part, moderate monopolistic behavior by the railway. The solution that separates train operations from the building and maintenance of track has been tainted by the UK experience.[16] However, if the correct lessons

are drawn from the UK experiment and a properly designed model is implemented, the opportunities for greater efficiency gains exist. In this case, there can be competition among different train operators on the same track. If this option is chosen, the regulator's role will be much larger, ranging from ensuring nondiscriminatory treatment by the track operator to prevention of collusion among train operators. The PUCSL has the necessary powers. However, if railway reforms of this magnitude are undertaken, there may be merit in creating a separate transport regulatory authority that will have railways, interprovincial buses, and perhaps even ports and airports under it. This will advance intermodal articulation and allow for the effective leveraging of intermodal competition for the benefit of consumers.

Petroleum, LPG, and CNG/LNG

The petroleum sector was partially liberalized in 2002–03, with the sale of one-third of filling stations previously operated by the government-owned CPC to the Lanka Indian Oil Corporation (LIOC), a company controlled by an Indian government-owned oil company. LIOC was also given the World War II oil tanks and associated facilities in Trincomalee, while the CPC retained control of the storage facilities in Kolonnawa and elsewhere as well as the pipelines serving them. Plans to sell half the filling stations remaining with CPC and to initiate a law that would introduce a new framework conducive to competition were not followed through. The formula for automatically raising or lowering retail prices based on international price movements was also abandoned in 2004. In the absence of legislation, the PUCSL could not regulate the sector as intended, and the Ministry of Power and Energy became the regulator. The entry of the LIOC to the Sri Lankan market allowed relatively lower-cost imports of refined products from the nearby refineries in South India. However, the recurrent losses experienced by LIOC (Lanka Business Online 2006, 2011d) as a result of politically determined retail prices may cause LIOC to exit or at least not invest more in the sector.

Restoring the formula for the pricing of fuel at the retail level will be an improvement in multiple aspects. It will greatly improve the investment climate by preventing administrative expropriation of private investors by politically determined price regulation. However, it has a weakness in that both CPC and LIOC will offer the same prices and only compete in terms of quality and service. LPG is an industry that is integrally tied to petroleum. The government privatized its poorly performing LPG supplier and promised a regulatory agency, but this was not done. The only constraint was the language in the privatization agreement that allowed a number of price increases without the periods between the raises specified. Shell, the private operator, raised prices repeatedly in a short time. The LPG privatization was quickly labeled the worst privatization in Sri Lankan history. Despite this misstep, the privatization succeeded in rapidly raising the number of urban households using LPG as a cooking fuel to about 48 percent (Department of Census and Statistics 2009–10).

After the renationalization (Lanka Business Online 2010), the Petroleum Ministry, under presidential direction, set quotas for the two LPG operators based

on its direct control of the CPC (Lanka Business Online 2011b). Shell imported LPG using a dedicated terminal in Kerawalapitiya that was built to satisfy a condition of the privatization agreement. A new entrant, Laugfs, was allowed to purchase LPG from the CPC refinery. The two companies constituted a duopoly in the industry, except for a short period when a third operator sought entry in 2003. LPG was declared an essential service and subject to rigid price control by the Consumer Protection Authority (CPA). As a result of factors including the resulting administrative expropriation (Lanka Business Online 2007), Shell exited the market and the government renationalized the major LPG supplier in 2010. After the renationalization (Lanka Business Online 2010), the Petroleum Ministry, under presidential direction, set quotas for the two LPG operators based on its direct control of the CPC (Lanka Business Online 2011b). The private operator, once favored by the government, is now at its mercy. Ideally, the LPG industry will be allowed to function under competitive conditions, driving up performance by getting more households converted to LPG, a more efficient and environmentally superior fuel. This would require the freeing up of government control over the input of LPG from the CPC refinery on one side, and the making available of the Kerawalapitiya unloading terminal to competitors under nondiscriminatory conditions and cost-oriented rates on the other. Politically determined tariff setting must be replaced by tariff determination by an independent regulatory agency. The logical candidate is the PUCSL. At present, Sri Lanka uses no LNG/CNG. Yet, there is much talk about introducing LNG, in light of increasing supplies and its environmentally superior qualities. If it is introduced, it will require a greenfield distribution system. It presents an extraordinary opportunity to define an industrial structure and regulatory system starting from scratch.

Telecommunications

Telecommunications is the success story of infrastructure reform in Sri Lanka. Connectivity has increased to extraordinary levels. Voice prices are among the lowest in the world (Nokia 2009). Data prices are also low (LIRNEasia 2010). Even though prices of the privatized fixed supplier were raised by the Telecommunications Regulatory Commission of Sri Lanka (TRCSL) as part of a rate rebalancing exercise (Samarajiva 2000), privatization continues to be popular. The legislation that constituted the framework for the reforms, the Sri Lanka Telecommunications Act, No. 25 of 1991, is still in force, 20 years later, albeit with some amendments made in 1997. It is normal to update legal frameworks in rapidly changing industries before so much time has passed. The National Telecommunications Policy goes back to 1994, again an unacceptably long time ago. The TRCSL is not in compliance with the country's commitments made under the General Agreement on Trade in Services (GATS), especially those regarding public availability of licensing criteria and the publication of the spectrum allocations.[17] The regulatory risk is said to be among the highest in the region (Lanka Business Online 2009).[18]

Implementing laws and a national policy appropriate for the present circumstances would be useful steps. Even without that, several actions can be taken to

improve the conditions for the additional investments needed for rapid rollout of broadband networks and to assist the information technology–based services to become internationally competitive. The highest priority is to modernize market entry by making the procedures more transparent, including the specification of procedures for market exit. It is claimed, based on the fact that many operators including the incumbent have suffered losses in recent years, that opaque licensing has resulted in ruinous competition. The TRCSL has attempted to remedy this by setting floor prices, especially for mobile voice services. The better solution is to make clear the conditions under which operators unable to make profits can exit the market, including the permitting of mergers and acquisitions. A related priority is to make transparent and rationalize the spectrum assignments. Sri Lanka is one of the few developing countries to have refarmed spectrum (Dutta and Mia 2009; Samarajiva 2006). However, this was 7 years ago and action is needed to clear and make available more frequencies for wireless broadband on the basis of a broadly consulted and adhered to roadmap and timetable. The obsolete prohibition against any operator other than Sri Lanka Telecom (SLT) laying wire guides to customer premises, a remnant of temporary measures to mollify trade unions when licensing new entrants in the 1990s, needs to be removed.

The rapid take-up of broadband on wireless platforms using smart phones and other devices is likely to increase pressure on domestic and international backhaul capacity. There is a significant amount of domestic fiber in the country, but it is poorly used. Five undersea cables are operational, though there are difficulties in the use of the main cable station by operators other than SLT. Regulatory action to ensure all operators are able to use domestic and international backhaul capacity at cost-oriented rates and under nondiscriminatory conditions is needed. Over 70 percent of households in the country have been connected without the help of universal service funds. The current universal service fund was originally intended to be closed by 2009, based on the levies on international calls being stepped down annually. It should be closed because the disbursements are too slow and the levies encourage gray market termination of international calls.

Changing perceptions of high regulatory risk is not easy. It will require depoliticization of the TRCSL by creating the necessary conditions for independence, such as staggered terms for members and the appointment of the director general by the commission based on advertisement and competitive selection rather than the present method of appointment by the Minister of Telecommunication and Information Technology. In addition, a period of sustained good regulatory enforcement will be needed to change ingrained perceptions. It was true until 2011 that the sector was affected by layers of complicated levies and taxes. The ideal solution would be to treat the sector as any other, giving it no special favors or penalties, that is, simply subjecting it to the normal value-added tax (VAT) regime. The 2011 budget has removed the VAT from telecommunication services and has cleared the underbrush of multiple taxes and levies, including an ill-advised environmental levy on mobile calls (Lanka Business Online 2010). The end result has been a decrease in taxes collected from consumers and transmitted to government, and a slight increase in the tax burden on the operators

who no longer can claim credit for VAT payments made to suppliers. Of all the infrastructure sectors, telecommunications is the one that requires zero investments of public funds. It is also the sector that has seen the greatest improvement in performance. These are great achievements, despite the shortcomings of the policy and regulatory regime described previously. Therefore, the government could commit to further improving the policy and regulatory environment, since this is of even greater importance in a sector that depends solely on private investment.

Sectoral Trade-Offs and Synergies

Prioritizing infrastructure investment across sectors raises important issues. The fundamental policy challenge is to address the trade-offs and strike a balance between the provision of economic infrastructure that directly increases the growth and employment-generating potential of the economy (such as transport, power and energy, and telecommunications) and delivery of basic services (such as water supply, sanitation, and solid waste management). At present, the highest priority is attached to improvement of roads, since this is expected to generate substantial economic and social benefits. In densely populated areas, the freeing up of rights-of-way for infrastructure poses many difficulties because of the resistance of private landowners. Therefore, there is a natural tendency for electricity and telecommunications cables, especially for access networks that directly connect to business and residential consumers, to be laid along and under roadways. The issue here is that in the absence of properly dimensioned conduits that are constructed as part of the roadway, the required digging and covering up results in damage to road surfaces. The ideal solution is for all new and rehabilitated roadways to include conduits and for an entity other than the Road Development Authority to set the rules for accessing the conduit. The rules will be based on the principle of nondiscrimination among competitive suppliers (especially relevant to telecommunications) and cost-oriented rates. The entity will ideally be the PUCSL, because the conduits can be used for multiple infrastructure sectors.

In the case of telecommunications backhaul networks (optical fiber), synergies exist not only with roads but also with railways and high-voltage electricity transmission lines. As noted, railways, for example, are a major landholder and therefore could alleviate land property rights issues in the country with respect to infrastructure. Multiservice infrastructures such as bridges are also an interesting option. Poor regulatory enforcement has resulted in underutilization of fiber optic cables laid by the incumbent telecommunications operator SLT and the use of less-efficient microwave links by competitors. Regulatory action to ensure nondiscriminatory and cost-oriented access to the SLT backbone network is the first-best solution. The embedding of dark fiber within conduits owned by the Road Development Authority, the SLR, or the CEB is the second-best solution. The lighting and the operation, on nondiscriminatory terms, of the dark fiber can be given on concession. This concession will have to be supervised by a third party, again, ideally, the PUCSL. Less obvious, but still with considerable potential, is the use of sewerage networks carrying electricity and

telecommunications. Here, the original design and construction would have to include purpose-built conduits and access points. There would also have to be rules for nondiscriminatory access set and enforced by the PUCSL.

Notes

1. The Ceylon Electricity Board (CEB) surplus excludes debt and arrears. The CEB received a subsidy on furnace oil, which is reflected in the losses incurred by Ceylon Petroleum Corporation (CPC). A number of local authorities and government departments have debts to CEB. The same appears to be the case with the National Water Supply and Drainage Board.
2. See Biller, Guasch, and Madawela for details.
3. See Biller, Guasch, and Madawela for details.
4. See http://www.pucsl.gov.lk/index.php?option=com_content&view=article&id=164&Itemid=126&lang=en.
5. See UNDP (n.d.) for a case study on water and sanitation reforms that involved international arbitration.
6. The 13th Amendment to the Constitution, 9th Schedule, List I, Article 6, assigns roads, bridges, and ferries, thereon, within the province to the provinces. National highways, bridges, and ferries, thereon, are assigned to the central government. National policy on roads is reserved to the central government under List II.
7. See http://www.dot.state.mn.us/materials/smoothnessdocs/IRIIntroduction.pdf.
8. See the Pathfinder Foundation (2009) and Ministry of Transport (2008).
9. The 13th Amendment to the Constitution, 9th Schedule, List III, Article 32.
10. The 13th Amendment to the Constitution, 9th Schedule, List II.
11. The current policy, described as the Sri Lanka Energy Policy of 2006, was adopted in 2008 (Ministry of Power and Energy 2006). May 2011 news reports indicate that the Power and Energy Minister informed Parliament of his intention to revise the policy (Colombo Page 2011).
12. http://www.energy.gov.lk/. See http://www.energy.gov.lk/pdf/SLSEA%20Act-E.pdf for the enabling legislation.
13. The 13th Amendment to the Constitution, 9th Schedule, List II.
14. The 13th Amendment to the Constitution, 9th Schedule, List II.
15. http://www.pppinindia.com/ppp-centre-civil-aviation.php.
16. The UK railway sector model separates train operators from building and maintaining tracks. This model is criticized for being unnecessarily complex, because it involves extensive coordination among multiple companies (and their subcontractors), causing confusion and raising prices for both operators and passengers.
17. Reference paper of the Fourth Protocol to the General Agreement on Trade in Services (GATS).
18. See also http://lirneasia.net/2011/05/2011-telecom-policy-and-regulatory-environment-tre-survey-results-released-in-dhaka/, where Learning Initiatives on Reforms for Network Economics Asia (LIRNEasia) (2011) and Business Monitor International (BMI) rankings are discussed.

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CHAPTER 5

Concluding Remarks and Recommendations

Sri Lanka's prospects are positive, and the country may well be on its way to achieving high-middle-income status in the next decade. In this sense, the experience of countries that share similarities with Sri Lanka may shed light on how to address certain obstacles in Sri Lanka's development path. Malaysia and Sri Lanka share many similarities and, at different points of time, similar development challenges. Both countries are richly endowed with natural and human capital, and transforming these forms of capital into man-made and social capital in a sustainable manner remains a key challenge. There are, however, notable differences. Malaysia generated rents from extracting its natural capital via hydrocarbon, timber, and palm oil exploitation, reinvesting them in a sustainable way primarily in human capital, and ensuring that the country's social compact does not collapse.[1] Sri Lanka's dependency on extractive forms of natural capital via agriculture and gems is likely to decrease in the future, and its dependency mainly on nonextractive forms of natural capital (for example, its natural beauty potential for tourism) should increase. This can be well associated with its existing human capital since an educated population can better provide high-end services and skilled manufacturing. The way the country uses these forms of capital efficiently to sustain economic growth and development in the medium and long term remains the main challenge.

Sri Lanka's future remains in increased services and manufacturing, but better infrastructure is needed. The services sector is splintering, and the modern, higher-productivity segment is increasing its share. Efforts need to continue to improve the investment climate for investing in modern services. This includes upgrading local standards to facilitate the export of services, further improving infrastructure (increasing Internet bandwidth and lowering the cost of calls to match East Asian levels), expanding the provision of reliable electricity, and taking a more proactive role in international negotiations on traded services. This also includes building high-end tourism infrastructure that allows tourists to enjoy the country's beauty and cultural heritage in a sustainable manner.

Internationally competitive manufacturing and services sectors will create demand for high-productivity, high-wage jobs, which will have to be matched with improved worker skills to take advantage of higher-income opportunities. Given its geography, Malaysia actually had more of an obstacle to address its distance problem than Sri Lanka has at the moment. Malaysia invested in multiple clusters of economic activity and improved the networks of roads that facilitated migration/commuting to work and exchange of goods in areas of dense economic activity. It extensively uses toll highways involving the private sector, which at the moment are nonexistent in Sri Lanka. In Sri Lanka, shortening of distance to promote economic activity in areas other than the Western Province will require lowering transportation costs. This, in turn, will require improving both the quality of road surface and easing congestion by connecting the already dense rural road network with main markets. Given its fiscal situation, it is difficult to perceive how this can be attained without private sector involvement.

The path of sustained high economic growth lies open ahead. It is up to Sri Lankan society to take it. To conclude, seen through the lens of Malaysia's successful economic transition, Sri Lanka has the basis to reap a peace dividend and move into a higher growth path that would help it achieve high-middle-income status in 15 years. Providing better connectivity; rolling out efficiency-enhancing reform to different sectors of the economy, especially infrastructure; and strengthening the competitiveness of manufacturing and modern services will increase the demand for productive workers and will put Sri Lanka on a course for sustained high economic growth.

Note

1. See Biller and Nabi for details.

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The liberalization policy implemented in the 1970s helped Sri Lanka to achieve middle-income-country status in 2010. Sri Lanka is now poised for the next phase of economic growth and productive employment. The two principal drivers of investment for sustained high economic growth are international competitiveness for export-led growth and urbanization. Crucial to both is efficient infrastructure that shortens the international supply chain and brings about agglomeration benefits.

Investing in Infrastructure: Harnessing Its Potential for Growth in Sri Lanka has two objectives:

- To improve understanding of the infrastructure sectors, including their current state and performance, future development needs, investment requirements, and financing gaps.
- To provide policy makers with a sound analytical basis for prioritizing investments and designing policy interventions to mobilize funds and using them effectively for infrastructure development.

Investing in Infrastructure: Harnessing Its Potential for Growth in Sri Lanka assesses the country's infrastructure endowment and performance, analyzes the contribution of infrastructure to economic and spatial development, and outlines investment needs and strategic priorities consistent with the framework of the Mahinda Chintana. Further, it provides a cross-sectoral analysis of the major infrastructure cross-cutting themes, including the links among infrastructure, poverty reduction, and economic growth; the infrastructure institutional and regulatory frameworks; the issues surrounding planning, coordination, and financing of infrastructure projects; and the potential of private-sector participation in infrastructure financing and service provision. Finally, it suggests policy adjustments to improve efficiency and expand infrastructure services where needed.

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